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Year 2000

The product documented in this manual is Year 2000 Ready.

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Commands Reference, Volume 2

First Edition (October 1997)

This edition of the *AIX Version 4.3 Commands Reference, Volume 2* applies to the AIX Version 4.3, 3270 Host Connection Program 2.1 and 1.3.3 for AIX, and Distributed SMIT 2.2 for AIX licensed programs, and to all subsequent releases of these products until otherwise indicated in new releases or technical newsletters.

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About This Book

This book is Volume 2 of the six−volume *AIX Version 4.3 Commands Reference*, SBOF−1877, which contains reference information on Advanced Interactive Executive (AIX) Operating System commands. It describes the tasks each command performs, how commands can be modified, how they handle input and output, who can run them and provides a master index for all six volumes.

For a quick reference list of commands arranged in functional groups, see Volume 6.

Who Should Use This Book

This book is intended for users of AIX commands.

How to Use This Book

A command is a request to perform an operation or run a program. You use commands to tell the AIX Operating System what task you want it to perform. When commands are entered, they are deciphered by a command interpreter (also known as a shell) and that task is processed.

Some commands can be entered simply by typing one word. It is also possible to combine commands so that the output from one command becomes the input for another command. This is known as pipelining.

Flags further define the actions of commands. A flag is a modifier used with the command name on the command line, usually preceded by a dash.

Commands can also be grouped together and stored in a file. These are known as shell procedures or shell scripts. Instead of executing the commands individually, you execute the file that contains the commands.

Some commands can be constructed using Web−based System Manager applications or the System Management Interface Tool (SMIT).

Highlighting

The following highlighting conventions are used in this book:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Format

Each command may include any of the following sections:

Purpose	A description of the major function of each command.
Syntax	A syntax diagram showing command line options.
Description	A discussion of the command describing in detail its function and use.

Flags	A list of command line flags and associated variables with an explanation of how the flags modify the action of the command.
Parameters	A list of command line parameters and their descriptions.
Subcommands	A list of subcommands (for interactive commands) that explains their use.
Exit Status	A description of the exit values the command returns.
Security	Specifies any permissions needed to run the command.
Examples	Specific examples of how you can use the command.
Files	A list of files used by the command.
Related Information	A list of related commands in this book and related discussions in other books.

Implementation Specifics

To list the installable software package (fileset) of an individual command use the **lslpp** command with the **−w** flag. For example, to list the fileset that owns the **installp** command, enter:

```
lslpp −w /usr/sbin/installp
```

Output similar to the following displays:

```
File                             Fileset               Type
-----------------------------------------------------------------
/usr/sbin/installp                 bos.rte.install          File
```

To list the fileset that owns all file names that contain `installp`, enter:

```
lslpp −w "*installp*"
```

Output similar to the following displays:

```
File                             Fileset               Type
-----------------------------------------------------------------
/usr/sbin/installp                 bos.rte.install          File
/usr/clvm/sbin/linstallpv          prpq.clvm                File
/usr/lpp/bos.sysmgt/nim/methods/c_installp
                                   bos.sysmgt.nim.client    File
```

Syntax Diagrams

AIX command syntax is represented by syntax diagrams and usage statements.

Syntax diagrams are designed to provide information about how to enter the command on the command line. A syntax diagram can tell you:

- Which flags can be entered on the command line
- Which flags must take a parameter
- Which flags have optional parameters
- Default values of flags and parameters, if any
- Which flags can and cannot be entered together
- Which flags and parameters are optional
- When you can repeat flag and parameter sequences.

AIX commands use the following conventions in their syntax diagrams:

- Diagram items that must be entered literally on the command line are in **bold**. These items include

the command name, flags, and literal characters.
- Diagram items representing variables that must be replaced by a name are in *italics*. These items include parameters that follow flags and parameters that the command reads, such as *Files* and *Directories*.
- Default values that do not have to be entered are in the normal font on a **bold** path.

The Sample Syntax Diagram illustrates the conventions used in syntax diagrams. Each part of the diagram is labeled. An explanation of the labels follows the diagram.

You interpret the example diagram as follows.

0 PATH LINE	The path line begins the syntax diagram.
1 COMMAND NAME	This item in the diagram is the name of the command you want to invoke. It is in bold, which indicates that it must be entered exactly as it appears in the diagram. In the example diagram, the path branches into two paths after the command name. You can follow either the lower path (discussed in item 2) or the upper path (discussed in item 3).
2 SINGLE CHOICE BOX	If you follow the lower path, you encounter a box with the words *one of* over it. You can choose only one item from this box.
3 DEFAULT LINE	If you follow the upper path, you bypass the single choice box, and enter nothing. The bold line around the box is a default line, which means that you do not have to enter anything from that part of the diagram. Exceptions are usually explained under "Description." One important exception, the blank default line around input and output files, is explained in item 10.
4 REPEAT ARROW	When you follow a path that takes you to a box with an arrow around it, you must choose at least one item from the box. Then you can either follow the arrow back around and continue to choose items from the box, or you can continue along the path. When following an arrow that goes around a box (rather than an arrow that includes several branches in the diagram), do not choose the same item more than once.
5 REQUIRED ITEM	Following the branch with the repeat arrow is a branch with three choices and no default line around them. This means that you must choose one of A, B, or C.
6 GO TO NEXT LINE	If a diagram is too long to fit on one line, this character tells you to go to the next line of the diagram to continue entering your command. Remember, the diagram does not end until you reach the vertical mark.
7 CONTINUE DIAGRAM	This character shows you where to continue with the diagram after it breaks on the previous line.
8 OPTIONAL PARAMETER	If a flag can (but does not have to) take a parameter, the path branches after the flag. If you cannot enter a space between the flag and parameter, you are told in a footnote.
9 DEFAULT VALUE	Often, a command has default values or actions that it will follow if you do not enter a specific item. These default values are indicated in normal font in the default line if they are equivalent to something you could enter on the command line (for example, a flag with a value). If the default is not something you can enter on the command line, it is not indicated in the diagram. **Note:** Default values are included in the diagram for your information. It is not necessary to enter them on the command line.
10 INPUT OR OUTPUT	A command that can read either input files or standard input has an empty

	default line above the file parameter. If the command can write its output to either an output file or to standard output, it is also shown with an empty default line above the output file parameter. If a command can read only from standard input, an input file is not shown in the diagram, and standard input is assumed. If a command writes only to standard output, an output file is not shown in the diagram, and standard output is assumed. When you must supply a file name for input or output, the file parameter is included in the diagram without an empty default line above it.
11 FOOTNOTE	If a command has special requirements or restrictions, a footnote calls attention to these differences.
12 VERTICAL MARK	This ends the syntax diagram.

Running Commands in the Background

If you are going to run a command that takes a long time to process, you can specify that the command run in the background. Background processing is a useful way to run programs that process slowly. To run a command in the background, you use the & (ampersand) operator at the end of the command:

```
Command&
```

Once the process is running in the background, you can continue to work and enter other commands on your system.

At times, you might want to run a command at a specified time or on a specific date. Using the **cron** daemon, you can schedule commands to run automatically. Or, using the **at** and **batch** commands, you can run commands at a later time or when the system load level permits.

Entering Commands

When you work with AIX, you typically enter commands following the shell prompt on the command line. The shell prompt can vary. In the following examples, **$** is the prompt.

To display a list of the contents of your current directory, you would type **ls** and press the Enter key:

```
$ ls
```

When you enter a command and it is running, the operating system does not display the shell prompt. When the command completes its action, the system displays the prompt again. This indicates that you can enter another command.

The general format for entering AIX commands is:

```
Command Flag(s) Parameter
```

The flag alters the way a command works. Many commands have several flags. For example, if you type the **−l** (long) flag following the **ls** command, the system provides additional information about the contents of the current directory. The following example shows how to use the **−l** flag with the **ls** command:

```
$ ls −l
```

A parameter consists of a string of characters that follows a command or a flag. It specifies data, such as the name of a file or directory, or values. In the following example, the directory named **/usr/bin** is a parameter:

```
$ ls −l /usr/bin
```

When entering commands in AIX, it is important to remember the following:

- Commands are usually entered in lowercase.
- Flags are usually prefixed with a − (minus sign).
- More than one command can be typed on the command line if the commands are separated by a `;` (semicolon).
- Long sequences of commands can be continued on the next line by using the \ (backslash). The backslash is placed at the end of the first line. The following example shows the placement of the backslash:

  ```
  $ cat /usr/ust/mydir/mydata > \
  /usr/usts/yourdir/yourdata
  ```

When certain commands are entered, the shell prompt changes. Because some commands are actually programs (such as the **telnet** command), the prompt changes when you are operating within the command. Any command that you issue within a program is known as a subcommand. When you exit the program, the prompt returns to your shell prompt.

AIX can operate with different shells (for example, Bourne, C, or Korn) and the commands that you enter are interpreted by the shell. Therefore, you must know what shell you are using so that you can enter the commands in the correct format.

Stopping Commands

If you enter a command and then decide to stop that command from running, you can halt the command from processing any further. To stop a command from processing, press the Interrupt key sequence (usually Ctrl−C or Alt−Pause). When the process is stopped, your shell prompt returns and you can then enter another command.

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AIX 32−Bit Support for the X/Open UNIX95 Specification

Beginning with AIX Version 4.2, the operating system is designed to support the X/Open UNIX95 Specification for portability of UNIX−based operating systems. Many new interfaces, and some current ones, have been added or enhanced to meet this specification. Beginning with SWsym.AIX42;, AIX is even more open and portable for applications.

At the same time, compatibility with previous AIX releases is preserved. This is accomplished by the creation of a new environment variable, which can be used to set the system environment on a per−system, per−user, or per−process basis.

To determine the proper way to develop a UNIX95−portable application, you may need to refer to the X/Open UNIX95 Specification, which can be obtained on a CD−ROM by ordering the printed copy of *AIX Version 4.3 Commands Reference*, order number SBOF−1877, or by ordering *Go Solo: How to Implement and Go Solo with the Single Unix Specification*, order number SR28−5705, a book which includes the X/Open UNIX95 Specification on a CD−ROM.

AIX 32−Bit and 64−Bit Support for the UNIX98 Specification

Beginning with AIX Version 4.3, the operating system is designed to support the X/Open UNIX98 Specification for portability of UNIX−based operating systems. Many new interfaces, and some current ones, have been added or enhanced to meet this specification. Making AIX Version 4.3 even more open and portable for applications.

At the same time, compatibility with previous AIX releases is preserved. This is accomplished by the creation of a new environment variable, which can be used to set the system environment on a per−system, per−user, or per−process basis.

To determine the proper way to develop a UNIX98−portable application, you may need to refer to the X/Open UNIX98 Specification, which can be obtained on a CD−ROM by ordering the printed copy of *AIX Version 4.3 Commands Reference*, order number SBOF−1877, or by ordering *Go Solo: How to Implement and Go Solo with the Single Unix Specification*, order number SR28−5705, a book which includes the X/Open UNIX98 Specification on a CD−ROM.

Related Information

The following books contain information about or related to commands:

- *AIX and Related Products Documentation Overview*, Order Number SC23−2456.
- *AIX Version 4.3 Files Reference*, Order Number SC23−4168.
- *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs,* Order Number SC23−4128.
- *AIX Version 4.3 Problem Solving Guide and Reference*, Order Number SC23−4123.
- *AIX Version 4.3 System Management Guide: Communications and Networks*, Order Number SC23−4127.
- *AIX Version 4.3 System Management Guide: Operating System and Devices*, Order Number SC23−4126.
- *AIX Version 4.3 System User's Guide: Operating System and Devices*, Order Number SC23−4121.
- *AIX Version 4.3 System User's Guide: Communications and Networks*, Order Number SC23−4122.
- *AIX Versions 3.2 and 4 Performance Tuning Guide,* Order Number SC23−2365.
- *AIX Version 4.3 Guide to Printers and Printing*, Order Number SC23−4130.
- *AIX Version 4.3 Kernel Extensions and Device Support Programming Concepts,* Order Number SC23−4125.
- *5080 Graphics System Installation, Operation, and Problem Determination*, Order Number GA23−2063.
- *AIX Version 4.3 Technical Reference: Base Operating System and Extensions Volume 1* Order Number SC23−4159
- *AIX Version 4.3 Technical Reference: Base Operating System and Extensions Volume 2,* Order Number SC23−4160.
- *AIX Version 4.3 Technical Reference: Communications Volume 1*, Order Number SC23−4161.
- *AIX Version 4.3 Technical Reference: Communications Volume 2*, Order Number SC23−4162
- *AIX Version 4.3 Technical Reference: Kernel and Subsystems Volume 1*, Order Number SC23−4163.
- *AIX Version 4.3 Technical Reference: Kernel and Subsystems Volume 2*, Order Number SC23−4164.
- *AIX Version 4 Keyboard Technical Reference,* Order Number SC23−2631.
- *Distributed SMIT 2.2 for AIX: Guide and Reference,* Order Number SC23−2667.
- *3270 Host Connection Program 2.1 and 1.3.3 for AIX: Guide and Reference,* Order Number SC23−2563.

The following books also may be helpful:

- Lamb, Linda. *Learning the vi Editor*. Sebastopol, CA: O'Reilly & Associates, 1990. Order Number SR28−4966.

- Dougherty, Dale. *sed & awk*. Sebastopol, CA: O'Reilly & Associates, 1990. Order Number SR28−4968.
- Hunt, Craig. *TCP/IP Network Administration*. Sebastopol, CA: O'Reilly & Associates, 1992. Order Number SR23−7422.

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To order additional copies of this book, use order number SC23−4116.

To order additional copies of all six volumes of *AIX Version 4.3 Commands Reference*, use Order Number SBOF−1877.

Use *AIX and Related Products Documentation Overview* for information on related publications and how to obtain them.

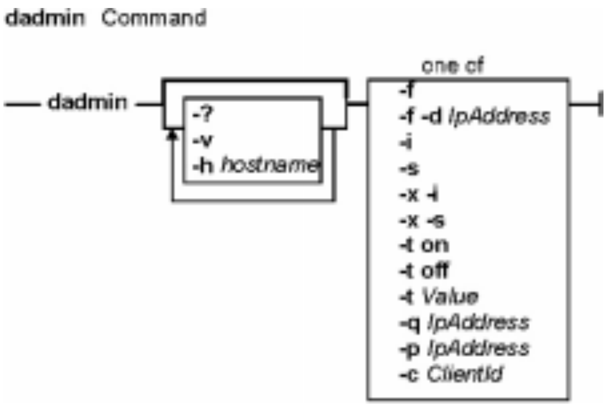
Alphabetical Listing of Commands

dadmin Command

Purpose

Used to query and modify the status of the DHCP server.

Syntax



dadmin [**−?**] [**−v**] [**−h***Hostname*] [**−f**] **−d***IpAddress* | [**−x**] **−i** | [**−x**] **−s** | **−ton**|**off**|*Value* | **−q***IpAddress* | **−p***IpAddress* | **−c***Clientld*

Description

The **dadmin** command lets the DHCP administrator query and modify the state of his DHCP servers' databases. It gives the administrator the ability to locally or remotely query the DHCP server for the status of an IP address, query for a pool of IP addresses, query for a client, delete an IP address mapping, refresh the server, and change the server's tracing level.

The **dadmin** command is backwards compatible with previous AIX release DHCP servers to list their IP address status and refresh.

When querying for an IP address information, the **dadmin** command returns the IP address's status. And depending on the IP address's status, the **dadmin** command may return the lease duration, start lease time, last leased time, whether the server supports DNS A record updates for this IP address, and the client identifier which is mapped to this IP address.

When querying for a client information, the **dadmin** command returns the client's IP address and IP address status, the last time the client was given any IP address, the hostname and domain name used by the client, and whether the server supports DNS A record updates for this IP address.

When modifying the server tracing level, the **dadmin** command sets and returns the server tracing level in the form of a tracing mask. This mask represents a bitstring where each bit represents whether a specific log item is being traced by the server (see DHCP Server Configuration File in the online documentation). From least significant to most significant order, these log items are LOG_NONE, LOG_SYSERR, LOG_OBJERR, LOG_PROTOCOL and LOG_PROTERR (same value), LOG_WARN, AND LOG_CONFIG (same value), LOG_EVENT, and LOG_PARSEERR (same value), LOG_ACTION, LOG_INFM, LOG_ACNTING, LOG_STAT, LOG_TRACE, LOG_START, and LOG_RTRACE.

Note: LOG_START cannot be disabled. This implies a mask range from 0x0800 through 0x1FFF.

Flags

−c*Clientld*	Returns the status for a specific client that may be known to the DHCP server. *Clientld* represents the client identifier that a DHCP client used to identify itself, or the field can either be specified as hexidecimal characters only, or in the TYPE−STRING representation used by the DHCP server.
−d*IpAddress*	Deletes the lease information associated with IP address *IpAddress*. As a result, the address will be moved to the FREE state and be available for binding once again.
−f	To be used with the **−d** flag. The **−f** flag forces the deletion of the address without any prompting. Deletes the lease information associated with IP.
−h*Hostname*	Used to specify the destination DHCP server. *Hostname* can either be a name or IP address.
−i	Reinitializes the DHCP server. This flag signals the server to sync its databases and restarts by rereading the configuration file.
−p*IpAddress*	Returns the status of each address in a subnet. *IpAddress* is used to identify the subnet to a list.
−q*IpAddress*	Returns the status of a specific IP address.
−s	Returns the status of each address in the DHCP server's configured pools.
−t on|off|*Value*	Changes the tracing level of the DHCP server. Trace values are reported in a hexidecimal format representing the tracing mask in use on the server. *Value* can be specified as either a decimal or hexidecimal format. The keywords **on** and **off** enable or disable a single bit at a time in the tracing mask.
−v	Executes the command in verbose mode.
−x	Use Version 1 of the **dadmin** protocol. The **−x** flag is used to connect to previous AIX release DHCP servers and is only valid for the **−i** and **−s** flags.
−?	Displays the usage syntax.

Exit Status

0	Successful completion.
>0	An error occurred.

Security

To secure connections from the dadmin clients, the DHCP server only allows connections from the server itself or from remote machines that are included in the superuser's **.rhosts** file. To prevent ordinary users from modifying the DHCP server's address mappings, the administrator should ensure that the execution of the **dadmin** command is limited to the proper users on those machines that are allowed access.

Files

/usr/sbin/dadmin	Contains the dadmin command.

Related Information

The **.rhosts** file format, **DHCP Server Configuration File** in the *AIX Version 4.3 Files Reference*.

The **dhcpsd** daemon.

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP) in the *AIX*

Version 4.3 System Management Guide: Communications and Networks.

The SMIT Interface for TCP/IP in the *AIX Version 4.3 System Management Guide: Communications and Networks*

TCP/IP Daemons in the *AIX Version 4.3 System Management Guide: Communications and Networks*

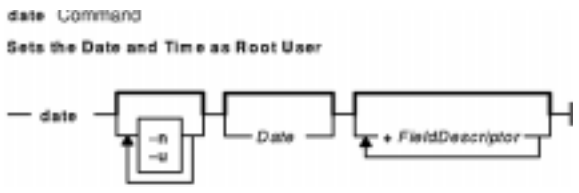
date Command

Purpose

Displays or sets the date or time.

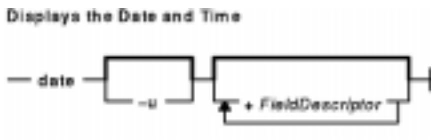
Syntax

To Set the Date and Time as Root User



/usr/bin/date [**−n**] [**−u**] [*Date*] [+*FieldDescriptor* ...]

To Display the Date and Time



/usr/bin/date [**−u**] [+*FieldDescriptor* ...]

Description

Attention: Do not change the date when the system is running with more than one user.

The **date** command writes the current date and time to standard output if called with no flags or with a flag list that begins with a **+** (plus sign). Otherwise, it sets the current date. Only a root user can change the date and time. The **date** command prints out the usage message on any unrecognized flags or input.

The following formats can be used when setting the date with the *Date* parameter:

- *mmddHHMM*[*ccyy*]
- *mmddHHMM*[*yy*]

The variables to the *Date* parameter are defined as follows:

mm	Specifies the month number.
dd	Specifies the number of the day in the month.
HH	Specifies the hour in the day (using a 24−hour clock).
MM	Specifies the minute number.
cc	Specifies the century and is the first two digits of the year.

Note: If you do not specify a century, values in the range 69 to 99 refer to the twentieth century, 1969 to 1999 inclusive, and values in the range 00 to 68 refer to years in the twenty−first century, 2000 to 2068 inclusive.

yy	Specifies the last two numbers of the year.

The current number of seconds and the current year are used as default values when the *SS* or *yy* variables are not specified. The system operates in Coordinated Universal Time (CUT).

If you follow the **date** command with a **+** (plus sign) and a field descriptor, you can control the output of the command. You must precede each field descriptor with a **%** (percent sign). The system replaces the field descriptor with the specified value. Enter a literal % as %% (two percent signs). The **date** command copies any other characters to the output without change. The **date** command always ends the string with a new−line character.

Flags

−n	Does not set the time globally on all machines in a local area network that have their clocks synchronized.
−u	Displays or sets the time in Coordinated Universal Time (CUT).

Field Descriptors

%a	Displays the locale's abbreviated weekday name.
%A	Displays the locale's full weekday name.
%b	Displays the locale's abbreviated month name.
%B	Displays the locale's full month name.
%c	Displays the locale's appropriate date and time representation. This is the default.
%C	Displays the century as a decimal number (00−99). A year is divided by 100 and truncated to an integer.
%d	Displays the day of the month as a decimal number (01−31). In a two−digit field, a 0 is used as leading space fill.
%D	Displays the date in the format equivalent to **%m/%d/%y**.
%e	Displays the day of the month as a decimal number (1−31). In a two−digit field, a blank space is used as leading space fill.
%h	Displays the locale's abbreviated month name (a synonym for **%b**).
%H	Displays the hour (24−hour clock) as a decimal number (00−23).
%I	Displays the hour (12−hour clock) as a decimal number (01−12).
%j	Displays the day of year as a decimal number (001−366).
%m	Displays the month of year as a decimal number (01−12).
%M	Displays the minutes as a decimal number (00−59).
%n	Inserts a <new−line> character.
%p	Displays the locale's equivalent of either AM or PM.
%r	Displays 12−hour clock time (01−12) using the AM−PM notation; in the POSIX locale, this is equivalent to **%I:%M:%S %p**.
%S	Displays the seconds as a decimal number (00− 59).
%t	Inserts a <tab> character.
%T	Displays the 24−hour clock (00−23) in the format equivalent to **HH:MM:SS** .
%u	Displays the weekday as a decimal number from 1−7 (Sunday = 7). Refer to the **%w** field descriptor.
%U	Displays week of the year(Sunday as the first day of the week) as a decimal number[00 − 53] . All days in a new year preceding the first Sunday are considered to be in week 0.
%V	Displays the week of the year as a decimal number from 01−53 (Monday is used as the first day of the week). If the week containing January 1 has four or more days in the new year, then it is considered week 01; otherwise, it is week 53 of the previous year.

%w	Displays the weekday as a decimal number from 0−6 (Sunday = 0). Refer to the **%u** field descriptor.
%W	Displays the week number of the year as a decimal number (00−53) counting Monday as the first day of the week.
%x	Displays the locale's appropriate date representation.
%X	Displays the locale's appropriate time representation.
%y	Displays the last two numbers of the year (00−99).
%Y	Displays the year with century as a decimal number.
%Z	Displays the time−zone name, or no characters if no time zone is determinable.
%%	Displays a % (percent sign) character.

Modified Field Descriptors

The **%E** and **%O** field descriptors can be modified to indicate a different format or specification, as described in **LC_TIME** Category for the Locale Definition Source File Format in *AIX Version 4.3 Files Reference*. If the corresponding keyword (see the **era**, **era_year**, **era_d_fmt**, and **alt_digits** keywords) is not specified or not supported for the current locale, the unmodified field descriptor value is used.

%Ec	Displays the locale's alternative appropriate date and time representation.
%EC	Displays the name of the base year (or other time period) in the locale's alternative representation.
%Ex	Displays the locale's alternative date representation.
%EX	Displays the locale's alternative time representation.
%Ey	Displays the offset from the **%EC** field descriptor (year only) in the locale's alternative representation.
%EY	Displays the full alternative year representation.
%Od	Displays the day of the month using the locale's alternative numeric symbols.
%Oe	Displays the day of the month using the locale's alternative numeric symbols.
%OH	Displays the hour (24−hour clock) using the locale's alternative numeric symbols.
%OI	Displays the hour (12−hour clock) using the locale's alternative numeric symbols.

%Om	Displays the month using the locale's alternative numeric symbols.
%OM	Displays minutes using the locale's alternative numeric symbols.
%OS	Displays seconds using the locale's alternative numeric symbols.
%Ou	Displays the weekday as a number in the locale's alternative representation (Monday=1).
%OU	Displays the week number of the year using the locale's alternative numeric symbols. Sunday is considered the first day of the week.
%OV	Displays the week number of the year using the locale's alternative numeric symbols. Monday is considered the first day of the week.
%Ow	Displays the weekday as a number in the locale's alternative representation (Sunday =0).
%OW	Displays the week number of the year using the locale's alternative numeric symbols. Monday is considered the first day of the week.
%Oy	Displays the year (offset from %C) in alternative representation.

Exit Status

This command returns the following exit values:

0	The date was written successfully.
>0	An error occurred.

Examples

1. To display current date and time, enter:

   ```
   date
   ```

2. To set the date and time, enter:

   ```
   date 0217142590
   ```

   This sets the date and time to Sat Feb 17 14:25:00 CST 1990.

   Note: You must have root authority to change the date and time.

3. To display the date and time in a specified format, enter:

   ```
   date +"%r %a %d %h %y (Julian Date: %j)"
   ```

   This displays the date shown in Example 2 as:

   ```
   02:25:03 PM Fri 17 Feb 90 (Julian Date: 048)
   ```

Environment Variables

The following environment variables affect the execution of the **date** command.

LANG	Determines the locale to use when both **LC_ALL** and the corresponding environment variable (beginning with **LC_**) do not specify a locale.
LC_ALL	Determines the locale to be used to override any values for locale categories specified by the setting of **LANG** or any environment variable beginning with **LC_**.
LC_CTYPE	Determines the locale for the interpretation of sequences of bytes of text data as characters (for example, single versus multibyte character in an argument).
LC_MESSAGES	Determines the language in which messages should be written.
LC_TIME	Determines the contents of date and time strings written by **date**.
NLSPATH	Determines the location of message catalogues for the processing of **LC_MESSAGES**.
TZ	Specifies the time zone in which the time and date are written, unless the **−u** option is specified. If the **TZ** variable is not set and the **−u** flag is not specified, an unspecified system default time zone is used.

Related Information

The **environment** file.

The **localtime** subroutine, **strftime** subroutine, **time** subroutine.

LC_TIME Category for the Locale Definition Source File Format in *AIX Version 4.3 Files Reference*.

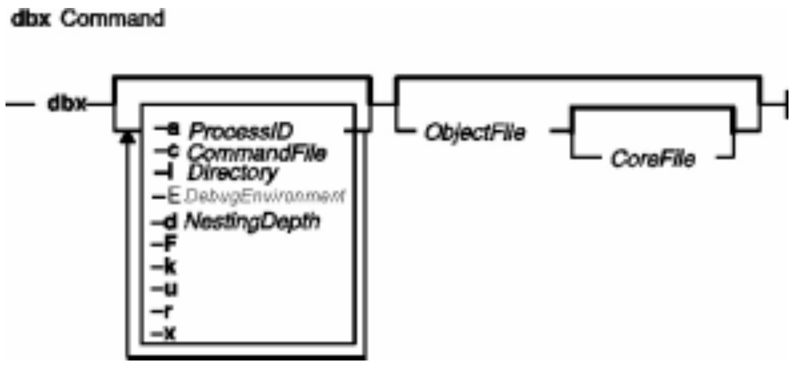
Understanding Locale in *AIX Version 4.3 System Management Concepts: Operating System and Devices* discusses locale values.

dbx Command

Purpose

Provides an environment to debug and run programs under the operating system.

Syntax



dbx [**−a** *ProcessID*] [**−c** *CommandFile*] [**−d** *NestingDepth*] [**−I** *Directory*] [**−E** *DebugEnvironment*] [**−k**] [**−u**] [**−F**] [**−r**] [**−x**] [*ObjectFile* [*CoreFile*]]

Description

The **dbx** command provides a symbolic debug program for C, C++, Pascal, and FORTRAN programs, allowing you to carry out operations such as the following:

- Examine object and core files.
- Provide a controlled environment for running a program.
- Set breakpoints at selected statements or run the program one line at a time.
- Debug using symbolic variables and display them in their correct format.

The *ObjectFile* parameter is an object (executable) file produced by a compiler. Use the **−g** (generate symbol table) flag when compiling your program to produce the information the **dbx** command needs.

> **Note:** The **−g** flag of the **cc** command should be used when the object file is compiled. If the **−g** flag is not used or if symbol references are removed from the **xcoff** file with the **strip** command, the symbolic capabilities of the **dbx** command are limited.

If the **−c** flag is not specified, the **dbx** command checks for a **.dbxinit** file in the user's **$HOME** directory. It then checks for a **.dbxinit** file in the user's current directory. If a **.dbxinit** file exists in the current directory, that file overrides the **.dbxinit** file in the user's **$HOME** directory. If a **.dbxinit** file exists in the user's **$HOME** directory or current directory, that file's subcommands run at the beginning of the debug session. Use an editor to create a **.dbxinit** file.

If *ObjectFile* is not specified, then **dbx** asks for the name of the object file to be examined. The default is **a.out**. If the **core** file exists in the current directory or a *CoreFile* parameter is specified, then **dbx** reports the location where the program faulted. Variables, registers, and memory held in the core image may be examined until execution of *ObjectFile* begins. At that point the **dbx** debug program prompts for commands.

Expression Handling

The **dbx** program can display a wide range of expressions. You can specify expressions in the **dbx** debug program with a common subset of C and Pascal syntax, with some FORTRAN extensions.

The following operators are valid in the debug program:

***** (asterisk) or ^ (caret)	Denotes indirection or pointer dereferencing.
[ ] (brackets) or **( )** (parentheses)	Denotes subscript array expressions.
. (period)	Use this field reference operator with pointers and structures. This makes the C operator −> (arrow) unnecessary, although it is allowed.
& (ampersand)	Gets the address of a variable.
.. (two periods)	Separates the upper and lower bounds when specifying a subsection of an array. For example: **n[1..4]**.

The following types of operations are valid in expressions in the debug program:

Algebraic	=, **−**, *****, / (floating division), **div** (integral division), **mod**, **exp** (exponentiation)
Bitwise	**−**, **I**, **bitand**, **xor**, ~. <<, >>
Logical	**or**, **and**, **not**, **II**, **&&**
Comparison	<, >, <=, >=, < > or **!**=, = or ==
Other	**(typename),sizeof**

Logical and comparison expressions are allowed as conditions in **stop** and **trace**.

Expression types are checked. You override an expression type by using a renaming or casting operator. The three forms of type renaming are *Typename(Expression)*, *Expression*|*Typename*, and *(Typename) Expression*. The following is an example where the *x* variable is an integer with value 97:

```
(dbx) print x
97
(dbx) print char (x), x \ char, (char) x, x
'a' 'a' 'a' 97
```

Command Line Editing

The **dbx** commands provides a command line editing feature similar to those provide by Korn Shell. **vi** mode provides **vi−like** editing features, while **emacs** mode gives you controls similar to **emacs**.

These features can be turned on by using **dbx** subcommand **set −o** or **set edit**. To turn on vi−style command−line editing, you would type the subcommand **set edit vi** or **set −o vi**.

You can also use the **EDITOR** environment variable to set the editing mode.

The **dbx** command saves commands entered to a history file **.dbxhistory**. If the **DBXHISTFILE** environment variable is not set, the history file used is **$HOME/.dbxhistory**.

By default, **dbx** saves the text of the last 128 commands entered. The **DBXHISTSIZE** environment variable can be used to increase this limit.

Flags

−a *ProcessID*	Attaches the debug program to a process that is running. To attach the debug

	program, you need authority to use the **kill** command on this process. Use the **ps** command to determine the process ID. If you have permission, the **dbx** program interrupts the process, determines the full name of the object file, reads in the symbolic information, and prompts for commands.
−c *CommandFile*	Runs the **dbx** subcommands in the file before reading from standard input. The specified file in the **$HOME** directory is processed first; then the file in the current directory is processed. The command file in the current directory overrides the command file in the **$HOME** directory. If the specified file does not exist in either the **$HOME** directory or the current directory, a warning message is displayed. The **source** subcommand can be used once the **dbx** program is started.
−d *NestingDepth*	Sets the limit for the nesting of program blocks. The default nesting depth limit is 25.
−E *DebugEnvironment*	Specifies the environment variable for the debug program.
−F	Can be used to turn off the lazy read mode and make the **dbx** command read all symbols at startup time. By default, lazy reading mode is on: it reads only required symbol table information on initiation of **dbx** session. In this mode, **dbx** will not read local variables and types whose symbolic information has not been read. Therefore, commands such as **whereis i** may not list all instances of the local variable **i** in every function.
−I *Directory*	(Uppercase i) Includes directory specified by the *Directory* variable in the list of directories searched for source files. The default is to look for source files in the following directories: • The directory the source file was located in when it was compiled. This directory is searched only if the compiler placed the source path in the object. • The current directory. • The directory where the program is currently located.
−k	Maps memory addresses; this is useful for kernel debugging.
−r	Runs the object file immediately. If it terminates successfully, the **dbx** debug program is exited. Otherwise, the debug program is entered and the reason for termination is reported. **Note:** Unless **−r** is specified, the **dbx** command prompts the user and waits for a command.
−u	Causes the **dbx** command to prefix file name symbols with an @ (at sign). This flag reduces the possibility of ambiguous symbol names.
−x	Prevents the **dbx** command from stripping _ (trailing underscore) characters from symbols originating in FORTRAN source code. This flag allows **dbx** to distinguish between symbols which are identical except for an underscore character, such as `xxx` and `xxx_`.

Examples

1. The following example explains how to start the **dbx** debug program simultaneously with a process. The example uses a program called **samp.c**. This C program is first compiled with the **−g** flag to produce an object file that includes symbolic table references. In this case, the program is named **samp**:

   ```
   $ cc −g samp.c −o samp
   ```

   When the program **samp** is run, the operating system reports a bus error and writes a core image to your current working directory as follows:

   ```
   $ samp
   Bus Error − core dumped
   ```

   To determine the location where the error occurred, enter:

```
$ dbx samp
```

The system returns the following message:

```
dbx version 3.1
Type 'help' for help.
reading symbolic information . . . [
using memory image in core]
  25   x[i] = 0;
(dbx) quit
```

2. This example explains how to attach **dbx** to a process. This example uses the following program, **looper.c**:

   ```
   main()
   {
         int i,x[10];

         for (i = 0; i < 10;);
   }
   ```

   The program will never terminate because **i** is never incremented. Compile **looper.c** with the **−g** flag to get symbolic debugging capability:

   ```
   $ cc −g looper.c −o looper
   ```

   Run **looper** from the command line and perform the following steps to attach **dbx** to the program while it is running:

   a. To attach **dbx** to **looper**, you must determine the process ID. If you did not run **looper** as a background process, you must have another Xwindow open. From this Xwindow , enter:

      ```
      ps −u UserID
      ```

      where *UserID* is your login ID. All active processes that belong to you are displayed as follows:

      ```
      PID     TTY      TIME    COMMAND
      68      console   0:04    sh
      467     lft3     10:48    looper
      ```

      In this example the process ID associated with **looper** is `467`.

   b. To attach **dbx** to **looper**, enter:

      ```
      $ dbx −a 467
      ```

      The system returns the following message:

      ```
      Waiting to attach to process 467 . . .
      Successfully attached to /tmp/looper.
      dbx is initializing
      Type 'help' for help.
      reading symbolic information . . .

      attached in main at line 5
      5     for (i = 0; i < 10;);
      (dbx)
      ```

      You can now query and debug the process as if it had been originally started with **dbx**.

3. To add directories to the list of directories to be searched for the source file of an executable file **objefile**, you can enter:

   ```
   $dbx −I /home/user/src −I /home/group/src
   objfile
   ```

   The **use** subcommand may be used for this function once **dbx** is started. The **use** command resets the list of directories, whereas the **−I** flag adds a directory to the list.

4. To use the **−r** flag, enter:

   ```
   $ dbx −r samp
   ```

   The system returns the following message:

   ```
   Entering debug program . . .
   dbx version 3.1
   Type 'help' for help.
   reading symbolic information . . .
   bus error in main at line 25
     25   x[i] = 0;
   (dbx) quit
   ```

   The **−r** flag allows you to examine the state of your process in memory even though a core image is not taken.

5. To specify the environment variables for the debug program, enter:
   ```
   dbx −E LIBPATH=/home/user/lib −E LANG=Ja_JP objfile
   ```

dbx Subcommands

Note: The subcommands can only be used while running the **dbx** debug program.

/	Searches forward in the current source file for a pattern.
?	Searches backward in the current source file for a pattern.
alias	Creates aliases for dbx subcommands.
assign	Assigns a value to a variable.
attribute	Displays information about all or selected attributes objects.
call	Runs the object code associated with the named procedure or function.
case	Changes how the dbx debug program interprets symbols.
catch	Starts trapping a signal before that signal is sent to the application program.
clear	Removes all stops at a given source line.
cleari	Removes all breakpoints at an address.
condition	Displays information about all or selected condition variables.
cont	Continues application program execution from the current stopping point until the program finishes or another breakpoint is encountered.
delete	Removes the traces and stops corresponding to the specified event numbers.
detach	Continues execution of application and exits the debug program.
display memory	Displays the contents of memory.
down	Moves the current function down the stack.
dump	Displays the names and values of variables in the specified procedure.
edit	Starts an editor on the specified file.

file	Changes the current source file to the specified file.
func	Changes the current function to the specified procedure or function.
goto	Causes the specified source line to be the next line run.
gotoi	Changes the program counter address.
help	Displays help information for dbx subcommands or topics.
ignore	Stops trapping a signal before that signal is sent to the application program.
list	Displays lines of the current source file.
listi	Lists instructions from the application program.
map	Displays information about load characteristics of the application.
move	Changes the next line to be displayed.
multproc	Enables or disables multiprocess debugging.
mutex	Displays information about all or selected mutexes.
next	Runs the application program up to the next source line.
nexti	Runs the application program up to the next machine instruction.
print	Prints the value of an expression or runs a procedure and prints the return code of that procedure.
prompt	Changes the dbx command prompt.
quit	Stops the dbx debug program.
registers	Displays the values of all general−purpose registers, system−control registers, floating−point registers, and the current instruction register.
rerun	Begins execution of an application with the previous arguments.
return	Continues running the application program until a return to the specified procedure is reached.
rwlock	Displays information about the rwlocks.
run	Begins running an application.
screen	Opens an Xwindow for dbx command interaction.
set	Defines a value for a dbx debug program variable.
sh	Passes a command to the shell to be run.
skip	Continues running the application program from the current stopping point.
source	Reads dbx subcommands from a file.
status	Displays the active trace and stop subcommands.
step	Runs one source line.
stepi	Runs one machine instruction.
stop	Stops running of the application program.
stopi	Sets a stop at a specified location.
thread	Displays and controls threads.
trace	Prints tracing information.
tracei	Turns on tracing.
unalias	Removes an alias.
unset	Deletes a variable.
up	Moves the current function up the stack.
use	Sets the list of directories to be searched when looking for source files.
whatis	Displays the declaration of application program components.
where	Displays a list of active procedures and functions.

whereis	Displays the full qualifications of all the symbols whose names match the specified identifier.
which	Displays the full qualification of the given identifier.

/ Subcommand

/ [*RegularExpression* [/]]

The / subcommand searches forward in the current source file for the pattern specified by the *RegularExpression* parameter. Entering the / subcommand with no arguments causes **dbx** to search forward for the previous regular expression. The search wraps around the end of the file.

Examples

1. To search forward in the current source file for the number 12, enter:

   ```
   / 12
   ```

2. To repeat the previous search, enter:

   ```
   /
   ```

See the **?** (search) subcommand and the **regcmp** subroutine.

? Subcommand

? [*RegularExpression* [**?**]]

The **?** subcommand searches backward in the current source file for the pattern specified by the *RegularExpression* parameter. Entering the **?** subcommand with no arguments causes the **dbx** command to search backwards for the previous regular expression. The search wraps around the end of the file.

Examples

1. To search backward in the current source file for the letter `z`, enter:

   ```
   ?z
   ```

2. To repeat the previous search, enter:

   ```
   ?
   ```

See the / (search) subcommand and the **regcmp** subroutine.

alias Subcommand

alias [*Name* [[(*Arglist*)] *String* | *Subcommand*]]

The **alias** subcommand creates aliases for **dbx** subcommands. The *Name* parameter is the alias being created. The *String* parameter is a series of **dbx** subcommands that, after the execution of this subcommand, can be referred to by *Name*. If the **alias** subcommand is used without parameters, it displays all current aliases.

Examples

1. To substitute `rr` for `rerun`, enter:

   ```
   alias rr rerun
   ```

2. To run the two subcommands `print n` and `step` whenever `printandstep` is typed at the

command line, enter:

```
alias printandstep "print n; step"
```

3. The `alias` subcommand can also be used as a limited macro facility. For example:

   ```
   (dbx) alias px(n) "set $hexints; print n; unset $hexints"
   (dbx) alias a(x,y) "print symname[x]->symvalue._n_n.name.Id[y]"
   (dbx) px(126)
   0x7e
   ```

   In this example, the alias `px` prints a value in hexadecimal without permanently affecting the debugging environment.

assign Subcommand

assign*Variable*=*Expression*

The **assign** subcommand assigns the value specified by the *Expression* parameter to the variable specified by the *Variable* parameter.

Examples

1. To assign a value of `5` to the `x` variable, enter:

   ```
   assign x = 5
   ```

2. To assign the value of the `y` variable to the `x` variable, enter:

   ```
   assign x =  y
   ```

3. To assign the character value `'z'` to the `z` variable, enter:

   ```
   assign  z  =  'z'
   ```

4. To assign the boolean value `false` to the logical type variable `B`, enter:

   ```
   assign  B  =  false
   ```

5. To assign the `"Hello World"` string to a character pointer `Y`, enter:

   ```
   assign  Y  =  "Hello  World"
   ```

6. To disable type checking, set the **dbx** debug program variable `$unsafeassign` by entering:

   ```
   set $unsafeassign
   ```

See Displaying and Modifying Variables.

attribute Subcommand

attribute [*AttributeNumber* ...]

The **attribute** subcommand displays information about the user thread, mutex, or condition attributes objects defined by the *AttributeNumber* parameters. If no parameters are specified, all attributes objects are listed.

For each attributes object listed, the following information is displayed:

`attr`	Indicates the symbolic name of the attributes object, in the form `$a`*AttributeNumber*.
`obj_addr`	Indicates the address of the attributes object.
`type`	Indicates the type of the attributes object; this can be `thr`, `mutex`, or `cond` for user threads,

	mutexes, and condition variables respectively.
`state`	Indicates the state of the attributes object. This can be `valid` or `inval`.
`stack`	Indicates the stacksize attribute of a thread attributes object.
`scope`	Indicates the scope attribute of a thread attributes object. This determines the contention scope of the thread, and defines the set of threads with which it must contend for processing resources. The value can be `sys` or `pro` for system or process contention scope.
`prio`	Indicates the priority attribute of a thread attributes object.
`sched`	Indicates the schedpolicy attribute of a thread attributes object. This attribute controls scheduling policy, and can be `fifo` , `rr` (round robin), or `other`.
`p−shar`	Indicates the process−shared attribute of a mutex or condition attribute object. A mutex or condition is process−shared if it can be accessed by threads belonging to different processes. The value can be `yes` or `no`.
`protocol`	Indicates the protocol attribute of a mutex. This attribute determines the effect of holding the mutex on a thread's priority. The value can be `no_prio`, `prio`, or `protect`.

Notes:

1. The **print** subcommand of the **dbx** debug program recognizes symbolic attribute names, and can be used to display the status of the corresponding object.
2. The available attributes depend on the implementation of POSIX options.

Examples

1. To list information about all attributes, enter:

   ```
   attribute
   ```

   The output is similar to:

   ```
   attr   obj_addr   type  state  stack   scope    prio
   sched p−shar
   $a1   0x200035c8  mutex valid                             no
   $a2   0x20003628  cond  valid                             no
   $a3   0x200037c8  thr   valid  57344    sys      126 other
   $a4   0x200050f8  thr   valid  57344    pro      126 other
   ```

2. To list information about attributes 1 and 3, enter:

   ```
   attribute 1 3
   ```

   The output is similar to:

   ```
   attr   obj_addr   type  state  stack   scope    prio
   sched p−shar
   $a1   0x200035c8  mutex valid                             no
   $a3   0x200037c8  thr   valid  57344    sys      126 other
   ```

See the **condition** subcommand, **mutex** subcommand, **print** subcommand, and **thread** subcommand for the **dbx** command.

Also, see Creating Threads, Using Mutexes, and Using Condition Variables in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs.*

call Subcommand

call *Procedure* ([*Parameters*])

The **call** subcommand runs the procedure specified by the *Procedure* parameter. The return code is not printed. If any parameters are specified, they are passed to the procedure being run.

Example

To call a command while running `dbx`, enter:

```
(dbx) call printf("hello")
hello
```

printf returns successfully.

case Subcommand

case [**default** | **mixed** | **lower** | **upper**]

The **case** subcommand changes how the **dbx** debug program interprets symbols. The default handling of symbols is based on the current language. If the current language is C, C++, or undefined, the symbols are not folded; if the current language is FORTRAN or Pascal, the symbols are folded to lowercase. Use this subcommand if a symbol needs to be interpreted in a way not consistent with the current language.

Entering the **case** subcommand with no parameters displays the current case mode.

Flags

default	Varies with the current language.
mixed	Causes symbols to be interpreted as they actually appear.
lower	Causes symbols to be interpreted as lowercase.
upper	Causes symbols to be interpreted as uppercase.

Examples

1. To display the current case mode, enter:

   ```
   case
   ```

2. To instruct **dbx** to interpret symbols as they actually appear, enter:

   ```
   case mixed
   ```

3. To instruct **dbx** to interpret symbols as uppercase, enter:

   ```
   case upper
   ```

See Folding Variables to Lowercase and Uppercase.

catch Subcommand

catch [*SignalNumber* | *SignalName*]

The **catch** subcommand starts the trapping of a specified signal before that signal is sent to the application program. This subcommand is useful when the application program being debugged handles signals such as interrupts. The signal to be trapped can be specified by number or by name using either the *SignalNumber* or the *SignalName* parameter, respectively. Signal names are case insensitive, and the **SIG** prefix is optional. If neither the *SignalNumber* nor the *SignalName* parameter is specified, all signals are trapped by default except the **SIGHUP**, **SIGCLD**, **SIGALARM**, and **SIGKILL** signals. If no arguments are specified, the current list of signals to be caught is displayed.

Examples

1. To display a current list of signals to be caught by **dbx**, enter:

   ```
   catch
   ```

2. To trap signal `SIGALARM`, enter:

   ```
   catch SIGALARM
   ```

See the **ignore** subcommand and Handling Signals.

clear Subcommand

clear *SourceLine*

The **clear** subcommand removes all stops at a given source line. The *SourceLine* parameter can be specified in two formats:

- As an integer
- As a file name string followed by a : (colon) and an integer

Examples

To remove breakpoints set at line `19`, enter:

```
clear 19
```

The **cleari** subcommand and **delete** subcommand. Also, see Setting and Deleting Breakpoints in in *AIX General Programming Concepts: Writing and Debugging Programs*.

cleari Subcommand

cleari*Address*

The **cleari** subcommand clears all the breakpoints at the address specified by the *Address* parameter.

Examples

1. To remove a breakpoint set at address `0x100001b4`, enter:

   ```
   cleari 0x100001b4
   ```

2. To remove a breakpoint set at the `main()` procedure address, enter:

   ```
   cleari &main
   ```

See the **clear** subcommand, the **delete** subcommand, and Setting and Deleting Breakpoints in in *AIX General Programming Concepts: Writing and Debugging Programs*.

condition Subcommand

condition [**wait** | **nowait** | *ConditionNumber* ...]

The **condition** subcommand displays information about one or more condition variables. If one or more *ConditionNumber* parameters are given, the **condition** subcommand displays information about the specified condition variables. If no flags or parameters are specified, the **condition** subcommand lists all condition variables.

The information listed for each condition is as follows:

`cv`	Indicates the symbolic name of the condition variable, in the form `$c`*ConditionNumber*.
`obj_addr`	Indicates the memory address of the condition variable.
`num_wait`	Indicates the number of threads waiting on the condition variable.
`waiters`	Lists the user threads which are waiting on the condition variable.

Note: The **print** subcommand of the **dbx** debug program recognizes symbolic condition variable names, and can be used to display the status of the corresponding object.

Flags

wait	Displays condition variables which have waiting threads.
nowait	Displays condition variables which have no waiting threads.

Examples

1. To display information about all condition variables, enter:

   ```
   condition
   ```

2. To display information about all condition variables which have waiting threads, enter:

   ```
   condition wait
   ```

3. To display information about the condition variable 3, enter:

   ```
   condition 3
   ```

   The output is similar to:

   ```
   cv      obj_addr     num_wait  waiters
   $c3     0x20003290         0
   ```

See the **attribute** subcommand, **mutex** subcommand, **print** subcommand, and **thread** subcommand.

Also, see Using Condition Variables in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*:.

cont Subcommand

cont [*SignalNumber* | *SignalName*]

The **cont** subcommand continues the execution of the application program from the current stopping point until either the program finishes or another breakpoint is reached. If a signal is specified, either by the number specified in the *SignalNumber* parameter or by the name specified in the *SignalName* parameter, the program continues as if that signal had been received. Signal names are not case sensitive and the **SIG** prefix is optional. If no signal is specified, the program continues as if it had not been stopped.

Examples

1. To continue program execution from current stopping point, enter:
   ```
   cont
   ```
2. To continue program execution as though it received the signal SIGQUIT, enter:
   ```
   cont SIGQUIT
   ```

See the **detach** subcommand for the **dbx** command, the **goto** subcommand for the **dbx** command, the **next** subcommand for the **dbx** command, the **skip** subcommand for the **dbx** command, the **step** subcommand for the **dbx** command.

delete Subcommand

delete { *Number* ... | **all** }

The **delete** subcommand removes traces and stops from the application program. The traces and stops to be removed can be specified through the *Number* parameters, or all traces and stops can be removed by using the all flag. Use the **status** subcommand to display the numbers associated by the dbx debug program with a trace or stop.

Flag

all Removes all traces and stops.

Examples

1. To remove all traces and stops from the application program, enter:
   ```
   delete all
   ```
2. To remove traces and stops for event number 4, enter:
   ```
   delete 4
   ```

See the **clear** subcommand, the **cleari** subcommand, the **status** subcommand and Setting and Deleting Breakpoints in BkSym.Concepts: Writing and Debugging Programs.

detach Subcommand

detach [*SignalNumber* | *SignalName*]

The **detach** subcommand continues the execution of the application program and exits the debug program. A signal can be specified either by:

- Name, using the *SignalName* parameter
- Number, using the *SignalNumber* parameter

  Signal names are not case sensitive and the **SIG** prefix is optional.

  If a signal is specified, the program continues as if it had received that signal. If no signal is specified, the program continues as if no stop had occurred.

Examples

1. To continue execution of the application and exit **dbx**, enter:
   ```
   detach
   ```
2. To exit **dbx** and continue execution of the application as though it received signal `SIGREQUEST`,

enter:
```
detach SIGREQUEST
```

See Using the dbx Debug Program.

display memory Subcommand

{ *Address,Address/* | *Address/* [*Count*] } [*Mode*] [*>File*]

The **display memory** subcommand, which does not have a keyword to initiate the command, displays a portion of memory controlled by the following factors:

The range of memory displayed is controlled by specifying either:

- Two *Address* parameters, where all lines between those two addresses are displayed,

  OR
- One *Address* parameter where the display starts and a *Count* that determines the number of lines displayed from *Address.*

Specify symbolic addresses by preceding the name with an & (ampersand). Addresses can be expressions made up of other addresses and the operators + (plus sign), − (minus sign), and * (indirection). Any expression enclosed in parentheses is interpreted as an address.

- The format in which the memory is displayed is controlled by the *Mode* parameter. The default for the *Mode* parameter is the current mode. The initial value of *Mode* is **X**. The possible modes include:

b	Prints a byte in octal.
c	Prints a byte as a character.
d	Prints a short word in decimal.
D	Prints a long word in decimal.
f	Prints a single−precision real number.
g	Prints a double−precision real number.
h	Prints a byte in hexadecimal.
i	Prints the machine instruction.
lld	Prints an 8−byte signed decimal number.
llu	Prints an 8−byte unsigned decimal number.
llx	Prints an 8−byte unsigned hexadecimal number.
llo	Prints an 8−byte unsigned octal number.
o	Prints a short word in octal
O	Prints a long word in octal.
q	Prints an extended−precision floating−point number.
s	Prints a string of characters terminated by a null byte.
x	Prints a short word in hexadecimal.
X	Prints a long word in hexadecimal.

Flag

>File	Redirects output to the specified file.

Examples

1. To display one long word of memory content in hexadecimal starting at the address `0x3fffe460`, enter:

   ```
   0x3fffe460 / X
   ```

2. To display two bytes of memory content as characters starting at the variable `y` address, enter:

   ```
   &y / 2c
   ```

3. To display the sixth through the eighth elements of the FORTRAN character string a_string, enter:

   ```
   &a_string + 5, &a_string + 7/c
   ```

See Examining Memory Addresses in *AIX General Programming Concepts: Writing and Debugging Programs*.

down Subcommand

down [*Count*]

The **down** subcommand moves the current function down the stack *Count* number of levels. The current function is used for resolving names. The default for the *Count* parameter is one.

Examples

1. To move one level down the stack, enter:

   ```
   down
   ```

2. To move three levels down the stack, enter:

   ```
   down 3
   ```

See the **up** subcommand, the **where** subcommand, and Displaying a Stack Trace in *AIX General Programming Concepts: Writing and Debugging Programs*.

dump Subcommand

dump [*Procedure*] [*>File*]

The **dump** subcommand displays the names and values of all variables in the specified procedure. If the *Procedure* parameter is **.** (period), then all active variables are displayed. If the *Procedure* parameter is not specified, the current procedure is used. If the *>File* flag is used, the output is redirected to the specified file.

Flags

>File	Redirects output to the specified file.

Examples

1. To display names and values of variables in the current procedure, enter:

   ```
   dump
   ```

2. To display names and values of variables in the **add_count** procedure, enter:

   ```
   dump add_count
   ```

3. To redirect names and values of variables in the current procedure to the **var.list** file, enter:

   ```
   dump > var.list
   ```

See Displaying and Modifying Variables in *AIX General Programming Concepts: Writing and Debugging Programs*.

edit Subcommand

edit [*Procedure* | *File*]

The **edit** subcommand invokes an editor on the specified file. The file may be specified through the *File* parameter or by specifying the *Procedure* parameter, where the editor is invoked on the file containing that procedure. If no file is specified, the editor is invoked on the current source file. The default is the **vi** editor. Override the default by resetting the **EDITOR** environment variable to the name of the desired editor.

Examples

1. To start an editor on the current source file, enter:

   ```
   edit
   ```

2. To start an editor on the `main.c` file, enter:

   ```
   edit main.c
   ```

3. To start an editor on the file containing the `do_count()` procedure, enter:

   ```
   edit do_count
   ```

See the **list** subcommand, the **vi** or **vedit** command. Also, see Changing the Current File or Procedure and Displaying the Current File in *AIX General Programming Concepts: Writing and Debugging Programs*.

file Subcommand

file [*File*]

The **file** subcommand changes the current source file to the file specified by the *File* parameter; it does not write to that file. The *File* parameter can specify a full path name to the file. If the *File* parameter does not specify a path, the **dbx** program tries to find the file by searching the use path. If the *File* parameter is not specified, the **file** subcommand displays the name of the current source file. The **file** subcommand also displays the full or relative path name of the file if the path is known.

Examples

1. To change the current source file to the `main.c` file, enter:

   ```
   file main.c
   ```

2. To display the name of the current source file, enter:

   ```
   file
   ```

See the **func** subcommand. Also, see Changing the Current File or Procedure and Displaying the Current File in *AIX General Programming Concepts: Writing and Debugging Programs*.

func Subcommand

func [*Procedure*]

The **func** subcommand changes the current function to the procedure or function specified by the *Procedure* parameter. If the *Procedure* parameter is not specified, the default current function is displayed. Changing the current function implicitly changes the current source file to the file containing the new function; the current scope used for name resolution is also changed.

Examples

1. To change the current function to the `do_count` procedure, enter:

   ```
   func do_count
   ```

2. To display the name of the current function, enter:

   ```
   func
   ```

See the **file** subcommand. Also, see Changing the Current File or Procedure in *AIX General Programming Concepts: Writing and Debugging Programs.*

goto Subcommand

goto*SourceLine*

The **goto** subcommand causes the specified source line to be run next. Normally, the source line must be in the same function as the current source line. To override this restriction, use the **set** subcommand with the **$unsafegoto** flag.

Example

To change the next line to be executed to line 6, enter:

```
goto 6
```

See the **cont** subcommand, the **gotoi** subcommand, and the **set** subcommand.

gotoi Subcommand

gotoi *Address*

The **gotoi** subcommand changes the program counter address to the address specified by the *Address* parameter.

Example

To change the program counter address to address `0x100002b4`, enter:

```
gotoi 0x100002b4
```

See the **goto** subcommand.

help Subcommand

help [*Subcommand* | *Topic*]

The **help** subcommand displays help information for **dbx** subcommands or topics, depending upon the parameter you specify. Entering the **help** subcommand with the *Subcommand* parameter displays the syntax statement and description of the specified subcommand. Entering the **help** subcommand with the *Topic* parameter displays a detailed description of the specified topic. The following topics are available:

startup	Lists **dbx** startup options.
execution	Lists **dbx** subcommands related to program execution.
breakpoints	Lists **dbx** subcommands related to breakpoints and traces.
files	Lists **dbx** subcommands for accessing source files.
data	Lists **dbx** subcommands for accessing program variables and data.
machine	Lists descriptions of **dbx** subcommands for machine−level debugging.
environment	Lists **dbx** subcommands for setting **dbx** configuration and environment.
threads	Lists **dbx** subcommands for accessing thread−related objects.
expressions	Describes **dbx** expression syntax and operators.
scope	Describes how **dbx** resolves names from different scopes.
set_variables	Lists **dbx** debug variables with a usage description.
usage	Lists common **dbx** subcommands with brief descriptions.

Examples

1. To list all available **dbx** subcommands and topics, enter:

   ```
   help
   ```

2. To display the description of the **dbx** subcommand **list**, enter:

   ```
   help list
   ```

3. To display the description of the **dbx** topic **set_variables**, enter:

   ```
   help set_variables
   ```

ignore Subcommand

ignore [*SignalNumber* | *SignalName*]

The **ignore** subcommand stops the trapping of a specified signal before that signal is sent to the application program. This subcommand is useful when the application program being debugged handles signals such as interrupts.

The signal to be trapped can be specified by:

- Number, with the *SignalNumber* parameter
- Name, with the *SignalName* parameter

Signal names are not case sensitive. The **SIG** prefix is optional.

If neither the *SignalNumber* nor the *SignalName* parameter is specified, all signals except the **SIGHUP**, **SIGCLD**, **SIGALRM**, and **SIGKILL** signals are trapped by default. The **dbx** debug program cannot ignore the **SIGTRAP** signal if it comes from a process outside of the debugee. If no arguments are specified, the list of currently ignored signals will be displayed.

Example

To cause **dbx** to ignore alarm clock time−out signals sent to the application program, enter:

```
ignore alrm
```

See the **catch** subcommand. Also, see Handling Signals in *AIX General Programming Concepts: Writing and Debugging Programs*.

list Subcommand

list [*Procedure* | *SourceLine−Expression* [**,***SourceLine−Expression*]]

The **list** subcommand displays a specified number of lines of the source file. The number of lines displayed are specified in one of two ways:

- By specifying a procedure using the *Procedure* parameter.

In this case, the **list** subcommand displays lines starting a few lines before the beginning of the specified procedure and until the list window is filled.

- By specifying a starting and ending source line number using the *SourceLine−Expression* parameter.

The *SourceLine−Expression* parameter should consist of a valid line number followed by an optional + (plus sign), or − (minus sign), and an integer. In addition, a *SourceLine* of $ (dollar sign) may be used to denote the current line number; a *SourceLine* of @ (at sign) may be used to denote the next line number to be listed.

All lines from the first line number specified to the second line number specified, inclusive, are then displayed.

If the second source line is omitted, the first line is printed only.

If the **list** subcommand is used without parameters, the number of lines specified by $listwindow are printed, beginning with the current source line.

To change the number of lines to list by default, set the special debug program variable, *$listwindow*, to the number of lines you want. Initially, *$listwindow* is set to 10.

Examples

1. To list the lines `1` through `10` in the current file, enter:
   ```
   list 1,10
   ```
2. To list `10`, or `$listwindow`, lines around the `main` procedure, enter:
   ```
   list main
   ```
3. To list 11 lines around the current line, enter:
   ```
   list $−5,$+5
   ```
4. You can use simple integer expressions involving addition and subtraction in *SourceLineExpression* expressions. For example:
   ```
   (dbx) list $
   4 {

   (dbx) list 5
   5 char i = '4';

   (dbx) list sub
   23 char *sub(s,a,k)
   24 int a;
   25 enum status k;  .  .  .
   ```

```
(dbx) move
25
(dbx) list @ −2
23 char *sub(s,a,k)
```

See the **edit** subcommand, the **listi** subcommand, and the **move** subcommand. Also, see Displaying the Current File in *AIX General Programming Concepts: Writing and Debugging Programs*.

listi Subcommand

listi [*Procedure* | **at** *SourceLine* | *Address* [**,** *Address*]]

The **listi** subcommand displays a specified set of instructions from the source file. The instructions displayed are specified by:

- Providing the *Procedure* parameter, where the **listi** subcommand lists instructions from the beginning of the specified procedure until the list window is filled.
- Using the **at***SourceLine* flag, where the **listi** subcommand displays instructions beginning at the specified source line and continuing until the list window is filled. The *SourceLine* variable can be specified as an integer or as a file−name string followed by a : (colon) and an integer.
- Specifying a beginning and ending address using the *Address* parameters, where all instructions between the two addresses, inclusive, are displayed.

If the **listi** subcommand is used without flags or parameters, the next **$listwindow** instructions are displayed. To change the current size of the list window, use the **set $listwindow=***Value* subcommand.

Disassembly Modes

The **dbx** program can disassemble instructions for either the POWER or PowerPC architecture. In the default mode, the **dbx** program displays the instructions for the architecture on which it is running.

The **$instructionset** and **$mnemonics** variables of the **set** subcommand for the **dbx** command allow you to override the default disassembly mode. For more information, see the **set** subcommand for the **dbx** command.

Flag

at *SourceLine*	Specifies a starting source line for the listing.

Examples

1. To list the next 10, or `$listwindow`, instructions, enter:

   ```
   listi
   ```

2. To list the machine instructions beginning at source line `10`, enter:

   ```
   listi at 10
   ```

3. To list the machine instructions beginning at source line `5` in file `sample.c`, enter:

   ```
   listi at "sample.c":5
   ```

4. To list the instructions between addresses `0x10000400` and `0x10000420`, enter:

   ```
   listi 0x10000400, 0x10000420
   ```

See the **list** subcommand and the **set** subcommand. Also, see Debugging at the Machine Level with dbx in *AIX General Programming Concepts: Writing and Debugging Programs*.

map Subcommand

map [> *File*]

The **map** subcommand displays characteristics for each loaded portion of the application. This information includes the name, text origin, text length, data origin, and data length for each loaded module.

Flag

>File	Redirects output to the specified file.

See Debugging at the Machine Level with dbx in *AIX General Programming Concepts: Writing and Debugging Programs*.

move Subcommand

move*SourceLine*

The **move** subcommand changes the next line to be displayed to the line specified by the *SourceLine* parameter. This subcommand changes the value of the @ (at sign) variable.

The *SourceLine* variable can be specified as an integer or as a file name string followed by a : (colon) and an integer.

Examples

1. To change the next line to be listed to line `12`, enter:

   ```
   move 12
   ```

2. To change the next line to be listed to line `5` in file `sample.c`, enter:

   ```
   move "sample.c":5
   ```

See the **list** subcommand. Also, see Displaying the Current File in *AIX General Programming Concepts: Writing and Debugging Programs*.

multproc Subcommand

multproc [**on** |**parent**|**child**| **off**]

The **multproc** subcommand specifies the behavior of the **dbx** debug program when forked and execed processes are created. The **on** flag is used to specify that a new **dbx** session will be created to debug the child path of a fork. The original **dbx** will continue to debug the parent path. The **parent** and **child** flags are used to specify a single path of a fork to follow. All flags except **off** enable **dbx** to follow an execed process. The **off** flag disables multiprocess debugging. If no flags are specified, the **multproc** subcommand returns the current status of multiprocess debugging.

The **dbx** program uses Xwindows for multiprocess debugging. The **dbx** program opens as many windows as needed for multiprocessing. The title for each child window is the process ID (pid) of the child process. To switch between processes, use Xwindows handling techniques to activate the window where the dbx session is displayed. If the system does not have Xwindows support, a warning message is issued when the debuggee forks, and the dbx program continues debugging only the parent process. Multiprocess debugging can also be unsuccessful for the following reasons:

- The **dbx** program is not running in an Xwindows environment.
- Xwindows is running but the **dbx** global **$xdisplay** variable is not set to a valid display name. The

$xdisplay variable is initialized to the shell **DISPLAY** environment variable. The **set** *Name*=*Expression***dbx** subcommand can be used to change the value of the display name.
- The **/tmp** directory does not allow read or write access to the debugging program. The **dbx** program requires a small amount of space in this directory when controlling an Xwindow environment.
- The system does not have enough resources to accommodate a new Xwindow.

If **$xdisplay** is set to a remote display, the user may not be able to see the newly created Xwindow. If the **$xdisplay** setting is not correct, Xwindows or other system resources report the cause of the failure.

The **dbx** program does not distinguish between different types of failures, but the following message is sent when the subcommand is not successful:

```
Warning: dbx subcommand multiproc fails. dbx
continued with multproc disabled.
```

The user−defined configuration of the newly created window can be defined under the **dbx_term** application name in the **.Xdefaults** file.

Flags

on	Enables multiprocess debugging.
off	Disables multiprocess debugging.

Examples

1. To check the current status of multiprocess debugging, enter:

   ```
   multproc
   ```

2. To enable multiprocess debugging, enter:

   ```
   multproc on
   ```

3. To disable multiprocess debugging, enter:

   ```
   multproc off
   ```

See the **screen** subcommand and the **fork** subroutine. Also, see Debugging Programs Involving Multiple Processes in *AIX General Programming Concepts: Writing and Debugging Programs.*

mutex Subcommand

mutex [**lock** | **unlock** | **thnum** | **utid** | *MutexNumber* ...]

The **mutex** subcommand displays information about mutexes. If the *MutexNumber* parameter is given, the **mutex** subcommand displays information about the specified mutexes. If no flags or parameters are specified, the **mutex** subcommand displays information about all mutexes.

The information listed for each mutex is as follows:

`mutex`	Indicates the symbolic name of the mutex, in the form `$m`*MutexNumber*.
`type`	Indicates the type of the mutex: `non-rec` (non recursive), `recursi` (recursive) or `fast`.
`obj_addr`	Indicates the memory address of the mutex.
`lock`	Indicates the lock state of the mutex: `yes` if the mutex is locked, `no` if not.
`owner`	If the mutex is locked, indicates the symbolic name of the user thread which holds the mutex.
`blockers`	List the user threads which are blocked on this mutex variable.

Note: The **print** subcommand of the **dbx** debug program recognizes symbolic mutex names, and can be used to display the status of the corresponding object.

Flags

lock	Displays information about locked mutexes.
unlock	Displays information about unlocked mutexes.
thnum	Displays information about all the mutexes held by a particular thread.
utid	Displays information about all the mutexes held by a user thread whose user thread id matches the given user thread id.

Examples

1. To display information about all mutexes, enter:

   ```
   mutex
   ```

2. To display information about all locked mutexes, enter:

   ```
   mutex lock
   ```

3. To display information about mutexes number four, five and six enter:

   ```
   mutex 4 5 6
   ```

   The output is similar to:

   ```
   mutex   obj_addr         type     lock owner  blockers
   $m4    0x20003274        non-rec   no
   $m5    0x20003280        recursi   no
   $m6    0x2000328a        fast      no
   ```

4. To display information about all the mutexes held by thread 1, enter:
   ```
   mutex thnum 1
   ```

5. To display information about all the mutexes held by a thread whose user thread id is 0x0001, enter:
   ```
   mutex utid 0x0001
   ```

See the **attribute** subcommand, the **condition** subcommand, the **print** subcommand, and the **thread** subcommand.

Also, see. Using Mutexes*AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

next Subcommand

next [*Number*]

The **next** subcommand runs the application program up to the next source line. The *Number* parameter specifies the number of times the **next** subcommand runs. If the *Number* parameter is not specified, **next** runs once only.

If you use the **next** subcommand in a multi−threaded application program, all the user threads run during the operation, but the program continues execution until the running thread reaches the specified source line. If you wish to step the running thread only, use the **set** subcommand to set the variable **$hold_next**. Setting this variable may result in deadlock since the running thread may wait for a lock held by one of the blocked threads.

Examples

1. To continue execution up to the next source line, enter:

   ```
   next
   ```

2. To continue execution up to the third source line following the current source line, enter:

   ```
   next 3
   ```

See the **cont** subcommand, **goto** subcommand, **nexti** subcommand, **set** subcommand, and the **step** subcommand.

nexti Subcommand

nexti [*Number*]

The **nexti** subcommand runs the application program up to the next instruction. The *Number* parameter specifies the number of times the **nexti** subcommand will run. If the *Number* parameter is not specified, **nexti** runs once only.

If you use the **nexti** subcommand in a multi−threaded application program, all the user threads run during the operation, but the program continues execution until the running thread reaches the specified machine instruction. If you wish to step the running thread only, use the **set** subcommand to set the variable **$hold_next**. Setting this variable may result in deadlock since the running thread may wait for a lock held by one of the blocked threads.

Examples

1. To continue execution up to the next machine instruction, enter:

   ```
   nexti
   ```

2. To continue execution up to the third machine instruction following the current machine instruction, enter:

   ```
   nexti 3
   ```

See the **gotoi** subcommand, **next** subcommand, **set** subcommand, and **stepi** subcommand. Also, see Running a Program at the Machine Level in *AIX General Programming Concepts: Writing and Debugging Programs*.

print Subcommand

print *Expression ...*

print*Procedure* ([*Parameters*])

The **print** subcommand does either of the following:

- Prints the value of a list of expressions, specified by the *Expression* parameters.
- Executes a procedure, specified by the *Procedure* parameter and prints the return value of that procedure. Parameters that are included are passed to the procedure.

Examples

1. To display the value of `x` and the value of `y` shifted left two bits, enter:

   ```
   print x, y << 2
   ```

2. To display the value returned by calling the `sbrk` routine with an argument of 0, enter:

   ```
   print sbrk(0)
   ```

See the **assign** subcommand, the **call** subcommand, and the **set** subcommand.

prompt Subcommand

prompt [**"***String***"**]

The **prompt** subcommand changes the **dbx** command prompt to the string specified by the *String* parameter.

Example

To change the prompt to `dbx>`, enter:

```
prompt "dbx>"
```

See Defining a New dbx Prompt in *AIX General Programming Concepts: Writing and Debugging Programs*.

quit Subcommand

quit

The **quit** subcommand terminates all processes running in the **dbx** debugging session.

See the **detach** subcommand.

registers Subcommand

registers [>*File*]

The **registers** subcommand displays the values of general purpose registers, system control registers, floating−point registers, and the current instruction register.

- General purpose registers are denoted by the **$r***Number* variable, where the *Number* parameter indicates the number of the register.
  > **Note:** The register value may be set to the **0xdeadbeef** hexadecimal value. The **0xdeadbeef** hexadecimal value is an initialization value assigned to general−purpose registers at process initialization.
- Floating point registers are denoted by the **$fr***Number* variable. By default, the floating−point registers are not displayed. To display the floating−point registers, use the **unset $noflregsdbx** subcommand.
  Note: The **registers** subcommand cannot display registers if the current thread is in kernel mode.

Flag

>File	Redirects output to the specified file.

See the **set** subcommand and the **unset** subcommand. Also, see Using Machine Registers in *AIX General Programming Concepts: Writing and Debugging Programs*.

rerun Subcommand

rerun [*Arguments*] [<*File*] [>*File*] [> >*File*] [**2**>*File*] [**2**> >*File*] [>**&***File*] [> >**&***File*]

The **rerun** subcommand begins execution of the object file. The *Arguments* are passed as command line arguments. If the *Arguments* parameter is not specified, the arguments from the last **run** or **rerun** subcommand are reused.

Flags

<*File*	Redirects input so that input is received from *File*.
>*File*	Redirects output to *File*.
> >*File*	Appends redirected output to *File*.
2>*File*	Redirects standard error to *File*.
2> >*File*	Appends redirected standard error to *File*.
>**&***File*	Redirects output and standard error to *File*.
> >**&***File*	Appends output and standard error to *File*.

See the **run** subcommand.

return Subcommand

return [*Procedure*]

The **return** subcommand causes the application program to execute until a return to the procedure specified by the *Procedure* parameter is reached. If the *Procedure* parameter is not specified, execution ceases when the current procedure returns.

Examples

1. To continue execution to the calling routine, enter:

   ```
   return
   ```

2. To continue execution to the `main` procedure, enter:

   ```
   return main
   ```

rwlock Subcommand

rwlock [read | write | *RwlockNumber*....]

The **rwlock** subcommand displays information about rwlocks. If the *RwlockNumber* parameter is given, the **rwlock** subcommand displays information about the specified rwlocks. If no flags or parameters are specified, the **rwlock** subcommand displays information about all rwlocks.

The information for each **rwlock** is as follows:

`rwl`	Indicates the symbolic name of the rwlock, in the form $rw *RwlockNumber*.
`flag_value`	Indicates the flag value.
`owner`	Indicates the owner of the rwlock
`status`	Indicates who is holding the rwlock. The values are read (if held by reader), write (if held by writer), free (if free).
`wsleep[#]`	Indicates threads blocking in write. # indicates the total number of threads blocking in write.

`rsleep[#]`	Indicates threads blocking in read. # indicates the total number of threads blocking in read.

Note: The **print** subcommand of the dbx debug program recognizes symbolic rwlock names, and can be used to display the status of the corresponding object

Flags

read	Displays information about all rwlocks whose status is in read mode.
write	Displays information about all rwlocks whose status is in write mode.

Examples

1. To display information about all rwlocks, enter:
   ```
   rwlock
   ```

   The output is similar to:

   ```
   rwl     flag_value    owner status
   $rwl        1         $t1    write
           rsleeps[     0]:
           wsleeps[     0]:
   ```
2. To display information about all rwlocks in write mode:
   ```
   rwlock write
   ```

   The output is similar to:

   ```
   rwl     flag_value    owner status
   $rwl        1         $t1    write
           rsleeps[     0]:
           wsleeps[     0]:
   ```

See the **attribute** subcommand, the **condition** subcommand, **mutex** subcommand, the **print** subcommand, and the**thread** subcommand

run Subcommand

run [*Arguments*] [<*File*] [>*File*] [> >*File*] [**2**>*File*] [**2**> >*File*] [>**&***File*] [> >**&***File*]

The **run** subcommand starts the object file. The *Arguments* are passed as command line arguments.

Flags

<*File*	Redirects input so that input is received from *File*.
>*File*	Redirects output to *File*.
2>*File*	Redirects standard error to *File*.
> >*File*	Appends redirected output to *File*.
2> >*File*	Appends redirected standard error to *File*.
>**&***File*	Redirects output and standard error to *File*.
> >**&***File*	Appends output and standard error to *File*.

Example

To run the application with the arguments `blue` and `12`, enter:

```
run blue 12
```

See the **rerun** subcommand.

screen Subcommand

screen

The **screen** subcommand opens an Xwindow for the **dbx** command interaction. You continue to operate in the window in which the process originated.

The **screen** subcommand must be run while the **dbx** debug program is running in an Xwindows environment. If the **screen** subcommand is issued in a non−Xwindow environment, the **dbx** program displays a warning message and resumes debugging as if the **screen** subcommand had not been given. The **screen** subcommand can also be unsuccessful in the following situations:

- The **dbx** program is not running in an Xwindows environment.
- Xwindows is running but the **dbx** global **$xdisplay** variable is not set to a valid display name. The **$xdisplay** variable is initialized to the **DISPLAY** environment variable. The **dbx** subcommand **set** *Name*=*Expression* changes the value of the display name.
- Xwindows is running, but the **TERM** environment variable is not set to a valid command name to invoke a new window.
- The **/tmp** directory does not allow read or write access to the program. The **dbx** program requires a small amount of space in this directory when the screen command is executed.
- System does not have enough resources to accommodate a new Xwindow.

The **dbx** program does not distinguish between different types of failures, but the program does send the following message:

```
Warning: dbx subcommand screen fails. dbx
continues.
```

If **$xdisplay** is set to a remote display, the user may not be able to see the newly created Xwindow. If the **$xdisplay** setting is not correct, Xwindows or other system resources report the problem.

The user−defined configuration of the newly created window can be defined under the **dbx_term** application name in the **.Xdefaults** file.

Example

To open an Xwindow for **dbx** command interaction, enter:

```
screen
```

See Separating dbx Output From Program Output in *AIX General Programming Concepts: Writing and Debugging Programs* and AIXwindows Overview, in *AIX Version 4 AIXwindows Programming Guide*.

set Subcommand

set [*Variable*=*Expression*]

The **set** subcommand defines a value for the **dbx** debug program variable. The value is specified by the *Expression* parameter; the program variable is specified by the *Variable* parameter. The name of the variable should not conflict with names in the program being debugged. A variable is expanded to the corresponding expression within other commands. If the **set** subcommand is used without arguments, the variables currently set are displayed.

The following variables are set with the **set** subcommand:

$catchbp	Catches breakpoints during the execution of the next command.
$expandunions	Displays values for each part of variant records or unions.
$frame	Uses the stack frame pointed to by the address designated by the value of **$frame** for doing stack traces and accessing local variables.
$hexchars	Prints characters as hexadecimal values.
$hexin	Interprets addresses in hexadecimal.
$hexints	Prints integers as hexadecimal values.
$hexstrings	Prints character pointers in hexadecimal.
$hold_next	Holds all threads except the running thread during the **cont**, **next**, **nexti**, and **step** subcommands. Setting this variable may result in deadlock since the running thread may wait for a lock held by one of the blocked threads.
$ignoreload	Does not stop when your program performs the **load**, **unload**, or **loadbind** subroutine.
$instructionset	Overrides the default disassembly mode. The following list contains possible values for the *Expression* parameter:

"default"	Specifies the architecture on which the **dbx** program is running.
"com"	Specifies the instruction set for the common intersection mode of the PowerPC and POWER architectures. The **dbx** program defaults to PowerPC mnemonics.
"pwr"	Specifies the instruction set and mnemonics for the POWER architecture.
"pwrx"	Specifies the instruction set and mnemonics for the POWER2 implementation of the POWER architecture.
"601"	Specifies the instruction set and mnemonics for the PowerPC 601 RISC Microprocessor.
"603"	Specifies the instruction set and mnemonics for the PowerPC 603 RISC Microprocessor.
"604"	Specifies the instruction set and mnemonics for the PowerPC 604 RISC Microprocessor.
"ppc"	Specifies the instruction set and mnemonics defined in the PowerPC architecture, excluding the optional instructions. These instructions are available in all PowerPC implementations except the PowerPC 601 RISC Microprocessor.
"any"	Specifies any valid PowerPC or POWER instruction. For instruction sets that overlap, the default is the PowerPC mnemonics.

If no value is set for the *Expression* parameter, the **dbx** program uses the default disassembly mode.

$listwindow	Specifies the number of lines to list around a function and the number to list when the **list** subcommand is used without parameters. The default is 10 lines.
$mapaddrs	Starts mapping addresses. Unsetting **$mapaddrs** stops address mapping.
$mnemonics	Changes the set of mnemonics to be used by the **dbx** program when disassembling.

"default"	Specifies the mnemonics that most closely match the specified instruction set.
"pwr"	Specifies the mnemonics for the POWER architecture.
"ppc"	Specifies the mnemonics defined in the PowerPC architecture book, excluding the optional instructions.

	If no value is set for the *Expression* parameter, the **dbx** program will use the mnemonics that most closely match the specified instruction set.
$noargs	Omits arguments from subcommands, such as *where*, *up*, *down*, and *dump*.
$noflregs	Omits the display of floating−point registers from the **registers** subcommand.
$octin	Interprets addresses in octal.
$octints	Prints integers in octal.
$repeat	Repeats the previous command if no command was entered.
$sigblock	Blocks signals to your program.
$stepignore	Controls how the **dbx** command behaves when the **step** subcommand runs on a source line that calls another routine for which no debugging information is available. This variable enables the **step** subcommand to step over large routines for which no debugging information is available. The following list contains possible values for the *Expression* parameter:

"function"	Performs the function of the **next** subcommand for the **dbx** command. This is the default value.
"module"	Performs the function of the **next** subcommand if the function is in a load module for which no debug information is available (such as a system library).
"none"	Performs the function of the **stepi** subcommand for the **dbx** command in the background until it reaches an instruction for which source information is available. At that point **dbx** will display where execution has stopped.

$thcomp	When **$thcomp** is set, the information displayed by the thread command **th−** is shown in a compressed format.
$unsafeassign	Turns off strict type checking between the two sides of an **assign** statement. Even if the **$unsafeassign** variable is set, the two sides of an **assign** statement may not contain storage types of different sizes.
$unsafebounds	Turns off subscript checking on arrays.
$unsafecall	Turns off strict type checking for arguments to subroutines or function calls.
$unsafegoto	Turns off the **goto** subcommand destination checking.
$vardim	Specifies the dimension length to use when printing arrays with unknown bounds. The default value is 10.
$xdisplay	Specifies the display name for Xwindows, for use with the multproc subcommand or the screen subcommand. The default is the value of the shell **DISPLAY** variable.

The **$unsafe** variables limit the usefulness of the **dbx** debug program in detecting errors.

Examples

1. To change the default number of lines to be listed to `20`, enter:

   ```
   set $listwindow=20
   ```

2. To disable type checking on the `assign` subcommand, enter:

   ```
   set $unsafeassign
   ```

3. To disassemble machine instructions for the PowerPC 601 RISC Microprocessor, enter:

   ```
   set $instructionset="601"
   ```

See the **unset** subcommand. Also, see Changing Print Output with Special Debug Program Variables in *AIX General Programming Concepts: Writing and Debugging Programs.*

set edit [vi, emacs] or set −o [vi, emacs] Subcommand

The **set** subcommand with the **−o** or **edit** option may be used to turn on one of the line edit modes. If the **set−o vi** or **set edit vi** command is given, you are placed in the input mode of the *vi* line editor. If the **set −o emacs** or **set edit emacs** command is given, you are placed in the input mode of the *emacs* line editor.

Example

1. To turn on the vi line editor, enter:
   ```
   set−o vi
   ```
   or
   ```
   set edit vi
   ```

sh Subcommand

sh [*Command*]

The **sh** subcommand passes the command specified by the *Command* parameter to the shell for execution. The **SHELL** environment variable determines which shell is used. The default is the **sh** shell. If no argument is specified, control is transferred to the shell.

Examples

1. To run the `ls` command, enter:
   ```
   sh ls
   ```
2. To escape to a shell, enter:
   ```
   sh
   ```
3. To use the `SHELL` environment variable, enter:
   ```
   sh echo $SHELL
   ```

See Running Shell Commands from dbx in *AIX General Programming Concepts: Writing and Debugging Programs*.

skip Subcommand

skip [*Number*]

The **skip** subcommand continues execution of the application program from the current stopping point. A number of breakpoints equal to the value of the *Number* parameter are skipped and execution then ceases when the next breakpoint is reached or when the program finishes. If the *Number* parameter is not specified, it defaults to a value of one.

Example

To continue execution until the second breakpoint is encountered, enter:

```
skip 1
```

Also see the **cont** subcommand.

source Subcommand

source*File*

The **source** subcommand reads **dbx** subcommands from the file specified by the *File* parameter.

Example

To read the **dbx** subcommands in the `cmdfile` file, enter:

```
source cmdfile
```

See Reading dbx Subcommands from a File in *AIX General Programming Concepts: Writing and Debugging Programs*.

status Subcommand

status [*>File*]

The **status** subcommand displays the **trace** and **stop** subcommands currently active. The > flag sends the output of the **status** subcommand to a file specified in the *File* parameter.

Flag

>File	Redirects output to *File*.

See the **clear** subcommand, the **delete** subcommand, the **stop** subcommand, and the **trace** subcommand for the **dbx** command.

Also, see Setting and Deleting Breakpoints in *AIX General Programming Concepts: Writing and Debugging Programs*.

step Subcommand

step [*Number*]

The **step** subcommand runs source lines of the application program. Specify the number of lines to be executed with the *Number* parameter. If the *Number* parameter is omitted, it defaults to a value of 1.

If you use the **step** subcommand on a multi−threaded application program, all the user threads run during the operation, but the program continues execution until the running thread reaches the specified source line. If you wish to step the running thread only, use the **set** subcommand to set the variable **$hold_next**. Setting this variable may result in deadlock since the running thread may wait for a lock held by one of the blocked threads.

> **Note:** Use the **$stepignore** variable of the **set** subcommand to control the behavior of the **step** subcommand. The **$stepignore** variable enables the **step** subcommand to step over large routines for which no debugging information is available.

Examples

1. To continue execution for one source line, enter:

   ```
   step
   ```

2. To continue execution for five source lines, enter:

```
step 5
```

3. To prevent the **dbx** program from single−stepping the **printf** function, as illustrated in the following example code:

   ```
   60 printf ("hello world \n");
   ```

   enter:

   ```
   set $stepignore="function"; step
   ```

See the **cont** subcommand, the **goto** subcommand, the **next** subcommand, the **set** subcommand, and the **stepi** subcommand.

stepi Subcommand

stepi [*Number*]

The **stepi** subcommand runs instructions of the application program. Specify the number of instructions to be executed in the *Number* parameter. If the *Number* parameter is omitted, it defaults to one.

If used on a multi−threaded application program, the **stepi** subcommand steps the running thread only. All other user threads remain stopped.

Examples

1. To continue execution for one machine instruction, enter:

   ```
   stepi
   ```

2. To continue execution for 5 machine instructions, enter:

   ```
   stepi 5
   ```

See the **gotoi** subcommand, the **nexti** subcommand, and the **step** subcommand.

stop Subcommand

stop { [*Variable*] [**at** *SourceLine* | **in** *Procedure*] [**if***Condition*]}

The **stop** subcommand halts the application program when certain conditions are fulfilled. The program is stopped when:

- The *Condition* is true when the **if***Condition* flag is used.
- The *Procedure* is called if the **in***Procedure* flag is used.
- The *Variable* is changed if the *Variable* parameter is specified.
- The *SourceLine* line number is reached if the **at***SourceLine* flag is used.

  The *SourceLine* variable can be specified as an integer or as a file name string followed by a : (colon) and an integer.

After any of these commands, the **dbx** debug program responds with a message reporting the event it has built as a result of your command. The message includes the event ID associated with your breakpoint along with an interpretation of your command. The syntax of the interpretation might not be exactly the same as your command. For example:

```
stop in main
```

```
[1] stop in main
stop at 19 if x == 3
[2] stop at "hello.c":19 if x = 3
```

The numbers in brackets are the event identifiers associated with the breakpoints. The **dbx** debug program associates event numbers with each **stop** subcommand. When the program is halted as the result of one of the events, the event identifier is displayed along with the current line to show what event caused the program to stop. The events you create coexist with internal events created by **dbx**, so event numbers may not always be sequential.

Use the **status** subcommand to view these numbers. You can redirect output from **status** to a file. Use the **delete** or **clear** subcommand to turn the **stop** subcommand off.

In a multi−threaded application program, all user threads are halted when any user thread hits a breakpoint. A breakpoint set on a source line or function will be hit by any user thread which executes the line or function, unless you specify conditions as shown in example 9 below. The following aliases specify the conditions automatically:

- **bfth**(*Function*, *ThreadNumber*)
- **blth**(*SourceLine*, *ThreadNumber*)

ThreadNumber is the number part of the symbolic thread name as reported by the **thread** subcommand (for example, 5 is the *ThreadNumber* for the thread name $t5). These aliases are actually macros which produce the expanded subcommands shown below:

```
stopi at &Function    if ($running_thread ==
ThreadNumber)
stop at SourceLine  if ($running_thread == ThreadNumber)
```

Flags

at*SourceLine*	Specifies the line number.
if*Condition*	Specifies the condition, such as true.
in*Procedure*	Specifies the procedure to be called.

Examples

1. To stop execution at the first statement in the `main` procedure, enter:

   ```
   stop in main
   ```

2. To stop execution when the value of the `x` variable is changed on line `12` of the execution, enter:

   ```
   stop x at 12
   ```

3. To stop execution at line 5 in file `sample.c`, enter:

   ```
   stop at "sample.c":5
   ```

4. To check the value of `x` each time that **dbx** runs a subroutine within `func1`, enter:

   ```
   stop in func1 if x = 22
   ```

5. To check the value of `x` each time that **dbx** begins to run `func1`, enter:

   ```
   stopi at &func1 if x = 22
   ```

6. To stop the program when the value of *Variable* changes, enter:

```
stop Variable
```

7. To stop the program whenever *Condition* evaluates to true, enter:

   ```
   stop if (x > y) and (x < 2000)
   ```

8. The following example shows how to display active events and remove them:

   ```
   status
   [1] stop in main
   [2] stop at "hello.c":19 if x = 3
   delete 1
   status
   [2] stop at "hello.c":19 if x = 3
   clear 19
   status
   (dbx)
   ```

   The **delete** command eliminates events by event identifier. The **clear** command deletes breakpoints by line number.

9. To place a breakpoint at the start of `func1` only when executed by thread `$t5`, enter one of the following equivalent commands:

   ```
   stopi at &func1 if ($running_thread == 5)
   ```

   or

   ```
   bfth(func1, 5)
   ```

See the **clear** subcommand, the **delete** subcommand, the **stopi** subcommand, and the **trace** subcommand. Also, see Setting and Deleting Breakpoints in *AIX General Programming Concepts: Writing and Debugging Programs*.

stopi Subcommand

stopi { [*Address*] [**at***Address* | **in** *Procedure*] [**if** *Condition*]}

The **stopi** subcommand sets a stop at the specified location:

- With the **if** *Condition* flag, the program stops when the condition true is specified.
- With the *Address* parameter, the program stops when the contents of *Address* change.
- With the **at** *Address* flag, a stop is set at the specified address.
- With the **in***Procedure* flag, the program stops when the *Procedure* is called.

Flags

if*Condition*	Specifies the condition, such as true.
in*Procedure*	Specifies the procedure to be called.
at*Address*	Specifies the machine instruction address.

Examples

1. To stop execution at address `0x100020f0`, enter:

   ```
   stopi at 0x100020f0
   ```

2. To stop execution when the contents of address `0x100020f0` change, enter:

   ```
   stopi 0x100020f0
   ```

3. To stop execution when the contents of address 0x100020f0 are changed by thread `$t1`, enter:

   ```
   stopi 0x200020f0 if ($running_thread == 1)
   ```

See the **stop** subcommand . Also, see Debugging at the Machine Level with dbx in *AIX General Programming Concepts: Writing and Debugging Programs*.

thread Subcommand

Display Selected Threads

thread { [**info**] [**-**] [*ThreadNumber* ...] } | **current** | **run** | **susp** | **term** | **wait**

Select an Individual Thread

thread current [−] *ThreadNumber*

Hold or Release Threads

thread { **hold** | **unhold** } [−] [*ThreadNumber* ...]

Help for the options displayed

thread {**help**}

The **thread** subcommand displays and controls user threads.

The first form of the **thread** subcommand can display information in two formats. If the **thread** subcommand is **th**, then the information displayed is in the first format. If the **thread** subcommand is **th -**, then the information displayed is in the second format. If no parameters are given, information about all user threads is displayed. If one or more *ThreadNumber* parameters are given, information about the corresponding user threads is displayed. When the **thread** subcommand displays threads, the current thread line is preceded by a >. If the running thread is not the same as the current thread, its line is preceded by a *****. The information displayed by the **thread** subcommand in both the formats is described below.

The information displayed by the **thread** subcommand in the first format is as follows:

`thread`	Indicates the symbolic name of the user thread, in the form `$t`*ThreadNumber*.
`state-k`	Indicates the state of the kernel thread (if the user thread is attached to a kernel thread). This can be `run`, `wait`, `susp`, or `term`, for running, waiting, suspended, or terminated.
`wchan`	Indicates the event on which the kernel thread is waiting or sleeping (if the user thread is attached to a kernel thread).
`state-u`	Indicates the state of the user thread. Possible states are `running`, `blocked`, or `terminated`.
`k-tid`	Indicates the kernel thread identifier (if the user thread is attached to a kernel thread).
`mode`	Indicates the mode (kernel or user) in which the user thread is stopped (if the user thread is attached to a kernel thread).
`held`	Indicates whether the user thread has been held.
`scope`	Indicates the contention scope of the user thread; this can be `sys` or `pro` for system or process contention scope.
`function`	Indicates the name of the user thread function.

The information displayed by the **thread** subcommand in the second format is given below. By default, for the **thread** subcommand **th -**, the information is displayed in the long form.

`thread`	Indicates the symbolic name of the user thread, in the form `$t`*ThreadNumber*.

Kernel thread related information

`tid`	Indicates the user thread identifier (if the user thread is attached to a kernel thread).
`pri`	Indicates the priority of the kernel thread.
`sched`	Indicates the scheduling policy of the kernel thread. This can be fif, oth, rr, for fifo, other, or round robin scheduling policies.
`state`	Indicates the state of the kernel thread (if the user thread is attached to a kernel thread). This can be run, wait, susp, or zomb, for running, waiting, suspended, or zombie.

User thread related information

`tid`	Indicates the user thread identifier.	
`pri`	Indicates the priority of the userl thread.	
`sched`	Indicates the scheduling policy of the user thread. This can be fif, oth, rr, for fifo, other, or round robin scheduling policies.	
`state`	Indicates the state of the user thread. This can be running, creating, suspended, blocked, runnable, or terminated.	
`state`	Indicates the user state in hex.	
`flags`	Indicates the values for pthread flags in hex.	
`wchan`	Indicates the event on which the kernel thread is waiting or sleeping (if the user thread is attached to a kernel thread).	
`mode`	Indicates the mode (kernel or user) in which the user thread is stopped (if the user thread is attached to a kernel thread).	
`held`	Indicates whether the user thread has been held.	
`scope`	Indicates the contention scope of the user thread; this can be sys or pro for system or process contention scope.	
`cancellation`	`pending`	Indicates if cancellation is pending or not.
	`state`	Indicates the mode and state of cancellation. If the cancellation is not pending and the state and mode are enabled and deferred respectively, then it is represented by **ed**, if cancellation state and mode is enabled and asynchronous, then it is represented by **ea**, and if mode is not enabled, then it is represented by **d**. If the cancellation is pending and the cancellation state and mode is enabled and deferred respectively, then it is represented by **ED**, if cancellation state and mode is enabled and asynchronous, then it is represented by **EA**, and if mode is not enabled, then it is represented by **D**.

`joinable`	Indicates whether the thread is joinable or not.
`boosted`	Indicates the boosted value of the thread.
`function`	Indicates the name of the user thread function.
`cursig`	Indicates the current signal value.

If the option set `$thcomp` is set, then the information is displayed in the compressed form as shown below.

```
m          mode           (k)ernel (u)ser
k          k-state        (r)unning (w)aiting (s)uspended (z)ombie
u          u-state        (r)unning (R)unnable (s)uspended (t)erminated
```

```
                        (b)locked (c)reating
h           held         (yes) (n)o
s           scope        (s)ystem (p)rocess
c           cancellation not pending:  (e)nabled (d)eferred,
                                       (e)nabled (a)sync, (d)isabled
                         pending    :  (E)nabled (D)eferred,
                                       (E)nabled (A)sync, (D)isabled
j           joinable     (yes) (n)o
b           boosted      value of boosted field in pthread structure
plk         kernel thread (oth)er  (fif)o  (rr)-> round-robin
            policy
plu         user thread  (oth)er  (fif)o  (rr)-> round-robin
            policy
prk         kernel thread hex number
            policy
pru         user thread  hex number
            policy
k-tid                    kernel thread id in hex
u-tid                    pthread id in hex
fl                       value of flags field in pthread structure in hex
sta                      value of state field in pthread structure in hex
cs                       value of the current signal
wchan                    event for which thread is waiting
function                 function name
```

The second form of the **thread** subcommand is used to select the current thread. The **print**, **registers**, and **where** subcommands of the **dbx** debug program all work in the context of the current thread. The **registers** subcommand cannot display registers if the current thread is in kernel mode.

The third form of the **thread** subcommand is used to control thread execution. Threads can be held using the **hold** flag, or released using the **unhold** flag. A held thread will not be resumed until it is released.

> **Note:** The **print** subcommand of the **dbx** debug program recognizes symbolic thread names, and can be used to display the status of the corresponding object.

Flags

current	If the *ThreadNumber* parameter is not given, displays the current thread. If the *ThreadNumber* parameter is given, selects the specified user thread as the current thread.
help	Displays all the information about the thread options that are shown when **th −** command is used.
hold	If the *ThreadNumber* parameter is not given, holds and displays all user threads. If one or more *ThreadNumber* parameters are given, holds and displays the specified user threads.
unhold	If the *ThreadNumber* parameter is not given, releases and displays all previously held user threads. If one or more *ThreadNumber* parameters are given, releases and displays the specified user threads.
info	If the *ThreadNumber* parameter is not given, displays a long format listing of all user threads. If one or more *ThreadNumber* parameters are given, displays a long format listing the specified user threads. All the above flags take [−] option. If this option is given, then the thread information displayed is in the second format and in the long form unless the **`set $thcomp`** option is set.
run	Displays threads which are in the `run` state.
susp	Displays threads which are in the `susp` state.
term	Displays threads which are in the `term` state.
wait	Displays threads which are in the `wait` state.

Examples

1. To display information about threads that are in the wait state, enter:
   ```
   thread wait
   ```

   The output is similar to:

   ```
   thread  state-k   wchan state-u   k-tid mode held scope function
    $t1     wait            running   17381   u   no   pro  main
    $t3     wait            running    8169   u   no   pro  iothread
   ```

2. To display information about several given threads, enter:
   ```
   thread 1 3 4
   ```

   The output is similar to:

   ```
   thread  state-k   wchan state-u   k-tid mode held scope function
    $t1     wait           running   17381   u   no   pro  main
    $t3     wait           running    8169   u   no   pro  iothread
   >$t4     run            running    9669   u   no   pro  save_thr
   ```

3. To make thread 4 the current thread, enter:
   ```
   thread current 4
   ```

4. To hold thread number 2, enter:

   ```
   thread hold 2
   ```

5. To display information about threads that are in the wait state, in the second format, enter:
   ```
   thread wait -
   ```

   The output is similar to:

   ```
   thread m k u h s c  j b  kpl  upl  kpr upr k_tid   u_tid   fl  sta wchan  function
   *$t1   u r w n p ed y 0  oth  oth  61   1  0043e5  000001  51  004        main
    $t3   u r w n p ed y 0  oth  oth  61   1  001fe9  000102  51  004        iothread
   >$t4   u r r n p ed y 0  oth  oth  61   1  0025c5  000203  50  064        save_thr
   ```

6. To display information about several given threads in the second format, enter:
   ```
   thread - 1 2 3
   ```

   The output is similar to:

   ```
   thread m k u h s c  j b  kpl  upl  kpr upr k_tid   u_tid   fl  sta wchan function
   *$t1   u r w n p ed y 0  oth  oth  61   1  0043e5  000001  51  004       main
    $t3   u r w n p ed y 0  oth  oth  61   1  00fe9   000102  51  004       iothread
   >$t4   u r r n p ed y 0  oth  oth  61   1  0025c5  000203  50  064       save_thr
   ```

See the **attribute** subcommand, the **condition** subcommand, the **mutex** subcommand, the **print** subcommand, the **registers** subcommand, and the **where** subcommand.

Also, see Creating Threads*AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

trace Subcommand

trace [*SourceLine* | *Expression* **at** *SourceLine* | *Procedure* | [*Variable*] [**at** *SourceLine* | **in** *Procedure*]] [**if** *Condition*]

The **trace** subcommand prints tracing information for the specified procedure, function, source line, expression, or variable when the program runs. The *SourceLine* variable can be specified as an integer or as a file name string followed by a : (colon) and an integer. A condition can be specified. The **dbx** debug program associates a number with each **trace** subcommand. Use the **status** subcommand to view these numbers. Use the **delete** subcommand to turn tracing off.

By default, tracing is process based. In order to make a thread based trace, specify the thread in a condition as shown in example 8 below.

Flags

at*SourceLine*	Specifies the source line where the expression being traced is found.
if*Condition*	Specifies a condition for the beginning of the trace. The trace begins only **if***Condition* is true.
in *Procedure*	Specifies the procedure to use to find the procedure or variable being traced.

Examples

1. To trace each call to the `printf` procedure, enter:

   ```
   trace printf
   ```

2. To trace each execution of line 22 in the `hello.c` file, enter:

   ```
   trace "hello.c":22
   ```

3. To trace changes to the `x` variable within the `main` procedure, enter:

   ```
   trace x in main
   ```

4. To trace the data address 0x2004000, enter:

   ```
   set $A=0x2004000
   trace $A
   ```

   Note: The **tracei** subcommand is designed to trace addresses.

5. You can restrict the printing of source lines to when the specified *Procedure* is active. You can also specify an optional *Condition* to control when trace information should be produced. For example:

   ```
   (dbx) trace in sub2
   [1] trace in sub2
   (dbx) run
   trace in hellosub.c:  8  printf("%s",s);
   trace in hellosub.c:  9  i = '5';
   trace in hellosub.c:  10  }
   ```

6. You can display a message each time a procedure is called or returned. When a procedure is called, the information includes passed parameters and the name of the calling routine. On a return, the information includes the return value from *Procedure*. For example:

   ```
   (dbx) trace sub
   [1] trace sub
   (dbx) run
   calling sub(s = "hello", a = −1, k = delete) from function main
   returning "hello" from sub
   ```

7. You can print the value of *Expression* when the program reaches the specified source line. The lines number and file are printed, but the source line is not. For example:

   ```
   (dbx) trace x*17 at "hellosub.c":8 if (x > 0)
   [1] trace x*17 at "hellosub.c":8 if x > 0
   (dbx) run
   at line 8 in file "hellosub.c": x*17 = 51
   ```

```
(dbx) trace x
[1] trace x
initially (at line 4 in "hello.c"):  x = 0
after line 17 in "hello.c":  x = 3
```

8. To trace changes to the **x** variable made by thread `$t1`, enter:

   ```
   (dbx) trace x if ($running_thread == 1)
   ```

Also, see the **tracei** subcommand.

tracei Subcommand

tracei [[*Address*] [**at** *Address* | **in** *Procedure*] | *Expression* **at** *Address*] [**if** *Condition*]

The **tracei** subcommand turns on tracing when:

- The contents of the address specified by the *Address* parameter change if the *Address* flag is included.
- The instruction **at** Address is run if the **at** *Address* parameter is specified.
- The procedure specified by *Procedure* is active if the **in***Procedure* flag is included.
- The condition specified by the *Condition* parameter is true if the **if** *Condition* flag is included.

Flags

at*Address*	Specifies an address. Tracing is enabled when the instruction at this address is run.
if *Condition*	Specifies a condition. Tracing is enabled when this condition is met.
in*Procedure*	Specifies a procedure. Tracing is enabled when this procedure is active.

Examples

1. To trace each instruction executed, enter:

   ```
   tracei
   ```

2. To trace each time the instruction at address `0x100020f0` is executed, enter:

   ```
   tracei at 0x100020f0
   ```

3. To trace each time the contents of memory location `0x20004020` change while the `main` procedure is active, enter:

   ```
   tracei 0x20004020 in main
   ```

4. To trace each time the instruction at address 0x100020f0 is executed by thread $t4, enter:

   ```
   tracei at 0x100020f0 if ($running_thread == 4)
   ```

See the **trace** subcommand. Also, see Debugging at the Machine Level with dbx in *AIX General Programming Concepts: Writing and Debugging Programs*.

unalias Subcommand

unalias*Name*

The **unalias** subcommand removes the alias specified by the *Name* parameter.

Example

To remove an alias named `printx`, enter:

```
unalias printx
```

See the **alias** subcommand. Also, see Creating Subcommand Aliases in *AIX General Programming Concepts: Writing and Debugging Programs*.

unset Subcommand

unset*Name*

The **unset** subcommand deletes the **dbx** debug program variable associated with the name specified by the *Name* parameter.

Example

To delete the variable inhibiting the display of floating−point registers, enter:

```
unset $noflregs
```

See the **set** subcommand. Also, see Changing Print Output With Special Debugging Variables in *AIX General Programming Concepts: Writing and Debugging Programs*.

up Subcommand

up [*Count*]

The **up** subcommand moves the current function up the stack *Count* number of levels. The current function is used for resolving names. The default for the *Count* parameter is one.

Examples

1. To move the current function up the stack 2 levels, enter:

   ```
   up 2
   ```

2. To display the current function on the stack, enter:

   ```
   up 0
   ```

See the **down** subcommand. Also, see Changing the Current File or Procedure, Displaying a Stack Trace in *AIX General Programming Concepts: Writing and Debugging Programs*.

use Subcommand

use [*Directory ...*]

The **use** subcommand sets the list of directories to be searched when the **dbx** debug program looks for source files. If the **use** subcommand is specified without arguments, the current list of directories to be searched is displayed.

The **@** (at−sign) is a special symbol that directs the **dbx** program to look at the full−path name information in the object file, if it exists. If you have a relative directory called @ to search, you should use `./@` in the search path.

The **use** subcommand uses the **+** (plus−sign) to add more directories to the list of directories to be searched. If you have a directory named **+**, specify the full−path name for the directory (for example, **./+** or **/tmp/+**).

Examples

1. To change the list of directories to be searched to the current directory (.), the parent directory (..), and the **/tmp** directory, enter:

   ```
   use . .. /tmp
   ```
2. To change the list of directories to be searched to the current directory (.), the directory the source file was located in at compilation time (@), and the **../source** directory, enter:

   ```
   use . @ ../source
   ```
3. To add the **/tmp2** directory to the list of directories to be searched, enter:

   ```
   use + /tmp2
   ```

Also, see the **edit** subcommand and the **list** subcommand.

whatis Subcommand

whatis*Name*

The **whatis** subcommand displays the declaration of *Name*, where the *Name* parameter designates a variable, procedure, or function name, optionally qualified with a block name.

> **Note:** Use the **whatis** subcommand only while running the **dbx** debug program.

Examples

1. To display the declaration of the `x` variable, enter:

   ```
   whatis x
   ```
2. To display the declaration of the `main` procedure, enter:

   ```
   whatis main
   ```
3. To display the declaration of the `x` variable within the `main` function, enter:

   ```
   whatis main.x
   ```
4. To print the declaration of an enumeration, structure, or union tag (or the equivalent in Pascal), use `$$TagName`:

   ```
   (dbx) whatis $$status
   enum $$status { run, create, delete, suspend };
   ```

where Subcommand

where [>*File*]

The **where** subcommand displays a list of active procedures and functions. By using the >*File* flag, the output of this subcommand can be redirected to the specified file.

Flag

>File	Redirects output to the specified file.

See the **up** subcommand and the **down** subcommand. Also, see Displaying a Stack Trace in *AIX General Programming Concepts: Writing and Debugging Programs*.

whereis Subcommand

whereis*Identifier*

The **whereis** subcommand displays the full qualifications of all the symbols whose names match the specified identifier. The order in which the symbols print is not significant.

Examples

To display the qualified names of all symbols named `x`, enter:

```
whereis x
```

Also, see the **which** subcommand.

which Subcommand

which *Identifier*

The **which** subcommand displays the full qualification of the given identifier. The full qualification consists of a list of the outer blocks with which the identifier is associated.

Examples

To display the full qualification of the `x` symbol, enter:

```
which x
```

See the **whereis** subcommand. Also. seeScoping of Names in in *AIX General Programming Concepts: Writing and Debugging Programs*.

Files

a.out	Object file; contains object code.
core	Contains core dump.
.dbxinit	Contains initial commands.

Related Information

The **adb** command, **cc** command.

The **a.out** file, **core** file.

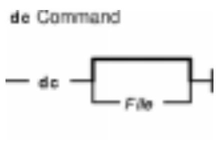
The dbx Symbolic Debug Program Overview and Using the dbx Debug Program in *AIX General Programming Concepts: Writing and Debugging Programs*.

dc Command

Purpose

Provides an interactive desk calculator for doing arbitrary−precision integer arithmetic.

Syntax



dc [*File*]

Description

The **dc** command is an arbitrary−precision arithmetic calculator. The **dc** command takes its input from the *File* parameter or standard input until it reads an end−of−file character. Once the **dc** command receives the input, it evaluates the value and writes the evaluation to standard output. It operates on decimal integers, but you can specify an input base, an output base, and a number of fractional digits to be maintained. The **dc** command is structured as a stacking, reverse Polish notation calculation.

The **bc** command is a preprocessor for the **dc** command. It provides infix notation and a syntax similar to the C language, which implements functions and control structures for programs.

Subcommands

c	Cleans the stack: the **dc** command pops all values on the stack.
d	Duplicates the top value on the stack.
f	Displays all values on the stack.
i	Pops the top value on the stack and uses that value as the number radix for further input.
I	Pushes the input base on the top of the stack.
k	Pops the top of the stack and uses that value as a nonnegative scale factor. The appropriate number of places is displayed on output and is maintained during multiplication, division, and exponentiation. The interaction of scale factor, input base, and output base is reasonable if all are changed together.
l*x*	Pushes the value in the register represented by the *x* variable on the stack. The register represented by the *x* variable is not changed. All registers start with a value of 0.
L*x*	Treats the *x* variable as a stack and pops its top value onto the main stack.
o	Pops the top value on the stack and uses that value as the number radix for further output.
O	Pushes the output base on the top of the stack.
p	Displays the top value on the stack. The top value remains unchanged.
P	Interprets the top of the stack as a string, removes it, and displays it.

q	Exits the program. If the **dc** command is running a string, it pops the recursion level by two.
Q	Pops the top value on the stack and on the string execution level by that value.
s*x*	Pops the top of the stack and stores it in a register named *x*, where the *x* variable can be any character.
S*x*	Treats the *x* variable as a stack. It pops the top of the main stack and pushes that value onto the stack represented by the *x* variable.
v	Replaces the top element on the stack by its square root. Any existing fractional part of the option is taken into account, but otherwise, the scale factor is ignored.
x	Treats the top element of the stack as a character string and runs it as a string of **dc** commands.
X	Replaces the number on the top of the stack with its scale factor.
z	Pushes the number of elements in the stack onto the stack.
Z	Replaces the top number in the stack with the number of digits in that number.
Number	Pushes the specified value onto the stack. A *Number* is an unbroken string of the digits 0 through 9. To specify a negative number, precede it with _ (underscore). A number may contain a decimal point.
+ − / * % ^	Adds (+), subtracts (−), multiplies (*), divides (/), remainders (%), or exponentiates (^) the top two values on the stack. The **dc** command pops the top two entries off the stack and pushes the result on the stack in their place. The **dc** command ignores fractional parts of an exponent.
[*String*]	Puts the bracketed *String* parameter onto the top of the stack.
[= | > | <] *x*	
	Pops the top two elements of the stack and compares them. Evaluates the register represented by the *x* variable as if it obeys the stated relation.
!	Interprets the rest of the line as an operating system command.
?	Gets and runs a line of input.
;:	The **bc** command uses these characters for array operations.

Examples

1. To use the **dc** command as a calculator, enter:

```
You:    1 4 / p
System: 0
You:    1 k   [ Keep 1 decimal place ]s.
        1 4 / p
System: 0.2
You:    3 k   [ Keep 3 decimal places ]s.
        1 4 / p
System: 0.250
You:    16 63 5 / + p
System: 28.600
You:    16 63 5 + / p
System: 0.235
```

Comments may be used in the **dc** command as in the example. Comments are enclosed in brackets and may be followed by **s.** (**[** *Comment***] s.**) is ignored by the **dc** command. Comments enclosed in brackets only are stored on the top of the stack.

When you enter the **dc** command expressions directly from the keyboard, press Ctrl−D to end the

bc command session and return to the shell command line.

2. To load and run a **dc** program file, enter:
```
You:    dc prog.dc
        5 lf x p [ 5 factorial ]s.
System: 120
You:    10 lf x p [ 10 factorial ]s.
System: 3628800
```

   This entry interprets the **dc** program saved in the **prog.dc** program file, then reads from the workstation keyboard. The `lfx` evaluates the function stored in register `f`, which could be defined in the **prog.c** program file as:

```
[ f: compute the factorial of n ]s.
[ (n = the top of the stack) ]s.
[ If 1>n do b; If 1<n do r ]s.
 [d 1 >b d 1 <r] sf
[ Return f(n) = 1 ]s.
 [d − 1 +] sb
[ Return f(n) = n * f(n−1) ]s.
 [d 1 − lf x *] sr
```

You can create **dc** program files with any text editor or with the **−c** (compile) flag of the **bc** command. When you enter the **dc** command expressions directly from the keyboard, press Ctrl−D to end the **bc** command session and return to the shell command line.

Files

/usr/bin/dc Contains the **dc** command.

Related Information

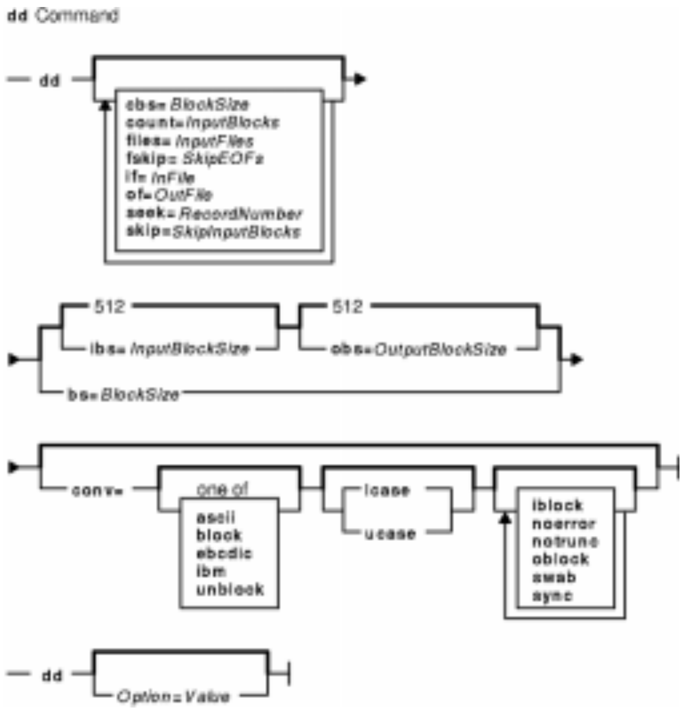
The **bc** command.

dd Command

Purpose

Converts and copies a file.

Syntax



dd [**cbs=***BlockSize*] [**count=***InputBlocks*] [**files=***InputFiles*] [**fskip=***SkipEOFs*] [**if=***InFile*] [**of=***OutFile*] [**seek=***RecordNumber*] [**skip=***SkipInputBlocks*] [**ibs=***InputBlockSize*] [**obs=***OutputBlockSize*] [**bs=***BlockSize*] [**conv=** [**ascii** | **block** | **ebcdic** | **ibm** | **unblock**] [**lcase** | **ucase**] [**iblock**] [**noerror**] [**swab**] [**sync**] [**oblock**] [**notrunc**]]

dd [*Option*=*Value*]

Description

The **dd** command reads the *InFile* parameter or standard input, does the specified conversions, then copies the converted data to the *OutFile* parameter or standard output. The input and output block size can be specified to take advantage of raw physical I/O.

> **Note:** The term *Block* refers to the quantity of data read or written by the **dd** command in one operation and is not necessarily the same size as a disk block.

Where sizes are specified, a number of bytes is expected. A number ending with **w**, **b**, or **k** specifies multiplication by 2, 512, or 1024 respectively; a pair of numbers separated by an **x** or an ***** (asterisk) indicates a product.

> **Note:** The count parameter expects the number of blocks, not the number of bytes, to be copied.

The character−set mappings associated with the **conv=ascii** and **conv=ebcdic** flags are complementary operations. These flags map between ASCII characters and the subset of EBCDIC characters found on most workstations and keypunches.

Use the **cbs** parameter value if specifying any of the **block**, **unblock**, **ascii**, **ebcdic**, or **ibm** conversions. If **unblock** or **ascii** parameters are specified, then the **dd** command performs a fixed−length to variable−length conversion. Otherwise it performs a conversion from variable−length to fixed−length. The **cbs** parameter determines the fixed−length.

Attention: If the **cbs** parameter value is specified smaller than the smallest input block, the converted block is truncated.

After it finishes, the **dd** command reports the number of whole and partial input and output blocks.

Notes:

1. Normally, you need only write access to the output file. However, when the output file is not on a direct−access device and you use the **seek** flag, you also need read access to the file.
2. The **dd** command inserts new−line characters only when converting with the **conv=ascii** or **conv=unblock** flags set; it pads only when converting with the **conv=ebcdic**, **conv=ibm**, or **conv=block** flags set.
3. Use the **backup**, **tar**, or **cpio** command instead of the **dd** command whenever possible to copy files to tape. These commands are designed for use with tape devices. For more information on using tape devices, see the **rmt** special file.
4. The block size values specified with the **bs**, **ibs** and **obs** flags must always be a multiple of the physical block size for the media being used.
5. When the **conv=sync** flag is specified, the **dd** command pads any partial input blocks with nulls. Thus, the **dd** command inserts nulls into the middle of the data stream if any of the reads do not receive a full block of data (as specified by the **ibs** flag). This is a common occurence when reading from pipes.
6. If the **bs** flag is specified by itself and no conversions other than **sync**, **noerror** or **notrunc** are specified, then the data from each input block will be written as a separate output block; if the read returns less than a full block and **sync** is not specified, then the resulting output block will be the same size as the input block. If the **bs** flag is not specified, or a conversion other than **sync**, **noerror** or **notrunc** is specified, then the input will be processed and collected into fullsized output blocks until the end of input is reached.

Flags

bs=*BlockSize*	Specifies both the input and output block size, superseding the **ibs** and **obs** flags. The block size values specified with the **bs** flag must always be a multiple of the physical block size for the media being used.
cbs=*BlockSize*	Specifies the conversion block size for variable−length to fixed−length and fixed−length to variable−length conversions, such as **conv=block**.
count=*InputBlocks*	Copies only the number of input blocks specified by the *InputBlocks* variable.
files=*InputFiles*	Copies the number of files specified by the *InputFiles* variable value of input files before ending (makes sense only where input is a magnetic tape or similar device).
fskip=*SkipEOFs*	Skips past the number of end−of−file characters specified by the *SkipEOFs* variable before starting to copy; this *SkipEOFs* variable is useful for positioning on multifile magnetic tapes.
ibs=*InputBlockSize*	Specifies the input−block size; the default is 512 bytes or one block. The block−size values specified with the **ibs** flag must always be a multiple of the physical block size

	for the media being used.
if=*InFile*	Specifies the input file name; standard input is the default.
obs=*OutputBlockSize*	Specifies the output−block size; the default is 512 bytes or one block. The block size values specified with the **obs** flag must always be a multiple of the physical block size for the media being used.
of=*OutFile*	Specifies the output file name; standard output is the default.
seek=*RecordNumber*	Seeks the record specified by the *RecordNumber* variable from the beginning of output file before copying.
skip=*SkipInputBlocks*	Skips the specified *SkipInputBlocks* value of input blocks before starting to copy.
conv= *Conversion***,....**	Specifies one or more conversion options. Multiple conversions should be separated by commas. The following list describes the possible options:

ascii	Converts EBCDIC to ASCII. This option is incompatible with the **ebcdic**, **ibm**, **block**, and **unblock** options.
block	Converts variable−length records to fixed−length. The length is determined by the conversion block size (cbs). This option is incompatible with the **ascii**, **ebcdic**, **ibm**, and **unblock** options.
ebcdic	Converts ASCII to standard EBCDIC. This option is incompatible with the **ascii**, **ibm**, **block**, and **unblock** options.
ibm	Converts ASCII to an IBM version of EBCDIC. This option is incompatible with the **ascii**, **ebcdic**, **block**, and **unblock** options.
iblock, **oblock**	Minimize data loss resulting from a read or write error on direct access devices. If you specify the **iblock** variable and an error occurs during a block read (where the block size is 512 or the size specified by the **ibs=***InputBlockSize* variable), the **dd** command attempts to reread the data block in smaller size units. If the **dd** command can determine the sector size of the input device, it reads the damaged block one sector at a time. Otherwise, it reads it 512 bytes at a time. The input block size (**ibs**) must be a multiple of this retry size. This option contains data loss associated with a read error to a single sector. The **oblock** conversion works similarly on output.
lcase	Makes all alphabetic characters lowercase.
noerror	Does not stop processing on an error.
notrunc	Does not truncate the output file. Instead, blocks not explicitly written to output are preserved.
ucase	Makes all alphabetic characters uppercase.
swab	Swaps every pair of bytes.
sync	Pads every input block to the **ibs** value.
unblock	Converts fixed−length blocks to variable−length. The length is determined by the conversion block size (cbs). This option is incompatible with the **ascii**, **ebcdic**, **ibm**, and **block** options.

Exit Status

This command returns the following exit values:

0	The input file was copied successfully.
>0	An error occurred.

Examples

1. To convert an ASCII text file to EBCDIC, enter:
   ```
   dd if=text.ascii of=text.ebcdic conv=ebcdic
   ```
   This command converts the `text.ascii` file to EBCDIC representation, storing the EBCDIC version in the `text.ebcdic` file.

   > **Note:** When you specify the **conv=ebcdic** parameter, the **dd** command converts the ASCII ^ (circumflex) character to an unused EBCDIC character (9A hexadecimal), and the ASCII ~ (tilde) to the EBCDIC ^ (NOT symbol).

2. To convert the variable−length record ASCII file **/etc/passwd** to a file of 132−byte fixed−length EBCDIC records, enter:
   ```
   dd if=/etc/passwd cbs=132 conv=ebcdic of=/tmp/passwd.ebcdic
   ```
3. To convert the 132−byte−per−record EBCDIC file to variable−length ASCII lines in lowercase, enter:
   ```
   dd if=/tmp/passwd.ebcdic cbs=132 conv=ascii of=/tmp/passwd.ascii
   ```
4. To convert the variable−length record ASCII file **/etc/passwd** to a file of 132−byte fixed−length records in the IBM version of EBCDIC, enter:
   ```
   dd if=/etc/passwd cbs=132 conv=ibm of=/tmp/passwd.ibm
   ```
5. To copy blocks from a tape with 1KB blocks to another tape using 2KB blocks, enter:
   ```
   dd if=/dev/rmt0 ibs=1024 obs=2048 of=/dev/rmt1
   ```
6. To use the **dd** command as a filter, enter:
   ```
   li −l | dd conv=ucase
   ```
   This command displays a long listing of the current directory in uppercase.

   > **Note:** The performance of the **dd** command and **cpio** command to the 9348 Magnetic Tape Unit Model 12 can be improved by changing the default block size. To change the block size, use the **chdev** command in the following way:
   >
   > ```
   > chdev −l Device_name −a block_size=32k
   > ```

7. To perform efficient transfers to 3.5−inch 1.4MB diskette using 36 blocks of 512 bytes, enter:
   ```
   dd if=Filename of=/dev/rfd0 bs=36b conv=sync
   ```
   This command writes the value of the *Filename* parameter to the diskette device a cylinder at a time. The `conv=sync` is required when reading from disk and when the file size is not a multiple of the diskette block size. Do not try this if the input to the **dd** command is a pipe instead of a file, it will pad most of the input with nulls instead of just the last block.

Files

/usr/bin/dd Contains the **dd** command.

Related Information

The **backup**, **cp**, **cpio**, **tar**, **tr** command.

The **rmt** special file.

The Backup Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating*

System and Devices provides information on using backups and using memory devices.

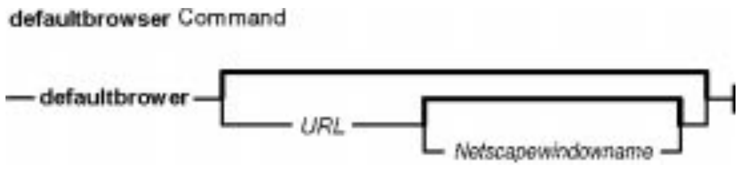
The Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* provides information on working with files.

defaultbrowser Command

Purpose

Launches the default web browser and optionally loads a specified URL.

Syntax



defaultbrowser [*URL* [*Netscapewindowname*]]

Description

The **defaultbrowser** command runs the browser launch command that is specified in the DEFAULT_BROWSER environment variable.

If a *URL* is given as an argument, it loads that URL into the browser. For this to work properly, the browser command must accept a URL as an argument.

Netscapewindowname is an optional argument that can be used if the browser that is being launched is a Netscape browser. A URL must always be specified with a window name. That URL will then be opened into the named Netscape browser window. If a Netscape window with the specified name is already open, the URL will be opened into that window. If the window is not already open, a new Netscape browser window with the specified name will be opened. If the browser is not a Netscape browser, the Netscape window name argument will be ignored.

The main purpose of the **defaultbrowser** command is to have applications use this command when they need to open a browser to display HTML documents or web−based applications. This way, a system administrator only needs to change the DEFAULT_BROWSER environment variable when a new browser is installed and all applications will automatically begin using the new browser.

The DEFAULT_BROWSER environment variable should be set to the command that would launch the desired browser. Include any arguments that must be included after the command to launch a specific URL address. For example, if the command to launch a browser and open a specific URL is `wonderbrowser −r URL`, then the DEFAULT_BROWSER environment variable would be set to equal `wonderbrowser −r`.

If the DEFAULT_BROWSER environment variable is not defined, then the **defaultbrowser** command runs Netscape if it is installed.

If specified, *URL* indicates the page for the browser to load on startup. If a *Netscapewindowname* is also specified, and the browser is Netscape, Netscape opens a window of that name, or if a window of that name is already open, it will load the specified URL in that window. Window name cannot be used unless a URL is also specified. If a window name is specified and the browser is not Netscape, then the window name is ignored.

Examples

1. To launch the designated default browser and have it open to it's default home page, enter:
   ```
   defaultbrowser
   ```
2. To launch the designated default browser and have it open to the URL http://machine/path/file.html, enter:
   ```
   defaultbrowser http://machine/path/file.html
   ```
3. To launch the designated default browser and have it open the URL http://machine/path/file.html where if the default browser is Netscape, then the page is displayed in a window called **webpage**, enter:
   ```
   defaultbrowser http://machine/path/file.html webpage
   ```

Files

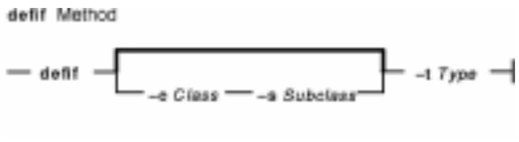
/usr/bin/defaultbrowser The **defaultbrowser** command

defif Method

Purpose

Defines a network interface in the configuration database.

Syntax



defif [**−c** *Class***−s** *Subclass*] **−t** *Type*

Description

The **defif** method defines the specified instance of a network interface. It only defines interfaces for currently configured adapters. To define the specified instance, the **defif** method does the following:

1. Creates a customized interface instance in the configuration database.
2. Derives the logical name of the interface instance.
3. Retrieves the predefined attributes.
4. Updates the Customized Dependency object class to reflect dependencies of the defined interface instance.
5. Sets the status flag of the interface instance to **defined**.

Flags

−c*Class*	Specifies the interface class to be defined. The valid value is **if**.
−s*Subclass*	Specifies the subclass of interface to be defined. Valid values are: **TR** Token−ring **EN** Ethernet **SL** Slip **XT** X.25 **LO** Loopback
−t*Type*	Specifies the type of interface to be defined. Valid values are: **tr** Token−ring **en** Ethernet **sl** Slip **ie3** IEEE 802.3 Ethernet **lo** Loopback **xt** X.25

Examples

To define a token−ring network interface instance, enter the method in the following format:

```
defif −t tr
```

Related Information

The **mkdev** command.

The **odm_run_method** subroutine.

TCP/IP Network Interfaces in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Object Data Manager (ODM) Overview for Programmers in *General Programming Concepts*.

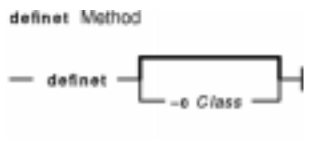
Writing a Device Method in *Kernel Extensions and Device Support Programming Concepts*.

definet Method

Purpose

Defines an inet instance in the system configuration database.

Syntax



definet [**−c** *Class*]

Description

The **definet** method creates an object in the ODM configuration database specifying the customized attributes of the inet instance. It performs the following operations:

1. Creates a customized inet instance.
2. Sets the status flag of the inet instance to defined.

This method is called by the **mkdev** high−level command and is not meant to be issued on the command line.

> **Note:** The **definet** method is a programming tool and should not be executed from the command line.

Flags

−c *Class*	Specifies the inet instance to be defined. The only valid value for the *Class* variable is **tcpip**.

Examples

To define the inet0 instance, issue the following method:

```
definet
```

Related Information

The **mkdev** command.

The **odm_run_method** subroutine.

Object Data Manager (ODM) Overview for Programmers in *General Programming Concepts*.

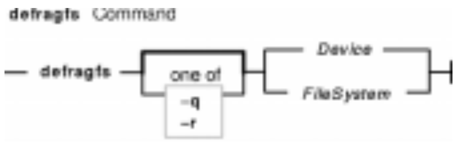
Writing a Device Method in *Kernel Extensions and Device Support Programming Concepts*.

defragfs Command

Purpose

Increases a file system's contiguous free space.

Syntax



defragfs [**−q** | **−r**] { *Device* | *FileSystem* }

Description

The **defragfs** command increases a file system's contiguous free space by reorganizing allocations to be contiguous rather than scattered across the disk. You can specify the file system to be defragmented with the *Device* variable, the path name of the logical volume (for example, **/dev/hd4**). You can also specify it with the *FileSystem* variable, which is the mount point in the **/etc/filesystems** file.

The **defragfs** command is intended for fragmented and compressed file systems. However, you can use the **defragfs** command to increase contiguous free space in nonfragmented file systems.

You must mount the file system read−write for this command to run successfully. Using the **−q** flag or the **−r** flag generates a fragmentation report. These flags do not alter the file system.

Flags

−q	Reports the current state of the file system.
−r	Reports the current state of the file system and the state that would result if the **defragfs** command is run without either **−q** or **−r** flag.

Examples

1. To defragment the **/data1** file system located on the **/dev/lv00** logical volume, enter:

   ```
   defragfs /data1
   ```

2. To defragment the **/data1** file system by specifying its mount point, enter:

   ```
   defragfs /data1
   ```

3. To generate a report on the **/data1** file system that indicates its current status as well as its status after being defragmented, enter:

   ```
   defragfs −r /data1
   ```

Files

/etc/filesystems	Lists the known file systems and defines their characteristics.

Related Information

The **crfs** command, the **lsfs** command, the **mkfs** command.

Understanding Data Compression, in the *AIX Version 4.3 System Management Concepts: Operating System and Devices* book.

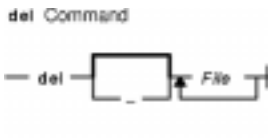
Understanding Fragments and a Variable Number of i−nodes, in the *AIX Version 4.3 System Management Concepts: Operating System and Devices* book.

del Command

Purpose

Deletes files if the request is confirmed.

Syntax



del [**-**] *File* ...

Description

> **Attention:** The **del** command ignores file protection, allowing the owner of a file to delete a write−protected file. However, to delete a file, you must have write permission in the directory containing the file. Since pressing the Enter key by itself is the same as answering yes, be careful not to delete files accidentally.

The **del** command displays the list of specified files and asks you to confirm your request to delete the group of files. To answer yes (delete the files), press the Enter key or enter a line beginning with `y` (or the locale's equivalent of a `y`). Any other response specifies no (do not delete the files).

The **del** command does not delete directories. See the **rmdir** command for information about deleting directories.

Environment Variables

The **LANG** and **LC_MESSAGES** environment variables determine the locale's equivalent of `y` for `yes/no` queries. If the **LANG** and **LC_MESSAGES** variables are not set or are set to an invalid locale, the **yesstr** value is from the default C locale. To find valid affirmative responses, enter `locale -k LC_MESSAGES` at the command line and note the values displayed after the `yesstr` heading.

Flags

- Requests confirmation for each specified file name rather than for the entire group.

Examples

1. To delete a file, enter:

   ```
   del chap1.bak
   ```

   This displays the message:

   ```
   del : Remove chap1.bak? Enter yes or press the Enter key for yes.
      Press any other key for no.
   ```

   You can press the Enter key or `y` to answer yes. Pressing any other key cancels the deletion. Note the warning under description.

2. To use the **del** command with pattern−matching characters, enter:

   ```
   del *.bak
   ```

   Before passing the command line to the **del** command, the shell replaces the pattern `*.bak` with the names of all the files in the current directory that end with `.bak`. (This is known as file−name expansion.) The **del** command prompts you for confirmation before deleting them all at one time. Note the warning under description.

3. To interactively select files to be deleted, enter:

   ```
   del − *
   ```

This displays the name of each file in the current directory one at a time, allowing you to select which ones to delete. Note the warning under description.

Files

/usr/bin/del Contains the **del** command.

Related Information

The **rm** command, **rmdir** command.

National Language Support Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains locale.

File and Directory Access Modes in *AIX Version 4.3 System Management Guide: Operating System and Devices* introduces file ownership and permissions to access files and directories.

Directory Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes the structure and characteristics of directories in the file system.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

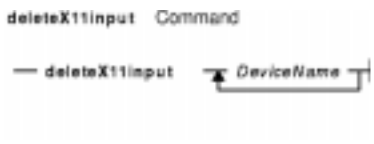
File Systems and Directories Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

deleteX11input Command

Purpose

Deletes an X11 input extension record from the ODM (Object Data Manager) database.

Syntax



deleteX11input *DeviceName* ...

Description

The **deleteX11input** command is used to delete an X11 input extension record from the ODM database. For each *DeviceName* specified, the ODM database finds as many instances of the object as possible. This command queries the user to verify whether to delete each specific device found. A partial name may be specified.

The command is a root or system user command. Its action fails with a permissions error if an unauthorized user attempts to delete a record.

Parameter

DeviceName	Specifies the name of the X11 input extension device.

Error Codes

No DeviceName is found in ODM Database	No objects that match the specified pattern were found in the ODM database.
Usage: deleteX11input DeviceName	The user has not specified a device name.

Related Information

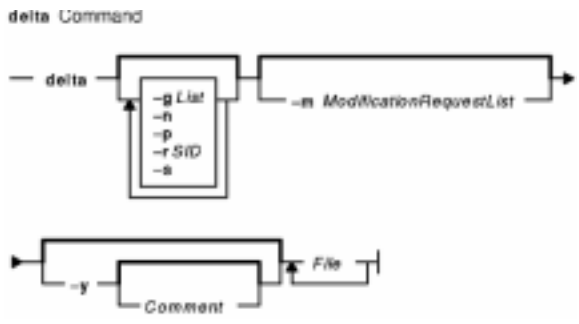
The **addX11input** command, **listX11input** command.

delta Command

Purpose

Creates a delta in a SCCS file.

Syntax



delta [**−r***SID*] [**−s**] [**−n**] [**−g** *List*] [**−p**] [**−m** *ModificationRequestList*] [**−y** [*Comment*]] *File ...*

Description

The **delta** command introduces into the named Source Code Control System (SCCS) file any changes that were made to the file version retrieved by a **get −e** command.

The **delta** command reads the g−files that correspond to the specified files (see the **get** command for a description of files created and used by SCCS) and creates a new delta. No line of a g−file can contain more than 512 characters.

If you specify a directory for the *File* value, the **delta** command performs the requested actions on all SCCS files within that directory that have been checked out previously for editing (that is, on all files with an **s.** prefix). If you specify a **−** (minus sign) in place of the *File* value, the **delta** command reads standard input and interprets each line as the name of an SCCS file. When the **delta** command reads standard input, you must supply the **−y** flag. You must also supply the **−m** flag if the **v** header flag is set. The **delta** command reads standard input until it reaches an end−of−file character.

> **Note:** Lines beginning with an SOH ASCII character (binary 001) cannot be placed in the SCCS file unless the SOH is quoted using a \ (backslash). SOH has special meaning to SCCS and causes an error.

Use of a **get** command on SCCS files, followed by the **delta** command on those same files, should be avoided when the **get** command generates a large amount of data. Instead, you should alternate the use of the **get** and **delta** commands.

The **delta** command saves the changes made to a particular version of an SCCS file. To use the **delta** command:

1. Use the **get −e** command to get an editable version of the file.
2. Edit that file.
3. Use the **delta** command to create a new version of the SCCS file.

The **delta** command prompts you for comments if the **−y** option is not specified. The comments apply to that particular delta and appear in the SCCS file header. The comments are not retrieved when you use the **get** command to get the delta and do not appear in the text of a retrieved file. Use comments to keep track of why a delta was created.

To see the comments, use an editor to look at the SCCS file, write the SCCS file to the display screen with the **cat** command, or print selected parts of the file to standard output using the **prs** command. Remember not to change the contents of the SCCS file directly. To change the delta comments, use the **cdc** command.

> **Note:** Do not use the **delta** command on a file if it contains expanded identification keywords. Read−only file versions replace keywords with text values. Using the **delta** command on a read−only file causes the keywords to be lost. To recover from this situation, remove the delta or edit the file again and replace the identification keywords.

The SCCS does not allow use of the **delta** command unless an editable copy of the file exists.

To prevent the loss of keywords, use the **admin** command with the **−f** flag to specify the **i** header flag. Afterwards, the absence of keywords in a file version will cause an error.

Flags

−g*List*	Specifies a list of SIDs (deltas) to be ignored when the **get** command creates the g−file. After you use this flag, the **get** command ignores the specified delta when it builds the g−file.
−m*ModificationRequestList*	If the SCCS file has the **v** header flag set, then a Modification Request (MR) number must be supplied as the reason for creating the new delta. If you do not specify the **−m** flag, and the **v** header flag is set, the **delta** command reads MRs from standard input. If standard input is a workstation, the **delta** command prompts you for the MRs. The **delta** command continues to take input until it reads an end−of−file character. It always reads MRs before the comments (see the **−y** flag). You can use blanks, tab characters, or both to separate MRs in a list. If the **v** header flag has a value, it is interpreted as the name of a program that validates the MR numbers. If the **delta** command returns a nonzero exit value from the MR validation program, the **delta** command assumes some of the MR numbers were invalid and stops running.
−n	Retains the g−file, which is normally removed at completion of the **delta** command processing.
−p	Writes to standard output (in the format of the **diff** command) the SCCS file differences before and after the delta is applied. See the **diff** command for an explanation of the format.
−r*SID*	Specifies which delta is to be created in the SCCS file. You must use this flag only if two or more outstanding **get −e** commands were done on the same SCCS file by the same person. The *SID* value can be either the SID specified on the **get** command line or the SID to be created (as reported by the **get** command.) An error results if the specified SID cannot be uniquely identified, or if an SID must be specified but it is not.
−s	Suppresses the information normally written to standard output on normal completion of the **delta** command.
−y[*Comment*]	Specifies text that describes the reason for making a delta. A null string is considered a valid *Comment* value. If your comment line includes special characters or blanks, the line must be enclosed in single or double quotation marks. If you do not specify the **−y** flag, the **delta** command reads comments from standard input until it encounters a blank line or an end−of−file character.

For keyboard input, the **delta** command prompts for the comments. If the last character of a line is a \ (backslash), it is ignored. Comments must be no longer than 512 characters.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Examples

1. To record changes you have made to an SCCS file, enter:

   ```
   delta s.prog.c
   ```

   This adds a delta to the SCCS file `s.prog.c`, recording the changes made by editing `prog.c`. The `delta` program then asks you for a comment that summarizes the changes you made. Enter the comment, and then enter an end−of−file character or press the return key twice to indicate that you have finished the comment.

2. To record the changes you have made to an SCCS file with a brief descriptive comment, enter:

   ```
   delta −y "This delta contains the payroll function" s.prog.c
   ```

Files

/usr/bin/delta	Contains the **delta** command.

Related Information

The **admin** command, **cat** command, **cdc** command, **diff** command, **get** command, **prs** command, **rmdel** command, **sccsdiff** command, and **sccshelp** command.

The **sccsfile** file format.

List of SCCS Commands in *AIX General Programming Concepts: Writing and Debugging Programs*.

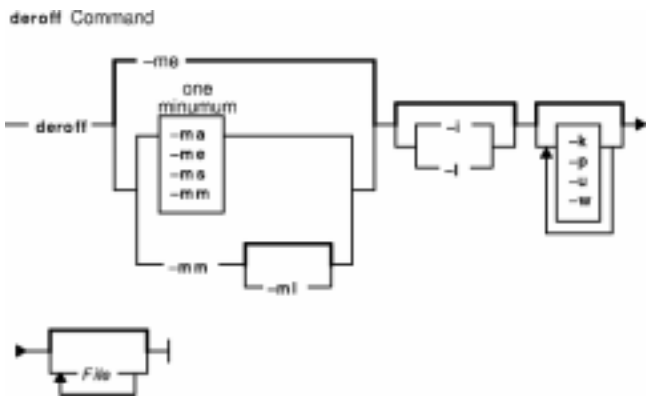
Source Code Control System (SCCS) Overview in *AIX General Programming Concepts: Writing and Debugging Programs*.

deroff Command

Purpose

Removes **nroff**, **troff**, **tbl**, and **eqn** command constructs from files.

Syntax



deroff { **−ma−me−ms** [**−mm** [**−ml**]] } [**−i** | **−l**] [**−k**] [**−p**] [**−u**] [**−w**] [*File* ...]

Description

The **deroff** command reads the specified files (standard input by default) containing English−language text, removes all **troff** requests, macro calls, backslash constructs, **eqn** command constructs (between **.EQ** and **.EN** lines and between delimiters), and **tbl** command descriptions, then writes the remainder of the file to standard output.

The **deroff** command normally follows chains of included files (**.so** and **.nxtroff** command requests). If a file has already been included, a **.so** request naming it is ignored and an **.nx** request naming that file ends execution.

> **Note:** The **deroff** command is not a complete **troff** command interpreter, so it can be confused by subtle constructs. Most errors result in too much rather than too little output.

Parameters

File Specifies English−language text files for the **deroff** command to remove the effects of **troff**, **eqn**, and **tbl** command processing. The default file is standard input.

Flags

−ma	Ignores **MA** (**man**) macros in text so that only running text is output.
−me	Ignores **ME** macros in text so that only running text is output. This is the default.
−ml	Ignores **MM** macros in text (**−mm** flag) and also deletes **MM** list structures. The **−mm** flag must be specified with this flag. **Note:** Do not use the **−ml** flag with nested lists.
−mm	Ignores **MM** macros.
−ms	Ignores **MS** macros in text so that only running text is output.

−i	Suppresses the processing of included files.
−l	Suppresses the processing of included files whose names begin with **/usr/lib**, such as macro files in **/usr/lib/tmac**.
−k	Retains blocks specified to be kept together. The default is to remove kept blocks of text; for example, the **.ne** construct is removed.
−p	Processes special paragraphs.
−u	Removes the ASCII underline and boldface control sequences. This flag automatically sets the **−w** flag.
−w	Makes the output a word list, with one word per line and all other characters deleted. Otherwise, the output follows the original. In text, a word is any string that begins with a letter, contains at least two letters, and is composed of letters, digits, ampersands (&), and apostrophes ('). In a macro call, however, a word is a string that begins with at least two letters and contains a total of at least three letters. Delimiters are any characters other than letters, digits, punctuation, apostrophes, and ampersands. Trailing apostrophes and ampersands are removed from words.

Related Information

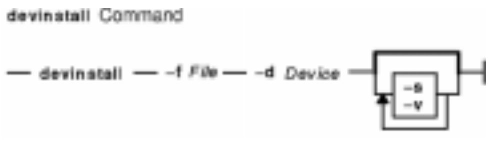
The **eqn** command, **neqn** command, **nroff** command, **tbl** command, **troff** command.

devinstall Command

Purpose

Installs software support for devices.

Syntax



devinstall **−f***File* **−d** *Device* [**−s**] [**−v**]

Description

The **devinstall** command installs software support for devices. This command is used when hardware is added to the system after the initial operating system installation and setup. It will install the software needed to support the new hardware.

For most new devices that are added after the initial software installation, the software for the new device can be installed using the **−i** flag of the **cfgmgr** command.

In some instances, the new device replaces a device that is needed to start the machine. For example, you might be replacing the SCSI adapter card that supports the root volume group or the graphics adapter card that supports the console. In this case, the machine will not start in normal mode until you have installed software support for this new device. To do this, turn your system off and install the new hardware according to the directions included with your hardware. Next, start up your machine in maintenance mode. During the startup process, the new adapter is detected and the **/tmp/device.pkgs** file is created containing the name of the software package needed to support the new hardware. Once the machine is in maintenance mode, you can install the software for this new device by running the **devinstall** command.

Flags

−f *File*	Specifies the file containing the list of packages to be installed. Typically, this will be the **/tmp/device.pkgs** file generated by the **cfgmgr** command.
−d *Device*	Specifies where the installation medium can be found. This can be a hardware device, such as tape or diskette; it can be a directory that contains installation images; or it can be the installation image file itself. When the installation media is an IBM Installation tape or IBM Corrective Service tape, the tape device should be specified as no−rewind−on−close and no−retention−on−open. Examples of this would be **/dev/rmt0.1** for a high−density tape or **/dev/rmt0.5** for a low−density tape. For non−IBM−supplied tapes, use the options specified by the tape supplier. The default device is **/dev/rfd0**.
−s	Overwrites the **/var/adm/dev_pkg.fail** file. This file contains a list of all packages that did not install successfully and can be used to facilitate recovery or installation from a different source.
−v	Specifies the verbose option, causing the **devinstall** command to display additional information while processing.

The **devinstall** command installs the device packages listed in the file specified on the command line. It runs the **installp** command with the **−a** (apply), **−c** (commit), **−X** (extend fs), **−e** (log), and **−g** (auto_include) flags. (See the **installp** command for more information on these flags.) The **devinstall** command checks the summary file generated by the **installp** command for the results of each package install attempt and, based on this information, creates two files. The **/var/adm/dev_pkgs.fail** file lists the packages that fail to install (if any). The **/usr/sys/inst.data/sys_bundles/diag.bnd** file lists all packages that are installed successfully.

Return Values

A return value of 0 indicates that no packages were installed.

A return value of 1 indicates that at least one package was successfully installed, and the **bosboot** command should be executed.

The **/usr/sys/inst.data/sys_bundles/diag.bnd** file lists those packages that successfully installed. The **/var/adm/dev_pkg.fail** file lists those packages that failed installation.

Security

Privilege Control: Only the root user can run this command.

Examples

To install software to support a new device after you have started the machine from the device installation tape and entered maintenance mode, enter:

```
devinstall −f /../tmp/device.pkgs −d /dev/rmt0.1
```

Then, run the **bosboot** command.

```
bosboot −ad /dev/ipldevice
```

File

/dev/rmtn Specifies the raw streaming tape interface.

Related Information

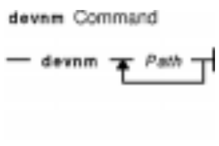
The **bosboot** command, **cfgmgr** command, **installp** command.

devnm Command

Purpose

Names a device.

Syntax



devnm *Path* ...

Description

The **devnm** command reads the *Path* parameter, identifies the special file associated with the mounted file system where the *Path* parameter resides, and writes the special file name to standard output. Each *Path* parameter must be a full path name.

The most common use of the **devnm** command is by the **/etc/rc** command file to construct a mount table entry for the root device.

Note: This command is for local file systems only.

Examples

1. To identify the device on which a file resides, enter:

   ```
   devnm /diskette0/bob/textfile
   ```

   This displays the name of the special device file on which the `/diskette0/bob/textfile` file resides. If a diskette is mounted as the `/diskette0` device, the **devnm** command displays:

   ```
   fd0 /diskette0/bob/textfile
   rfd0 /diskette0/bob/textfile
   ```

   This means the `/diskette0/bob/textfile` file resides on the **/dev/fd0** diskette drive.

2. To identify the device on which a file system resides, enter:

   ```
   devnm /
   ```

   This displays the name of the device on which the root file system(/) resides. The following list is displayed on the screen:

   ```
   hd0 /
   ```

This means that the root file system (/) resides on the **/dev/hd0** device.

Files

/dev	Specifies the directory.
/usr/sbin/devnm	Contains the **devnm** command.

Related Information

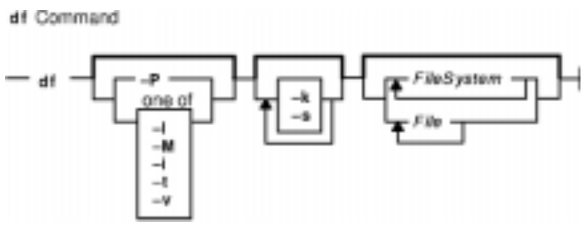
The **rc** command.

df Command

Purpose

Reports information about space on file systems.

Syntax



df [[**−P**] | [**−I** | **−M** | **−i** | **−t** | **−v**]] [**−k**] [**−s**] [*FileSystem* ... | *File*...]

Description

The **df** command displays information about total space and available space on a file system. The *FileSystem* parameter specifies the name of the device on which the file system resides, the directory on which the file system is mounted, or the relative path name of a file system. The *File* parameter specifies a file or a directory that is not a mount point. If the *File* parameter is specified, the **df** command displays information for the file system on which the file or directory resides. If you do not specify the *FileSystem* or *File* parameter, the **df** command displays information for all currently mounted file systems. File system statistics are displayed in units of 512−byte blocks by default.

The **df** command gets file system space statistics from the **statfs** system call. However, specifying the **−s** flag gets the statistics from the virtual file system (VFS) specific file system helper. If you do not specify arguments with the **−s** flag and the helper fails to get the statistics, the **statfs** system call statistics are used. Under certain exceptional conditions, such as when a file system is being modified while the **df** command is running, the statistics displayed by the **df** command might not be accurate.

> **Note:** Some remote file systems, such as the Network File System (NFS), do not provide all the information that the **df** command needs. The **df** command prints blanks for statistics that the server does not provide.

Flags

−i	Displays the number of free and used i−nodes for the file system; this output is the default when the specified file system is mounted.
−I	Displays information on the total number of blocks, the used space, the free space, the percentage of used space, and the mount point for the file system.
−k	Displays statistics in units of 1024−byte blocks.
−M	Displays the mount point information for the file system in the second column.
−P	Displays information on the file system in POSIX portable format.

When the **−P** flag is specified, the header line appears similar to:

```
Filesystem 512−blocks Used Available Capacity Mounted on\n
```

If the **−k** flag is specified in addition to the **−P** flag, the column heading `512−blocks` is replaced by the heading `1024−blocks`.

File system statistics are displayed on one line in the following order:

FileSystem, TotalSpace, UsedSpace, FreeSpace, UsedPercentage, MountPoint

−s	Gets file system statistics from the VFS specific file system helper instead of the **statfs** system call. Any arguments given when using the **−s** flag must be a JFS filesystem mount point or device. The filesystem must also be listed in **/etc/filesystem**.
−t	Includes figures for total allocated space in the output.
−v	Displays all information for the specified file system.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Examples

1. To display information about all mounted file systems, enter:

   ```
   df
   ```

   If your system has the **/**, **/usr**, **/site**, and **/usr/venus** file systems mounted, the output from the **df** command resembles the following:

   ```
   Filesystem 512−blocks Free   %Used   Iused  %Iused  Mounted on
   /dev/hd0    19368     9976    48%     4714    5%     /
   /dev/hd1    24212     4808    80%     5031   19%     /usr
   /dev/hd2     9744     9352     4%     1900    4%     /site
   /dev/hd3     3868     3856     0%      986    0%     /usr/venus
   ```

2. To display available space on the file system in which your current directory resides, enter:

   ```
   cd/
   df .
   ```

   The output from this command resembles the following:

   ```
   Device   512−blocks  free   %used   iused   %iused  Mounted on
   /dev/hd4    19368    9976    48%     4714    5%     /
   ```

Files

/etc/filesystems	Lists the known file systems and defines their characteristics.
/etc/vfs	Contains descriptions of virtual file system types.

Related Information

The **fsck** command.

The **filesystems** file.

The File Systems Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains file system types, management, structure, and maintenance.

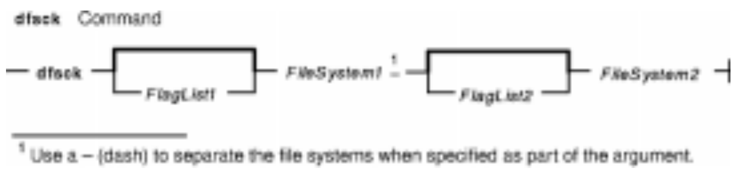
The Mounting Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains mounting files and directories, mount points, and automatic mounts.

dfsck Command

Purpose

Checks and repairs two file systems simultaneously on different drives.

Syntax


dfsck Command
dfsck
FlagList1
FileSystem1
1
–
FlagList2
FileSystem2
1 Use a – (dash) to separate the file systems when specified as part of the argument.

dfsck [*FlagList1*] *FileSystem1* [*FlagList2*] *FileSystem2*

Description

The **dfsck** command lets you simultaneously check two file systems on two different drives. Use the *FlagList1* and *FlagList2* parameters to pass flags and parameters for the two sets of file systems. For a list of valid flags for *FlagList1* and *FlagList2*, see the flags section. Use a **−** (minus sign) to separate the file system groups if you specify flags as part of the arguments.

The **dfsck** command permits you to interact with two **fsck** commands at once. To aid in this, the **dfsck** command displays the file system name with each message. When responding to a question from the **dfsck** command, prefix your response with a `1` or a `2` to indicate whether the answer refers to the first or second file system group.

Attention: Do not use the **dfsck** command to check the root file system.

Flags

−d*BlockNumber*	Searches for references to a specified disk block. Whenever the **fsck** command encounters a file that contains a specified block, it displays the i−node number and all path names that refer to it.
−f	Performs a fast check. Under normal circumstances, the only file systems likely to be affected by halting the system without shutting down properly are those that are mounted when the system stops. The **−f** flag prompts the **fsck** command not to check file systems that were unmounted successfully. The **fsck** command determines this by inspecting the **s_fmod** flag in the file system superblock. This flag is set whenever a file system is mounted and cleared when it is unmounted successfully. If a file system is unmounted successfully, it is unlikely to have any problems. Because most file systems are unmounted successfully, not checking those file systems can reduce the checking time.
−i*i−NodeNumber*	Searches for references to a specified i−node. Whenever the **fsck** command encounters a directory reference to a specified i−node, it displays the full path name of the reference.
−n	Assumes a `no` response to all questions asked by the **fsck** command; does not open the specified file system for writing.
−o*Options*	Passes comma−separated options to the **fsck** command. These options are assumed to be file system implementation−specific, except that the following are currently supported for all file systems: **mountable** Causes the **fsck** command to exit with success, returning a value of 0, if the

		file system in question is mountable (clean). If the file system is not mountable, the **fsck** command exits returning with a value of 8.
	mytype	Causes the **fsck** command to exit with success (0) if the file system in question is of the same type as either specified in the **/etc/filesystems** file or by the **−V** flag on the command line. Otherwise, 8 is returned. For example, `fsck −o mytype −V jfs` / exits with a value of 0 if / (the root file system) is a journaled file system.

−p	Does not display messages about minor problems but fixes them automatically. This flag does not grant the wholesale license that the **−y** flag does and is useful for performing automatic checks when the system is started normally. You should use this flag as part of the system startup procedures, whenever the system is being run automatically. Also allows parallel checks by group.
−t*File*	Specifies a *File* parameter as a scratch file on a file system other than the one being checked, if the **fsck** command cannot obtain enough memory to keep its tables. If you do not specify the **−t** flag and the **fsck** command needs a scratch file, it prompts you for the name of the scratch file. However, if you have specified the **−p** flag, the **fsck** command is unsuccessful. If the scratch file is not a special file, it is removed when the **fsck** command ends.
−V*VfsName*	Uses the description of the virtual file system specified by the *VFSName* variable for the file system instead of using the **/etc/filesystems** file to determine the description. If the **−V***VfsName* flag is not specified on the command line, the **/etc/filesystems** file is checked and the **vfs=***Attribute* of the matching stanza is assumed to be the correct file system type.
−y	Assumes a yes response to all questions asked by the **fsck** command. This flag lets the **fsck** command take any action it considers necessary. Use this flag only on severely damaged file systems.

Examples

1. To simultaneously check two file systems on two different drives, enter:

```
dfsck −p /dev/hd1 − −p /dev/hd7
```

This command checks both file systems simultaneously, if the file systems on the **/dev/hd1** and **/dev/hd7** devices are located on two different drives. You can also specify the file system names found in the **/etc/filesystems** file.

Files

/usr/sbin/dfsck	Contains the **dfsck** command.
/etc/filesystems	Lists the known file systems and defines their characteristics.
/etc/vfs	Contains descriptions of virtual file system types.
/etc/rc	Contains commands (including the **fsck** command) that are run when the system is started.

Related Information

The **fsck** command, **fsdb** command, **istat** command, **mkfs** command, **ncheck** command, **rc** command, **shutdown** command.

The **filesystems** file, **filsys.h** file.

The File Systems Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains file system types, management, structure, and maintenance.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

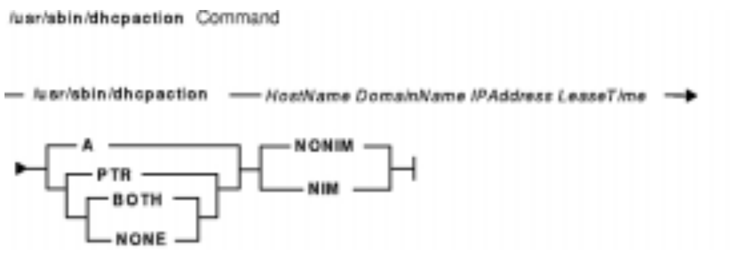
The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the SMIT structure, main menus, and tasks.

dhcpaction Command

Purpose

Provides a script that runs every time a client updates its lease.

Syntax


/usr/sbin/dhcpaction Command
/usr/sbin/dhcpaction
HostName DomainName IPAddress LeaseTime
A
PTR
BOTH
NONE
NONIM
NIM

/usr/sbin/dhcpaction*HostNameDomainNameIPAddressLeaseTime*{ **A** | **PTR** | **BOTH** | **NONE** }{ **NONIM** | **NIM** }

Description

The **dhcpaction** command provides methods to update the DNS server by means of calling the **nsupdate** command with the proper sequence of events to update the `A` record, `PTR` record, or both. The **dhcpaction** command is called by the DHCP client and server daemons. It is called from the updateDNS string. This is configurable because in some environments, mainly heterogenous ones, some clients may not be able to update the `A` record or the `PTR` record. The default action is for the client to update the `A` record and the server to update the `PTR` record. The options may be set in the daemon configuration files to allow for any policy the network administator wants.

The **dhcpaction** command also allows you to run NIM and DHCP concurrently. The **dhcpaction** command, when given the NIM paramete, will try and issue updates to NIM objects when their IP addresses change. This keeps the objects in sync. To do this, some pending operations may have to be canceled. The objects will be commented and a message will be sent to the console of the master machine. The objects should not be reset often. Addresses should not commonly change in the DHCP environment. Only the clients should set the `NONIM` option.

Parameters

HostName	Specifies the hostname to try and update in the DNS server.
DomainName	Specifies the domain name to use when updating the DNS server.
IPAddress	Specifies the IP address to associate with the hostname in the DNS server.
LeaseTime	Specifies the duration of the association between the hostname and IP address in the DNS server in seconds.

Options

A | **PTR** | **BOTH** | **NONE**	Specifies which if any record should be updated in the DNS server.
NONIM | **NIM**	Specifies if the script should take actions to help NIM and DHCP interact correctly. This should only be set to `NIM` on DHCP Servers.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: Any User, but may need to be root for some NIM actions

Files

/usr/sbin/dhcpaction	Contains the **dhcpaction** command.
/etc/dhcpcd.ini	Contains the DHCP Client Configuration File

Related Information

The **inetd** daemon, **dhcpsd** daemon, **dhcprd** daemon.

DHCP Client Configuration File

DHCP Server Configuration File

bootp Configuration File

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP)

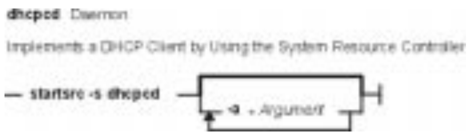
TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

dhcpcd Daemon

Purpose

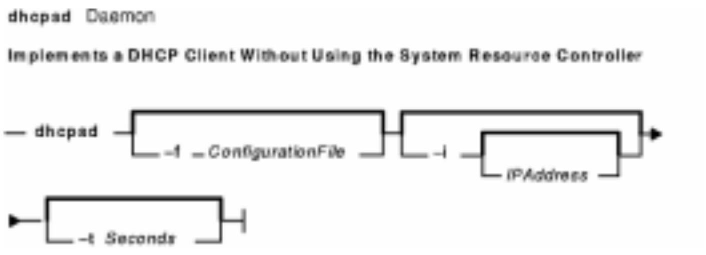
Implements a Dynamic Host Configuration Protocol (DHCP) client. Serves addresses and configuration information to DHCP server.

To Implement a DHCP Client by Using the System Resource Controller:


dhcpcd Daemon
Implements a DHCP Client by Using the System Resource Controller
startsrc -s dhcpcd
-a Argument

startsrc−s dhcpcd [**−a***Argument*] ...

To Implement a DHCP Client without Using the System Resource Controller:


dhcpsd Daemon
Implements a DHCP Client Without Using the System Resource Controller
dhcpsd
-f ConfigurationFile
-i
IPAddress
-t Seconds

dhcpsd [**−f** *ConfigurationFile*] [**−i** *IPAddress*] [**−t** *Seconds*]

Description

The **dhcpcd** daemon implements a DHCP client by setting up IP (Internet Protocol) addresses and other parameters by using the DHCP protocol.

The **dhcpcd** daemon is normally started by the **/etc/rc.net** file that normally runs at boot time. By default, this is commented out and not run on machine startup. There are smit options to enable the DHCP client.

The **dhcpcd** daemon reads its configuration file and attempts to bring up and get an IP address and other configuration options for the interfaces specified within the configuration file. The **dhcpcd** daemon runs in the background while the system is up. It will renew an already received address as required.

The **dhcpcd** daemon also runs in DHCP Inform mode when the **−i** flag is used. This mode lets a client retrieve configuration information from a DHCP server without getting an IP address. This is useful for static addresses, but not for dynamic items like print servers and other options. The **dhcpcd** daemon will run once for the specified address.

The **refresh** command can be used to cause the **dhcpcd** daemon to reread the configuration file. A SIGHUP may also be used to get the same response.

The default dhcpcd configuration file is **/etc/dhcpcd.ini**. It contains logging and network interface information.

You can use a Web−based System Manager application (**wsm network** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit usedhcp** fast path to run this command.

Flags

−f *ConfigurationFile*	Specifies the configuration file to be used. The default is the **/etc/dhcpcd.ini** file.
−i *IPAddress*	Specifies that the **dhcpcd** daemon should use DHCP Inform mode. The ip address tells DHCP which interface to get configuration information on.
−t *Seconds*	Specifies the amount of seconds that **dhcpcd** will wait before placing itself in the background. This allows a machine to continue booting if a DHCP Server cannot be found.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: You must have root authority to run this command.

Files

/usr/sbin/dhcpcd	Contains the **dhcpcd** daemon.
/etc/dhcpcd.ini	Contains the default client configuration file
/etc/services	Defines sockets and protocols used for internet services.
/etc/inetd.conf	Defines the services controlled by the **inetd** daemon.

Related Information

The **dhcpsconf** command.

The **startsrc** command, **stopsrc** command.

The **inetd** daemon, **dhcpsd** daemon, **dhcprd** daemon.

The /etc/inetd.conf file format, **/etc/services** file format.

DHCP Client Configuration File

DHCP Server Configuration File

bootp Configuration File

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP)

The System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* gives an explanation of subsystems, subservers, and the System Resource Controller.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

The SMIT Interface for TCP/IP in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

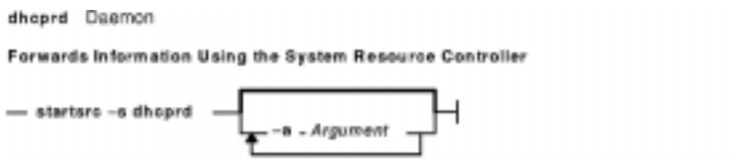
dhcprd Daemon

Purpose

Forwards BOOTP and DHCP packets off the local network.

Syntax

To Forward Information to the DHCP Server by Using the System Resource Controller:



startsrc−s dhcprd [**−a** *Argument*] [**−a** *Argument*] ...

To Forward Information to the DHCP Server without Using the System Resource Controller:

dhcprd Daemon
Forwards Information Without Using the System Resource Controller
dhcprd
-f ConfigurationFile

dhcprd [**−f** *ConfigurationFile*]

Description

The **dhcprd** daemon listens for broadcast packets, receives them, and forwards them to the appropriate server. This keeps broadcasts from having to be propagated to other networks. The DHCP Relay Agent handles the forwarding the DHCP and BOOTP client broadcast packets off of the local network and on to a set of servers. The initial packets sent by a BOOTP or DHCP client are broadcasts on the local interface of the client machine. These packets are not allowed to be passed through network gateways and routers. So, a BOOTP/DHCP relay agent, the **dhcprd** daemon, sends these packets to the appropriate servers.

The DHCP Server reads **/etc/services** file to determine which port it should use for receiving requests. The default service is **dhcps**. Since this is the same port that the **bootpd** daemon uses, you can only have one (either **dhcprd** or **bootpd**) daemon running. If you choose the **dhcprd** daemon, you will need to uncomment **bootp** from the **/etc/inetd.conf** file, then enter **refresh −s inetd** on the command line.

> **Note:** If **bootpd** is running, this program needs to be stopped before starting the daemons.

Flags

−f *ConfigurationFile*	Specifies the configuration file to be used. The default is the **/etc/dhcprd.cnf** file.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: You must have root authority to run this command.

Files

/usr/sbin/dhcprd	Contains the **dhcprd** daemon.
/etc/dhcprd.cnf	Contains the default configuration file.
/etc/services	Defines sockets and protocols used for internet services.
/etc/inetd.conf	Defines the services controlled by the **inetd** daemon.

Related Information

The **dhcpsconf** command, **startsrc** command, **stopsrc** command.

The **dhcpcd** daemon, **dhcpsd** daemon, **inetd** daemon.

DHCP Client Configuration File

DHCP Server Configuration File

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP)

The System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* gives an explanation of subsystems, subservers, and the System Resource Controller.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

The SMIT Interface for TCP/IP in *AIX Version 4.3 System Management Guide: Communications and Networks*.

TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

dhcpsconf Command

Purpose

Simplifies DHCP (Dynamic Host Configuration Protocol) server configuration through a Graphical User Interface.

Syntax

dhcpsconf

Description

The **dhcpsconf** command brings up an X−windows GUI (Graphical User Interface) that lets the network administrator read, save, and modify configuration files. It also lets you start, stop, and retrieve statistics from a running server.

The **dhcpsconf** command displays a set of lists. The lists on the left show the available options and keys. The **dhcpsconf** command reads the **/etc/options.file** to determine its basic options and keys and starts with these as generic resource types. The GUI lets the network administrator define a set of named resources by selecting the resource menu button.

The resource definition dialog box lets the network administrator generate all the options and specifics that are on the networks. The network administrator can define and name the network, printers, name servers, dhcp servers, and other valid resource objects. Once this is done, these new resources are added to the key and option display on the main panel. These can be used to generate a server configuration file or set of server configuration files.

The GUI starts with an empty master file. A master file may contain either a single server or the definition of many servers and one actual server readable file. The master file is readable by one DHCP server, but multiple server information can be stored in it. This lets the network administator configure a single server image of the network, create a set of servers to handle the same set of data, and view and maintain it all in one file.

Options and keys are added to the server window by selecting the key or option, selecting where in the edit window the option or key should go, and selecting the add button corresponding to the key or option section. The option is added to the edit window at the position specified. If the item is a named resource, then it is added as is. If the item is one of the standard defaults, then a window requesting a value for the item appears.

DHCP servers are added just like other keys, except that they specify machines in the network that will be responsible for the items within their scope. The keys have scoping and syntactic ordering. Comments are not really keys, but they are allowed anywhere.

A server may have a network, class, client, or options specified within it. A network may have a subnet, class, client, or option. A subnet may have a class, client, or options. A class and client may only have options.

The servers have a set of configuration parameters that only apply to them. These are specified by the DHCP server key in the key list, or by using the default server options under the Server menu bar. The default server options apply to the master file. A DHCP Server specified within the master file receives the default options, but may be modified.

Any item placed in the Edit window may be edited, renamed, viewed, or deleted. This lets you place an item, see if it looks appropriate and make changes as necessary.

Upon completion of the configuration file, a single master file may be saved and/or a set of server files may be generated. The File menu button and server menu button both have save options. The File save button is for saving the master file. The Server save button is for saving a particular server to a file.

The File menu button also contains a quit option, an open option to retrieve a file, and a new option to erase everything created so far.

The Operations menu button contains a status button, a start button, a stop button, a refresh, and a send configuration file button. From these buttons, a remote server can report status, refresh itself with a new configuration file, may be stopped, and a configuration sent and restarted.

The Help button contains a set of help statements describing each of the windows items.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: Any User

Files

/usr/sbin/dhcpsconf	Contains the **dhcpsconf** command.
/etc/dhcpcd.cnf	Contains the default client configuration file

Related Information

The **dhcpcd** daemon, **dhcprd** daemon, **dhcpsd** daemon, and **inetd** daemon.

DHCP Client Configuration File

DHCP Server Configuration File

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP)

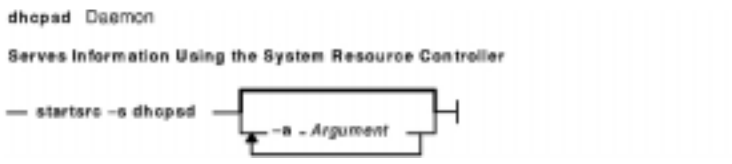
dhcpsd Daemon

Purpose

Implements a Dynamic Host Configuration Protocol (DHCP) server. Serves addresses and configuration information to DHCP clients.

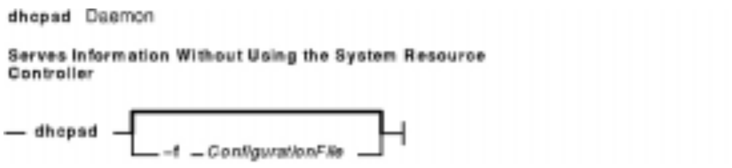
Syntax

To Serve Information to the DHCP Clients by Using the System Resource Controller:



startsrc−s dhcpsd [**−a** *Argument*] [**−a** *Argument*] ...

To Serve Information to the DHCP Clients without Using the System Resource Controller:


dhcpsd Daemon
Serves Information Without Using the System Resource Controller
dhcpsd
-f ConfigurationFile

dhcpsd [**−f***ConfigurationFile*]

Description

The DHCP Server handles the assignment and maintenance of dynamic address assignment. It also handles the distribution of additional configuration information. The **dhcpsd** daemon runs in the background and maintains a database of server information that contains logging parameters, IP(Internet Protocol) address ranges, other network configuration information, and accessability information. The initial database is specified by the configuration file. The configuration file contains all the data to start configuring DHCP clients.

The DHCP Server maintains a database of addresses it has given out as well as who has them. These databases are kept in the files **/etc/dhcpsd.ar** and **/etc/dhcpsd.cr**. A server on startup will read the configuration file and setup its initial database of available addresses. The server accepts the **refresh** command or a SIGHUP signal to reread the configuration file.

The DHCP Server reads **/etc/services** file to determine which port it should use for receiving requests. The default service is dhcps. Since this is the same port that the **bootpd** daemon uses, you can only have one (either **dhcpsd** or **bootpd**) daemon running. If you choose the **dhcpsd** daemon, you will need to comment **bootp** from the **/etc/inetd.conf** file, then enter **refresh −s inetd** on the command line.

Note: If **bootpd** is running, this program needs to be stopped before starting the daemons.

Flags

−f *ConfigurationFile*	Specifies the configuration file to be used.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: You must have root authority to run this command.

Files

/usr/sbin/dhcpsd	Contains the **dhcpsd** daemon.
/etc/services	Defines sockets and protocols used for internet services.
/etc/inetd.conf	Defines the services controlled by the **inetd** daemon.

Related Information

The **dhcpsconf** command

The **startsrc** command, **stopsrc** command.

The **dhcpcd** daemon, **dhcprd** daemon, **inetd** daemon.

DHCP Client Configuration File

DHCP Server Configuration File

TCP/IP Address and Parameter Assignment − Dynamic Host Configuration Protocol (DHCP)

The System Resource Controller Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* gives an explanation of subsystems, subservers, and the System Resource Controller.

The SMIT Interface for TCP/IP in *AIX Version 4.3 System Management Guide: Communications and Networks*.

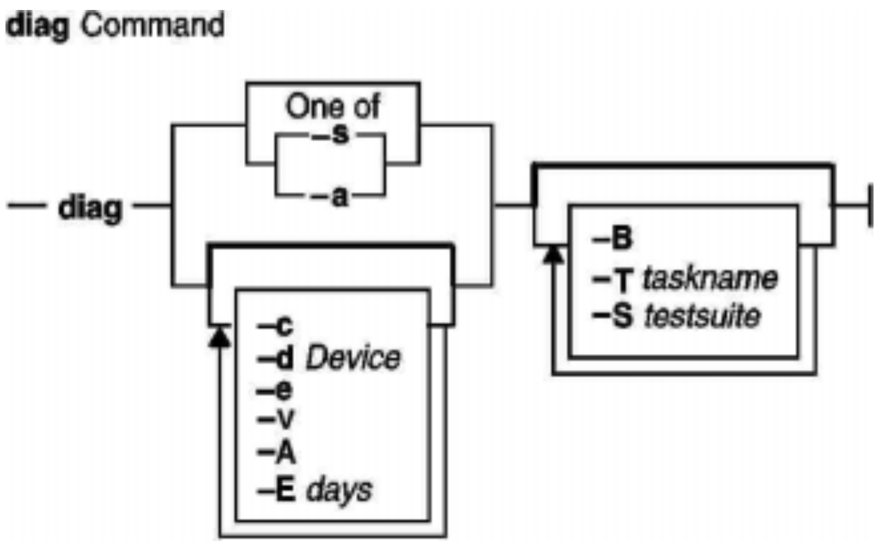
TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

diag Command

Purpose

Performs hardware problem determination.

Syntax



diag [[**−a**] | [**−s**] | [[**−d** *Device*] [**−v**] [**−c**] [**−e**] [**−A**] [**−E***days*]] | [**−B**] | [**−T***taskname*] [**−S***testsuite*]

Description

The **diag** command is the starting point to run a wide choice of tasks and service aids. Most of the tasks/service aids are platform specific. The following tasks and service aids are available:

- Run Diagnostics
- Display or Change Diagnostic Run Time Options
- Display Service Hints
- Display Previous Diagnostic Results
- Display Hardware Error Report
- Display Software Product Data
- Display Configuration and Resource List
- Display Hardware Vital Product Data
- Display Resource Attributes
- Change Hardware Vital Product Data
- Format Media
- Certify Media
- Display Test Patterns
- Local Area Network Analyzer
- Add Resource to Resource List
- Delete Resource from Resource List
- SCSI Bus Analyzer
- Download Microcode
- Display or Change Bootlist
- Periodic Diagnostics
- Backup and Restore Media

- Disk Maintenance
- Configure Dials and LPFkeys
- Add or Delete Drawer Config
- Create Customized Configuration Diskette
- Update Disk Based Diagnostics
- Configure ISA Adapter
- AIX Shell Prompt (Online Service Mode only)
- Display or Change Multiprocessor Configuration
    - Enable and disable individual processors
- Display or change BUMP Configuration
    - Update the flash EPROM with a new binary image
    - Display or change diagnostic modes
    - Display or change remote phone numbers and modem configurations
- Display or Change Electronic Mode Switch
- Process Supplemental Media (Standalone Mode only)
- Generic Microcode Download
- Run Error Log Analysis
- Service Aids for Use with Ethernet
- Update System Flash (RSPC)
- Configure Ring Indicate Power−On (RSPC)
- Configure Service Processor (RSPC)
- Save or Restore Service Processor Configuration (RSPC)
- Display Machine Check Error Log (RSPC)
- 7135 RAIDiant Array Service Aids
- SCSI Device Identification and Removal
- SCSD Tape Drive Service Aid
- Escon Bit Error Rate Service Aid
- SSA Service Aid
- PCI RAID Physical Disk Identify
- Configure Ring Indicate Power On Policy (CHRP)
- Configure Surveillance Policy (CHRP)
- Configure Reboot Policy (CHRP)
- Configure Remote Maintenance Policy (CHRP)
- Save or Restore Hardware Management Policies (CHRP)
- Display Firmware Device Node Information (CHRP)
- Spare Sector Availability
- 7318 Serial Communication Network Server
- Update System or Service Processor Flash (CHRP)
- Display System Environmental Sensors (CHRP)
- Display Checkstop Analysis Results
- Analyze Adapter Internal Log
- Flash SK−NET FDDI Firmware
- Display Microcode Level

You can use the Web−based System Manager Devices application (**wsm devices** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit diag** fast path to run this command.

Flags

Note: Most users do not need to use any flags since the **diag** command is a menu driven program.

−A	Specifies Advanced mode.
−a	Processes any changes in the hardware configuration by asking if missing resources have been

removed, turned off, and so on.

−B	Instructs diagnostics to run the base system test. Error log analysis will also be done on areas in the base system that supports error log analysis.
−c	Indicates that the machine will not be attended. No questions will be asked. Results are written to standard output.
−d*Device*	Specifies the device to run diagnostics on.
−E*Days*	Specifies the number of days to use when searching the error log during Run Error Log Analysis.
−e	Performs error log analysis if supported on the selected device. No tests are performed. Must be used with the **−d** flag.
−S*testsuite*	Indicates a particular Test Suite of devices to test: 1. Base System 2. I/O Devices 3. Async Devices 4. Graphic Devices 5. SCSI Devices 6. Storage Devices 7. Commo Devices 8. Multimedia Devices
−s	Runs diagnostics on all resources.
−T*taskname*	Fastpath to specific task to run. Current fastpath tasks are the following:

format	− Format Media Task
certify	− Certify Media Task
download	− Download Microcode Task
disp_mcode	− Display Microcode Level Task
chkspares	− Spare Sector Availability Task
identify	− PCI RAID Physical Disk Identify Task

Note: Tasks are platform and device dependent. Some tasks may not be available on the system.

−v	Runs diagnostics in System Verification Mode, no error log analysis performed. The default is Problem Determination mode that tests the device and runs error log analysis.

Security

Access Control: Only the root user can run this command.

Privilege Control: System group.

Examples

To run diagnostics on the `scdisk0` device, without questions, enter:

```
diag −d scdisk0 −c
```

File

/**usr**/**sbin**/**diag**	Contains the **diag** command.

Related Information

Symptom Index in *AIX Version 4.3 Problem Solving Guide and Reference*.

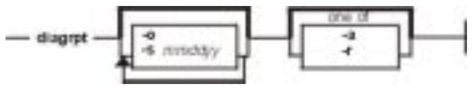
Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

diagrpt Command

Purpose

Displays previous diagnostic results.

Syntax



diagrpt [[**−o**] | [**−s** *mmddyy*] | [**−a**] | [**−r**]]

Description

The **diagrpt** command displays the results of previous diagnostic sessions. There are three types of results that can be viewed:

- Diagnostic result files stored in **/etc/lpp/diagnostic/data** directory.
- Diagnostic Event Log Information.
- Diagnostic results stored in NVRAM on CHRP systems.

Flags

−o	Displays the last diagnostic results file stored in the **/etc/lpp/diagnostics/data** directory.
−s*mmddyy*	Displays all diagnostic result files logged since the date specified.
−a	Displays the long version of the Diagnostic Event Log.
−r	Displays the short version of the Diagnostic Event Log.

Examples

1. To list all previous diagnostic result files since Jan 31, 1999, enter:

   ```
   /usr/lpp/diagnostics/bin/diagrpt −s 013199
   ```

2. To view the short version of the diagnostic event log, enter:

   ```
   /usr/lpp/diagnostics/bin/diagrpt −r
   ```

File

/**usr**/**lpp**/**diagnostics**/**bin**/**diagrpt**	Contains the **diagrpt** command.

Related Information

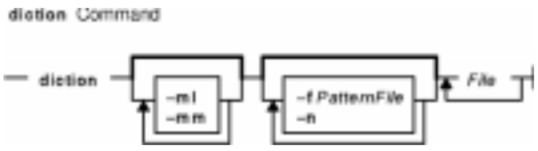
The **diag** command.

diction Command

Purpose

Highlights unclear or wordy sentences.

Syntax



diction [**−ml**] [**−mm**] [**−f** *PatternFile*] [**−n**] *File* ...

Description

The **diction** command finds all sentences in an English−language document that contain phrases from a database of unclear or wordy diction. Each phrase is bracketed with [ ] (brackets). Because the **diction** command runs the **deroff** command before looking at the text, header files that contain appropriate formatting information should be included as part of the input. The **explain** command provides an interactive thesaurus for the phrases found by the **diction** command.

Use of nonstandard formatting macros may cause incorrect sentence breaks. In particular, the **diction** command does not understand the **−me** flag.

Flags

−f *PatternFile*	Specifies a file containing examples of unclear diction; this file is used in addition to the default file.
−ml	Causes the **deroff** command to skip **mm** macro lists; can be used if a document contains many lists of nonsentences.
−mm	Overrides the default **ms** macro package.
−n	Suppresses the use of the default file when used with the **−f** flag; only the file specified by the *PatternFile* parameter is used.

Files

/usr/lib/dict.d	Contains default pattern.

Related Information

The **deroff** command, **explain** command.

The **ms** macro package.

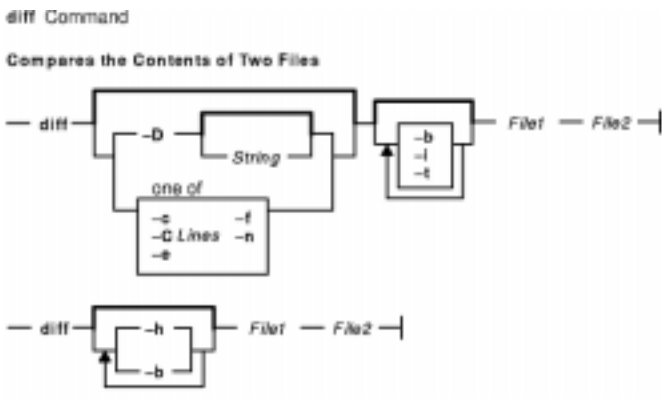
diff Command

Purpose

Compares text files.

Syntax

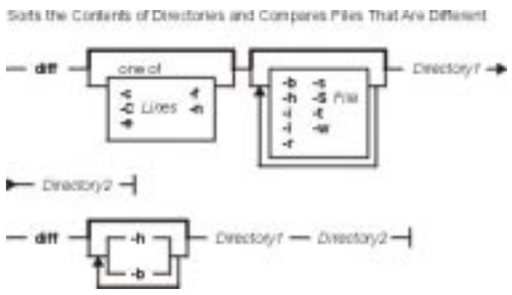
To Compare the Contents of Two Files



diff [**−c**| **−C** *Lines* | **−D**[*String*] | ; **−e** | **−f** | **−n**] [**−b**] [**−i**] [**−t**] *File 1 File2*

diff [**−h**] [**−b**]

To Sort the Contents of Directories and Compare Files That Are Different



diff [**−c** | **−C** *Lines* | **−e** | **−f** | **−n**] [**−b**] [**−i**] [**−l**] [**−r**] [**−s**] [**−S** *File*] [**−t**] [**−w**] *Directory1 Directory2*

diff [**−h**] [**−b**] *Directory1 Directory2*

Description

The **diff** command compares text files. It can compare single files or the contents of directories.

> **Note:** The **diff** command only works with input files that are text files.

If the *Directory1* and *Directory2* parameters are specified, the **diff** command compares the text files that have the same name in both directories. Binary files that differ, common subdirectories, and files that appear in only one directory are listed.

When the **diff** command is run on regular files, and when comparing text files that differ during directory comparison, the **diff** command tells what lines must be changed in the files to make them agree. If neither the *File1* nor *File2* parameter is a directory, then either may be given as − (minus sign), in which case the standard input is used. If the *File1* parameter is a directory, then a file in that directory whose file name is the same as the *File2* parameter is used.

The normal output contains lines of these forms:

Lines Affected in File1	**Action**	**Lines Affected in** File2
Number1	**a**	Number2[,Number3]
Number1[,Number2]	**d**	Number3
Number1[,Number2]	**c**	Number3[,Number4]

These lines resemble **ed** subcommands to convert *File1* into *File2*. The numbers before the action letters pertain to *File1*; those after pertain to *File2*. Thus, by exchanging **a** for **d** and reading from right to left, you can also tell how to convert *File2* into *File1*. As in the **ed** command, identical pairs (where *Number1* = *Number2*) are abbreviated as a single number.

Following each of these lines, the **diff** command displays all lines affected in the first file preceded by a **<:** (less than sign, colon), then displays all lines affected in the second file are preceded by a > (greater than sign).

An exit value of 0 indicates no differences, 1 indicates differences found, and 2 indicates an error.

Note: If more than one of the **−c**, **−C**, **−D**, **−e**, **−f**, or **−n** flags are specified, the last one on the command line takes precedence. The system does not issue an error message.

Flags

−b	Causes any amount of white space at the end of a line to be treated as a single newline character (the white−space characters preceding the newline character are ignored) and other strings of white−space characters, not including newline characters, to compare equally.
−C*Lines*	Produces a **diff** command comparison with a number of lines of context equal to the value specified by the *Lines* variable. The **−C** flag modifies the output slightly. The output begins with identification of the files involved and their creation dates. Each change is separated by a line with a dozen `*` (asterisks). The lines removed from *File1* are marked with a **−** (minus sign) and those added to *File2* are marked with a **+** (plus sign). Lines changed from one file to the other are marked in both files with an `!` (exclamation point). Changes that lie within the specified context lines of each other are grouped together as output.
−c	Produces a **diff** command comparison with three lines of context. The **−c** flag modifies the output slightly. The output begins with identification of the files involved and their creation dates. Each change is separated by a line with a dozen `*` (asterisks). The lines removed from *File1* are marked with a **−** (minus sign) and those added to *File2* are marked with a **+** (plus sign). Lines changed from one file to the other are marked in both files with an `!` (exclamation point). Changes within the specified context lines of each other are grouped together as output.
−D [*String*]	Causes the **diff** command to create a merged version of *File1* and *File2* on the standard output. The C preprocessor controls are included so that a compilation of the result without defining *String* is equivalent to compiling *File1*, while defining *String* yields *File2*.
−e	Produces output in a form suitable for use with the **ed** editor to convert *File1* to *File2*. When using this flag, the following shell program may help maintain multiple versions of a file. Only an ancestral file (**$1**) and a chain of version−to−version **ed** scripts (**$2**, **$3**, ...) made by the **diff** command need to be on hand. The latest version appears on the standard output as follows:

```
(shift; cat $*; echo '1,$p') | ed − $1
```

Extra commands are added to the output when the **−e** flag is used to compare directories, so

	the result is a shell script for converting text files which are common to the two directories from their state in *Directory1* to their state in *Directory2*. **Note:** Editing scripts produced by the **−e** or **−f** flags cannot create lines consisting of a single . (period).
−f	Produces output in a form not suitable for use with the **ed** editor, showing the modifications necessary to convert *File1* to *File2* in the reverse order of that produced under the **−e** flag.
−h	Performs an alternate comparison which may be faster if the changed sections are short and well separated. The **−h** flag works on files of any length. The **−c**, **−C**, **−D**, **−e**, **−f**, and **−n** flags cannot be used with the **−h** flag. All other flags except the **−b** flag are ignored when used with the **−h** flag.
−i	Ignores the case of letters.
−l	Long output format. Each result from the **diff** command text file comparison is piped through the **pr** command for pagination. Other differences are remembered and summarized after all text file differences are reported.
−n	Produces output similar to that of the **−e** flag, but in the opposite order and with a count of changed lines on each insert or delete command. This is the form used by the revision control system (RCS).
−r	Causes application of the **diff** command recursively to common subdirectories encountered.
−s	Reports files that are the same and otherwise not mentioned.
−S [*File*]	Ignores files whose names collate before the file specified by the *File* variable when comparing directories. The **−S** flag only applies to the directories specified in the *Directory1* and *Directory2* parameters. If you use the **−r** flag with the **−S** flag, the **−S** flag does not work recursively in the *Directory1* and *Directory2* subdirectories.
−t	Expands tabs in output lines. Normal output or the **−c** flag output adds characters to the front of each line, which may affect indentation of the original source lines and makes the output listing difficult to interpret. This flag preserves the original source's indentation.
−w	Ignores all spaces and tab characters.

Exit Status

This command returns the following exit values:

0	No differences were found.
1	Differences were found.
>1	An error occurred.

Examples

1. To compare two files, enter:

   ```
   diff chap1.back chap1
   ```

   This displays the differences between the files `chap1.bak` and `chap1`.

2. To compare two files while ignoring differences in the amount of white space, enter:

   ```
   diff −w prog.c.bak prog.c
   ```

   If two lines differ only in the number of spaces and tabs between words, the **diff −w** command considers them to be the same.

3. To create a file containing commands that the **ed** command can use to reconstruct one file from another, enter:

```
diff −e chap2 chap2.old >new.to.old.ed
```

This creates a file named `new.to.old.ed` that contains the **ed** subcommands to change `chap2` back into the version of the text found in `chap2.old`. In most cases, `new.to.old.ed` is a much smaller file than `chap2.old`. You can save disk space by deleting `chap2.old`, and you can reconstruct it at any time by entering:

```
(cat new.to.old.ed ; echo '1,$p') | ed − chap2 >chap2.old
```

The commands in parentheses add `1,$p` to the end of the editing commands sent to the **ed** editor. The `1,$p` causes the **ed** command to write the file to standard output after editing it. This modified command sequence is then piped to the **ed** command (`| ed`), and the editor reads it as standard input. The `−` flag causes the **ed** command not to display the file size and other extra information since it would be mixed with the text of `chap2.old`.

Files

/usr/bin/diff Contains the **diff** command.

Related Information

The **bdiff** command, **cmp** command**, diff3** command, **ed** command**, pr** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces you to files and the way you can work with them.

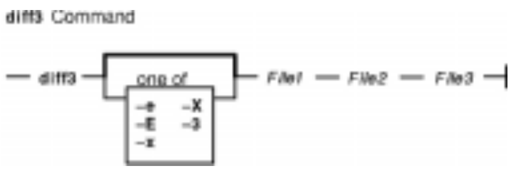
Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

diff3 Command

Purpose

Compares three files.

Syntax



diff3 [**−e** | **−x** | **−E** | **−X** | **−3**] *File1 File2 File3*

Description

The **diff3** command compares three files and writes to standard output the ranges of text that differ, flagged with the following codes:

====	All three files differ.
====**1**	*File1* differs.
====**2**	*File2* differs.
====**3**	*File3* differs.

The type of change needed to convert a given range of a given file to match another file is indicated in one of these two ways in the output:

File:*Number1* **a**	Text is to be added after line number *Number1* in *File*, where *File* is **1**, **2**, or **3**.
File:*Number1*[,*Number2*]**c**	Text in the range line *Number1* to line *Number2* is to be changed. If *Number1* is the same as *Number2,* the range may be abbreviated to *Number1*.

The contents of the range follows a **c** indication. When the contents of two files are identical, the **diff3** command does not show the contents of the lower−numbered file, although it shows the location of the identical lines for each.

Note: Edit scripts produced by the **−e** flag cannot create lines consisting of a . (period).

Flags

−3	Produces an edit script to incorporate only changes flagged ====3.
−E, **−X**	These are similar to **−e** and **−x** respectively, but treat overlapping changes (that is, changes that would be flagged ==== in the normal listing) differently. The overlapping lines from both files are inserted by the edit script, bracketed by <<<<<< and >>>>>> lines. The **−E** option is used by Revision Control System (RCS) Merge to ensure that overlapping changes in the merged files are preserved and brought to someone's attention.
−e	Creates an edit script for use with the **ed** command to incorporate into *File1* all changes between *File2* and *File3* (that is, the changes that normally would be flagged ==== and ====3).
−x	Produces an edit script to incorporate only changes flagged ====.

Examples

To list the differences among three files:

```
diff3 fruit.a fruit.b fruit.c
```

If `fruit.a`, `fruit.b`, and `fruit.c` contain the following data:

```
fruit.a                fruit.b                fruit.c
banana                 apple                  grape
grape                  banana                 grapefruit
kiwi                   grapefruit             kiwi
lemon                  kiwi                   lemon
mango                  orange                 mango
orange                 peach                  orange
peach                  pear                   peach
pare
```

then the output from the **diff3** command shows the differences between these files as follows. (The comments on the right do not appear in the output.)

```
====            All three files are different.
1:1,2c          Lines 1 and 2 of the first file, fruit.a
  banana
  grape
2:1,3c          Lines 1 through 3 of fruit.b
  apple
  banana
  grapefruit
3:1,2c          Lines 1 and 2 of fruit.c
  grape
  grapefruit
====2           The second file, fruit.b, is different.
1:4,5c          Lines 4 and 5 the same in fruit.a and fruit.c.
2:4a            To make fruit.b look same, add after line 4.
3:4,5c
  lemon
  mango
====            The first file, fruit.a, is different.
1:8c
  pare
2:7c            fruit.b line 7 and fruit.c line 8 are the same
  pear
3:7a
```

Files

/usr/bin/diff3	Indicates the **diff3** command.
/usr/lbin/diff3prog	Called by the **diff3** shell script.

Related Information

The **diff** command, **ed** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces you to files and the way you can work with them.

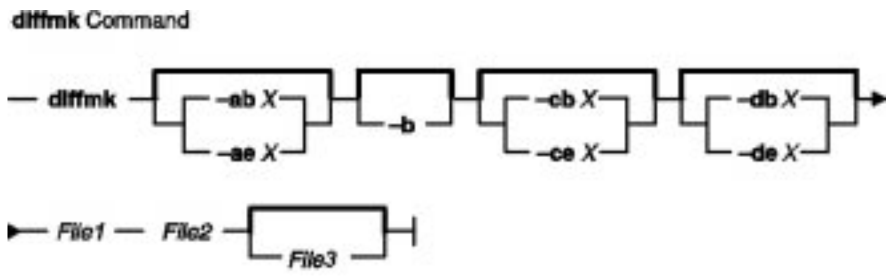
Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the AIX operating system processes input and output.

diffmk Command

Purpose

Marks differences between files.

Syntax



diffmk [{**−ab***X* | **−ae***X*] [**−b**] [**−cb***X* | **−ce***X*] [**−db***X* | **−de***X*] *File1File2* [*File3*]

Description

The **diffmk** command compares the English−language file specified by the *File1* parameter with the file by the *File2* parameter. It then creates a third file that includes **.mc** requests (for creating change marks) for the **nroff** and **troff** commands. The *File1* and *File2* parameters specify the old and new versions, respectively, of the files. The **diffmk** command writes the newly created file to the *File3* parameter, if specified, or else to standard output. The *File3* file contains the lines of the *File2* file plus inserted formatter **.mc** requests. When the *File3* file is formatted, the changed or inserted text is marked by a | (vertical bar) at the right margin of each line. An * (asterisk) in the margin indicates that a line was deleted.

If the **DIFFMARK** environment variable is defined, it names a command string that the **diffmk** command uses to compare the files. (Normally, the **diffmk** command uses the **diff** command.) For example, to handle extremely large files better, you can set the **DIFFMARK** variable to `diff −h`.

Parameters

File1	Specifies an English−language file that is compared to the file specified by the *File2* parameter. The results of the comparison comprise the file specified by the *File3* parameter. *File1* is considered the "old" file.
File2	Specifies an English−language file that is compared to the file specified by the *File1* parameter. The results of the comparison comprise the file specified by the *File3* parameter. *File2* is considered the "new" file.
File3	Specifies a file that contains lines of the *File2* file and includes inserted formatter **.mc** requests for the **nroff** and **troff** commands. The contents of this file are the results of a comparison between the files specified by the *File1* and *File2* parameters. When formatted, the changed text is marked by a (|) vertical bar at the right margin of each line. An * (asterisk) indicates the line was deleted. If *File3* is not specified, the results of the comparison are written to standard input.

Flags

−ab*X*	Uses *X* to mark where added lines begin.
−ae*X*	Uses *X* to mark where added lines end.

−b	Ignores differences that are only changes in tabs or spaces on a line.
−cb*X*	Uses *X* to mark where changed lines begin.
−ce*X*	Uses *X* to mark where changed lines end.
−db*X*	Uses *X* to mark where deleted lines begin.
−de*X*	Uses *X* to mark where deleted lines end.

Examples

1. To mark the differences between two versions of a text file, enter:

   ```
   diffmk chap1.old chap1 chap1.nroff
   ```

   This produces a copy of `chap1` containing **nroff** and **troff** change mark requests to identify text that has been added to, changed in, or deleted from `chap1.old.` This copy is saved in the `chap1.nroff` file.

2. To mark differences with non−**nroff** and **troff** messages, enter:

   ```
   diffmk −ab'>>New:' −ae'<<End New' \
   chap1.old chap1 chap1.nroff
   ```

   This causes the **diffmk** command to write `>>New:` on the line before a section of newly added lines to `chap1,` and to write `<<End New` on the line following the added lines. Changes and deletions still generate **nroff** and **troff** commands to put a | (vertical bar) or * (asterisk) in the margin.

3. To use different **nroff** and **troff** command−marking requests and ignore changes in white space, enter:

   ```
   diffmk −b −cb'.mc %' chap1.old chap1 chap1.nroff
   ```

This imbeds commands that mark changes with `% (`percent sign) additions with a | (vertical bar), and deletions with an * (asterisk). It does not mark changes that only involve a different number of spaces or tabs between words (`−b`).

Related Information

The **diff** command, **nroff** command, **troff** command.

digest Command

Purpose

Converts the ASCII form of the **/etc/qconfig** file into the **/etc/qconfig.bin** file, a binary version of the queue configuration used by the **qdaemon** command. This command should not be entered on the command line; it is called by the **qdaemon** command.

Syntax

/usr/lib/lpd/digest Command
/usr/lib/lpd/digest
ASCIIFile
BinaryFile

/usr/lib/lpd/digest*ASCIIFileBinaryFile*

Description

The **digest** command accepts an input file of ASCII characters and converts it into a binary file. This command is only used by the **qdaemon** command to translate the **/etc/qconfig** file into the binary version of the file, the **/etc/qconfig.bin** file.

Files

/etc/qconfig	Contains the queue configuration file.
/usr/sbin/qdaemon	Contains the queuing daemon.
/etc/qconfig.bin	Contains the digested, binary version of the **/etc/qconfig** file.

Related Information

The **qdaemon** command.

dircmp Command

Purpose

Compares two directories and the contents of their common files.

Syntax

dircmp Command
dircmp
−d
−s
Directory1
Directory2

dircmp [**−d**] [**−s**] *Directory1 Directory2*

Description

The **dircmp** command compares the two directories specified by the *Directory1* and *Directory2* parameters and writes information about their contents to standard output. First, the **dircmp** command compares the file names in each directory. If the same file name appears in both, the **dircmp** command compares the contents of both files.

In the output, the **dircmp** command lists the files unique to each directory. It then lists the files with identical names in both directories, but with different contents. If no flag is specified, it also lists files that have identical contents as well as identical names in both directories.

The **diff −r** command offers a function similar to the **dircmp** command.

Flags

−d	Displays for each common file name both versions of the differing file contents. The display format is the same as that for the **diff** command.
−s	Does not list the names of identical files.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Note: Differences in directory contents are not considered errors.

Examples

1. To summarize the differences between the files in two directories, enter:

   ```
   dircmp proj.ver1 proj.ver2
   ```

   This displays a summary of the differences between the directories `proj.ver1` and `proj.ver2`. The summary lists separately the files found only in one directory or the other, and those found in both. If a file is found in both directories, the **dircmp** command notes whether the two copies are identical.

2. To show the details of the differences between files, enter:

   ```
   dircmp −d −s proj.ver1 proj.ver2
   ```

The **−s** flag suppresses information about identical files. The **−d** flag displays a **diff** listing for each of the differing files found in both directories.

Files

/usr/bin/dircmp Contains the **dircmp** command.

Related Information

The **cmp** command, **diff** command.

Directory Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes the structure and characteristics of directories in the file system.

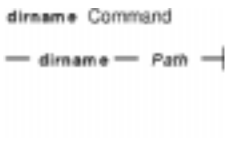
Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

dirname Command

Purpose

Writes to standard output all but the last part of a specified path.

Syntax



dirname *Path*

Description

The **dirname** command reads the specified path name, deletes all but the last / (slash) and the characters following it, and writes the result to standard output. If no characters follow the last /, the **dirname** command uses the next to last / and ignores all characters following it. The **dirname** command applies the following rules in creating the path name:

1. If the *Path* parameter is a // (double slash), or if the *Path* parameter consists entirely of slash characters, change the string to a single / (slash). Skip steps 2 through 7.
2. Remove any trailing / characters from the specified path.
3. If there are no / characters remaining in the *Path* parameter, change the path to a single **.** (period). Skip steps 4 through 7.
4. Remove any trailing, non−slash characters from the path.
5. If the remaining path is // (double slash), go to step 6.
6. Remove any trailing slash characters from the path.
7. If the remaining path is empty, change the path to a single /.

For example, entering:

```
dirname //
```

results in a single `/` (slash). Entering:

```
dirname /a/b/
```

results in `/a`. Entering:

```
dirname a
```

results in a single `.` (period). Entering:

```
dirname a/b
```

results in the path name `a`.

The **dirname** and **basename** commands are generally used inside command substitutions within a shell procedure to specify an output file name that is some variation of a specified input file name.

Exit Status

This command returns the following exit values:

0	Successful completion
>0	An error occurred.

Examples

To construct the name of a file located in the same directory as another, enter:

```
AOUTFILE=`dirname $TEXTFILE`/a.out
```

This sets the shell variable `AOUTFILE` to the name of an **a.out** file that is in the same directory as `TEXTFILE`. If `TEXTFILE` is **/home/fran/prog.c**, the value of `dirname$TEXTFILE` is **/home/fran** and `AOUTFILE` becomes **/home/fran/a.out**.

Files

/usr/bin/dirname Contains the **dirname** command.

Related Information

The **basename** command, **sh** command.

disable Command

Purpose

Disables printer queue devices.

Syntax

disable Command
disable
-c
-rReason
PrinterName

disable [**−c**] [**−r***Reason*] *PrinterName ...*

Description

The **disable** command disables or brings offline the printer queue devices specified by the *PrinterName* parameter.

> **Note:** You must have root user authority or belong to the printq group to run this command.

Flags

−c	Cancels all job requests. Using this flag is the same as entering the **enq −K** command.
−r*Reason*	Specifies the reason for disabling the printer queue device with the *Reason* variable. This flag is a "no operation" flag, which means that the system ignores this flag.

Examples

1. To bring printer queue `lp0` offline without waiting for the current print jobs to finish, enter:

   ```
   disable −c lp0
   ```

2. To bring printer queue `lp0` offline after all print jobs are finished, enter:

   ```
   disable lp0
   ```

Files

/usr/sbin/qdaemon	Queuing daemon
/etc/qconfig	Queue configuration file
/etc/qconfig.bin	Digested, binary version of the **/etc/qconfig** file
/var/spool/lpd/qdir/*	Queue requests
/var/spool/lpd/stat/*	Information on the status of the devices
/var/spool/qdaemon/*	Temporary copies of enqueued files

Related Information

The **cancel** command, **enable** command, **enq** command, **lp** command, **lpstat** command.

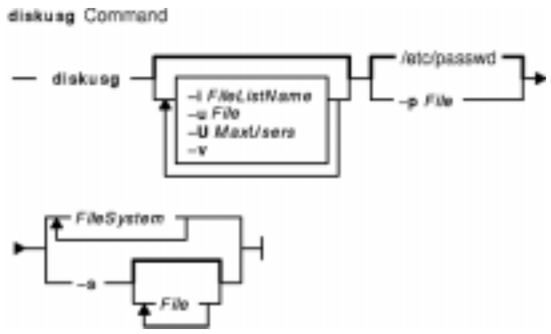
Starting and Stopping a Print Queue in *AIX Version 4.3 Guide to Printers and Printing*.

diskusg Command

Purpose

Generates disk accounting data by user ID.

Syntax



diskusg [**−U***MaxUsers*] [**−i** *FileListName*] [**−p** *File*] [**−u** *File*] [**−v**]
{ **−s** [*File* ...] | *FileSystem* ... }

Description

The **diskusg** command generates intermediate disk−accounting information from data in the files specified with the *File* or *FileSystem* parameters or from standard input. The **diskusg** command writes one record per user to standard output. This command is called by the **dodisk** command, which can be run under the **cron** daemon. The output is in the following format:

UID	Contains the numerical user ID of the user.
Login	Contains the login name of the user.
Blocks	Contains the total number of 512−byte disk blocks allocated to the user.

The output of this command becomes the input of the **acctdisk** command, which converts the information to a total accounting record. The total accounting record is merged with other total accounting records to produce the daily report.

If you specify the *FileSystem* parameter, the **diskusg** command reads the i−nodes of the specified file systems to generate the usage data. The *FileSystem* parameters must be the special file names of the file system devices. For example, use the **/dev/hd4** device instead of **/** (root) directory to generate usage data for the root file system.

If you specify the *File* parameter, the input must be in a **diskusg** output format.

For more information on disk usage, see the **acctdusg** command**.**

Note: This command is for local devices only.

Flags

−i *FileListName*	Ignores the data in the *FileListName* file system. The *FileListName* variable specifies a list of file system names separated by commas or enclosed within quotation marks.

−p *File*	Uses the password file specified by the *File* variable to generate login names. The default is the **/etc/passwd** file.
−s [*File*]	Combines all records from the input file(s) or from standard input into a single record. The input data is already in a **diskusg** output format.
−U*MaxUsers*	Sets the maximum number of users that can be processed by the **diskusg** command. You need to use this flag only if the number of users is greater than the default of 5000.
−u *File*	Writes a record to the specified *File* variable for each file that is charged to a user ID of no one. Each record consists of the special file name, the i−node number, and the user ID.
−v	Writes a list of all files that are charged to no one to the standard error output.

Security

Access Control: This command should grant execute (x) access only to members of the **adm** group.

Examples

To generate daily disk−accounting information, add a line similar to the following to the **/var/spool/cron/crontab/root** file:

```
0 2 * * 4 /usr/sbin/acct/dodisk
```

This command tells the **cron** daemon to run the **dodisk** command at 2 a.m. (`02`) each Thursday (`4`). The **dodisk** command calls both the **diskusg** and **acctdisk** commands.

> **Note:** To perform this example, you must have root authority.

Files

/usr/sbin/acct/diskusg	Contains the **diskusg** command.
/etc/passwd	Contains the basic attributes of users.

Related Information

The **acctdisk** command, **acctmerg** command, **dodisk** command, **runacct** command.

The **acct** subroutine.

The **acct** file format and **utmp** file format.

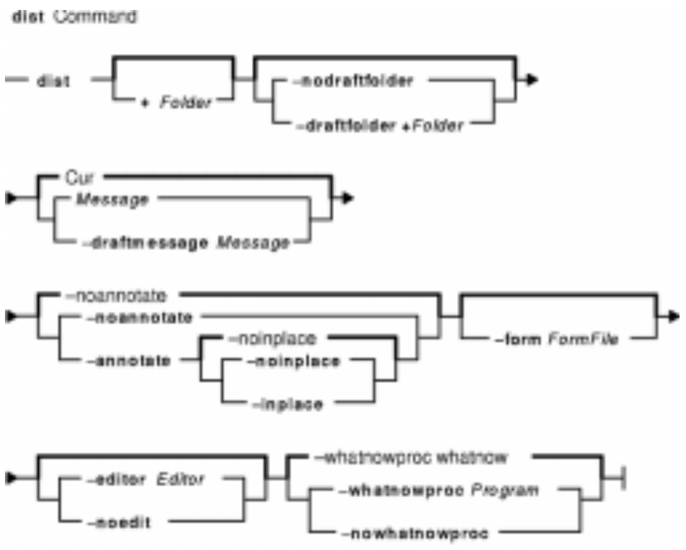
Accounting Commands, Accounting Overview, Setting Up an Accounting System in *AIX Version 4.3 System Management Guide: Operating System and Devices*

dist Command

Purpose

Redistributes a message to additional addresses.

Syntax



dist [+Folder] [**−nodraftfolder** | **−draftfolder** +*Folder*] [*Message* | **−draftmessage** *Message*]
[**−annotate** [**−inplace** | **−noinplace**] | **−noannotate**] [**−form** *FormFile*]
[**−editor** *Editor* | **−noedit**] [**−nowhatnowproc** | **−whatnowproc** *Program*]

Description

The **dist** command provides an interface for redistributing existing messages to a new list of addresses. By default, the **dist** command copies the current message in the current folder to the *UserMHDirectory*/**draft** file and starts an editor. To specify a message in the current folder other than the default, use the *Message* parameter.

Once started, the editor prompts you to enter values for each header field. The **dist** command uses the header format defined in the *UserMHDirectory*/**distcomps** file. (If this file does not exist, the system uses the **/etc/mh/distcomps** file.) Since the body of the message is the message you are redistributing, do not fill in the body. To define a format file other than *UserMHDirectory*/**distcomps** file, use the **−form** flag.

To change the default editor, use the **−editor** flag or define the `Editor:` entry in your **$HOME/.mh_profile** file.

Press the Ctrl−D key sequence to exit the editor. Upon exiting the editor, the **dist** command starts the Message Handler (MH) `What Now?` prompt. Press the Enter key to see a list of the available **whatnow** subcommands. These subcommands enable you to continue editing the message header, list the message header, direct the disposition of the message, or end the processing of the **dist** command.

> **Note:** A line of dashes or a blank line must be left between the header and the body of the message for the message to be identified when it is sent.

Redistributed messages consist of the original header and body appended to a new header. The **draft** file you edit using the **dist** command consists of header fields only. A copy of the original message with the new draft message is not automatically stored.

To annotate the original message with redistribution information, use the **−annotate** flag. This flag appends the original message with the `Resent:` field, and the current date and time.

Flags

−annotate	Annotates the message being redistributed with the lines:
	`Resent: date`
	`Resent: address`
	Since the **−annotate** flag is not preserved over multiple executions of the command, annotation is completed only if the message is sent directly from the **dist** command. The **−inplace** flag forces annotation to be done in place in order to preserve links to the annotated message.

−draftfolder *+Folder*	Places the draft message in the specified folder. If **−draftfolder** *+Folder* flag is followed by a *Message* variable, it is the same as using the **−draftmessage** flag. If *+Folder* is not specified, the draft message is placed in *Current−Folder*.
−draftmessage *Message*	Specifies a draft message. By default, the system creates a new draft message in the current folder. The draft message becomes the current message.
−editor *Editor*	Specifies the initial editor for preparing the message for distribution.
+Folder	Identifies the folder that contains the message to redistribute. If a folder is not specified, then *Current−Folder* is assumed.
−form *FormFile*	Determines the message form. The **dist** command treats each line in the specified form file.
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For MH, the name of this flag must be fully spelled out.
−inplace	Forces annotation to be done in place in order to preserve links to the annotated message.
Message	Identifies the message to redistribute. Use the following references to specify messages:

Number	Number of the message.
cur or **.** (period)	Current message. This is the default.
first	First message in a folder.
last	Last message in a folder.
next	Message following the current message.
prev	Message preceding the current message.

−noannotate	Suppresses annotation. This flag is the default.
−nodraftfolder	Places the draft in the *UserMHDirectory*/**draft** file.

−noedit	Suppresses the initial edit.
−noinplace	Prevents annotation in place. This flag is the default.
−nowhatnowproc	Suppresses interactive processing of the **dist** command. The **−nowhatnowproc** flag prevents any edit from occurring.
−whatnowproc *Program*	Starts the specified program to guide you through the distribution tasks. If you specify the **whatnow** command as the *Program* variable, the **dist** command starts an internal **whatnow** procedure instead of a program with the file name **whatnow**.

Profile Entries

The following entries are entered in the *UserMHDirectory*/**.mh_profile** file:

`Current−Folder:`	Sets the default current folder.
`Draft−Folder:`	Sets the default folder for drafts.
`Editor:`	Sets the default editor.
`fileproc:`	Specifies the program used to refile messages.
`Path:`	Specifies the user's MH directory.
`whatnowproc:`	Specifies the program used to prompt `What now?` questions.

Examples

1. To redistribute the current message from the current folder, enter:

   ```
   dist
   ```

   The system prompts you for the header field values. After entering a value, press the Enter key. To skip an entry, press the Enter key without entering a value. You must fill in the `Resent−to:` field. After completing the headers, do not modify the body of the text. Press the Ctrl−D key sequence to exit the editor. The system prompts you with:

   ```
   What now?
   ```

   Press the Enter key to see a list of available options. If you want to redistribute this message, enter `send.` Your message is redistributed to the new list of addresses.

2. To redistribute a message to a new list of addresses when a message draft exists, enter:

   ```
   dist
   ```

   The system responds with a message similar to the following:

   ```
   Draft "$HOME/Mail/draft" exists (43 bytes).
   Disposition? _
   ```

   To redistribute this draft, enter:

   ```
   replace
   ```

   The system prompts you for the header field values. After entering a value, press the Enter key. To skip an entry, press the Enter key without entering a value. You must fill in the `Resent−to:` field.

After completing the headers, do not modify the body of the text. Press the Ctrl−D key sequence to exit the editor. The system prompts you with:

```
What now?
```

Press the Enter key to see a list of available options. If you want to redistribute the draft, enter `send.` Your message is redistributed to the new list of addresses.

3. To redistribute message `15` from the `schedules` folder, enter:

   ```
   dist +schedules 15
   ```

   The system prompts you for the header field values. After entering a value, press the Enter key. To skip an entry, press the Enter key without entering a value. You must fill in the `Resent−to:` field. After completing the headers, do not modify the body of the text. Press the Ctrl−D key sequence to exit the editor. The system prompts you with:

   ```
   What now?
   ```

Press the Enter key to see a list of available options. To redistribute the message, type `send` and press the Enter key.

Files

/etc/mh/distcomps	Contains the system default message format.
UserMHDirectory/**distcomps**	Contains the user's default message format.
UserMHDirectory/**draft**	Contains the current draft file.
/usr/bin/dist	Contains the executable form of the **dist** command.

Related Information

The **ali** command, **anno** command, **comp** command, **forw** command, **prompter** command, **refile** command, **repl** command, **send** command, **whatnow** command.

The **mh_alias** file, **mh_profile** file.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

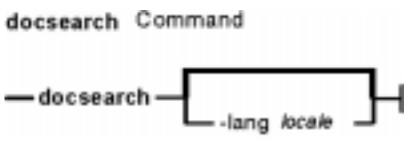
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

docsearch Command

Purpose

Launches the AIX Documentation Library Service library function.

Syntax



docsearch

docsearch [**−lang***locale*]

Description

The **docsearch** command launches the AIX Documentation Library Service library application into a web browser window. This global library shows all document volumes/collections that are registered with the service on the documentation server. You can read documents by selecting their links or select the volumes you want to search and then type in the words you want to search for. The search service then returns a list of the documents that contain the query words. Each document is shown as a hyperlink that opens the document for reading. The client or server portion of the Documentation Search Service package must be installed to enable this command.

The **docsearch** command reads the environment variables **DOCUMENT_SERVER_MACHINE_NAME** and **DOCUMENT_SERVER_PORT** to determine the hostname of the machine where the documents are located and the port of the webserver on that machine.

Flags

−lang*locale*	Uses the language specified in *locale* to create the library application. Use the standard AIX locale names to specify *locale*. This specifies the language for the library application buttons and lables. The form will only offer for search those document (indexes) that are written in that language and the search will be conducted in the same language.

Examples

To open the global library in German (locale=de_DE) and only show all German documents installed on the system, enter:

```
docsearch −lang de_DE
```

Files

/usr/bin/docsearch	The docsearch command
/usr/lib/nls/msg/$LANG/docsearch.cat	The docsearch message catalog
/usr/bin/defaultbrowser	The defaultbrowser command

Related Information

The **defaultbrowser** command.

Documentation Search Service in the *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

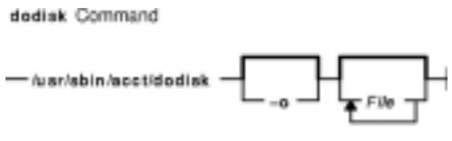
Documentation Search Service in the *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

dodisk Command

Purpose

Initiates disk−usage accounting.

Syntax



/usr/sbin/acct/dodisk [**−o**] [*File* ...]

Description

The **dodisk** command initiates disk−usage accounting by calling the **diskusg** command and the **acctdisk** command. If you specify the **−o** flag with the **dodisk** command, a more thorough but slower version of disk accounting by login directory is initiated using the **acctdusg** command. Normally, the **cron** daemon runs the **dodisk** command.

By default, the **dodisk** command does disk accounting only on designated files with stanzas in the **/etc/filesystems** file and that contain the attribute **account=true**. If you specify file names with the *File* parameter, disk accounting is done on only those files.

If you do not specify the **−o** flag, the *File* parameter should contain the special file names of mountable file systems. If you specify both the **−o** flag and the *File* parameter, the files should be mount points of mounted file systems.

> **Note:** You should not share accounting files among nodes in a distributed environment. Each node should have its own copy of the various accounting files.

Flags

−o Calls the **acctdusg** command, instead of the **diskusg** command, to initiate disk accounting by login directory.

Security

Access Control: This command should grant execute (x) access only to members of the **adm** group.

Examples

To start automatic disk−usage accounting, add the following to the **/var/spool/cron/crontabs/root** file:

```
0 2 * * 4 /usr/sbin/acct/dodisk
```

This example shows the instructions that the **cron** daemon will read and act upon. The **dodisk** command will run at 2 a.m. (`0 2`) each Thursday (`4`). This command is only one of the accounting instructions normally given to the **cron** daemon. See "Setting Up an Accounting System" in *AIX Version 4.3 System Management*

Guide: Operating System and Devices for more information on typical **cron** accounting entries.

Files

/usr/sbin/acct	The path to the accounting commands
/etc/filesystems	Contains information about file system.

Related Information

The **acctdisk** or **acctdusg** command, **diskusg** command.

The **cron** daemon.

For more information about the Accounting System, the preparation of daily and monthly reports, and the accounting files, see the Accounting Overview in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

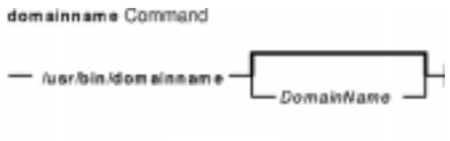
Setting Up an Accounting System in *AIX Version 4.3 System Management Guide: Operating System and Devices* explains the steps you must take to establish an accounting system.

domainname Command

Purpose

Displays or sets the name of the current Network Information Service (NIS) domain.

Syntax



/usr/bin/domainname [*DomainName*]

Description

The **domainname** command displays or sets the name of the current NIS domain. If you do not specify a parameter, the **domainname** command displays the name of the current NIS domain. A domain typically encompasses a group of hosts under the same administration.

Only the root user can set the name of the domain by giving the **domainname** command an argument.

Examples

1. To join a new domain, enter:

   ```
   domainname caesar
   ```

   In this example, the `domainname` command sets the NIS domain name to caesar.

2. To find out the name of the domain your machine belongs to, enter:

   ```
   domainname
   ```

Related Information

The **ypinit** command.

The **ypbind** daemon, **ypserv** daemon.

Network Information Service (NIS) Overview for System Management in *AIX Version 4.3 Network Information Services (NIS and NIS+) Guide*.

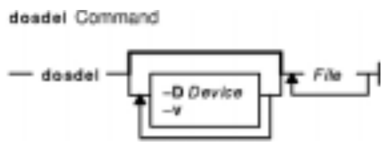
NIS Reference.

dosdel Command

Purpose

Deletes DOS files.

Syntax



dosdel [**−v**] [**−D***Device*] *File* ...

Description

The **dosdel** command deletes the DOS file specified by the *File* parameter. Use the **−v** flag to obtain format information about the disk.

DOS file−naming conventions are used with one exception. Since the \ (backslash) character can have special meaning to the operating system, use a / (slash) character as the delimiter to specify subdirectory names in a DOS path name. The **dosdel** command converts lowercase characters in the file or directory name to uppercase before it checks the disk. Because all file names are assumed to be full (not relative) path names, you need not add the initial / (slash).

Flags

−D*Device*	Specifies the name of the DOS device as **/dev/fd0** or **/dev/fd1**. The default device is **/dev/fd0.**
−v	Writes information to standard output about the format of the disk. Use this flag to verify that a device is a DOS disk.

Examples

To delete a DOS file on the default device, enter:

```
dosdel file.ext
```

Files

/usr/bin/dosdel	Contains the **dosdel** command.

Related Information

The **dosdir** command, **dosformat** command, **dosread** command, **doswrite** command.

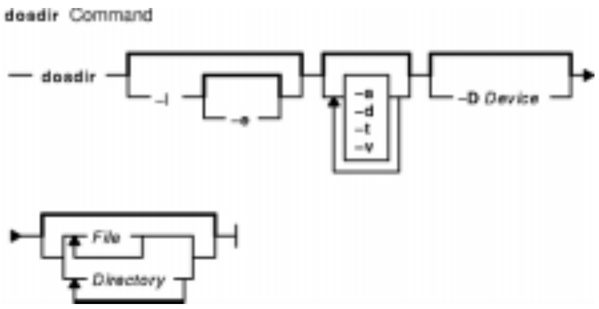
Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

dosdir Command

Purpose

Lists the directory for DOS files.

Syntax



dosdir [**−l** [**−e**]] [**−a**] [**−d**] [**−t**] [**−v**] [**−D** *Device*] [*File* ... | *Directory* ...]

Description

The **dosdir** command displays information about the specified DOS files or directories. If you specify a directory without also specifying the **−d** flag, the **dosdir** command displays information about the files in that directory.

DOS file−naming conventions are used with one exception. Since the \ (backslash) character can have special meaning to the operating system, use a / (slash) character as the delimiter to specify subdirectory names in a DOS path name. The **dosdir** command converts lowercase characters in the file or directory name to uppercase before it checks the disk. Because all file names are assumed to be full (not relative) path names, you need not add the initial / (slash).

Flags

−a	Writes information about all files. This includes hidden and system files as well as the . (dot) and .. (dot−dot) files.
−d	Treats the *File* value as a file, even if a directory is specified. When a directory is specified with the *Directory* parameter, information about the directory itself is listed instead of information about the files it contains.
−D*Device*	Specifies the name of the DOS device as **/dev/fd0** or **/dev/fd1**. The default device is **/dev/fd0**.
−e	Uses the **−l** flag to write the list of clusters allocated to the file.
−l	Produces a list of clusters that includes the creation date, size in bytes, and attributes of the file. The size of a subdirectory is specified as 0 bytes. The attributes have the following meanings:

A (Archive)	The file has not been backed up since it was last modified.
D (Directory)	The file is a subdirectory and not included in the normal DOS directory search.
H (Hidden)	The file is not included in the normal DOS directory search.
R (Read−only)	The file cannot be modified.
S (System)	The file is a system file and not included in the normal DOS directory search.

−t	Lists the entire directory tree starting at the named directory.

−v	Writes information to standard output about the format of the disk. Use this flag to verify that a device is a DOS disk.

Examples

To read a directory of the DOS files on **/dev/fd0**, enter:

```
dosdir
```

The command returns the names of the files and disk−space information.

```
PG3−25.TXT
PG4−25.TXT
PG5−25.TXT
PG6−25.TXT
Free space: 312320 bytes
```

To read a directory of the DOS files on **/dev/fd1**, enter:

```
dosdir −D/dev/fd1
```

The command returns the names of the files and disk−space information.

```
PG7−25.TXT
PG8−25.TXT
PG9−25.TXT
PG10−25.TXT
Free space: 312320 bytes
```

Files

/usr/bin/dosdir Contains the **dosdir** command.

Related Information

The **dosdel** command, **dosformat** command, **dosread** command, **doswrite** command.

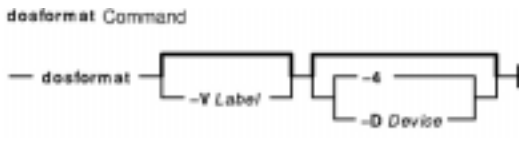
Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

dosformat Command

Purpose

Formats a DOS diskette.

Syntax



dosformat [**−V** *Label*] [**−D** *Device* | **−4**]

Description

The **dosformat** command formats a diskette with the DOS format.

The default device and DOS diskette drive format is **/dev/fd0** for a 3.5−inch diskette. The density is usually either 1.44M−byte or 2.88M−byte, depending on the density that the drive supports. Other DOS diskette drive formats are implemented by using the **−D** or **−4** flags.

To include a volume label, use the **−V** flag.

> **Note:** The purpose of this command is to facilitate file transfer between AIX and DOS systems. Using this command to format a diskette that needs to have the DOS system startup files on it is not recommended.

Flags

−V	Write the *Label* parameter to the diskette as the DOS volume label.
−D*Device*	Specifies the diskette drive type and size. The *Device* parameter can be specified as:

For a 3.5−inch, 1.44M drive:

/dev/fd0	1.44MB (default)
/dev/fd0h	1.44MB
/dev/fd0l	720KB
/dev/fd0.18	1.44MB
/dev/fd0.9	720KB

For a 3.5−inch, 2.88M drive:

/dev/fd0	2.88MB (default)
/dev/fd0h	2.88MB
/dev/fdol	720KB
/dev/fd0.36	2.88MB
/dev/fd0.18	1.44MB

/dev/fd0.9	720KB

For a 5.25−inch, 1.2M drive:

/dev/fd0	1.2MB (default)
/dev/fd0.15	1.2MB
/dev/fd0.9	360KB

−4 Specifies the lower density for the diskette size.

Examples

1. To format a 3.5−inch, 1.44M−byte diskette with the volume label "homework," type the following:

   ```
   dosformat −V homework
   ```
2. To format a 5.25−inch, 360K−byte diskette, type the following:

   ```
   dosformat −D /dev/fd1.9
   ```

   OR

   ```
   dosformat −D /dev/fd1 −4
   ```

Files

/usr/bin/dosformat Contains the **dosformat** command.

Related Information

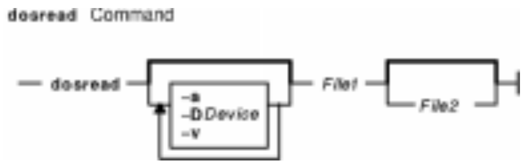
The **dosdel** command, **dosdir** command, **dosread** command, **doswrite** command.

dosread Command

Purpose

Copies DOS files to AIX files.

Syntax



dosread [**−a**] [**−v**] [**−D***Device*] *File1* [*File2*]

Description

The **dosread** command copies the DOS file specified by the *File1* variable to standard output or to the AIX file specified by the *File2* variable. If no pathname is specified for the *File2* variable, the DOS file is copied to the root directory.

Unless otherwise specified, the **dosread** command copies the number of bytes specified in the directory entry for the file specified by the *File1* variable. This means, in particular, that you cannot copy directories because, by convention, directories have a record size of 0.

You can use DOS file−naming conventions with one exception: the \ (backslash). Because the \ character can have special meaning in DOS, use a / (slash) character as the delimiter to specify subdirectory names in a DOS path name. The **dosdir** command converts lowercase characters in the file or directory name to uppercase before it checks the disk. Because all file names are assumed to be full (not relative) path names, you need not add the initial / (slash).

Notes:

1. The **dosread** command does not interpret the * and ? (asterisk and question mark) wildcard characters as having special meaning. If you do not specify a file−name extension, the file name is matched as if you had specified a blank extension.
2. You cannot customize the name of this command. The command must be named **dosread**.
3. The **dosread** command reads files from the default drive containing the DOS diskette. The **dosread** command then copies the files to the current AIX directory as AIX files. If the DOS diskette contains subdirectories, the **dosread** command does not create corresponding new subdirectories in AIX. You must create the subdirectory for AIX and specify each DOS file you want to copy into the new AIX subdirectory.

Flags

−a	Replaces each CR−LF (carriage return, line−feed) key sequence with a new−line character and interprets a Ctrl−Z (ASCII SUB) key sequence as the end−of−line character.
−D*Device*	Specifies the name of the DOS device as **/dev/fd0** or **/dev/fd1**. The default value of the *Device* variable is **/dev/fd0**. This device must have the DOS disk format.

−v	Writes file information to standard output about the format of the disk. Use this flag to verify that a device is a DOS disk.

Examples

1. To copy a text file from a DOS diskette to the AIX file system, enter:

   ```
   dosread −a chap1.doc chap1
   ```

   This command sequence copies the DOS text file `\CHAP1.DOC` on default device **/dev/fd0** to the AIX file `chap1` in the current directory.

2. To copy a binary file from a DOS diskette to the AIX file system, enter:

   ```
   dosread −D/dev/fd1 /survey/test.dta /home/fran/testdata
   ```

   This command sequence copies the DOS data file `\SURVEY\TEST.DTA` on **/dev/fd1** to the AIX file `/home/fran/testdata`.

3. To copy every DOS file on a diskette to the AIX file system, enter:

   ```
   dosdir | awk '!/There are/ {print $1}'|xargs −t −i dosread {} {}
   ```

This command sequence takes files from the default drive containing the DOS disk and copies them to the current directory as AIX files.

Files

/usr/bin/dosread	Contains the **dosread** command.
/dev/fd0	Contains the device name for a diskette drive.

Related Information

The **awk** command, **dosdel** command, **dosdir** command, **dosformat** command, **doswrite** command, **xargs** command.

File Systems and Directories Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

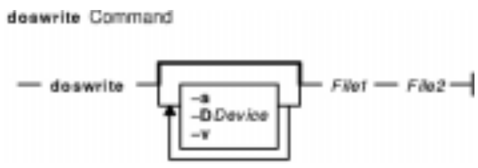
Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

doswrite Command

Purpose

Copies AIX files to DOS files.

Syntax



doswrite [**−a**] [**−v**] [**−D***Device*] *File1 File2*

Description

The **doswrite** command copies the AIX file specified by the *File1* parameter to the DOS file specified by the *File2* parameter. The **doswrite** command copies files to a single DOS diskette. The **doswrite** command cannot copy files across multiple DOS diskettes.

The **doswrite** command writes the file specified by the *File2* parameter to the DOS device using standard DOS naming conventions. Because the DOS \ (backslash) character can have a special meaning for the DOS operating system, do not use a \ (backslash) when specifying subdirectory names in the *File2* parameter. Use the AIX / (slash) character instead.

The **doswrite** command converts lowercase characters specified in the *File1* parameter to uppercase before it checks the DOS device. Because all file names are assumed to be full (not relative) path names, you do not need to add the initial / (slash).

If the file specified in the *File2* parameter contains a / (slash), each intervening component must exist as a directory and the last component (the named file) must not exist. Any existing file with the same name is overwritten.

Notes:

1. The wildcard characters * and ? (asterisk and question mark) are not treated in a special way by this command (although they are by the shell). If you do not specify a file−name extension, the file name is matched as if you had specified a blank extension.
2. This command must be named **doswrite**.
3. A DOS directory holds up to 244 files.

Flags

−a	Replaces NL (new−line) characters with the CR−LF (carriage return, line−feed) sequence. Ctrl−Z is added to the output at the end of file.
−D*Device*	Specifies the name of the DOS device as **/dev/fd0** or **/dev/fd1**. The default device is **/dev/fd0**. This device must have the DOS disk format.
−v	Writes information to standard output about the format of the disk. Use this flag to verify that a device is a DOS disk.

Examples

1. To copy a text file from the AIX file system to a DOS diskette, enter:

   ```
   doswrite −a chap1 chap1.doc
   ```

   This copies the AIX file `chap1` in the current directory to the DOS text file `\CHAP1.DOC` on default device **/dev/fd0**.

2. To copy a binary file from the AIX file system to a DOS diskette, enter:

   ```
   doswrite −D/dev/fd1 /home/fran/testdata /survey/test.dta
   ```

   This copies the AIX data file `/home/fran/testdata` to the DOS file `\SURVEY\TEST.DTA` on **/dev/fd1**.

3. To copy every AIX file in the current directory to a DOS diskette in your default drive, enter:

   ```
   for i in *
   do
   doswrite $i $i
   done
   ```

Files

/usr/bin/doswrite	Contains the **doswrite** command.
/dev/fd0	Contains the device name for diskette drive.

Related Information

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

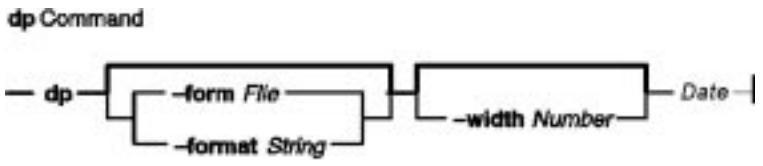
The **dosdel** command, **dosdir** command, **dosformat** command, **dosread** command.

dp Command

Purpose

Parses and reformats dates.

Syntax



dp [**−form***File* | **−format***String*] [**−width***Number*] *Date*

Description

The **dp** command parses and reformats dates. The **dp** command is not started by the user. The **dp** command is called by other programs, typically by its full path name, **/usr/lib/mh/dp**.

The **dp** command parses each mail header string specified as a date and attempts to reformat the string. The default output format for the **dp** command is the ARPA RFC 822 standard. For each string it is unable to parse, the **dp** command displays an error message.

Parameter

Date Specifies the date to be parsed.

Flags

−form *File*	Reformats the date specified in the *Date* parameter to the alternate format described by the *File* variable.
−format *String*	Reformats the date specified in the *Date* parameter to the alternate format specified by the *String* variable. The default format string follows: `%<(nodate{text})error:%{text}%|%(putstr(pretty{text}))%>`
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For Message Handler (MH), the name of this flag must be fully spelled out.
−width *Number*	Sets the maximum number of columns the **dp** command uses to display dates and error messages. The default is the width of the display.

Files

$HOME/.mh_profile	Contains the MH user profile.
/etc/mh/mtstailor	Contains MH command definitions.

Related Information

The **ap** command.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

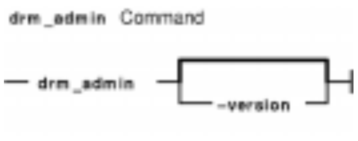
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

drm_admin Command

Purpose

Administers servers based on the Data Replication Manager (DRM), such as **glbd**, the replicated version of the global location broker (GLB).

Syntax



drm_admin [**−version**]

Description

The **drm_admin** tool administers servers based on the Data Replication Manager (DRM) such as **glbd**, the replicated version of the global location broker (GLB).

With **drm_admin**, you can inspect or modify replica lists, merge databases to force convergence among replicas, stop servers, and delete replicas.

The role of **drm_admin** is to administer the replication of databases, not to change the data they contain. For instance, you can use **drm_admin** to merge two replicas of the GLB database, but you must use **lb_admin** to add a new entry to the database. Also, although **drm_admin** can stop or delete a GLB replica, you must invoke **glbd** directly if you want to start or create a replica.

Once invoked, **drm_admin** enters an interactive mode, in which it accepts the commands described below.

Flags

−version Displays the version of NCS that this **glbd** belongs to, but does not start the daemon.

Subcommands

Most **drm_admin** commands operate on a default object (*DefaultObj*) at a default host (*DefaultHost*). Together, *DefaultObj* and *DefaultHost* specify a default replica. Defaults are established by the set command and are remembered until changed by another set.

Currently, the only known object is GLB.

Some **drm_admin** commands operate on a host other than the default. We identify this host as *OtherHost*.

The host name you supply as a *DefaultHost* or an *OtherHost* takes the form *Family:Host*, where the host can be specified either by its name or by its network address. For example, `ip:jeeves`, `ip:bertie`, and `ip:#192.5.5.5` are acceptable host names.

addrep *OtherHost*	Adds *OtherHost* to the replica list at *DefaultHost*. The replica at *DefaultHost* will propagate *OtherHost* to all other replica

lists for *DefaultObj*.

chrep −from *OtherHost* **−to** *NewOtherHost*
: Changes the network address for *OtherHost* in the replica list at *DefaultHost* to *NewOtherHost*. The replica at *DefaultHost* will propagate this change to all other replica lists for *DefaultObj*. The **chrep** command will fail if a replica of *DefaultObj* is running at *OtherHost* or if *OtherHost* is not on the replica list at *DefaultHost*.

delrep *OtherHost*
: Deletes the replica of *DefaultObj* at *OtherHost*. The **delrep** command tells the replica at *OtherHost* to:

1. Propagate all of the entries in its propagation queue.
2. Propagate a delete request to all other replicas, causing *OtherHost* to be deleted from all other replica lists for *DefaultObj*.
3. Delete its copy of *DefaultObj*.
4. Stop running.

The **delrep** command returns you immediately to the **drm_admin** prompt, but the actual deletion of the replica can take a long time in configurations that are not stable and intact. You can check whether the daemon for the deleted replica has stopped by listing the processes running on its host.

info
: Gets status information about the replica for *DefaultObj* at *DefaultHost*.

lrep [**−d**] [**−clocks**] [**−na**]
: Lists replicas for *DefaultObj* as stored in the replica list at *DefaultHost*.

−d	Lists deleted as well as existing replicas.
−clocks	Shows the current time on each host and indicates clock skew among the replicas.
−na	Lists the network address of each host.

merge {**−from** \| **−to**} *OtherHost*
: Copies entries in the *DefaultObj* database and replica list from one replica to another. It copies an entry if no corresponding entry exists in the destination database or if the corresponding entry in the destination database bears an earlier timestamp.

A merge does not cause entries to be propagated. The database and replica list at the origination are not changed.

The **−from** option copies entries from the *DefaultObj* database and replica list at *OtherHost* to the *DefaultObj* database and replica list at *DefaultHost*.

The **−to** option copies entries from the database and replica list at *DefaultHost* to the database and replica list at *OtherHost*.

A **merge −from** followed by a **merge−to** causes the replicas at the two hosts to converge.

merge_all
: Uses *DefaultHost* as the hub for a global merge of all replicas for *DefaultObj*. For each host on the replica list at *DefaultHost*, a **merge_all** first does a **merge −from**, then does a **merge −to**. All replicas of *DefaultObj* are thereby forced into a consistent state. The **merge_all** operation does not cause any entries to be propagated.

You should do a **merge_all** when:

	A replica is purged. A replica is reset. A replica has been inaccessible for two weeks or more. A replica has become physically inaccessible (for example, when its database is destroyed by a disk failure)
monitor [**−r n**]	This command causes **drm_admin** to read the clock of each replica of *DefaultObj* every n minutes and to report any clock skews or nonanswering replicas. If you do not specify **−r**, the period is 15 minutes.
purgerep*OtherHost*	Purges *OtherHost* from the replica list at *DefaultHost*. The replica at *DefaultHost* then propagates a delete request to the replicas at the hosts remaining on its list, thereby removing *OtherHost* from all other replica lists for *DefaultObj*. The delete request is not sent to *OtherHost*. A **purgerep** can cause data to be lost and should only be used when a replica has become physically inaccessible. You should do a **merge_all** operation after the **purgerep** to prevent the remaining replicas of the *DefaultObj* database from becoming inconsistent. If the purged replica is still running, it should be reset. We recommend that you use **chrep** (rather than **addrep** and **purgerep**) to change entries on the replica list.
quit	Quits the **drm_admin** session.
reset*OtherHost*	Resets the replica of *DefaultObj* at *OtherHost*. The **reset** command tells the replica at *OtherHost* to delete its copy of *DefaultObj* and to stop running. It does not cause *OtherHost* to be deleted from any other replica lists. This command can cause data to be lost unless a successful **merge_all** is done first.
set [**−o** *ObjName*] **−h** *HostName*	Sets the default object and host. All subsequent commands will operate on *ObjName*. Subsequent commands that do not specify a host will be sent to *HostName*. If you do not specify the **−o** option, **drm_admin** keeps the current *DefaultObj*. If you use set with the **−o** option, **drm_admin** checks the clocks at all hosts with replicas of the specified object.
stop	Stops the server for *DefaultObj* that is running at *DefaultHost*.

Example

The following example starts **drm_admin**, sets the default object to GLB, and sets the default host to `mars`:

```
/etc/ncs/drm_admin drm_admin: set −o glb −h dds:mars
 Default object: glb default host: dds:mars
 state: in service
 Checking clocks of glb replicas
 dds:mars 1987/04/09.17:09
 dds:pluto 1987/04/09.17:09
 dds:mercury  1987/04/09.17:07
```

Related Information

The **lb_admin** command.

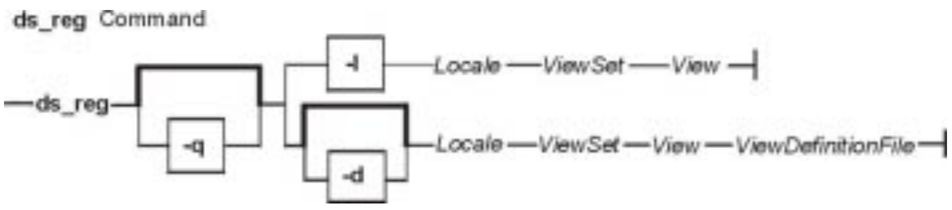
The **glbd** (NCS) daemon

ds_reg Command

Purpose

Documentation Library Service registration tool.

Syntax



ds_reg [**−q**] **−l***LocaleViewSetView*
ds_reg [**−q**] [**−d**] *LocaleViewSetViewViewDefinitionFile*

Description

By default, the **ds_reg** command registers the contents of a view definition file with the specified view in the given view set for the specified locale.
With the **−d** flag, the **ds_reg** command removes previously registered contents of a view definition file from the specified view in the given view set for the specified locale.
With the **−l** flag, the **ds_reg** command lists the specified view in the given view set for the specified locale.

Flags

−d	Unregisters the contents of the view definition file from the specified view in the given view set for the specified locale.
−l	Lists the contents of the specified view in the given view set and locale. No view definition file need be specified.
−q	Specifies the quiet option, causing the **ds_reg** to suppress the display of messages.

Examples

To register the contents of the view definition file 'MyBook.vdf' into the view 'Books' of the 'Global' view set in the English (en_US) locale, enter:

```
ds_reg en_US Global Books MyBook.vdf
```

To remove the contents of the view definition file 'MyBook.vdf' from the view 'Books' of the 'Global' view set in the English (en_US) locale, enter:

```
ds_reg −d en_US Global Books MyBook.vdf
```

To list the contents of the 'Books' view of the 'Global' view set in the English (en_US) locale, enter:

```
ds_reg −l en_US Global Books
```

Files

/usr/sbin/ds_reg	The ds_reg command
/usr/docsearch/views/<locale>/<view set>/<view>.vdf	The view set registries
/usr/lib/nls/msg/$LANG/docsearch.cat	The Documentation Library message catalog

Related Information

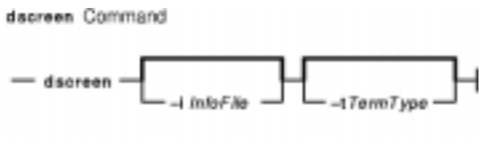
The Documentation Library Service chapters in the System Management Guide and the General Programming Concepts Guide.

dscreen Command

Purpose

Starts the Dynamic Screen utility.

Syntax



dscreen [**−i***InfoFile*] [**−t***TermType*]

Description

The **dscreen** command starts the Dynamic Screen utility, which allows a single physical terminal to be connected to several virtual sessions, or screens, at one time.

If no flags are specified, the **dscreen** command reads the description for the terminal specified in the **TERM** environment variable from the file specified in the **DSINFO** environment variable. If the **DSINFO** environment variable is not specified, the terminal description is read from the **/etc/dsinfo** file. A terminal description typically contains the following configuration information:

- Keys used with the Dynamic Screen utility and their function
- Number of pages of screen memory the terminal has available
- Code sequences that must be sent or received to access and use Dynamic Screen features

Flags

−i*InfoFile*	Specifies the file that contains alternate key mappings for use with the Dynamic Screen utility. This option is useful when the originally defined Dynamic Screen keys conflict with one of your applications. If this flag is not specified, terminal configuration information is read from the file specified in the **DSINFO** environment variable, if set. Otherwise, information is read from the **/etc/dsinfo** file.
−t*TermType*	Identifies the terminal description to be read from the file containing the key mappings. This option is useful when the desired terminal type does not match the setting of the **TERM** environment variable.

Examples

1. To start the Dynamic Screen utility using key mapping defaults, enter:

   ```
   dscreen
   ```

   This sets the **DSINFO** and **TERM** environment variables as designated in the default **/etc/dsinfo** file.

2. To start the Dynamic Screen utility and specify a file that contains alternate key mappings and also identifies a terminal description to be read from the file, enter:

```
dscreen −i myfile −t myterm
```

This uses information from a user−created **dsinfo−**type file named `myinfo` to handle unusual key mapping needs. The `myinfo` file also contains a terminal definition named `myterm`.

3. To start the Dynamic Screen utility and specify an alternate terminal setup, enter:

```
dscreen −t wy60−wp
```

This terminal definition (maintained in the **/etc/dsinfo** file) sets **dscreen** assigned key actions so they do not conflict with control key command sequences in the word processing application being used.

Files

/etc/dsinfo	Contains the terminal descriptions for the Dynamic Screen utility.

Related Information

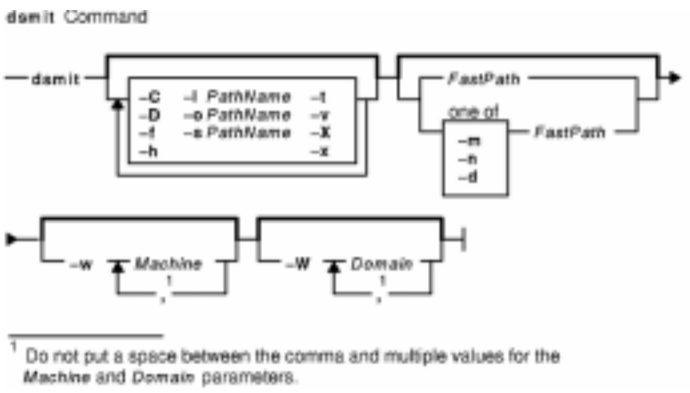
Dynamic Screen Utility in *AIX Version 4.3 System Management Guide: Communications and Networks* book.

dsmit Command

Purpose

Starts the Distributed System Management Interface Tool (DSMIT).

Syntax



dsmit [**−C**] [**−D**] [**−f**] [**−h**] [**−l** *PathName*] [**−o** *PathName*] [**−s** *PathName*] [**−t**] [**−v**] [[**−m** | **−n** | **−d**] *FastPath*] [**−X**] [**−x**] [**−w** *Machine* [**,***Machine*] ...] [**−W** *Domain* [**,***Domain*] ...]

> **Note:** Do not put a space between the comma and multiple values for the *Machine* and *DomainName* parameters.

Description

The **dsmit** command starts the Distributed System Management Interface Tool (DSMIT). DSMIT is an interface designed to simplify system management tasks. The **dsmit** command displays a hierarchy of menus that lead to interactive dialogs. DSMIT builds and runs commands as directed by the user. Because DSMIT runs system management commands, you must be a registered DSMIT administrator to use it. The server must specify the working collective, a list of machines authorized to receive commands. The working collective is a temporary list. It must be reset beginning each DSMIT session by the DSMIT administrator.

Flags

−C	Starts the Distributed System Management Interface Tool (DSMIT) using the ASCII interface (also called the Curses interface).
−D	Sets the debug mode; sets **−t** and **−v** flags.
−d*FastPath*	Identifies that the *FastPath* is the name of a dialog.
−f	Allows standard input and output from DSMIT to be redirected.
−h	Displays the command usage message.
−l*PathName*	Redirects the **smit.log** file to the specified *PathName* file.
−M	Starts DSMIT in the windows mode.
−m*FastPath*	Identifies that the *FastPath* is the name of a menu.
−n*FastPath*	Identifies that the *FastPath* is the name of a selector.
−o *PathName*	Specifies the directory *PathName* of an alternate repository for DSMIT objects.
−s *PathName*	Redirects the **smit.script** file to the specified *PathName* file.

−t	Records detailed trace information in the **smit.log** file.
−v	Records the command strings for intermediate and target task commands run by DSMIT, and also records their output in the **smit.log** file.
−w *Machine*	Specifies the machines to be in the working collective.
−W *Domain*	Specifies the domains to be in the working collective.
−x	Does not run any **cmd_to_execute**, but logs them for later execution.
−X	Does not run any **cmd_to_discover**, **cmd_to_list**, **cmd_to_classify** or **cmd_to_execute**.
−z	Starts DSMIT in the distributed mode.

Security

Access Control: You must be a registered DSMIT administrator to run this command.

Files

/usr/share/DSMIT/domains	Contains the list of domains used by DSMIT.
/usr/share/DSMIT/dsmitos	Contains the list of operating systems of DSMIT clients.
/usr/share/DSMIT/hosts	Contains the list of machines with DSMIT installed that can run commands built by the DSMIT server.
/usr/share/DSMIT/secuity/v5srvtab	Stores the local machine's unique DSMIT principal key.
/usr/share/DSMIT/secuity/admin.cfg	Stores the DSMIT administrator's keys.
/usr/share/DSMIT/secuity/managing.cfg	Stores intermediate keys used by the managing systems.
/usr/share/DSMIT/secuity/managed.cfg	Stores the managed machine's DSMIT principal keys.
/usr/share/DSMIT/secuity/dsmit.ptr	Stores the name of the DSMIT configuration file server.

Related Information

Distributed System Management Interface Tool (DSMIT) Overview in the *Distributed SMIT 2.2 for AIX: Guide and Reference*.

System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

System Management Interface Tool (SMIT) Overview for Programmers in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

dsmit−addkey Command

Purpose

Installs the DSMIT principal key in the local keytab file.

Syntax

dsmit−addkey*SourceFileTargetFile*

Description

The **dsmit−addkey** command adds the new **DSMIT** principal key for the local machine to the local keytab file.

Parameters

SourceFile	Specifies the keytab file containing new keys. This file is created on the managing machine when you initialize or modify the **DSMIT** security configuration. **Attention:** The *SourceFile* should be brought over to the local machine in a secure manner and you should delete it immediately after running the **dsmit−addkey** command.
TargetFile	Specifies the keytab file used by **DSMIT** on the local machine.

Security

Access Control: You must have root authority to run this command.

Examples

To install the new principal key for the local machine:

1. Transfer the **new−v5srvtab** file from the managing machine to **/tmp/new−v5srvtab** on the local machine.
2. To add the new **DSMIT** principal key, enter:
   ```
   dsmit−addkey /tmp/new−v5srvtab /usr/share/DSMIT/security/v5srvtab
   ```
3. Delete **/tmp/new−v5srvtab** by entering:
   ```
   del /tmp/new−v5srvtab
   ```

Files

/tmp/dsmit/new−v5srvtab	Contains the file on the managing system that includes the new **DSMIT** principal keys created when you intialize or modify the **DSMIT** security configuration.
/usr/share/DSMIT/security/v5srvtab	Contains the local machine's unique **DSMIT** principal key. The

location of this file can be changed, for example, to the Kerberos v.5 or DCE keytab file by specifying the full path name in the **DSMIT_KEYTAB_PATH** environment variable.

Related Information

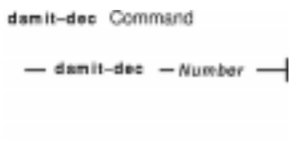
The **dsmit−rmkey** command.

dsmit−dec Command

Purpose

Decrements or resets **/usr/share/DSMIT/security/dslock.ctr** file.

Syntax



dsmit−dec*Number*

Description

The **dsmit−dec** command modifies the **/usr/share/DSMIT/security/dslock.ctr** file. Use this command when you get the message `Manually decrement counter in dslock.ctr`. It can also be usedl if DSMIT abnormally terminates, or if one of the keys cannot be obtained.

Parameters

Number	Specifies the amount the current value in **dslock.ctr** file is to be decremented. If *Number* is positive, the **dsmit−dec** command will decrement the current value in the **dslock.ctr** file by that amount. If *Number* is zero, it will reset the **dslock.ctr** file to zero.

Security

Access Control: You must be a registered DSMIT administrator to run this command.

Examples

1. To decrement the **dslock.ctr** file by 1, enter:

   ```
   dsmit−dec 1
   ```

2. To reset the **dslock.ctr** file, enter:

   ```
   dsmit−dec 0
   ```

Files

/usr/share/DSMIT/security/dslock.ctr	Contains the number of current locks for DSMIT.

Related Information

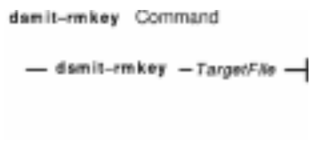
The **dsmit−unlock** command.

dsmit−rmkey Command

Purpose

Removes the **DSMIT** principal key from the local keytab file.

Syntax



dsmit−rmkey*TargetFile*

Description

The **dsmit−rmkey** command removes the **DSMIT** principal key for the local machine from the local keytab file.

Parameters

TargetFile	Specifies the keytab file used by **DSMIT** on the local machine.

Security

Access Control: You must have root authority to run this command.

Example

To remove the **DSMIT** principal key for the local machine, enter:

```
dsmit−rmkey /usr/share/DSMIT/security/v5srvtab
```

Files

/usr/share/DSMIT/security/v5srvtab	Contains the local machine's unique **DSMIT** principal key. The location of this file can be changed, for example, to the Kerberos v.5 or DCE keytab file by specifying the full pathname in the **DSMIT_KEYTAB_PATH** environment variable.

Related Information

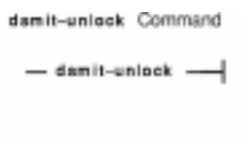
The **dsmit−addkey** command.

dsmit−unlock Command

Purpose

Clears the locks on the **DSMIT** configuration file server.

Syntax



dsmit−unlock

Description

The **dsmit−unlock** command clears the **/usr/share/DSMIT/security/dslock** file and resets the **/usr/share/DSMIT/security/dslock.ctr** file on the DSMIT configuration file server. These lock files reside on the DSMIT configuration file server and control access to the DSMIT configuration files. In the event that DSMIT terminates abnormally, these locks may be left in a state that prevents you from restarting DSMIT. If you get a message such as `Cannot acquire lock` or `Cannot create credentials`, you should run the **dsmit−unlock** command on the DSMIT managing machine.

Security

Access Control: You must be a registered DSMIT administrator to run this command.

Example

To clear the **dslock** file and reset the **dslock.ctr** file, enter:

```
dsmit−unlock
```

Files

/usr/share/DSMIT/security/dslock	The **DSMIT** lock file on the DSMIT configuration file server. Controls access to the DSMIT configuration files.
/usr/share/DSMIT/security/dslock.ctr	The **DSMIT** lock counter on the DSMIT configuration file server. Controls access to the DSMIT configuration files.

Related Information

The **dsmit−dec** command.

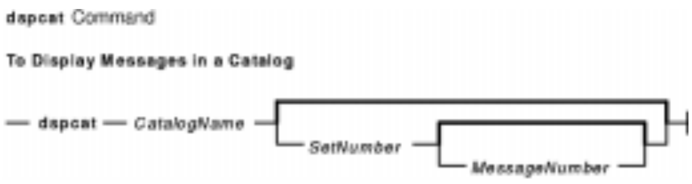
dspcat Command

Purpose

Displays all or part of a message catalog.

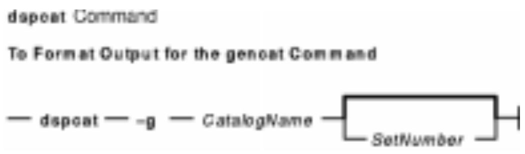
Syntax

To Display Messages in a Catalog



dspcat*CatalogName* [*SetNumber* [*MessageNumber*]]

To Format Output for the gencat Command



dspcat−g*CatalogName* [*SetNumber*]

Description

The **dspcat** command displays a particular message, all the messages in a set, or all the messages in a catalog. The **dspcat** command directs the messages to standard output.

The *CatalogName* parameter specifies a message catalog. The *SetNumber* parameter specifies a set in the catalog specified by the *CatalogName* parameter. The *MessageNumber* parameter specifies a particular message in the set specified by the *SetNumber* parameter. If you include all three parameters, the **dspcat** command displays the specified message. If you do not include the *MessageNumber* parameter, the **dspcat** command displays all the messages in the set. If you specify a nonexistent value for the *SetNumber* or *MessageNumber* parameter, the **dspcat** command displays an error message and returns a nonzero return value. If you specify only the *CatalogName* parameter, the **dspcat** command displays all the messages in the catalog. You must include the *SetNumber* parameter if you include the *MessageNumber* parameter.

The **dspcat** command uses the **NLSPATH** environment variable and the **LC_MESSAGES** category to find the specified message catalog if you do not use / (slash) characters in the value of the *CatalogName* parameter.

Flags

−g Formats output to be used as input to the **gencat** command. The *MessageNumber* parameter is not valid when you use the **−g** flag.

Examples

To display message number `2` in set number `1` of the `test.cat` file, enter:

```
dspcat test.cat 1 2
```

Files

/usr/bin/dspcat	Contains the **dspcat** command.

Related Information

The **dspmsg** command, **gencat** command, **mkcatdefs** command, **runcat** command.

The **catclose** subroutine, **catgets** subroutine, **catopen** subroutine.

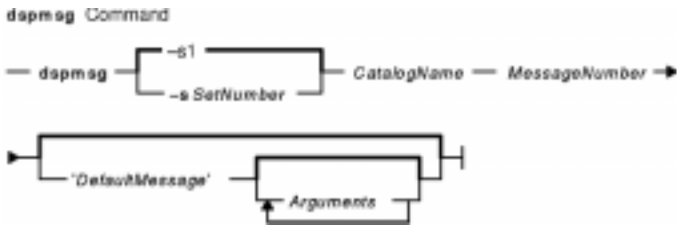
For more information about the Message Facility, see Message Facility Overview for System Management in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

dspmsg Command

Purpose

Displays a selected message from a message catalog.

Syntax



dspmsg [**−s***SetNumber*] *CatalogNameMessageNumber* ['*DefaultMessage*' [*Arguments*]]

Description

The **dspmsg** command displays either the text of a particular message from a message catalog generated with the **gencat** command or, if the message cannot be retrieved, a default message supplied as a parameter to the command. The **dspmsg** command directs the message to standard output. This command is intended for use in shell scripts as a replacement for the **echo** command.

The **NLSPATH** environment variable and the **LC_MESSAGES** category are used to find the specified message catalog if no / (slash) characters are used in the value of the *CatalogName* parameter. If the catalog named by the *CatalogName* parameter is not found or if the message named by the *MessageNumber* parameter (and optional *SetNumber* value) is not found, then the supplied *DefaultMessage* value is displayed. If a *DefaultMessage* value is not specified, a system−generated error message is displayed.

The **dspmsg** command allows up to ten string arguments to be substituted into the message if it contains the **%s**, %n$s, **%ld**, or %n$ld **printf** subroutine conversion specification. Missing arguments for conversion specifications result in a **dspmsg** error message. Normal **printf** subroutine control character escapes (for example, **n**) are recognized.

The use of **printf** subroutine format strings is recommended in the catalog. This format provides for correct insertion of arguments even if the format strings in the message are in a different order than the default message. You must enclose the default message in single quotation marks if using the **%n$s** notation for message inserts.

Flags

−s *SetNumber*	Specifies an optional set number. The default value for the *SetNumber* variable is 1.

Examples

To display set number 1, message number 2 of the `test.cat` catalog, enter:

```
dspmsg    −s    1    test.cat    2    'message    %s    not    found'    2
```

If the message is not found, `message 2 not found` is displayed.

Files

/usr/bin/dspmsg Contains the **dspmsg** command.

Related Information

The **dspcat** command, **gencat** command, **mkcatdefs** command, **runcat** command.

The **catclose** subroutine, **catgets** subroutine, **catopen** subroutine.

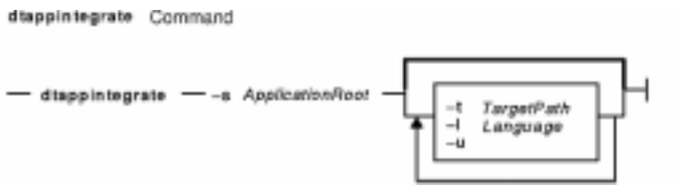
For more information about the Message Facility, see Message Facility Overview for System Management in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

dtappintegrate Command

Purpose

The Common Desktop Environment application integration tool.

Syntax



dtappintegrate −s *ApplicationRoot* [**−t***TargetPath*] [**−l***Language*] [**−u**]

Description

The **dtappintegrate** command links the application CDE configuration files from application−specific locations to system locations and updates the system's Browser help volumes for the languages affected. The **dtappintegrate** command is used during the installation process of an application. The application installation script should invoke the **dtappintegrate** command at the end.

There are four key subdirectories under the application root (referred to as **$APP_ROOT**) dictated by CDE policy. The directories are:

$APP_ROOT/dt/appconfig/types/*Language*	For filetype, Front Panel, and action files.
$APP_ROOT/dt/appconfig/appmanager/*Language*	For application group files.
$APP_ROOT/dt/appconfig/icons/*Language*	For icons used by the CDE managers.
$APP_ROOT/dt/appconfig/help/*Language*	For application help. For example, the default−language application **SpreadSheet** would load its desktop icons under: **/opt/SpreadSheet/dt/appconfig/icons/C/*.bm** and **/opt/Spreac** where **/opt/SpreadSheet** is the value of **$APP_ROOT**.

> **Note: $APP_ROOT** is a syntactical convention of this document and is not used by the runtime environment.) All of these CDE configuration files and subdirectories are placed under a common top and should always include the default language subdirectory **C**.

In the simplest case, the command takes as input the application root, for example, **/opt/thisapp**. The outputs from this operation are corresponding subdirectories and files on the application server that contain relative symbolic links to the applications CDE configuration files described above, under the following system locations:

/etc/dt/appconfig Top−level application configuration subdirectory, consists of following subdirectories:

/etc/dt/appconfig/types/*Language/*	Contains the ***.dt** and any ***.fp** links.
/etc/dt/appconfig/appmanager/*Language/*	Contains links to the application group subdirectory and the action script files to appear as actions under the Application

	Manager.
/etc/dt/appconfig/help/*Language*/	Contains symbolic links to the help files installed under the application's root.
/etc/dt/appconfig/icons/*Language*/	Contains symbolic links to the CDE icons for the application.

Flags

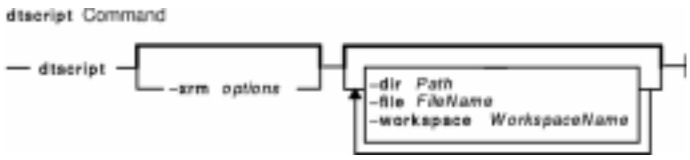
−s *ApplicationRoot*	Integrates the application located at *ApplicationRoot*. This flag is required.
−t *TargetPath*	Links the application CDE configuration files from the application−specific location to *TargetPath* rather than to the system locations. This flag is optional. If the **−t** flag is supplied, the files are linked under the specified subdirectory. For example, specifying **−t /etc/dt/private** would cause the application help files to be symbolically linked under **/etc/dt/private/help/***Language*. This flag is typically used only by system administrators who want to create separate applications and not by the application post−installation script. By default (with no **−t** specified), the application subdirectory root is global to the application host. All applications installed on the host will have their configuration files copied to the same place for merging with other application configuration files.
−l *Language*	Specifies the language to integrate. Basically, this flag indicates the directories under which to find the application CDE configuration files. If this parameter is not specified, all languages will be integrated. This parameter is optional.
−u	Integration of application is canceled. This flag is optional.

dtscript Command

Purpose

Builds simple dialogs used in the X Window System environment.

Syntax



dtscript [**−xrm** *options*] [**−dir** *Path*] [**−file** *FileName*] [**−workspace** *WorkspaceName*]

> **Note:** The **−xrm***options* must be specified, if used, before any other flag.

Description

Desktop Script supports a subset of Motif widgets you drag and drop from the palette into your dialog. You can move or resize any widget in a dialog. You can also edit widget properties using the specialized editors provided.

You can enter callbacks to give widgets desired behavior. When a dialog is complete, Desktop Script generates dtksh code for it.

Flags

−dir *Path*	Sets Desktop Script's current directory shown in the File Select dialog to *Path*.
−file *FileName*	Loads an existing dialog called: *FileName*. The *FileName* argument can be an absolute path name, a path name relative to the current directory, or a path name relative to the **−dir** value.
−workspace *WorkspaceName*	Loads Desktop Script into the corresponding CDE workspace.
−xrm *options*	Enables you to enter any of the specifications (*options*) that you would otherwise put into a resource file.

Examples

To invoke the Desktop Script from a window, enter:

```
dtscript
```

Files

/usr/dt/bin/dtscript Contains the **dtscript** command.

Related Information

AIXwindows *Desktop Script User's Guide*.

dtterm Command

Purpose

Provides runtime support of legacy applications.

Syntax

dtterm [Flags...]

Description

The **dtterm** client provides runtime support of legacy applications written for ANSI X3.64−1979 and ISO 6429:1992(E) conformant character terminals.

Flags

Note: The **dtterm** terminal emulator accepts all of the standard X Toolkit command line flags along with additional flags, all of which are listed below (if the flag begins with a **+** instead of a **−**, the flag is restored to its default value):

−132	Causes the DECCOLM escape sequence to be recognized, and the **dtterm** window will resize appropriately. Normally the DECCOLM escape sequence that switches between 80 and 132 column mode is ignored. Associated resource: c132.
+132	Causes the DECCOLM escape sequence to be ignored. This is the default behavior. Associated resource: c132.
−aw	Indicates that auto−wraparound should be allowed. This allows the cursor to automatically wrap to the beginning of the next line when it is at the right−most position of a line and text is output. This is the default behavior. Associated resource: autoWrap.
+aw	Indicates that auto−wraparound should not be allowed. Associated resource: autoWrap.
−background*background_color*	Specifies the background of the terminal window as well as the default background used for the scroll bar and the X11 pointer cursor. Under CDE, this flag defaults to the primary colorset select pixel or background pixel, see −bs. Without CDE, this flag defaults to *background/*Background with an ultimate fallback color of black. *background_color* describes the background color to use. Associated resource: background.
−bd*border_color*	Specifies the border color for all windows. The shell widget's border may not be visible when reparenting window managers such as **dtwm** and **mwm** are used. The default color is black. *border_color* describes the border color to use. Associated resource: borderColor.
−bg*background_color*	Identical to −background. *background_color* describes the background color to use. Associated resource: background.
−bordercolor*border_color*	Identical to −bd above. *border_color* describes the border color to use. Associated resource: borderColor.
−borderwidth*border_width*	Specifies the border width of the shell widget's window. This value may be overridden by reparenting window managers such as **dtwm** and **mwm**. The default is 0. *border_width* specifies the width of the window border in

	pixels. Associated resource: borderWidth.
−bs	Specifies that the terminal window should use the Motif select color instead of the background color for the terminal window's background color. This is the default behavior. Associated resource: backgroundIsSelect.
+bs	Specifies that the terminal window should not use the Motif select color instead of the background color for the terminal window's background color. Associated resource: backgroundIsSelect.
−bw*border_width*	Identical to −borderwidth. Associated resource: borderWidth.
−C	Specifies that output directed at **/dev/console** should be directed instead to the terminal window. It is provided as a way to prevent output that would normally be displayed on the ITE from overwriting the X server's display. It is not provided as a general mechanism to direct the output from an arbitrary system's **/dev/console** to an arbitrary X server.

Note: You must have ownership of and read/write access to **/dev/console** for this flag to work.

−display*display_name*	Specifies the X11 display server to be used by **dtterm**. This defaults to the value in the $DISPLAY environment variable. *display_name* specifies the X11 server to connect to.
−e*program_argument...*	Specifies an executable program to be invoked as a subprocess when **dtterm** is started. This flag must be the last flag on the command line. *program_argument* specifies the program and command line arguments to run.
−fb*fontset*	Specifies an XFontSet to be used when displaying bold terminal text. It should be specified as a Motif XmFontList. Only character or mono spaced fonts are supported. The behavior when using proportional fonts is undefined. A default bold font will be generated based on the XLFD name of the userFont. If that font is not available, bold text will be generated by overstriking (with a one pixel offset) the userFont. *fontset* specifies the bold terminal XFontSet to use. Associated resource: userFont.
−fg*foreground_color*	Specifies the foreground color of the terminal window as well as the default foreground color used for the scroll bar and for the X11 pointer cursor. Under CDE, this resource will default to the primary color set foreground pixel. Without CDE, this resource will default to *foreground or *Foreground with an ultimate fallback color of white. *foreground_color* specifies the foreground color to use. Associated resource: foreground.
−fn*fontset*	Specifies an XFontSet to be used when displaying terminal text. It should be specified as a Motif XmFontList. Only character or mono spaced fonts are supported. The behavior when using proportional fonts is undefined. This font will not be used to display non−terminal text (menu bar, popup menus, dialogs, etc.). The default is to use the XmNtextFontList value of the parent bulletin board (see XmBulletinBoard) in the same manner as the XmText widget. *fontset* specifies the terminal XFontSet to use. Associated resource: userFont.
−font*fontset*	Identical to −fn. *fontset* specifies the terminal XFontSet to use. Associated resource: userFont.
−foreground*foreground*	Identical to −fg. *foreground* specifies the foreground color to use. Associated resource: foreground.
−geometry*geometry_string*	Specifies the preferred size and position of the terminal window. The default size is 24 lines of 80 characters each. There is no default position. *geometry_string* specifies the terminal geometry to use. Associated resource: geometry.
−help	Displays a message summarizing the usage of **dtterm**.

−iconic	Specifies that the terminal emulator should initially be placed on the display iconified. Associated resource: iconic.
+iconic	Specifies that the terminal emulator should initially be placed on the display as a normal window. This is the default behavior. Associated resource: iconic.
−j	Specifies that jump scrolling should be used. Under jump scrolling, the screen may be scrolled more than one line at a time. This provides for faster screen updates when multiple lines of text are being sent to the terminal. The maximum number of lines that may be jump scrolled is limited to the number of lines in the terminal window. All lines are displayed. This is the default behavior. Associated resource: jumpScroll.
+j	Specifies that jump scrolling should not be used. For a description of jump scrolling, see −j. Associated resource: jumpScroll.
−kshMode	Specifies that **ksh** mode should be enabled. Under **ksh** mode, a key pressed with the extend modifier bit set will generate an escape character followed by the character generated by the un−extended keystroke. This flag is provided for use with emacs and the emacs command line editor mode of **ksh** or **ied**. It conflicts with \ the normal use of the meta key for generating extended single byte characters, and for generating multi−byte Asian characters. Associated resource: kshMode.
+kshMode	Specifies that the **ksh** mode should not be enabled. This is the default behavior. Associated resource: kshMode.
−l	Enables output logging. When logging is enabled, all output received from the subprocess is logged either to a file or to a command pipeline (as specified via the −lf flag). Since the data is being logged directly from the subprocess, it includes all escape characters and carriage return/newline pairs sent by the terminal line discipline. Output may be enabled and disabled via escape sequences. Associated resource: logging.
+l	Disables output logging. For a description of output logging, see −l. This flag is the default. Associated resource: logging.
−lf*file_name*	Specifies the name of the file to which the output log described in the −l flag. If *file_name* begins with a pipe symbol (|), the rest of the string is assumed to be a command to be used as the endpoint of a pipe. The default filename is DttermLog*XXXXX* (where *XXXXX* is the process id of **dtterm**) and is created in the directory from which **dtterm** was started. If the last five characters are *XXXXX*, they are replaced by the process ID. *file_name* specifies the log file name to use. Associated resource: logFile.
−ls	Indicates that the shell that is started should be a login shell (i.e. the first character of argv[0] will be a dash, indicating to the shell that it should read the system's profile and the user's **$HOME/.profile** (for **ksh** and **sh**) or the system's **csh.login** and the user's **$HOME.login** (for **csh**). Associated resource: loginShell.
+ls	Specifies that a normal (non−login) shell should be started. This is the default behavior. Associated resource: loginShell.
−map	Indicates that **dtterm** should map (de−iconify) itself upon subprocess output if it is unmapped (iconified). An initial period of time during which **dtterm** will not map itself upon subprocess output may be specified via the mapOnOutputDelay resource. Associated resource: mapOnOutput.
+map	Specifies that there should be no special mapping behavior. This is the default behavior. Associated resource: mapOnOutput.
−mb	Indicates that **dtterm** should ring a margin bell when the user types near the right margin. The actual distance involved is specified by the −nb flag. Associated resource: marginBell.

+mb	Indicates that margin bell should not be rung when the user types near the right margin. This is the default. Associated resource: marginBell.
−ms*pointer_color*	Specifies the foreground color to use for the terminal window's (X11) pointer cursor. The default is to use the terminal window's foreground color. See foreground. *pointer_color* specifies the pointer foreground color to use. Associated resource: pointerColor.
−name*prog_name*	Specifies the X11 name of the **dtterm** window. *prog_name* the name to use.
−nb*number*	Specifies the number of characters from the right margin at which the margin bell will ring, if enabled. The default is 10. Associated resource: nMarginBell.
−r	Causes the **dtterm** window to be displayed with the foreground and background colors reversed. This is identical to the −rv and −reverse flags.
+r	Causes the **dtterm** window to be displayed with the normal foreground and background colors. This is the default, and is also identical to the +rv flag.
−reverse	Causes the **dtterm** window to be displayed with the foreground and background colors reversed. This is identical to the −r and −rv flag.
−rv	Causes the **dtterm** window to be displayed with the foreground and background colors reversed. This is identical to choosing Options | Global Options, and then changing the ``windowBackground" options menu to ``Inverse." A **dtterm** window started with this flag has the`` Window Background" options menu set to ``Inverse." See ``Global Options".
+rv	Causes the **dtterm** window to be displayed with the normal foreground and background colors. This is the default.
−rw	Specifies that reverse−wraparound should be enabled. Associated resource: reverseWrap.
+rw	Indicates that reverse−wraparound should not be enabled. This is the default. Associated resource: reverseWrap.
−Sccn	Specifies that the terminal emulator should be run against a pre−opened pty or STREAMS device. This flag is provided for use where the pty or STREAMS device's slave name is of the form tty?? (i.e., exactly two characters following the tty). This flag is intended for use when **dtterm** is invoked programmatically from another application. *cc* specifies the last two characters of the pty or STREAMS device's slave name, where the slave name is of the form tty??. This value is ignored, but must be exactly two characters in length. *n* specifies the number of the file descriptor that corresponds to the pty or STREAMS device's already−opened master side.
−Sc.n	This flag is identical to **−Sccn** above, but is provided for systems with a larger pty name space. *c* specifies the last component of the pty slave name. This values is ignored and may be empty. *n* specifies the number of the file descriptor that corresponds to the pty's already−opened master side.
−sb	Indicates that a scrollbar should be displayed. This is the default. Associated resource: scrollBar.
+sb	Indicates that a scrollbar should not be displayed. Associated resource: scrollBar.
−sf	Indicates that Sun Function Key escape codes should be generated for function keys instead of standard VT220 escape sequences. Associated resource: sunFunctionKeys.
+sf	Indicates that the standard escape sequences should be generated for function keys instead of the Sun Function Key escape codes. This is the default behavior. Associated resource: sunFunctionKeys.
−sl*screens[s|l]*	Specifies the number of lines in the terminal buffer beyond the length of the window. The flag value consists of a number followed by an optional suffix. If no suffix is included, or the suffix is **l** (ell), the total length of the terminal buffer will be screens plus the length of the terminal window. If the suffix is **s** (ess), the

	total length of the terminal buffer will be (screens plus one) times the length of the terminal window. **dtterm** will try to maintain the same buffer−to−window ratio when the window is resized larger. The default is **4s**. *screens* specifies the number of screens or lines to save. Associated resource: saveLines.
−ti*term_id*	Supplies the name used to select the correct response to terminal ID queries. Valid values are vt100, vt101, vt102, and vt220. The default is vt220. *term_id* specifies the terminal ID to use.
−title*title_string*	Specifies the window title. If the −e flag is used, the default will be the last component of the program's path. If the −e flag is not used, the default will be the last component of the name used to run **dtterm** (i.e., argv[0]). *title_string* specifies the title to use. Associated resource: title.
−tm*term_modes*	Specifies a string containing terminal−setting keywords and the characters to which they may be bound. Allowable keywords include intr, quit, erase, kill, eof, eol, swtch, start, stop, brk, susp, dsusp, rprnt, flush, weras, and lnext. Keywords that do not apply to a specific architecture will be correctly parsed and ignored. Control characters may be specified as ^ followed by char (e.g. ^c or ^u), and ^? may be used to indicate delete. This is useful for overridding the default terminal settings without having to do an **stty** every time a terminal process is started. The default is NULL. *term_modes* specifies the terminal mode string. Associated resource: ttyModes.
−tn*term_name*	Specifies a name to set the $TERM environment variable to. The default is **vt220**. *term_name* specifies the terminal name to use. Associated resource: termName.
−usage	Prints a usage message on the screen.
−vb	Indicates that a visual bell is preferred over an audible one. Instead of ringing the terminal bell whenever a Control−G is received, the window will be flashed. Associated resource: visualBell.
+vb	Indicates that an audio bell is preferred over a visual one. This is the default behavior. Associated resource: visualBell.
−w*border_width*	Identical to −borderwidth. *border_width* specifies the width of the window border in pixels.
−xrm*resource_string*	Allows X11 Resource Manager−style resources to be specified on the command line. *resource_string* specifies an X11 resource string.

Resources

allowSendEvents	Specifies that the terminal emulator should allow synthetic events (generated and sent by another application). Enabling this resource opens up a possible security risk. The default is False.
appCursorDefault	If True, the cursor keys are initially in application mode. If False, they are initially in cursor mode. The default is False.
appKeypadDefault	If True, the keypad keys are initially in application mode. If False, they are initially in numeric mode. The default is False.
autoWrap	Specifies whether or not auto−wraparound is initially enabled. The default is True.
background	Specifies the background color of the terminal window as well as the default background color used for the scrollbar. Under CDE, this resource defaults to either the primary color set select pixel or the primary color set background pixe, see backgroundIsSelect. The default is the primary color set background pixel. Without CDE, this resource defaults to black.
backgroundIsSelect	When True, this resource specifies that the terminal window should use the Motif select color instead of the background color for the terminal window's

	background color. The default is False.
blinkRate	Specifies the number of milliseconds the cursor is in the on and off states while blinking. A value of 250 will blink the cursor two times per second. A value of 0 will turn blinking off. The default is 250.
borderColor	Defines the border color for the window. The window border may not be visible when reparenting window managers such as **dtwm** and **mwm** are used. The default is ``black".
borderWidth	Specifies the border width of the shell widget's window. This value may be overridden by reparenting window managers such as **dtwm** and **mwm**. The default is 0.
c132	Specifies whether or not the DECCOLM escape sequence that switches to window with between 80 and 132 columns should be honored. The default is False.
charCursorStyle	Specifies the shape of the text cursor. A value of char_cursor_box specifies a cursor with the width and height of the base font's bounding box. A value of char_cursor_bar specifies a cursor with the width of the base font's bounding box, a height of two pixels, and drawn with it's top on the baseline. The default is char_cursor_box.
consoleMode	Specifies that output directed at **/dev/console** should be directed instead to the terminal window. It is provided as a way to prevent output that would normally be displayed on the ITE from overwriting the X server's display. It is not provided as a general mechanism to direct the output from an arbitrary system's **/dev/console** to an arbitrary X server. Note that you must have ownership of and read/write access to **/dev/console** for this flag to work. The default is False.
foreground	Specifies the foreground color of the terminal window as well as the default foreground color used for the scrollbar and the color used for the pointer cursor. Under CDE, this resource will default to the primary colorset foreground. Otherwise, it defaults to ``white".
geometry	Specifies the preferred size and position of the terminal window. The default size is 24 lines of 80 characters each. There is no default position.
iconGeometry	Specifies the preferred position of the terminal emulator's icon. Window managers may ignore this value. There is no default.
iconic	If true, specifies that the terminal emulator should initially be placed on the display iconified. Window managers (including **dtwm** and **mwm** may ignore this value. The default is False.
iconicName	Specifies the name for the icon. If the −e flag is used, the default will be the last component of the program's path. If the −e flag is not used, the default will be the base name of the name used to run **dtterm** (i.e., argv[0]).
jumpScroll	Specifies that jump scrolling should be used. Under jump scrolling, the screen may be scrolled more than one line at a time. This provides for faster screen updates when multiple lines of text are being sent to the terminal. The maximum number of lines that may be jump scrolled is limited to the number of lines in the display. It is guaranteed that all lines will be displayed. The default is True.
kshMode	Specifies that **ksh** mode should be enabled. Under **ksh** mode, a key pressed with the extend modifier bit set will generate an escape character followed by the character generated by the un− extended keystroke. This flag is provided for use with emacs and emacs command line editor mode of **ksh** or **ied**. It conflicts with the normal use of the meta key for generating extended single byte characters and for generating multi−byte Asian characters. The default is False.
logFile	Specifies the name of the file to which the output log described below is written. If the filename begins with a pipe symbol (|), the rest of the string is assumed to be a command to be used as the endpoint of a pipe. The default filename is DttermLog*XXXXX* (where *XXXXX* is a unique character string) and is created in

	the directory from which the subprocess was started. If the last five characters are *XXXXX*, they are replaced by a unique character string.
logging	Enables output logging. When logging is enabled, all output received from the subprocess is logged either to a file or to a command pipeline (as specified via the logFile flag). Since the data is being logged directly from the subprocess, it includes all escape characters and carriage return/newline pairs sent by the terminal line discipline. Output may be enabled and disabled via escape sequences. The default is False.
logInhibit	Specifies that device and file logging should be inhibited. The default is False.
loginShell	Specifies that the shell that is started should be a login shell (i.e. the first character of argv[0] will be a dash, indicating to the shell that it should read the system's profile and the user's **$HOME/.profile** (for **ksh** and **sh**) or the system's **csh.login** and the user's **$HOME/.login** (for **csh**). The default is False.
mapOnOutput	Indicates that the terminal emulator should map (de−iconify) itself upon subprocess output if it is unmapped (iconified). An initial period of time during which it will not map itself upon subprocess output may be specified via the mapOnOutputDelay resource. The default is False.
mapOnOutputDelay	Specifies the number of seconds after start−up that **dtterm** will not honor the mapOnOutput resource. This allows for initial output (e.g., shell prompts) to be sent to the terminal without auto mapping the window. The default is 0 (no delay)
marginBell	Specifies whether or not the bell should be run when the user types near the right margin. The default is False.
menuBar	Specifies that a pulldown menu should be displayed. The default is True.
menuPopup	Specifies that a popup menu should be enabled. The default is True.
nMarginBell	Specifies the number of characters from the right margin at which the margin bell should be rung, when enabled. The default is 10.
pointerBlank	Specifies that the pointer cursor should be put into blanking mode. In this mode, the cursor will turn on when the pointer is moved, and will be blanked either after a selectable number of seconds or after keyboard input has occurred. The delay is set via the pointerBlankDelay resource. The default is False.
pointerBlankDelay	Defines the number of seconds to wait before blanking the pointer cursor after the pointer has been moved. A value of 0 invokes pointer blanking only on keyboard input. The default is 2 seconds.
pointerColor	Specifies the foreground color to use for the terminal window's pointer (X11) cursor. The default is to use the terminal window's foreground color. See foreground.
pointerColorBackground	Specifies the background color to use for the terminal windows pointer (X11) cursor. The default is to use the terminal windows background color See background.
pointerShape	Specifies the X cursor font character to use as the pointer cursor. It should be specified as a string from the include file with the leading XC_ removed. The default is **xterm**.
reverseVideo	Specifies whether or not reverse video should be used. The default is False.
reverseWrap	Specifies whether or not reverse−wraparound should be enabled. The default is False.
saveLines	Specifies the number of lines in the terminal buffer beyond length of the window. The value consists of a number followed by an optional suffix. If no suffix is included, or the suffix is **l** (ell), the total length of the terminal buffer will be screens plus the length of the terminal window. If the suffix is **s** (ess), the total length of the terminal buffer will be (screens plus one) times the length of the terminal window. **dtterm** will try to maintain the same buffer−to−window ratio when the window is resized larger. The default is **4s**.

scrollBar	Specifies whether or not the scrollbar should be visible. The default is True.
sunFunctionKeys	Specifies whether or not Sun Function Key escape codes should be generated for function keys instead of standard VT220 escape sequences. The default is False.
termId	Supplies the name used to select the correct response to terminal ID queries. Valid values are vt100, vt101, vt102, and vt220. The default is vt220.
termName	Defines the name for the $TERM environment variable. The default is vt220.
title	Specifies the window title. If the −e flag is used, the default will be the last component of the program's path. If the −e flag is not used, the default will be the last component of the name used to run **dtterm** (i.e., argv[0]).
ttyModes	Specifies a string containing terminal−setting keywords and the characters to which they may be bound. Allowable keywords include: intr, quit, erase, kill, eof, eol, swtch, start, stop, brk, susp, dsusp, rprnt, flush, weras, and lnext. Keywords that do not apply to a specific architecture will be correctly parsed and ignored. Control characters may be specified as ^ followed by char (e.g. ^c or ^u), and ^? may be used to indicate delete. This is very useful for overriding the default terminal settings without having to do an **stty** every time a terminal process is started. The default is NULL.
userBoldFont	Specifies an XFontSet to be used when displaying bold terminal text. It should be specified as a Motif XmFontList. Only character or mono spaced fonts are supported. The behavior when using proportional fonts is undefined. A default bold font will be generated based on the XLFD name of the userFont. If that font is not available, bold text will be generated by overstriking (with a one pixel offset) the userFont.
userFont	Specifies an XFontSet to be used when displaying terminal text. It should be specified as a Motif XmFontList. Only character or mono spaced fonts are supported. The behavior when using proportional fonts is undefined. This font will not be used to display non−terminal text (menu bar, popup menu, dialog, etc.). The default is to use the XmNtextFontList value of the parent bulletin board (see XmBulletinBoard(3X)) in the same manner as the XmText widget.
visualBell	Specifies that a visual bell is preferred over an audible one. Instead of ringing the terminal bell whenever a CTRL−G is received, the windows will be flashed. The default is False.

Pointer Usage

Note:dtterm allows you to select regions of text. Selection is based on the model specified in the Inter−Client Communication Conventions Manual (ICCCM). **dtterm** supports primary selection only. You can copy or paste selected text using primary transfer. Input is treated as keyboard input, and is inserted at the cursor. The select/insert operations and their default assignments are described below.

select	The left button is used to select the text to be copied. Move the pointer to the beginning of the text to copy, press and hold the left button, move the cursor to the end of the text to copy, and release the button. Any currently selected text can be deselected by clicking the left button once without moving the mouse.
insert	The middle button pastes the text from the primary selection, treating it as keyboard input.

Actions

bell *([Percentage])*	This action rings the keyboard bell at the specified percentage above or below the base volume.
break ( )	This action send a break signal to the child process.

cancel ( )	This action sends a **CAN** (cancel) character to the child process.
do ( )	This action sends the escape sequence associated with the **Do** key to the child process.
edit−key *(string)*	This action sends the escape sequence associated with the corresponding edit key to the child process. The interpretation of these keys is application specific. Valid values for string are find, insert, next, prior, remove, and select.
extend−start ( )	Start the extension of the currently selected text. extend−end ( ) **Note:** Extends the current selection. The amount of text selected depends on the number of mouse clicks.
function−key−execute *(num [,type])*	This action sends the escape sequence associated with the corresponding function key *num* to the child process. Valid values for *num* are 1 through 35. If type is set to function (or not set at all), the escape sequence associated with function key *num* is sent to the child process. If *type* is set to **UDK**, then the string associated with user defined key *num* is sent to the child process.
grab−focus ( )	This action performs one of the following depending on the number of multiple mouse clicks. One click will deselect any selected text and set the selection anchor at the pointer position, two clicks will select a word, three clicks will select a line of text, and four clicks will select all text.
hard−reset ( )	This action will perform a hard reset on the terminal emulator.
help ( )	This action sends the escape sequence associated with the DEC VT220 Help key to the child process. The interpretation of this key is application specific.
keymap *(name)*	This action dynamically defines a new translation table whose resource name is name with the suffix Keymap (case is significant). The name "None" restores the original translation table.
keypad−key−execute *(string)*	This action sends the escape sequence associated with the corresponding keypad key to the child process. The interpretation of these keys are application specific. Valid values for *string* include: f1−f4, space, tab, enter, equal, multiply, add, separator, subtract, decimal, divide, and 0 − 9.
move−cursor *(direction)*	This action sends the escape sequence associated with the corresponding cursor motion to the child process. The interpretation of these keys are application specific. Valid values for *direction* include: up, down, backward, and forward.
redraw−display ( )	This action redraws the contents of the text window.
scroll *(count [,units])*	This action will scroll the display memory down if count is less than zero, or up if *count* is greater than zero. The number of lines scrolled is based on *count* and *units*. Valid values for *units* are page, halfpage, or line. The default for *units* is line.
select−adjust ( )	This action extends the selection. The amount of text selected depends on the number of mouse clicks: • 1 click = char • 2 clicks = word • 3 clicks = line • 4 clicks = buffer
select−all ( )	This action selects all text.
select−page ( )	This action selects all text on the screen.
self−insert ( )	This action sends the character associated with the key pressed to the child process.

soft−reset ( )	This action perform a soft reset of the terminal.
stop *(state)*	This action either toggles, starts, or stops the process of reading data from the child process. Valid values for *state* are toggle, on, and off.
string *(string)*	This action inserts the specified text *string* as if it had been typed. The *string* must be quoted if it contains whitespace or non−alphanumeric characters. The *string* is interpreted as a hex character constant if it begins with the characters 0x.
tab ( )	This action sends a tab to the child process.
visual−bell ( )	This action flashes the window quickly.
Virtual Bindings	The bindings for virtual keys are vendor specific. Virtual bindings do not apply when the **dtterm** widget has input focus. For information about bindings for virtual buttons and keys, see VirtualBindings.

Files

/usr/bin/diff Contains the **diff** command.

Related Information

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces you to files and the way you can work with them.

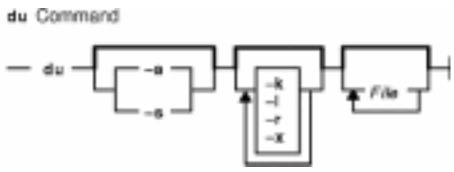
Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

du Command

Purpose

Summarizes disk usage.

Syntax



du [**−a** | **−s**] [**−k**] [**−l**] [**−r**] [**−x**] [*File* ...]

Description

The **du** command displays the number of blocks used for files. If the *File* parameter specified is actually a directory, all files within the directory are reported on. If no *File* parameter is provided, the **du** command uses the files in the current directory.

Specifying the **−a** flag reports the number of blocks in individual files. Whether the **−a** flag is used or not, individual files specified by the *File* parameter are always listed.

Specifying the **−s** flag reports the total blocks for all specified files or all files in a directory.

The block count includes indirect blocks of each file. Block count is calculated in 512−byte units independent of the cluster size used by the system. Specifying the **−k** flag calculates the block count in 1024−byte units.

Notes:

1. Files with multiple links are counted and written for only one entry.
2. Block counts are based only on file size; therefore, unallocated blocks are not accounted for in the reported block counts.

Flags

−a	Displays disk usage for each file specified, or displays the individual disk usage for each file in a directory. Contrast this flag with the **−s** flag.
−k	Calculates the block count in 1024−byte units rather than the default 512−byte units.
−l	Allocates blocks evenly among the links for files with multiple links. By default, a file with two or more links is counted only once.
−r	Reports names of inaccessible files and directories. This is the default.
−s	Displays the total disk usage for all specified files, or displays the total disk usage for all files in a directory. Contrast this flag with the **−a** flag.
−x	When evaluating file sizes, evaluates only those files that reside on the same device as the file or directory specified by the *File* parameter. For example, you may specify a directory that contains files on several devices. In this case, the **−x** flag displays block sizes for all files that reside on the same device as the directory.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Examples

1. To summarize the disk usage of a directory tree and each of its subtrees, enter:
   ```
   du   /home/fran
   ```
   This displays the number of disk blocks in the `/home/fran` directory and each of its subdirectories.

2. To display the disk usage of each file, enter:
   ```
   du     −a     /home/fran
   ```
   This displays the number of disk blocks contained in each file and subdirectory of the `/home/fran` directory. The number beside a directory is the disk usage of that directory tree. The number beside a regular file is the disk usage of that file alone.

3. To display only the total disk usage of a directory tree, enter:
   ```
   du −s     /home/fran
   ```

The **−s** flag instructs the **du** command to display only the sum total disk usage of the `/home/fran` directory and the files it contains. By default, the **du** command displays an error message if it cannot read a file or directory.

Files

/usr/bin/du Contains the **du** command.

Related Information

The **df** command.

The Directory Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* explains working with directories and path names.

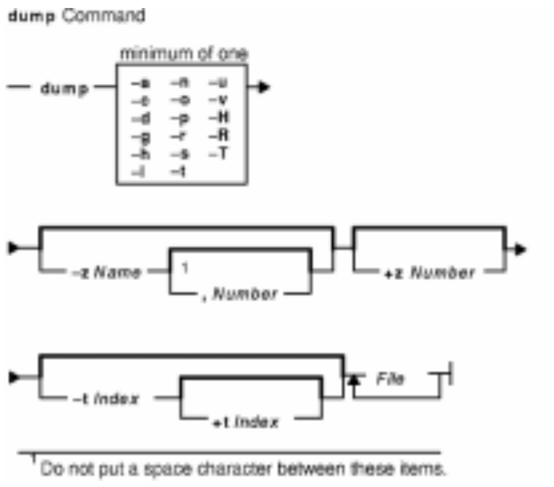
The Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* provides information on working with files.

dump Command

Purpose

Dumps selected parts of an object file.

Syntax



dump { **−a −c−d −g −h −l −n −o −p −r −s −t −u −v −H −R −T** } [**−z***Name* [,*Number*] [**+z***Number*]] [**−t***Index* [**+t***Index*]] [**−X** {**32**|**64**|**32_64**}] *File* ...

> **Note:** Do not put a space between the **−z***Name* flag and the ,*Number* parameter.

Description

The **dump** command dumps selected parts of the specified *File* parameter. The **dump** command accepts object files, archive object files, and executable files.

Flags

−a	Dumps the archive header of each member of each specified archive.
−c	Dumps the string table.
−d	Dumps the raw data for each section.
−g	Dumps the global symbols in the archive symbol table.
−h	Dumps section headers.
−l	Dumps line number information.
−n	Dumps all loader section information.
−o	Dumps each optional header.
−p	Suppresses header printing.
−r	Dumps relocation information.
−s	Dumps the raw data for each selection.
−t	Dumps symbol table entries.
−t*Index*	Dumps only the index symbol table entry specified with the *Index* parameter. Use the **−t** flag with the **+t** flag to specify a range of symbol table entries.

+t*Index*	Dumps the symbol entry in the range that ends with the *Index* parameter. The range starts at the first symbol table entry or at the entry specified by the **−t** flag.
−u	Underlines the name of the *File* parameter.
−v	Dumps the information in symbolic representation rather than numeric. Any flag except the **−o** flag and **−s** flag can be used with the **−v** flag.
−z*Name*[,*Number*]	Dumps line number entries for the *Name* parameter or a range of line number entries that starts at the specified number.
+z*Number*	Dumps all line numbers up to the *Number* parameter.
−H	Dumps the header of the loader section. The **−H** flag applies only to executable files.
−R	Dumps the relocation entries for the leader section. The **−R** flag applies only to executable files.
−T	Dumps the symbol table entries for the loader section. The **−T** flag applies only to executable files.
−X*mode*	Specifies the type of object file **dump** should examine. The *mode* must be one of the following:

32	Processes only 32−bit object files
64	Processes only 64−bit object files
32_64	Processes both 32−bit and 64−bit object files

The default is to process 32−bit object files (ignore 64−bit objects). The *mode* can also be set with the **OBJECT_MODE** environment variable. For example, **OBJECT_MODE=64** causes **dump** to process any 64−bit objects and ignore 32−bit objects. The **−X** flag overrides the **OBJECT_MODE** variable.

Examples

1. To dump the string table of the `a.out` file, enter:

```
dump −c a.out
```

2. To dump the contents of an XCOFF data section to standard output, enter:

```
dump −d a.out
```

3. To dump the object file headers, enter:

```
dump −o a.out
```

4. To dump line number information for the `a.out` file, enter:

```
dump −l a.out
```

5. To dump relocation information for the `a.out` file, enter:

```
dump −r a.out
```

6. To dump the contents of the `a.out` object file text section, enter:

```
dump −s a.out
```

7. To dump symbol table information for the `a.out` object file, enter:

```
dump −t a.out
```

8. To print symbol table entries `20` to `31` without header information, enter:

```
dump −p −t20 +t30 a.out
```

9. To dump the object file headers from only 64−bit objects in lib.a, enter:
```
dump −X64 −o lib.a
```

Related Information

The **ar** command, **size** command.

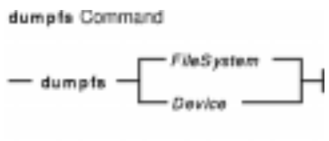
The **a.out** file, **ar** file.

dumpfs Command

Purpose

Dumps file system information.

Syntax



dumpfs { *FileSystem* | *Device* }

Description

The **dumpfs** command prints out the superblock, i−node map, and disk map information for the file system or special device specified. This listing is used to find out file system information. Primarily, the **dumpfs** command is for debugging purposes.

Examples

To print the information for **/dev/hd4**, enter:

```
dumpfs /dev/hd4
```

Related Information

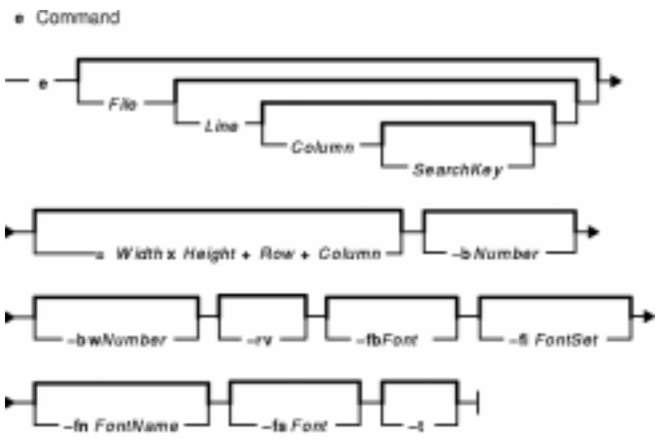
The **fsck** command, **mkfs** command.

e Command

Purpose

Starts the INed editor.

Syntax



e [*File* [*Line* [*Column* [*SearchKey*]]]] [**=***Width***x***Height*+*Row*+*Column*] [**−b***Number*] [**−bw***Number*] [**−fb***Font*] [**−fi***FontSet*] [**−fn***FontName*] [**−fs***Font*] [**−rv**] [**−t**]

Description

The **e** command starts the INed full−screen editor. How the editor starts depends on the parameters you give the **e** command. For example:

e	Starts the editor at the file and cursor position displayed the last time you exited from the editor. If you were using multiple windows, only the file in the last active window is displayed. If the **$HOME/.estate** file does not exist, your current directory is displayed.
e *File*	Starts the editor at the first page of the specified file. If this file does not exist, the editor displays the menu to create it. The *File* parameter can be either a file in the current directory or a complete file path name.

You can enter as many as three additional parameters with the *File* parameter, as follows:

e *FileLine*	Starts the editor at the specified line number (the *Line* parameter) where the cursor is to be positioned. If you do not specify a line number, line 1 is assumed.
e *FileLineColumn*	Starts the editor at the specified line number and the column number (the *Column* parameter) where the cursor is to be positioned.
e *FileLineColumnSearchKey*	Starts the editor at the line and column number where the cursor is to be positioned. A search down is then started to find the next occurrence of the search key (the *SearchKey* parameter). Enter: `File 0 0 SearchKey` to search from the beginning of the file.

If you are using the INed editor with AIXwindows, the window and border sizes and the font can be changed with **e** command flags.

Use the **TERM** environment variable to indicate the terminal type in the terminal description file.

While you can use a **TDESC** shell variable to specify the full path name of an alternative terminal description file to use in place of the default, you must produce that file with the **tdigest** command.

Flags

Use the following flags only when running the INed editor in AIXwindows. You can use any of these flags separately or together to change the INed window characteristics.

=*Width***x***Height*+*Row*+*Column*	Sets the size and placement of the INed window when using AIXwindows. The *Width* and *Height* variables designate the size of the INed window. The *Row* and *Column* variables designate the placement of the window on the screen. For example, `=80x24+0+0` would produce an 80−column by 24−line window in the upper left corner of the display device. The default value of =*Width***x***Height*+*Row*+*Column* is `=80x24+0+0`. **Note:** If the window size (*Width***x***Height*) is entered without values for *Row* and *Column*, the INed window is created with a blinking, broken−line border, and can be positioned with the mouse.
−b *Number*	Sets the distance from the AIXwindows border to the INed characters. The default value of the *Number* variable is 1.
−bw *Number*	Sets the width of the AIXwindows border. The default value of the *Number* variable is 2.
−fb *Font*	Specifies the name of the bold font. This font must be the same height and width as the normal font.
−fi *FontSet*	Specifies the name of the italics font set.
−fn *FontName*	Specifies an AIXwindows font to be used in the INed window.
−fs *Font*	Specifies the name of the special graphics font.
−rv	Displays the INed window in reverse video.
−t	Opens INed in the current window.

Files

/usr/lpp/msg/$LANG/editorprf	Contains the system editor profile.
$HOME/profiles/editorprf	Contains the user's editor profile.
$HOME/.estate	Stores the name of the last file edited and the cursor position.
...*Filexxxxxxxxx*	Contains the temporary dots file for editing the specified file.
*File***.bak**	Contains the previous copy of the specified file.
/usr/bin/e	Contains the editor program.
/usr/lib/INed/terms.bin	Contains the standard terminal description file.

Related Information

The **ghost** command, **history** command, **keymaps** command, **newfile** command, **readfile** command, **rmhist** command, **tdigest** command, **versions** command.

The **TERM** environment variable.

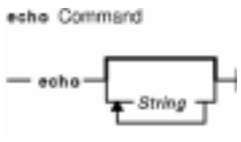
INed Editor Overview in *AIX Version 4.3 INed Editor User's Guide* introduces general concepts about the INed editor.

echo Command

Purpose

Writes character strings to standard output.

Syntax



echo [*String* ...]

Description

The **echo** command writes character strings to standard output. *String*s are separated by spaces, and a new−line character follows the last *String* parameter specified. If no *String* parameter is specified, a blank line (new−line character) is displayed.

Normally you could distinguish between a flag and a string that begins with a hyphen by using a −− (double hyphen). Since no flags are supported with the **echo** command, a −− (double hyphen) is treated literally.

The **echo** command recognizes the following escape conventions:

\a	Displays an alert character.
\b	Displays a backspace character.
\c	Suppresses the new−line character that otherwise follows the final argument in the output. All characters following the **\c** sequence are ignored.
\f	Displays a form−feed character.
\n	Displays a new−line character.
\r	Displays a carriage return character.
\t	Displays a tab character.
\v	Displays a vertical tab character.
\\	Displays a backslash character.
\0*Number*	Displays an 8−bit character whose ASCII value is a 0−, 1−, 2−, or 3−digit octal number.

> **Note:** The **bsh**, **ksh**, and **csh** commands each contain a built−in **echo** subcommand. The **echo** command and the **bsh** and **kshecho** subcommands work the same way. The **csh** **echo** subcommand does not work the same way as the **echo** command. For information on the **echo** subcommands, see "Bourne Shell Built−in Commands,""Regular Built−in Command Descriptons," and "C Shell Built−in Commands" in *AIX Version 4.3 System User's Guide: Operating System and Devices.*

The \ (backslash) is a quote character in the shell. This means that unless the \ is used with an escape character or enclosed in quotes, for example `"\"` or `'\'`, the shell removes the backslashes when the command is expanded.

After shell expansion, the **echo** command writes the output based on the escape sequences in the input. Refer to the Backslash Reduction table for an example comparison of how backslashes in a command are first reduced by the shell and then by the **echo** command:

Backslash Reduction		
Command Entered	**After Shell Expansion**	**After echo Command Processing**
echo hi\\\\there	echo hi\\there	hi\there
echo 'hi\\\\there'	echo 'hi\\\\there'	hi\\there
echo "hi\\\\there'	echo "hi\\there"	hi\there

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

1. To write a message to standard output, enter:

   ```
   echo Please insert diskette . . .
   ```

2. To display a message containing special characters, enter:

   ```
   echo "\n\n\nI'm at lunch.\nI'll be back at 1:00."
   ```

   This skips three lines and displays the message:

   ```
   I'm at lunch.
   I'll be back at 1:00.
   ```

   Note: You must put the message in quotation marks if it contains escape sequences. Otherwise, the shell interprets the \ (backslash) as a metacharacter and treats the \ differently.

3. To use the **echo** command with pattern−matching characters, enter:

   ```
   echo The back−up files are: *.bak
   ```

   This usage displays the message `The back−up files are:` followed by the file names in the current directory ending with `.bak`.

4. To add a single line of text to a file, enter:

   ```
   echo Remember to set the shell search path to $PATH. >>notes
   ```

   This usage adds the message to the end of the file notes after the shell substitutes the value of the **PATH** shell variable.

5. To write a message to the standard error output, enter:

   ```
   echo Error: file already exists. >&2
   ```

This command redirects the error message to standard error. If the `>&2` is omitted, the message is written to standard output.

File

/usr/bin/echo Contains the **echo** command.

Related Information

The **bsh** command, **csh** command, **ksh** command, **printf** command.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output and how to use the redirect and pipe symbols.

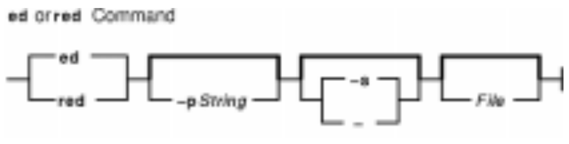
The Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes what shells are, the different types of shells, and how shells affect the way commands are interpreted.

ed or red Command

Purpose

Edits text by line.

Syntax



ed [**−p***String*] [**−s** | **−**] [*File*]

red [**−p***String*] [**−s** | **−**] [*File*]

Description

The **ed** command starts the ed editor line−editing program. The ed editor works on only one file at a time by copying it into a temporary edit buffer and making changes to that copy. The ed editor is part of a family of editors that also includes the edit editor, ex editor, and vi editor. The ed editor makes the changes you specify in a buffer. It does not alter the file itself until you use the write (**w**) subcommand.

You can specify the name of the file you want to edit when you start the ed editor with the **ed** command, or you can use the **e** subcommand. When the **ed** command reads a new file into the buffer, the contents of that file replace the buffer's previous contents.

The **red** command is a restricted version of the **ed** command, for use with the restricted shell (**rsh**). With the **red** command, you edit only files that reside in the current directory or in the **/tmp** directory; you cannot use the **!** subcommand.

An ed editor subcommand consists of zero, one, or two addresses, followed by a single−character subcommand, followed by optional parameters to that subcommand. The addresses specify one or more lines in the buffer. Because every subcommand has default addresses, it is frequently unnecessary to specify addresses.

The ed editor allows editing only the current line unless you address another line in the buffer. You can move and copy only complete lines of data. The ed editor is useful for editing large files or for editing within a shell program.

The ed editor operates in one of two modes:

command mode	In command mode, the ed editor recognizes and runs subcommands. When you start the ed editor, it is in command mode. Type a **.** (period) and press the Enter key to confirm that you are in command mode.
text input mode	In text input mode, the ed editor allows you to enter text into the file buffer but does not recognize subcommands. You enter text input mode by using the **a** subcommand, **c** subcommand, or **i** subcommand. You exit text input mode and return to the command mode by typing a **.** (period) alone at the beginning of a line. To place a **.**(period) into the buffer while in text input mode, enter a character followed by the **.**(period). Then, exit text input mode and use the **s** subcommand to remove the character.

The following list provides the maximum limits of the ed editor.

- 64 characters per file name
- LINE_MAX characters per line (although there is currently a system−imposed limit of 255 characters per line entered from the keyboard)
- 256 characters per global subcommand list
- 128,000 character buffer size

  Note: The buffer contains the original file as well as editing information.

The maximum number of lines depends on the amount of memory available. The maximum file size depends on the amount of physical data storage (disk or tape drive) available or on the maximum number of lines permitted in user memory.

Flags

−p*String*	Sets the editor prompt to the *String* parameter. The default for *String* is a null value (no prompt).
−s	Suppresses character counts that the editor displays with the **e** subcommand, **r** subcommand, and **w** subcommand. This flag also suppresses diagnostic messages for the **e** subcommand and the **q** subcommand, and suppresses the ! (exclamation point) prompt after an **!** subcommand.
−	Provides the same functions as the **−s** flag.

Pattern Matching

The ed editor supports a limited form of special pattern−matching characters that you can use as regular expressions (REs) to construct pattern strings. You can use these patterns in addresses to specify lines and in some subcommands to specify portions of a line.

Regular Expressions

The following REs match a single character or a collating element as follows:

Character Matches itself and can be any ordinary character (other than one of the special pattern−matching symbols).

. Matches any single character except the new−line character.

[*String*] Matches any one character in the string. Certain pattern−matching characters have special meanings within brackets as follows:

- ^ Matches any character except the characters in the *String* parameter and the new−line character if the first character of the *String* parameter is a ^ (circumflex). This condition is true only if the ^ is the first character in the string, [^*String*].
- − Indicates a range of consecutive ASCII characters according to the current collating sequence. For example, [a−f] can be equivalent to [abcdef] or [aAbBcCdDeEfF] or [abcdef] and could even include accented a and e characters. A collating sequence can define equivalence classes for characters.

  The minus sign loses its significance if it occurs as the first character in the string, [−*String*]; if it immediately follows an initial circumflex, [^−*String*]; or if it appears as the last character in the string, [*String*−].
-] Functions as a part of the string rather than as the string terminator, when the] (right bracket) is the first character in the string, []*String*], or when it immediately follows an initial circumflex, [^]*String*].

Forming Patterns

The following rules describe how to form patterns from REs:

- An RE that consists of a single, ordinary character matches that same character in a string.
- An RE followed by an `*` (asterisk) matches zero or more occurrences of the character that the RE matches. For example, the following pattern:

  ```
  ab*cd
  ```

  matches each of the following strings:

  ```
  acd
  abcd
  abbcd
  abbbcd
  ```

  but not the following string:

  ```
  abd
  ```

  If a choice exists, the longest matching leftmost string is chosen. For example, given the following string:

  ```
  122333444
  ```

  the pattern .* matches 122333444, the pattern .*3 matches 122333, and the pattern .*2 matches 122.

- An RE followed by:

`\{`*m*`\}`	Matches *exactlym* occurrences of the character matched by the RE.
`\{`*m*,`\}`	Matches *at least m* occurrences of the character matched by the RE.
`\{`*m*,*n*`\}`	Matches *any number* of occurrences of the character matched by the RE from *m* to *n* inclusive.

  The numbers *m* and *n* must be integers from 0 to 255, inclusive. Whenever a choice exists, this pattern matches as many occurrences as possible.
- You can combine REs into patterns that match strings containing that same sequence of characters. For example, the pattern AB*CD matches the string AB*CD, and the pattern [A−Za−z]*[0−9]* matches any string that contains any combination of alphabetic characters (including none), followed by any combination of numerals (including none).
- The character sequence \(*Pattern*\) marks a subpattern that matches the same string the sequence would match if it were not enclosed.
- The characters *Number* match the same string of characters that a subpattern matched earlier in the pattern (see the preceding rule). The pattern of the *Number* parameter represents a digit. The pattern *Number* matches the string matched by the occurrence of the subpattern specified by the *Number* parameter, counting from left to right.

  For example, the following pattern:

  ```
  \(A\)\(B\)C\2\1
  ```

matches the string ABCBA. You can nest subpatterns.

Restricting What Patterns Match

You can restrict a pattern to match only the first segment of a line, the final segment, or the entire line. The null pattern, `//` (two slashes), duplicates the previous pattern.

Matching the First Segment of a Line

The ^*Pattern* parameter matches only a string that begins in the first character position on a line.

Matching the Last Segment of a Line

The *Pattern*$ parameter matches only a string that ends with the last character (not including the new−line character) on a line.

Matching the Entire Line

The ^*Pattern*$ parameter restricts the pattern to match an entire line.

Addressing Lines

The ed editor uses three types of addresses: line number addresses, addresses relative to the current line, and pattern addresses. The current line (usually the last line affected by a subcommand) is the point of reference in the buffer.

You can use line addressing to do the following:

- Designate a new current line
- Display the addressed line or lines
- Cause a command to act on a certain line or lines

Subcommands that do not accept addresses regard the presence of an address as an error. Subcommands that accept addresses can use either given or default addresses. When given more addresses than it accepts, a command uses the last (rightmost) ones.

In most cases, commas (,) separate addresses (for example `2,8`). Semicolons (;) also can separate addresses. A semicolon between addresses causes the ed editor to set the current line to the first address and then calculate the second address (for example, to set the starting line for a search). In a pair of addresses, the first address must be numerically smaller than the second.

You can use line numbers and symbolic addresses to perform the following tasks:

- Addressing the current line
- Addressing a line by number
- Addressing the line before the first line
- Addressing the last line
- Addressing a line above an addressed line
- Addressing a line below an addressed line
- Addressing the first line through the last line
- Addressing the current line through the last line
- Addressing a group of lines
- Addressing the next line that contains a specified pattern
- Addressing the previous line that contains a specified pattern
- Addressing a marked line

Addressing the Current Line

A **.** (period) addresses the current line. The . (period) is the default for most ed editor subcommands and does not need to be specified.

Addressing a Line by Number

To address a specified line of the buffer, enter:

```
Number$
```

where the *Number* parameter represents a line number. For example:

```
2253$
```

addresses line number 2253 as the current line.

Addressing the Line before the First Line

To address the line before the first line of the buffer, enter:

```
0
```

Addressing the Last Line

To address the last line of the buffer, enter:

```
$
```

Addressing a Line above an Addressed Line

To specify an address that is a specified number of lines above the current line, enter:

```
−Number
```

where the *Number* parameter is the specified number of lines above the current line that you want to address. For example:

```
−5
```

addresses the line five lines above the current line as the current line.

You also can specify only a − to address the line immediately above the current line. The minus sign has a cumulative effect. For example, the address − − (two minus signs) addresses the line two lines above the current line.

Addressing a Line below an Addressed Line

To specify an address that is a specified number of lines below the current line, enter:

```
+Number
```

where the *Number* parameter is the specified number of lines below the current line that you want to address.

The + (plus sign) is optional. For example:

```
+11
```

addresses the line 11 lines below the current line as the current line.

You also can specify only a + to address the line immediately below the current line. The + has a cumulative effect. For example, the address + + (two plus signs) addresses the line two lines below the current line.

Addressing the First Line through the Last Line

To address the first line through the last line, enter:

```
,
```

The , (comma) represents the address pair 1,$ (first line through last line). The first line becomes the current line.

Addressing the Current Line through the Last Line

To address the current line through the last line, enter:

```
;
```

The ; (semicolon) represents the address pair .,$ (current line through last line).

Addressing a Group of Lines

To address a group of lines, enter:

```
FirstAddress,LastAddress
```

where the *FirstAddress* parameter is the line number (or symbolic address) of the first line in the group you want to address, and the *LastAddress* parameter is the line number (or symbolic address) of the last line in the group. The first line in the group becomes the current line. For example:

```
3421,4456
```

addresses the lines 3421 through 4456. Line 3421 becomes the current line.

Addressing the Next Line That Contains a Specified Pattern

To address the next line that contains a matching string, enter:

```
/Pattern/
```

where the *Pattern* parameter is a character string or regular expression. The search begins with the line after the current line and stops when it finds a match for the pattern. If necessary, the search moves to the end of the buffer, wraps around to the beginning of the buffer, and continues until it either finds a match or returns to the current line. For example:

```
/Austin, Texas/
```

addresses the next line that contains Austin, Texas as the current line.

Addressing the Previous Line That Contains a Specified Pattern

To address the previous line that contains a match for the pattern, enter:

```
?Pattern?
```

where the *Pattern* parameter is a character string or regular expression. The `?`*Pattern*`?` construction, like `/`*Pattern*`/`, can search the entire buffer, but it searches in the opposite direction. For example:

```
?Austin, Texas?
```

addresses the previous line that contains Austin, Texas as the current line.

Addressing a Marked Line

To address a marked line with the **k** subcommand, enter:

```
'x
```

where the *x* parameter is a lowercase letter a to z. For example:

```
'c
```

addresses the line marked as c with the **k** subcommand.

Subcommands

Use the ed editor subcommands to perform the following actions:

- Editing a file
- Manipulating files
- Performing miscellaneous functions
    - Changing the prompt string
    - Entering system commands
    - Exiting the ed editor
    - Requesting help

In most cases, you can enter only one ed editor subcommand on a line. However, you can add the **l** (list) and **p** (print) subcommands to any subcommand except the **e** (edit), **E** (Edit), **f** (file), **q** (quit), **Q** (Quit), **r** (read), **w** (write), and **!** (AIX commands) subcommands.

The **e**, **f**, **r**, and **w** subcommands accept file names as parameters. The ed editor stores the last file name used with a subcommand as a default file name. The next **e**, **E**, **f**, **r**, or **w** subcommand given without a file name uses the default file name.

The ed editor responds to an error condition with one of two messages: `?` (question mark) or `?File`. When the ed editor receives an Interrupt signal (the Ctrl−C key sequence), it displays a `?` and returns to command mode. When the ed editor reads a file, it discards ASCII null characters and all characters after the last new−line character.

Editing a File

You can use the ed editor subcommands to perform the following tasks:

- Adding text
- Changing text
- Copying text
- Deleting text
- Displaying text
- Joining and splitting lines
- Making global changes
- Marking text
- Moving text
- Saving text
- Searching text
- Substituting text
- Undoing text changes

Note: In the following descriptions of ed editor subcommands, default addresses are shown in parentheses. Do not type the parentheses. The address . (period) refers to the current line. A . (period) in the first position of an otherwise empty line is the signal to return to command mode.

Adding Text

(.)**a** [**l**] [**n**] [**p**]
Text
.

The **a** (append) subcommand adds text to the buffer *after* the addressed line. The **a** subcommand sets the current line to the last inserted line, or, if no lines were inserted, to the addressed line. A 0 address adds text to the beginning of the buffer.

Type the **l** (list), **n** (number), or **p** (print) optional subcommand if you want to display the added text.

Type your text, pressing the Enter key at the end of each line. If you do not press the Enter key at the end of each line, the ed editor automatically moves your cursor to the next line after you fill a line with characters. The ed editor treats everything you type before you press the Enter key as one line, regardless of how many lines it takes up on the screen.

Type a . (period) at the start of a new line, after you have typed all of your text.

(.)**i** [**l**] [**n**] [**p**]
Text
.

The **i** (insert) subcommand inserts text *before* the addressed line and sets the current line to the last inserted line. If no lines are inserted, the **i** subcommand sets the current line to the addressed line. You cannot use a 0 address for this subcommand.

Type the **l** (list), **n** (number), or **p** (print) optional subcommand if you want to display the inserted text.

Type your text, pressing the Enter key at the end of each line. If you do not press the Enter key at the end of each line, the ed editor automatically moves your cursor to the next line after you fill a line with characters. The ed editor treats everything you type before you press the Enter key as one line, regardless of how many lines it takes up on the screen.

Type a . (period) at the start of a new line, after you have typed all of your text.

Note: The **i** subcommand differs from the **a** subcommand only in the placement of the text.

You can use different ed editor subcommands to add text in different locations. Use the preceding format to perform the following editing tasks:

- Adding text after the current line
- Adding text before the current line
- Adding text after an addressed line
- Adding text before an addressed line
- Adding text after lines that contain a search pattern
- Adding text before lines that contain a search pattern
- Adding text after lines that do not contain a search pattern
- Adding text before lines that do not contain a search pattern

To Add Text after the Current Line

1. Enter the following subcommand:

   ```
   a[l][n][p]
   ```

   where **l**, **n**, and **p** are optional subcommands that display the added text.
2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Add Text before the Current Line

1. Enter the following subcommand:

   ```
   i[l][n][p]
   ```

   where **l**, **n**, and **p** are optional subcommands that display the added text.
2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Add Text after an Addressed Line

1. Enter the following subcommand:

   ```
   Addressa[l][n][p]
   ```

   where the *Address* parameter is the line number of the line that the inserted text should follow. The **l**, **n**, and **p** optional subcommands display the added text.
2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Add Text before an Addressed Line

1. Enter the following subcommand:

   ```
   Addressi[l][n][p]
   ```

   where the *Address* parameter is the line number of the line that the inserted text should precede. The **l**, **n**, and **p** optional subcommands display the added text.

2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Add Text after Lines That Contain a Search Pattern

1. Enter the following subcommand:
   ```
   [Address]g/Pattern/a[l][n][p]
   ```
   where *Address* is an optional parameter that specifies the range of lines to search for the pattern specified in the *Pattern* parameter. The *Pattern* parameter is a character string or regular expression. If you omit the *Address* parameter, the ed editor searches the entire file for lines that contain the pattern. The **l**, **n**, and **p** optional subcommands display the added text.
2. Type a backslash:
   ```
   \
   ```
3. Type the text. To start new lines within the added text, type a backslash:
   ```
   \
   ```
   and press the Enter key. The text you type is added after every line that contains the pattern specified in the command.
4. To return to command mode, press the Enter key.

To Add Text before Lines That Contain a Search Pattern

1. Enter the following subcommand:
   ```
   [Address]g/Pattern/i[l][n][p]
   ```
   where *Address* is an optional parameter that specifies the range of lines to search for the pattern specified in the *Pattern* parameter. The *Pattern* parameter is a character string or regular expression. If you omit the *Address* parameter, the ed editor searches the entire file for lines that contain the pattern. The **l**, **n**, and **p** optional subcommands display the added text.
2. Type a backslash:
   ```
   \
   ```
3. Type the text. To start new lines within the added text, type a backslash:
   ```
   \
   ```
   and press the Enter key. The text you type is added before every line that contains the pattern specified in the command.
4. To return to command mode, press the Enter key.

To Add Text after Lines That Do Not Contain a Search Pattern

1. Enter the following subcommand:
   ```
   [Address]g/Pattern/a[l][n][p]
   ```
   where *Address* is an optional parameter that specifies the range of lines to search for lines that do not contain the pattern specified in the *Pattern* parameter. The *Pattern* parameter is a character string or regular expression. If you omit the *Address*, the ed editor searches the entire file for lines that do not contain the pattern. The **l**, **n**, and **p** optional subcommands display the added text.

2. Type a backslash:

   ```
   \
   ```

3. Type the text. To start new lines within the added text, type a backslash:

   ```
   \
   ```

   and press the Enter key. The text you type is added after every line that does not contain the pattern specified in the command.

4. To return to command mode, press the Enter key.

To Add Text before Lines That Do Not Contain a Search Pattern

1. Enter the following subcommand:

   ```
   [Address]g/Pattern/i[l][n][p]
   ```

   where *Address* is an optional parameter that specifies the range of lines to search for lines that do not contain the pattern specified in the *Pattern* parameter. The *Pattern* parameter is a character string or regular expression. If you omit the *Address* parameter, the ed editor searches the entire file for lines that do not contain the pattern. The **l**, **n**, and **p** optional subcommands display the added text.

2. Type a backslash:

   ```
   \
   ```

3. Type the text. To start new lines within the added text, type a backslash:

   ```
   \
   ```

   and press the Enter key. The text you type is added before every line that does not contain the pattern specified in the command.

4. To return to command mode, press the Enter key.

Changing Text

(.,.)**c** [**l**] [**n**] [**p**]
Text

.	The **c** (change) subcommand deletes the addressed lines you want to replace and then replaces them with the new lines you enter. The **c** subcommand sets the current line to the last new line of input, or, if no input existed, to the first line that was not deleted. Type the **l** (list), **n** (number), or **p** (print) optional subcommand if you want to display the inserted text. Type the new text, pressing the Enter key at the end of each line. When you have entered all of the new text, type a . (period) on a line by itself.

You can change text in several different ways with the ed editor. Use the preceding format to perform the following editing tasks:

- Changing the text of the current line
- Changing the text of a line or group of lines
- Changing text of lines that contain a specified pattern
- Changing text of lines that do not contain a specified pattern

To Change the Text of the Current LIne

1. Enter the following subcommand:

   ```
   c[l][n][p]
   ```

   where **l**, **n**, and **p** are optional subcommands that display the changed text.

2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Change the Text of a Line or Group of Lines

1. Enter the following subcommand:

   ```
   Addressc[l][n][p]
   ```

   where the *Address* parameter is the address of the line or group of lines to change. The **l**, **n**, and **p** optional subcommands display the changed text.

2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Change the Text of Lines That Contain a Specified Pattern

1. Enter the following subcommand:

   ```
   Addressg/Pattern/c[l][n][p]
   ```

   where the *Address* parameter is the address of the group of lines that you want to search for the pattern specified with the *Pattern* parameter. The **l**, **n**, and **p** optional subcommands display the changed text.

2. Type a backslash:

   ```
   \
   ```

3. Type the new text. To start new lines within the new text, type a backslash:

   ```
   \
   ```

   and press the Enter key.

4. To return to command mode, press the Enter key again, type a . (period), and press the Enter key again.

To Change the Text of Lines That Do Not Contain a Specified Pattern

1. Enter the following subcommand:

   ```
   Addressv/Pattern/c[l][n][p]
   ```

   where the *Address* parameter is the address of the group of lines that you want to search for the pattern specified with the *Pattern* parameter. The **l**, **n**, and **p** optional subcommands display the changed text.

2. Type a backslash:

   ```
   \
   ```

3. Type the new text. To start new lines within the new text, type a backslash:

```
\
```

and press the Enter key.

4. To return to command mode, press the Enter key again, type a . (period), and press the Enter key again.

Copying Text

(.,.)**t***Address* [**p**] [**l**] [**n**]	The **t** (transfer) subcommand inserts a copy of the addressed lines after the line specified by the *Address* parameter. The **t** subcommand accepts the 0 address to insert lines at the beginning of the buffer. The **t** subcommand sets the current line to the last line copied. Type the **l** (list), **n** (number), or **p** (print) optional subcommand if you want to display the transferred text.

Copying a line or a set of lines leaves the specified lines in their original location and puts a copy in the new location. You can select the lines to copy by specifying an address or pattern. Use the preceding format to perform the following editing tasks:

- Copying the current line
- Copying lines specified by address
- Copying lines that contain a specified pattern
- Copying lines that do not contain a specified pattern

To Copy the Current Line

1. Enter the following subcommand:

   ```
   tAddress[l][n][p]
   ```

   where the *Address* parameter is the line number or symbolic address of the line you want a copy of the current line to follow. The **l**, **n**, and **p** optional subcommands display the copied line.

2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Copy Lines Specified by Address

1. Enter the following subcommand:

   ```
   LineNumbertDestinationAddress[l][n][p]
   ```

   where the *LineNumber* parameter is the address of the lines you want to copy, and the *DestinationAddress* parameter is the line you want the copy to follow. The **l**, **n**, and **p** optional subcommands display the copied line.

2. Type the text, and press the Enter key.
3. Type a **.** (period), and press the Enter key again to return to command mode.

To Copy Lines That Contain a Specified Pattern

Enter the following subcommand:

```
[Address]g/Pattern/t[DestinationAddress][l][n][p]
```

where *Address* is an optional parameter that specifies the range of lines to search for lines that contain the specified pattern, the *Pattern* parameter is the text you are searching for, and the *DestinationAddress* is an optional parameter that identifies the line you want the copied text to follow. The **l**, **n**, and **p** optional subcommands display the copied line.

If you omit the *Address* parameter, the ed editor searches the entire file for lines that contain the pattern. If you omit the *DestinationAddress* parameter, the copied text is placed after the current line.

To Copy Lines That Do Not Contain a Specified Pattern

Type the following subcommand:

```
[Address]v/Pattern/t[DestinationAddress][l][n][p]
```

where *Address* is an optional parameter that specifies the range of lines to search for lines that do not contain the specified pattern, the *Pattern* parameter is the text, and the *DestinationAddress* is an optional parameter that identifies the line you want the copied text to follow. The **l**, **n**, and **p** optional subcommands display the copied line.

If you omit the *Address* parameter, the ed editor searches the entire file for lines that do not contain the pattern. If you omit the *DestinationAddress* parameter, the copied text is placed after the current line.

Deleting Text

(.,.)**d** [**l**] [**n**] [**p**]	The **d** (delete) subcommand removes the addressed lines from the buffer. The line after the last line deleted becomes the current line. If the deleted lines were originally at the end of the buffer, the new last line becomes the current line. Type the **l** (list), **n** (number), or **p** (print) optional subcommand if you want to display the deletion.

The ed editor provides several ways to delete text. Use the preceding format to perform the following editing tasks:

- Deleting the current line
- Deleting a line or group of lines
- Deleting a line or group of lines that contain a specified pattern
- Deleting a line or group of lines that does not contain a specified pattern
- Deleting text from the current line
- Deleting text within selected lines
- Deleting text from addressed lines
- Deleting text from lines that contain a specified pattern
- Deleting a pattern from lines that contain a different specified pattern
- Deleting a pattern from lines that do not contain a different specified pattern

To Delete the Current Line

Enter the following subcommand:

```
d[l][n][p]
```

where **l**, **n**, and **p** are optional subcommands that display the deleted line.

To Delete a Line or Group of Lines

Enter the following subcommand:

```
Addressd[l][n][p]
```

where the *Address* parameter is the line number or symbolic address of the lines you want to delete, and **l**, **n**, and **p** are optional subcommands that display the deleted line or lines.

To Delete a Line or Group of Lines That Contain a Specified Pattern

Enter the following subcommand:

```
[Address]g/Pattern/d[l][n][p]
```

where *Address* is an optional parameter that specifies the line number or symbolic address of the lines you want to search, and the *Pattern* parameter is a character string or regular expression that represents the text you want to find. If you omit the *Address* parameter, the ed editor searches the entire file for lines that contain the specified pattern. The **l**, **n**, and **p** optional subcommands display the deleted line or lines.

To Delete a Line or Group of Lines That Does Not Contain a Specified Pattern

Type the following subcommand:

```
[Address]v/Pattern/d[l][n][p]
```

where *Address* is an optional parameter that specifies the line number or symbolic address of the lines you want to search, and the *Pattern* parameter is a character string or regular expression that represents the text you want to find. If you omit the *Address* parameter, the ed editor searches the entire file for lines that do not contain the specified pattern. The **l**, **n**, and **p** optional subcommands display the deleted line or lines.

To Delete Text from the Current Line

1. Type the following subcommand:

   ```
   s/Pattern
   ```

   where the *Pattern* parameter is a character string or regular expression that represents the text you want to delete.

2. To delete the *first instance* of the pattern from the line, type:

   ```
   //
   ```

   OR

   To delete *every instance* of the pattern from the line, type:

   ```
   //g
   ```

3. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```

4. Press the Enter key.

To Delete Text within Selected Lines

1. Type the address of a group of lines to select (or skip this step to select all lines).
2. To select the lines indicated by the *Pattern* parameter in step 4, type:

   ```
   g
   ```

   OR

   To select the lines *not* indicated by the *Pattern* parameter in step 4, type:

   ```
   v
   ```
3. To enter the text you want to search, type the following subcommand:

   ```
   /Pattern/s
   ```

   where the *Pattern* parameter is the text you want to search.
4. Type one of the following commands to make the desired deletion:

   To delete the first instance of the *Pattern* parameter within each selected line, type:

   ```
   ///
   ```

   To delete every instance of the *Pattern* parameter within each selected line, type:

   ```
   ///g
   ```

   To delete the first specified number of occurrences of the *Pattern* parameter on each selected line (where the *Number* parameter is an integer), type:

   ```
   ///Number
   ```

   To delete the first character string indicated by the *OtherPattern* parameter within each line selected by the *Pattern* parameter (where the *OtherPattern* parameter is the pattern you want to search), type:

   ```
   /OtherPattern//
   ```

   To delete every instance of the *OtherPattern* parameter within each line selected by the *Pattern* parameter, type:

   ```
   /OtherPattern//g
   ```

   To delete the first specified number of occurrences of the *OtherPattern* parameter on each line selected by the *Pattern* parameter (where the *Number* parameter is an integer), type:

   ```
   /OtherPattern//Number
   ```
5. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

```
n
```

```
p
```

6. Press the Enter key.

For example, to delete all instances of a pattern from *a range of lines*, type:

```
38,$g/tmp/s/gn
```

The previous example searches all the lines from line 38 to the last line (`38,$`) for the `tmp` character string and deletes every instance (`/g`) of that character string within those lines. It then displays the lines that had text deleted from them and their line numbers (`n`).

To delete all instances of a pattern from *all lines* that contain that pattern, type:

```
g/rem/s///gl
```

The previous example searches the entire file (address parameter is omitted) for all lines that contain (`g`) the `rem` character string. It deletes all instances (`///g`) of the `rem` character string from each of those lines and then displays the lines that had text deleted from them, including the nonprinting characters in those lines (`l`).

To Delete Text from Addressed Lines

1. Type the following subcommand:

   Note: The *Address* parameter is followed by the **s** subcommand.

   ```
   Addresss/Pattern
   ```

   where the *Address* parameter is the line number, range of line numbers, or symbolic address of the lines you want to delete the pattern from, and the *Pattern* parameter is a character string or regular expression that represents the text you want to delete.

2. To delete the *first instance* of the pattern from each line, type:

   ```
   //
   ```

   OR

   To delete *every instance* of the pattern from each line, type:

   ```
   //g
   ```

3. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```

4. Press the Enter key.

To Delete Text from Lines That Contain a Specified Pattern

1. Type the following subcommand:

   ```
   [Address]g/Pattern/s
   ```

where *Address* is an optional parameter that specifies the line number, range of line numbers, or symbolic address of the lines that contains a specified pattern, and the *Pattern* parameter is a character string or regular expression that represents the text you want to find and delete. If you omit the *Address* parameter, the ed editor searches all lines in the file for the pattern.

2. To delete the *first instance* of the pattern from each line that contains it, type:

   ```
   ///
   ```

   OR

   To delete *every instance* of the pattern from each line that contains it, type:

   ```
   ///g
   ```
3. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```
4. Press the Enter key.

To Delete a Pattern from Lines That Contain a Different Specified Pattern

1. Type the following subcommand:

   ```
   [Address]g/SearchPattern/s
   ```

   where *Address* is an optional parameter that specifies the line number, range of line numbers, or symbolic address of the lines that contains a specified pattern, and the *SearchPattern* parameter is a character string or regular expression that represents text that is in the lines you want to change. If you omit the *Address* parameter, the ed editor searches all lines in the file for the specified pattern.
2. To specify the text you want to delete, type:

   ```
   /DeletePattern/
   ```
3. To delete the *first instance* of the pattern from each line, type:

   ```
   /
   ```

   OR

   To delete *every instance* of the pattern from each line, type:

   ```
   /g
   ```

   Note: The entire subcommand string looks like this:

   ```
   [Address]g/SearchPattern/s/DeletePattern//[g]
   ```
4. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

```
p
```

5. Press the Enter key.

For example, to delete the first instance of a pattern from lines that contain a different specified pattern, type:

```
1,.g/rem/s/tmp//l
```

The previous example searches from the first line to the current line (`1,.`) for all lines that contain (`g`) the `rem` character string. It deletes the first instance of the `tmp` character string from each of those lines (`/`), then displays the lines that had text deleted from them, including the nonprinting characters in those lines (`l`).

To Delete a Pattern from Lines That Do Not Contain a Different Specified Pattern

1. Type the following subcommand:

   ```
   [Address]v/SearchPattern/s
   ```

   where *Address* is an optional parameter that specifies the line number, range of line numbers, or symbolic address of the lines that contains a specified pattern, and the *SearchPattern* parameter is a character string or regular expression that represents text that is not in the lines you want to find and change. If you omit the *Address* parameter, the ed editor searches all lines in the file for the specified pattern.
2. To specify the text you want to delete, type:

   ```
   /DeletePattern/
   ```
3. To delete the *first instance* of the pattern, type:

   ```
   /
   ```

   OR

   To delete *every instance* of the pattern from each line, type:

   ```
   /g
   ```

   Note: The entire subcommand string looks like this:

   ```
   [Address]v/SearchPattern/s/DeletePattern//[g]
   ```
4. If you want to display the deletion, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```
5. Press the Enter key.

For example, to delete the first instance of a pattern from lines that do not contain a specified pattern, type:

```
1,.v/rem/s/tmp//l
```

The previous example searches from the first line to the current line (`1,.`) for all lines that do not contain (`v`) the `rem` character string. It deletes the first instance of the `tmp` character string from each of those lines (`/`), then displays the lines that had text deleted from them, including the nonprinting characters in those lines (`l`).

Displaying Text

(.,.)**l**	The **l** (list) subcommand writes the addressed lines to standard output in a visually unambiguous form and writes the characters `\\\`, `\\a`, `\\b`, `\\f`, `\\r`, `\\t`, and `\\v` in the corresponding escape sequence. The **l**subcommand writes nonprintable characters as one 3−digit octal number, with a preceding \ (backslash) for each byte in the character (most significant byte first). The **l** subcommand wraps long lines, and you can indicate the wrap point by writing the \ (backslash)/new−line character sequence. Wrapping occurs at the 72nd column position. The $ (dollar sign) marks the end of each line. You can append the **l** subcommand to any ed editor subcommand except the **e**, **E**, **f**, **q**, **Q**, **r**, **w**, or **!** subcommand. The current line number is set to the address of the last line written.
(.,.)**n**	The **n** (number) subcommand displays the addressed lines, each preceded by its line number and a tab character (displayed as blank spaces); **n** sets the current line to the last line displayed. You can append the **n** subcommand to any ed editor subcommand except **e**, **f**, **r**, or **w**. For example, the **dn** subcommand deletes the current line and displays the new current line and line number.
(.,.)**p**	The **p** (print) subcommand displays the addressed lines and sets the current line to the last line displayed. You can append the **p** subcommand to any ed editor subcommand except **e**, **f**, **r**, or **w**. For example, the **dp** subcommand deletes the current line and displays the new current line.
(.)=	Without an address, the = (equal sign) subcommand displays the current line number. When preceded by the $ address, the = subcommand displays the number of the last line in the buffer. The = subcommand does not change the current line and cannot be appended to a **g** subcommand or **v** subcommand.

When you search for lines that contain or do not contain a specified pattern, you can select a range of line numbers to search. You can select and display one line or a group of lines in an ed editor file several different ways. Use the preceding format to perform the following editing tasks:

- Displaying an addressed line or group of lines
- Displaying an addressed line or group of lines and their nonprinting characters
- Displaying an addressed line or group of lines and their line numbers
- Displaying lines that contain a search pattern
- Displaying lines that contain a search pattern, including their nonprinting characters
- Displaying lines that contain a search pattern, including their line numbers
- Displaying lines that do not contain a search pattern
- Displaying lines that do not contain a search pattern, including their nonprinting characters
- Displaying lines that do not contain a search pattern, including their line numbers

To Display an Addressed Line or Group of Lines

Enter the following subcommand:

```
Addressp
```

where the *Address* parameter is the line number or symbolic address of the lines you want to display.

The line or lines addressed are displayed on the screen. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display an Addressed Line or Group of Lines and Their Nonprinting Characters

Enter the following subcommand:

```
Addressl
```

where the *Address* parameter is the line number or symbolic address of the lines you want to display.

The line or lines addressed and their nonprinting characters are displayed on the screen. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display an Addressed Line or Group of Lines and Their Line Numbers

Enter the following subcommand:

```
Addressn
```

where the *Address* parameter is the line number or symbolic address of the lines you want to display.

The line or lines addressed are displayed on the screen. The line number for each line is displayed beside the line. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Contain a Search Pattern

Enter the following subcommand:

```
Addressg/Pattern/p
```

where the *Address* parameter is the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search.

The line or lines that contain the specified pattern are displayed on the screen. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Contain a Search Pattern, Including Their Nonprinting Characters

Enter the following subcommand:

```
[Address]g/Pattern/l
```

where *Address* is an optional parameter that specifies the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search. If you omit the *Address* parameter, the ed editor searches the entire file.

The line or lines that contain the specified pattern are displayed on the screen. Nonprinting characters show up in the display. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Contain a Search Pattern, Including Their Line Numbers

Enter the following subcommand:

```
[Address]g/Pattern/n
```

where *Address* is an optional parameter that specifies the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search. If you omit the *Address* parameter, the ed editor searches the entire file.

The line or lines that contain the specified pattern are displayed on the screen. The line number for each line is displayed beside the line. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Do Not Contain a Search Pattern

Enter the following subcommand:

```
[Address]v/Pattern/p
```

where *Address* is an optional parameter that specifies the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search. If you omit the *Address* parameter, the ed editor searches the entire file.

The line or lines that do not contain the specified pattern are displayed on the screen. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Do Not Contain a Search Pattern, Including Their Nonprinting Characters

Enter the following subcommand:

```
[Address]v/Pattern/l
```

where *Address* is an optional parameter that specifies the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search. If you omit the *Address* parameter, the ed editor searches the entire file.

The line or lines that do not contain the specified pattern are displayed on the screen, including the nonprinting characters. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

To Display Lines That Do Not Contain a Search Pattern, Including Their Line Numbers

Enter the following subcommand:

```
[Address]v/Pattern/n
```

where *Address* is an optional parameter that specifies the range of lines and the *Pattern* parameter is the character string or regular expression that you want to search. If you omit the *Address* parameter, the ed editor searches the entire file.

The line or lines that do not contain the specified pattern are displayed on the screen, along with their line numbers. If the group of lines is too long to fit on the screen, the ed editor displays as many as will fit, beginning with the first line addressed.

Joining and Splitting Lines

(.,.+1)**j** [**l**] [**n**] [**p**]	The **j** (join) subcommand joins contiguous lines by removing the intervening new−line characters. If given only one address, the **j** subcommand does nothing.

Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the joined lines. These subcommands are optional.

The ed editor provides several ways to join or split a line. Use the preceding format to perform the following editing tasks:

- Joining the current and next lines
- Joining addressed lines
- Splitting the current line
- Splitting an addressed line

To Join the Current and Next Lines

Enter the following subcommand:

```
j[l][n][p]
```

where **l**, **n**, and **p** are optional subcommands that display the joined lines.

To Join Addressed Lines

Enter the following subcommand:

```
Addressj[l][n][p]
```

where the *Address* parameter is a set of contiguous lines that will form one line, and **l**, **n**, and **p** are optional subcommands that display the joined lines.

To Split the Current Line

1. To split the current line after a specified pattern, type the following subcommand:

   ```
   s/Pattern/Pattern\
   ```

   where the *Pattern* parameter is the character string that you want to split the line after.

   > **Note:** Make sure that both strings represented by the *Pattern* parameter are exactly alike.

2. Press the Enter key.
3. Type the following backslash:

   ```
   /
   ```

4. To display the split line, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```

5. Press the Enter key.

To Split an Addressed Line

1. To split an addressed line after a specified pattern, type the following subcommand:

```
Addresss/Pattern/Pattern\
```

where the *Address* parameter is the address of the line to split, and the *Pattern* parameter is the character string to split the line after.

> **Note:** Make sure that both strings represented by the *Pattern* parameter are exactly alike.

2. Press the Enter key.
3. Type the following backslash:

   ```
   /
   ```

4. To display the split line, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```

5. Press the Enter key.

Making Global Changes

(1,$)**g**/*Pattern*/*SubcommandList* [**l**] [**n**] [**p**]	The **g** (global) subcommand first marks every line that matches the *Pattern* parameter. The pattern can be a fixed character string or a regular expression. Then, for each marked line, this subcommand sets the current line to the marked line and runs the *SubcommandList* parameter. Enter a single subcommand or the first subcommand of a list of subcommands on the same line with the **g** subcommand; enter subsequent subcommands on separate lines. Except for the last line, each of the lines should end with a \ (backslash). The *SubcommandList* parameter can include the **a**, **i**, and **c** subcommands and their input. If the last command in the *SubcommandList* parameter would normally be the **.** (period) that ends input mode, the **.** (period) is optional. If no *SubcommandList* parameter exists, the current line is displayed. The *SubcommandList* parameter cannot include the **g** , **G**, **v**, or **V** subcommand. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the changes. These subcommands are optional. **Note:** The **g** subcommand is similar to the **v** subcommand, which runs the *SubcommandList* parameter for every line that does not contain a match for the pattern.
(1,$)**G**/*Pattern*/ [**l**] [**n**] [**p**]	The interactive **G** (Global) subcommand marks every line that matches the *Pattern* parameter, displays the first marked line, sets the current line to that line, and then waits for a subcommand. A pattern can be a fixed character string or a regular expression. The **G** subcommand does not accept the **a**, **i**, **c**, **g**, **G**, **v**, and

	V subcommands. After the subcommand finishes, the **G** subcommand displays the next marked line, and so on. The **G** subcommand takes a new−line character as a null subcommand. A :& (colon ampersand) causes the **G** subcommand to run the previous subcommand again. You can stop the **G** subcommand by typing the Ctrl−C key sequence. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the changes. These subcommands are optional.
(1,$)**v**/*Pattern*/*SubcommandList* [**l**] [**n**] [**p**]	The **v** subcommand runs the subcommands in the *SubcommandList* parameter for each line that does not contain a match for the *Pattern* parameter. A pattern can be a fixed character string or a regular expression. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the changes. These subcommands are optional. The **v** subcommand does not accept the **a**, **i**, **c**, **g**, **G**, and **V** subcommands. **Note:** The **v** subcommand complements the **g** subcommand, which runs the *SubcommandList* parameter for every line that contains a match for the pattern.
(1,$)**V**/*Pattern*/ [**l**] [**n**] [**p**]	The **V** subcommand marks every line that does not match the *Pattern* parameter, displays the first marked line, sets the current line to that line, and then waits for a subcommand. A pattern can be a fixed character string or a regular expression. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the changes. These subcommands are optional. The **V** subcommand does not accept the **a**, **i**, **c**, **g**, **G**, and **v** subcommands. **Note:** The **V** subcommand complements the **G** subcommand, which marks the lines that match the pattern.

Marking Text

(.)**k***x* [**l**] [**n**] [**p**]	The **k** (mark) subcommand marks the addressed line with the name specified by the *x* parameter, which must be a lowercase ASCII letter. The address '*x* (single quotation mark before the marking character) then addresses this line. The **k** subcommand does not change the current line. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the marked text. These subcommands are optional.

To Mark the Current Line

Enter the following subcommand:

```
kLetter[l][n][p]
```

where the *Letter* parameter is the letter a through z for a mark, and **l**, **n**, and **p** are optional subcommands that display the marked text.

To Mark an Addressed Line

Enter the following subcommand:

```
AddresskLetter[l][n][p]
```

where the *Address* parameter is the line number or symbolic address of the line you want to mark, and the *Letter* parameter is the letter a through z for a mark. The **l**, **n**, and **p** optional subcommands display the marked text.

Moving Text

(.,.)**m***A* [**l**] [**n**] [**p**]	The **m** (move) subcommand repositions the addressed line or lines. The first moved line follows the line addressed by the *A* parameter. A parameter of 0 moves the addressed line or lines to the beginning of the file. The address specified by the *A* parameter cannot be one of the lines to be moved. The **m** subcommand sets the current line to the last moved line. Type the **l** (list), **n** (number), or **p** (print) subcommands if you want to display the deletion. These subcommands are optional.

Moving a line or a set of lines deletes the specified lines from their original location and places them in a new location. You can select which lines to move by address or pattern. Use the preceding format to perform the following editing tasks:

- Moving the current line
- Moving lines specified by address
- Moving lines that contain a specified pattern
- Moving lines that do not contain a specified pattern

To Move the Current Line

Enter the following subcommand:

```
mAddress[l][n][p]
```

where the *Address* parameter is the line number or symbolic address of the line you want the current line to follow, and **l**, **n**, and **p** are optional subcommands that display the moved line.

To Move Lines Specified by Address

Enter the following subcommand:

```
LineNumbermDestinationAddress[l][n][p]
```

where the *LineNumber* parameter is the address of the lines you want to move, and the

DestinationAddress parameter is the line you want the moved lines to follow. The **l**, **n**, and **p** optional subcommands display the moved lines.

To Move Lines That Contain a Specified Pattern

Enter the following subcommand:

```
[Address]g/Pattern/m[DestinationAddress][l][n][p]
```

where *Address* is an optional parameter that specifies the range of lines to search for lines that contain the specified pattern, the *Pattern* parameter is the text you are searching for, and *DestinationAddress* is an optional parameter that represents the line you want the moved lines to follow. The **l**, **n**, and **p** optional subcommands display the moved lines.

If you omit the *Address* parameter, the ed editor searches the entire file for lines that contain the pattern. If you omit the *DestinationAddress* parameter, the moved text is placed after the current line.

To Move Lines That Do Not Contain a Specified Pattern

Enter the following subcommand:

```
[Address]v/Pattern/m[DestinationAddress][l][n][p]
```

where *Address* is an optional parameter that specifies the range of lines to search for lines that do not contain the specified pattern, the *Pattern* parameter is the text, and *DestinationAddress* is an optional parameter that represents the line you want the moved text to follow. The **l**, **n**, and **p** optional subcommands display the moved lines.

If you omit the *Address* parameter, the ed editor searches the entire file for lines that do not contain the pattern. If you omit the *DestinationAddress* parameter, the moved text is placed after the current line.

Saving Text

(1,$)**w***File* The **w** (write) subcommand copies the addressed lines from the buffer to the file specified by the *File* parameter. If the file does not exist, the **w** subcommand creates it with permission code 666 (read and write permission for everyone), unless the **umask** setting specifies another file creation mode.

The **w** subcommand does not change the default file name (unless the *File* parameter is the first file name used since you started the ed editor). If you do not provide a file name, the **w** subcommand uses the default file name. The **w** subcommand does not change the current line.

If the ed editor successfully writes the file from the buffer, it displays the number of characters written. If you specify the **!***Command* subcommand instead of a file name, the **w** subcommand reads the output of the AIX command specified by the *Command* parameter. The **w** subcommand does not save the name of the AIX command you specified as a default file name.

Note: Because 0 is not a legal address for the **w** subcommand, you cannot create an empty file with the **ed** command.

You can save changes to a file in several ways. Use the preceding format to perform the following actions:

- Saving a file to the current file
- Saving part of a file to the current file
- Saving a file to a different file

- Saving part of a file to a different file

To Save a File to the Current File

Enter the following subcommand:

```
w
```

The current file is saved under its current name, and the ed editor displays the number of characters written.

To Save Part of a File to the Current File

Enter the following subcommand:

```
Addressw
```

where the *Address* parameter specifies the line or group of lines to write. The ed editor displays the number of characters written.

To Save a File to a Different File

Enter the following subcommand:

```
w File
```

where the *File* parameter is the name of the file to write to.

The current file is saved to the file specified by the *File* parameter. The ed editor displays the number of characters written.

To Save Part of a File to a Different File

Enter the following subcommand:

```
Addressw File
```

where the *Address* parameter specifies the line or group of lines to write and the *File* parameter specifies the file to write to.

The specified lines are saved to the file specified by the *File* parameter. The ed editor displays the number of characters written.

Searching Text

You can search forward or backward from the current line for a pattern of text. The pattern can be a character string or a regular expression made up of literal characters and the special characters ^ (circumflex), $ (dollar sign), . (period), [(left bracket),] (right bracket), * (asterisk), \ (reverse slash), & (ampersand), and % (percent sign).

You can use the ed editor to perform the following text searches:

- Searching forward
- Searching backward
- Repeating a search in the same direction
- Repeating a search in the opposite direction

To Search Forward

Enter the following subcommand:

```
/Pattern
```

where the *Pattern* parameter is a character string or regular expression that specifies the text to search for.

The cursor moves to the first character of the text specified by the pattern.

To Search Backward

Enter the following subcommand:

```
?Pattern
```

where the *Pattern* parameter is a character string or regular expression that specifies the text to search for.

The cursor moves to the first character of the text specified by the pattern.

To Repeat a Search in the Same Direction

Enter the following subcommand:

```
/
```

The cursor moves to the first character of the closest instance of the text specified by the pattern in the last search command.

To Repeat a Search in the Opposite Direction

Enter the following subcommand:

```
?
```

The cursor moves to the first character of the closest instance of the text specified by the pattern in the last search command.

Substituting Text

(.,.)**s**/*Pattern*/*Replacement*/ [**l**] [**n**] [**p**] (.,.)**s**/*Pattern*/*Replacement*/**ng** [**l**] [**n**] [**p**]	The **s** (substitute) subcommand searches each addressed line for a string that matches the *Pattern* parameter and replaces the string with the specified *Replacement* parameter. A pattern can be a fixed character string or a regular expression. Without the global subcommand (**g**), the **s** subcommand replaces only the first matching string on each addressed line. With the **g** subcommand, the **s** subcommand replaces every occurrence of the matching string on each addressed line. If the **s** subcommand does not find a match for the pattern, it returns the error message ? (question mark). Type the **l** (list), **n** (number), or **p** (print) subcommand to display the substituted text. These subcommands are optional. **Note:** Any character except a space or a

new−line character can separate (delimit) the *Pattern* and *Replacement* parameters. The **s** subcommand sets the current line to the last line changed.

If the *Number* parameter (an integer) is specified, then the first number that matches strings in each addressed line is replaced.

An & (ampersand) character used in the *Replacement* parameter has the same value as the *Pattern* parameter. For example, the subcommand **s/are/&n't/** has the same effect as the subcommand **s/are/aren't/** and replaces **are** with **aren't** on the current line. A \& (backslash, ampersand) removes the special meaning of the & (ampersand) in the *Replacement* parameter.

A subpattern is part of a pattern enclosed by the strings \((backslash, left parenthesis) and \) (backslash, right parenthesis); the pattern works as if the enclosing characters were not present. In the *Replacement* parameter, *Number* refers to strings that match subpatterns. For example, the **s/\(t\)\(h\)\(e\)/t\1\2ose)** subcommand replaces **the** with **those** if a match for the pattern **the** exists on the current line. Whether subpatterns are nested or in a series, *Number* refers to the occurrence specified by the *Number* parameter, counting from the left of the delimiting characters, \) (backslash, right parenthesis).

The % (percent sign), when used alone as the *Replacement* parameter, causes the **s** subcommand to repeat the previous *Replacement* parameter. The % does not have this special meaning if it is part of a longer *Replacement* parameter or if it is preceded by a \ (backslash).

You can split lines by substituting new−line characters into them. In the *Replacement* parameter, the \−Enter key sequence quotes the new−line character (not displayed) and moves the cursor to the next line for the remainder of the string. New−line characters cannot be substituted as part of a **g** subcommand or **v** subcommand list.

The ed editor provides several ways to substitute text. Use the preceding format to perform the following editing tasks:

- Substituting text within the current line
- Substituting text within an addressed line or group of lines
- Substituting a specified pattern within lines that contain that pattern
- Substituting a pattern within lines that contain a different pattern
- Substituting a pattern within lines that do not contain a different pattern

To Substitute Text within the Current Line

1. Type the following subcommand:

   ```
   s/OldString/NewString
   ```

   where the *OldString* parameter is the existing text and the *NewString* parameter is the text you want to substitute for it.

2. Type one of the following actions:

   To substitute the *NewString* parameter for the first instance of the *OldString* parameter within the current line, type:

   ```
   /
   ```

   To substitute the *NewString* parameter for every instance of the *OldPattern* parameter within the current line, type:

   ```
   /g
   ```
3. To display the changed text, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```
4. Press the Enter key.

To Substitute Text within an Addressed Line or Group of Lines

1. Type the following subcommand:

   ```
   Addresss/OldPattern/NewString
   ```

   where the *Address* parameter is the address of the line or group of lines where you want to substitute text, the *OldPattern* parameter is the existing text, and the *NewString* parameter is the text you want to substitute.
2. Type one of the following actions:

   To substitute the *NewString* parameter for the first instance of the *OldPattern* parameter within each line, type:

   ```
   /NewString/
   ```

   To substitute the *NewString* parameter for every instance of the *OldPattern* parameter within each line, type:

   ```
   /NewString/g
   ```

   To substitute the *NewString* parameter for the first instance of the *NumberOldPattern* parameter on each address line, type:

   ```
   /NewString/Number
   ```
3. To display the changed text, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

```
p
```

4. Press the Enter key.

To Substitute a Specified Pattern within Lines That Contain That Pattern

1. Type the following subcommand:

   ```
   Addressg/Pattern/s//NewString
   ```

   where the *Address* parameter is the address of the group of lines that you want to search for the pattern specified with the *Pattern* parameter, and the *NewString* parameter is the text you want to substitute for the *Pattern* parameter.

2. Type one of the following actions:

   To substitute the *NewString* parameter for the first instance of the *Pattern* parameter within each line, type:

   ```
   /
   ```

   To substitute the *NewString* parameter for every instance of the *Pattern* parameter within each line, type:

   ```
   /g
   ```

3. To display the changed text, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```

4. Press the Enter key.

To Substitute a Pattern within Lines That Contain a Different Pattern

1. Type the following subcommand:

   ```
   Addressg/Pattern/s/OldString/NewString
   ```

   where the *Address* parameter is the address of the group of lines that you want to search for the pattern specified with the *Pattern* parameter, the *OldString* parameter is the text you want to replace, and the *NewString* parameter is the text you want to substitute in place of the *OldString* parameter.

2. Type one of the following actions:

   To substitute the *NewString* parameter for the first instance of the *OldString* parameter within each line that contains the *Pattern* parameter, type:

   ```
   /
   ```

   To substitute the *NewString* parameter for every instance of the *OldString* parameter within each line that contains the *Pattern* parameter, type:

   ```
   /g
   ```

3. To display the changed text, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```
4. Press the Enter key.

To Substitute a Pattern within Lines That Do Not Contain a Different Pattern

1. Type the following subcommand:

   ```
   Addressv/Pattern/s/OldString/NewString
   ```

   where the *Address* parameter is the address of the group of lines that you want to search for the pattern specified with the *Pattern* parameter, the *OldString* parameter is the text you want to replace, and the *NewString* parameter is the text you want to substitute in place of the *OldString* parameter.
2. Type one of the following actions:

   To substitute the *NewString* parameter for the first instance of the *OldString* parameter within each line that does not contain the *Pattern* parameter, type:

   ```
   /
   ```

   To substitute the *NewString* parameter for every instance of the *OldString* parameter within each line that does not contain the *Pattern* parameter, type:

   ```
   /g
   ```
3. To display the changed text, type one of the following optional subcommands:

   ```
   l
   ```

   ```
   n
   ```

   ```
   p
   ```
4. Press the Enter key.

Undoing Text Changes

u [**l**] [**n**] [**p**]	The **u** (undo) subcommand restores the buffer to the state it was in before it was last modified by an ed editor subcommand. The **u** subcommand cannot undo the **e**, **f**, and **w** subcommands. Type the **l** (list), **n** (number), or **p** (print) subcommand if you want to display the changes. These subcommands are optional.

To Undo Text Changes

Enter the following subcommand:

```
u[l][n][p]
```

where **l**, **n**, and **p** are optional subcommands that display the changes. All add, change, move, copy, or delete editing functions performed to the text after the last save are undone.

Manipulating Files

You can use ed editor subcommands to manipulate files to perform the following tasks:

- Adding another file to the current file
- Changing the default file name
- Editing additional files

Adding Another File to the Current File

(\$)**r***File*	The **r** (read) subcommand reads a file into the buffer after the addressed line. The **r** subcommand does not delete the previous contents of the buffer. When entered without the *File* parameter, the **r** subcommand reads the default file, if any, into the buffer. The **r** subcommand does not change the default file name. A 0 address causes the **r** subcommand to read a file in at the beginning of the buffer. After it reads a file successfully, the **r** subcommand displays the number of characters read into the buffer and sets the current line to the last line read. If ! (exclamation point) replaces the *File* parameter in an **r** subcommand, the rest of the line is taken as an AIX shell command whose output is to be read. The **r** subcommand does not store the names of AIX commands as default file names.

To Insert a File after the Current Line

Enter the following subcommand:

```
r File
```

where the *File* parameter is the name of the file to be inserted.

The ed editor reads the file specified by the *File* parameter into the current file after the current line and displays the number of characters read into the current file.

To Insert a File after a Line Specified by Address

Enter the following subcommand:

```
Addressr File
```

where the *Address* parameter specifies the line that you want the inserted file to follow, and the *File* parameter is the name of the file to be inserted.

The ed editor reads the file specified by the *File* parameter into the current file after the specified line and displays the number of characters read into the current file.

Changing the Default File Name

f [*File*]	The **f** (file name) subcommand changes the default file name (the stored name of the last file used) to the name specified by the *File* parameter. If a *File* parameter is not specified, the **f** subcommand displays the default file name. (The **e** subcommand stores the default file name.)

To Display the Name of a File

Enter the following subcommand:

```
f
```

The ed editor displays the name of the file in the edit buffer.

To Name a File

Enter the following subcommand:

```
f File
```

where the *File* parameter is the new name for the file in the edit buffer.

The file in the edit buffer is renamed.

Editing Additional Files

e*File*	The **e** (edit) subcommand first deletes any contents from the buffer, sets the current line to the last line of the buffer, and displays the number of characters read into the buffer. If the buffer has been changed since its contents were saved (with the **w** subcommand), the ed editor displays a `?` (question mark) before it clears the buffer. The **e** subcommand stores the *File* parameter as the default file name to be used, if necessary, by subsequent **e**, **r**, or **w** subcommands. (To change the name of the default file name, use the **f** subcommand.) When an ! (exclamation point) replaces the *File* parameter, the **e** subcommand takes the rest of the line as an AIX shell command and reads the command output. The **e** subcommand does not store the name of the shell command as a default file name.
E*File*	The **E** (Edit) subcommand works like the **e** subcommand with one exception; the **E** subcommand does not check for changes made to the buffer after the last **w** subcommand. Any changes you made before re−editing the file are lost.

You can use the **e** or **E** subcommands to perform the following tasks:

- Re−editing the current file without saving it
- Re−editing the current file after saving it
- Editing a file after the current file Is saved
- Editing a file without saving the current file

To Re−Edit the Current File without Saving It

Enter the following subcommands:

```
E
```

The ed editor displays the number of characters in the file. Any changes you made before re−editing the file are lost.

To Re−Edit the Current File after Saving It

Enter the following subcommands:

```
e
```

The ed editor displays the number of characters in the file.

To Edit a File after the Current File Is Saved

Enter the following subcommands:

```
e File
```

where the *File* parameter is the name of a new or existing file that you want to edit.

For an existing file, the ed editor displays the number of characters in the file. For a new file, the ed editor displays a ? (question mark) and the name of the file.

To Edit a File without Saving the Current File

Enter the following subcommands:

```
E File
```

where the *File* parameter is the name of a new or existing file that you want to edit.

For an existing file, the editor displays the number of characters in the file. For a new file, the ed editor displays a ? (question mark) and the name of the file.

Miscellaneous Functions of the ed Editor Subcommands

You can use ed editor subcommands to perform the following tasks:

- Changing the prompt string
- Entering system commands
- Exiting the ed editor
- Requesting help

Changing the Prompt String

P The **P** (Prompt) subcommand turns on or off the ed editor prompt string, which is represented by an * (asterisk). Initially, the **P** subcommand is turned off.

To Start or Stop Displaying the Prompt String

Enter the following subcommand:

```
P
```

The ed editor prompt, an * (asterisk), is displayed or not displayed, depending on its previous setting.

Entering System Commands

!*Command*	The **!** subcommand allows you to run AIX operating−system commands without leaving the ed editor. Anything that follows the **!** subcommand on an ed editor subcommand line is interpreted as an AIX command. Within the text of that command string, the ed editor replaces the unescaped % (percent sign) with the current file name, if one exists. You can repeat the previous AIX command by entering an ! (exclamation point) after the **!** ed editor subcommand. If the AIX command interpreter (the **sh** command) expands the command string, the ed editor echoes the expanded line. The **!** subcommand does not change the current line.

You can use the **!** subcommand to perform the following actions:

- Running one operating−system command
- Repeating an operating−system command
- Running several operating−system commands

To Run One Operating−System Command

Enter the following subcommand:

```
!Command
```

where the *Command* parameter specifies an AIX command usually entered at the operating−system prompt.

The command runs and displays its output. After the command completes, the editor displays an **!** (exclamation point).

To Repeat an Operating−System Command

Enter the following subcommand:

```
!
```

The previously run AIX operating−system command runs and displays its output. After the command completes, the editor displays an **!** (exclamation point).

To Run Several Operating−System Commands

1. Type the following subcommand to display an AIX operating−system prompt:

   ```
   !sh
   ```

2. Type an AIX operating−system command.
3. Press the Enter key to run the command and display its output.
4. Repeat steps 2 and 3 to run more AIX operating−system commands.
5. Press the Ctrl−D key sequence to return to command mode. The editor displays an **!** (exclamation point).

Exiting the ed Editor

q	The **q** (quit) subcommand exits the ed editor after checking whether the buffer has been saved to a file after the last changes were entered. If the buffer has not been saved to a file, the **q** subcommand displays the ? (question mark) message. Enter the **q** subcommand again to exit the ed editor anyway. The changes to the current file are lost.

Q The **Q** (Quit) subcommand exits the ed editor without checking whether any changes were made since the buffer was saved to a file. Any changes made to the buffer since the last save are lost.

To Quit after Checking for Edits

1. Type the following subcommand:

   ```
   q
   ```

2. If the ed editor displays a `?`, type one of the following subcommands:

   To save changes before quitting, type:

   ```
   w
   ```

   then press the Enter key.

   To quit without saving changes, type:

   ```
   q
   ```

3. Press the Enter key.

To Quit and Discard Edits

1. Type the following subcommand:

   ```
   Q
   ```

2. Press the Enter key. Any changes made to the buffer since the last save are lost.

Requesting Help

h The **h** (help) subcommand provides a brief help message for the most recent `?` diagnostic or error message displayed.

H The **H** (Help) subcommand causes the ed editor to display help messages for all subsequent ? diagnostic messages. The **H** subcommand also explains the previous ? if one existed. The **H** subcommand alternately turns this mode on and off; it is initially off.

To Start or Stop Displaying Help Messages

Enter the following subcommand:

```
H
```

The help messages are displayed or not displayed for ? responses from the ed editor, depending on the previous setting.

To Display the Last Help Message

Enter the following subcommand:

```
h
```

A help message is displayed for the last ? response from the ed editor.

Character Class Support in the ed Editor

In standard *Patterns* expression, a range expression matches the set of all characters that fall between two characters in the collation sequence of the current locale. The syntax of the range expression is as follows:

```
[character-character]
```

The first character must be lower than or equal to the second character in the collation sequence. For example, [a−c] matches any of the characters a, b, or c in the En_US locale.

The range expression is commonly used to match a character class. For example, [0−9] is used to mean all digits, and [a−z A−Z] is used to mean all letters. This form may produce unexpected results when ranges are interpreted according to the collating sequence in the current locale.

Instead of the preceding form, use a character class expression within [ ] (brackets) to match characters. The system interprets this type of expression according to the character class definition in the current locale. However, you cannot use character class expressions in range expressions.

The syntax of a character class expression is as follows:

```
[:CharacterClass:]
```

That is, a left bracket, a colon, the name of the character class, another colon, and then a right bracket.

The following character classes are supported in all locales:

`[:upper:]`	Uppercase letters
`[:lower:]`	Lowercase letters
`[:alpha:]`	Uppercase and lowercase letters
`[:digit:]`	Digits
`[:alnum:]`	Alphanumeric characters
`[:xdigit:]`	Hexadecimal digits
`[:punct:]`	Punctuation character (neither a control character nor alphanumeric)
`[:space:]`	Space, tab, carriage return, new−line, vertical tab, or form feed character
`[:print:]`	Printable characters, including space
`[:graph:]`	Printable characters, not including space
`[:cntrl:]`	Control characters
`[:blank:]`	Space and tab characters

The brackets are part of the character class definition. To match any uppercase ASCII letter or ASCII digit, use the following regular expression:

```
[[:upper:] [:digit:]]
```

Do not use the expression `[A−Z0−9]`.

A locale may support additional character classes.

The newline character is part of the `[:space:]` character class but will not be matched by this character class. The newline character may only be matched by the special search characters $ (dollar sign) and ^ (caret).

Exit Status

The **ed** and **red** commands return the following exit values:

0	Successful completion.
>0	An error occurred.

Related Information

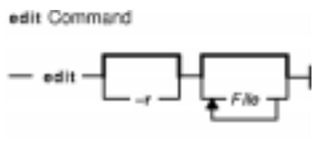
The **edit** command, **ex** command, **grep** command, **rsh** command, **sed** command, **sh** command, **stty** command, **vi** or **vedit** command, **view** command.

edit Command

Purpose

Provides a simple line editor for the new user.

Syntax



edit [**−r**] [*File* ...]

Description

The **edit** command starts a line editor designed for beginning users, a simplified version of the ex editor. The edit editor belongs to a family of editors that includes the ed editor, ex editor, and vi editor. Knowing about the edit editor can help you learn the more advanced features of the other editors. To edit the contents of a file, enter:

```
edit  File
```

When the file specified by the *File* parameter names an existing file, the **edit** command copies it to a buffer and displays the number of lines and characters in it. It then displays a **:** (colon) prompt to show that it is ready to read subcommands from standard input.

If the file specified in the *File* parameter does not already exist, the **edit** command indicates this information and creates the new file. You can specify more than one file name for the *File* parameter, in which case the **edit** command copies the first file into its buffer and stores the remaining file names in an argument list for later use. The edit editor does not make changes to the edited file until you use the **w** subcommand to write the changes.

The edit editor operates in one of the following two modes:

command mode	Recognizes and runs the edit editor subcommands. When you start the edit editor, it is in command mode. To enter command mode at other times, enter only a **.** (period) at the beginning of a line.
text input mode	Allows you to enter text into the edit editor buffer. Enter text input mode by using the **append (a)** subcommand, **change (c)** subcommand, or **insert (i)** subcommand. To end text input mode, enter only a **.** (period) at the beginning of a line.

Flags

−r Recovers the file being edited after an editor or system malfunction.

Addressing Lines in a File

The edit editor uses the following three types of addresses:

- Line number addresses
- Relative position addresses
- Pattern addresses

Line Number Addresses

Line number addresses specify a line within a file by its line number or symbolic name. This method is the simplest way to address a line or lines.

To address the first line by its symbolic name, enter:

```
.
```

To address the last line by its symbolic name, enter:

```
$
```

You also can specify a range of lines by separating the line numbers or symbolic addresses with a comma or a semicolon. The second address must refer to a line that follows the first addressed line in the range.

For example:

```
1,5
```

addresses the lines 1 through 5.

```
.,$
```

addresses the first through the last lines.

Relative Position Addresses

The edit editor can address a line by its relative position to the current line. An address that begins with the −*Number* or +*Number* parameter addresses a line the specified number of lines before or after the current line, respectively.

For example:

```
+8
```

addresses 8 lines after the current line.

You can also address a line relative to the first or last line by using the symbolic names in combination with the −*Number* or +*Number* addresses.

For example:

```
.+3
```

addresses 3 lines after the first line, and:

```
$−10
```

addresses 10 lines before the last line.

Pattern Addresses

You can specify an address line by searching the buffer for a particular pattern. The edit editor searches forward or backward and stops at the first line that contains the match for the *Pattern* parameter. If necessary, the search wraps past the end or beginning of the buffer until it finds a match or returns to the current line.

To search forward, enter:

```
/Pattern/
```

To search backward, enter:

```
?Pattern?
```

You also can specify a range of lines by separating the *Pattern* parameters with a comma or a semicolon. The second address must refer to a line that follows the first addressed line in the range.

For example:

```
Pattern,Pattern
```

The following characters have special meanings when used as part of the *Pattern* parameter:

^	Matches the beginning of a line when used as the first character of the *Pattern* parameter.
$	Matches the end of a line when used as the last character of the *Pattern* parameter.

Using edit Editor Subcommands

The edit editor subcommands affect the current line, which is represented by a **.** (period). When you start the edit editor, the current line is the last line in the buffer. As the buffer is edited, the current line changes to the last line affected by a subcommand. To work with different parts of a file, you must know how to find the current line and how to address different lines in a file.

You can use the edit editor subcommands to perform the following tasks:

- Adding text
- Changing the name of the current file
- Changing text
- Deleting text
- Displaying the current file name and status
- Displaying text and finding the current line
- Editing additional files
- Ending and exiting the edit editor
- Making global changes
- Moving or copying text
- Saving a file after a system crash
- Saving text
- Substituting text
- Undoing a change

Adding Text

In the following subcommands, the *Address* parameter is optional. If you specify an address, do not type the brackets. You can use the full subcommand or its abbreviation, which is shown in parentheses.

[*Address*]**append** (**a**)

Text

. Appends the text you type after the current line if you do not specify an *Address* parameter. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **a** subcommand appends text after the specified line. If you specify a 0 address, the **a** subcommand places the text at the beginning of the buffer.

Type the text, pressing the Enter key at the end of each line. When you have entered all the text, type a **.** (period) alone at the start of a line to end text input mode and return to command mode. You can use the **1,$p** subcommand to display the entire contents of the buffer.

Note: The **a** subcommand differs from the **i** subcommand in the placement of text.

[*Address*]**insert** (**i**)

Text

. Inserts text before the current line if you do not specify an *Address* parameter. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **i** subcommand inserts text before the specified line. You cannot specify a 0 address.

Type your text, pressing the Enter key at the end of each line. When you have entered all your text, type a **.** (period) alone at the start of a line to end text input mode and return to command mode. You can use the **1,$p** subcommand to display the entire contents of the buffer.

Note: The **i** subcommand differs from the **a** subcommand in the placement of text.

Changing the Name of the Current File

file *File*	Changes the name of the current file to the name specified by the *File* parameter. The edit editor does not consider this file to be edited.

Changing Text

In the following subcommand, the *Address* parameters are optional. If you specify an address, do not type the brackets. You can use the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1***,***Address2*]**change** (**c**)

Text

. Replaces the current line with the text you type if you do not specify the *Address* parameters. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **c** subcommand replaces the addressed line or lines. You can specify a range of lines by separating the addresses with a comma.

Type your text, pressing the Enter key at the end of each line. When you have entered all your text, type a **.** (period) alone at the start of a line to end text input mode and return to command mode. You can use the **1,$p** subcommand to display the entire contents of the buffer. The last input line becomes the current line.

Deleting Text

In the following subcommand, the *Address* and *Buffer* parameters are optional. If you specify an address or buffer, do not type the brackets. You can use the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**delete** [*Buffer*] (**d**)

Deletes the current line if you do not specify the *Address* parameters. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **d** subcommand deletes the addressed line or lines. You can specify a range of lines by separating the addresses with a comma. The line following the last deleted line becomes the current line.

If you specify a buffer by giving a lowercase letter from a to z, the edit editor saves the addressed lines in that buffer. If you specify an uppercase letter, the ed editor appends the lines to that buffer. You can use the **pu** subcommand to put the deleted lines back into the buffer.

Displaying the Current File Name and Status

In the following subcommand, you can use the full subcommand or its abbreviation, which is shown in parentheses.

file (**f**) Displays the current file name along with the following related information:

- Whether the file was modified since the last **w** subcommand
- Current line number
- Number of lines in the buffer
- Percentage of the buffer indicating the current line location

Displaying Text and Finding the Current Line

In the following subcommands, the *Address* parameters are optional. If you specify an address, do not type the brackets. You can use either the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**number** (**nu**)

Displays the addressed line or lines preceded by its buffer line number. If you do not specify the *Address* parameters, the **nu** subcommand displays the current line and number.

If you specify an address, the **nu** subcommand displays the addressed line or lines. You can specify a range of lines by separating the addresses with a comma. The last line displayed becomes the current line.

[*Address1*,*Address2*]**print** (**p**)

Displays the addressed line or lines. If you do not specify the

	Address parameters, the **p** subcommand displays the current line. If you specify an address, the **p** subcommand displays the addressed line or lines. You can specify a range of lines by separating the addresses with a comma. The last line displayed becomes the current line.
[*Address*]=	Displays the line number of the addressed line. If you do not specify an *Address* parameter, the = subcommand displays the line number of the current line.
[*Address*]**z**	Displays a screen of text beginning with the addressed line. If an *Address* parameter is not specified, the **z** subcommand displays a screen of text beginning with the current line.
[*Address*]**z−**	Displays a screen of text with the addressed line at the bottom. If an *Address* parameter is not specified, the **z−** subcommand displays a screen of text with the current line at the bottom.
[*Address*]**z.**	Displays a screen of text with the addressed line in the middle. If an *Address* parameter is not specified, the **z.** subcommand displays a screen of text with the current line in the middle.

Editing Additional Files

In the following subcommand, you can use the full subcommand or its abbreviation, which is shown in parentheses.

edit *File* (**e**)	Begins an editing session on a new file specified by the *File* parameter. The editor first checks to see if the buffer was edited since the last **write (w)** subcommand. If the file was edited since the last **w** subcommand, the edit editor issues a warning and cancels the **e** subcommand. Otherwise, the edit editor deletes the contents of the editor buffer, makes the named file the current file, and displays the new file name. After insuring that this file can be edited, the edit editor reads the file into its buffer. If the edit editor reads the file without error, it displays the number of lines and characters that it read. The last line read becomes the new current line.
next (**n**)	Copies the next file named in the command line argument list to the buffer for editing.

Ending and Exiting the edit Editor

In the following subcommands, you can use the full subcommand or its abbreviation, which is shown in parentheses.

quit (**q**)	Ends the editing session after using the **write (w)** subcommand. If you have modified the buffer and have not written the changes, the edit editor displays a warning message and does not end the editing session.
quit! (**q!**)	Ends the editing session, discarding any changes made to the buffer since the last **w** subcommand.

Making Global Changes

In the following subcommand, the *Address* parameters are optional. If you specify an address, do not type the brackets. You can use the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**global**/*Pattern*/*SubcommandList* (**g**)	
	Marks each of the addressed lines that match the *Pattern* parameter.

The edit editor then performs the list of subcommands specified in the *SubcommandList* parameter on each marked line.

If you do not specify the *Address* parameters, the **g** subcommand works on the current line. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **g** subcommand works on the addressed line or lines. You can specify a range of lines by separating the addresses with a comma.

A single subcommand or the first subcommand in a subcommand list appears on same line as the **g** subcommand. The remaining subcommands must appear on separate lines, where each line (except the last) ends with a \ (backslash). The default subcommand is the **print (p)** subcommand.

The subcommand list can include the **append (a)** subcommand, **insert (i)** subcommand, and **change (c)** subcommand, and their associated input. In this case, if the ending period is on the last line of the command list, you can omit it.

> **Note:** The **undo (u)** subcommand and the **g** subcommand cannot appear in the subcommand list.

Moving or Copying Text

In the following subcommands, the *Address1* and *Address2* parameters are optional. If you specify an address, do not type the brackets. You must specify the *Address3* parameter. You can use either the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**move***Address3* (**m**)

Moves the current line after the line specified by the *Address3* parameter if you do not specify an address or an address range. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **m** subcommand moves the addressed line or lines. You can specify a range of addresses by separating the addresses with a comma. The first of the moved lines becomes the current line.

[*Address1*,*Address2*]**yank** [*Buffer*] (**ya**)

Copies the specified line or lines into the *Buffer*, an optional parameter specified by a single alpha character a to z. You can use the **pu** subcommand to put these lines into another file.

[*Address*]**put** [*Buffer*] (**pu**)

Retrieves the contents of the specified *Buffer* parameter and places it after the current line if you do not specify an address. You may need to find the current line or specify an address if you are not in the correct position in the buffer.

If you specify an address, the **pu** subcommand retrieves the contents of the specified buffer and places it after the addressed line. If you do not specify a *Buffer* parameter, the **pu** subcommand restores the last deleted or copied text.

You can use the **pu** subcommand with the **delete (d)** subcommand to move lines within a file or with the **yank (ya)** subcommand to duplicate lines between files.

Saving a File after a System Malfunction

preserve	Saves the current editor buffer as though the system had just malfunctioned. Use this subcommand when a **write (w)** subcommand has resulted in an error and you do not know how to save your work. Use the **recover** subcommand to recover the file.
recover*File*	Recovers the file specified by the *File* parameter from the system save area. Use this subcommand after a system crash or after a **preserve** subcommand.

Saving Text

In the following subcommand, the *Address* parameters are optional. If you specify an address, do not type the brackets. You can use the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**write** [*File*] (**w**)

Writes the entire contents of the buffer to the file specified by the *File* parameter if you do not specify an address.

If you specify an address, the **w** subcommand writes the addressed line or lines to the file specified. You can specify a range of lines by separating the addresses with a comma. The edit editor displays the number of lines and characters that it writes.

If you do not specify a file, the edit editor uses the current file name. If a *File* parameter does not exist, the editor creates one.

Substituting Text

In the following subcommand, the *Address* parameters are optional. If you specify an address, do not type the brackets. You can use either the full subcommand or its abbreviation, which is shown in parentheses.

[*Address1*,*Address2*]**substitute/***Pattern*/*Replacement*/ (**s**)

[*Address1*,*Address2*]**substitute/***Pattern*/*Replacement*/**g**

Replaces the first instance of the specified *Pattern* parameter on each addressed line. You can replace every instance of the *Pattern* parameter by adding the **global (g)** subcommand to the end of the **s** subcommand.

If you do not specify an address, the **s** subcommand works on the current line. You may need to find the current line or specify an address if you are not in the correct position in the buffer. If you specify an address, the **s** subcommand works on the addressed line or lines. You can specify a range of lines by separating the addresses with a comma.

Undoing a Change

In the following subcommand, you can use the full subcommand or its abbreviation, which is shown in parentheses.

undo (**u**)	Reverses the changes made in the buffer by the last buffer editing subcommand. You cannot undo a **write (w)** subcommand or an **edit (e)** subcommand. **Note:** The **global** subcommands are considered a single subcommand to a **u** subcommand.

Related Information

The **ed** or **red** command, **ex** command, **vi** or **vedit** command.

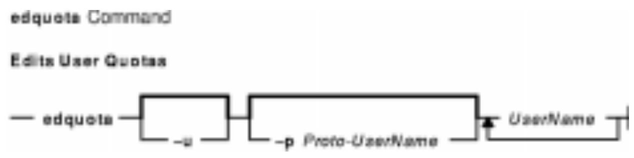
edquota Command

Purpose

Edits user and group quotas.

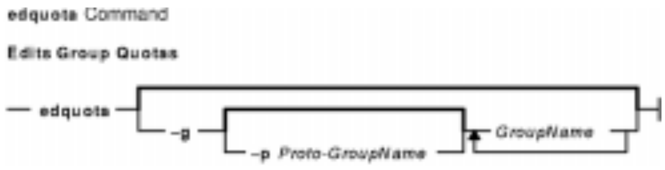
Syntax

To Edit User Quotas



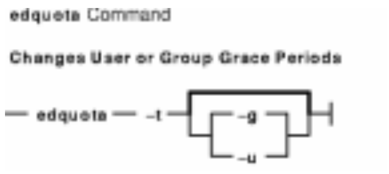
edquota [**−u**] [**−p***Proto−UserName*] *UserName* ...

To Edit Group Quotas



edquota [**−g** [**−p***Proto−GroupName*] *GroupName* ...]

To Edit Change User or Group Grace Period



edquota−t [**−u** | **−g**]

Description

The **edquota** command creates and edits quotas. It creates a temporary file that contains each user's and group's current disk quotas. It determines the list of file systems with established quotas from the **/etc/filesystems** file. The **edquota** command also invokes the vi editor (or the editor specified by the **EDITOR** environment variable) on the temporary file so that quotas can be added and modified.

> **Note:** If you specify an editor in the **EDITOR** environment variable, you must specify the full pathname of the editor.

Quotas are maintained separately for each file system. When you create or edit a quota for a user or a group, the quota applies to a specific file system. A quota must be set in each file system where you want to use quotas.

By default, or when used with the **−u** flag, the **edquota** command edits the quotas of one or more users specified by the *UserName* parameter on the command line. When used with the **−g** flag, the

edquota command edits the quotas of one or more groups specified by the *GroupName* parameter. The **−p** flag identifies a prototypical user (*UserName*) or a prototypical group *(Proto−GroupName*) and duplicates these quotas for a specified user or group.

A user can exceed established soft limits for a default grace period of 1 week. Upon expiration of the grace period, the soft limit is enforced as a hard limit. The grace period can be specified in days, hours, minutes, or seconds. A value of 0 indicates that the default grace period is imposed; a value of 1 second indicates that no grace period is granted. The **−t** flag changes the grace period.

Fields displayed in the temporary file are:

`Blocks in use`	The current number of 1KB file system blocks used by this user or group.
`Inodes in use`	The current number of files used by this user or group.
`Block soft limit`	The number of 1KB blocks the user or group will be allowed to use during normal operations.
`Block hard limit`	The total amount of 1KB blocks the user or group will be allowed to use, including temporary storage during a quota grace period.
`Inode soft limit`	The number of files the user or group will be allowed to create during normal operations.
`Inode hard limit`	The total number of files the user or group will be allowed to create, including temporary files created during a quota grace period.

Note: A hard limit with a value of 1 indicates that no allocations are permitted. A soft limit with a value of 1, in conjunction with a hard limit with a value of 0, indicates that allocations are permitted only on a temporary basis.

When the editor is exited, the **edquota** command reads the temporary file and modifies the binary quota files to reflect any changes.

Hard or soft limits can only be specified in whole 1KB block amounts.

Flags

−g	Edits the quotas of one or more specified groups.
−p	When invoked with the **−u** flag, duplicates the quotas established for a prototypical user for each specified user. When invoked with the **−g** flag, the **−p** flag duplicates the quotas established for a prototypical group for each listed group.
−t	Changes the grace period during which quotas can be exceeded before a soft limit is imposed as a hard limit. The default value of the grace period is 1 week. When invoked with the **−u** flag, the grace period is set for all file systems with user quotas specified in the **/etc/filesystems** file. When invoked with the **−g** flag, the grace period is set for all file systems with group quotas specified in the **/etc/filesystems** file.
−u	Edits the quotas of one or more users.

Note: If the user or group names contains all numbers then it will be treated as a user or group ID. Quotas will then be edited for the ID rather than the name.

Security

Access Control:	Only the root user can execute this command.

Examples

To create quotas for user `sharl`, using the quotas established for user `davec` as a prototype, enter:

```
edquota −u −p davec sharl
```

Files

quota.user	Specifies user quotas.
quota.group	Specifies group quotas.
/etc/filesystems	Contains file system names and locations.

Related Information

The **quota** command, **quotacheck** command **quotaon** and **quotaoff** command, **repquota** command.

The Disk Quota System Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* introduces the disk quota system.

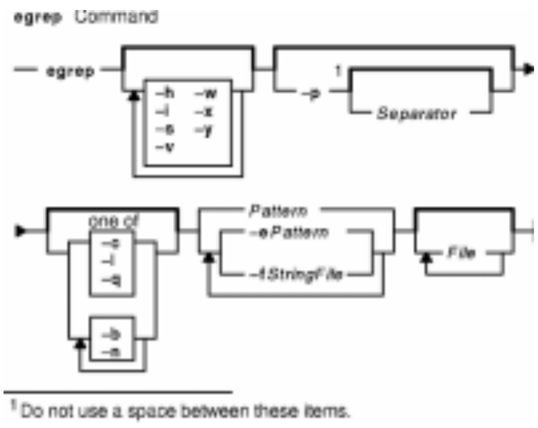
How to Set Up the Disk Quota System in *AIX Version 4.3 System Management Guide: Operating System and Devices* describes how to establish disk quotas.

egrep Command

Purpose

Searches a file for a pattern.

Syntax



egrep [**−h**] [**−i**] [**−p**[*Separator*]] [**−s**] [**−v**] [**−w**] [**−x**] [**−y**] [[**−b**] [**−n**] | [**−c** | **−l** | **−q**]] { { **−e***Pattern* | **−f***StringFile* } ... | *Pattern* } [*File* ...]

Description

The **egrep** command searches an input file (standard input by default) for lines matching a pattern specified by the *Pattern* parameter. These patterns are full regular expressions as in the **ed** command (except for the \ (backslash) and \\ (double backslash)). The following rules also apply to the **egrep** command:

- A regular expression followed by a + (plus sign) matches one or more occurrences of the regular expression.
- A regular expression followed by a ? (question mark) matches zero or one occurrence of the regular expression.
- Multiple regular expressions separated by a | (vertical bar) or by a new−line character match strings that are matched by any of the regular expressions.
- A regular expression may be enclosed in ( ) (parentheses) for grouping.

The new−line character will not be matched by the regular expressions.

The order of precedence for operators is [,], *, ?, +, concatenation, | and the new−line character.

> **Note:** The **egrep** command is the same as the **grep** command with the **−E** flag, except that error and usage messages are different and the **−s** flag functions differently.

The **egrep** command displays the file containing the matched line if you specify more than one *File* parameter. Characters with special meaning to the shell ($, *, [, |, ^, (,), \ ) must be in quotation marks when they appear in the *Pattern* parameter. When the *Pattern* parameter is not a simple string, you usually must enclose the entire pattern in single quotation marks. In an expression such as `[a−z]`, the minus means through according to the current collating sequence. A collating sequence may define equivalence classes for use in character ranges.

Notes:

1. Lines are limited to 2048 bytes.
2. Paragraphs (under the **−p** flag) are currently limited to a length of 5000 characters.
3. Do not run the **grep** command on a special file because it produces unpredictable results.
4. Input lines should not contain the NULL character.
5. Input files should end with the newline character.
6. Although some flags can be specified simultaneously, some flags override others. For example, if you specify **−l** and **−n** together, only file names are written to standard output.

Flags

−b	Precedes each line by the block number on which it was found. Use this flag to help find disk block numbers by context. The **−b** flag cannot be used with input from stdin or pipes.
−c	Displays only a count of matching lines.
−e *Pattern*	Specifies a *Pattern*. This works like a simple *Pattern* but is useful when the *Pattern* begins with a − (minus sign).
−f*StringFile*	Specifies a file that contains strings.
−h	Suppresses file names when multiple files are being processed.
−i	Ignores the case of letters when making comparisons.
−l	Lists just the names of files (once) with matching lines. Each file name is separated by a new−line character. If standard input is searched, a path name of `"(StandardInput)"` is returned.
−n	Precedes each line with its relative line number in the file.
−p[*Separator*]	Displays the entire paragraph containing matched lines. Paragraphs are delimited by paragraph separators, as specified by the *Separator* parameter, which are patterns in the same form as the search pattern. Lines containing the paragraph separators are used only as separators; they are never included in the output. The default paragraph separator is a blank line.
−q	Suppresses all output to standard output, regardless of matching lines. Exits with a 0 status if an input line is selected.
−s	Displays only error messages. This is useful for checking status.
−v	Displays all lines except those that match the specified pattern.
−w	Does a word search.
−x	Displays lines that match the specified pattern exactly with no additional characters.
−y	Ignores the case of letters when making comparisons.

Exit Status

This command returns the following exit values:

0	A match was found.
1	No match was found.
>1	A syntax error was found or a file was inaccessible (even if matches were found).

Examples

To use an extended pattern that contains some of the pattern−matching characters +, ?, |, (, and), enter:

```
egrep "\( *([[:lower:][:upper:]]*|[:digit:]*\)" my.txt
```

This displays lines that contain letters in parentheses or digits in parentheses, but not parenthesized letter−digit combinations. It matches `(y)` and `(783902)`, but not `(alpha19c)`.

> **Note:** When using the **egrep** command, \ ((backslash followed by open parenthesis) or \ ((backslash followed by close parenthesis) match parentheses in the text, but ((open parenthesis) and) (closed parenthesis) are special characters that group parts of the pattern. The reverse is true when using the **grep** command.

Files

/usr/bin/egrep	Contains the hard link to the **egrep** command.
/bin/egrep	Specifies the symbolic link to the **egrep** command.

Related Information

The **awk** command, **ed** command, **fgrep** command, **grep** command, **sed** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

National Language Support Overview for Programmers in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

enable Command

Purpose

Enables printer queue devices.

Syntax

enable Command
enable
PrinterName

enable*PrinterName ...*

Description

The **enable** command brings the printer queue devices specified by the *PrinterName* parameter on line, or enables the printer queue devices to be used with the system.

1. You must have root user authority or belong to the printq group to run this command.
2. If you enter `enable −?`, the system displays the following error message:
   ```
   enq: (FATAL ERROR): 0781−048: Bad queue or device name: −?
   ```

Examples

To enable the print queue device `lp0:lpd0`, enter:

```
enable lp0:lpd0
```

Files

/etc/qconfig	Contains the queue configuration file.
/etc/qconfig.bin	Contains the digested, binary version of the **/etc/qconfig** file.
/usr/sbin/qdaemon	Contains the queuing daemon.
/var/spool/lpd/qdir/*	Contains the queue requests.
/var/spool/lpd/stat/*	Contains information on the status of the devices.
/var/spool/qdaemon/*	Contains temporary copies of enqueued files.

Related Information

The **cancel** command, **disable** command, **lp** command, **lpstat** command.

Starting and Stopping a Print Queue in *AIX Version 4.3 Guide to Printers and Printing*.

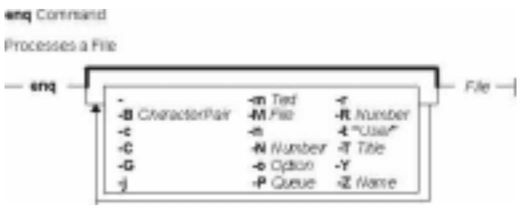
enq Command

Purpose

Enqueues a file.

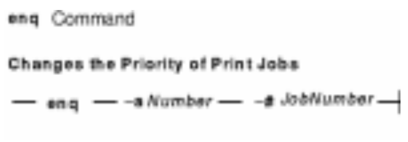
Syntax

To Process a File



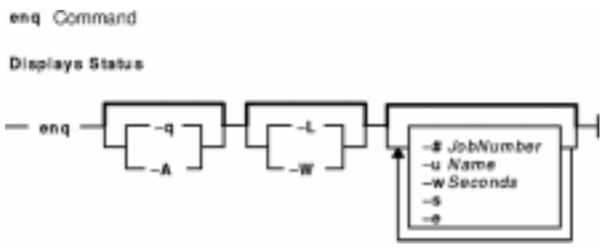
enq [**−**] [**−B***CharacterPair*] [**−c**] [**−C**] [**−j**] [**−m** *Text*] [**−M** *File*] [**−n**] [**−N** *Number*] [**−o** *Option*] [**−P** *Queue*] [**−r**] [**−R** *Number*] [**−t** "*User*"] [**−T** *Title*] [**−Y**] [**−Z** *Name*] *File*

To Change the Priority of Print Jobs



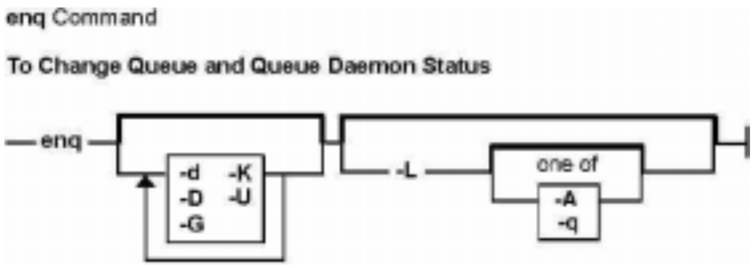
enq−a *Number* **−#***JobNumber*

To Display Status



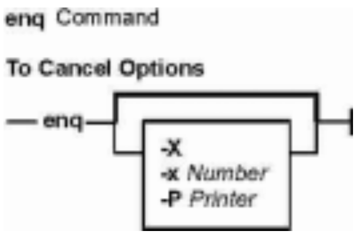
enq [**−q** | **−A**] [**−L** | **−W**] [**−e**] [**−#** *JobNumber*] [**−u***Name*] [**−w** *Seconds*] [**−s**]

To Change Queue and Queue Daemon Status



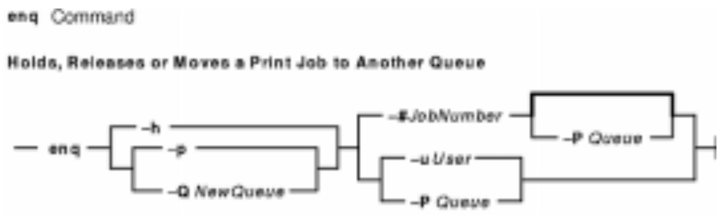
enq [**−d**] [**−D**] [**−G**] [**−K**] [**−L**] [**−U**]

To Cancel Options



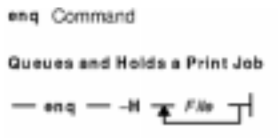
enq [**−X**] [**−x***Number*] [**−P***Printer*]

To Hold, Release or Move a Print Job to Another Queue



enq {**−h**| **−p**|**−Q***NewQueue* } { **−#***JobNumber* [**−P***Queue*] | **−u***User*| **−P***Queue*}

To Queue and Hold a Print Job



enq **−H***File* ...

Description

The **enq** command is a general−purpose utility for enqueuing requests to a shared resource, typically a printer device. Use the **enq** command to enqueue requests, cancel requests, alter the priority of a request, and display the status of queues and devices.

The **enq** command has five different syntax diagrams because all the flags are not meant to work together. Some of these flags are meant for file processing and accept *FileName* as an option. The other flags are used for changing the priority of a print job, displaying the status, changing the status of the queue or the queue daemon, and canceling a print job.

To enqueue files on a specific queue, use the **−P** flag (**−P** *Queue*). If more than one device services a queue, you can also request a particular device by specifying that device (*:device*) after the name of the queue. If you do not specify a device, the job is sent to the first available device. If you do not specify a file, the **enq** command copies standard input into a file and enqueues it for printing.

The **enq** command requests can have operator messages associated with them. This feature is useful in a distributed environment or on a system with many users. The messages are used to tell the printer operator such information as a request to load a special form or different color paper into the printer before allowing the job to print. These messages are specified with the **−m** and **−M** flags. The **qdaemon** command processes the **enq** command requests. When the **qdaemon** is ready to begin a request that has an associated message, the system displays the message on the console of the machine where the **qdaemon** process is running. The text of the message is accompanied by a prompt that tells the printer operator how to signal the request to continue or how to cancel the request.

The display generated by the **enq −A** command contains two entries for remote queues. The first entry contains the client's local queue and local device name and its status information. The second entry follows immediately; it contains the client's local queue name (again), followed by the remote queue name. Any jobs submitted to a remote queue are displayed first on the local side and are moved to the remote device as the job is processed on the remote machine.

Since the status commands communicate with remote machines, the status display may occasionally appear to hang while waiting for a response from the remote machine. The command will eventually time−out if a connection cannot be established between the two machines.

Notes:

1. Before you can enqueue a file, you must have read access to it. To remove a file, (see the **−r** flag) you must also have write access to the directory that contains the file.
2. If you want to continue changing the file after you issue the **enq** command but before it is printed, you must use the **−c** flag.
3. When enqueuing files on a printer, flags can be interspersed in any order.
4. The **−d** and **−G** flags are acted upon immediately. Syntax error appearing before these flags on the command line are reported. Syntax errors appearing after these flags on the command line are ignored.

Flags

File Processing Options

If you give the **enq** command a list of file names, it enqueues them all for file processing on the default device or on the specified device.

−	Causes the **enq** command to act as a filter. The **enq** command automatically reads standard input if you do not specify a file or files. However, if you do specify a file, you can also use the dash (−) to force the **enq** command to read standard input. The dash (−) is actually not a flag, but a special type of file name. Therefore, it must come after all other flags have been specified on the command line.
−B*CharacterPair*	Controls the printing of burst pages according to the value of *CharacterPair* as follows. (**n** = never, **a** = always, **g** = group. The first character is for header, the second character is for trailer.)

HT	Description
nn	No headers, no trailers
na	No headers, trailer on every file
ng	No header, trailer at the end of the job
an	Header on every file, no trailers
aa	Headers and trailers on every file in the job
ag	Header on every file, trailer after job
gn	Header at the beginning of job, no trailer
ga	Header at beginning of job, trailer after every file
gg	Header at beginning of job, trailer at end of job

The header and trailer stanzas in the **/etc/qconfig** file define the default treatment of burst pages.

Note: In a remote print environment, the default is to print a header page and not a trailer page.

−c	Copies the file. To save disk space, the **enq** command remembers the name of the file, but

	does not actually copy the file itself. Use the **−c** flag if you want to continue changing the file while you are waiting for the current copy to be printed.
−C	Specifies that the **mail** command be used instead of the **write** command for error messages and job completion notification. (Using this flag is useful for writing PostScript applications since it allows better feedback from the printer.) Error messages and job completion messages (both generated by the **piobe** command) and any data read from the printer are also sent back by mail. The **−C** flag only applies to local print jobs. If you want to be notified when a job sent to a remote printer is completed, use the **−n** flag to receive a mail message. **Note:** There are some messages that cannot be redirected from **qdaemon** and the printer backend in any way. These are system errors and are sent directly to the **/dev/console** file.
−j	Specifies that the message `Job number is: nnn`, where `nnn` is the assigned job number, be displayed to standard output. This occurs only if the job is submitted to a local print queue.
−m*Text*	Submits an operator message with an **enq** command request. The specified text contains the message.
−M*File*	Submits an operator message with an **enq** command request. The specified file contains the text of the message.
−n	Notifies you when your job is finished. If the **−t** flag is also used, the **enq** command also notifies the user for whom the request is intended (see the **−t** flag).
−N *Number*	Prints *Number* copies of the file. Normally, a file is printed only once.
−o *Option*	Specifies that flags specific to the backend be passed to the backend. Thus, for each queue there are flags not described in this article that can be included on the **enq** command line. See the **piobe** command for a list of these flags.
−P *Queue*	Specifies the queue to which the job is sent. A particular device on a queue can be specified by typing `−P Queue:Device.`
−r	Removes the file after it has been successfully printed.
−R*Number*	Sets the priority of the current job to *Number*. This flag is used at job submission time. Use the **−a** flag to alter priority after the job is submitted. Higher numbers assign higher priority. The default priority is 15. The maximum priority is 20 for most users and 30 for the users with root user authority.
−t "*User*"	Labels the output for delivery to *User*. Normally the output is labeled for delivery to the user name of the person issuing the **enq** command request. The value of *User* must be a single word meeting the same requirements of a regular user ID.
−T *Title*	Puts title on the header page and displays it when the **−q** flag is specified. Normally the job title is the name of the file. If the **enq** command reads from standard input, the job title is **STDIN.#** where **#** is the process ID of the **enq** command.
−Y	Tells the **enq** command to ignore the rest of the command line after this flag. This is useful for discovering whether a queue is valid (if it is in the **/etc/qconfig** file). For example, typing `enq −P lp4 −Y` returns with an exit value of 0 if the line printer **lp4** is a valid queue; if otherwise, a nonzero value is returned. Using this flag is also good for forcing the **qdaemon** command to redigest the **/etc/qconfig** file.
−Z *Name*	Specifies originator of remote print jobs.

Print Job Priority Options

−a*Number*	Changes the priority of the named job to *Number*. The job must have been submitted for printing prior to entering the **enq** command with this flag. See the **−R** flag for a description of priorities. Use the **−#** flag to specify the job number. This flag is only valid for local print jobs.

−#*JobNumber* Specifies the job number used by the **enq −q** command or the **enq−a** command, and displays only the job specified in status output.

Notes:

1. Specify the **−P***Queue* to override the default destination printer.
2. If jobs 1, 2, and 3 are in the printer queue, and you specify that you want the status of job 3 while job 1 is running, the status information will show job 1 and job 3, not only job 3.
3. If you specify a job number that does not exist, the system displays the current job number on the queue instead of an error message.

Display Status Options

−A Provides status for all queues. This is like running the **enq −q** command once for each queue in the **qconfig** file.

−e Excludes status information from queues that are not under the control of the **qdaemon** command. The status from such queues may be in different formats. The **−e** flag can be used with any combination of flags.

−L Specifies the long status. This flag can be used with the **−A** flag or the **−q** flag. This flag cannot be used with the **−W** flag. If the **−L** flag and **−W f**lag are used simultaneously, the first one specified takes precedence. Use the **−L** flag to show multiple files to be printed in a single print job.

−q Displays the status of the default queue. The **LPDEST** and **PRINTER** environment variable control the name of the default printer. If the **LPDEST** environment variable contains a value, that value is always used first. If the **LPDEST** variable has no value, the **enq** command uses the **PRINTER** environment variable. If the **PRINTER** environment variable contains no value, then the **enq** command uses the system default.

Notes:

1. Use the **−P***Queue* flag with the **−q** flag to display the status of a particular queue.
2. Any destination command line options override both the **LPDEST** and the **PRINTER** environment variables.

−s Obtains the status of print queues without listing any files.

−u*Name* Specifies the user name for which to print job status.

−w*Seconds* Specifies continuous output of the queue status, updating the screen every *Seconds* specified until the queue is empty (see the **lpq** command). When the queue is empty, the process halts. This flag is only used with either the **−q** flag, or the **−A** flag, or the **−L** flag.

−W Specifies the wide status format with longer queue names, device names, and job numbers. Job number information is available on AIX Version 4.3.2 and later. This flag can be used with the **−A** flag or the **−q** flag. It cannot be used with the **−L** flag. If the **−L** flag and **−W f**lag are used simultaneously, the first one specified takes precedence.

Change the queue and queue Daemon Status Options

−d Runs the **digest** command on the **/etc/qconfig** file. Once the digest is completed, any changes to the **/etc/qconfig** file are reflected in the **/etc/qconfig.bin** file. A user must have root user authority to run this option.

In addition to the previous flags available to all users, the **enq** command accepts the following flags when they are entered by users that have root user authority. Root user authority means that you are root or you belong to the **printq** group.

Note: The following flags can only be used on local print jobs.

−D Device DOWN. Turns off the device associated with the queue. The **qdaemon** process no longer send jobs to the device, and entering the **enq−q** command shows its status as DOWN. Any job currently running on the device is allowed to finish.

−G Die GRACEFULLY. Ends the **qdaemon** process after all currently running jobs are finished. Use of this flag is the only clean way to bring the **qdaemon** process down. Use of the **kill** command may cause problems, such as jobs hanging up in the queue.

If the **qdaemon** process is running under **srcmstr** (the default configuration), **enq −G** does not prevent **qdaemon** from being restarted automatically. You must use the **chssys** command, which changes the default configuration and prevents the automatic restart of the **qdaemon** process. The following command:

```
chssys −s qdaemon −O
```

issued prior to the **enq −G** command, prevents the automatic restart of **qdaemon**.

The following command:

```
startsrc −s qdaemon
```

restarts the **qdaemon** process manually.

−K Acts the same as the **−D** flag, except that all current jobs are KILLED. They remain in the queue, and are run again when the device is turned on.

−L Specifies the long status. This flag can be used with the **−A** flag or the **−q** flag. Use the **−L** flag to show multiple files to be printed in a single print job.

−U Brings UP the device associated with a queue. The **qdaemon** process sends jobs to it again and entering the **enq −q** command shows its status as READY.

> **Note:** If more than one device is associated with a queue, you must specify the device as well as the queue when you use the **−D** flag, the **−K** flag, and the **−U** flags. For example, entering `−P lp:lpd` designates the same device only if there is no other device on that queue.

Cancel Options

−X	Cancels the printing of your jobs. If you have root user authority, all jobs on the specified queue are deleted. This flag is only valid on local print jobs.
−x *Number*	Cancels the printing of the specified job *Number*.
−P *Printer*	Specifies the *Printer* where either all jobs or the selected job number is to be canceled.

> **Attention:** If you have root user authority and do not specify a queue, all jobs on all queues are deleted.

Holding and Releasing a Print Job Options

−# *JobNumber*	Designates the number of the print job to be held or released.
−h	Holds the specified print job.
−H	Queues and holds the file indicated with the *File* parameter.
−p	Releases the specified print job.
−P *Queue*	Designates the print queue to be held or released.
−u *User*	Designates the user whose print jobs are to be held or released.

Moving Print Job Options

−# *JobNumber*	Designates the number of the print job to be moved.
−P *Queue*	Designates the print queue to be moved. The value of the *Queue* variable can be a queue name or in the form queue:device name.
−Q *NewQueue*	Designates the target queue where the print job will be moved to. The value of the *NewQueue* variable can be in the form of a queue name or in the form queue:device name.
−u *User*	Designates the user whose print jobs are to be moved.

Security

Auditing Events:

Event	**Information**
ENQUE_admin	Queue name, device name, job name, user name

Examples

1. To print the file `memo` on the default printer, enter:

   ```
   enq memo
   ```

2. To print the file `prog.c` with page numbers, enter:

   ```
   pr prog.c | enq
   ```

   The **pr** command puts a heading at the top of each page that includes the date the file was last modified, the name of the file, and the page number. The **enq** command then prints the file.

3. To print a file with page numbers, reading from standard input, enter:

   ```
   pr x | enq −P bill −n −r fn1 − fn3
   ```

   The dash (`−`) special file name tells the **enq** command to read from standard input. Normally the **enq** command will not read from standard input if there are file names on the command line. It also indicates the order in which to print things. The **pr** command creates a page numbered version of the file `x` and passes it to the **enq** command, which creates a temporary file containing that output in the **/var/spool/qdaemon** file.

   The **enq** command creates a job with four files and submits it to the queue named `bill`. It will print the `fn1` file twice. Then it will print whatever the output of the **pr** command was. Lastly it will print the file `fn3`. The four files are treated as one job for the purposes of burst pages. Notification is sent (the `−n` flag) when the job is complete. Since the `−r` flag was specified, the `fn1` and `fn3` files are removed at job completion. The temporary file created by the dash (`−`) file is always deleted.

   The **pr** command puts a heading at the top of each page that includes the date the file was last modified, the name of the file, and the page number. The **enq** command then prints the file.

4. To print the file `report` on the next available printer configured for the `fred` queue, enter:

   ```
   enq −P fred report
   ```

5. To print several files beginning with the prefix `sam` on the next available printer configured for the `fred` queue, enter:

   ```
   enq −P fred sam*
   ```

All files beginning with the prefix `sam` are included in one print job. Normal status commands show only the title of the print job, which in this case is the name of the first file in the queue unless a different value was specified with the **−T** flag. To list the names of all the files in the print job, use the long status command **enq−A−L**.

6. To check the print queue to see if a file is still waiting to be printed, enter:

   ```
   enq −q
   ```

   This command displays the status of the user's default queue. If the file is not yet printed, then it appears in the queue status listing. The system default queue is defined as the first queue in the **/etc/qconfig[.bin]** file. Users can have their own default override by setting and exporting the **PRINTER** environment variable.

7. To display the status of a nondefault queue, `lp0`, enter:

   ```
   enq −q −P lp0
   ```

8. To obtain the long queue status, enter:

   ```
   enq −L
   ```

9. To obtain status on all queues, enter:

   ```
   enq −A
   ```

10. To obtain long status on all queues, enter:

    ```
    enq −A −L
    ```

11. To obtain the status of the default queue, in wide format, for AIX Version 4.2.1 or later, enter:

    ```
    enq −W
    ```

12. To obtain the wide status of all queues for AIX Version 4.2.1 or later, enter:

    ```
    enq −W −A
    ```

13. To stop printing a job (a job is one or more files), enter:

    ```
    enq −x 413
    ```

    This command cancels the request you made earlier to print a job. The number was obtained from the listing obtained by entering the **enq −q** command. If the job is currently being printed, the printer stops immediately. If the job has not been printed yet, it is removed from the queue so that it will not be printed. If the job is not in the queue, the **enq** command displays a message similar to the following:

    ```
    no such request from you -- perhaps it's done?
    ```

14. To disconnect a printer from the queuing system, enter:

    ```
    enq −P lp0:dlp0 −D
    ```

    Entering this command stops the **enq** command requests from being sent to the printer that serves the `lp0` queue. If a file is currently printing, it is allowed to finish. You must be able to execute the **qadm** command to run this command.

    > **Note:** The printers serving a given queue are named by the device stanza name as it appears in the **/etc/qconfig[.bin]** file.

15. To print a file with page numbers using the **piobe** command backend on the default printer, enter:

    ```
    enq −o −p filename
    ```

    The `−p` flag is not looked at by the **enq** command. The `−o` flag tells the **enq** command to pass the next item, which can be in quotes, to the backend unchanged. So, the **enq** command passes the `−p` flag to the **qdaemon** process, which in turn passes it to the backend **piobe**. The `−p` flag causes **piobe** to execute the **/usr/bin/pr** filter to apply page numbers to the document before giving data to the device. Multiple options can be given in quotes preceded by one `−o` flag or without quotes and individually preceded by more than one `−o` flag.

16. Assuming a **qconfig** file with the following information:

    ```
    qname:
                   device = fred
    fred:
                   file = /tmp/hello
                   backend = /usr/bin/sh /usr/bin/diff
    ```

    And given the following commands:

    ```
    rm /tmp/hello
    touch /tmp/hello
    pr /etc/hosts|enq −P qname:fred − /etc/hosts
    ```

    The **qdaemon** process executes the `/usr/bin/diff` program with two arguments, one of which is a temporary file name and the other being the `/etc/hosts` file. The only difference between the two files is that one was run through the **pr** command. The `/tmp/hello` file will contain the differences between the two files. The **qdaemon** process does not create the `/tmp/hello` file if it does not exist.

17. The following command:

    ```
    enq −m'i want pink paper for this job' /etc/passwd
    ```

    sends the specified operator message to the operator's console just before the print job is to print. The operator must respond to this message to continue or cancel the job.

    ```
    enq −M pink /etc/passwd
    ```

    This command accomplishes the same thing, only the message is contained in a file called `pink`.

18. To cancel all jobs in the `fred` queue, enter:

    ```
    enq −X −P fred
    ```

    If the user who entered this command has root user authority, all the jobs from the `fred` queue are deleted. If the user does not have root user authority, only the users jobs are deleted from that queue.

19. To queue the file named `MyFile` and return the `MyFile` job number to the **jdf** file, enter:

    ```
    enq −j MyFile
    ```

20. To hold print job number `310`, enter:

    ```
    enq −h −#310
    ```

    To release the hold on print job number `310`, enter:

```
enq −p −#310
```

21. To hold all the print jobs on queue `lp0`, enter:

    ```
    enq −h −P lp0
    ```

    To release the `lp0` queue, enter:

    ```
    enq −p −P lp0
    ```
22. To hold all print jobs created by `fred`, enter:

    ```
    enq −h −u fred
    ```

    To release the print jobs created by `fred`, enter:

    ```
    enq −p −u fred
    ```
23. To move job number `318` to queue `lp0`, enter:

    ```
    enq −Q lp0 −#318
    ```

The flags that control moving print jobs work in the same way as the flags that hold the print files. The hold flags and variables are illustrated in the preceding examples.

Files

/usr/sbin/qdaemon	Queuing daemon.
/etc/qconfig	Queue configuration file.
/var/spool/lpd/qdir/*	Queue requests.
/var/spool/lpd/stat/*	Information on the status of the devices.
/var/spool/qdaemon/*	Temporary copies of enqueued files.
/etc/qconfig.bin	Digested, binary version of the **/etc/qconfig** file.

Related Information

The **chquedev** command, **lsque** command, **mkque** command, **rmque** command.

The **qconfig** file.

Changing / Showing Queue Characteristics in *AIX Version 4.3 Guide to Printers and Printing*.

Printer Overview for System Management in *AIX Version 4.3 Guide to Printers and Printing*.

Printer−Specific Information in *AIX Version 4.3 Guide to Printers and Printing*.

Printer Support in *AIX Version 4.3 Guide to Printers and Printing*.

Spooler Overview for System Management in *AIX Version 4.3 Guide to Printers and Printing*.

Virtual Printer Definitions and Attribute in *AIX Version 4.3 Guide to Printers and Printing*.

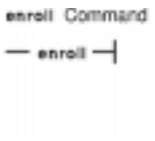
Printer Colon File Conventions in *AIX Version 4.3 Guide to Printers and Printing*.

enroll Command

Purpose

Sets up a password used to implement a secure communication channel.

Syntax



enroll

Description

The **enroll** command establishes a password and secures a communication channel in which messages can only be read by the intended recipient. The password is used to receive secret mail.

The **enroll** command is used with the **xsend** and **xget** commands to send and receive secret mail. The **xsend** command sends secret mail. The **xget** command asks for your password and gives you your secret mail.

Examples

To set up a password, enter:

```
enroll
```

When prompted, enter your password. This allows other users on your system to send you secret mail. Use the **xget** command to read the secret mail.

Files

/var/spool/secretmail/User.key	Contains the encrypted key for the user.
/usr/bin/enroll	Contains the **enroll** command.

Related Information

The **mail** command, **xget** command, **xsend** command.

Mail Overview in *AIX Version 4.3 System Management Guide: Communications and Networks*.

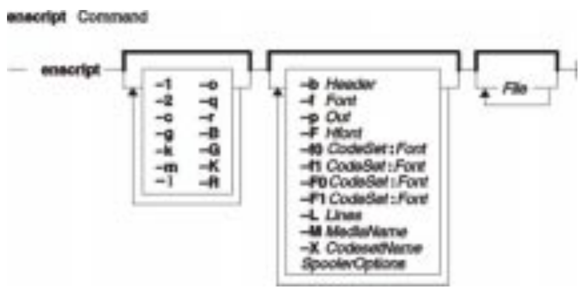
Sending and Receiving Secret Mail in *AIX Version 4.3 System Management Guide: Communications and Networks*.

enscript Command

Purpose

Converts text files to PostScript format for printing.

Syntax



enscript [**−1 −2−c−g−k−l −m−o−q−r−B−G−K−R**] [**−b***Header*] [**−f** *Font*] [**−f0***CodeSet***:***Font*] [**−f1***CodeSet***:***Font*] [**−p** *Out*] [**−F** *Hfont*] [**−F0***CodeSet***:***Font*] [**−F1***CodeSet***:***Font*] [**−L** *Lines*] [**−M** *MediaName*] [**−X** *CodesetName*] [*SpoolerOptions*] [*File ...*]

Description

The **enscript** command reads a text file, converts it to PostScript format, and spools the file for printing on a PostScript printer. You can use this command to specify fonts, headings, limited formatting options, and spooling options.

For example:

```
enscript −daleph bubble.txt
```

prints a copy of the **bubble.txt** file on the printer called aleph, and

```
enscript −2r finder.c
```

prints a two−up landscape listing of the **finder.c** file on the default printer.

The **ENSCRIPT** environment variable can be used to specify defaults. The value of **ENSCRIPT** is parsed as a string of arguments before the arguments that are displayed on the command line. For example:

```
ENSCRIPT='−fTimes−Roman8'
```

sets your default body type size and font to 8−point Times Roman.

Information containing various media sizes for the **psdit** command and the **enscript** command are contained in the file **/usr/lib/ps/MediaSizes**.

The information required for each entry in the **MediaSizes** file can be obtained from the **PostScript Printer Description**, or **PPD**, file that matches the PostScript printer used with TranScript. The **PPD** files are available from Adobe Systems, Incorporated. The measurements extracted from the **PPD** files are expressed in a printer's measure called points. A printer's point is 1/72 of an inch.

Any line in the **MediaSizes** file beginning with an ASCII * (asterisk) is ignored when matching media−size names provided on the command line to the **enscript** command and the **psdit** command.

Each entry in the **MediaSizes** file contains either 8 or 9 fields. The first 8 fields are required for all entries. The 9th field is optional. Fields are separated by white space. The fields for each entry are as follows:

Field Name	Description
`EntryName`	Contains a character string to match against a media name provided with the **−M** flag with the **enscript** command or the **psdit** command.
`MediaWidth`	Specifies the media width in points.
`MediaDepth`	Specifies the media depth in points.
`ImageableLLX`	Specifies the imageable lower left−hand corner x coordinate in points.
`ImageableLLY`	Specifies the imageable lower left−hand corner y coordinate in points.
`ImageableURX`	Specifies the imageable upper right−hand corner x coordinate in points.
`ImageableURY`	Specifies the imageable upper right−hand corner y coordinate in points.
`PageRegionName`	Specifies the PostScript sequence for the particular printer to identify the size of the imageable area.
`PaperTrayName`	Specifies the PostScript sequence for the particular printer to select a particular paper/media tray. This field is optional. **Note:** The sequence can be multiple PostScript operators or words for both the `PageRegionName` field and the `PaperTrayName` field. To specify such a sequence, use the ASCII " (double quote character) to delimit the entire sequence.

The following table shows examples of field entries in the **MediaSizes** file:

Name	Width	Depth	llx	lly	urx	ury	Page− Region− Name	Paper− Tray− Name
Letter	612	792	18	17	597	776	Letter	

PostScript Font Information

The PostScript Fonts for Transcript table shows the fonts available for the enscript command. The Font Name is specified with the **−F** and **−fencscipt** command flags. The alphabetic characters are case−sensitive:

PostScript Fonts for Transcript	
Font Name	**Font Family**
AvantGarde−Book	AvantGarde
AvantGarde−Demi	AvantGarde
AvantGarde−DemiOblique	AvantGarde
AvantGarde−BookOblique	AvantGarde
Bookman−Demi	Bookman
Bookman−DemiItalic	Bookman
Bookman−Light	Bookman
Bookman−LightItalic	Bookman
Courier	Courier

Courier−Bold	Courier
Courier−BoldOblique	Courier
Courier−Oblique	Courier
Garamond−Bold	Garamond
Garamond−BoldItalic	Garamond
Garamond−Light	Garamond
Garamond−LightItalic	Garamond
Helvetica	Helvetica
Helvetica−Bold	Helvetica
Helvetica−Oblique	Helvetica
Helvetica−BoldOblique	Helvetica
Helvetica−Narrow	Helvetica
Helvetica−Narrow−Bold	Helvetica
Helvetica−Narrow−BoldOblique	Helvetica
Helvetica−Narrow−Oblique	Helvetica
LubalinGraph−Book	Lubalin
LubalinGraph−BookOblique	Lubalin
LubalinGraph−Demi	Lubalin
LubalinGraph−DemiOblique	Lubalin
Miryam−Iso	Miryam Iso
Miryam−IsoBold	Miryam Iso
Miryam−IsoBoldItalic	Miryam Iso
Miryam−IsoItalic	Miryam Iso
NarkissimIso	Narkissim Iso
NarkissimIso−Bold	Narkissim Iso
NarkissimIso−BoldItalic	Narkissim Iso
NarkissimIso−Italic	Narkissim Iso
NarkissTamIso	Narkiss Tam Iso
NarkissTamIso−Bold	Narkiss Tam Iso
NarkissTamIso−BoldItalic	Narkiss Tam Iso
NarkissTamIso−Italic	Narkiss Tam Iso
NewCenturySchlbk	NewCentury
NewCenturySchlbk−Bold	NewCentury

NewCenturySchlbk−Italic	NewCentury
NewCenturySchlbk−Roman	NewCentury
Optima	Optima
Optima−Bold	Optima
Optima−BoldOblique	Optima
Optima−Oblique	Optima
Palatino−Bold	Palatino
Palatino−BoldItalic	Palatino
Palatino−Italic	Palatino
Palatino−Roman	Palatino
Rokaa	Rokaa
Rokaa−Bold	Rokaa
Rokaa−BoldItalic	Rokaa
Rokaa−Italic	Rokaa
Setting	Setting
Setting−Bold	Setting
Setting−BoldItalic	Setting
Setting−Italic	Setting
ShalomIso	ShalomIso Iso
ShalomIso−Bold	ShalomIso Iso
ShalomIso−BoldItalic	ShalomIso Iso
ShalomIso−Italic	ShalomIso Iso
Souvenir−Demi	Souvenir
Souvenir−DemiItalic	Souvenir
Souvenir−Light	Souvenir
Souvenir−LightItalic	Souvenir
Times−Bold	Times
Times−BoldItalic	Times
Times−Italic	Times
Times−Roman	Times
Typing	Typing
Typing−Bold	Typing
Typing−BoldItalic	Typing

Typing−Italic	Typing
Symbol	(none)
ZapfChancery−MediumItalic	Zapf
ZapfDingbats	(none)

Parameters

SpoolerOptions Provides options for spooling the print file. The following are the *SpoolerOptions* flags:

{**−d** | **−P**}*Queue*	Queues the output to the named queue.
−n*Number*	Produces the specified number of copies. The default is 1.
−t*Title*	Sets job title for use on the first banner page.
File	Specifies the text file to be converted into PostScript format. If you leave this parameter blank, the **enscript** command reads from standard input.

Flags

−1	Sets in 1 column (the default).
−2	Sets in 2 columns.
−c	Truncates (cuts) lines that are longer than the page width. Normally, long lines are wrapped around to the following line on the page.
−g	Performs no function, but the **−g** flag is still accepted for backwards compatibility.
−k	Enables page prefeed (if the printer supports it). This allows simple documents (such as program listings in a single font) to print somewhat faster by keeping the printer running between pages.
−l	Simulates a line printer printing pages 66 lines long and omitting headers.
−m	Sends mail after the files are printed.
−o	Lists the missing characters if the **enscript** command cannot find characters in a font.
−q	Causes the **enscript** command to not report about what it is doing. The **enscript** command cannot report on pages, destination, omitted characters, and so on. Fatal errors are still reported to the standard error output.
−r	Rotates the output 90 degrees (landscape mode). Use this flag for output that requires a wide page or for program listings when used in conjunction with the **−2** flag. The following example shows one way to get program listings: `enscript −2r File . . .`
−B	Omits page headings.
−G	Prints in gaudy mode, causing page headings, dates, and page numbers to be printed in a flashy style, at some slight performance expense.
−K	Disables page prefeed (the default).
−R	Prints in portrait mode (unrotated), which is the default.
−b*Header*	Sets the string to be used for page headings to the value of the

Header variable. The default header is constructed from the file name, its last modification date, and a page number.

−f*Font*
: Sets the font to be used for the body of each page. The default is Courier10, unless the two−column rotated mode is used, in which case it defaults to Courier7.

  Notes:

  1. A PostScript font name (such as Times−Roman, Times−BoldItalic, Helvetica, Courier).
  2. A point size (1 point = 1/72 inch). Fonts are specified in this fashion: Courier−Bold8 is 8−point Courier Bold; Helvetica12 is 12−point Helvetica.

−f0*Codeset***:***Font*
: Sets the character codeset name, which is written into the PostScript file, and the SBCS font to use for the body of each page. The default is determined by the **/usr/lib/ps/transcript.conf** configuration file for each locale.

−f1*Codeset***:***Font*
: Sets the character codeset name, which is written into the PostScript file, and the MBCS font to use for the body of each page. The default is determined by the **/usr/lib/ps/transcript.conf** configuration file for each locale.

−p*Out*
: Causes the PostScript file to be written to the named file rather than being spooled for printing. As a special case, entering the following will send the PostScript file to standard output:

```
−p −
```

−F*Hfont*
: Sets the font to be used for page headings. The default is Courier Bold10.

  Note: Font specifications have two parts:

  - A PostScript font name (such as Times−Roman, Times−BoldItalic, Helvetica, Courier).
  - A point size (1 point = 1/72 inch). Fonts are specified in this fashion: Courier−Bold8 is 8−point Courier Bold; Helvetica12 is 12−point Helvetica.

−F0*Codeset***:***Font*
: Sets the character codeset name, which is written into the PostScript file, and the SBCS font to use for the header of each page. The default is determined by the **/usr/lib/ps/transcript.conf** configuration file for each locale.

−F1*Codeset***:***Font*
: Sets the character codeset name, which is written into the PostScript file, and the MBCS font to use for the header of each page. The default is determined by the **/usr/lib/ps/transcript.conf** configuration file for each locale.

−L*Lines*
: Sets the maximum number of lines to print on a page. The **enscript** command usually computes how many lines to put on a page based on point size. (It might put fewer per page than requested by the **−L** flag.)

−M*MediaName*
: Specifies a media name to use to determine the amount of imageable area on the paper. The name provided is matched against entries in the **MediaSizes** file. For instance, `−M legal` would request a legal size of paper as the imageable area. If this flag is not used, the default size is letter size, which is 8.5 inches wide by 11.0 inches deep (21.6 cent. wide by 27.9 cent. deep).

−X*CodesetName*	Specifies the code set for the input data. By default, the input code set is determined by the **nl_langinfo** subroutine. If this flag is used, the codeset is determined by the *CodesetName*.

International Character Support

All characters not found in a font will be replaced with the character ? (question mark). For a complete list of characters that were not found, use the **−o** flag. The **NLSvec** file provides information about character translation.

Environment Variables

ENSCRIPT	Specifies a string of options to be used by the **enscript** command.
LPDEST	Specifies a printer destination. The **−d** spooler option overrides this environment variable.
PSLIBDIR	Provides a path name of a directory to use instead of the **/usr/lib/ps** directory for the **enscript** command prologue and font metric files.
PSTEMPDIR	Provides a path name of temporary directory to use instead of the **/var/tmp** directory of spooled temporary files.
TRANSCRIPT	Provides the absolute path name of a file to use, instead of the **/usr/lib/ps/transcript.conf** configuration file, for MBCS handling.

Files

/usr/lib/ps/*.afm	Contains Adobe Font Metrics (AFM) files.
/usr/lib/ps/font.map	Contains the list of font names with their abbreviations.
/usr/lib/ps/enscript.pro	Contains prologue for **enscript** command files.
/usr/lib/ps/MediaSizes	Contains the default file used for media sizes.

Related Information

The **col** command, **eqn** command, **lp** command, **managefonts** command, **nroff** command, **pic** command, **pr** command, **ps630** command, **psdit** command, **refer** command, **tbl** command, **troff** command.

The **nl_langinfo** subroutine.

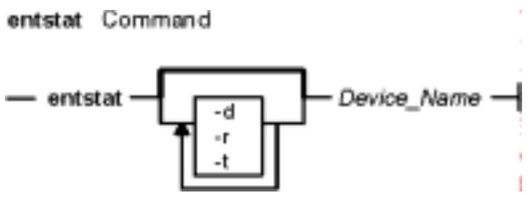
NLSvec File provides information about character translation.

entstat Command

Purpose

Shows ethernet device driver and device statistics.

Syntax



entstat [**−d−r−t**] *Device_Name*

Description

The **entstat** command displays the statistics gathered by the specified Ethernet device driver. The user can optionally specify that the device−specific statistics be displayed in addition to the device generic statistics. If no flags are specified, only the device generic statistics are displayed.

This command is also invoked when the **netstat** command is run with the **−v** flag. The **netstat** command does not issue any **entstat** command flags.

If an invalid *Device_Name* is specified, the **entstat** command produces an error message stating that it could not connect to the device.

Flags

−d	Displays all the statistics, including the device−specific statistics.
−r	Resets all the statistics back to their initial values. This flag can only be issued by privileged users.
−t	Toggles debug trace in some device drivers.

Parameters

Device_Name	The name of the Ethernet device, for example, **ent0**.

Statistic Fields

> **Note:** Some adapters may not support a specific statistic. The value of non−supported statistic fields is always 0.

The statistic fields displayed in the output of the **entstat** command and their descriptions are:

Title Fields

`Device Type`	Displays the description of the adapter type.
`Hardware Address`	Displays the Ethernet network address currently used by the device.

`Elapsed Time`	Displays the real time period which has elapsed since last time the statistics were reset. Part of the statistics may be reset by the device driver during error recovery when a hardware error is detected. There will be another Elapsed Time displayed in the middle of the output when this situation has occurred in order to reflect the time differences between the statistics.

Transmit Statistics Fields

`Packets`	The number of packets transmitted successfully by the device.
`Bytes`	The number of bytes transmitted successfully by the device.
`Interrupts`	The number of transmit interrupts received by the driver from the adapter.
`Transmit Errors`	The number of output errors encountered on this device. This is a counter for unsuccessful transmissions due to hardware/network errors.
`Packets Dropped`	The number of packets accepted by the device driver for transmission which were not (for any reason) given to the device.
`Max Packets on S/W Transmit Queue`	The maximum number of outgoing packets ever queued to the software transmit queue.
`S/W Transmit Queue Overflow`	The number of outgoing packets which have overflowed the software transmit queue.
`Current S/W+H/W Transmit Queue Length`	The number of pending outgoing packets on either the software transmit queue or the hardware transmit queue.
`Broadcast Packets`	The number of broadcast packets transmitted without any error.
`Multicast Packets`	The number of multicast packets transmitted without any error.
`No Carrier Sense`	The number of unsuccessful transmissions due to the no carrier sense error.
`DMA Underrun`	The number of unsuccessful transmissions due to the DMA underrun error.
`Lost CTS Errors`	The number of unsuccessful transmissions due to the loss of the Clear−to−Send signal error.
`Max Collision Errors`	The number of unsuccessful transmissions due to too many collisions. The number of collisions encountered exceeded the number of retries on the adapter.
`Late Collision Errors`	The number of unsuccessful transmissions due to the late collision error.
`Deferred`	The number of outgoing packets deferred during transmission. Deferred means that the adapter had to defer while trying to transmit a frame. This condition occurs if the network is busy when the adapter is ready to transmit. The adapter will only defer the first attempt to send a packet. After that the adapter will transmit the packet without checking. If the network is still busy then a collision will be recorded.

`SQE Test`	Contains the number of "Signal Quality Error" Tests (i.e. Heartbeat) performed successfully during transmission.
`Timeout Errors`	The number of unsuccessful transmissions due to adapter reported timeout errors.
`Single Collision Count`	The number of outgoing packets with single (only one) collision encountered during transmission.
`Multiple Collision Count`	The number of outgoing packets with multiple (2 − 15) collisions encountered during transmission.
`Current HW Transmit Queue Length`	The number of outgoing packets which currently exist on the hardware transmit queue.
`CRC Errors`	The number of incoming packets with the Checksum (FCS) error.
`DMA Overrun`	The number of incoming packets with the DMA overrun error.
`Alignment Errors`	The number of incoming packets with the alignment error.
`No Resource Errors`	The number of incoming packets dropped by the hardware due to the no resource error. This error usually occurs because the receive buffers on the adapter were exhausted. Some adapters may have the size of the receive buffers as a configurable parameter. Check the device configuration attributes (or smit helps) for possible tuning information.
`Receive Collision Errors`	The number of incoming packets with the collision errors during the reception.
`Packet Too Short Errors`	The number of incoming packets with the length error indicating that the packet size is less than the Ethernet minimum packet size.
`Packet Too Long Errors`	The number of incoming packets with the length error indicating that the packet size is bigger than the Ethernet maximum packet size.
`Packets Discarded by Adapter`	The number of incoming packets dropped by the hardware for any other reasons.
`Receiver Start Count`	The number of times that the receiver (receive unit) on the adapter has been started.

Receive Statistics Fields

`Packets`	The number of packets received successfully by the device.
`Bytes`	The number of bytes received successfully by the device.
`Interrupts`	The number of receive interrupts received by the driver from the adapter.
`Receive Errors`	The number of input errors encountered on this device. This is a counter for unsuccessful reception due to hardware/network errors.
`Packets Dropped`	The number of packets received by the device driver from this device which were not (for any reason) given to a network demuxer.
`Bad Packets`	The number of bad packets received (i.e. saved) by the device driver.

`Broadcast Packets`	The number of broadcast packets received without any error.
`Multicast Packets`	The number of multicast packets received without any error.
`CRC Errors`	The number of incoming packets with the Checksum (FCS) error.
`DMA Overrun`	The number of incoming packets with the DMA overrun error.
`Alignment Errors`	The number of incoming packets with the alignment error.
`No Resource Errors`	The number of incoming packets dropped by the hardware due to the no resource error.
`Receive Collision Errors`	The number of incoming packets with the collision errors during the reception.
`Packet Too Short Errors`	The number of incoming packets with the length error indicating that the packet size is less than the Ethernet minimum packet size.
`Packet Too Long Errors`	The number of incoming packets with the length error indicating that the packet size is bigger than the Ethernet maximum packet size.
`Packets Discarded by Adapter`	The number of incoming packets dropped by the hardware for any other reasons.
`Receiver Start Count`	The number of times that the receiver (receive unit) on the adapter has been started.

General Statistics Fields

`No mbuf Errors`	The number of times that mbufs were not available to the device driver. This usually occurs during receive operations when the driver must obtain mbuf buffers to process inbound packets. If the mbuf pool for the requested size is empty, the packet will be discarded. The **netstat −m** command can be used to confirm this.
`Adapter Reset Count`	The number of times that the adapter has been restarted (re−initialized).
`Driver Flags`	The device driver internal status flags that are currently turned on.

Device Specific Statistics Fields

This part of the display may be different for each type of the adapter. It may contain adapter specific information and some extended statistics that were not included in the generic statistics. Some adapters may not have any device specific statistics.

Examples

1. To display the device generic statistics for **ent0**, enter:

   ```
   entstat ent0
   ```

   This produces the following output:

   ```
   ETHERNET STATISTICS (ent0) :
   Device Type: Ethernet High Performance LAN Adapter
   Hardware Address: 02:60:8c:2e:d0:1d
   Elapsed Time: 0 days 0 hours 8 minutes 41 seconds

   Transmit Statistics:     Receive Statistics:
   --------------------     -------------------
   Packets: 3               Packets: 2
   Bytes: 272               Bytes: 146
   Interrupts: 3            Interrupts: 2
   Transmit Errors: 0       Receive Errors: 0
   ```

```
Packets Dropped: 0       Packets Dropped: 0
Max Packets on S/W       Bad Packets: 0
Transmit Queue:0
S/W Transmit Queue
Overflow: 0
Current S/W+H/W Transmit
Queue Length: 0

Broadcast Packets: 2     CRC Errors: 0
Multicast Packets: 0     Broadcast Packets: 1
No Carrier Sense: 0      Multicast Packets: 0
DMA Underrun: 0          DMA Overrun: 0
Lost CTS Errors: 0       Alignment Errors: 0
Max Collision Errors: 0  No Resource Errors: 0
Late Collision Errors: 0 Receive Collision Errors: 0
Deferred: 0              Packet Too Short Errors: 0
SQE Test: 0              Packet Too Long Errors: 0
Timeout Errors: 0        Packets Discarded by Adapter: 0
Single Collision         Receiver Start Count: 1
Count: 0
Multiple Collision Count: 0
Current HW Transmit Queue
Length: 0

General Statistics:
-------------------
No mbuf Errors: 0
Adapter Reset Count: 0
Driver Flags: Up Broadcast Running Simplex
```

2. To display the Ethernet device generic statistics and the ethernet device−specific statistics for **ent0**, enter:

   ```
   entstat −d ent0
   ```

   This produces the following output:

   ```
   ETHERNET STATISTICS (ent0) :
   Device Type: Ethernet High Performance LAN Adapter
   Hardware Address: 02:60:8c:2e:d0:1d
   Elapsed Time: 0 days 2 hours 6 minutes 30 seconds

   Transmit Statistics:      Receive Statistics:
   --------------------      -------------------
   Packets: 3                Packets: 2
   Bytes: 272                Bytes: 146
   Interrupts: 3             Interrupts: 2
   Transmit Errors: 0        Receive Errors: 0
   Packets Dropped: 0        Packets Dropped: 0
   Max Packets on S/W        Receiver Start Count: 1
   Transmit Queue:0
   Bad Packets: 0
   S/W Transmit Queue Overflow: 0
   Current S/W+H/W Transmit Queue Length: 0

   Broadcast Packets: 0      Broadcast Packets: 0
   Multicast Packets: 0      Multicast Packets: 0
   No Carrier Sense: 0       CRC Errors: 0
   DMA Underrun: 0           DMA Overrun: 0
   Lost CTS Errors: 0        Alignment Errors: 0
   Max Collision Errors: 0   No Resource Errors: 0
   Late Collision Errors: 0  Receive Collision Errors: 0
   Deferred: 0               Packet Too Short Errors: 0
   SQE Test: 0               Packet Too Long Errors: 0
   Timeout Errors: 0         Packets Discarded by Adapter: 0
   ```

```
Single Collision Count: 0 Receiver Start Count: 1
Multiple Collision Count: 0
Current HW Transmit Queue Length: 0

General Statistics:
-------------------
No mbuf Errors: 0
Adapter Reset Count: 0
Driver Flags: Up Broadcast Running Simplex

Ethernet High Performance LAN Adapter Specific Statistics:
----------------------------------------------------------
Receive Buffer Pool Size: 37
Transmit Buffer Pool Size: 39
In Promiscuous Mode for IP Multicast: No
Packets Uploaded from Adapter: 0
Host End-of-List Encountered: 0
82586 End-of-List Encountered: 0
Receive DMA Timeouts: 0
Adapter Internal Data: 0x0 0x0 0x0 0x0 0x0
```

Related Information

The **atmstat** command, **fddistat** command, **netstat** command, **tokstat** command.

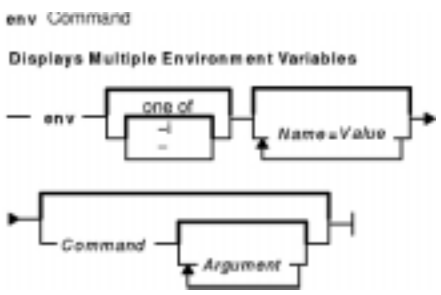
env Command

Purpose

Displays the current environment or sets the environment for the execution of a command.

Syntax

To Display Multiple Environment Variables



env [**−i** |**−**] [*Name*=*Value*]... [*Command* [*Argument* ...]]

To Display A Single Environment Variable

env Command
Displays A Single Environment Variable
env
Name

env [*Name*]

Description

The **env** command allows you to display your current environment or run a specified command in a changed environment.

If no flags or parameters are specified, the **env** command displays your current environment, showing one *Name*=*Value* pair per line.

Flags

−i	Ignores the inherited environment and invokes the command specified by the *Command* parameter with the environment specified by the *Name*=*Value* parameters.
−	Obsolete flag. Use the **−i** flag.

Parameters

Name=Value	You can run a command in a modified version of the current environment by specifying one or more *Name=Value* parameters. Use the **−i** flag if you wish to replace the entire current environment with the specified *Name =Value* parameters. In either case, environment changes are effective only while the specified command is running.
Command	The *Command* parameter has an optional *Argument* variable. If the specified command is one

of the Korn shell special built−in commands, results are unspecified. Korn shell built−in commands are described in the **ksh** command.

Exit Status

If the *Command* parameter is specified, the exit status of the **env** command is the exit status of the command specified in the *Command* parameter. Otherwise, the **env** command exits with one of the following values:

0	The **env** command completed successfully.
1−125	An error occurred in the **env** command.
126	The command specified by the *Command* parameter was found, but could not be invoked.
127	The command specified by the *Command* parameter was not found.

Examples

1. To change the **TZ** environment variable while running the **date** command, enter:

   ```
   TZ=MST7MDT date
   ```

   OR

   ```
   env TZ=MST7MDT date
   ```

   Each of these commands displays the time in mountain time and the current date. The two commands shown are equivalent. When the **date** command is finished, the previous value of the **TZ** environment variable takes effect again.

2. To run the **make** command in an environment that consists only of definitions for the **PATH, IDIR,** and **LIBDIR** environment variables, enter:

   ```
   env −i PATH=$PATH IDIR=/$HOME/include LIBDIR=/$HOME/lib make
   ```

You must specify the **PATH** environment variable so that the shell can find the **make** command. When the **make** command is finished, the previous environment takes effect.

Files

/usr/bin/env Contains the **env** command.

Related Information

The **printenv** command, **ksh** command.

The **environment** file.

The **profile** file format.

The **exec** subroutines.

Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

Profiles Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

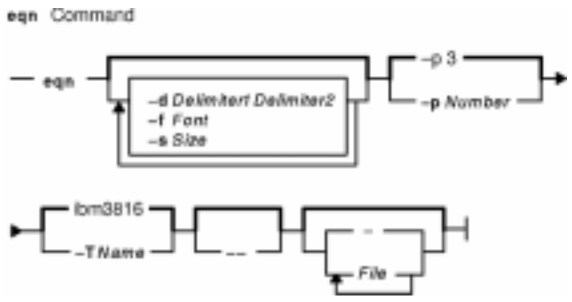
Shells Overview in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

eqn Command

Purpose

Formats mathematical text for the **troff** command.

Syntax



eqn [**−d** *Delimiter1Delimiter2*] [**−f** *Font*] [**−p** *Number*] [**−s** *Size*] [**−T** *Name*] [**−−**] [*File* ... | **−**]

Description

The **eqn** command is a **troff** preprocessor for typesetting mathematical text on a phototypesetter or comparable device. The output of the **eqn** command is generally piped into the **troff** command, as follows:

eqn [*Flag...*] *File...* **|** **troff** [*Flag...*] **|** [*Typesetter*]

The **eqn** command reads files specified by the *File* parameter. It reads standard input when a − (minus sign) is specified as the last parameter. A line beginning with the **.EQ** macro marks the start of equation text. The end of equation text is marked by a line beginning with the **.EN** macro. These lines are not altered by the **troff** command, so they can be defined in macro packages to provide additional formatting function such as centering and numbering.

Keywords

The following are keywords known to both the **eqn** and **neqn** commands.

```
above      dot        gsize      over       tdefine
back       dotdot     hat        pile       tilde
bar        down       italic     rcol       to
bold       dyad       lcol       right      under
ceiling    fat        left       roman      up
ccol       floor      lineup     rpile      vec
col        font       lpile      size
cpile      from       mark       sqrt
define     fwd        matrix     sub
delim      gfont      ndefine    sup
```

Keywords recognized by the **eqn** command can be set apart with spaces, tabs, new lines, braces, double quotes, tildes, and circumflexes. Use { } (braces) for groupings; anywhere you can use a single character, such as X, you can substitute a complicated construction enclosed in braces. The ~ (tilde) represents a full space in the output, and the ^ (circumflex) represents a half−space.

Produce subscripts and superscripts using the **sub** and **sup** keywords. Produce fractions with the **over**keyword. Produce square roots with the **sqrt** keyword.

Introduce lower and upper limits using the **from** and **to** keywords. Produce delimiters (such as left and right brackets and braces) of the correct height using the **left** and **right** keywords. Legal characters after the **left** and **right** keywords are braces, brackets, bars, **c** and **f** for ceiling and floor, and `" "` (double quotes) for nothing at all (which is useful for a right−side−only bracket). A **left** character does not need a matching **right** character, but a **right** character must have a matching **left** character.

Vertical lists (piles) of things are made with the **pile**, **lpile**, **cpile**, and **rpile** keywords. Piles can have arbitrary numbers of elements. The **lpile** keyword left−justifies, the **pile** and **cpile** keywords center (but with different vertical spacing), and the **rpile** keyword right−justifies. Matrices are made with the **matrix** keyword. In addition, there is an **rcol** keyword for a right−justified column.

Diacritical marks are made with the **dot**, **dotdot**, **hat**, **tilde**, **bar**, **vec**, **dyad**, and **under** keywords.

You can change point sizes and fonts with the **size***Number* (or **size** +/−*Number*), **roman**, **italic**, **bold**, and **font** *Number* keywords. You can change point sizes and fonts globally in a document with the **gsize***Number* and **gfont** *Number* keywords, or with the command−line **−s***Number* and **−f***Number* flags.

Normally, subscripts and superscripts are reduced by three points from the previous size. You can change this with the command−line **−p***Number* flag.

You can line up successive display parameters. Place the **mark** keyword before the desired lineup point in the first equation; place the **lineup** keyword where it is to line up vertically in subsequent equations.

You can define shorthands or redefine existing keywords with the **define** keyword; for example:

```
define   Thing%Replacement%
```

The preceding example defines a new token called *Thing* that is replaced by *Replacement* whenever it appears thereafter. The % (percent sign) can be any character that does not occur in *Replacement*.

Keywords such as **sum**, **int**, **inf**, and shorthands such as **>=**, **!=**, and **−>** are recognized. Greek letters are spelled out in the desired case, as in **alpha** or **GAMMA**. Mathematical words such as **sin**, **cos**, and **log** are made Roman automatically. The **troff** command 4−character escapes, such as **\(dd**, which produces the double dagger, can be used anywhere. Strings enclosed in `" "` (double quotes) are passed through untouched. This permits keywords to be entered as text, and can always be used to communicate with the **troff** command.

Flags

−d*Delimiter1Delimiter2*	Sets two ASCII characters, *Delimiter1* and *Delimiter2,* as delimiters of the text to be processed by the **eqn** command, in addition to the input enclosed by the **.EQ** and **.EN** macros. The text between these delimiters is treated as input to the **eqn** command. **Note:** Within a file, you can also set delimiters for **eqn** text using the **delim***Delimiter1Delimiter2*command. They are turned off by the **delim off** command. All text not between **.EQ** and **.EN** macros is passed through unprocessed.
−f*Font*	Changes font in all the **eqn** command processed text to the value specified by the *Font* variable. The *Font* value (a font name or position) must be one or two ASCII characters.
−p*Number*	Reduces subscripts and superscripts the specified number of points in size (the

	default is 3).
−s*Size*	Changes point size in all the **eqn** command processed text to the value specified by the *Size* variable.
−T*Name*	Prepares the output for the specified printing device. Terminal Names for Phototypesetter or Comparable Devices provides *Name* variables. The default is **ibm3816**.
−	Forces input to be read from standard input.
−−	(double dash) Indicates the end of flags.

Files

/usr/share/lib/pub/eqnchar Contains special character definitions.

Related Information

The **checkeq** command, **mmt** command, **mvt** command, **neqn** command, **nroff** command, **tbl** command, **troff** command.

The **eqnchar** file format contains special character definitions for the **eqn** and **neqn** commands.

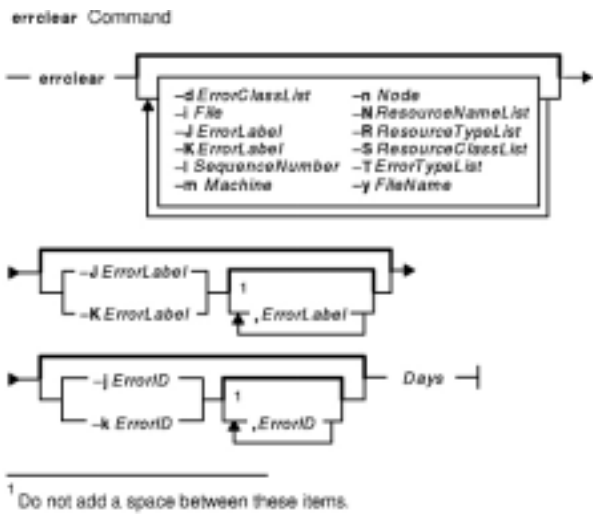
The **.EQ** and **.EN** macros, **mm** macro package, **mv** macro package.

errclear Command

Purpose

Deletes entries from the error log.

Syntax



errclear [**−d** *ErrorClassList*] [**−i** *File*] [**−J** *ErrorLabel* [*,Errorlabel*]] | [**−K** *ErrorLabel* [*,Errorlabel*]] [**−l** *SequenceNumber*] [**−m** *Machine*] [**−n** *Node*] [**−N** *ResourceNameList*] [**−R** *ResourceTypeList*] [**−S** *ResourceClassList*] [**−T** *ErrorTypeList*] [**−y** *FileName*] [**−j** *ErrorID* [**,***ErrorID*]] | [**−k** *ErrorID* [**,***ErrorID*]] *Days*

Description

The **errclear** command deletes error−log entries older than the number of days specified by the *Days* parameter. To delete all error−log entries, specify a value of **0** for the *Days* parameter.

If the **−i** flag is not used with the **errclear** command, the error log file cleared by **errclear** is the one specified in the error log configuration database. (To view the information in the error log configuration database, use the **errdemon** command.)

> **Note:** The **errclear** command clears the specified entries, but does not decrease the error log file size.

You can use the Web−based System Manager System application (**wsm system** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit errclear** fast path to run this command.

Flags

−d *List*	Deletes error−log entries in the error classes specified by the *List* variable. The *List* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters. The valid *List* variable values are **H** (hardware), **S** (software), **O** (**errlogger** messages), and **U** (undetermined).

−i*File*	Uses the error−log file specified by the *File* variable. If this flag is not specified, the **errclear** command uses the value from the error−log configuration database.
−j *ErrorID*[,*ErrorID*]	Deletes the error−log entries specified by the *ErrorID* (error identifier) variable. The *ErrorID* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−J*ErrorLabel*	Deletes the error−log entries specified by the *ErrorLabel* variable. The *ErrorLabel* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−k *ErrorID*[,*ErrorID*]	Deletes all error−log entries except those specified by the *ErrorID* (error identifier) variable. The *ErrorID* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−K*ErrorLabel*	Deletes all error−log entries except those specified by the *ErrorLabel* variable. The *ErrorLabel* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−l*SequenceNumber*	Deletes error−log entries with the specified sequence numbers. The *SequenceNumber* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−m *Machine*	Deletes error−log entries for the machine specified by the *Machine* variable. The **uname −m** command returns the value of the *Machine* variable.
−n *Node*	Deletes error−log entries for the node specified by the *Node* variable. The **uname −n** command returns the value of the *Node* variable.
−N *List*	Deletes error−log entries for the resource names specified by the *List* variable. The *List* variable is list of names of resources that have detected errors. For software errors, these are the names of resources that have detected errors. For hardware errors, these are names of devices or system components. It does not indicate that the component is faulty or needs replacement. Instead, it is used to determine the appropriate diagnostic modules to be used to analyze the error. The *List* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−R *List*	Deletes error−log entries for the resource types specified by the *List* variable. For hardware errors, the *List* variable is a device type. For software errors, the value of the *List* variable is **LPP**. The *List* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−S *List*	Deletes error−log entries for the resource classes specified by the *List* variable. For hardware errors, the *List* variable is a device class. The *List* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−T *List*	Deletes error−log entries for error types specified by the *List* variable. Valid *List* variable values are: **PERM**, **TEMP**, **PERF**, **PEND**, **INFO**, and **UNKN**. The *List* variable values can be separated by , (commas), or enclosed in " " (double quotation marks) and separated by , (commas) or space characters.
−y*FileName*	Uses the error−record template file specified by the *FileName* variable.

Security

Access Control: Only the root user can run this command.

Examples

1. To delete all entries from the error log, enter:

```
errclear 0
```

2. To delete all entries in the error log classified as software errors, enter:

   ```
   errclear −d S 0
   ```

3. To clear all entries from the alternate error−log file `/var/adm/ras/errlog.alternate`, enter:

   ```
   errclear −i /var/adm/ras/errlog.alternate 0
   ```

4. To clear all hardware entries from the alternate error−log file `/var/adm/ras/errlog.alternate`, enter:

   ```
   errclear −i /var/adm/ras/errlog.alternate −d H 0
   ```

Files

/etc/objrepos/SWservAt	Contains the Software Service Aids Attributes object class, which is the error−log configuration database.

Related Information

The **errdead** command, **errinstall** command, **errlogger** command, **errmsg** command, **errpt** command, **errstop** command, **errupdate** command, **uname** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

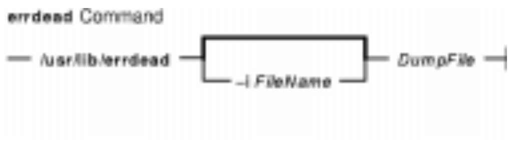
Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

errdead Command

Purpose

Extracts error records from a system dump.

Syntax



/usr/lib/errdead [**−i** *FileName*] *DumpFile*

Description

The **errdead** command extracts error records from a system dump containing the internal buffer maintained by the **/dev/error** file. The **errdead** command extracts the error records from the dump file and adds those error records directly to the error log.

The error log daemon need not be running when the **errdead** command is run.

Flag

−i*FileName*	Adds the extracted error records to the error log file specified by the *FileName* variable. If the file does not exist, the **errdead** command creates it. If this flag is not specified, the value from the error log configuration database is used.

Security

Access Control: Only the root user can run this command.

Example

To capture error log information from a dump image that resides in the `/dev/hd7` file, enter:

```
/usr/lib/errdead /dev/hd7
```

Error logging information is in the dump image if the **errdemon** daemon was not running when the dump occurred.

File

/etc/objrepos/SWservAt	Contains the software service aids attributes object class; that is, the error log configuration database.

Related Information

The **errclear** command, **errinstall** command, **errlogger** command, **errmsg** command, **errpt** command, **errstop** command, **errupdate** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

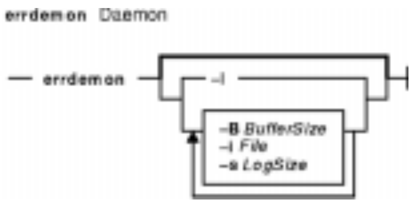
Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

errdemon Daemon

Purpose

Starts error logging daemon (**errdemon**) and writes entries to the error log.

Syntax



errdemon [[**−B** *BufferSize*] [**−i** *File*] [**−s** *LogSize*] | **−l**]

Description

The error logging daemon reads error records from the **/dev/error** file and creates error log entries in the system error log. Besides writing an entry to the system error log each time an error is logged, the error logging daemon performs error notification as specified in the error notification database. The **/etc/objrepos/errnotify** file is the error notification database. The default system error log is maintained in the **/var/adm/ras/errlog** file. The last error entry is placed in nonvolatile random access memory (NVRAM). During system startup, this last error entry is read from NVRAM and added to the error log when the error logging daemon is started.

The error logging daemon does not create an error log entry for the logged error if the error record template specifies `Log=FALSE.`

If you use the error logging daemon without flags, the system restarts the error logging daemon using the values stored in the error log configuration database for the error log file name, the error log file size, and the internal buffer size.

Use the **errclear** command to remove entries from the system error log.

> **Attention:** The error logging daemon is normally started during system initialization. Stopping the error logging daemon can cause error data temporarily stored in internal buffers to be overwritten before it can be recorded in the error log file.

Flags

−i*File*	Uses the error log file specified by the *File* variable. The specified file name is saved in the error log configuration database and is immediately put into use.
−l	Displays the values for the error log file name, file size, and buffer size from the error log configuration database.
−s*LogSize*	Uses the size specified by the *LogSize* variable for the maximum size of the error log file. The specified log file size limit is saved in the error log configuration database, and it is immediately put into use. If the log file size limit is smaller than the size of the log file currently in use, the error logging daemon renames the current log file by appending **.old** to the file name. The error logging daemon creates a new log file with the specified size limit. Generate a report form the old log file using the **−i** flag of the **errpt** command.

	If this parameter is not specified, the error logging daemon uses the log file size from the error log configuration database.
−B*BufferSize*	Uses the number of bytes specified by the *BufferSize* parameter for the error log device driver's in−memory buffer. The specified buffer size is saved in the error log configuration database. If the *BufferSize* parameter is larger than the buffer size currently in use, the in−memory buffer is immediately increased. If the *BufferSize* parameter is smaller than the buffer size currently in use, the new size is put into effect the next time the error logging daemon is started after the system is rebooted. The buffer cannot be made smaller than the hard−coded default of 8KB. If this parameter is not specified, the error logging daemon uses the buffer size from the error log configuration database. The size you specify is rounded up to the next integral multiple of the memory page size (4KB). The memory used for the error log device driver's in−memory buffer is not available for use by other processes. (The buffer is pinned). Be careful not to impact your system's performance by making the buffer excessively large. On the other hand, if you make the buffer too small, the buffer can become full if error entries arrive faster than they can be read from the buffer and put into the log file. When the buffer is full, new entries are discarded until space becomes available in the buffer. When this situation occurs, the error logging daemon creates an error log entry to inform you of the problem. You can correct the problem by enlarging the buffer.

Security

Access Control: Only the root user can run this daemon.

Examples

1. To start the error−logging daemon, enter:

   ```
   /usr/lib/errdemon
   ```
2. To view the current maximum error−log size, enter:

   ```
   /usr/lib/errdemon −l
   ```
3. To change the current maximum error−log size from 1MB to 64KB, enter:

   ```
   /usr/lib/errdemon −s 65536
   ```

Files

/dev/error	Source of error records.
/var/adm/ras/errtmplt	Contains the error template repository.
/usr/lib/errdemon	Contains the **errdemon** daemon.
/etc/objrepos/SWservAt	Contains the software service aids attributes object class; that is, the error log configuration database.

Related Information

The **errclear** command, **errdead** command, **errinstall** command, **errlogger** command, **errmsg** command, **errpt** command, **errstop** command, **errupdate** command.

The **errsave** kernel service.

The **error logging** special files.

The **errlog** subroutine.

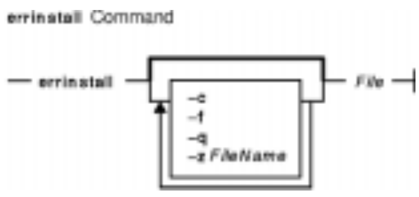
Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

errinstall Command

Purpose

Installs messages in the error logging message sets.

Syntax



errinstall [**−c**] [**−f**] [**−q**] [**−z** *FileName*] *File*

Description

The **errinstall** command is an installation aid that adds or replaces messages in the Error Description, Probable Cause, User Cause, Install Cause, Failure Cause, Recommended Action, and Detailed Data data id message sets of the error log message catalog.

The *File* parameter specifies an input file containing messages to be added or replaced. If you do not specify the *File* parameter or if you specify it as the **−** (minus sign), the **errinstall** command reads from standard input.

> **Note:** Program products and in−house applications should use predefined messages from the error logging message sets. List the predefined messages using the **errmsg −w** command. To add new messages, third−party software vendors should contact IBM Developer Solutions to register new messages. During the development of in−house applications, the **errmsg** command can be used to add new messages, but the new messages must not conflict with the messages added for other in−house applications.

Undo Feature

The **errinstall** command creates an undo file in the current directory named the *File*.**undo** file. (If the **errinstall** command is reading from standard input, the undo file information is written to standard output.) The *File***.undo** file can be used as input to the **errinstall** command to undo the changes the **errinstall** command has just made. To undo changes, run the **errinstall** command with the **−f** flag and specify the *File***.undo** file for the *File* parameter.

Input File (or Standard In) File Format

Two separate lines of information are required to add or replace a single message in the error log message catalog. You can include multiple additions or replacements in a single file. The first line is required to identify the message set to which the message is to be added or replaced. Use the following format:

```
SET MessageSetID
```

where the *MessageSetID* parameter is one of the following single characters:

E	Identifies Error Description
P	Identifies Probable Cause
U	Identifies User Cause
I	Identifies Install Cause
F	Identifies Failure Cause
R	Identifies Recommended Action
D	Identifies Detailed Data

The second line lists the message ID with the message to be added or replaced. At least one line is required, and multiple lines can be included, following a single line that identifies a message set. As described earlier, users should contact their service representative to obtain the message ID, unless it is required for an in−house application only (in which case, use the **errmsg** command to install the error message without a predetermined error message ID).

You must put a space between the message ID and the message text, and enclose the text of the message in double quotes as follows:

```
message ID "message text"
```

In addition to the two required lines of information, you can also include lines of comments. A comment line must have a $ (dollar sign) or an * (asterisk) operator in the first column. The asterisk is the preferred choice.

> **Note:** Messages added to the Error Description, Probable Cause, and Detailed Data ID message sets must not exceed 40 characters in length. Messages added to the User Cause, Install Cause, Failure Cause, and Recommended Action message sets must not exceed 128 characters in length. If messages exceed these lengths, the **errinstall** command displays a warning message, but adds the messages to the codepoint catalogue. These messages will be truncated when displayed by the summary errpt command.

Flags

−c	Checks the input *File* parameter for syntax errors.
−f	Replaces messages having duplicate IDs. When an attempt is made to add a message using a message ID that is already in use, the **−f** flag forces the **errinstall** command to replace the old message text with the new message text. If the **−f** flag is not specified, the old message text is not replaced and a warning message is written to standard error. The **−f** flag is also required to undo a message installation.
−q	Suppresses the creation of an **undo** file.
−z*FileName*	Uses the error logging message catalog specified by the *FileName* parameter.

Security

Access Control: Only the root user can run this command.

Examples

1. To install the error log messages for the licensed product `lpp`, enter:

   ```
   errinstall −f /tmp/lpp.desc
   ```

2. To undo the changes made to the error log message catalog by the above example of the **errinstall** command, enter:

```
errinstall −f /tmp/lpp.desc.undo
```

3. To install an error message in the Probable Cause message set, enter:

```
errinstall

* Add a probable cause for widget failure:
SET P
E100 "widget adapter"
```

4. To replace a message with a duplicate ID in the Probable Cause message set, enter:

```
errinstall −f

* Replace the message associated with ID E100 in the
* Recommended Action message set
SET R
E100 "Replace disk drive"
```

5. If you name your input file **in_file** and then want to use it to install new error messages, enter:

```
errinstall in_file
```

6. To overwrite existing error messages in message sets, use the previously defined ID numbers in your **in_file**, and specify the **−f** flag with the **errinstall** command as follows:

```
errinstall −f in_file
```

7. The following example illustrates sample contents of an input file to be installed.

```
*
* Add these error messages to the Detailed Data message set:
*
SET D
8105 "Logical channel number"
8106 "Timer reference stamp"
*
* Add these error messages to the Probable Cause message set:
*
SET P
E861 "Bad memory card"
E865 "Unexpected System Halt"
E876 "Fiber Optic Cable"
*
* Add this message to the Recommended Action message set:
*
SET R
E850 "Install updated driver code"
```

Files

/usr/lib/nls/msg/$LANG/codepoint.cat	Contains the error log message catalog. In the United States, the value of the **$LANG** environment variable is **En_US**.

Related Information

The **errclear** command, **errdead** command, **errlogger** command, **errmsg** command, **errpt** command, **errstop** command, **errupdate** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

The **error logging** special files.

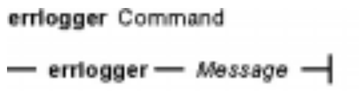
The Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

errlogger Command

Purpose

Logs an operator message.

Syntax



errlogger*Message*

Description

The **errlogger** command creates an operator error log entry that contains an operator message up to 1024 bytes in length.

Security

Access Control: Only the root user can run this command.

Examples

To create an operator message for system drive reconfiguration, enter:

```
errlogger system drive reconfigured
```

Related Information

The **errpt** command.

The **errsave** kernel service.

The **errlog** subroutine.

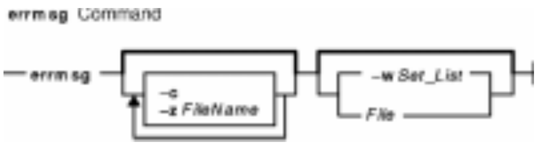
The Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

errmsg Command

Purpose

Adds a message to the error log message catalog.

Syntax



errmsg [**−c**] [**−z** *FileName*] [**−w** *Set_List* | *File*]

Description

The **errmsg** command updates and displays the error−log message catalog containing the Error Description, Probable Cause, User Cause, Install Cause, Failure Cause, Recommended Action, and Detailed Data ID message sets.

The message sets to which messages are to be added or deleted are listed in the input *File* parameter as follows:

***** or **$**	Comment lines must have an * (asterisk) or $ (dollar sign) comment operator in the first column. The * is the preferred choice.
+	Messages to be added must be preceded by a + (plus sign).
−	Messages to be deleted must be preceded by a − (minus sign).
SET	Message set ID.
"Message Text"	Message text must be enclosed in double quotation marks.
Message ID	Message ID of the message to be deleted.

Messages added to the Error Description, Probable Cause, and Detailed Data ID message sets must not exceed 40 characters in length. Messages added to the User Cause, Install Cause, Failure Cause, and Recommended Action message sets must not exceed 128 characters in length. A maximum of 2047 user−defined messages can be added to each message set.

The **errmsg** command is used by application developers to create new messages used in the Error Record Templates Repository. An existing message should always be used, if possible.

If no flags are specified on the command line, the default operation is an update. Updates are specified in the input *File* parameter. If the input *File* parameter is not specified or if a − (minus sign) is specified instead of the *File* parameter, the **errmsg** command reads from standard input. For each message that is added, the **errmsg** command assigns an identifier. In addition to adding the message to the message catalog, the **errmsg** command writes the identifier and message text to the *File***.out** file. The *File***.out** file is also created when deletions are made from the message catalog. If the **errmsg** command is reading from standard input, the identifier and message text are written to standard output.

Flags

−c	Checks the input file for syntax errors.
−w*Set_List*	Displays the error log message sets specified by the *Set_List* variables. This option displays the messages contained in the Error Log message sets and their identifiers. Output is written to standard output. The *Set_List* variables can be separated by commas or enclosed in double−quotation marks and separated by commas or blanks. The *Set_List* variables are the message set IDs or, if the value of the *Set_List* variable **all** is specified, the contents of all of the Error Log message sets are displayed. The valid values of the *Set_List* variables are:

all	Displays all message sets
D	Displays Detailed Data ID message set
E	Displays Error Description message set
F	Displays Failure Cause message set
I	Displays Install Cause message set
P	Displays Probable Cause message set
R	Displays Recommended Action message set
U	Displays User Cause message set

−z*Filename*	Uses the error−logging message catalog specified by the *Filename* variable.

Security

Access Control: Only the root user can run this command.

Examples

1. To delete messages from the Probable Cause message set, enter:

```
errmsg
* Delete messages FF1A, FF1B, and FF1C from the Probable Cause
* message set
SET P
− FF1A
− FF1B
− FF1C
```

2. To add a message to the Probable Cause message set for the Widget Failure error, enter:

```
errmsg
* Add a Probable Cause for Widget Failure
SET P
+ "WIDGET ADAPTER"
```

File

/usr/lib/nls/msg/$LANG/codepoint.cat	Contains the error log message catalog. In the United States, the value of **$LANG** is **En_US**.

Related Information

The **errclear** command, **errdead** command, **errinstall** command, **errlogger** command, **errpt** command, **errstop** command, **errupdate** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

The **error logging** special files.

Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

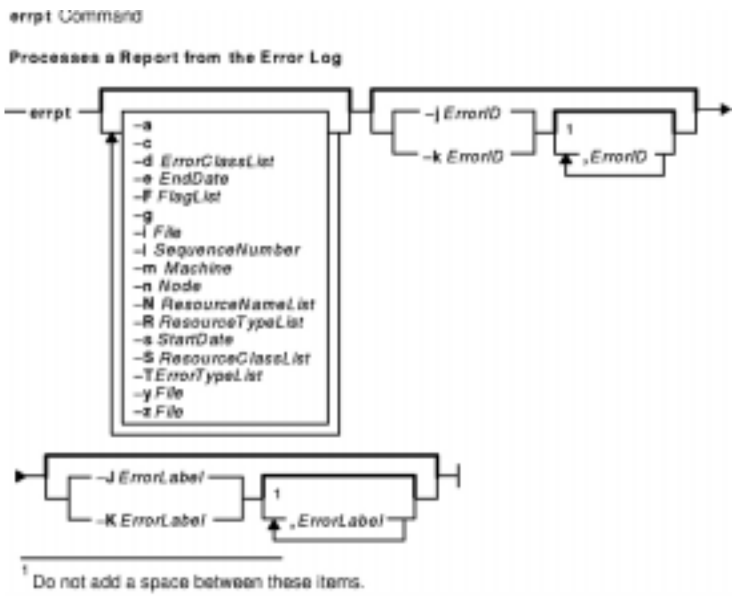
errpt Command

Purpose

Generates a report of logged errors.

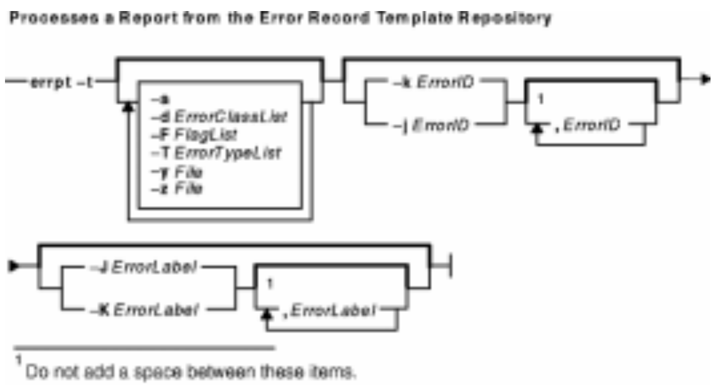
Syntax

To Process a Report from the Error Log



errpt [**−a**] [**−c**] [**−d** *ErrorClassList*] [**−e** *EndDate*] [**−g**] [**−i** *File*] [**−j** *ErrorID* [**,***ErrorID*]] | [**−k** *ErrorID* [**,***ErrorID*]] [**−J** *ErrorLabel* [**,***ErrorLabel*]] | [**−K** *ErrorLabel* [**,***ErrorLabel*]] [**−l** *SequenceNumber*] [**−m** *Machine*] [**−n** *Node*] [**−s** *StartDate*] [**−F** *FlagList*] [**−N** *ResourceNameList*] [**−R** *ResourceTypeList*] [**−S** *ResourceClassList*] [**−T** *ErrorTypeList*] [**−y** *File*] [**−z** *File*]

To Process a Report from the Error Record Template Repository



errpt [**−a**] [**−t**] [**−d** *ErrorClassList*] [**−j** *ErrorID* [**,***ErrorID*]] | [**−k** *ErrorID* [**,***ErrorID*]] [**−J** *ErrorLabel* [**,***ErrorLabel*]] | [**−K** *ErrorLabel* [**,***ErrorLabel*]] [**−F** *FlagList*] [**−T** *ErrorTypeList*] [**−y** *File*] [**−z** *File*]

Description

The **errpt** command generates an error report from entries in an error log. It includes flags for selecting errors that match specific criteria. By using the default condition, you can display error log entries in the reverse order they occurred and were recorded. By using the **− c** (concurrent) flag, you can display errors as they occur. If the **−i** flag is not used with the **errpt** command, the error log file processed by **errpt** is the one specified in the error log configuration database. (To view the information in the error log configuration database, use the **errdemon** command.)

The default summary report contains one line of data for each error. You can use flags to generate reports with different formats.

> **Note:** The **errpt** command does not perform error log analysis; for analysis, use the **diag** command.

You can use the Web−based System Manager Devices application (**wsm devices** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit errpt** fast path to run this command.

Flags

−a	Displays information about errors in the error log file in detailed format. If used in conjunction with the **− t** flag, all the information from the template file is displayed.
−c	Formats and displays each of the rror entries concurrently, that is, at the time they are logged. The existing entries in the log file are displayed in the order in which they were logged.
−d *ErrorClassList*	Limits the error report to certain types of error records specified by the valid *ErrorClassList* variables: **H** (hardware), **S** (software), **0** (**errlogger** command messages), and **U** (undetermined). The *ErrorClassList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.
−e *EndDate*	Specifies all records posted prior to and including the *EndDate* variable, where the *EndDate* variable has the form *mmddhhmmyy* (month, day, hour, minute, and year).
−g	Displays the ASCII representation of unformatted error−log entries. The output of this flag is in the following format:

el_sequence	Error−log stamp number
el_label	Error label
el_timestamp	Error−log entry time stamp
el_crcid	Unique cyclic−redundancy−check (CRC) error identifier
el_machineid	Machine ID variable
el_nodeid	Node ID variable
el_class	Error class
el_type	Error type
el_resource	Resource name
el_rclass	Resource class
el_rtype	Resource type
el_vpd_ibm	IBM vital product data (VPD)
el_vpd_user	User VPD
el_in	Location code of a device
el_connwhere	Hardware−connection ID (location on a specific device, such as

	slot number)
et_label	Error label
et_class	Error class
et_type	Error type
et_desc	Error description
et_probcauses	Probable causes
et_usercauses	User causes
et_useraction	User actions
et_instcauses	Installation causes
et_instaction	Installation actions
et_failcauses	Failure causes
et_failaction	Failure actions
et_detail_length	Detail−data field length
et_detail_descid	Detail−data identifiers
et_detail_encode	Description of detail−data input format
et_logflg	Log flag
et_alertflg	Alertable error flag
et_reportflg	Error report flag
el_detail_length	Detail−data input length
el_detail_data	Detail−data input

−i *File*	Uses the error log file specified by the *File* variable. If this flag is not specified, the value from the error log configuration database is used.
−j*ErrorID*[**,***ErrorID*]	Includes only the error−log entries specified by the *ErrorID* (error identifier) variable. The *ErrorID* variables can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters. When combined with the **−t** flag, entries are processed from the error−template repository. (Otherwise entries are processed from the error−log repository.)
−k *ErrorID*[**,***ErrorID*]	Excludes the error−log entries specified by the *ErrorID* variable. The *ErrorID* variables can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters. When combined with the **−t** flag, entries are processed from the error−template repository. (Otherwise entries are processed from the error−log repository.)
−l*SequenceNumber*	Selects a unique error−log entry specified by the *SequenceNumber* variable. This flag is used by methods in the error−notification object class. The *SequenceNumber* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.
−m*Machine*	Includes error−log entries for the specified *Machine* variable. The **uname −m** command returns the *Machine* variable value.
−n*Node*	Includes error−log entries for the specified *Node* variable. The **uname −n** command returns the *Node* variable value.
−s *StartDate*	Specifies all records posted on and after the *StartDate* variable, where the *StartDate* variable has the form *mmddhhmmyy* (month, day, hour, minute, and year).
−t	Processes the error−record template repository instead of the error log. The **−t** flag can be used to view error−record templates in report form.
−y*File*	Uses the error record template file specified by the *File* variable. When combined with the **−t** flag, entries are processed from the specified error template repository. (Otherwise, entries are processed from the error log repository, using the specified error template repository.)
−z*File*	Uses the error logging message catalog specified by the *File* variable. When

	combined with the **−t** flag, entries are processed from the error template repository. (Otherwise, entries are processed from the error log repository.)
−F*FlagList*	Selects error−record templates according to the value of the `Alert`, `Log`, or `Report` field of the template. The *FlagList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters. The **−F** flag is used with the **−t** flag only. Valid values of the *FlagList* variable include:

alert=0	Selects error−record templates with the `Alert` field set to False.
alert=1	Selects error−record templates with the `Alert` field set to True.
log=0	Selects error−record templates with the `Log` field set to False.
log=1	Selects error−record templates with the `Log` field set to True.
report=0	Selects error−record templates with the `Report` field set to False.
report=1	Selects error−record templates with the `Report` field set to True.

−J*ErrorLabel*	Includes the error log entries specified by the *ErrorLabel* variable. The *ErrorLabel* variable values can be separated by commas or enclosed in double−quotation marks and separated by commas or blanks. When combined with the **−t** flag, entries are processed from the error template repository. (Otherwise, entries are processed from the error log repository.)
−K*ErrorLabel*	Excludes the error log entries specified by the *ErrorLabel* variable. The *ErrorLabel* variable values can be separated by commas or enclosed in double−quotation marks and separated by commas or blanks. When combined with the **−t** flag, entries are processed from the error template repository. (Otherwise, entries are processed from the error log repository).
−N*ResourceNameList*	Generates a report of resource names specified by the *ResourceNameList* variable. The *ResourceNameList* variable is a list of names of resources that have detected errors. For software errors, these are the names of resources that have detected errors. For hardware errors, these are names of devices or system components. It does not indicate that the component is faulty or needs replacement. Instead, it is used to determine the appropriate diagnostic modules to be used to analyze the error. The *ResourceNameList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.
−R*ResourceTypeList*	Generates a report of resource types specified by the *ResourceTypeList* variable; for hardware errors the *ResourceTypeList* variable is a device type; for software errors it is the **LPP** value. The *ResourceTypeList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.
−S*ResourceClassList*	Generates a report of resource classes specified by the *ResourceClassList* variable. For hardware errors, the *ResourceClassList* variable is a device class. The *ResourceClassList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.
−T *ErrorTypeList*	Limits the error report to error types specified by the valid *ErrorTypeList* variables: **INFO**, **PEND**, **PERF**, **PERM**, **TEMP**, and **UNKN**. The *ErrorTypeList* variable can be separated by , (commas), or enclosed in "" (double quotation marks) and separated by , (commas) or space characters.

Examples

1. To display a complete summary report, enter:

```
errpt
```

2. To display a complete detailed report, enter:

   ```
   errpt −a
   ```

3. To display a detailed report of all errors logged for the error identifier `E19E094F`, enter:

   ```
   errpt −a −j E19E094F
   ```

4. To display a detailed report of all errors logged in the past 24 hours, enter:

   ```
   errpt −a −s mmddhhmmyy
   ```

   where the `mmddhhmmyy` string equals the current month, day, hour, minute, and year, minus 24 hours.

5. To list error−record templates for which logging is turned off for any error−log entries, enter:

   ```
   errpt −t −F log=0
   ```

6. To view all entries from the alternate error−log file `/var/adm/ras/errlog.alternate`, enter:

   ```
   errpt −i /var/adm/ras/errlog.alternate
   ```

7. To view all hardware entries from the alternate error−log file `/var/adm/ras/errlog.alternate`, enter:

   ```
   errpt −i /var/adm/ras/errlog.alternate −d H
   ```

8. To display a detailed report of all errors logged for the error label `ERRLOG_ON`, enter:

   ```
   errpt −a −J ERRLOG_ON
   ```

Files

/etc/objrepos/SWservAt	Contains the software service aids attributes object class; that is, the error log configuration database.

Related Information

The **diag** command, **errclear** command, **errinstall** command, **errupdate** command, **uname** command.

The **errsave** kernel service.

The **errlog** subroutine.

Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

Examples of Detailed Error Reports, Example of a Summary Error Report in *AIX Version 4.3 Problem Solving Guide and Reference*.

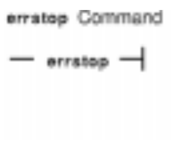
Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

errstop Command

Purpose

Terminates the error logging daemon.

Syntax



errstop

Description

> **Attention:** Running the **errstop** command disables diagnostic and recovery functions. Normally the **errdemon** command is started automatically during system initialization and stopped during system shutdown. The error log should never be stopped during normal operations. The **errstop** command should only be used during special circumstances when it is absolutely required and the consequences are clearly understood.

The **errstop** command stops the error logging daemon initiated by the **errdemon** command.

Security

Access Control: Only a root user can run this command.

Examples

To terminate the **errdemon** daemon, enter:

```
/usr/lib/errstop
```

Related Information

The **errclear** command, **errdead** command, **errinstall** command, **errlogger** command, **errmsg** command, **errpt** command, **errupdate** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

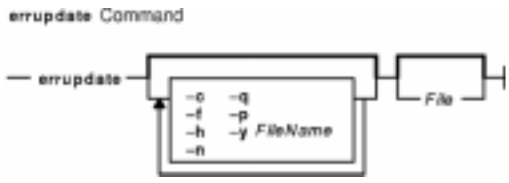
The Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

errupdate Command

Purpose

Updates the Error Record Template Repository.

Syntax



errupdate [**−c**] [**−f**] [**−h**] [**−n**] [**−p**] [**−q**] [**−y***FileName*] [*File*]

Description

The **errupdate** command adds or deletes entries in the Error Record Template Repository, or modifies the log, report, or alert characteristics of existing entries. The **errupdate** command reads from the specified *File* parameter. If the *File* parameter is not specified, the **errupdate** command reads from standard input and writes to standard output.

Each entry to be added, deleted, or modified must be preceded by an operator. The valid operators are:

+	Adds an entry (add operator).
−	Deletes an entry (delete operator).
=	Modifies the log, report, or alert characteristics of an entry.

Entries in the input file must be separated by a blank line.

Comments in the input file can be placed between templates and are indicated by an `*` (asterisk) in the first column.

If XPG/4 messages are used in error templates, a message catalog must be specified. This can be done with a line of the form:

```
<*!catalog-name>
```

For example

```
*!mycat.cat
```

The catalog specified applies to XPG/4 messages found in subsequent templates, until another "*!" catalog specifier is encountered. Also, the "*!" specifier may be overridden on an individual template basis with the "catname" keyword.

Unless a full pathname to the catalog is specified, the normal rules for retrieving a message catalog are followed. For example, in the above example, mycat.cat is assumed to be in **/usr/lib/nls/msg/%L**.

Entries to be added must be defined in a specific format. The general form of the error record template is:

```
Error Record Template

        + LABEL:
                         Comment=
                         Class=
                         Log=
                         Report=
                         Alert=
                         Err_Type=
                         Err_Desc=
                         Prob_Causes=
                         User_Causes=
                         User_Actions=
                         Inst_Causes=
                         Inst_Actions=
                         Fail_Causes=
                         Fail_Actions=
                         Detail_Data= <data_len>, <data_id>,
                         <data_encoding>
```

Additionally, a catalog name for XPG/4 messages can be specified with:

```
catname = <catalog>
```

Any template which contains XPG4 messages, the catname keyword, more than eight detail data items will be referred to as an XPG4 template. An XPG4 template is not alertable, and uses a slightly different calculation for the error id.

The error record template fields are described as follows:

`Alert`
: Indicates that the error log entry can be processed by products that conform to the SNA Generic Alert Architecture. The `Alert` field can be set to True or False. If this field is omitted from the template, its value will default to False. If the `Alert` field is set to True, the **errupdate** command does not add the template unless the contents of the `Err_Desc` , `Inst_Actions` , `Fail_Cause, Fail_Actions` , and `Detail_Data data_id` fields are values recognized by the SNA Generic Alert Architecture (in publication GA27−3136). If any of the values used are not recognized by the SNA Generic Alert Architecture or the template is an XPG4 template, and the `Alert` field is set to True, the **−p** flag must be specified to add or update the template.

`Class`
: Describes whether the error occurred in hardware or software, is an operator message, or is undetermined. One of the following class descriptors must be specified:

H	Indicates the error is a hardware failure.
O	Indicates the error is an operator message.
S	Indicates the error is a software failure.
U	Indicates the error is undetermined.

`Comment`
: Specifies a comment to be included with the **#define** statement that was created for the Error ID message set. The comment must not exceed 40 characters and must be enclosed in double quotation marks. Comments longer than 40 characters are automatically truncated. The **errupdate** command encloses the comment in the C language comment delimiters, /* (slash, asterisk) and */ (asterisk, slash).

`Detail_Data`
: Describes detailed data, such as detecting module names, sense data, or return codes, that are logged with the error when the error occurs. If no detailed data is logged with the error, this field can be left blank or it can display a message from the Detailed Data ID message set by specifying a **data_len** value of zero. The following three values are required for each **Detail_Data** field and must be separated by commas.

data_len
: Number of bytes of data to be associated with the **data_id** value. The **data_len** value is interpreted as a decimal value.

data_id	Identifies a text message from the Detailed Data ID message set "D" to be printed in the error report in front of the detailed data. The value is interpreted as an unsigned hexadecimal up to 4 digits in length. `data_id` may also specify an XPG/4 style message. This is discussed later.
data_encoding	Describes how detailed data is to be printed in an error report. Valid values are:

ALPHA	The detailed data is a printable ASCII character string.
DEC	The detailed data is the binary representation of an integer value, and the decimal equivalent is to be printed.
LDEC	The detailed data is the binary representation of a 64−bit value, and the decimal equivalent is to be printed.
HEX	The detailed data is to be printed in hexadecimal.

Up to 16 `Detail_Data` entries may be specified per template. The amount of data logged with an error must not exceed the maximum error record length defined in the **/usr/include/sys/err_rec.h** file. Error data that cannot be contained in an error log entry should be saved elsewhere. Detailed data in the error log entry should contain information that can be used to correlate the error data and the error log entry.

`Err_Desc`
Describes the error that has occurred. An Error Description message identifier must be specified in this field. This value identifies a text message from the Error Description message set "E" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to 4 digits in length. The field may also specify an XPG/4 style message. This is discussed later.

`Err_Type`
Describes the severity of the error that has occurred. One of the following values must be specified:

PERF	Condition where the performance of the device or component has degraded to below an acceptable level (performance).
PERM	Condition that cannot be recovered from (permanent).
PEND	Condition signifying that the loss of availability of a device or component is imminent (impending).
TEMP	Condition that was recovered from after a number of unsuccessful attempts (temporary).
UNKN	Condition where it is not possible to determine the severity of the error (unknown).
INFO	Condition for informational error log entry.

`Fail_Actions`
Describes recommended actions for correcting an error that resulted from a failure cause. A list of up to 4 Recommended Action message identifiers separated by commas can be specified. This value identifies a text message from the Recommended Action message set "R" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to four digits in length. This field must be blank if the `Fail_Causes` field is blank.

The order in which the recommended actions are listed should be determined by the expense of the action and the probability that the action will correct the error. Always list the actions that have little or no cost (or little or no impact) on the system first. List the actions for which the probability of correcting the error is equal or nearly equal next, with the least expensive actions first. List the remaining actions in order of decreasing probability. The field may also specify an XPG/4 style message. This is discussed later.

`Fail_Causes`
Describes failure causes for the error that has occurred. A failure cause is defined as a condition that resulted from the failure of a resource. This field can list up to four Failure Cause message identifiers separated by commas. This value identifies a text message

	from the Failure Cause messages set "F" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to 4 digits in length. List the failure causes in order of decreasing probability. This field can be left blank if it does not apply to the error that has occurred. If this field is blank, either the `User_Causes` or the `Inst_Causes` field must not be blank. The field may also specify an XPG/4 style message. This is discussed later.
`Inst_Actions`	Describes recommended actions for correcting an install caused error. This field can list of up to 4 Recommended Action message identifiers separated by commas. This value identifies a text message from the Recommended Action message set "R" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to four digits in length. This field must be blank if the `Inst_Causes` field was left blank. The order in which the recommended actions are listed is determined by the expense of the action and the probability that the action will correct the error. The actions that have little or no cost or little or no impact on the system should always be listed first. Actions for which the probability of correcting the error are equal or nearly equal should be listed next, with the least expensive actions first. The remaining actions should be listed in order of decreasing probability. The field may also specify an XPG/4 style message. This is discussed later.
`Inst_Causes`	Describes install causes for the error that has occurred. An install cause is defined to be a condition that resulted from the initial installation or setup of a resource. A list of up to 4 Install Cause message identifiers separated by commas can be specified. This value identifies a text message from the Install Cause message set "I" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to four digits in length. Install causes should be listed in order of decreasing probability. This field can be left blank if it is not applicable to the error that has occurred. If this field is left blank, the `User_Causes` or the `Fail_Causes` field must be nonblank. The field may also specify an XPG/4 style message. This is discussed later.
`LABEL`	Specifies a unique label of up to 19 characters that must be provided for each error logging template. A string containing " `#define #ERRID_label Error_ID` ", where the **Error_ID** value is the unique ID assigned to the Error Record Template is written to standard output if the **−h** flag was specified at the command line.
`Log`	Specifies whether an error log entry should be created for this error when it occurs. The log field can be set to True or False. If this field is omitted from the template, its value will default to True. When this field is set to False, the `Report` and `Alert` fields are ignored.
`Prob_Causes`	Describes 1 or more probable causes for the error that has occurred. A list of up to 4 Probable Cause message identifiers separated by commas can be specified. This value identifies a text message from the Probable Cause message set "P" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to 4 digits in length. Probable causes should be listed in order of decreasing probability. At least one probable cause is required. The field may also specify an XPG/4 style message. This is discussed later.
`Report`	Specifies whether logged occurrences of this error should be reported when an error report is printed. The `Report` field can be set to True or False. If this field is omitted from the template, its value will default to True.
`User_Actions`	Describes recommended actions for correcting a user−caused error. A list of up to 4 Recommended Action message identifiers separated by commas can be specified. This value identifies a text message from the Recommended Action message set "R" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to 4 digits in length. This field must be left blank if the `User_Causes` field was left blank. The order in which the recommended actions are listed is determined by the expense of the error and the probability that the action will correct the error. The actions that have little or no cost, or little or no impact on the system should always be listed first. Actions for which the probability of correcting the

	error are equal or nearly equal should be listed next, with the least expensive actions first. The remaining actions should be listed in order of decreasing probability. The field may also specify an XPG/4 style message. This is discussed later.
`User_Causes`	Describes user causes for the error that has occurred. A user cause is defined as a condition that can be corrected without contacting a service organization. A list of up to four User Cause message identifiers separated by commas can be specified. This value identifies a text message from the User Cause message set "U" to be displayed for an occurrence of the error. The value is interpreted as an unsigned hexadecimal up to four digits in length. User causes should be listed in order of decreasing probability. This field can be left blank if it is not applicable to the error that has occurred. If this field is left blank, the `Inst_Causes` or the `Fail_Causes` field must be nonblank. The field may also specify an XPG/4 style message. This is discussed later.

The catname is used to specify a message catalog to be used for retrieving XPG/4 messages for the current template. This will override a catalog specified with a previous "*!" catalog specifier. Any template containing XPG/4 messages must have a catalog specified either with catname or "*!". The catalog name must be enclosed in quotes. Unless a full pathname to the catalog is specified, the normal rules for retrieving a message catalog are followed.

For example, if

```
catname = "mycat.cat"
```

is specified, `mycat.cat` is assumed to be in **/usr/lib/nls/msg/%L**.

The Error Description, Probable Cause, User Cause, Install Cause, Failure Cause, Recommended Actions, and Detailed Data ID messages must be either an error message identifier maintained in the error log message catalog, or an XPG/4 message.

An error message identifier consists of up to 4 hexadecimal digits, without any leading "0x". For example, 1234 or ABCD. The **errmsg −w** command can be used to print these messages along with their identifiers. The **errmsg** command can be used to add new messages.

An XPG/4 message is specified using the form

```
{<set>, <number>, <"default text">}
```

The set, number, and default text are all required. Symbolic message references are not supported. Also, templates which contain XPG/4 messages are not alertable.

A message catalog must be specified for XPG/4 messages. This is done with either the "*!" catalog specifier, or the catname keyword.

Error logging does not support all the features of normal error messaging. Strings used in error log templates must conform to some restrictions.

- Variable substitution is not supported. For example, the strings may not be used as format specifyers to print values. The strings may only contain the formatting characters "\t" and "\n".
- The default text strings may not be longer than 1 kb, 1024 bytes.
- It must be noted that the error description is printed in a 40 character area on the non−detailed reports. No string formatting is done for these reports, and only the first 40 characters will be printed.
- The strings should not contain a trailing new line. This is supplied by errpt.

The Error Description, Probable Cause, User Cause, Install Cause, Failure Cause, Recommended Actions, and Detailed Data ID messages are maintained in the error log message catalog. The **errmsg −w** command can be used to print the messages along with their identifiers. The **errmsg** command can be used to add new messages.

For each entry added, the errupdate command assigns a unique Error ID that is written to the header file specified by *File*.h (where the *File* parameter is the name of the errupdate command input file). If the errupdate command is reading from standard input, the `#define` statement is written to standard output. The values supplied for the `Class` , `Err_Desc` , `Err_Type` , `Fail_Actions` , `Fail_Causes` , `Inst_Actions` , `Inst_Causes` , `Prob_Causes` , `User_Actions` , `User_Causes` fields, and the `Detail_Data` . `data_id` value, are used to calculate the unique Error ID for that error. For XPG4 templates, the Label is also included in the calculation.

The contents of the `Log` , `Report` , and `Alert` fields are not included in the calculation of the unique Error ID; therefore, the log, report, and alert characteristics of a particular error can be modified at any time in the error entry definition stored in the Error Record Template Repository using the **errupdate** command. Also note that the data_len and data_encode portions of the detail data field are not used.

The **errupdate** command also creates an undo file in the current directory named *File*.**undo**. If the **errupdate** command is reading from standard input, the **undo** file is written to **errids.undo** file. The **undo** file contains inputs to the **errupdate** command to undo changes the **errupdate** command has made.

The **errpt−t** command can be used to view the contents of the Error Record Template Repository. The templates are processed and printed as they would appear in an actual error report.

Flags

−c	Checks the input file for syntax errors.
−f	Forces all templates to be updated, including any templates with error ids identical to ones in the input templates
−h	Creates a `#define` statement for each Error ID assigned to an error template. If a file name was supplied on the command line, the header file name will be that supplied file name appended with **.h**. Otherwise, the `#define` statements are written to standard output.
−n	Suppresses the addition of the error record template to the Error Record Template Repository.
−p	Adds or updates a template with the `Alert` field set to True that contains Error Description, Probable Cause, User Cause, User Action, Install Cause, Install Action, Failure Cause, Fail Action, or Detailed Data data id values that are not recognized by the SNA Generic Alert Architecture (in publication GA27−3136). The **errupdate** command will not let you add a template with these characteristics unless you specify this flag.
−q	Suppresses the creation of an undo file.
−y*FileName*	Uses the error record template file specified by the *FileName* parameter.

Security

Access Control: Only the root user can run this command.

Examples

1. To add an entry, define the entry in the input file in the following manner:

```
+ CDROM_ERR22:
        Comment=        "Temporary CDROM read error"
        Class=  H
        Log=            True
        Report= True
        Alert=          False
        Err_Type=       TEMP
        Err_Desc=       E801
        Prob_Causes=    5004
        Fail_Causes=    E800, 6312
        Fail_Actions=   1601, 0000
        Detail_Data=    120, 11, HEX
        Detail_Data=    4, 8058, DEC
        Detail_Data=    4, 8059, DEC
```

To enter the data,

```
errupdate <input file>
```

2. To modify the log, report, and alert characteristics of entry `99999999` , specify the modify operator = (equal sign) followed by the unique Error ID, and the new characteristics for the entry to be modified:

   ```
   errupdate
    =99999999:
    Report = False
    Log = True
   ```

3. To delete entry `99999999` from the Error Record Template Repository, specify the delete operator − (minus sign) followed by the unique Error ID of the entry to be deleted:

   ```
   errupdate
    -99999999:
   ```

4. To override the XPG/4 message catalog specified for this input stream with "*!", use the "catname" keyword.
   `*!mycat.cat`

   `* mycat.cat` is used for all XPG/4 messages from now on.

   * except for this one:

   ```
   + CDROM_ERR23:
           Comment=        "Temporary CDROM read error"
           catname= "othercat.cat"
           Class=  H
           Log=            True
           Report= True
           Alert=          False
           Err_Type=       TEMP
           Err_Desc=       {1, 1, "CD ROM is broken"}
           Prob_Causes=    {2, 1, "cause 1"},\
                          {2, 2, "Cause 2"}
           Fail_Causes=    E800, 6312
           Fail_Actions=   1601, 0000
           Detail_Data=    120, 11, HEX
           Detail_Data=    4, 8058, DEC
           Detail_Data=    4, 8059, DEC
   ```

The catalog othercat.cat will be used for the CDROM_ERR23 template only.

Note: A template may contain both XPG/4 messages and the traditional error ids or codepoints.

Files

/usr/include/sys/errids.h	Contains the header file that contains Error IDs.
/usr/include/sys/err_rec.h	Contains the header file that contains structures for logging errors.

Related Information

The **errclear** command, **errdead** command, **errinstall** command, **errlogger** command, **errmsg** command, **errpt** command, **errstop** command.

The **errdemon** daemon.

The **errsave** kernel service.

The **errlog** subroutine.

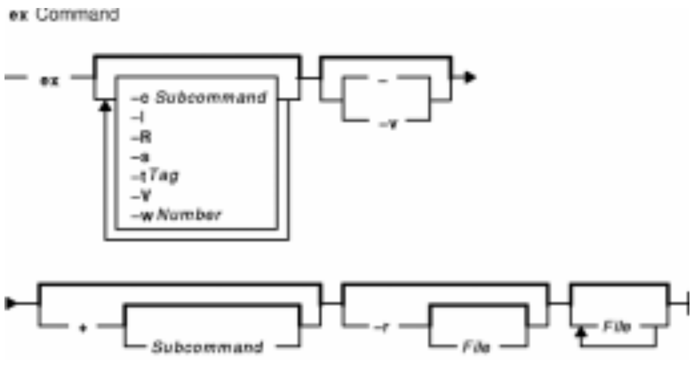
Error Logging Overview in *AIX Version 4.3 Problem Solving Guide and Reference*.

ex Command

Purpose

Edits lines interactively, with a screen display.

Syntax



ex[**−c***Subcommand*] [**−l**] [**−R**] [**−s**] [**−t***Tag*] [**−V**] [**−w***Number*] [**−v**|**−**] [+[*Subcommand*]] [**−r**[*File*]] [*File*...]

Description

The **ex** command starts the ex editor. The ex editor is part of a family of editors that includes the edit editor, which is a simpler version of the ex editor for novice or casual use, and the vi editor, which is a full−screen display editor. Calling the vi editor directly sets environment variables for screen editing. The ex editor is more powerful than a simple line editor since it is a subset of the vi editor and can access the screen editing capabilities of the vi editor.

The *File* parameter specifies the file or files to be edited. If you supply more than one file name, the ex editor edits each file in the specified order.

Notes:

1. To determine how your workstation can perform more efficiently, the ex editor uses the workstation capability database **terminfo** and the type of the workstation you are using from the **TERM** environment variable.
2. The **ex** command affects the current line unless you specify otherwise. In order to work with different parts of the file, you need to know how to address lines in a file.

Flags

−c*Subcommand*	Carries out the ex editor subcommand before editing begins. When a null operand is entered, as in `−c ''` , the editor places the current line at the bottom of the file. (Normally, the ex editor sets the current line at the start of the file or at some specified tag or pattern.)
−l	Indents appropriately for LISP code and accepts the ( ) (open or close parenthesis), { } (left or right brace), and the [[ ]] (double left or double right bracket) characters as text rather than interpreting them as vi subcommands. This flag is active in visual and open modes.
−R	Sets the **readonly** option, preventing you from altering the file.
−s	Suppresses all interactive−user feedback. If you use this flag, file input/output errors do not

	generate a helpful error message. Using this flag is the same as using the **−** flag.
−t *Tag*	Loads the file that contains the tag indicated by the parameter *Tag* and positions the editor at that tag. To use this flag, you must first create a database of function names and their locations using the **ctags** command.
−w*Number*	Sets the default window size to *Number*.
−v	Invokes the vi editor. **Note:** When the **−v** flag is selected, an enlarged set of subcommands are available, including screen editing and cursor movement features. See the **vi** command.
−V	Invokes the editor in verbose mode.
−	Suppresses all interactive−user feedback. If you use this flag, file input/output errors do not generate a helpful error message. Using this flag is the same as using the **−s** flag.
+[*Subcommand*]	Begins an edit at the specified editor search or subcommand. When no parameter is entered, the +*Subcommand* places the current line at the bottom of the file. Normally, the ex editor sets the current line to the start of the file, or to some specified tag or pattern.
−r [*File*]	Recovers a file after an editor or system crash. If you do not specify the *File* parameter, a list of all saved files is displayed.

Exit Status

The following exit values are returned:

0	Successful completion.
>**0**	An error occurred.

Files

/usr/lbin/exrecover	Recover subcommand
/usr/lbin/expreserve	Preserve subcommand
$HOME/.exrc	Editor startup file
./.exrc	Editor startup file
/var/tmp/Ex*nnnnn*	Editor temporary
/var/tmp/Rx*nnnnn*	Names buffer temporary
/var/preserve	Preservation directory

Related Information

The **ctags** command, **ed** command, **edit** command, **vi** command.

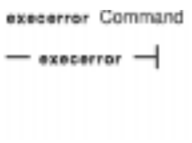
Editor Overview in *AIX Version 4.3 INed Editor User's Guide* introduces general concepts about the INed editor.

execerror Command

Purpose

Writes error messages to standard error.

Syntax



execerror

Description

The **execerror** command is executed by an **exec** subroutine when the load of the real program is unsuccessful. It is passed the name of the file being executed and zero or more loader error message strings. Each loader error message string contains an error number followed by error data.

Examples

The **execerror** command is used as follows:

```
char *buffer[1024];
buffer[0] = "execerror" ;
buffer[1] = "name of program that failed to load";
loadquery(L_GETMESSAGES, &buffer[2], sizeof buffer −8);
execvp("/usr/sbin/execerror",buffer);
```

This sample code causes the application to terminate after the messages are written to standard error.

Files

/usr/sbin/execerror Contains the **execerror** command.

Related Information

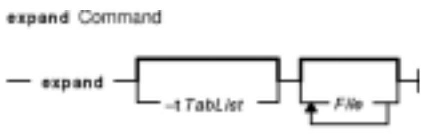
The **exec** subroutine, **loadquery** subroutine.

expand Command

Purpose

Writes to standard output with tabs changed to spaces.

Syntax



expand [**−t** *TabList*] [*File* ...]

Description

The **expand** command writes the named files or standard input to standard output, and replaces the tab characters with one or more space characters. Any backspace characters are copied to the output and cause the column position count for tab stop calculations to decrement; the column position count will not decrement below zero.

> **Note:** The *File* parameter must be a text file.

Flags

−t *TabList*	Specifies the position of the tab stops. The default value of a tab stop is 8 column positions. The *TabList* variable must consist of a single positive−decimal integer or multiple positive−decimal integers. The multiple integers must be in ascending order, and must be separated by commas or by blank characters with quotation marks around the integers. The single *TabList* variable sets the tab stops an equal number of column positions apart. The multiple *TabList* variable sets the tab stops at column positions that correspond to the integers in the *TabList* variable. If the **expand** command processes a tab stop beyond the last one specified in the *TabList* variable, the tab stop is replaced by a single−space character in the output.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

1. To adjust the tab stops an equidistance amount in `text.fil`, enter:
   ```
   expand −t 3 text.fil
   ```
   If `text.fil` contains:

```
1       2        3456789
```

then the **expand** command displays:

```
1  2        3456789
```

2. To adjust the tab stops a varied amount in `text.fil`, enter:
   ```
   expand -t 3,15,22  text.fil
   ```

   OR

   ```
   expand -t "3 15 22" text.fil
   ```

   If `text.fil` contains:

   ```
   1      2      3      456789
   ```

   then the **expand** command displays:

   ```
   1  2       3      456789
   ```

Files

/usr/bin/expand Contains the **expand** command.

Related Information

The **newform** command, **tab** command, **unexpand** command, **untab** command.

Files Overview in the *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces you to files and the way you can work with them.

Input and Output Redirection Overview in the *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

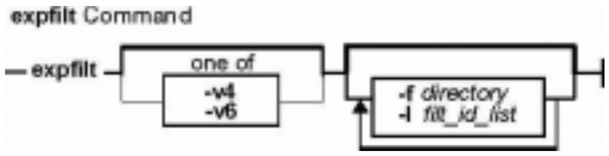
expfilt Command

Purpose

Exports filter rules to an export file.

Exports filter rules.

Syntax



expfilt [**−v 4**|**6**] **−f***directory* [**−l***filt_id_list*]

Description

Use the **expfilt** command to export filter rules into export text file(s), which can be used by the **impfilt** command. This is useful if you want to define similar rules on multiple machines.

The **expfilt** command exports filter rules into text file(s) which can be used by the **impfilt** command.

Flags

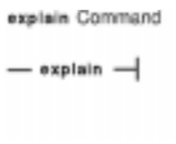
−v	IP version of the filter rules you want to export. The value of **4** specifies IP version 4 and the value of **6** specifies IP version 6. When this flag is not used, both IP version 4 and IP version 6 rules are exported.
−v	IP version for which you want to export the filter rules. Value 4 specifies IP Version 4. Value 6 specifies IP Version 6. Default is for both IP Version 4 and IP Version 6.
−f	Specifies the directory to create the exported text files. The directory will be created if it does not exist.
−f	Defines the directory where the exported text files are to be written. The directory is created if it does not exists.
−l	Lists the id's of the filter rules(s) you want to export. The filter rule ids can be separated by "**,**" or "**−**". If this flag is not used, all the filter rules defined in the filter rule table for the applicable IP version(s) will be exported.
−l	List of the filter rule id(s) you want to export. The filter rule ids are separated by space, "," or "−". If omitted, all the filter rules defined in the filter rule table for the IP version(s) will be exported.

explain Command

Purpose

Provides an interactive thesaurus.

Syntax



explain

Description

The **explain** command provides an interactive thesaurus for the English−language phrases found by the **diction** command. Before using the **explain** command, use the **diction** command to obtain a list of poorly worded phrases. When you use the **explain** command, the system prompts you for a phrase and responds with a grammatically acceptable alternative. You can continue typing phrases, or you can exit by entering the Ctrl−D key sequence.

The **explain** command also takes piped input from the command line, as shown in the following example:

```
diction Filename | explain
```

No other command line parameters are valid.

Files

/usr/lib/explain.d Contains thesaurus.

Related Information

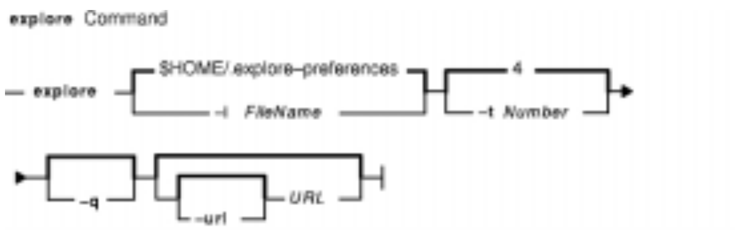
The **diction** command.

explore Command

Purpose

Starts the AIX WebExplorer World Wide Web browser.

Syntax



explore [**−i***FileName*] [**−t***Number*] [**−q**] [[**−url**] *URL*]

Description

The **explore** command opens the WebExplorer main window and connects to the Uniform Resource Locator (URL) for the home document.

Flags

−i*FileName*	Specifies an alternate initialization file, where *FileName* is the full path name of the file to use instead of the default **$HOME/.explore−preferences**. This allows you to start the WebExplorer with an alternate set of user preferences.
−t*Number*	Specifies the number of threads to use for loading images, where *Number* is the number of image loader threads. Each thread is represented in the status area of the main window. A maximum of eight can be specified, and the default is four.
−q	Specifies quiet mode. This suppresses the WebExplorer title window when you start the application and bypasses the confirmation window when you exit.
−url*URL*	Specifies a particular document to load when starting WebExplorer, where *URL* is the URL of the document to load. If WebExplorer has a home document defined, this URL will override it. You do not have to precede the URL with the **−url** flag. If you specify the URL by itself, WebExplorer will accept it.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Security

Access Control: Any User

Auditing Events: N/A

Examples

To start the browser without the title window appearing and go directly to the Dilbert Zone URL, enter:

```
explore −q  http://www.unitedmedia.com/comics/dilbert/
```

or

```
explore −q  −url http://www.unitedmedia.com/comics/dilbert/
```

Files

/usr/lpp/explorer/bin/explore	Contains the **explore** command.
$HOME/.explore−preferences	Contains the initialization file that specifies user preferences for settings such as the number of colors used.
$HOME/.mailcap	Contains the configuration file that maps mimetype to external viewers.
$HOME/.mimetypes	Contains the user−defined configuration file that maps mimetype to external viewers. It is set through the **Configure Viewers** dialog. this file overrides the **.mailcap** settings.

Related Information

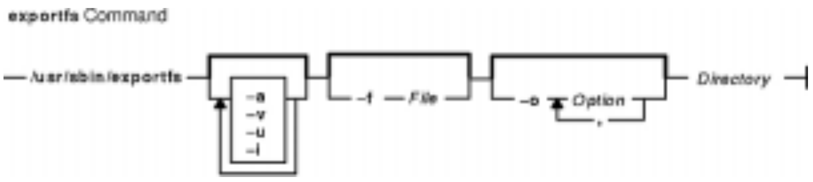
None

exportfs Command

Purpose

Exports and unexports directories to NFS clients.

Syntax



/usr/sbin/exportfs [**−a**] [**−v**] [**−u**] [**−i**] [**−f***File*] [**−o***Option* [,*Option* ...]] [*Directory*]

Description

The **exportfs** command makes local directories available for Network File System (NFS) clients to mount. This command is normally invoked during system startup by the **/etc/rc.nfs**file and uses information in the **/etc/exports** file to export one or more directories, which must be specified with full path names.

The **/etc/xtab** file lists directories that are currently exported. To display this file, enter the **exportfs** command without flags or arguments. To alter the file or to alter the characteristics of one of its directories, root users can edit the **/etc/exports** file and run the **exportfs** command. Such alterations can be done at any time. Never edit the **/etc/xtab** file directly.

> **Note:** You cannot export a directory that is either a parent directory or a subdirectory of one that is currently exported and within the same file system.

Flags

−a	Exports all directories listed in the **/etc/exports** file.
−v	Prints the name of each directory as it is exported or unexported.
−u	Unexports the directories you specify. When used with the **−a** flag, unexports all directories listed in the **/etc/exports** file.
−i	Allows the exporting of directories not specified in the exports file or ignores the options in the **/etc/exports** file. Normally the **exportfs**command consults the **/etc/exports** file for the options associated with the exported directory.
−f *File*	Specifies an export file, other than the **/etc/exports** file, that contains a list of directories that you can export. This file should follow the same format as the **/etc/exports** file. NOTE: This alternate file will not be used for exporting directories automatically when the system and NFS is started. The **/etc/exports** file is the only file that is supported for specifying directories to export at system start.
−o*Options*	Specifies optional characteristics for the exported directory. You can enter more than one variable by separating them with commas. Choose from the following options:

ro	Exports the directory with read−only permission. Otherwise, if not specified, the directory is exported with read−write permission.

rw = Client [:Client]	Exports the directory with read−write permission to the machines specified by the *Client* parameter and read−only to all others. The *Client* parameter can be either the host name or the network name. If a *rw* host name is not specified, the directory is exported with read−write permission to all.
anon = UID	Uses the *UID* value as the effective user ID, if a request comes from a root user. The default value for this option is −2. Setting the value of the *anon* option to −1 disables anonymous access. Thus, by default, secure NFS accepts nonsecure requests as anonymous, and users who want more security can disable this feature by setting *anon* to a value of −1.
root = HostName[:HostName,...]	Gives root access only to the root users from the specified *HostName*. The default is for no hosts to be granted root access.
access = Client[:Client,...]	Gives mount access to each client listed. A client can be either a host name or a net group name. Each client in the list is first checked for in the **/etc/netgroup** database and then in the **/etc/hosts** database. The default value allows any machine to mount the given directory.
secure	Requires clients to use a more secure protocol when accessing the directory.
public	Specifies a directory as the NFS Server public directory. This option only applies to AIX Version 4.2.1.

Examples

1. To export all directories in the **/etc/exports** file, enter:

   ```
   exportfs −a
   ```
2. To export one directory from the **/etc/exports** file, enter:

   ```
   exportfs /home/notes
   ```

   In this example, the `/home/notes` directory is exported.

   > **Note:** For this command to work, the **/home/notes** directory must be specified in the **/etc/exports** file.
3. To unexport a directory, enter:

   ```
   exportfs −u /home/notes
   ```

   In this example, the `/home/notes` directory is unexported.
4. To display the name of the directory currently being exported, enter:

   ```
   exportfs −v
   ```
5. To export a directory that is not specified in the **/etc/exports** file, enter:

   ```
   exportfs −i /home/zeus
   ```

   In this example, the `/home/zeus` directory is exported without restrictions.

6. To export a directory and give netgroup members permission to access this directory, enter:

   ```
   exportfs access=cowboys:oilers /home/notes −o
   ```

   In this example, the `/home/notes` directory is exported and permits users of `cowboys` and `oilers` host machines to have access.

7. To export a directory with different options from the **/etc/exports** file, enter:

   ```
   exports −i −o −root=zorro:silver /directory
   ```

   In this example, the `/directory` directory is exported and allows root user access to `zorro` and `silver` host machines, regardless of the access permissions specified in the **/etc/exports** file.

Files

/etc/exports	Lists the directories that the server can export.
/etc/xtab	Lists currently exported directories.
/etc/hosts	Contains an entry for each host on the network.
/etc/netgroup	Contains information about each user group on the network.
/etc/rc.nfs	Contains the startup script for the NFS and &Symbol.NIS; daemons.

Related Information

The **chnfsexp** command, **mknfsexp** command, **rmnfsexp** command, **showmount** command.

How to Export a File System Using Secure NFS in *AIX Version 4.3 System Management Guide: Communications and Networks*.

List of NFS Commands and List of NFS Files.

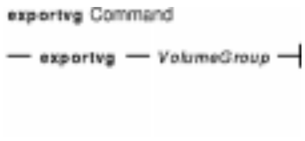
Network File System (NFS) Overview for System Management in *AIX Version 4.3 System Management Guide: Communications and Networks*.

exportvg Command

Purpose

Exports the definition of a volume group from a set of physical volumes.

Syntax



exportvg *VolumeGroup*

Description

The **exportvg** command removes the definition of the volume group specified by the *VolumeGroup* parameter from the system. Since all system knowledge of the volume group and its contents are removed, an exported volume group can no longer be accessed. The **exportvg** command does not modify any user data in the volume group.

A volume group is a nonshared resource within the system; it should not be accessed by another processor until it has been explicitly exported from its current processor and imported on another. The primary use of the **exportvg** command, coupled with the **importvg** command, is to allow portable volumes to be exchanged between processors. Only a complete volume group can be exported, not individual physical volumes.

Using the **exportvg** command and the **importvg** command, you can also switch ownership of data on physical volumes shared between two processors.

> **Note:** To use this command, you must either have root user authority or be a member of the **system** group.

You can use the Web−based System Manager Volumes application (**wsm lvm** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit exportvg** fast path to run this command.

> **Notes:**
>
> 1. A volume group that has a paging space volume on it cannot be exported while the paging space is active. Before exporting a volume group with an active paging space volume, ensure that the paging space is not activated automatically at system initialization, and then reboot the system.
> 2. The mount point information of a logical volume would be missing from the LVCB (logical volume control block) if it is longer than 128 characters. Please make a note of the mount points that are longer than 128 characters as you will need to edit the **/etc/filesystems** file manually upon executing **importvg** command to import this volume group completely.

Examples

To remove volume group `vg02` from the system, enter:

```
exportvg vg02
```

Note: The volume group must be varied off before exporting.

The definition of `vg02` is removed from the system and the volume group cannot be accessed.

Files

/usr/sbin Directory where the **exportvg** command resides.

Related Information

The **importvg** command, **varyoffvg** command, **varyonvg** command.

The Logical Volume Storage Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the Logical Volume Manager, physical volumes, logical volumes, volume groups, organization, ensuring data integrity, and allocation characteristics.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

expr Command

Purpose

Evaluates arguments as expressions.

Syntax

expr *Expression*

Description

The **expr** command reads the *Expression* parameter, evaluates it, and writes the result to standard output.

You must apply the following rules to the *Expression* parameter:

- Separate each term with blanks.
- Precede characters special to the shell with a \ (backslash).
- Quote strings containing blanks or other special characters.

Integers may be preceded by a unary hyphen. Internally, integers are treated as 32−bit, twos complement numbers.

Note: The **expr** command returns 0 to indicate a zero value, rather than the null string.

The following items describe *Expression* parameter operators and keywords. Characters that need to be escaped are preceded by a \ (backslash). The items are listed in order of increasing precedence, with equal precedence operators grouped within { } (braces):

*Expression1***\\\|** *Expression2*	Returns *Expression1* if it is neither a null value nor a 0 value; otherwise, it returns *Expression2*.
*Expression1***\&***Expression2*	Returns *Expression1* if both expressions are neither a null value nor a 0 value; otherwise, it returns a value of 0.
*Expression1***{ =, \>, \>=, \<, \<=, != }** *Expression2*	Returns the result of an integer comparison if both expressions are integers; otherwise, it returns the result of a string comparison.
Expression1 **{+, − }***Expression2*	Adds or subtracts integer−valued arguments.
Expression1 **{ *, /, % }***Expression2*	Multiplies, divides, or provides the remainder from the division of integer−valued arguments.
Expression1 **:** *Expression2*	Compares the string resulting from the evaluation of *Expression1* with the regular expression pattern resulting from the evaluation of

Expression2. Regular expression syntax is the same as that of the **ed** command, except that all patterns are anchored to the beginning of the string (that is, only sequences starting at the first character of a string are matched by the regular expression). Therefore, a ^ (caret) is not a special character in this context.

Normally the matching operator returns the number of characters matched (0 on failure). If the pattern contains a subexpression, that is:

```
\( Expression \)
```

then a string containing the actual matched characters is returned.

A collating sequence can define equivalence classes for use in character ranges. See "Understanding Locale Environment Variables" in *AIX Version 4.3 System Management Concepts: Operating System and Devices* for more information on collating sequences and equivalence classes.

Note: The following string arguments are extensions beyond that of the standards, and the behavior may be different across operating systems. These string arguments are NOT portable.

match*String1String2*	Same as *Expression1* **:** *Expression2*.
length*String1*	Returns the length of the *String1*.
index*String1String2*	Returns the first position in *String1* where any character in *String2* exists.
substr*String1StartPositionLength*	Returns a string that starts with the character at *StartPosition* in *String1* and continuies for *Length* characters

Exit Status

This command returns the following exit values:

0	The *Expression* parameter evaluates to neither null nor 0.
1	The *Expression* parameter evaluates to null or 0.
2	The *Expression* parameter is not valid.
>**2**	An error occurred.

Note: After parameter processing by the shell, the **expr** command cannot distinguish between an operator and an operand except by the value. Thus, if the value of `$a` is `j`, the command:

```
expr $a = j
```

looks like:

```
expr j = j
```

after the shell passes the arguments to the **expr** command. The following is also true:

```
expr X$a = Xj
```

Examples

1. To modify a shell variable, enter:

   ```
   COUNT=`expr $COUNT + 1`
   ```

   This adds `1` to the shell variable `$COUNT`. The **expr** command is enclosed in grave accents, which causes the shell to substitute the standard output from the **expr** command into the `COUNT=` command. The `$COUNT` variable must be initialized before using.

2. To find the length of the **$STR** shell variable, enter:

   ```
   LENGTH=`expr $STR : ".*"`
   ```

   This sets the `LENGTH` variable to the value given by the: (colon) operator. The pattern .* (dot, asterisk) matches any string from beginning to end, so the colon operator gives the length of the `$STR` variable as the number of characters matched. Note that `.*` must be within quotes to prevent the shell from treating the * (asterisk) as a pattern−matching character. The quotes are not part of the pattern.

   If the `$STR` variable is set to the null string or contains any white space (blanks or tabs), then the command displays the error message `expr: syntax error`. This happens because the shell does not normally pass null strings to commands. In this case, the **expr** command sees only:

   ```
   :.*
   ```

   The shell also removes the single quotation marks. This does not work because the colon operator requires two values. The problem is fixed by enclosing the shell variable in double quotation marks:

   ```
   LENGTH=`expr "$STR" : ".*"`
   ```

   Now if the value of the `$STR` variable is null, the `LENGTH` variable is set to a value of 0. Enclosing shell variables in double quotation marks is generally recommended. Do not enclose shell variables in single quotation marks.

3. To use part of a string, enter:

   ```
   FLAG=`expr "$FLAG" : "−*\(.*\)"`
   ```

   This removes leading hyphens, if any, from the `$FLAG` shell variable. The colon operator gives the part of the `FLAG` variable matched by the subexpression enclosed between \(and \) characters (backslash, open parenthesis and backslash, close parenthesis). If you omit the \(and \) subexpression characters, the colon operator gives the number of characters matched.

   If the `$FLAG` variable is set to − (hyphen), the command displays a syntax error message. This happens because the shell substitutes the value of the `$FLAG` variable before running the **expr** command. The **expr** command does not know that the hyphen is the value of a variable. It can only see:

   ```
   − : −*\(.*\)
   ```

   and it interprets the first hyphen as the subtraction operator. To eliminate this problem, use:

```
FLAG=`expr "x$FLAG" : "x-*\(.*\)"`
```

4. To use the **expr** command in an **if** statement, enter:

   ```
   if expr "$ANSWER" : "[yY]" >/dev/null
   then
   echo ANSWER begins with "y" or "Y"
   fi
   ```

   If the `$ANSWER` variable begins with `y` or `Y`, the `then` part of the **if** statement is performed. If the match succeeds, the result of the expression is 1 and the **expr** command returns an exit value of 0, which is recognized as the logical value True by the **if** statement. If the match fails, the result is 0 and the exit value 1 (False).

   Redirecting the standard output of the **expr** command to the **/dev/null** special file discards the result of the expression. If you do not redirect it, the result is written to the standard output, which is usually your workstation display.
5. Consider the following expression:

   ```
   expr "$STR" = "="
   ```

   If the `$STR` variable has the value = (equal sign), then after the shell processes this command the **expr** command sees the expression:

   ```
   = = =
   ```

   The **expr** command interprets this as three = operators in a row and displays a syntax error message. This happens whenever the value of a shell variable is the same as that of one of the **expr** operators. You can avoid this problem by phrasing the expression as:

   ```
   expr "x$STR" = "x="
   ```
6. To return the length of the $SHELL environment variable, /usr/bin/ksh, enter:

   ```
   expr length $SHELL
   ```

   The following is displayed:

   ```
   12
   ```
7. To return the first position of where any characters in the string "de" is found in "abcdef", enter:

   ```
   expr index abcdef de
   ```

   The following is displayed:

   ```
   4
   ```
8. To return the first position of where any characters in the string "fd" is found in "abcdef", enter:

   ```
   expr index abcdef fd
   ```

   The following is displayed:

   ```
   4
   ```
9. To return the string starting at position 11, for a length of 6 of the string "Goodnight Ladies", enter:

```
expr substr "Goodnight Ladies" 11 6
```

The following is displayed:

```
Ladies
```

Files

/usr/bin/expr Contains the **expr** command.

Related Information

The **bsh** command, **csh** command, **ed** command, **ksh** command.

Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

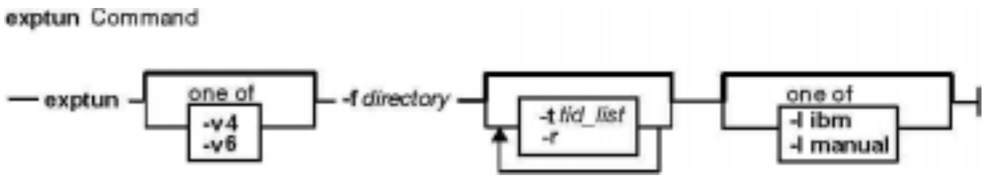
National Language Support Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

exptun Command

Purpose

Exports a tunnel definition and, optionally, all the user defined filter rules associated with the tunnel. Creates a tunnel export file and an optional filter rule export file that can be used for the tunnel partner.

Syntax



exptun [**−v 4**|**6**] **−f***directory* [**−t***tid_list*] [**−r**] [**−l ibm** | **manual**]

Description

Use the **exptun** command to create a tunnel context export file and, optionally, a filter rule appendage file for a tunnel partner to import. This command does not activate a tunnel, it simply creates the required files for the tunnel partner.

Notes:

- If the initiator flag for an IBM tunnel in the tunnel database is set to N (for non−initiator), the value will be changes in the exported file to Y to show that it is the initiator. If the tunnel definition in the database specifies that it initiates the session key exchange, the exported definition will have that setting as well.
- Generated export files contain keys used by the tunnel. Protect these files with the AIX file system protection features.

Flags

−fDefines the directory where the export files are to be written. The directory will be created if it does not exist. The export files may then be sent to the tunnel partner to be imported. It is recommended that export files for each tunnel partner have a different directory specification.**−l** The type of the tunnel(s) you want to export. If ibm is specified, only IBM tunnel(s) will be exported. If manual is specified, only manual ibm tunnel(s) will be exported.**−r** Exports all the user defined filter rules associated with the tunnel(s). If this flag is not used, only the tunnel definitions will be exported.**−t**Specifies the list of tunnel IDs to be used for the export files. The list may be specified as a sequence of tunnel IDs separated by a **","** or **"−"** (1, 3, 10, 50−55). If this flag is not used, all tunnel definitions from the tunnel database will be exported.**−v**The IP version of the tunnels being exported. Value **4** specifies IP version 4 tunnels. Value **6** specifies IP version 6 tunnels. If this flag is not used, both IP version 4 and IP version 6 tunnel definitions will be exported.

Related Information

The **chtun** command, **gentun** command, **imptun** command, **lstun** command, **mktun** command, and **rmtun** command.

extendlv Command

Purpose

Increases the size of a logical volume by adding unallocated physical partitions from within the volume group.

Syntax

To Add Available Physical Partitions

extendlv [**−a** *Position*] [**−e** *Range*] [**−u** *Upperbound*] [**−s** *Strict*] *LogicalVolume Partitions* [*PhysicalVolume ...*]

To Add Specific Physical Partitions

extendlv [**−m***MapFile*] *LogicalVolume Partitions*

Description

The **extendlv** command increases the number of logical partitions allocated to the *LogicalVolume* by allocating the number of additional logical partitions represented by the *Partitions* parameter. The *LogicalVolume* parameter can be a logical volume name or a logical volume ID. To limit the allocation to specific physical volumes, use the names of one or more physical volumes in the *PhysicalVolume* parameter; otherwise, all the physical volumes in a volume group are available for allocating new physical partitions.

By default, the logical volume is expanded using the existing characteristics which are displayed when you use the **lslv** command. To temporarily override these existing characteristics for the new partitions only, choose different values for these characteristics by using the flags. The characteristics of the logical volume do not change.

The default maximum number of partitions for a logical volume is 128. Before extending a logical volume more than 128 logical partitions, use the **chlv** command to increase the default value.

The default allocation policy is to use a minimum number of physical volumes per logical volume copy, to place the physical partitions belonging to a copy as contiguously as possible, and then to place the physical partitions in the desired region specified by the **−a** flag. Also, by default, each copy of a logical partition is placed on a separate physical volume.

Notes:

1. When extending a striped logical volume, the number of partitions must be in an even multiple of the striping width.
2. When extending a striped logical volume only the striping width (disks striped across) is used. If there is not enough partitions on the physical volumes, used for this striped logical volume, the extend of the logical volume fails.
3. It is recommended that a logical volume using a large number of partitions (more than 800MB) be extended gradually in sections.
4. Changes made to the logical volume are not reflected in the file systems. To change file system characteristics use the **chfs** command.
5. To use this command, you must either have root user authority or be a member of the **system** group.

You can use the Web−based System Manager Volumes application (**wsm lvm** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit extendlv** fast path to run this command.

Flags

Note: The **−e**, **−m**, **−s**, and **−u** flags are not valid with a striped logical volume.

−a*Position* Sets the intraphysical volume allocation policy (the position of the logical partitions on the physical volume). The *Position* variable can be one of the following:

- **m** Allocates logical partitions in the outer middle section of each physical volume. This is the default position.
- **c** Allocates logical partitions in the center section of each physical volume.
- **e** Allocates logical partitions in the outer edge section of each physical volume.
- **ie** Allocates logical partitions in the inner edge section of each physical volume.
- **im** Allocates logical partitions in the inner middle section of each physical volume.

−e *Range* Sets the interphysical volume allocation policy (the number of physical volumes to extend across, using the volumes that provide the best allocation). The value of the *Range* variable is limited by the *Upperbound* variable (set with the −u flag) and can be one of the following:

- **x** Allocates logical partitions across the maximum number of physical volumes.
- **m** Allocates logical partitions across the minimum number of physical volumes.

−m*MapFile* Specifies the exact physical partitions to allocate. Partitions are used in the order given in the *MapFile* parameter. Used partitions in the *MapFile* parameter are skipped. All physical partitions belonging to a copy are allocated before allocating for the next copy of the logical volume. The *MapFile* parameter format is: `PVname:PPnum1[−PPnum2].` In this example, `PVname` is a physical volume name (for example, `hdisk0`). It is one record per physical partition or a range of consecutive physical partitions. `PPnum` is the physical partition number.

−s*Strict* Determines the strict allocation policy. Copies of a logical partition can be allocated to share or not to share the same physical volume. The *Strict* variable is represented by one of the following:

- **y** Sets a strict allocation policy, so copies for a logical partition cannot share the same physical volume.
- **n** Does not set a strict allocation policy, so copies for a logical partition can share the same physical volume.
- **s** Sets a super strict allocation policy, so that the partitions allocated for one mirror cannot share a physical volume with the paritions from another mirror.

  Note: When changing a non superstrict logical volume to a superstrict logical volume you must specify physical volumes or use the **−u** flag.

−u*Upperbound* Sets the maximum number of physical volumes for new allocation. The value of the *Upperbound* variable should be between one and the total number of physical volumes. The default is the total total number of physical volumes in the volume group. When using striped logical volumes or super strictness the upper bound indicates the maximum number of physical volumes allowed for each mirror copy.

Examples

To increase the size of the logical volume represented by the `lv05` directory by three logical partitions, enter:

```
extendlv lv05 3
```

Files

/usr/sbin/ Directory where the **extendlv** command resides.

Related Information

The **chfs** command, **chlv** command, **chpv** command, **lslv** command, **mklv** command, **mklvcopy** command.

The Logical Volume Storage Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the Logical Volume Manager, physical volumes, logical volumes, volume groups, organization, ensuring data integrity, and allocation characteristics.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

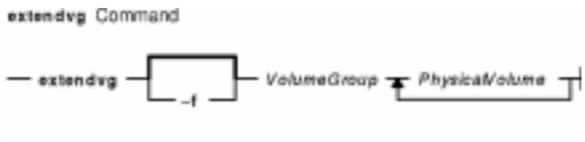
AIX HACMP/6000 Concepts and Facilities.

extendvg Command

Purpose

Adds physical volumes to a volume group.

Syntax



extendvg [**−f**] *VolumeGroup PhysicalVolume* ...

Description

The **extendvg** command increases the size of the *VolumeGroup* by adding one or more *PhysicalVolumes*.

The physical volume is checked to verify that it is not already in another volume group. If the system believes the physical volume belongs to a volume group that is varied on, it exits. But if the system detects a description area from a volume group that is not varied on, it prompts the user for confirmation in continuing with the command. The previous contents of the physical volume are lost, so the user must be cautious when using the override function.

> **Note:** To use this command, you must either have root user authority or be a member of the **system** group.

You can use the Web−based System Manager Volumes application (**wsm lvm** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit extendvg** fast path to run this command.

Flags

−f Forces the physical volume to be added to the specified volume group unless it is a member of another volume group in the Device Configuration Database or of a volume group that is active.

Examples

To add physical volumes `hdisk3` and `hdisk8` to volume group `vg3`, enter:

```
extendvg vg3 hdisk3 hdisk8
```

> **Note:** The volume group must be varied on before extending.

Files

/usr/sbin/extendvg Contains the **extendvg** command.

Related Information

The **reducevg** command.

The Logical Volume Storage Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the Logical Volume Manager, physical volumes, logical volumes, volume groups, organization, ensuring data integrity, and allocation characteristics.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

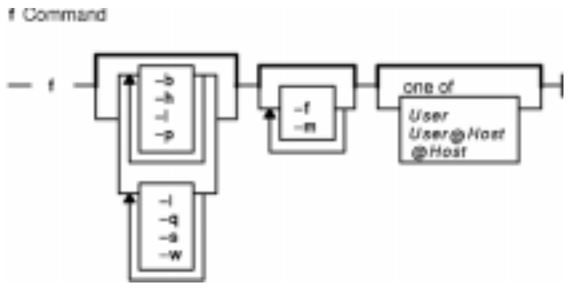
The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the structure, main menus, and tasks that are done with SMIT.

f Command

Purpose

Shows user information. This command is the same as the **finger** command.

Syntax



{ **f** | **finger** } [[**−b**] [**−h**] [**−l**] [**−p**]] | [**−i**] [**−q**] [**−s**] [**−w**]]

[**−f**] [**−m**] [*User* | *User@Host* | *@Host*]

Description

The **/usr/bin/f** command displays information about the users currently logged in to a host. The format of the output varies with the options for the information presented.

Default Format

The default format includes the following items:

- Login name
- Full user name
- Terminal name
- Write status (an * (asterisk) before the terminal name indicates that write permission is denied)

For each user on the host, the default information list also includes, if known, the following items:

- Idle time (Idle time is minutes if it is a single integer, hours and minutes if a : (colon) is present, or days and hours if a "d" is present.)
- Login time
- Site−specific information

  The site−specific information is retrieved from the gecos field in the **/etc/passwd** file. The gecos field may contain the Full user name followed by a comma. All information that follows the comma is displayed by the finger command with the Site−specific information.

Longer Format

A longer format is used by the **f** command whenever a list of user's names is given. (Account names as well as first and last names of users are accepted.) This format is multiline, and includes all the information described above along with the following:

- User's **$HOME** directory
- User's login shell
- Contents of the **.plan** file in the user's **$HOME** directory
- Contents of the **.project** file in the user's **$HOME** directory

The **f** command may also be used to look up users on a remote system. The format is to specify the user as *User@Host*. If you omit the user name, the **f** command provides the standard format listing on the remote system.

Create the **.plan** and **.project** files using your favorite text editor and place the files in your **$HOME** directory. The **f** command uses the **toascii** subroutine to convert characters outside the normal ASCII character range when displaying the contents of the **.plan** and **.project** files. The **f** command displays a `M−` before each converted character.

When you specify users with the *User* parameter, you can specify either the user's first name, last name, or account name. When you specify users, the **f** command, at the specified host, returns information about those users only in long format.

For other information about the **f** command, see "Installation and Configuration for TCP/IP" in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Flags

−b	Gives a brief, long−form listing.
−f	Suppresses printing of header line on output (the first line that defines the fields that are being displayed).
−h	Suppresses printing of **.project** files on long and brief long formats.
−i	Gives a quick listing with idle times.
−l	Gives a long−form listing.
−m	Assumes that the *User* parameter specifies a user ID (used for discretionary access control), *not* a user login name.
−p	Suppresses printing of **.plan** files on long−form and brief long−form formats.
−q	Gives a quick listing.
−s	Gives a short format list.
−w	Gives a narrow, short−format list.

Parameters

@Host	Specifies all logged−in users on the remote host.
User	Specifies a local user ID (used for discretionary access control) or local user login name, as specified in the **/etc/passwd** file.
User@Host	Specifies a user ID on the remote host, displayed in long format.

Examples

1. To get information about all users logged in to host `alcatraz`, enter:

   ```
   f @alcatraz
   ```

   Information similar to the following is displayed:

   ```
   [alcatraz.austin.ibm.com]
   Login     Name        TTY Idle         When      Site Info
   brown    Bob Brown   console   2d   Mar 15 13:19
   ```

```
smith    Susan Smith    pts0  11:   Mar 15 13:01
jones    Joe Jones      tty0    3   Mar 15 13:01
```

User `brown` is logged in at the `console`, user `smith` is logged in from pseudo teletype line `pts0`, and user `jones` is logged in from `tty0`.

2. To get information about user `brown` at `alcatraz`, enter:

```
f brown@alcatraz
```

Information similar to the following is displayed:

```
Login name: brown
Directory: /home/brown    Shell: /home/bin/xinit −L −n Startup
On since May 8 07:13:49 on console
No Plan.
```

3. To get information about user `brown` at a local host in short form, enter:

```
f −q brown
```

Information similar to the following is displayed:

```
Login           TTY             When
brown           pts/6           Mon Dec 17 10:58
```

Files

/usr/bin/f	Contains the **f** command.
/etc/utmp	Contains list of users currently logged in.
/etc/passwd	Defines user accounts, names, and home directories.
/etc/security/passwd	Defines user passwords.
/var/adm/lastlog	Contains last login times.
$HOME/.plan	Optional file that contains a one−line description of a user's plan.
$HOME/.project	Optional file that contains a user's project assignment.

Related Information

The **hostname** command, **rwho** command, **finger** command.

The **fingerd** daemon.

Displaying Information about Logged−In Users in *AIX Version 4.3 System User's Guide: Communications and Networks*.

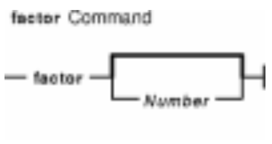
Network Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

factor Command

Purpose

Factors a number.

Syntax



factor [*Number*]

Description

When called without specifying a value for the *Number* parameter, the **factor** command waits for you to enter a positive number less than `1E14` (100,000,000,000,000). It then writes the prime factors of that number to standard output. It displays each factor the proper number of times. To exit, enter `0` or any nonnumeric character.

When called with an argument, the **factor** command determines the prime factors of the *Number* parameter, writes the results to standard output, and exits.

Examples

To calculate the prime factors of 123, enter:

```
factor 123
```

The following is displayed:

```
123
     3
     41
```

Files

/usr/bin/factor Contains the **factor** command.

Related Information

The **bc** command.

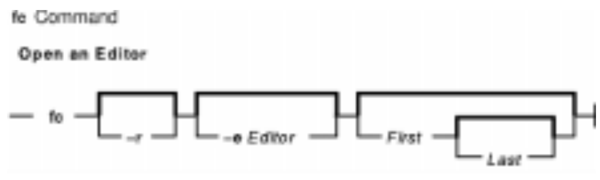
fc Command

Purpose

Processes the command history list.

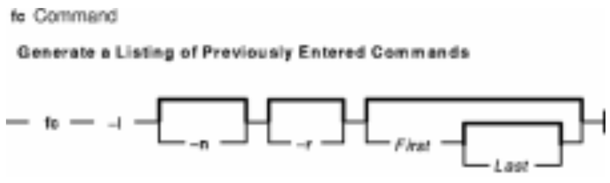
Syntax

To Open an Editor to Modify and Reexecute Previously Entered Commands



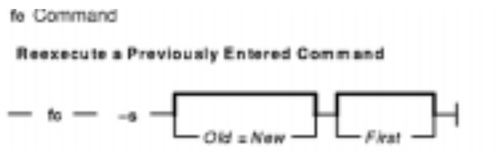
fc [**−r**] [**−e***Editor*] [*First* [*Last*]]

To Generate a Listing of Previously Entered Commands



fc−l [**−n**] [**−r**] [*First* [*Last*]]

To Reexecute a Previously Entered Command



fc−s [*Old*=*New*] [*First*]

Description

The **fc** command displays the contents of your command history file or invokes an editor to modify and reexecutes commands previously entered in the shell.

The command history file lists commands by number. The first number in the list is selected arbitrarily. The relationship of a number to its command does not change except when the user logs in and no other process is accessing the list. In that case, the system resets the numbering to start the oldest retained command at 1.

If the numbers in the command history file reach a limit greater than the value of the **HISTSIZE** environment variable or 32767, whichever is greater, the shell wraps to 1. Despite this optional number wrapping, the **fc** command maintains the time−ordering sequence of the commands. For example, if three commands in sequence are given the numbers 32766, 32767, and 1 (wrapped), command 32767 is still considered previous to command 1.

The commands in the history file can be displayed using the **−l** (lowercase L) flag. When the **−l** flag is not specified and commands are edited using the **−e***Editor* flag, the resulting lines are entered at the end of the history file and then reexecuted by the shell (the **fc −e** *Editor* command is not entered into the command history list). If the editor returns a non−zero exit status, this suppresses entry in the history file and command reexecution.

Any command−line variable assignments or redirection operators used with the **fc** command again invoke the previous command, suppressing standard error for both the **fc** command and the previous command. For example:

```
fc −s −− −1 2>/dev/null
```

Flags

−e*Editor*	Edits commands using the specified editor. The *Editor* parameter should be a command name. The command is located using the **PATH** environment variable. The value in the **FCEDIT** environment variable is used as a default when the **−e** flag is not specified. If the **FCEDIT** environment variable is null or unset, the ed editor is used.
−l	(lowercase L) Lists the commands in your history file. No editor is invoked to modify them. The commands are written in the sequence indicated by the *First* and *Last* parameters, as affected by the **−r** flag, with each command preceded by the command number.
−n	Suppresses command numbers when used with the **−l** flag.
−r	Reverses the order of the commands listed (when used with the **−l** flag) or reverses the order of the commands edited (when the **−l** flag is not specified).
−s	Reexecutes a command without invoking an editor. If the *First* parameter is not also specified, the **−s** flag reexecutes the previous command.

Parameters

First or *Last* Selects the commands to list or edit. The number of previous commands that can be accessed is determined by the value of the **HISTSIZE** environment variable. The *First* and *Last* parameters must have one of the following values:

[+] *Number*	Represents a specific command number. Command numbers can be displayed with the **−l** flag. A + (plus sign) is the default.
−*Number*	Represents a command that was previously executed, specified by the number of commands to back up in the history list. For example, −1 indicates the immediately previous command.
String	Indicates the most recently entered command that begins with the specified string. If the *Old*=*New* parameter is specified without the **−s** flag, the string from the *First* parameter cannot contain an embedded = (equal sign).

When using the **−s** flag, omission of the *First* parameter causes the previous command to be used.

When the **−s** flag is not specified, the following rules apply:

- When using the **−l** flag, omission of the *Last* parameter causes a default to the previous command.
- When using the **−r**, **−n**, and **−e** flags, omission of the *Last* parameter causes a default to the *First* parameter.
- If both the *First* and *Last* parameters are omitted, the previous 16 commands are listed or the previous single command is edited (depending on whether or not the **−l** flag is used).
- If both the *First* and *Last* parameters are present, all commands are listed (when the **−l** flag is specified) or edited (when the **−l** flag is not specified). Editing multiple commands is accomplished by presenting to the editor all the commands at one time, each command starting on a new line. If the

First parameter represents a newer command than the *Last* parameter, the commands are listed or edited in reverse sequence. This is equivalent to using the **−r** flag. For example, the following commands on the first line are equivalent to the corresponding commands on the second line:

```
fc  −r  10  20          fc      30  40
fc      20  10          fc  −r  40  30
```

- When a range of commands is used, it is not an error to specify *First* or *Last* values that are not in the history list. The **fc** command substitutes the value representing the oldest or newest command in the list, as appropriate. For example, if there are only ten commands in the history list, numbered 1 to 10, the commands:

```
fc  −l
fc   1   99
```

list and edit, respectively, all ten commands.

Old=*New*	In commands to be reexecuted, replaces the fist occurrence of the old string with the new string.

Environment Variables

The following environment variables affect the execution of the **fc** command:

FCEDIT	When expanded by the shell, determines the default value for the **−e***editor* variable. If the **FCEDIT** environment variable is null or is not set, the ed editor is the default.
HISTFILE	Determines the path name of the command history file. If the **HISTFILE** environment variable is not set, the shell may attempt to access or create the **.sh_history** file in the user's home directory.
HISTSIZE	Determines a decimal number representing the limit to the number of previous commands that are accessible. If this variable is not set, a default value of128 is used.

Exit Status

The following exit values are returned:

0	Successful completion of the listing.
>**0**	An error occurred.

Otherwise, the exit status is that of the commands executed by the **fc** command.

Examples

1. To invoke the editor defined by the **FCEDIT** environment variable on the most recent command (the default editor is **/usr/bin/ed**), enter:
   ```
   fc
   ```
   The command is executed when you finish editing.
2. To list the previous two commands that were executed, enter:
   ```
   fc −l −2
   ```
3. To find the command that starts with `cc`, change `foo` to `bar`, and display and execute the command, enter:
   ```
   fc −s foo=bar cc
   ```

Files

/usr/bin/ksh	Contains the Korn shell **fc** built−in command.
/usr/bin/fc	Contains the **fc** command.

Related Information

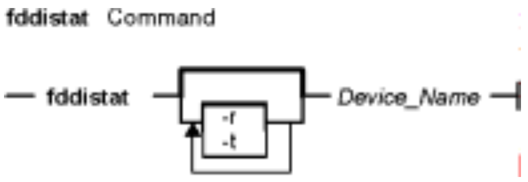
The **ksh** command.

fddistat Command

Purpose

Shows FDDI device driver and device statistics.

Syntax



fddistat [**−r−t**] *Device_Name*

Description

The **fddistat** command displays the statistics gathered by the specified FDDI device driver. If no flags are specified, only the device driver statistics are displayed. This command is also invoked when the **netstat** command is run with the **−v** flag. The **netstat** command does not issue any **fddistat** command flags.

If an invalid *Device_Name* is specified, the **fddistat** command will produce an error message stating that it could not connect to the device.

Flags

−r Resets all the statistics back to their initial values. This flag can only be issued by privileged users.
−t Toggles debug trace in some device drivers.

Parameter

Device_Name The name of the FDDI device, for example, **fddi0**.

Statistic Fields

> **Note:** Some adapters may not support a specific statistic. The value of non−supported statistic fields is always 0.

The statistic fields displayed in the output of the **fddistat** command and their descriptions are:

Title Fields

`Elapsed Time` Displays the real time period has elapsed since last time the statistics was reset. Since part of the statistics may be reset by the device driver during error recovery when a hardware error was detected, there will be another Elapsed Time displayed in the middle of the output when this situation has occurred in order to reflect the time differences between the statistics.

Transmit Statistics Fields

`Packets`	The number of packets transmitted successfully by the device.
`Bytes`	The number of bytes transmitted successfully by the device.
`Interrupt`	The number of transmit interrupts received by the driver from the adapter.
`Transmit Errors`	The number of output errors encountered on this device. This is a counter for unsuccessful transmissions due to hardware/network errors.
`Packets Dropped`	The number of packets accepted by the device driver for transmission which were not (for any reason) given to the device.
`Max Packets on S/W Transmit Queue`	The maximum number of outgoing packets ever queued to the software transmit queue.
`S/W Transmit Queue Overflow`	The number of outgoing packets overflowed the software transmit queue.
`Current S/W+H/W Transmit Queue Length`	The number of pending outgoing packets on either the software transmit queue or the hardware transmit queue.
`Broadcast Packets`	The number of broadcast packets has been transmitted without any error.
`Multicast Packets`	The number of multicast packets has been transmitted without any error.

Receive Statistics Fields

`Packets`	The number of packets has been received successfully by the device.
`Bytes`	The number of bytes received successfully by the device.
`Interrupts`	The number of receive interrupts received by the driver from the adapter.
`Receive Errors`	The number of input errors encounteredon this device. This is a counter for unsuccessful reception due to hardware/network errors.
`Packets Dropped`	The number of packets received by the device driver from this device which were not (for any reason) given to a network demuxer.
`Bad Packets`	The number of bad packets received (i.e.saved) by the device driver.
`Broadcast Packets`	The number of broadcast packets received without any error.
`Multicast Packets`	The number of multicast packets received without any error.

General Statistics Fields

`No mbuf Errors`	The number of times that mbufs were not available to the device driver. This usually occurs during receive operations when the driver must obtain mbuf buffers to process inbound packets. If the mbuf pool for the requested size is empty, the packet will be discarded. The **netstat−m** command can be used to confirm this.
`SMT Error Word`	The adapter's SMT error status.
`SMT Event Word`	The adapter's SMT event status.
`Connection Policy Violation`	The status of the adapter's connection to the ring.
`Port Event`	The adapter's port status.

`Set Count`	The current set count value.
`Adapter Check Code`	The adapter's most recent adapter check status.
`Purged Frames`	Receive frames dropped by the adapter due to lack of available descriptors.
`ECM State Machine`	Entity Coordination Management State Machine.
`PCM State Machine: Port A`	Physical Connection Management for the primary adapter State Machine
`PCM State Machine: Port B`	Physical Connection Management for the secondary adapter State Machine
`CFM State Machine: Port A`	Configuration Management for the primary adapter State Machine
`CFM State Machine: Port B`	Configuration Management for the secondary adapter State Machine
`CF State Machine`	Overall Configuration State Machine.
`MAC CFM State Machine`	Configuration Management for the MAC State Machine.
`RMT State Machine`	Ring Management State Machine.
`Driver Flags`	The device driver internal status flags that are currently turned on.

Example

To display the device driver statistics for **fddi0**, enter:

```
fddistat fddi0
```

This produces the following output:

```
-------------------------------------------------------------
FDDI STATISTICS (fddi0) :
Elapsed Time: 0 days 0 hours 1 minutes 3 seconds


Transmit Statistics:                        Receive Statistics:
--------------------                        -------------------
Packets: 100                                Packets: 100
Bytes: 113800                               Bytes: 104700
Interrupts: 100                             Interrupts: 100
Transmit Errors: 0                          Receive Errors: 0
Packets Dropped: 0                          Packets Dropped: 0
Max Packets on S/W Transmit Queue: 0        Bad Packets: 0
S/W Transmit Queue Overflow: 0
Current S/W+H/W Transmit Queue Length: 0


Broadcast Packets: 0                        Broadcast Packets: 0
Multicast Packets: 0                        Multicast Packets: 0


General Statistics:
-------------------
No mbuf Errors: 0
SMT Error Word: 00040080                    SMT Event Word: 000004a0
Connection Policy Violation: 0000           Port Event: 0000
Set Count Hi: 0000                          Set Count Lo: 0003
Adapter Check Code: 0000                    Purged Frames: 0


ECM State Machine:        IN
PCM State Machine Port A: CONNECT
PCM State Machine Port B: ACTIVE
```

```
CFM State Machine Port A: ISOLATED
CFM State Machine Port B: CONCATENATED
CF State Machine:         C_WRAP_B
MAC CFM State Machine:    PRIMARY
RMT State Machine:        RING_OP


Driver Flags: Up Broadcast Running
        Simplex DualAttachStation
```

Related Information

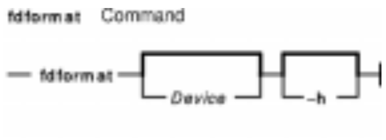
The **atmstat** command, **entstat** command, **netstat** command, **tokstat** command.

fdformat Command

Purpose

The **fdformat** command formats diskettes.

Syntax



fdformat [*Device*] [**−h**]

Description

> **Attention:** Formatting a diskette or read/write optical disk destroys any existing data on it.

The **fdformat** command formats diskettes in the diskette drive specified for low density unless the **−h** flag is specified.

Before formatting a diskette or read/write optical disk, the **ffdformat** command prompts for verification. This allows you to end the operation cleanly.

Flags

−h Forces high−density formatting. This flag is used only with the **fdformat** command.

Parameters

Device Specifies the device containing the diskette to be formatted. The default is the **/dev/rfd0** device for drive 0.

Examples

To force high−density formatting of a diskette when using the **fdformat** command, enter:

```
fdformat −h
```

Files

/usr/sbin/fdformat	Contains the **fdformat** command.
/dev/rfd*	Specifies the device parameters.
/dev/fd*	Specifies the device parameters.
/dev/romd*	Specifies the device parameters.
/dev/omd*	Specifies the device parameters.

Related Information

The **flcopy** command, **format** command.

The **fd** special file.

fdpr Command

Purpose

A performance tuning utility for improving execution time and real memory utilization of user−level application programs.

Syntax

Most Common Usage:

fdpr Command
Most Common Use
fdpr
-p ProgramName
-x Command

fdpr −p*ProgramName***−x***Command*

fdpr −p*ProgramName* [**−M***Segnum*] [**−o***OutputFile*] [**−nI**] [[**−Rn**]|[**−R0** |**−R1** |**−R2** |**−R3**]] [**−v**] **−s** [**−1** |**−3**] [**−x***Command*]

Use with Phases 1 and 3 Flags:

fdpr −p*ProgramName* [**−armember***ArchiveMemberList*] [**−M***Segnum*] [**−o***OutputFile*] [**−nI**] [**−tb**] [**−pc**] [**−pp**] [**−toc**] [**−bt**] [**−nop**] [**−opt−fdpr−glue**] [**−inline**] [**−disasm**] [**−profcount**] [**−map**] [[**−Rn**]| [**−R0** | **−R1** | **−R2** | **−R3**]] [**−v**] **−s** [**−1** | **−3**] [**−x***Command*]

fdpr −p*ProgramName* [**−M** *Segnum*] [**−o***OutputFile*] [**−nI**] [[**−Rn**]|[**−R0** |**−R1** |**−R2** |**−R3**]] [**−v**] [**−s** [**−2** |**−12**|**−23**] **−x***Command*

Use With Phase 2 Flag:

fdpr−p*ProgramName* [**−armember***ArchiveMemberList*] [**−M** *Segnum*] [**−o***OutputFile*] [**−nI**] [**−tb**] [**−pc**] [**−pp**] [**−toc**] [**−bt**] [**−nop**] [**−optfdpr_glue**] [**−inline**] [**−disasm**] [**−profcount**] [**−map**] [[**−Rn**]| [**−R0** | **−R1** | **−R2** | **−R3**]] [**−v**] [**−s** [**−2** |**−12**|**−23**] **−x***Command*

Description

The **fdpr** command (Feedback Directed Program Restructuring) is a performance−tuning utility that may help improve the execution time and the real memory utilization of user−level application programs. The **fdpr** program optimizes the executable image of a program by collecting information on the behavior of the program while the program is used for some typical workload, and then the program creates a new version that is optimized for that workload. The new program generated by **fdpr** typically runs faster and uses less real memory.

> **Attention:** The **fdpr** command applies advanced optimization techniques to a program that may result in programs that do not behave as expected; programs that are reordered using this tool should be used with due caution and should be rigorously retested with, at a minimum, the same test suite used to test the original program in order to verify expected functionality. The reordered program is not supported.

The **fdpr** command builds an optimized executable program in 3 distinct phases:

- Phase 1: Create an instrumented executable program.
- Phase 2: Run the instrumented program and create the profile data.
- Phase 3: Generate the optimized executable program file.

These phases can be run separately or in partial or full combination, but must be run in order (i.e., **−1** then **−2** then **−3** or **−12** then **−3**) and by the same user. The default is to run all three phases.

> **Note:** The instrumented executable, created in phase 1 and run in phase 2, typically runs several times slower than the original program. Due to the increased execution time required by the instrumented program, the executable should be invoked in such a way as to minimize execution duration, while still fully exercising the desired code areas. The **fdpr** command user should also attempt to eliminate, where feasible, any time dependent aspects of the program.

Flags

−1, **−2**, **−3**	Specifies the phase to run. The default is all 3 phases (**−123**). The **−s** flag must be used when running separate phases so that the succeeding phases can access the required intermediate files. The phases must be run in order (for example, **−1**, then **−2**, then **−3**, or **−1**, then **−23**) and by the same user.
−M*SegNum*	Specifies where to map shared memory for profiling. The default is **0x30000000**. Specify an alternate shared memory address if the program to be reordered or any of the command strings invoked with the **−x** flag use conflicting shared−memory addresses. Typical alternative values are **0x40000000**, **0x50000000**, ... up to **0xC0000000**).
−nI	Does not permit branch reversing.
−o *OutFile*	Specifies the name of the output file from the optimizer. The default is *program***.fdpr**
−p*ProgramName*	Contains the name of the executable program to optimize. This program must be an unstripped executable.
−armember*ArchiveMembersList*	Lists archive members to be optimized, within a shared archive file specified by the **−p** flag. If **−armember** is not specified, all members of the archive file are optimized. The entries in *ArchiveMemberList* should be separated by spaces.
−Rn	Copies input to output instead of invoking the optimizer. **Note:** The **−Rn** flag cannot be used with the **−R0**, **−R1**, **−R2**, or **−R3** flags.
−R0,**−R1**,**−R2**, **−R3**	Specifies the level of optimization. **−R3** is the most aggressive optimization. The default is **−R0**. See "Optimization" for more information. **Note:** The **−R2** and **−R0** flags do not support programs that are compiled with the **−g** flag.
−tb	Force the restructuring of traceback tables in reordered code. If **−tb** is omitted, traceback tables are automatically included only for C++ applications using Try Catch mechanism.
−pc	Preserve CSECT boundaries. Effective only with **−R1/−R3**.
−pp	Preserve procedures' boundaries. Effective only with **−R1/−R3**.
−toc	Enable TOC pointer modifications. Effective only with **−R0/−R2**.
−bt	Enable branch table modifications. Effective only with **−R0/−R2**.
−inline	Perform inlining of Hot functions.

−nop	Remove NOP instructions from reordered code.
−opt_fdpr_glue	Optimize Hot BBs in FDPR Glue during code reordering.
−map	Print a map of basic blocks with their respective old −> new addresses into a suffixed **.map** file.
−disasm	Print the disassembled version of the input program into a suffixed **.dis** file.
−profcount	Print the profiling counters into a suffixed **.counters** file.
−s	Specifies that temporary files created by the **fdpr** command cannot be removed. This option must be used when running **fdpr** in separate phases.
−v	Contains verbose output.
−x *Command*	Specifies the command used for invoking the instrumented program. All the arguments after the **−x** flag are used for the invocation. The **−x** flag is required when the **−s** flag is used with the **−2** flag.

Optimization

The **fdpr** command provides four levels of optimization. The flags **−R1**, **−R2**, and **−R3** provide the most aggressive optimization along with the greatest potential speedups. However, in some cases, using these optimization levels may result in an executable that does not behave as expected. Programs that contain assembler code (in particular, code that performs dynamic branch calculations) or programs derived from nonstandard compilers are prone to these types of reordering−induced anomalies. In addition, the **−R1** and **−R3** flags produce executables that do not include debug information and are therefore not supported by the **dbx** command.

Use of the **−R0** flag can result in a slightly reduced performance improvement as this flag attempts to preserve functionality and debug capability by maintaining the original program structure and by eliminating branch table and function descriptor pointer adjustments. Functional errors are much less likely, though still possible. Also, this option produces a reordered executable that is typically 20−40% larger than the original program.

Both the **−R0** and **−R2** flags utilize a program−reordering technique in which the original structure of the program, including traceback entries, is preserved. The reordered code, which represents the highly−executed code paths through the program, is appended to the end of the executable. This technique provides near optimal performance improvement by allowing global code reordering (independent of procedure boundaries and absent of interleaved traceback entries) while preserving the debug capability. In addition, program functionality is maintained for a larger class of programs using the original program structure as a "safety net" to catch undetected and/or unmodified dynamically (runtime) computed branch instructions). The **−R2** flag attempts to fix all dynamically computed branches that branch to moved code. However, for some programs (especially assembler programs), it is difficult to correctly identify these dynamic branches and using the **−R2** flag for this class of programs can result in unexpected functional errors. Also, reordering programs that utilize any form of self−modifying code will probably result in unexpected functional errors.

Executables built with the **−qfdpr** compiler flag contain information to assist **fdpr** in producing reordered programs with guaranteed functionality. When this compiler flag is used, the functionality advantage of the **fdpr** option **−R0** is extended to options **−R1**, **−R2**, and **−R3**. However, if **−qfdpr** is used, only those object modules built with this flag are reordered. If the **−qfdpr** flag is used, it should be used for all object modules in a program. Static linking will not improve performance if the **−qfdpr** flag is used.

Additional performance enhancements can be realized by using static linking when building the program to be reordered. Since the **fdpr** program only reorders the instructions within the executable program specified, any dynamically linked shared library routines called by the program are not reordered. Statically linking these library routines to the executable allows for reordering both the instructions in the program and all library routines used by the program. There are other advantages as well as disadvantages to building a statically linked program. See "Dynamic and Static Linking" in the *AIX Versions 3.2 and 4 Performance Tuning Guide* for further information.

Output Files

All files created by the **fdpr** command are stored in the current directory with the exception of any files that may be created by running the command specified in the **−x** flag. During the optimization process, the original program is saved by renaming the program, and is only restored to the original program name upon successful completion of the final phase.

The profile file created by the **fdpr** command explicitly uses the name of the current directory since scripts used to run the program may change the working directory before executing the program.

The files created and/or used by the **fdpr** command are:

program	Name of the unstripped executable to be optimized.
__*program***.save**	Saved version of the original executable program.
__*program***.save.histo**	Intermediate file.
__*program***.save.bt**	Intermediate file.
__*program***.prof**	Name of the profile file.
__*program***.instr**	Name of the instrumented version of program.
__*program.save.dis*	Name of the default disassembly file produced by the **−disasm** flag.
__*program.save.map*	Name of the default mapping file produced by the **−map** flag.
__*program.save.counters*	Name of the default profile counters file produced by the **−profcount** flag.
*program***.fdpr**	Default name of optimized executable output file.

Debug Support

The use of the optimization flags **−R0** and **−R2** results in an executable that has additional information included in the program file for use by the **dbx** debug program. This additional information allows **dbx** to provide limited debug support by mapping reordered instruction addresses to their original locations and by maintaining traceback entries in the original text section. The **dbx** command maps most reordered instruction addresses to the corresponding addresses in the original executable as follows:

0x*RRRRRRRR***= fdpr[0x***YYYYYYYY***]**

where **0x***RRRRRRRR* indicates the reordered address and **fdpr[0x***YYYYYYYY***]** indicates the original address. Also, **dbx** uses the traceback entries in the original instruction area to find associated procedure names and during stack traceback. See the "Examples" section for further details.

Enhanced Debugging Capabilities

In order to enable a certain degree of debugging capability for optimized programs, **fdpr** updates the Symbol Table to reflect the changes that were made in the **.text** section.

Entry fields in the Symbol Table that specify addresses of symbols that were relocated during the reordering of **fdpr**, are modified to point to their new addresses in the **.text** section.

In addition, in the case where functions or files are split during reordering, **fdpr** creates new entries in the Symbol Table for each new part of the split function/file. These new parts of the same function are given new symbol names in the Symbol Table according to the following naming convention:

```
<original function name> [<number of function's part>] [fdpr|orig
```

For optimization flags **−R0**/**−R2**, which append all new reordered code to the end of the **.text** section, the suffix string **[fdpr]** indicates that the new entry refers to an address in the appended text area whereas the

[orig] string refers to an address in the original text area. For optimization flags **−R1**/**−R3** all the new entries are suffixed with the **[fdpr]** string.

For example: Originally, if a function was split into 3 parts, it would have 3 entries in the Symbol Table; one for each part:

```
  [Index] m   Value       Scn     Aux   Sclass    Type    Name
Original Entry:
   [456]  m  0x00000230    2       1     0x02    0x0000   .main

Restructured Entries:
   [456]  m  0x00000304    2       1     0x02    0x0000   .main
  [1447]  m  0x00003328    2       1     0x02    0x0000   .main[1] [fdpr]
  [1453]  m  0x000033b4    2       1     0x02    0x0000   .main[2] [fdpr]
```

Examples

The following are typical usage examples of the **fdpr** command.

1. This example allows the user to run all three phases. In this example, `test1` is the unstripped executable and `test2` is a shell script that invokes `test1`. The current working directory is **/tmp/fdpr**.
   `test2` `script file:`

   ```
   # code to exercise test1
   test1 −expand 100 −root $PATH file.jpg −quit
   # the end of test2
   ```

   Run the **fdpr** command (using the default optimization):

   ```
   fdpr −p test1 −x test2
   ```

   This results in the new reordered executable **test1.fdpr**.

2. To run one phase at a time, execute phase one of **fdpr** and save the necessary temporary files.
   ```
   fdpr −s −1 −p test1
   ```

   This command string renames the original program to **__test1.save** and creates an instrumented version with the name `test1`.

   To execute phase two and save temporary files:

   ```
   fdpr −s −2 −p test1 −x test2
   ```

   This command string executes the script file `test2` that runs the instrumented version of `test1` to collect the profile data.

   To execute phase three, saving temporary files:

   ```
   fdpr −s −3 −p test1
   ```

   Again, this results in the new reordered executable **test1.fdpr**.

3. To run the first two phases followed by phase three, execute phase one and two, saving temporary files.
   ```
   fdpr −s −12 −p test1 −x test2
   ```

   Execute phase three, while saving temporary files and using optimization level three.

   ```
   fdpr −s −3 −R3 −p test1
   ```

4. If an error occurs while running an **fdpr** reordered program built with the **−R0** or **−R2** optimization flags, the **dbx** command can be used to determine what procedure the error occurred in (either in the original text section or in the reordered text section) as follows:
   ```
   dbx program.fdpr
   ```
   which produces the output similar to the following:
   ```
   Type 'help' for help.
   reading symbolic information ...warning: no source compiled with −g

   [using memory image in core]

   Segmentation fault in proc_d at 0x10000634 = fdpr[0x10000290]
   0x10000634 (???) 98640000        stb   r3,0x0(r4)
   (dbx)
   ```
   The address mapping information `0x10000634= fdpr[0x10000290]` indicates that the instruction at address `0x10000634` is in the reordered text section and originally resided (in the original program) at address `0x10000290 in proc_d`. Running **dbx** on the original program and using the mapped addresses (`0x10000290` in the above example) may provide additional information to aid in debugging.

   A stack traceback, which is used to determine how the program arrived at the current location, is produced as follows:
   ```
   (dbx) where
   ```
   which produces the following output:
   ```
   proc_d(0x0) at 0x10000634
   proc_c(0x0) at 0x10000604
   proc_b(0x0) at 0x100005d0
   proc_a(0x0) at 0x1000059c
   main(0x2, 0x2ff7fba4) at 0x1000055c
   (dbx)
   ```
5. The **dbx** subcommand **stepi** may also be used to single step through the instructions of a reordered executable program as follows:
   ```
   (dbx) stepi
   ```
   which produces the following output:
   ```
   stopped in proc_d at 0x1000061c = fdpr[0x10000278]
   0x1000061c (???) 9421ffc0       stwu   r1,−64(r1)
   (dbx)
   ```

In this example, **dbx** indicates that the program stopped in routine `proc_d` at address `0x1000061c` in the reordered text section (originally located at address `0x10000278`).

Files

/usr/bin/fdpr	Contains the **fdpr** command.
program	Name of the unstripped executable to be optimized.
__*program*.**save**	Saved version of the original executable program.
__*program*.**save.histo**	Intermediate file.
__*program*.**save.bt**	Intermediate file.
__*program*.**prof**	Name of the profile file.
__*program*.**instr**	Name of the instrumented version of program.

__program.save.dis	Name of the default disassembly file produced by the **−disasm** flag.
__program.save.map	Name of the default mapping file produced by the **−map** flag.
__program.save.counters	Name of the default profile counters file produced by the **−profcount** flag.
*program***.fdpr**	Default name of optimized executable output file.

Related Information

The **dbx** command.

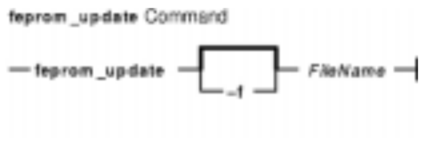
Restructuring Executables with fdpr in *AIX Versions 3.2 and 4 Performance Tuning Guide*.

feprom_update Command

Purpose

Loads flash EPROM and reboots the system.

Syntax



feprom_update [**−f**] *FileName*

Description

> **Attention:** Do not use this command when the system is running with more than one user.

The **feprom_update** command loads the system's flash EPROM with the specified file, which must contain a valid binary flash EPROM image, and then reboots the system. The file name can also be the device name for the diskette drive containing the flash EPROM image.

By default, the **feprom_update** command warns that the system will be rebooted, and asks for confirmation before proceeding. If the **−f** flag is given, this warning is not given; the flash EPROM is updated and the system is rebooted without asking for confirmation.

The system must be in service mode and single−user root mode when the **feprom_update** command is run.

> **Note:** The **feprom_update** command works only on multiprocessor systems with Micro Channel I/O. For IBM systems, this includes the IBM 7012 Model G Series, the IBM 7013 Model J Series, and the IBM 7015 Model R Series.

Flags

−f Forces the **feprom_update** command to update the flash EPROM and reboot the system without asking for confirmation.

Examples

1. To update the flash EPROM with the contents of the file **/tmp/eprom.new**, and then reboot the system, enter the following command:

   ```
   feprom_update /tmp/eprom.new
   ```

2. To update the flash EPROM with the contents of the diskette in driver **rfd0**, and then reboot the system without warning, enter the following command:

   ```
   feprom_update −f /dev/rfd0
   ```

File

/usr/sbin/feprom_prom	Contains the **feprom_prom** command.

Related Information

The **smit** command.

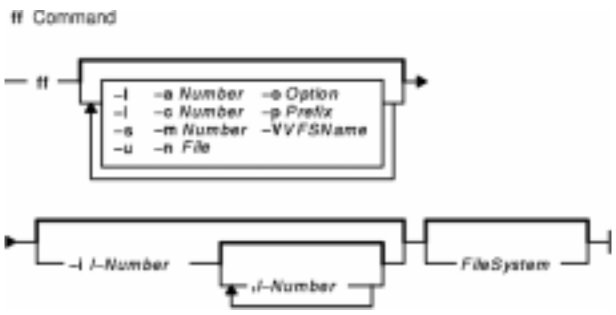
Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

ff Command

Purpose

Lists the file names and statistics for a file system.

Syntax



ff [**−a***Number*] [**−c***Number*] [**−I**] [**−l**] [**−m***Number*] [**−n***File*] [**−o***Option*] [**−p** *Prefix*] [**−s**] [**−u**] [**−V***VFSName*] [**−i***I−Number* [**,***I−Number* ...]] [*FileSystem*]

Description

The **ff** command reads the i−nodes in the file system specified by the *FileSystem* parameter and then writes information about them to standard output. It assumes the *FileSystem* is a file system, which is referenced in the **/etc/filesystems** file, and saves i−node data for files specified by flags.

The output from the **ff** command consists of the path name for each requested i−node number, in addition to other file information that you can request using the flags. The output is listed in order by i−node number, with tabs between all fields. The default line produced by the **ff** command includes the path name and i−node number fields. With all flags enabled, the output fields include path name, i−node number, size, and UID (user ID).

The *Number* parameter is a decimal number that specifies a number of days. It is prefixed by a + or − (plus or minus sign). Therefore, +3 means more than 3 days, −3 means less than 3 days, and 3 means 3 days, where a day is defined as a 24−hour period.

The **ff** command lists only a single path name out of many possible ones for an i−node with more than one link, unless you specify the **−l** flag. With the **−l** flag, the **ff** command lists all links.

Flags

−a *Number*	Displays the file if it has been accessed within the number of days specified by the *Number* parameter.
−c *Number*	Displays the file if its i−node has been changed within the number of days specified by the *Number* parameter.
−i *I−Number*	Displays the files corresponding to the i−node numbers specified by the *I−Number* parameter. The i−node numbers listed must be separated by a comma.
−I	(This flag is an uppercase i.) Does not display the i−node after each path name.
−l	(This flag is a lowercase L.) Additionally displays a list of pathnames for files with more than

	one link.
−m *Number*	Displays the file if it has been modified within the number of days specified by the *Number* parameter.
−n *File*	Displays the file if it has been modified more recently than the file specified by the *File* parameter.
−o*Options*	Specifies file system implementation−specific options.
−p *Prefix*	Adds the prefix specified by the *Prefix* parameter to each path name. The default prefix is **.** (dot).
−s	Writes the file size, in bytes, after each path name.
−u	Writes the owner's login name after each path name.
−V*VFSName*	Instructs the **ff** command to assume the file system is of type *VFSName*, overriding the value in the **/etc/filesystems** file.

Examples

1. To list the path names of all files in a given file system, enter:
   ```
   ff    −I    /dev/hd0
   ```
   This displays the path names of the files on the `/dev/hd0` device. If you do not specify the **−I** flag, the **ff** command also displays the i−node number of each file.

2. To list files that have been modified recently, enter:
   ```
   ff    −m    −2    −u    /dev/hd0
   ```
   This displays the path name, i−node number, and owner's user name (the `−u` flag) of each file on the `/dev/hd0` device that has been modified within the last two days (`−m −2`).

3. To list files that have *not* been used recently, enter:
   ```
   ff    −a    +30    /dev/hd0
   ```
   This displays the path name and i−node of each file that was last accessed more than 30 days ago (`−a+30`).

4. To find out the paths corresponding to certain i−node numbers, enter:
   ```
   ff    −l    −i    451,76    /dev/hd0
   ```

This displays all the path names (`−l`) associated with i−nodes `451` and `76`.

Files

/etc/vfs	Contains descriptions of virtual file system types.
/etc/filesystems	Lists the known file systems and defines their characteristics.

Related Information

The **find** command, **ncheck** command.

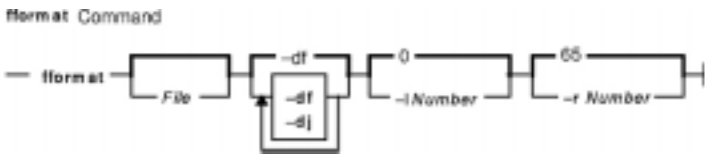
The File Systems Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains file system types, management, structure, and maintenance.

fformat Command

Purpose

Formats a text paragraph.

Syntax



fformat [*File*] [**−df**] [**−dj**] [**−l***Number*] [**−r***Number*]

Description

The **fformat** command fills or justifies paragraphs to the right margin, while preserving any left−margin indentation. The end of a paragraph is indicated by an empty line or a line beginning with a . (period).

You can use the **fformat** command as a filter with the **Do** function (the Alt−X key sequence), which runs the filter, or as a filter command from the system prompt. For information about keyboard layouts, press the F1 key (the **Help** function) within the INed editor. See "To Run Filter Commands" for more information on running filters from the editor

If you enter the **fformat** command with a file name from the system prompt, it reads the text from that file, justifies and fills each paragraph, and then writes the result to standard output.

Flags

−df	Sets the format mode to fill, which is the default.
−dj	Sets the format mode to justify.
−l*Number*	Sets the default left margin to the specified number (default 0). Since the input left margin is preserved, the value of the *Number* variable is used only where the left margin cannot be inferred. (For example, where an input paragraph consists of a single long line that must be split into two or more lines, the second and subsequent lines are indented by the specified number of characters.)
−r*Number*	Sets the right margin to the specified number. The maximum value for the *Number* variable is 130 and the default value is 65.

Using either the **−df** flag or the system default of 65 starts fill mode.

Examples

Using the following text as a sample paragraph:

```
People who are serious about collecting
sea shells often get up at the first light of dawn,
hoping to find the one
perfect shell.
```

entering `fformat -dj-r34` results in:

```
    People who are serious about
collecting sea shells often ge
t up
at the first light of dawn, ho
ping
to find the  one perfect shell.
```

Related Information

The **e** command.

Editors Overview in *AIX Version 4.3 INed Editor User's Guide* introduces general concepts about editors and describes the main AIX editors.

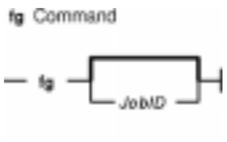
Runnning AIX and Filter Commands from the INed Editor in *AIX Version 4.3 INed Editor User's Guide* provides more information about running a filter from the command.

fg Command

Purpose

Runs jobs in the foreground.

Syntax



fg [*JobID*]

Description

If job control is enabled (see "Job Control in the Korn Shell" in *AIX Version 4.3 System User's Guide: Operating System and Devices*), the **fg** command moves a background job in the current environment into the foreground. Use the *JobID* parameter to indicate a specific job to be run in the foreground. If this parameter is not supplied, the **fg** command uses the job most recently suspended, placed in the background, or run as a background job.

The *JobID* parameter can be a process ID number, or you can use one of the following symbol combinations:

%*Number*	Refers to a job by the job number.
%*String*	Refers to a job whose name begins with the specified string.
%?*String*	Refers to a job whose name contains the specified string.
%+ OR **%%**	Refers to the current job.
%−	Refers to the previous job.

Using the **fg** command to place a job into the foreground removes the job's process ID from the list of those known by the current shell environment.

The **/usr/bin/fg** command does not work when operating in its own command execution environment, because that environment does not have applicable jobs to manipulate. For this reason, the **fg** command is implemented as a Korn shell or POSIX shell regular built−in command.

Exit Status

The following exit values are returned:

0	Successful completion.
>0	An error occurred.

If job control is disabled, the **fg** command exits with an error, and no job is placed in the foreground.

Examples

If the output of the **job −l** command shows the following job running in the background:

```
[1] + 16477RunningSleep 100 &
```

use the process ID to run the `sleep 100 &` command in the foreground by entering:

```
fg 16477
```

The screen displays:

```
sleep
```

Files

/usr/bin/ksh	Contains the Korn shell **fg** built−in command.
/usr/bin/fg	Contains the **fg** command.

Related Information

The **bg** command, **csh** command, **jobs** command, **kill** command, **wait** command.

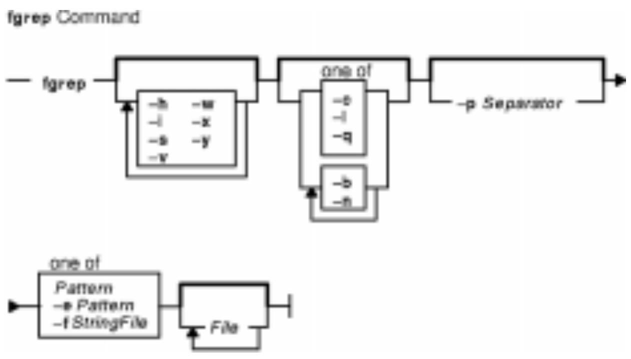
Job Control in the Korn Shell in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

fgrep Command

Purpose

Searches a file for a literal string.

Syntax



fgrep [**−h**] [**−i**] [**−s**] [**−v**] [**−w**] [**−x**] [**−y**] [[**−b**] [**−n**] | [**−c** | **−l** | **−q**]] [**−p***Separator*] {*Pattern* | **−e***Pattern* | **−f***StringFile*} [*File...*]

Description

The **fgrep** command searches the input files specified by the *File* Parameter (standard input by default) for lines matching a pattern. The **fgrep** command searches specifically for *Pattern* parameters that are fixed strings. The **fgrep** command displays the file containing the matched line if you specify more than one file in the *File* parameter.

Notes:

1. The **fgrep** command is the same as the **grep** command with the **−F** flag, except that error and usage messages are different and the **−s** flag functions differently.
2. Lines are limited to 2048 bytes.
3. Paragraphs (under the **−p** flag) are currently limited to a length of 5000 characters.
4. Do not run the **grep** command on a special file because it produces unpredictable results.
5. Input lines should not contain the NULL character.
6. Input files should end with the new line character.
7. Although some flags can be specified simultaneously, some flags override others. For example, if you specify **−l** and **−n** together, only file names are written to standard output.

Flags

−b	Precedes each line by the block number on which it was found. Use this flag to help find disk block numbers by context. The **−b** flag cannot be used with input from stdin or pipes.
−c	Displays only a count of matching lines.
−e *Pattern*	Specifies a pattern. This works like a simple pattern but is useful when the pattern begins with

	a **−** (minus sign).
−f*StringFile*	Specifies a file that contains strings.
−h	Suppresses file names when multiple files are being processed.
−i	Ignores the case of letters when making comparisons.
−l	Lists just the names of files (once) with matching lines. Each file name is separated by a new line character.
−n	Precedes each line with its relative line number in the file.
−p*Separator*	Displays the entire paragraph containing matched lines. Paragraphs are delimited by paragraph separators, as specified by the *Separator* parameter, which are patterns in the same form as the search pattern. Lines containing the paragraph separators are used only as separators; they are never included in the output. The default paragraph separator is a blank line.
−q	Suppresses all writing to standard output, regardless of matching lines. Exits with a 0 status if an input line is selected.
−s	Displays only error messages. This is useful for checking status.
−v	Displays all lines except those that match the specified pattern.
−w	Does a word search.
−x	Displays lines that match the pattern exactly with no additional characters.
−y	Ignores the case of letters when making comparisons.

Exit Status

This command returns the following exit values:

0	A match was found.
1	No match was found.
>1	A syntax error was found or a file was inaccessible (even if matches were found).

Examples

1. To search several files for a simple string of characters:

   ```
   fgrep"strcpy"*.c
   ```

   This searches for the string `strcpy` in all files in the current directory with names ending in the `.c` character string.

2. To count the number of lines that match a pattern:

   ```
   fgrep−c"{"pgm.c
   fgrep−c"}"pgm.c
   ```

   This displays the number of lines in `pgm.c` that contain left and right braces.

   If you do not put more than one { (left brace) or one } (right brace) on a line in your C programs, and if the braces are properly balanced, the two numbers displayed are the same. If the numbers are not the same, you can display the lines that contain braces in the order that they occur in the file with:

   ```
   egrep "{|}" pgm.c
   ```

3. To display the names of files that contain a pattern:

   ```
   fgrep−l"strcpy"*.c
   ```

This searches the files in the current directory that end with `.c`and displays the names of those files that contain the `strcpy` string.

Files

/usr/bin/fgrep	Contains the **fgrep** command.
/bin/fgrep	Symbolic link to the **fgrep** command.

Related Information

The **ed** command, **egrep** command, **grep** command, **sed** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces you to files and the way you can work with them.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

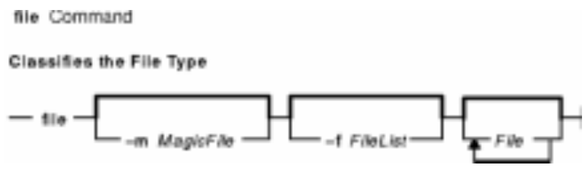
file Command

Purpose

Determines the file type.

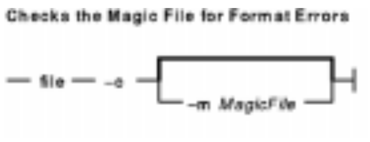
Syntax

To Classify the File Type



file [**−m***MagicFile*] [**−f** *FileList*] [*File*...]

To Check the Magic File for Format Errors



file−c [**−m***MagicFile*]

Description

The **file** command reads the files specified by the *File* parameter or the *FileList* variable, performs a series of tests on each file, and attempts to classify them by type. The command then writes the file types to standard output.

If a file appears to be in ASCII format, the **file** command examines the first 1024 bytes and determines the file type. If a file does not appear to be in ASCII format, the **file** command further attempts to distinguish a binary data file from a text file that contains extended characters.

If the *File* parameter specifies an executable or object module file and the version number is greater than 0, the **file** command displays the version stamp. The **ld** command explains the use of **a.out** files.

The **file** command uses the **/etc/magic** file to identify files that have some sort of a magic number; that is, any file containing a numeric or string constant that indicates type.

Flags

−c	Checks the specified magic file (the **/etc/magic** file, by default) for format errors. This validation is not normally done. File typing is not done under this flag.
−f *FileList*	Reads the specified file list. The file must list one file per line and must not contain leading or trailing spaces.
−m *MagicFile*	Specifies the file name of the magic file (the **/etc/magic** file, by default).

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Examples

1. To display the type of information a file contains, enter:
   ```
   filemyfile
   ```
   This displays the file type of `myfile` (such as directory, data, ASCII text, C−program source, and archive).

2. To display the type of each file named in a list of file names, enter:
   ```
   file−ffilenames
   ```

This displays the type of each file named in the `filenames` list. Each file name must appear alone on a line.

Files

/usr/bin/file	Contains the **file** command.
/etc/magic	Contains the file type database.

Related Information

The **find** command, **ld** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, and how to name files.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

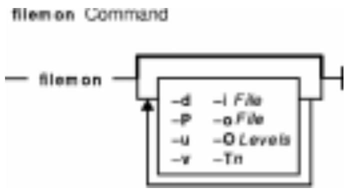
File and Directory Access Modes in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces file ownership and permissions to access files and directories.

filemon Command

Purpose

Monitors the performance of the file system, and reports the I/O activity on behalf of logical files, virtual memory segments, logical volumes, and physical volumes.

Syntax



filemon [**−d**] [**−i***File*] [**−o***File*] [**−O***Levels*] [**−P**] [**−T***n*] [**−u**] [**−v**]

Description

The **filemon** command monitors a trace of file system and I/O system events, and reports on the file and I/O access performance during that period.

In its normal mode, the **filemon** command runs in the background while one or more application programs or system commands are being executed and monitored. The **filemon** command automatically starts and monitors a trace of the program's file system and I/O events in real time. By default, the trace is started immediately; optionally, tracing may be deferred until the user issues a **trcon** command. The user can issue **trcoff** and **trcon** commands while the **filemon** command is running in order to turn off and on monitoring, as desired. When tracing is stopped by a **trcstop** command, the **filemon** command generates an I/O activity report and exits.

The **filemon** command can also process a trace file that has been previously recorded by the trace facility. The file and I/O activity report will be based on the events recorded in that file.

To provide a more complete understanding of file system performance for an application, the **filemon** command monitors file and I/O activity at four levels:

Logical file system	The **filemon** command monitors logical I/O operations on logical files. The monitored operations include all **read**, **write**, **open**, and **lseek** system calls, which may or may not result in actual physical I/O, depending on whether or not the files are already buffered in memory. I/O statistics are kept on a per−file basis.
Virtual memory system	The **filemon** command monitors physical I/O operations (that is, paging) between segments and their images on disk. I/O statistics are kept on a per−segment basis.
Logical volumes	The **filemon** command monitors I/O operations on logical volumes. I/O statistics are kept on a per−logical−volume basis.
Physical volumes	The **filemon** command monitors I/O operations on physical volumes. At this level, physical resource utilizations are obtained. I/O statistics are kept on a per−physical−volume basis.

Any combination of the four levels can be monitored, as specified by the command line flags. By default, the **filemon** command only monitors I/O operations at the virtual memory, logical volume, and physical volume levels. These levels are all concerned with requests for real disk I/O.

The **filemon** command writes its report to standard output or to a specified file. The report begins with a summary of the I/O activity for each of the levels being monitored and ends with detailed I/O activity statistics for each of the levels being monitored. Summary and detailed report contents are described in the "Reports " section.

> **Notes:**The reports produced by the **filemon** command can be quite long. Consequently, the **−o** option should usually be used to write the report to an output file. When a physical device is opened and accessed directly by an application, only reads and writes of complete 512−byte blocks are reflected in the report. "Short" reads and writes, used by the device driver to issue device commands and read device status, are ignored. CD−ROMs do not have concentric "tracks" or "cylinders," as in hard files. (There is one spiral track.) Consequently, it is not possible to report seek distance statistics for CD−ROMs in terms of cylinders.
>
> The **−u** flag is used to generate reports on files opened prior to the start of the **trace** daemon. Some of this data can be useful, but much of it applies to daemons and other unrelated activity. This background information can be overwhelming, especially on large systems. If the **/unix** file and the running kernel are not the same, then the kernel addresses will be incorrect, causing the **filemon** command to exit. When using the **filemon** command from within a shell script, allow for a slight delay prior to viewing the contents of the **filemon** output file. The **filemon** command may take a few seconds to produce this report.

System Trace Facility

The **filemon** command obtains raw I/O performance data using the AIX system trace facility. Currently, the trace facility only supports one output stream. Consequently, only one **filemon** or trace process can be active at a time. If another **filemon** or trace process is already running, the **filemon** command responds with the message:

```
/dev/systrace: Device busy
```

While monitoring very I/O−intensive applications, the **filemon** command may not be able to consume trace events as fast as they are produced in real time. When that happens, the error message:

```
Trace kernel buffers overflowed, N missed entries
```

will be displayed on `stderr`, indicating how many trace events were lost while the trace buffers were full. The **filemon** command will continue monitoring I/O activity, but the accuracy of the report will be diminished to some unknown degree. One way to prevent overflow is to monitor fewer levels of the file and I/O subsystems: the number of trace events generated is proportional to the number of levels monitored. Additionally, the trace buffer size can be increased using the **−T** option, to accommodate larger bursts of trace events before overflow. Remember that increasing the trace buffer size will result in more pinned memory, and therefore may effect I/O and paging behavior.

In memory−constrained environments (where demand for memory exceeds supply), the **−P** option can be used to pin the text and data pages of the real−time **filemon** process in memory so the pages cannot be swapped out. If the **−P** option is not used, allowing the **filemon** process to be swapped out, the progress of the **filemon** command may be delayed to the point where it cannot process trace events fast enough. This situation leads to trace buffer overflow as described above. Of course, pinning this process takes memory away from the application (although the **filemon** command is not a large program, its process image can consume up to 500KB).

Before using the **filemon** command to process an existing trace data file, you must use the **−r** option of the **trcrpt** command to rewrite the trace data sequentially to a new file. Otherwise, the **filemon** command produces the following error message, and then exits:

```
error: run 'trcrpt −r' on logfile first
```

Reports

Each report generated by the **filemon** command has a header that identifies the date, the machine ID, and the length of the monitoring period, in seconds. The CPU utilization during the monitoring period is also reported.

Next, summary reports are generated for each of the file system levels being monitored. By default, the logical file and virtual memory reports are limited to the 20 most active files and segments, respectively, as measured by the total amount of data transferred. If the **−v** flag has been specified, activity for all files and segments is reported. There is one row for each reported file, segment, or volume. The columns in each row for the four summary reports are described in the following lists:

Most Active Files Report

Column	**Description**
`#MBS`	Total number of megabytes transferred to/from file. The rows are sorted by this field, in decreasing order.
`#opns`	Number of times the file was opened during measurement period.
`#rds`	Number of read system calls made against file.
`#wrs`	Number of write system calls made against file.
`file`	Name of file (full path name is in detailed report).
`volume:inode`	Name of volume that contains the file, and the file's i−node number. This field can be used to associate a file with its corresponding persistent segment, shown in the virtual memory I/O reports. This field may be blank; for example, for temporary files created and deleted during execution.

Most Active Segments Report

Column	**Description**
`#MBS`	Total number of megabytes transferred to/from segment. The rows are sorted by this field, in decreasing order.
`#rpgs`	Number of 4096−byte pages read into segment from disk (that is, page).
`#wpgs`	Number of 4096−byte pages written from segment to disk (page out).
`segid`	Internal ID of segment.
`segtype`	Type of segment: working segment, persistent segment (local file), client segment (remote file), page table segment, system segment, or special persistent segments containing file system data (log, root directory, `.inode`, `.inodemap`, `.inodex`, `.inodexmap`, `.indirect`, `.diskmap`).
`volume:inode`	For persistent segments, name of volume that contains the associated file, and the file's inode number. This field can be used to associate a persistent segment with its corresponding file, shown in the file I/O reports. This field is blank for non−persistent segments. **Note:** The virtual memory analysis tool, **svmon** can be used to display more information about a segment, given its segment ID (segid), as follows:

```
svmon −S <segid>
```

Most Active Logical Volumes Report

Column	Description
`util`	Utilization of the volume (fraction of time busy). The rows are sorted by this field, in decreasing order.
`#rblk`	Number of 512−byte blocks read from the volume.
`#wblk`	Number of 512−byte blocks written to the volume.
`KB/sec`	Total transfer throughput, in Kilobytes per second.
`volume`	Name of volume.
`description`	Contents of volume: either a file system name, or logical volume type (paging, jfslog, boot, or sysdump). Also, indicates if the file system is fragmented or compressed.

Most Active Physical Volumes Report

Column	Description
`util`	Utilization of the volume (fraction of time busy). The rows are sorted by this field, in decreasing order.
`#rblk`	Number of 512−byte blocks read from the volume.
`#wblk`	Number of 512−byte blocks written to the volume.
`KB/sec`	Total volume throughput, in Kilobytes per second.
`volume`	Name of volume.
`description`	Type of volume, for example, `120MB disk`, `355MB SCSI`, or `CDROM SCSI`. **Note:** Logical volume I/O requests start before, and end after, physical volume I/O requests. For that reason, total logical volume utilization will appear to be higher than total physical volume utilization.

Finally, detailed reports are generated for each of the file system levels being monitored. By default, the logical file and virtual memory reports are limited to the 20 most active files and segments, respectively, as measured by the total amount of data transferred. If the **−v** flag is specified, activity for all files and segments is reported. There is one entry for each reported file, segment, or volume. The fields in each entry are described below for the four detailed reports as described in the following lists.

Some of the fields report a single value, others report statistics that characterize a distribution of many values. For example, response time statistics are kept for all read or write requests that were monitored. The average, minimum, and maximum response times are reported, as well as the standard deviation of the response times. The standard deviation is used to show how much the individual response times deviated from the average. Roughly two−thirds of the sampled response times are between `average − standard deviation` and `average + standard deviation`. If the distribution of response times is scattered over a large range, the standard deviation will be large compared to the average response time.

Detailed File Stats Report

Column	Description
`FILE`	Name of the file. The full path name is given, if possible.
`volume`	Name of the logical volume/file system containing the file.
`inode`	I−node number for the file within its file system.
`opens`	Number of times the file was opened while monitored.
`total bytes xfrd`	Total number of bytes read/written to/from the file.
`reads`	Number of read calls against the file.

`read sizes (bytes)`	The read transfer−size statistics (avg/min/max/sdev), in bytes.
`read times (msec)`	The read response−time statistics (avg/min/max/sdev), in milliseconds.
`writes`	Number of write calls against the file.
`write sizes (bytes)`	The write transfer−size statistics.
`write times (msec)`	The write response−time statistics.
`seeks`	Number of **lseek** subroutine calls.

Detailed VM Segment Stats Report

Column	**Description**
`SEGMENT`	Internal AIX segment ID.
`segtype`	Type of segment contents.
`segment flags`	Various segment attributes.
`volume`	For persistent segments, the name of the logical volume containing the corresponding file.
`inode`	For persistent segments, the i−node number for the corresponding file.
`reads`	Number of 4096−byte pages read into the segment (that is, paged in).
`read times (msec)`	The read response−time statistics (avg/min/max/sdev), in milliseconds.
`read sequences`	Number of read sequences. A sequence is a string of pages that are read (paged in) consecutively. The number of read sequences is an indicator of the amount of sequential access.
`read seq. lengths`	Statistics describing the lengths of the read sequences, in pages.
`writes`	Number of pages written from the segment (that is, paged out).
`write times (msec)`	Write response time statistics.
`write sequences`	Number of write sequences. A sequence is a string of pages that are written (paged out) consecutively.
`write seq.lengths`	Statistics describing the lengths of the write sequences, in pages.

Detailed Logical/Physical Volume Stats Reports

Column	**Description**
`VOLUME`	Name of the volume.
`description`	Description of the volume. (Describes contents, if discussing a logical volume; describes type, if dealing with a physical volume.)
`reads`	Number of read requests made against the volume.
`read sizes (blks)`	The read transfer−size statistics (avg/min/max/sdev), in units of 512−byte blocks.
`read times (msec)`	The read response−time statistics (avg/min/max/sdev), in milliseconds.
`read sequences`	Number of read sequences. A sequence is a string of 512−byte blocks that are read consecutively and indicate the amount of sequential access.
`read seq. lengths`	Statistics describing the lengths of the read sequences, in blocks.
`writes`	Number of write requests made against the volume.
`write sizes (blks)`	The write transfer−size statistics.
`write times (msec)`	The write−response time statistics.
`write sequences`	Number of write sequences. A sequence is a string of 512−byte blocks that are written consecutively.
`write seq. lengths`	Statistics describing the lengths of the write sequences, in blocks.
`seeks`	Number of seeks that preceded a read or write request; also expressed as a percentage of the total reads and writes that required seeks.

`seek dist (blks)`	Seek distance statistics, in units of 512−byte blocks. In addition to the usual statistics (avg/min/max/sdev), the distance of the initial seek operation (assuming block 0 was the starting position) is reported separately. This seek distance is sometimes very large, so it is reported separately to avoid skewing the other statistics.
`seek dist (cyls)`	(Hard files only.) Seek distance statistics, in units of disk cylinders.
`time to next req`	Statistics (avg/min/max/sdev) describing the length of time, in milliseconds, between consecutive read or write requests to the volume. This column indicates the rate at which the volume is being accessed.
`throughput`	Total volume throughput, in Kilobytes per second.
`utilization`	Fraction of time the volume was busy. The entries in this report are sorted by this field, in decreasing order.

Flags

−i*File* Reads the I/O trace data from the specified *File*, instead of from the real−time trace process. The **filemon** report summarizes the I/O activity for the system and period represented by the trace file.

> **Note:** Trace data files are usually written in a circular manner. If the trace data has wrapped around, the chronological beginning and end of the trace may occur in the middle of the file. Use the raw mode of the **trcrpt** command to rewrite the data sequentially, before invoking the **filemon** command, as follows:
> ```
> trcrpt −r file > new.file
> ```

For the report to be accurate, the trace file must contain all the hooks required by the **filemon** command.

−o*File* Writes the I/O activity report to the specified *File*, instead of to the **stdout** file.

−d Starts the **filemon** command, but defers tracing until the **trcon** command has been executed by the user. By default, tracing is started immediately.

−T*n* Sets the kernel's trace buffer size to *n* bytes. The default size is 32,000 bytes. The buffer size can be increased to accommodate larger bursts of events, if any. (A typical event record size is 30 bytes.)

> **Note:** The trace driver in the kernel uses double buffering, so in fact there will be two buffers allocated of size *n* bytes. Also, note that these buffers are pinned in memory, so they are not subject to paging. Large buffers may affect the performance of paging and other I/O.

−P Pins monitor process in memory. The **−P** flag causes the **filemon** command's text and data pages to be pinned in memory for the duration of the monitoring period. This flag can be used to ensure that the real−time **filemon** process is not paged out when running in a memory−constrained environment.

−v Prints extra information in the report. The most significant effect of the **−v** flag is that all logical files and all segments that were accessed are included in the I/O activity report, instead of only the 20 most active files and segments.

−O*Levels* Monitors only the specified file system levels. Valid level identifiers are:

lf	Logical file level
vm	Virtual memory level
lv	Logical volume level
pv	Physical volume level
all	Short for **lf, vm, lv, pv**

The **vm**, **lv**, and **pv** levels are implied by default.

−u Reports on files that were opened prior to the start of the **trace** daemon. The process ID (PID) and the file descriptor (FD) are substituted for the file name.

Note: Since PIDs and FDs are reusable, it is possible to see different files reported with the same name field.

Examples

1. To monitor the physical I/O activity of the virtual memory, logical volume, and physical volume levels of the file system, enter:
   ```
   filemon
   ```
   The **filemon** command automatically starts the system trace and puts itself in the background. After this command, enter the application programs and system commands to be run at this time, then enter:
   ```
   trcstop
   ```
   After the **trcstop** command is issued, the I/O activity report is displayed on standard output (but will probably scroll off the screen). The virtual memory I/O report will be limited to the 20 segments that incurred the most I/O.

2. To monitor the activity at all file system levels, and write the report to the `fmon.out` file, enter:
   ```
   filemon -o fmon.out -O all
   ```
   The **filemon** command automatically starts the system trace and puts itself in the background. After this command, enter the application programs and system commands to be run at this time, then enter:
   ```
   trcstop
   ```
   After the **trcstop** command is issued, the I/O activity report is written to the `fmon.out file`. All four levels of the file and I/O system (the logical file, virtual memory, logical volume, and physical volume levels) will be monitored. The logical file and virtual memory I/O reports will be limited to the 20 files and segments (respectively) that incurred the most I/O.

3. To monitor the activity at all file system levels and write a verbose report to the `fmon.out` file, enter:
   ```
   filemon -v -o fmon.out -O all
   ```
   The **filemon** command automatically starts the system trace and puts itself in the background. After this command, enter the application programs and system commands to be run at this time, then enter:
   ```
   trcstop
   ```
   This example is similar to the previous example, except a verbose report is generated on the `fmon.out` file. The primary difference is that the **filemon** command will indicate the steps it is taking to start up the trace, and the summary and detailed reports will include all files and segments that incurred any I/O (there may be many), instead of just the top 20.

4. To report on I/O activity captured by a previously recorded trace session, enter:
   ```
   filemon -i trcfile | pg
   ```
   In this example, the **filemon** command reads file system trace events from the input file `trcfile`. The input file must already be in raw trace format, as a result of running the **trcrpt -r** command. Since the trace data is already captured on a file, the **filemon** command does not put itself in the background to allow application programs to be run. After the entire file is read, an I/O activity report for the virtual memory, logical volume, and physical volume levels will be displayed on standard output (which, in this example, is piped to `pg`).

5. To monitor the I/O activity for logical and physical volumes only, while controlling the monitored intervals using the **trcon** and **trcoff** commands, enter:
   ```
   filemon -d -o fmon.out -O pv,lv
   ```

   The **filemon** command automatically starts the system trace and puts itself in the background. After this command, you can enter the unmonitored application programs and system commands to be run at this time, then enter:

   ```
   trcon
   ```

   After this command, you can enter the monitored application programs and system commands to be run at this time, then enter:

   ```
   trcoff
   ```

   After this command, you can enter the unmonitored application programs and system commands to be run at this time, then enter:

   ```
   trcon
   ```

   After this command, you can enter the monitored application programs and system commands to be run at this time, then enter:

   ```
   trcstop
   ```

In this example, the **-O** flag is used to restrict monitoring to logical and physical volumes only. Only those trace events that are relevant to logical and physical volumes are enabled. Also, as a result of using the **-d** flag, monitoring is initially deferred until the **trcon** command is issued. System tracing can be intermittently disabled and reenabled using the **trcoff** and **trcon** commands, so that only specific intervals are monitored.

Related Information

The **svmon** command, **trcrpt** command, **trcstop** command.

The **lseek** subroutine.

Monitoring and Tuning Disk I/O in *AIX Versions 3.2 and 4 Performance Tuning Guide*.

fileplace Command

Purpose

Displays the placement of file blocks within logical or physical volumes.

Syntax

fileplace Command
fileplace
-l
-p
-i
-v
File

fileplace [{**−l** | **−p** } [**−i**] [**−v**]] *File*

Description

The **fileplace** command displays the placement of a specified file within the logical or physical volumes containing the file.

By default, the **fileplace** command lists to standard output the ranges of logical volume fragments allocated to the specified file. The order in which the logical volume fragments are listed corresponds directly to their order in the file. A short header indicates the file size (in bytes), the name of the logical volume in which the file lies, the block size (in bytes) for that volume, the fragment size in bytes, and the compression, indicating if the file system is compressed or not.

Occasionally, portions of a file may not be mapped to any fragments in the volume. These areas, whose size is an integral number of fragments, are implicitly zero−filled by the file system. The **fileplace** command indicates which areas in a file have no allocated fragments.

Optionally, the **fileplace** command also displays:

- Statistics indicating the degree to which the file is spread within the volume.
- The indirect block addresses for the file.
- The file's placement on physical (as opposed to logical) volume, for each of the physical copies of the file.

Notes:

1. The **fileplace** command is not able to display the placement of remote Network File System (NFS) files. If a remote file is specified, the **fileplace** command returns an error message. However, the placement of the remote file can be displayed if the **fileplace** command is run directly on the file server.
2. The **fileplace** command reads the file's list of blocks directly from the logical volume on disk. If the file is newly created, extended, or truncated, the file system information may not yet be on the disk when the **fileplace** command is run. Use the **sync** command to flush the file information to the logical volume.

Flags

−i	Displays the indirect blocks for the file, if any. The indirect blocks are displayed in terms of either their logical or physical

	volume block addresses, depending on whether the **−l** or **−p** flag is specified.
−l	Displays file placement in terms of logical volume fragments, for the logical volume containing the file. The **−l** and **−p** flags are mutually exclusive. **Note:** If neither the **−l** flag nor the**−p** flag is specified, the **−l** flag is implied by default. If both flags are specified, the **−p** flag is used.
−p	Displays file placement in terms of underlying physical volume, for the physical volumes that contain the file. If the logical volume containing the file is mirrored, the physical placement is displayed for each mirror copy. The **−l** and **−p** flags are mutually exclusive.
−v	Displays more information about the file and its placement, including statistics on how widely the file is spread across the volume and the degree of fragmentation in the volume. The statistics are expressed in terms of either the logical or physical volume fragment numbers, depending on whether the **−l** or **−p** flag is specified.

File space efficiency is calculated as the number of nonnull fragments (*N*) divided by the range of fragments (*R*) assigned to the file and multiplied by 100, or (*N* /*R*) x 100. Range is calculated as the highest assigned address minus the lowest assigned address plus 1, or *MaxBlk*−*MinBlk*+1. For example, the logical blocks written for the file are 01550 through 01557, so *N* equals 8. The range, *R*, (01557 − 01550 +1) also equals 8. Space efficiency for this file is 100% or 8/8 x 100. The **−v** flag message prints the results of the (*N*/*R*)+100 equation.

According to this method of calculating efficiency, files greater than 32KB are never 100% efficient because of their use of the indirect block.

Sequential efficiency is defined as 1 minus the number of gaps (*nG*) divided by number of possible gaps (*nPG*) or 1 − (*nG*/*nPG*). The number of possible gaps equals *N* minus 1 (*nPG*=*N* − 1). If the file is written to 9 blocks (greater than 32KB), and the logical fragment column shows:

```
01550−01557
01600
```

The file is stored in 2 fragments out of a possible 9 fragments. The sequential efficiency calculation for this file is:

```
nG=1
nPG=9−1=8
(1−1/8) x 100=87.5%
```

Examples

1. To display the placement of a file in its logical volume, enter:
   `fileplace data1`

   This example displays the list of fragments and the logical volume that contains the file `data1`.

2. To display the indirect blocks for a file, enter:
   ```
   fileplace -i data1
   ```
   In addition to the default list of logical volume fragments, the indirect blocks (if any) used to store the file block addresses in the file system are enumerated.

3. To display more placement information for a file, enter:
   ```
   fileplace -v data1
   ```
   In addition to the default list of logical volume fragments, statistics about the placement efficiency are displayed.

4. To display all information about the placement of a file on its physical volumes, enter:
   ```
   fileplace -piv data1
   ```

This example displays the list of file and indirect blocks in terms of the underlying physical volumes, and includes statistics about the efficiency of the placement.

Files

/dev/hd0, /dev/hd1, .../dev/hd*n*	Specifies the logical volume.

Related Information

The **sync** command.

Monitoring and Tuning Disk I/O in *AIX Versions 3.2 and 4 Performance Tuning Guide*.

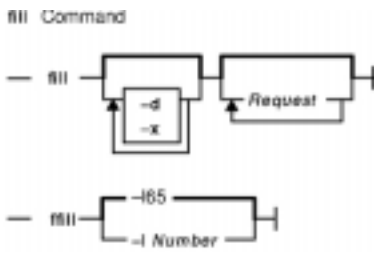
The Logical Volume Storage Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* defines and discusses logical volume storage.

fill or ffill Command

Purpose

Fills arbitrarily broken lines of text.

Syntax



fill [**−d**] [**−x**] [*Request* ...]

ffill [**−l***Number*]

Description

The **fill** command is a text−processing filter that provides the paragraph fill and indentation effects of the **nroff** command without requiring special command lines in the original text file. The **ffill** command is a fast version of the **fill** command that does not use the **nroff** formatter.

You can use the **fill** and **ffill** commands as filters with the **Do** command (the Alt−X key sequence), which runs the filter, or as filter commands from the system prompt. For information about keyboard layouts, press the F1 key (the Help key) within the INed editor. The **fill** command reads text from standard input, performs text processing by inserting command lines in the text file, and then processes the result through the **nroff** formatter. You also use the **fill** command to insert **nroff** subcommands into a text file to produce an **nroff** source file, which you can then revise for other applications. See "Running AIX and Filter Commands from the INed Editor" in the *AIX Version 4.3 INed Editor User's Guide* for more information on running filters from the editor.

> **Attention:** If you do not have the **nroff** formatter installed, using the **fill** command may cause loss of data. The **fill** command should not be run from the command line.

If you enter the **fill** command with a file name from the system prompt, it reads the text from that file, fills each paragraph, and writes the result to standard output.

The **fill** command treats a blank line as the end of the current paragraph. This command indents the first and second lines of each paragraph as they are indented in the input file. All subsequent lines in the paragraph are indented to match the second line. All tabs are removed. An extra space is inserted after each word that ends with a . (period), ? (question mark), or an ! (exclamation point).

In the text processing mode, the **fill** command turns off hyphenation, sets all escape characters to ~ (tilde) to prevent the text from being altered unexpectedly, and disables pagination.

The **fill** command formats indented paragraphs and reads embedded **nroff** requests. This command always indents the first and second lines of a paragraph exactly as they are indented in the source text, and aligns all subsequent lines with the second line. The **fill** command treats multiple spaces and tabs within a line as single spaces, except for spaces preceded by periods and colons. If a . (period) or : (colon) is followed by more than one space in the original text, the **fill** command follows the . (period) or : (colon) by two spaces in the result. The **fill** command correctly formats block paragraphs with hanging labels on the first line. Therefore, you can edit previously filled paragraphs and then refill the text. In situations such as tables, the compression of multiple blanks is undesirable and can be suppressed with the **−x** flag.

If you supply the *Request* parameter, the **fill** command treats it as an **nroff** command line and passes it directly to the **nroff** command if the specified request begins with a . (period). If the request does not begin with a . (period), the **fill** command passes it to the **nroff** command as a value. You can give the **fill** command one or more *Request* parameters (**nroff** requests).

All lines beginning with a . (period) are considered to be **nroff** requests. These lines are preserved as separate lines, even when they are in the middle of a paragraph. This allows you to use the **fill** command to improve the appearance of a draft document without destroying embedded **nroff** requests that may be inserted for reformatting a final or a typeset version.

With the INED editor, you can format a paragraph by beginning the first two lines with the proper indentations and then using the **fill** command to fill the entire paragraph.

You cannot change the escape characters with a parameter to the **fill** command.

If the **fill** command is unable to create its temporary file, the **fill** command exits with the value of −2.

Notes:

1. The **ffill** command sets the left margin incorrectly if the first line of any paragraph is more than twice as long as the specified right margin.
2. The **ffill** command produces incorrect output for input lines longer than 512 characters.

Flags

−d	Does not process through the **nroff** formatter. In this mode, the **fill** command takes text from standard input, inserts **nroff** request lines that preserve indentation and paragraphing, and writes the result to standard output.
−l*Number*	Sets the right margin at the column specified by the *Number* variable. The default value for *Number* is 65. The **−l***Number* flag is used with the **ffill** command only.
−x	Suppresses compression of multiple blanks within input text lines. Initial blanks are always replaced by paragraph−indenting commands. The **−x** flag is useful for processing text that is bracketed by the **nroff** requests, **.nf** or **.na**, because it prevents the loss of spacing between columns.

You can use the **−d** flag and the **−x** flag to insert **nroff** commands in a text file without passing the text through the **nroff** formatter. This is useful as a first step in converting a conventionally formatted text file to an **nroff** source file or as a building block in a program or AIX command file that performs specialized processing of text files.

Examples

1. To fill with hyphenation, enter:

   ```
   fill".hy1"
   ```

2. To fill lines between columns 10 and 70, enter:

   ```
   fill".in10"".l170"
   ```

Files

/var/tmp/Ijust*Number*	Contains the temporary file. The *Number* part of the file name represents the process number in decimal.

Related Information

The **e** command, **just** command, **nroff** command.

Editors Overview in *AIX Version 4.3 INed Editor User's Guide* introduces general concepts about editors and describes the main AIX editors.

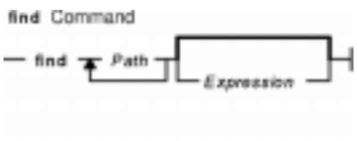
Running AIX and Filter Commands from the INed Editor*AIX Version 4.3 INed Editor User's Guide*.

find Command

Purpose

Finds files with a matching expression.

Syntax



find *Path* ... [*Expression*]

Description

The **find** command recursively searches the directory tree for each specified *Path* parameter, seeking files that match a Boolean expression written using the terms given in the following text. When the **find** command is recursively descending directory structures, it will not descend into directories that are symbolically linked into the current hierarchy. The output from the **find** command depends on the terms specified by the *Expression* parameter.

The **find** command does not support the 4.3 BSD fast find syntax.

Expression Terms

These Boolean expressions and variables describe the search boundaries of the **find** command as defined in the *Path* and *Expression* parameters.

> **Note:** In the following definitions, the *Number* variable specifies a decimal integer that can be expressed as +*Number* (more than *Number*), −*Number* (less than *Number*), or *Number* (exactly *Number*).

\\(*Expression* **\\)**	Evaluates to the value True if the expression in parentheses is true.
−cpio *Device*	Writes the current file to the specified device in the **cpio** command format.
−depth	Always evaluates to the value True. Causes the descent of the directory hierarchy to be done so that all entries in a directory are affected before the directory itself is affected. This can be useful when the **find** command is used with the **cpio** command to transfer files that are contained in directories without write permission.
−exec *Command*	Evaluates to the value True if the specified command runs and returns a 0 value as exit status. The end of the specified command must be punctuated by a quoted or escaped semicolon. A command parameter {} (braces) is replaced by the current path name.
−fstype *Type*	Evaluates to the value True if the file system to which the file belongs is of the specified type, where the *Type* variable has a value of **jfs** (journaled file system) or **nfs** (network file system).
−group *Group*	Evaluates to the value True if the file belongs to the specified group. If the value of the *Group* variable is numeric and does not appear in the **/etc/group** file, it is interpreted as a group ID.

−nogroup	Evaluates to the value True if the file belongs to a group not in the **/etc/group** database.
−inum *Number*	Evaluates to the value True if file has an i−node matching the value of the *Number* variable.
−links *Number*	Evaluates to the value True if the file has the specified number of links. See the **ln** command for a description of links.
−ls	Always evaluates to the value True. Causes the current path name to be printed together with its associated statistics. These statistics include the following: • I−node number • Size in kilobytes (1024 bytes) • Protection mode • Number of hard links • User • Group • Size in bytes • Modification time If the file is a special file, the size field contains the major and minor device numbers. If the file is a symbolic link, the path name of the linked−to file is printed preceded by the −> (dash, greater than) symbols. Formating is similar to that of the **ls −filds** command, however formatting is done internally without executing the **ls** command, therefore differences in output with the **ls** command may exist, such as with the protection mode.
−name *File*	Evaluates to the value True if the value of the *File* variable matches the file name. You can use wildcard (pattern−matching) characters, provided they are quoted. See "Pattern Matching with Wildcards and Metacharacters" in Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* for more information on using wildcard characters. In an expression such as [a−z], the dash means "through" according to the current collating sequence. A collating sequence may define equivalence classes for use in character ranges. See the National Language Support Overview for Programming in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs* for more information on collating sequences and equivalence classes.
−newer *File*	Evaluates to the value True if the current file has been modified more recently than the file indicated by the *File* variable.
−ok *Command*	The same as the **−exec** expression, except that the **find** command asks you whether it should start the specified command. An affirmative response starts the command. The end of the specified command must be punctuated by a semicolon enclosed in quotes or the \; (backslash−escape semicolon).
−perm [**−**] *OctalNumber*	Evaluates to the value True if the permission code of the file exactly matches the *OctalNumber* parameter (see the **chmod** command for an explanation of file permissions). If the optional **−** (dash) is present, this expression evaluates to true if at least these permissions are set. The *OctalNumber* parameter may be up to nine octal digits.
−perm [**−**] *Mode*	The *Mode* parameter is identical to the **chmod** command syntax. This expression evaluates to the value True if the file has exactly these permissions. If the optional **−** (dash) is present, this expression evaluates to the value True if at least these permissions are set.
−print	Always evaluates to the value True. Displays the current path name. The **find** command assumes a **−print** expression, unless the **−exec, − ls**, or **−ok** expressions are present.

−prune	Always evaluates to the value True. Stops the descent of the current path name if it is a directory. If the **−depth** flag is specified, the **−prune** flag is ignored.
−size *Number*	Evaluates to the value True if the file is the specified *Number* of blocks long (512 bytes per block). The file size is rounded up to the nearest block for comparison.
−size *Number***c**	Evaluates to the value True if the file is exactly the specified *Number* of bytes long. Adding **c** to the end of the *Number* variable indicates that the size of the file is measured in individual bytes not blocks.
−atime *Number*	Evaluates to the value True if the file has been accessed in *Number*−1 to *Number* multiples of 24 hours. For example, **−atime 2** is true if the file has been accessed within 24 to 48 hours.
−ctime *Number*	Evaluates to the value True if the file i−node (status information) has been changed in the specified number of 24−hour periods.
−mtime *Number*	Evaluates to the value True if the file has been modified in *Number*−1 to *Number* multiples of 24 hours.
−type *Type*	Evaluates to the value True if the *Type* variable specifies one of the following values: **b** Block special file **c** Character special file **d** Directory **f** Plain file **l** Symbolic link **p** FIFO (a named pipe) **s** Socket
−user *User*	Evaluates to the value True if the file belongs to the specified user. If the value of the *User* variable is numeric and does not appear as a login name in the **/etc/passwd** file, it is interpreted as a user ID.
−nouser	Evaluates to the value True if the file belongs to a user not in the **/etc/passwd** database.
−xdev	Always evaluates to the value True. Prevents the **find** command from traversing a file system different from the one specified by the *Path* parameter.

These expressions can be combined using the following operators in the order of decreasing precedence:

1. **(***Expression***)** − A parenthetic group of expressions and operators (parentheses are special to the shell and require the backslash−escape sequence).
2. **!***Expression* − The negation of an expression ('**!**' is the unary NOT operator).
3. *Expression* [**−a**] *Expression* − Concatenation of expressions (the AND operation is implied by the juxtaposition of two primaries or may be explicitly stated as **−a**).
4. *Expression***−o***Expression* − Alternation of primaries; **−o** is the OR operator. The second expression will not be evaluated if the first expression is true.

Exit Status

This command returns the following exit values:

0	All *Path* parameters were traversed successfully.
>**0**	An error occurred.

Examples

1. To list all files in the file system with a given base file name, enter:

   ```
   find / −name .profile −print
   ```

   This searches the entire file system and writes the complete path names of all files named **.profile**. The `/` (slash) tells the **find** command to search the root directory and all of its subdirectories. In order not to waste time, it is best to limit the search by specifying the directories where you think the files might be.

2. To list files having a specific permission code in the current directory tree, enter:

   ```
   find . −perm 0600 −print
   ```

   This lists the names of the files that have *only* owner−read and owner−write permission. The . (dot) tells the **find** command to search the current directory and its subdirectories. See the **chmod** command for an explanation of permission codes.

3. To search several directories for files with certain permission codes, enter:

   ```
   find manual clients proposals −perm −0600 −print
   ```

   This lists the names of the files that have owner−read and owner−write permission and possibly other permissions. The `manual`, `clients`, and `proposals` directories and their subdirectories are searched. In the previous example, `−perm 0600` selects only files with permission codes that match `0600` exactly. In this example, `−perm −0600` selects files with permission codes that allow the accesses indicated by `0600` and other accesses above the `0600` level. This also matches the permission codes 0622 and 2744.

4. To list all files in the current directory that have been changed during the current 24−hour period, enter:

   ```
   find . −ctime 1 −print
   ```

5. To search for regular files with multiple links, enter:

   ```
   find . −type f −links +1 −print
   ```

   This lists the names of the ordinary files (`−type f`) that have more than one link (`−links +1`).

   > **Note:** Every directory has at least two links: the entry in its parent directory and its own `.` (dot) entry. The **ln** command explains multiple file links.

6. To find all accessible files whose path name contains **find**, enter:

   ```
   find . −name '*find*' −print
   ```

7. To remove all files named `a.out` or `*.o` that have not been accessed for a week and that are not mounted using **nfs**, enter:

   ```
   find / \( −name a.out −o  −name '*.o' \) −atime +7 ! −fstype nfs −exec \ rm {} \;
   ```

   > **Note:** The number used within the **−atime** expression is `+7`. This is the correct entry if you want the command to act on files not accessed for more than a week (seven 24−hour periods).

8. To print the path names of all files in or below the current directory, except the directories named `SCCS` or files in the `SCCS` directories, enter:

```
find . −name SCCS −prune −o −print
```

To print the path names of all files in or below the current directory, including the names of **SCCS** directories, enter:

```
find . −print −name SCCS −prune
```

9. To search for all files that are exactly 414 bytes long, enter:

   ```
   find . −size 414c −print
   ```

10. To find and remove every file in your home directory with the **.c** suffix, enter:

    ```
    find /u/arnold −name "*.c" −exec rm {} ;
    ```

Every time the **find** command identifies a file with the **.c** suffix, the **rm** command deletes that file. The **rm** command is the only parameter specified for the **−exec** expression. The {} (braces) represent the current path name.

Files

/usr/bin/find	Contains the **find** command.
/bin/find	Symbolic link to the **find** command.
/etc/group	Contains a list of all known groups.
/etc/passwd	Contains a list of all known users.

Related Information

Backup Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* introduces archiving methods, including the use of the **cpio** command.

Directories Overview in *AIX Version 4.3 Files Reference* describes the structure and characteristics of directories in the file system.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes files, file types, how to name files, and how to use wildcard characters.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes how the operating system processes input and output.

Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* describes shells, the different types of shells, and how shells affect the way commands are interpreted.

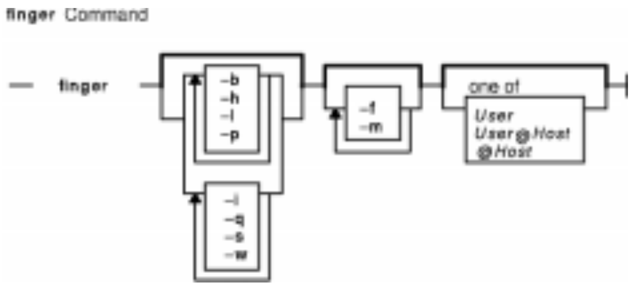
File and Directory Access Modes in *AIX Version 4.3 System User's Guide: Operating System and Devices* introduces file ownership and permissions to access files and directories.

finger Command

Purpose

Shows user information. This command is the same as the **f** command.

Syntax



{ **finger** | **f** }[[**−b**][**−h**] [**−l**][**−p**]]|[**−i**][**−q**][**−s**][**−w**]]

[**−f**][**−m**][*User*| *User***@***Host*|**@***Host*]

Description

The **/usr/bin/finger** command displays information about the users currently logged in to a host. The format of the output varies with the options for the information presented.

Default Format

The default format includes the following items:

- Login name
- Full user name
- Terminal name
- Write status (an * (asterisk) before the terminal name indicates that write permission is denied)

For each user on the host, the default information list also includes, if known, the following items:

- Idle time (Idle time is minutes if it is a single integer, hours and minutes if a : (colon) is present, or days and hours if a "d" is present.)
- Login time
- Site−specific information

The site−specific information is retrieved from the gecos field in the **/etc/passwd** file. The gecos field may contain the Full user name followed by a comma or / (slash character). All information that follows the comma or slash character is displayed by the finger command with the Site−specific information.

Longer Format

A longer format is used by the **finger** command whenever a list of user's names is given. (Account names as well as first and last names of users are accepted.) This format is multiline, and includes all the information described above along with the following:

- User's **$HOME** directory
- User's login shell
- Contents of the **.plan** file in the user's **$HOME** directory
- Contents of the **.project** file in the user's **$HOME** directory

The **finger** command may also be used to look up users on a remote system. The format is to specify the user as *User@Host*. If you omit the user name, the **finger** command provides the standard format listing on the remote system.

Create the **.plan** and **.project** files using your favorite text editor and place the files in your **$HOME** directory. The **finger** command uses the **toascii** subroutine to convert characters outside the normal ASCII character range when displaying the contents of the **.plan** and **.project** files. The **finger** command displays a `M−` before each converted character.

When you specify users with the *User* parameter, you can specify either the user's first name, last name, or account name. When you specify users, the **finger** command, at the specified host, returns information about those users only in long format.

For other information about the **finger** command, see "Installation and Configuration for TCP/IP" in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Flags

−b	Gives a brief, long−form listing.
−f	Suppresses printing of header line on output (the first line that defines the fields that are being displayed).
−h	Suppresses printing of **.project** files on long and brief long formats.
−i	Gives a quick listing with idle times.
−l	Gives a long−form listing.
−m	Assumes that the *User* parameter specifies a user ID (used for discretionary access control), *not* a user login name.
−p	Suppresses printing of **.plan** files on long−form and brief long−form formats.
−q	Gives a quick listing.
−s	Gives a short format list.
−w	Gives a narrow, short−format list.

Parameters

@Host	Specifies all logged−in users on the remote host.
User	Specifies a local user ID (used for discretionary access control) or local user login name, as specified in the **/etc/passwd** file.
User@Host	Specifies a user ID on the remote host, displayed in long format.

Examples

1. To get information about all users logged in to host `alcatraz`, enter:

   ```
   finger @alcatraz
   ```

   Information similar to the following is displayed:

   ```
   [alcatraz.austin.ibm.com]
   Login     Name        TTY Idle         When      Site Info
   brown    Bob Brown   console   2d   Mar 15 13:19
   ```

```
smith    Susan Smith    pts0  11:   Mar 15 13:01
jones    Joe Jones      tty0    3   Mar 15 13:01
```

User `brown` is logged in at the `console`, user `smith` is logged in from pseudo teletype line `pts0`, and user `jones` is logged in from `tty0`.

2. To get information about user `brown` at `alcatraz`, enter:

   ```
   finger brown@alcatraz
   ```

   Information similar to the following is displayed:

   ```
   Login name: brown
   Directory: /home/brown    Shell: /home/bin/xinit −L −n Startup
   On since May 8 07:13:49 on console
   No Plan.
   ```

3. To get information about user `brown` at a local host in short form, enter:

   ```
   finger −q brown
   ```

   Information similar to the following is displayed:

   ```
   Login           TTY              When
   brown           pts/6            Mon Dec1710:58
   ```

Files

/usr/bin/finger	Contains the **finger** command.
/etc/utmp	Contains list of users currently logged in.
/etc/passwd	Defines user accounts, names, and home directories.
/etc/security/passwd	Defines user passwords.
/var/adm/lastlog	Contains last login times.
$HOME/.plan	Optional file that contains a one−line description of a user's plan.
$HOME/.project	Optional file that contains a user's project assignment.

Related Information

The **hostname** command, **rwho** command.

The **fingerd** daemon.

Displaying Information about Logged−In Users in *AIX Version 4.3 System User's Guide: Communications and Networks*.

Network Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

fingerd Daemon

Purpose

Provides server function for the **finger** command.

Syntax

fingerd Daemon
/usr/sbin/fingerd
-s
-f

> **Note:** The **fingerd** daemon is normally started by the **inetd** daemon. It can also be controlled from the command line, using System Resource Controller) (SRC) commands.

/usr/sbin/fingerd [**−s**] [**−f**]

Description

The **/usr/sbin/fingerd** daemon is a simple protocol that provides an interface to the **finger** command at several network sites. The **finger** command returns a status report on either the current system or a user. The **fingerd** daemon listens for Transmission Control Protocol (TCP) requests at port 79 as listed in the **/etc/services** file and the /**etc**/**inetd.conf** file.

For individual site security concern the **fingerd** daemon, by default, will not forward any **finger** request to any other system. If it receives a **finger** forward request, the **fingerd** daemon replies with the message `Finger forwarding service denied` to the **finger** command. The system administractor has the option to turn on finger forwarding as the default when running the **fingerd** daemon by using the **−f** flag.

Changes to the **fingerd** daemon can be made using the System Management Interface Tool (SMIT) or SRC or by editing the **/etc/inetd.conf** file or /**etc**/**services** file. Entering `fingerd` at the command line is not recommended. The **fingerd** daemon is started by default when it is uncommented in the **/etc/inetd.conf** file.

The **inetd** daemon get its information from the /**etc**/**inetd.conf** file and the /**etc**/**services** file.

After changing the /**etc**/**inetd.conf** or /**etc**/**services** file, run the **refresh−s inetd** or **kill−1***InetdPID* command to inform the **inetd** daemon of the changes to its configuration file.

The **fingerd** daemon should have a user ID with the least privileges possible. The **nobody** ID allows the least permissions. Giving the **fingerd** daemon the **nobody** user ID allows the daemon to be used on your host. Change the /**etc**/**services** file to the reflect the user ID you want to use.

Manipulating the fingerd Daemon with the System Resource Controller

The **fingerd** daemon is a subserver of the **inetd** daemon, which is a subsystem of the SRC. The **fingerd** daemon is a member of the **tcpip** SRC subsystem group. This daemon is enabled when it is uncommented in the **/etc/inetd.conf** file and can be manipulated by the following SRC commands:

startsrc	Starts a subsystem, group of subsystems, or a subserver.
stopsrc	Stops a subsystem, group of subsystems, or a subserver.

lssrc	Gets the status or a subsystem, group or subsystems, or a subserver.

Flags

−s Turns on socket−level debugging.

−f Turns on finger forwarding service for this **fingerd** daemon.

Examples

Note: The arguments for the **fingerd** daemon can be specified by using SMIT or by editing the **/etc/inetd.conf** file.

1. To start the **fingerd** daemon enter:

   ```
   startsrc −t finger
   ```

   This command starts the **fingerd** subserver.
2. To stop the **fingerd** daemon normally, enter:

   ```
   stopsrc −t finger
   ```

   This command allows all pending connections to start and existing connections to complete but prevents new connections from starting.
3. To force stop the **fingerd** daemon and all **fingerd** connections enter:

   ```
   stopsrc −t −f finger
   ```

   This command terminates all pending connections and existing connections immediately.
4. To display a short status report about the **fingerd** daemon enter:

   ```
   lssrc −t finger
   ```

This command returns the daemon's name, process ID, and state (active or inactive).

Related Information

The **finger** command, **lssrc** command, **kill** command, **refresh** command, **startsrc** command, **stopsrc** command.

TCP/IP daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

The **/etc/inetd.conf** file format, **/etc/services** file format.

Setting up and running Web−based System Managementin *AIX Version 4.3 System Management Guide: Operating System and Devices*.

The SMIT Interface for TCP/IP.

fish Command

Purpose

Plays the go fish card game.

Syntax

fish

Description

The object of the go fish game is to accumulate books of four cards with the same face value. You and the program (your opponent) take turns asking for cards from one another's hand. If your opponent has one or more cards of the value requested, your opponent must hand them over. If not, your opponent prompts `GO FISH!`, and you draw a card from the pool of undealt cards. If you draw the card you asked for, you draw again. As books are made, they are laid down on the table. Play continues until there are no cards left. The player with the most books wins the game. The **fish** command tells you the winner and exits.

The **fish** command prompts with `instructions?` before play begins. To see the instructions, enter `Y` (yes).

Entering a `p` as your first move gives you the professional−level game. The default is an amateur−level game.

When playing go fish, you enter the card you want when your opponent prompts:

```
you ask me for:
```

If you press only the Enter key when prompted, you receive information about the number of cards in your opponent's hand and in the pool.

The game displays:

- your current hand, including the books you have accumulated
- `GO FISH!` when either you or your opponent ask for a card the other does not have
- the card drawn after the `GO FISH`! prompt
- the card your opponent asks you for
- completed books (yours or your opponent's)
- the requested card when you or your opponent get another guess.

Examples

The following is a sample of a **fish** screen display:

```
your hand is: A 5 5 7 10 J Q
you ask me for: 5
I say "GO FISH!"
```

```
You draw A
I ask you for: 5
Made a book of 5's
I get another guess
I ask you for 6
You say "GO FISH!"
your hand is: A A 7 10 J Q
you ask me for:
```

To exit the game before play is completed, press the Interrupt (Ctrl−C) key sequence.

Files

/usr/games Location of the system's games.

Related Information

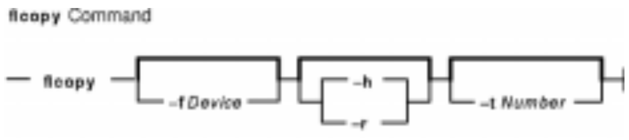
The **arithmetic** command, **back** command, **bj** command, **craps** command, **fortune** command, **hangman** command, **moo** command, **number** command, **quiz** command, **ttt** command, **turnoff** command, **turnon** command, **wump** command.

flcopy Command

Purpose

Copies to and from diskettes.

Syntax



flcopy [**−f***Device*] [**−h** | **−r**] [**−t** *Number*]

Description

The **flcopy** command copies a diskette (opened as **/dev/rfd0**) to a file named **floppy** created in the current directory, then prints the message: `Change floppy, hit return when done`. The **flcopy** command then copies the **floppy** file to the diskette. You can specify the **−f**, **−h**, **−r**, or **−t***Number* flag to modify the behavior of the **flcopy** command.

> **Note:** You cannot use the **flcopy** command to copy data from one diskette to another diskette of different size.

Flags

−f*Device*	Allows you to specify a drive other than **/dev/rfd0**.
−h	Causes the **flcopy** command to open the **floppy** file in the current directory and copy it to **/dev/rfd0**.
−r	Tells the **flcopy** command to exit after copying the diskette to the **floppy** file in the current directory.
−t *Number*	Causes only the specified *Number* of tracks to be copied. The tracks copied always begin with the first tracks on the diskette.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

1. To copy **/dev/rfd1** to the **floppy** file in the current directory, enter:

   ```
   flcopy−f/dev/rfd1−r
   ```

2. To copy the first 100 tracks of the diskette, enter:

   ```
   flcopy−f/dev/rfd1−t100
   ```

Files

/usr/sbin/flcopy Contains the **flcopy** command.

Related Information

The **format** or **fdformat** command.

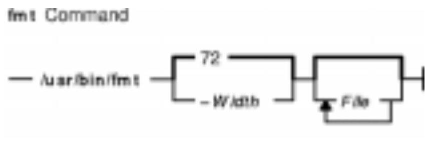
The **fd** special file.

fmt Command

Purpose

Formats mail messages prior to sending.

Syntax



/usr/bin/fmt [−*Width*] [*File* ...]

Description

The **fmt** command starts a text formatter that reads the concatenation of input *Files* (or standard input if no *Files* are specified), then produces on standard output a version of the input with the line lengths set to the value of −*Width*. If no value is specified with the −*Width* flag, the default value of 72 characters is used. The spacing at the beginning of the input lines is preserved in the output, as are blank lines and spacing between words.

The **fmt** command is generally used to format mail messages to improve their appearance before they are sent. However, the **fmt** command may also be useful for simple formatting tasks. For example, within visual mode of a text editing program such as the vi editor, the command **!}fmt** formats a paragraph so that all lines are set to the value specified with the −*Width* flag. If no value is specified with the −*Width* flag, the default value of 72 characters is used. Standard text editing programs are more appropriate than **fmt** for complex formatting operations.

> **Note:** Do not use the **fmt** command if the message contains embedded messages or preformatted information from other files. This command formats the heading information in embedded messages and may change the format of preformatted information.

Flags

File	Specifies the name of the file to be formatted.
−*Width*	Specifies the line length. The default value for *Width* is 72 characters.

Examples

1. To format a message you have created with the mail editor, enter:

   ```
   ~| fmt
   ```

   The `~|` is entered at the left margin of the message. After you issue the `~| fmt` command, the message is formatted. The word `(continue)` is displayed to indicate that you can enter more information or send the message.

2. To format a file and display the output on your screen, enter:

   ```
   fmt file1
   ```

In this example, the file `file1` is formatted and displayed on your screen.

Files

/usr/bin/fmt Contains the **fmt** command.

Related Information

The **mail** command, **nroff** command, **vi** command.

Editor Overview in *AIX Version 4.3 INed Editor User's Guide*.

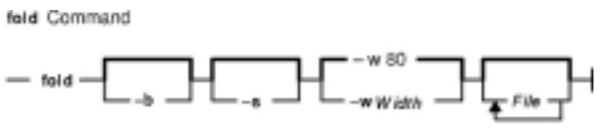
Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

fold Command

Purpose

Folds long lines for finite−width output device.

Syntax



fold [**−b**] [**−s**] [**−w** *Width*] [*File*...]

Description

The **fold** command is a filter that folds long lines for a finite−width output device. By default, the command folds the contents of standard input, breaking the lines to a line width of 80 (eighty). You can also specify one or more files as input to the command.

The **fold** command inserts a new−line character in the input lines so that each output line is as wide as possible without exceeding the value specified by the *Width* parameter. If the **−b** flag is specified, line width is counted in bytes. If the **−b** flag is not specified:

- *Width* is counted in columns as determined by the **LC_CTYPE** environment variable.
- A backspace character decreases the length of an output line by 1.
- A tab character advances to the next column where the column position is 1 plus a multiple of 8.

The **fold** command accepts **−w** *Width* values in multiples of 8 if the file contains tabs. To use other width values when the file contains tabs, use the **expand** command before using the **fold** command.

Notes:

1. The **fold** command may affect any underlining that is present.
2. The **fold** command does not insert new−line characters in the middle of multibyte characters even when the **−b** flag is used.

Flags

−b	Counts *Width* in bytes. The default is to count in columns.
−s	Breaks the line after the rightmost blank within the *Width* limit, if an output line segment contains any blank characters. The default is to break lines so each output line segment is as wide as possible.
−w *Width*	Specifies the maximum line width as the value of the *Width* variable. The maximum line width is 2048. The default is 80.

Exit Status

This command returns the following exit values:

0	All input files processed successfully.
>0	An error occurred.

Examples

To fold the lines of a file named `longlines` into width 72 (seventy−two), enter:

```
fold −w 72 longlines
```

Files

/usr/bin/fold	Contains the **fold** command.

Related Information

The **expand** command, **tab** command.

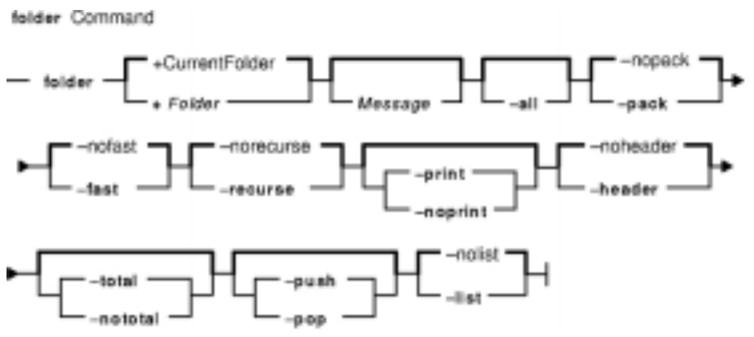
Devices Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

folder Command

Purpose

Selects and lists folders and messages.

Syntax



folder [+*Folder*] [*Message*] [**−all**] [**−nopack** | **−pack**] [**−nofast** | **−fast**] [**−norecurse** | **−recurse**] [**−print** | **−noprint**] [**−header** | **−noheader**] [**−nototal** | **−total**] [**−push** | **−pop**] [**−list** | **−nolist**]

Description

The **folder** command sets the current folder and the current message for that folder, and lists information about your folders. By default, the **folder** command lists the current folder name, the number of messages, the range of the message numbers, and the current message.

The folder specified by the +*Folder* flag becomes the current folder. The message specified by the *Message* parameter becomes the current message for the folder. Use the **−pack** flag to renumber the messages in a folder.

Flags

−all	Displays a line of information about each folder in your mail directory.
−fast	Displays only the names of the folders.
+*Folder*	Specifies the folder information to display.
−header	Displays column headings for the folder information.
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For Message Handler (MH), the name of this flag must be fully spelled out.
−list	Displays the current folder followed by the contents of the folder stack.
Message	Sets the specified message as the current message. Unless you specify the +*Folder* flag, the command sets the specified message for the current folder. Use the following references to specify a message:

Number	Number of the message.
cur or **.** (period)	Current message. This is the default.
first	First message in a folder.
last	Last message in a folder.
next	Message following the current message.

new	The new message that is created.
prev	Message preceding the current message.

−nofast	Displays information about each folder. This flag is the default.
−noheader	Suppresses column headings for the folder information. This flag is the default.
−nolist	Suppresses the display of the folder−stack contents. This flag is the default.
−nopack	Prevents renumbering of the messages in the folder. This flag is the default.
−noprint	Prevents display of folder information. If the **−push**, **−pop**, or **−list** flag is specified, the **−noprint** flag is the default.
−norecurse	Displays information about the top−level folders in your current folder only. Information about subfolders is not displayed. This flag is the default.
−nototal	Prevents display of the total of all messages and folders in your mail directory structure. When the **−all** flag is specified, the default is the **−total** flag; otherwise, the **−nototal** flag is the default.
−pack	Renumbers the messages in the specified folder. Renumbering eliminates gaps in the message numbering after messages have been deleted.
−pop	Removes the folder from the top of the folder stack and makes it the current folder. The +*Folder* flag cannot be specified with the **−pop** flag.
−print	Displays information about the folders. If the **−push**, **−pop**, or **−list** flag is specified, the **−noprint** flag is the default; otherwise, the **−print** flag is the default.
−push	Moves the current folder to the top of the folder stack and sets the specified folder as the current folder. If no folder is specified, the **−push** flag swaps the current folder for the folder on top of the folder stack.
−recurse	Displays information about all folders and subfolders in your current folder.
−total	Displays all messages and folders in your mail directory structure. The **−total** flag does not display information for subfolders unless you specify the **−recurse** flag. The **−total** flag is the default if the **−all** flag is specified.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Current−Folder:`	Sets the default current folder.
`Folder−Protect:`	Sets the protection level for the new folder directories.
`Folder−Stack:`	Specifies the folder stack.
`lsproc:`	Specifies the program used to list the contents of a folder.
`Path:`	Specifies the user's MH directory.

Examples

1. To display information about the current folder, enter:
   ```
   folder
   ```
   The system responds with a message similar to the following:
   ```
   inbox+  has  80  messages  (1−82);  cur  =  7;  (others).
   ```
   In this example, the current folder is `inbox`.The folder contains `80 messages`, ranging from message `1` to message `82`. The current message number is `7`.

2. To display information about all folders, enter:
   ```
   folder  −all
   ```
   The system responds with a message similar to the following:

```
Folder    #  of  messages  (range);  cur  msg    (other  files)
inbox+  has  80  messages  (1−82);  cur=  7;  (others).
test    has    5  messages  (1−5);    cur=  5;  (others).

        Total=  85  messages  in  2  folders
```

In this example, there are `2` folders containing a total of `85` messages. The current folder is `inbox`, indicated by the `+` (plus sign) that follows it.

3. To make the `test` folder the current folder and display information about `test`, enter:
   ```
   folder  +test
   ```
   The system responds with a message similar to the following:
   ```
   test+  has  5  messages  (1−5);  cur  =  5;  (others)
   ```
4. To make message `2` the current message in the current folder, enter:
   ```
   folder  2
   ```
   The system responds with a message similar to the following:
   ```
   test+  has  5  messages  (1−5);  cur  =  2;  (others)
   ```
5. To create a folder called `group` and make it the current folder, enter:
   ```
   folder  +group
   ```
   The system responds with a message similar to the following:
   ```
   Create  folder  "/home/dawn/Mail/group"?  _
   ```
   Enter:
   ```
   yes
   ```
   The system responds with a message similar to the following:
   ```
   group+  has  no  messages.
   ```
6. To renumber the messages in the current folder, enter:
   ```
   folder  −pack
   ```
   The system responds with a message similar to the following:
   ```
   inbox+  has  80  messages  (1−80);  cur=  7;  (others).
   ```

In this example, the messages are renumbered to eliminate gaps in the message numbering after messages have been deleted.

Files

$HOME/.mh_profile	Contains the MH user profile.
/usr/bin/folder	Contains the **folder** command.

Related Information

The **folders** command, **mhpath** command, **packf** command, **refile** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

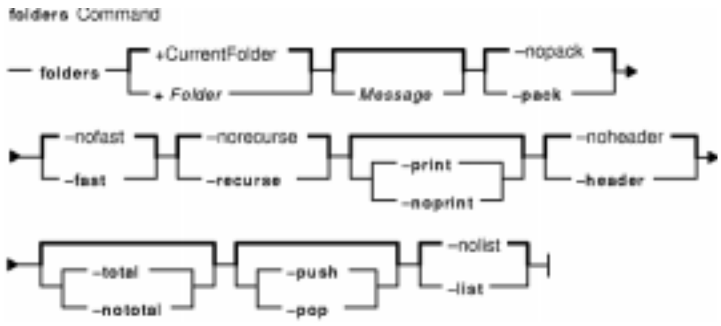
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

folders Command

Purpose

Lists all folders and messages in mail directory.

Syntax



folders [+*Folder*] [*Message*] [**−all**] [**−pack** | **−nopack**] [**−fast** | **−nofast**] [**−recurse** | **−norecurse**] [**−print** | **−noprint**] [**−header** | **−noheader**] [**−total** | **−nototal**] [**−push** | **−pop**] [**−list** | **−nolist**]

Description

The **folders** command lists all folders and messages in your mail directory. This command is equivalent to the **folder** command specified with the **−all** flag.

Flags

−all	Displays a line of information about each folder in your mail directory.
−fast	Displays only the names of the folders.
+*Folder*	Specifies the folder information to display.
−header	Displays column headings for the folder information. This flag is the default.
−help	Lists the command syntax, available switches (toggles), and version information. **Note:** For Message Handler (MH), the name of this flag must be fully spelled out.
−list	Displays the current folder followed by the contents of the folder stack.
Message	Sets the specified message as the current message. Unless you specify the +*Folder* flag, the command sets the specified message for the current folder. Use the following references to specify a message:

Number	Number of the message.
cur or **.** (period)	Current message. This is the default.
first	First message in a folder.
last	Last message in a folder.
next	Message following the current message.
new	The new message that is created.
prev	Message preceding the current message.

−nofast	Displays information about each folder. This flag is the default.
−noheader	Suppresses column headings for the folder information.

−nolist	Suppresses the display of the folder−stack contents. This flag is the default.
−nopack	Prevents renumbering of the messages in the folder. This flag is the default.
−noprint	Prevents display of folder information. If the **−push**, **−pop**, or **−list** flag is specified, the **−noprint** flag is the default.
−norecurse	Displays information about the folders in your mail directory. Information about subfolders is not displayed. This flag is the default.
−nototal	Prevents display all messages and folders in your mail directory structure.
−pack	Renumbers the messages in the folders. Renumbering eliminates gaps in message numbering after messages have been deleted.
−pop	Removes the folder from the top of the folder stack and makes it the current folder.
−print	Displays the number of messages in each folder, the current message for each folder, and the current folder. If the **−push**, **−pop**, or **−list** flag is specified, the **−noprint** flag is the default; otherwise, the **−print** flag is the default.
−push	Moves the current folder to the top of the folder stack and sets the specified folder as the current folder. If no folder is specified, the **−push** flag swaps the current folder for the folder on top of the folder stack.
−recurse	Displays information about all folders and subfolders in your mail directory structure.
−total	Displays all messages and folders in your mail directory structure. The **−total** flag does not display information for subfolders unless you specify the **−recurse** flag. The **−total** flag is the default.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Current−Folder:`	Sets the default current folder.
`Folder−Protect:`	Sets the protection level for the new folder directories.
`Folder−Stack:`	Specifies the folder stack.
`lsproc:`	Specifies the program used to list the contents of a folder.
`Path:`	Specifies the user's MH directory.

Examples

1. To display information about all folders, enter:
   ```
   folders
   ```
   The system responds with a message similar to the following:
   ```
   Folder  # of messages (range); cur msg  (other files)
   inbox+ has 80 messages (1−82); cur= 7; (others).
   test has 5 messages (1−6);   cur=  5; (others).

      Total= 85 messages in 2 folders.
   ```
   In this example, there are `2` folders containing a total of `85` messages. The current folder is `inbox`, indicated by the `+` (plus sign) following it.

2. To list only the names of all folders, enter:
   ```
   folders   −fast
   ```
   The system responds with a message similar to the following:
   ```
   inbox
   test
   ```

3. To renumber the messages in all folders, enter:

   ```
   folders   −pack
   ```

   The system responds with a message similar to the following:

   ```
   inbox+ has 80 messages (1−80); cur= 7; (others).
   test has 5 messages (1−5);  cur= 5; (others).
   ```

In this example, the messages in the `inbox` folder and in the `test` folder have been renumbered to eliminate gaps in message numbering after messages were deleted.

Files

$HOME/.mh_profile	Contains the MH user profile.
/usr/bin/folders	Contains the **folders** command.

Related Information

The **folder** command, **mhpath** command, **packf** command, **refile** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

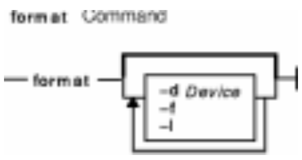
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

format Command

Purpose

Formats either diskettes or read/write optical media disks.

Syntax



format [**−d***Device*] [**−f**] [**−l**]

Description

Attention: Formatting a diskette or read/write optical disk destroys any existing data on it.

The **format** command formats diskettes in the diskette drive specified by the *Device* parameter. The **format** command determines the device type, which may be one of the following:

- 5.25−inch low−density diskette (360KB) containing 40x2 tracks, each with 9 sectors
- 5.25−inch high−capacity diskette (1.2MB) containing 80x2 tracks, each with 15 sectors
- 3.5−inch low−density diskette (720KB) containing 80x2 tracks, each with 9 sectors
- 3.5−inch high−capacity diskette (1.44MB) containing 80x2 tracks, each with 18 sectors
- 3.5−inch high−capacity diskette (2.88MB) containing 80x2 tracks, each with 36 sectors

The sector size is 512 bytes for all diskette types.

The **format** command formats a diskette with the highest capacity supported by the diskette drive, unless the *Device* parameter specifies a different density.

The **format** command formats a read/write optical disk, provided that the drive supports setting the Format Options Valid (FOV) bit of the defect list header to 0. To format a read/write optical disk, use the name of the read/write optical drive (such as **/dev/romd0**) after the **−d** flag. For more information, see the **DKFORMAT** operation of the **ioctl** subroutine in "scdisk SCSI Device Driver" in *AIX Version 4 Technical Reference: Volume 6, Kernel and Subsystems.*

Before formatting a diskette or read/write optical disk, the **format** command prompts for verification. This allows you to end the operation cleanly.

Flags

−d *Device*	Specifies the device used to format the diskette. If the device name ends with the letter **h**, the drive formats the diskette for high density. If the device name ends with the letter **l**, the drive formats the diskette for low density. Refer to the **fd** special file for information about valid device types. This flag is used only with the **format** command. **Attention:** If the diskette drive supports a higher capacity than the highest capacity for which the diskette was manufactured, the capacity of the diskette should be explicitly stated in the *Device* parameter (**−d***Device* flag) of the

format command. For example, to format a 1MB diskette on a 4MB diskette drive, specify the diskette capacity in the **−d** flag as follows:

```
−d /dev/fd0.9 for a 1MB diskette
```

Failure to do this may cause read and write errors.

−f	Formats the diskette without checking for bad tracks, thus formatting the diskette more quickly. This flag applies to diskettes only, not to read/write optical disks. It is used only with the **format** command.
−l	(Lowercase L) Formats a 360KB diskette in a 5.25−inch, 1.2MB diskette drive. Formats a 720KB diskette in a 3.5−inch 1.4MB diskette drive. This flag applies to diskettes only, not to read/write optical disks. It is used only with the **format** command. **Attention:** A 360KB diskette drive may not be able to read a 360KB diskette that has been formatted in a 1.2MB drive.

Parameters

Device	Specifies the device containing the diskette to be formatted. The default is the **/dev/rfd0** device for drive 0.

Examples

1. To format a diskette in the **/dev/rfd0** device, enter:

   ```
   format   −d   /dev/rfd0
   ```

2. To format a diskette without checking for bad tracks, enter:

   ```
   format   −f
   ```

3. To format a 360KB diskette in a 5.25−inch, 1.2MB diskette drive in the **/dev/rfd1** device, enter:

   ```
   format   −l   −d   /dev/rfd1
   ```

4. To format a 3.5−inch, low−density (720KB) diskette, enter:

   ```
   format −d /dev/fd0.9
   ```

5. To format a 3.5−inch, high−capacity (1.44MB) diskette, enter:

   ```
   format −d /dev/fd0.18
   ```

6. To format a read/write optical disk in the **/dev/romd0** device, enter:

   ```
   format −d /dev/romd0
   ```

Files

/usr/sbin/format	Contains the **format** command.
/dev/rfd*	Specifies the device parameters.
/dev/fd*	Specifies the device parameters.
/dev/romd*	Specifies the device parameters.
/dev/omd*	Specifies the device parameters.

Related Information

The **flcopy** command, **fdformat** command.

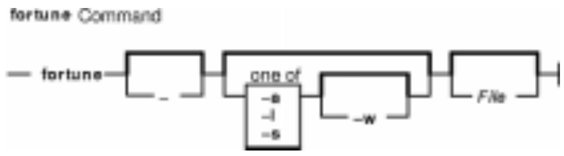
The **fd** special file.

fortune Command

Purpose

Displays a random fortune from a database of fortunes.

Syntax



fortune [**−**] [−**s** | **−l** | **−a** [**−w**]] [*File*]

Description

The **fortune** command displays a fortune from either the **fortunes.dat** file or the file specified by the *File* parameter. After displaying the fortune, the **fortune** command exits.

Flags

−	Displays the usage summary.
−a	Displays either type of fortune.
−l	Displays long fortunes only.
−s	Displays short fortunes only.
−w	Waits after displaying a fortune to allow the user time to read the fortune.

Files

/usr/games	Location of the system's games.
/usr/games/lib/fortune/fortunes.dat	Location of the default **fortune** database.

Related Information

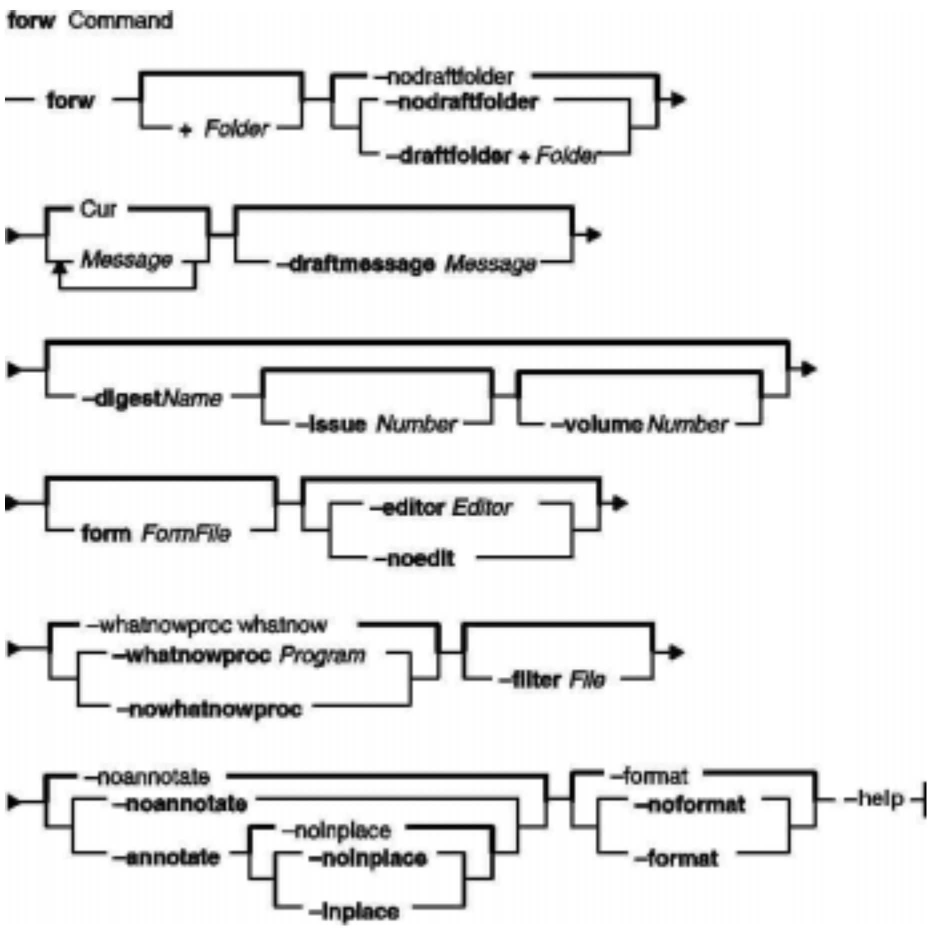
The **arithmetic** command, **back** command, **bj** command, **craps** command, **fish** command, **hangman** command, **moo** command, **number** command, **quiz** command, **ttt** command, **turnoff** command, **turnon** command, **wump** command.

forw Command

Purpose

Forwards messages.

Syntax



forw [+*Folder*] [**−draftfolder** +*Folder* | **−nodraftfolder**] [*Message*] [**−draftmessage** *Message*] [**−digest** *Name* [**−issue** *Number*] [**−volume** *Number*]] [**−form** *FormFile*] [**−editor** *Editor* | **−noedit**] [**−whatnowproc** *Program* | **−nowhatnowproc**] [**−filter***File*] [**−annotate** [**−inplace** | **−noinplace**] | **−noannotate**] [**−format** | **−noformat**] [**−help**]

Description

The **forw** command starts an interface for forwarding messages. By default, the **forw** command interface:

- Opens for editing a *UserMhDirectory*/**draft** file.
- Prompts the user to enter forwarding information based on the template defined in the **/etc/mh/mhl.forward** file.
- Prompts the user to enter any additional text that should accompany the forwarded message.

To complete editing of the *UserMhDirectory*/**draft** file, press the Ctrl−D sequence. The **forw** command appends the current message from the current folder to the **draft** file. If you want to append more than one message, use the *Messages* parameter.

> **Note:** A line of dashes or a blank line must be left between the header and the body of the message for the message to be identified when it is sent.

Upon exiting the editor, the **forw** command starts the `What Now?` prompt. Press the Enter key to see a list of the available **whatnow** subcommands. These subcommands enable you to continue to edit the message, list the message, direct the disposition of the message, or end the processing of the **forw** command.

The **forw** command allows you to change the format of the forwarded message with the **−form** flag. By default, the command uses the default message format located in your *UserMhDirectory*/**forwcomps** file. If you have not defined your own **forwcomps** file, the **/etc/mh/forwcomps** file is used.

Use the **−annotate** flag to annotate the original message with forwarding information. To ensure annotation, send the forwarded note before exiting the **forw** command interface.

> **Note:** The **−annotate** flag is not preserved over multiple executions of the **forw** command on the same draft.

Flags

−annotate	Annotates the forwarded messages with the lines:
	`Forwarded: Date`
	`Forwarded: Addresses`
	
	Use the **−inplace** flag to force annotation in place. This preserves links to the annotated message.

−digest *Name*	Uses the digest facility to create a new issue for the digest specified by the *Name* variable. The **forw** command expands the format strings in the **components** file (using the same format string mechanism used by the **repl** command) and composes the draft using the standard digest encapsulation algorithm. After the draft has been composed, the **forw** command writes out the volume and issue entries for the digest and starts the editor. Unless you specify the **−form** flag, the **forw** command uses the format in the *UserMhDirectory*/**digestcomps** file. If this file does not exist, the command uses the default specified in the **/etc/mh/digestcomps** file.
−draftfolder +*Folder*	Places the draft message in the specified folder. If you do not specify this flag, the **forw** command selects a default draft folder according to the information supplied in the Message Handler (MH) profiles. If +*Folder* is not specified, the `Current−Folder` is assumed. You can define a default draft folder in the **$HOME/.mh_profile** file. **Note:** If **−draftfolder** +*Folder* is followed by a *Message* parameter, it is the same as specifying the **−draftmessage** flag.
−draftmessage *Message*	Identifies a draft message. If you specify **−draftfolder** without the **−draftmessage** flag, then the default message is `new`.
−editor *Editor*	Specifies the initial editor for preparing the message.
−filter *File*	Reformats each message being forwarded and places the reformatted message in the draft message. The **−filter** flag accepts formats used by the **mhl** command.

+Folder
: Specifies the folder that contains the messages you want to forward. If a folder is not specified, `Current−Folder` is assumed.

−form *FormFile*
: Displays the **forw** command output in the format specified by the *FormFile* variable. The **forw** command treats each line in the specified file as a format string. If the **−digest** flag is also specified, the **forw** command uses the form specified by the *File* variable as the format of the digest. If the **−form** flag is not specified when the **−digest** flag is used, the digest filter file becomes the form default.

−format
: Using the **mhl** command and a default format file, reformats each message being forwarded and places the reformatted message in the draft message. If the *UserMhDirectory*/**mhl.forward** file exists, it contains the default format. Otherwise, the **/etc/mh/mhl.forward** file contains the default format.

−help
: Lists the command syntax, available switches (toggles), and version information.

  Note: For MH, the name of this flag must be fully spelled out.

−inplace
: Forces annotation to be done in place to preserve links to the annotated message.

−issue *Number*
: Specifies the issue number of the digest. The default issue number is one greater than the current value of the `DigestName−issue−list` entry in the *UserMhDirectory*/**context** file.

Message
: Specifies a message. You can specify several messages, a range of messages, or a single message. Use the following references when specifying messages:

Number	Number of the message.
Sequence	A group of messages specified by the user. Recognized values include:

all	All messages in the folder.
cur or **.** (period)	Current message. This is the default.
first	First message in a folder.
last	Last message in a folder.
new	New message that is created.
next	Message following the current message.
prev	Message preceding the current message

The default message is the current message in the current folder. When you specify several messages, the first message forwarded becomes the current message. When you specify a folder, that folder becomes the current folder.

−noannotate
: Prevents annotation of the original message. This flag is the default.

−nodraftfolder
: Places the draft in the *UserMhDirectory*/**draft** file.

−noedit
: Suppresses the initial edit.

−noformat	Prevents reformatting of the messages being forwarded. This flag is the default.
−noinplace	Prevents annotation in place. This flag is the default.
−nowhatnowproc	Prevents interactive processing of the **forw** command. With this flag, no editing occurs.
−volume *Number*	Specifies the volume number of the digest. The default volume number is the current value of the `DigestName−volume−list` entry in the *UserMhDirectory*/**context** file.
−whatnowproc *Program*	Starts the specified program to guide you through the forwarding tasks. **Note:** If you specify the **whatnow** command for *Program*, the **forw** command starts an internal **whatnow** procedure instead of a program with the file name **whatnow**.

Profile Entries

The following entries are entered in the *UserMhDirectory*/**.mh_profile** file:

`Current−Folder:`	Sets the default current folder.
`Draft−Folder:`	Sets the default folder for drafts.
`Editor:`	Sets the default editor.
`fileproc:`	Specifies the program used to refile messages.
`mhlproc:`	Specifies the program used to filter messages being forwarded.
`Msg−Protect:`	Sets the protection level for the new message files.
`Path:`	Specifies the *UserMhDirectory*.
`whatnowproc:`	Specifies the program used to prompt `What now?` questions.

Examples

1. To forward the current message to another person, enter:

   ```
   forw
   ```

   The system prompts you to enter information in the header fields. To skip a field, press the Enter key. You must enter information in the `To:` field. The system responds with:

   ```
   ---------Enter initial text
   ```

   Enter the text you want displayed before the text of the forwarded message, and press the Ctrl−D key sequence. The text of the forwarded message is displayed, and you are prompted with `What now?` Enter `send` after the `What now?` prompt to forward the message.

2. To forward message `5` from the `inbox` folder, enter:

   ```
   forw   +inbox   5
   ```

Files

/etc/mh/digestcomps	Defines the MH default message form when the **−digest** flag is specified.
/etc/mh/mhl.forward	Contains the default MH message filter.
UserMhDirectory/**digestcomps**	Specifies a user's default message form when the **−digest** flag is specified. (If it exists, it overrides the MH default message filter.)

UserMhDirectory/**forwcomps**	Contains a user's default message form.
UserMhDirectory/**mhl.forward**	Contains a user's default message filter. (If it exists, it overrides the MH default message filter.)
/usr/bin/forw	Contains the executable form of the **forw** command.
$HOME/.mh_profile	Contains the file that customizes MH for an individual user.
UserMhDirectory/**draft**	Contains the draft created for editing messages.
/etc/mh/forwcomps	Defines components for the messages created by the **forw** command.

Related Information

The **anno** command, **comp** command, **dist** command, **mhl** command, **repl** command, **whatnow** command.

The **mh_alias** file format, **mh_profile** file format.

Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

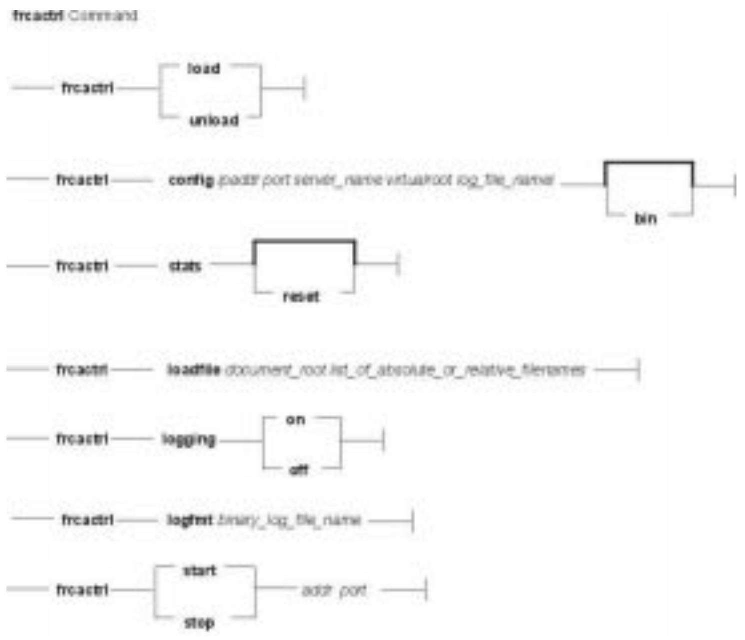
Peek, Jerry. *MH and xmh: E−mail for Users and Programmers.* Sebastopol, CA: O'Reilly & Associates, 1992.

frcactrl Command

Purpose

Controls and configures FRCA

Syntax


frcactrl Command
frcactrl
load
unload
config ipaddr port server_name virtualroot log_file_name
bin
stats
reset
loadfile document_root list_of_absolute_or_relative_filenames
logging
on
off
logfmt binary_log_file_name
start
stop
addr port

frcactrl [**load** | **unload**]
frcactrlconfig*ipaddr port server_name virtual_root log_file_name* [**bin**]
frcactrlstats [**reset**]
frcactrlloadfile*document_root list_of_absolute_or_relative_filenames*
frcactrllogging [**on** | **off**]
frcactrllogfmt*binary_log_file_name*
frcactrl [**start** | **stop**] *ipaddr port*

Description

The **frcactrl** command controls and configures the FRCA kernel extension. The kernel extension must be loaded before starting any WEB servers that want to use FRCA.

For the IBM HTTP Web Server, no config commands are necessary. Configuration data is stored in the IBM HTTP Web Server configuration files, and automatically passed to FRCA via an API. The IBM HTTP Web Server automatically loads files into the Network Buffer Cache.

For other WEB servers, which wish to use FRCA, an **frcactrl config** command is required after the W server has been started. This causes FRCA to be activated on the socket with the specified address and port. If the server is restarted, it is necessary to reissue this command.

An administrator can monitor the operation of FRCA with the **stats** command. The **clear** subcommand resets (zeros) the statistic counters.

The **loadfile** subcommand can be used to manually load files into the FRCA cache.

The **logging** subcommand can be used to turn the logging of HTTP requests on or off.

The **logfmt** subcommand converts binary logfiles to Common Log Format

The operation of FRCA for a specific IP address and port may be enable or disabled with the **start** and **stop** commands.

SubCommands

load
: Loads the FRCA kernel extension if not loaded.

unload
: Unloads the FRCA kernel extension if loaded

config*ipaddr port server_name virtual_root log_file_name [* ***bin*** *]*
: Configures and starts FRCA under the name *server_name* for IP address *ipaddr* on port *port*. The *virtual_root* parameter specifies the directory where the Web data starts. The requests will be logged in the file specified by *log_file_name* (this must be fully qualified).

  The optional bin keyword specifies that the log file will be written in binary format, instead of Common Log Format. Note, that this means that the log must be converted with the logfmt command, in order to be readable.

  > **Note:** FRCA only support one log file. When running more than one WEB server on a system with FRCA, all requests will be logged to the same file.

  Example:

```
frcactrl config 9.1.1.1 80 Apache /usr/local/apache/htdocs /logs/frca.log
```

  The IP address may be 0.0.0.0, if the Web server is not bound to a specific IP address.

stat *[* ***clear*** *]*
: Displays FRCA statistics:

```
Number of successful hits: 16556
Number of cache misses: 0
Number of resource errors: 0
```

  The optional **clear** subcommand resets (zeros) the statistics.

loadfile*document_root list_of_absolute_or_relative_filenames*
: Loads given files into the FRCA / Network Buffer Cache

  Example:

```
frcactrl loadfile /a/b/c /a/b/c/d e
```

  Loads content of files /a/b/c/d and /a/b/c/e with URLs /d and /e.

logging *[* ***on*** | ***off*** *]*
: Turns logging of request served by the kernel get engine on or off.

logfmt*binary_log_file_name*
: Converts *binary_log_file_name* from binary log format to Common Log Format with the name *binary_log_file_name*.asc.

  Example:

```
frcactrl frca.log.1
```

Generates: frca.log.1.asc

start*addrport*
: Enables the kernel get engine to serve request send to *port* at address *addr*

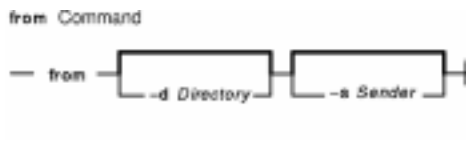
stop*addrport*
: Disables the kernel get engine for *port* at address *addr*

from Command

Purpose

To determine whom mail is from.

Syntax



from [**−d***Directory*] [**−s***Sender*]

Description

The **from** command displays the message headings in your mailbox file to show you whom mail is from. If you specify *User*, the *User* mailbox is examined instead of your own (provided that you have read permission to *User's* mailbox).

Flags

−d *Directory*	Specifies the system mailbox directory.
−s *Sender*	Prints message headers only for mail sent by *Sender*.

Examples

1. To display the message headings in your mailbox, enter:

   ```
   from
   ```

   The names of the senders and message dates are displayed.

2. To display the message headings for mail sent by a specific user, enter:

   ```
   from  −s  dale
   ```

   In this example, only the message headings of the messages sent from user `dale` are displayed.

3. To display the message headings in a specific user's mailbox, enter:

   ```
   from  dawn
   ```

In this example, the message headings from user `dawn's` mailbox are displayed (provided that you have read permission to `dawn's` mailbox).

Files

/var/spool/mail/*	System mailboxes for all users.
/usr/bin/from	User mailbox files.

Related Information

The **mail** command.

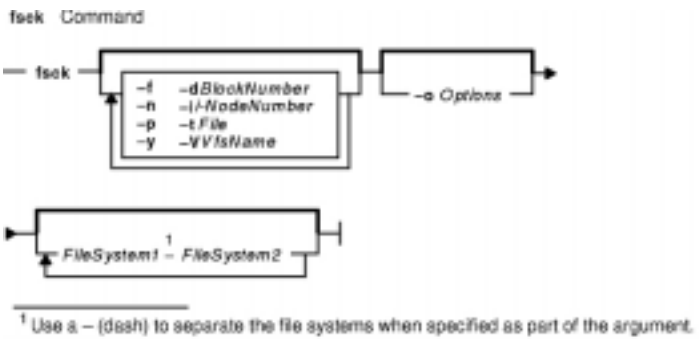
Mail Overview in *AIX Version 4.3 System User's Guide: Communications and Networks*.

fsck Command

Purpose

Checks file system consistency and interactively repairs the file system.

Syntax



fsck [**−n**] [**−p**] [**−y**] [**−d***BlockNumber*] [**−f**] [**−i***i−NodeNumber*] [**−o** *Options*] [**−t***File*] [**−V** *VfsName*] [*FileSystem1 − FileSystem2 ...*]

Description

Attention: Always run the **fsck** command on file systems after a system malfunction. Corrective actions may result in some loss of data. The default action for each consistency correction is to wait for the operator to enter `yes` or `no`. If you do not have write permission for an affected file system, the **fsck** command defaults to a `no` response in spite of your actual response.

Notes:

1. The **fsck** command does not make corrections to a mounted file system.
2. The **fsck** command can be run on a mounted file system for reasons other than repairs. However, inaccurate error messages may be returned when the file system is mounted.

The **fsck** command checks and interactively repairs inconsistent file systems. You should run this command before mounting any file system. You must be able to read the device file on which the file system resides (for example, the **/dev/hd0** device). Normally, the file system is consistent, and the **fsck** command merely reports on the number of files, used blocks, and free blocks in the file system. If the file system is inconsistent, the **fsck** command displays information about the inconsistencies found and prompts you for permission to repair them.

The **fsck** command is conservative in its repair efforts and tries to avoid actions that might result in the loss of valid data. In certain cases, however, the **fsck** command recommends the destruction of a damaged file. If you do not allow the **fsck** command to perform the necessary repairs, an inconsistent file system may result. Mounting an inconsistent file system may result in a system crash.

If you do not specify a file system with the *FileSystem* parameter, the **fsck** command checks all file systems listed in the **/etc/filesystems** file for which the **check** attribute is set to True. You can enable this type of checking by adding a line in the stanza, as follows:

```
check=true
```

The **fsck** command can perform simultaneous checks on multiple file systems. This procedure can reduce the time required to check a large number of file systems. Use a − (minus sign) to separate the file systems when specified as part of the argument.

You can also perform simultaneous checks on multiple file systems by grouping the file systems in the **/etc/filesystems** file. To do so, change the **check** attribute in the **/etc/filesystems** file as follows:

```
check=Number
```

The *Number* parameter tells the **fsck** command which group contains a particular file system. File systems that use a common log device should be placed in the same group. Each group is checked in a separate parallel process. File systems are checked, one at a time, in the order that they are listed in the **/etc/filesystems** file. All `check=true` file systems are in group 1. The **fsck** command attempts to check the root file system before any other file system regardless of the order specified on the command line or in the **/etc/filesystems** file.

The **fsck** command checks for the following inconsistencies:

- Blocks or fragments allocated to multiple files.
- i−nodes containing block or fragment numbers that overlap.
- i−nodes containing block or fragment numbers out of range.
- Discrepancies between the number of directory references to a file and the link count of the file.
- Illegally allocated blocks or fragments.
- i−nodes containing block or fragment numbers that are marked free in the disk map.
- i−nodes containing corrupt block or fragment numbers.
- A fragment that is not the last disk address in an i−node. This check does not apply to compressed file systems.
- Files larger than 32KB containing a fragment. This check does not apply to compressed file systems.
- Size checks:
    - Incorrect number of blocks.
    - Directory size not a multiple of 512 bytes.

  These checks do not apply to compressed file systems.
- Directory checks:
    - Directory entry containing an i−node number marked free in the i−node map.
    - i−node number out of range.
    - Dot (.) link missing or not pointing to itself.
    - Dot dot (..) link missing or not pointing to the parent directory.
    - Files that are not referenced or directories that are not reachable.
- Inconsistent disk map.
- Inconsistent i−node map.

Orphaned files and directories (those that cannot be reached) are, if you allow it, reconnected by placing them in the **lost+found** subdirectory in the root directory of the file system. The name assigned is the i−node number. If you do not allow the **fsck** command to reattach an orphaned file, it requests permission to destroy the file.

In addition to its messages, the **fsck** command records the outcome of its checks and repairs through its exit value. This exit value can be any sum of the following conditions:

0	All checked file systems are now okay.
2	The **fsck** command was interrupted before it could complete checks or repairs.
4	The **fsck** command changed the file system; the user must restart the system immediately.
8	The file system contains unrepaired damage.

When the system is booted from a disk, the boot process explicitly runs the **fsck** command, specified with the **−f** and **−p** flags on the **/**, **/usr**, **/var**, and **/tmp** file systems. If the **fsck** command is unsuccessful on any of these file systems, the system does not boot. Booting from removable media and performing maintenance work will then be required before such a system will boot.

If the **fsck** command successfully runs on **/**, **/usr**, **/var**, and **/tmp**, normal system initialization continues. During normal system initialization, the **fsck** command specified with the **−f** and **−p** flags runs from the **/etc/rc** file. This command sequence checks all file systems in which the **check** attribute is set to True (`check=true`). If the **fsck** command executed from the **/etc/rc** file is unable to guarantee the consistency of any file system, system initialization continues. However, the mount of any inconsistent file systems may fail. A mount failure may cause incomplete system initialization.

> **Note:** By default, the **/**, **/usr**, **/var**, and **/tmp** file systems have the **check** attribute set to False (`check=false`) in their **/etc/filesystem** stanzas. The attribute is set to False for the following reasons:
>
> 1. The boot process explicitly runs the **fsck** command on the **/**, **/usr**, **/var**, and **/tmp** file systems.
> 2. The **/**, **/usr**, **/var**, and **/tmp** file systems are mounted when the **/etc/rc** file is executed. The **fsck** command will not modify a mounted file system. Furthermore, the **fsck** command run on a mounted file system produces unreliable results.

You can use a Web−based System Manager File Systems application (**wsm fs** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit fsck** fast path to run this command.

Flags

−d*BlockNumber*	Searches for references to a specified disk block. Whenever the **fsck** command encounters a file that contains a specified block, it displays the i−node number and all path names that refer to it.
−f	Performs a fast check. Under normal circumstances, the only file systems likely to be affected by halting the system without shutting down properly are those that are mounted when the system stops. The **−f** flag prompts the **fsck** command not to check file systems that were unmounted successfully. The **fsck** command determines this by inspecting the **s_fmod** flag in the file system superblock. This flag is set whenever a file system is mounted and cleared when it is unmounted successfully. If a file system is unmounted successfully, it is unlikely to have any problems. Because most file systems are unmounted successfully, not checking those file systems can reduce the checking time.
−i*i−NodeNumber*	Searches for references to a specified i−node. Whenever the **fsck** command encounters a directory reference to a specified i−node, it displays the full path name of the reference.
−n	Assumes a `no` response to all questions asked by the **fsck** command; does not open the specified file system for writing.
−o*Options*	Passes comma−separated options to the **fsck** command. These options are assumed to be file system implementation−specific, except that the following are currently supported for all file systems: **mountable** Causes the **fsck** command to exit with success, returning a value of 0, if the file system in question is mountable (clean). If the file system is not mountable, the **fsck** command exits returning with a value of 8. **mytype** Causes the **fsck** command to exit with success (0) if the file system in question is of the same type as either specified in the **/etc/filesystems** file or by the **−V** flag on the command line. Otherwise, 8 is returned. For example, `fsck −o mytype −V jfs` / exits with a value of 0 if / (the root file

	system) is a journaled file system.
−p	Does not display messages about minor problems but fixes them automatically. This flag does not grant the wholesale license that the **−y** flag does and is useful for performing automatic checks when the system is started normally. You should use this flag as part of the system startup procedures, whenever the system is being run automatically. Also allows parallel checks by group. If the primary superblock is corrupt, the secondary superblock is verified and copied to the primary superblock.
−t*File*	Specifies a *File* parameter as a scratch file on a file system other than the one being checked, if the **fsck** command cannot obtain enough memory to keep its tables. If you do not specify the **−t** flag and the **fsck** command needs a scratch file, it prompts you for the name of the scratch file. However, if you have specified the **−p** flag, the **fsck** command is unsuccessful. If the scratch file is not a special file, it is removed when the **fsck** command ends.
−V*VfsName*	Uses the description of the virtual file system specified by the *VFSName* variable for the file system instead of using the **/etc/filesystems** file to determine the description. If the **−V***VfsName* flag is not specified on the command line, the **/etc/filesystems** file is checked and the **vfs**=*Attribute* of the matching stanza is assumed to be the correct file system type.
−y	Assumes a yes response to all questions asked by the **fsck** command. This flag lets the **fsck** command take any action it considers necessary. Use this flag only on severely damaged file systems.

Examples

1. To check all the default file systems, enter:

   ```
   fsck
   ```

   This command checks all the file systems marked `check=true` in the **/etc/filesystems** file. This form of the **fsck** command asks you for permission before making any changes to a file system.

2. To fix minor problems with the default file systems automatically, enter:
   ```
   fsck −p
   ```

3. To check a specific file system, enter:

   ```
   fsck /dev/hd1
   ```

This command checks the unmounted file system located on the **/dev/hd1** device.

Files

/usr/sbin/fsck	Contains the **fsck** command.
/etc/filesystems	Lists the known file systems and defines their characteristics.
/etc/vfs	Contains descriptions of virtual file system types.
/etc/rc	Contains commands (including the **fsck** command) that are run when the system is started.

Related Information

The **dfsck** command, **fsdb** command, **istat** command, **mkfs** command, **ncheck** command, **rc** command, **shutdown** command.

The **filesystems** file, **filsys.h** file.

The File Systems Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains file system types, management, structure, and maintenance.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

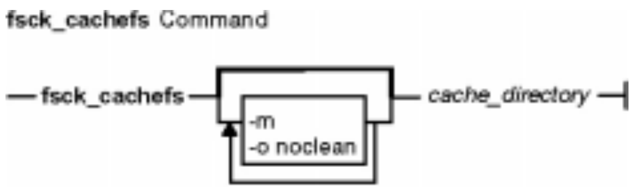
The System Management Interface Tool (SMIT): Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains the SMIT structure, main menus, and tasks.

fsck_cachefs Command

Purpose

Checks the integrity of data cached with CacheFS.

Syntax



fsck_cachefs [**−m**] [**−o noclean**] *cache_directory*

Description

The CacheFS version of the **fsck** command checks the integrity of a cache directory. By default it corrects any CacheFS problems it finds. There is no interactive mode. The most likely invocation of **fsck_cachefs** for CacheFS filesystems is at boot time from an entry in **/etc/rc.nfs**.

Flags

−m	Check, but do not repair.
−o noclean	Force a check on the cache even if there is no reason to suspect there is a problem.

Examples

To force a check on the cache directory, enter:

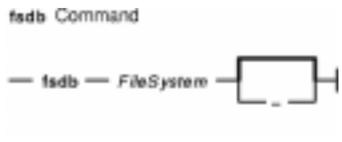
```
fsck_cachefs −o noclean /cache3
```

fsdb Command

Purpose

Debugs file systems.

Syntax



fsdb*FileSystem* [**−**]

Description

The **fsdb** command enables you to examine, alter, and debug a file system, specified by the *FileSystem* parameter. The command provides access to file system objects, such as blocks, i−nodes, or directories. You can use the **fsdb** command to examine and patch damaged file systems. Key components of a file system can be referenced symbolically. This feature simplifies the procedures for correcting control−block entries and for descending the file system tree.

To examine a file system, specify it by a block device name, a raw device name, or a mounted file system name. In the last case, the **fsdb** command determines the associated file system name by reading the **/etc/filesystems** file. Mounted file systems cannot be modified.

The subcommands for the **fsbd** command allow you to access, view, or change the information in a file system. Any number you enter in the subcommand is considered decimal by default, unless you prefix it with either 0 to indicate an octal number or 0x to indicate a hexadecimal number. All addresses are printed in hexadecimal.

Because the **fsdb** command reads and writes one block at a time, it works with raw as well as with block I/O.

Flag

− Disables the error checking routines used to verify i−nodes and block addresses. The **O** subcommand switches these routines on and off. When these routines are running, the **fsdb** command reads critical file system data from the superblock. The obtained information allows the **fsdb** command to access the various file system objects successfully and to perform various error checks.

Subcommands

The **fsdb** subcommands are requests to locate and display or modify information in the file system. The main categories of subcommands are:

Category	**Function**
Location	Access the information in the file system.
Display	View the information in the file system.
Modification	Change the information in the file system.

In addition, there are a few miscellaneous subcommands.

Location Subcommands

There are two types of location subcommands:

Number[**I** | **M** | **i** | **b**]

OR

d*DirectorySlot*

The first type consists of a number, optionally followed by an address specification. The address specification defines how the preceding number is to be interpreted. There are four address specifications corresponding to four different interpretations of the *Number* variable:

I	I−node map block number
M	Disk map block number
i	I−node number
b	Fragment number

Depending on the address specification (or absence of it), this type of location subcommand accesses information as follows:

Number	Accesses data at the absolute byte offset specified by the *Number* variable.
*MapBlockNumber***I**	Accesses the i−node map block indicated by the *MapBlockNumber* variable.
*MapBlockNumber***M**	Accesses the disk map block indicated by the *MapBlockNumber* variable.
*InodeNumber***i**	Accesses the i−node indicated by the *InodeNumber* variable.
*FragmentNumber***b**	Accesses the file system block indicated by the *FragmentNumber* variable. A fragment number consists of a block address and an encoded length. A complete fragment address is 32 bits in length. The low−order 28 bits are the beginning fragment address. The fragment length is encoded in the remaining 4 bits; it is encoded as the number of fragments less than a full block. For example, on a file system consisting of 1024−byte fragments, the address `0x2000010f` references a block that begins at 1KB block number `0x10f` and is 2KB in length. In contrast, on a file system of 512−byte fragments, the address `0x2000010f` references a block that begins at 512−byte block `0x10f` and is 3072 (512 * 6) bytes in length.

The second type of location subcommand is used to access directory entries. The subcommand consists of the character **d** followed by a directory−slot number. Directory−slot numbers start at 0 for each block of the associated i−node.

This type of location subcommand accesses information as follows:

d*DirectorySlot*	Accesses the directory entry indexed by the *DirectorySlot* variable for the current i−node. Only allocated directory entries can be manipulated using this location subcommand.

Display Subcommands

To view information relative to the address specification, use a display subcommand comprised of one of the display facilities in conjunction with one of the display formats, as follows:

p[*Number*]{ **i** | **d** | **o** | **e** | **c** | **b** | **y** | **M** | **I** | **x** | **s** | **D** }

OR

f[*Number*]{ **i** | **d** | **o** | **e** | **c** | **b** | **y** | **M** | **I** | **x** | **s** | **D** }

The display facilities are:

p Indicates a general facility. Use the general display subcommand to display data relative to the current address. If you enter a number after the **p** symbol, the **fsdb** command displays that number of entries. A check is made to detect block boundary overflows. If you enter 0 or * (asterisk), the **fsdb** command displays all entries to the end of the current fragment.

f Indicates a file facility. Use the file display subcommand to display data blocks associated with the current i−node. If you enter a number after the **f** symbol, the **fsdb** command displays that block of the file. Block numbering begins at 0. The display format follows the block number. If you enter **f** without a block number, the **fsdb** command defaults to displaying block 0 of the current i−node.

The display formats for either facility are:

i	Displays as i−nodes.
d	Displays as directories.
o	Displays as octal words.
e	Displays as decimal words.
c	Displays as characters.
b	Displays as octal bytes.
y	Displays as hexadecimal bytes.
M	Displays as disk map entries.
I	Displays as i−node map entries.
x	Displays as hexadecimal words.
S	Displays as single indirect blocks.
D	Displays as double indirect blocks.

The chosen display facility and display format remain in effect during the processing of the **fsdb** command until explicitly changed. You may receive an error message indicating improper alignment if the address you specify does not fall on an appropriate boundary.

If you use the *Number*, *MapBlockNumber***I**, or *FragmentNumber***b** location subcommands to access i−node information, you can step through the data, examining each byte, word, or double word. Select the desired display mode by entering one of the following subcommands:

B	Begins displaying in byte mode.
D	Begins displaying in double−word mode.
W	Begins displaying in word mode.

You can move forward or backward through the information. The boundary advances with the display screen and is left at the address of the last item displayed. The output can be ended at any time by pressing the INTERRUPT key. The following symbols allow movement through the information:

+ *Number*	Moves forward the specified number of units currently in effect.
−*Number*	Moves backward the specified number of units currently in effect.

The following symbols allow you to store the current address and return to it conveniently:

>	Stores the current address.
<	Returns to the previously stored address.

You can use dots, tabs, and spaces as subcommand delimiters, but they are only necessary to delimit a hexadecimal number from a subcommand that could be interpreted as a hexadecimal digit. Pressing the Enter key (entering a blank line) increments the current address by the size of the data type last displayed. That is, the address is set to the next byte, word, double word, directory entry, or i−node, allowing you to step through a region of a file system.

The **fsdb** command displays information in a format appropriate to the data type. Bytes, words, and double words are displayed as a hexadecimal address followed by the hexadecimal representation of the data at that address and the decimal equivalent enclosed in parentheses. The **fsdb** command adds a **.B** or **.D** suffix to the end of the address to indicate a display of byte or double word values. It displays directories as a directory slot offset followed by the decimal i−node number and the character representation of the entry name. It displays i−nodes with labeled fields describing each element. The environment variables control the formats of the date and time fields.

Modification Subcommands

You can modify information relative to the address specification by using a field specification (for fields in the i−node and fields in the directory). The general form for assigning new values is: *mnemonic operator new−value*, where the *mnemonic* parameter represents one of the fields described in the following list:

The following mnemonics are used for the names of the fields of an i−node and refer to the current working i−node:

`md`	Permission mode
`ln`	Link count
`uid`	User number
`gid`	Group number
`sz`	File size
`a`*Number*	Data block numbers (0 to 8) where the *Number* parameter can be a location subcommand
`at`	Access time
`mt`	Modification time
`maj`	Major device number
`min`	Minor device number

The following mnemonics refer to the i−node and disk maps:

`mf`	Map free count
`ms`	Map size
`mp`	Permanent allocation bit map
`mw`	Working allocation bit map

The following mnemonics are used for the names of the fields in directories:

`rl`	Length of directory entry record
`nl`	Length of directory name
`nm`	Directory name

Valid values of the *Operator* parameter include:

> **Note:** A file system must be unmounted before attempting to modify it.

`=`	Assigns the *New−Value* parameter to the specified *Mnemonic* parameter.

`=+`	Increment the *Mnemonic* parameter by the specified *New−Value* parameter. The default *New−Value* parameter is a value of one.
`=−`	Decrease the *Mnemonic* by the specified *New−Value*. The default *New−Value* is a value of one.
`="`	Assigns the character string specified by the *New−Value* parameter to the specified *Mnemonic* parameter. If the current display format is the **d** address specification for directory and a mnemonic is not specified, the directory name is changed. The new directory name cannot be longer than the previous directory name.

Miscellaneous Subcommands

Miscellaneous subcommands are:

q Quits.

x*n*	Expands a directory by *n* bytes where *n* plus the current size of the directory is not greater than the current directory's fragment in bytes.
!	Escapes to the shell.
O	Toggles error checking.

Examples

The following examples show subcommands you can use after starting the **fsdb** command.

1. To display an i−node, enter:

   ```
   386i
   ```

   This command displays i−node `386` in i−node format. It now becomes the current i−node.
2. To change the link count for the current i−node to a value of `4`, enter:

   ```
   ln=4
   ```
3. To increase the link count of the current i−node by a value of `1`, enter:

   ```
   ln=+1
   ```
4. To display part of the file associated with the current i−node, enter:

   ```
   fc
   ```

   This command displays block 0 of the file associated with the current i−node in ASCII bytes.
5. To display entries of a directory, enter:

   ```
   2i.fd
   ```

   This changes the current i−node to the root i−node (i−node `2`) and then displays the directory entries in the first block associated with that i−node. One or more of the last entries displayed may have an i−node number of 0 (zero). These are unused directory blocks; such entries cannot be manipulated as in the next example.
6. To go down a level of the directory tree, enter:

   ```
   d5i.fc
   ```

   This command changes the current i−node to the one associated with directory entry `5`. Then it displays the first block of the file as ASCII text (`fc`). Directory entries are numbered starting from 0.

7. To display a block when you know its block number, enter:

   ```
   1b.p0o
   ```

   This command displays the superblock (block `1`) of file system in octal.

8. To change the i−node of a directory entry, enter:

   ```
   2i.a0b.d7=3
   ```

   This command changes the i−node of directory entry `7` in the root directory (`2i`) to `3`. This example also shows how several operations can be combined on one line.

9. To change the file name of a directory entry, enter:

   ```
   d7.nm="chap1.rec"
   ```

   This command changes the name field of directory entry `7` to `chap1.rec`.

10. To display a given block of the file associated with the current i−node, enter:

    ```
    a2b.p0d
    ```

    This command displays block `2` of the current i−node as directory entries.

11. To display the content of a single indirect block at block 7, enter:

    ```
    7b. p0S
    ```

    This command displays the block numbers allocated to the i−node that has a single indirect block at block 7.

12. To display the first page of the disk map, enter:

    ```
    OM
    ```

13. To display the first 10 words of permanent block allocation map in hexadecimal, enter:

    ```
    mp1.p10x
    ```

This command shows the allocation bit map at the current address; for example, at 0M.

Files

/usr/sbin	Contains the **fsdb** command.
/etc/filesystems	Contains information on the file systems.

Related Information

The **dfsck** command, **fsck** command.

The **dir** file, **filsys.h** file.

The **environment** miscellaneous facility.

The **read** subroutine.

The File Systems Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices* explains file system types, management, structure, and maintenance.

The Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices* provides information on working with files.

fsplit Command

Purpose

Splits FORTRAN source code into separate routine files.

Syntax

fsplit Command
fsplit
−e SubprogramUnit
File

fsplit [**−e** *SubprogramUnit*] ... [*File*]

Description

The **fsplit** command takes as input either a file or standard input containing FORTRAN source code and splits the input into separate routine files of the form *name*.**f**, where *name* is the name of the program unit (for example, function, subroutine, block data or program).

The name for unnamed block data subprograms has the form *blkdtaNNN*.**f**, where NNN is three digits and a file of this name does not already exist. For unnamed main programs the name has the form *mainNNN*.**f**. If there is an error in classifying a program unit, or if *name*.**f** already exists, the program unit is put in a file of the form *zzzNNN*.**f**, where *zzzNNN*.**f** does not already exist.

> **Note:** The **fsplit** command assumes that the subprogram name is on the first non−comment line of the subprogram unit. Non−standard source formats can confuse the command and produce unpredictable results.

Flags

−e *SubprogramUnit*	Causes only the specified subprogram units to be split into separate files. Normally each subprogram unit is split into a separate file. The **−e** flag can be used only for named main programs and block data subprograms. If names specified via the **−e** option are not found, a diagnostic is written to standard error.

Example

The following **fsplit** command splits the subprograms `readit` and `doit` into separate files:

```
fsplit −e readit −e doit prog.f
```

Files

/usr/bin/fsplit	Contains the **fsplit** command.

Related Information

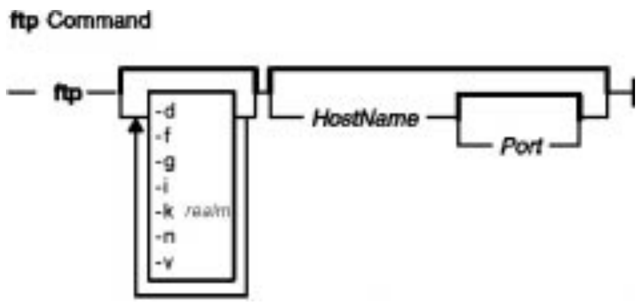
The **asa** or **fpr** command, **struct** command.

ftp Command

Purpose

Transfers files between a local and a remote host.

Syntax



ftp [**−d**] [**−g**] [**−i**] [**−n**] [**−v**] [**−f**] [**−k** *realm*] [*HostName* [*Port*]]

Description

The **ftp** command uses the File Transfer Protocol (FTP) to transfer files between the local host and a remote host or between two remote hosts.

The FTP protocol allows data transfer between hosts that use dissimilar file systems. Although the protocol provides a high degree of flexibility in transferring data, it does not attempt to preserve file attributes (such as the protection mode or modification times of a file) that are specific to a particular file system. Moreover, the FTP protocol makes few assumptions about the overall structure of a file system and does not provide or allow such functions as recursively copying subdirectories.

> **Note:** If you are transferring files between systems and need to preserve file attributes or recursively copy subdirectories, use the **rcp** command.

Issuing Subcommands

At the `ftp>` prompt, you can enter subcommands to perform tasks such as listing remote directories, changing the current local and remote directory, transferring multiple files in a single request, creating and removing directories, and escaping to the local shell to perform shell commands. See the Subcommands section for a description of each subcommand.

If you execute the **ftp** command and do not specify the *HostName* parameter for a remote host, the **ftp** command immediately displays the `ftp>` prompt and waits for an **ftp** subcommand. To connect to a remote host, execute the **open** subcommand**.** When the **ftp** command connects to the remote host, the **ftp** command then prompts for the login name and password before displaying the `ftp>` prompt again. The **ftp** command is unsuccessful if no password is defined at the remote host for the login name.

The **ftp** command interpreter, which handles all subcommands entered at the `ftp>` prompt, provides facilities that are not available with most file−transfer programs, such as:

- Handling file−name parameters to **ftp** subcommands

- Collecting a group of subcommands into a single subcommand macro
- Loading macros from a **$HOME/.netrc** file

These facilities help simplify repetitive tasks and allow you to use the **ftp** command in unattended mode.

The command interpreter handles file−name parameters according to the following rules:

- If a − (hyphen) is specified for the parameter, standard input (stdin) is used for read operations and standard output (stdout) is used for write operations.
- If the preceding check does not apply and file−name expansion is enabled (see the **−g** flag or the **glob** subcommand), the interpreter expands the file name according to the rules of the C shell. When globbing is enabled and a pattern−matching character is used in a subcommand that expects a single file name, results may be different than expected.

  For example, the **append** and **put** subcommands perform file−name expansion and then use only the first file name generated. Other **ftp** subcommands, such as **cd**, **delete**, **get**, **mkdir**, **rename**, and **rmdir**, do not perform file−name expansion and take the pattern−matching characters literally.

- For the **get**, **put**, **mget**, and **mput** subcommands, the interpreter has the ability to translate and map between different local and remote file−name syntax styles (see the **case**, **ntrans**, and **nmap** subcommands) and the ability to modify a local file name if it is not unique (see the **runique** subcommand). Additionally, the **ftp** command can send instructions to a remote **ftpd** server to modify a remote file name if it is not unique (see the **sunique** subcommand).
- Use double quotes (" ") to specify parameters that include blank characters.

  Note: The **ftp** command interpreter does not support pipes. It also does not necessarily support all multibyte−character file names.

To end an **ftp** session when you are running interactively, use the **quit** or **bye** subcommand or the End of File (Ctrl−D) key sequence at the `ftp>` prompt. To end a file transfer before it has completed, press the Interrupt key sequence. The default Interrupt key sequence is Ctrl−C. The **stty** command can be used to redefine this key sequence.

The **ftp** command normally halts transfers being sent (from the local host to the remote host) immediately. The **ftp** command halts transfers being received (from the remote host to the local host) by sending an FTP ABOR instruction to the remote FTP server and discarding all incoming file transfer packets until the remote server stops sending them. If the remote server does not support the ABOR instruction, the **ftp** command does not display the `ftp>` prompt until the remote server has sent all of the requested file. Additionally, if the remote server does something unexpected, you may need to end the local **ftp** process.

Security and Automatic Login

If Standard AIX is the current authentication method:

The **ftp** command also handles security by sending passwords to the remote host and permits automatic login, file transfers, and logoff.

If you execute the **ftp** command and specify the host name (*HostName*) of a remote host, the **ftp** command tries to establish a connection to the specified host. If the **ftp** command connects successfully, the **ftp** command searches for a local **$HOME/.netrc** file in your current directory or home directory. If the file exists, the **ftp** command searches the file for an entry initiating the login process and command macro definitions for the remote host. If the **$HOME/.netrc** file or automatic login entry does not exist or if your system has been secured with the **securetcpip** command, the **ftp** command prompts the user for a user name and password. The command displays the prompt whether or not the *HostName* parameter is specified on the command line.

Note: The queuing system does not support multibyte host names.

If the **ftp** command finds a **$HOME/.netrc** automatic login entry for the specified host, the **ftp** command attempts to use the information in that entry to log in to the remote host. The **ftp** command also loads any command macros defined in the entry. In some cases (for example, when the required password is not listed in an automatic login entry), the **ftp** command prompts for the password before displaying the `ftp>` prompt.

Once the **ftp** command completes the automatic login, the **ftp** command executes the **init** macro if the macro is defined in the automatic login entry. If the **init** macro does not exist or does not contain a **quit** or **bye** subcommand, the **ftp** command then displays the `ftp>` prompt and waits for a subcommand.

Note: The remote user name specified either at the prompt or in a **$HOME/.netrc** file must exist and have a password defined at the remote host. Otherwise, the **ftp** command fails.

If Kerberos 5 is the current authentication method:

The **ftp** command will use the extensions to ftp specifications as defined in IETF draft document "draft−ietf−cat−ftpsec−09.txt". The FTP security extensions will be implemented using the Generic Security Service API (GSSAPI) security mechanism. The GSSAPI provides services independent to the underlying security and communication mechanism. The GSSAPI is defined in rfc 1508 and 1509.

The **ftp** command will use the AUTH and ADAT commands to authenticate with the **ftpd** daemon. If both support Kerberos authentication, then they will use the local users DCE credentials to authenticate the user on the remote system. If this fails and Standard AIX authentication is configured on both systems, the process described above will be used.

The *HostName* parameter is the name of the host machine to which files are transferred. The optional *Port* parameter specifies the ID of the port through which to transmit. (The **/etc/services** file specifies the default port.)

Flags

−d Sends debugging information about **ftp** command operations to the **syslogd** daemon. If you specify the **−d** flag, you must edit the **/etc/syslog.conf** file and add one of the following entries:

```
user.info FileName
```

OR

```
user.debug FileName
```

Note: The **syslogd** daemon debug level includes info level messages.

If you do not edit the **/etc/syslog.conf** file, no messages are produced. After changing the **/etc/syslog.conf** file, run the **refresh−s syslogd** or **kill −1** *SyslogdPID* command to inform the **syslogd** daemon of the changes to its configuration file. For more information about debug levels, refer to the **/etc/syslog.conf** file. Also, refer to the **debug** subcommand**.**

−g Disables the expansion of metacharacters in file names. Interpreting metacharacters can be referred to as expanding (sometimes called globbing) a file name. See the **glob** subcommand.

−i Turns off interactive prompting during multiple file transfers. See the **prompt**, **mget**, **mput**, and **mdelete** subcommands for descriptions of prompting during multiple file transfers.

−n Prevents an automatic login on the initial connection. Otherwise, the **ftp** command searches for a

$HOME/.netrc entry that describes the login and initialization process for the remote host. See the **user** subcommand**.**

−v Displays all the responses from the remote server and provides data transfer statistics. This display mode is the default when the output of the **ftp** command is to a terminal, such as the console or a display.

If stdin is not a terminal, the **ftp** command disables verbose mode unless the user invoked the **ftp** command with the **−v** flag or issued the **verbose** subcommand.

−fCauses the credentials to be forwarded. This flag will be ignored if Kerberos 5 is not the current authentication method. **−k***realm*Allows the user to specify the realm of the remote station if it is different from the local systems realm. For these purposes, a realm is synonymous with a DCE cell. This flag will be ignored if Kerberos 5 is not the current authentication method.

Subcommands

The following **ftp** subcommands can be entered at the `ftp>` prompt. Use double quotes (" ") to specify parameters that include blank characters.

![*Command* [*Parameters*]]	Invokes an interactive shell on the local host. An optional command, with one or more optional parameters, can be given with the shell command.
$*Macro* [*Parameters*]	Executes the specified macro, previously defined with the **macdef** subcommand. Parameters are not expanded.
?[*Subcommand*]	Displays a help message describing the subcommand. If you do not specify a *Subcommand* parameter, the **ftp** command displays a list of known subcommands.
account [*Password*]	Sends a supplemental password that a remote host may require before granting access to its resources. If the password is not supplied with the command, the user is prompted for the password. The password is not displayed on the screen.
append *LocalFile* [*RemoteFile*]	Appends a local file to a file on the remote host. If the remote file name is not specified, the local file name is used, altered by any setting made with the **ntrans** subcommand or the **nmap** subcommand. The **append** subcommand uses the current values for **form**, **mode**, **struct**, and **type** subcommands while appending the file.
ascii	Synonym for the **type ascii** subcommand.
bell	Sounds a bell after the completion of each file transfer.
binary	Synonym for the **type binary** subcommand.
block	Synonym for the **mode block** subcommand.
bye	Ends the file−transfer session and exits the **ftp** command. Same as the **quit** subcommand.
carriage−control	Synonym for the **form carriage−control** subcommand.
case	Sets a toggle for the case of file names. When the **case** subcommand is On, the **ftp** command changes remote file names displayed in all capital letters from uppercase to lowercase when writing them in the local directory. The default is Off (so the **ftp** command writes uppercase remote file names in uppercase in the local directory).
cd *RemoteDirectory*	Changes the working directory on the remote host to the

	specified directory.
cdup	Changes the working directory on the remote host to the parent of the current directory.
close	Ends the file−transfer session, but does not exit the **ftp** command. Defined macros are erased. Same as the **disconnect** subcommand.
copylocal	Toggles local copy. **copylocal** defaults to off. An effort is made by ftp to make sure you do not zero out a file by ftp'ing it to itself (eg. same hostname, same pathname). Turning **copylocal** ON bypasses this check.
cr	Strips the carriage return character from a carriage return and line−feed sequence when receiving records during ASCII−type file transfers. (The **ftp** command terminates each ASCII−type record with a carriage return and line feed during file transfers.) Records on non−AIX remote hosts can have single line feeds embedded in records. To distinguish these embedded line feeds from record delimiters, set the **cr** subcommand to Off. The **cr** subcommand toggles between On and Off.

debug [**0** | **1**]	Toggles debug record keeping On and Off. Specify **debug** or **debug 1** to print each command sent to the remote host and save the restart control file. Specify **debug** again, or **debug 0**, to stop the debug record keeping. The Ctrl−C key sequence also saves the restart control file.
	
	Specifying the **debug** subcommand sends debugging information about **ftp** command operations to the **syslogd** daemon. If you specify the **debug** subcommand, you must edit the **/etc/syslog.conf** file and add one of the following entries:
	
	`user.info FileName`
	
	OR
	
	`user.debug FileName`
	
	Note: The **syslogd** daemon debug level includes info level messages.
	
	If you do not edit the **/etc/syslog.conf** file, no messages are produced. After changing the **/etc/syslog.conf** file, run the **refresh−s syslogd** or **kill −1** *SyslogdPID* command to inform the **syslogd** daemon of the changes to its configuration file. For more information about debug levels, refer to the **/etc/syslog.conf** file. Also, refer to the **ftp −d** flag.

delete *RemoteFile*	Deletes the specified remote file.
dir [*RemoteDirectory*][*LocalFile*]	Writes a listing of the contents of the specified remote directory (*RemoteDirectory*) to the specified local file (*LocalFile*). If the *RemoteDirectory* parameter is not specified, the **dir** subcommand lists the contents of the

	current remote directory. If the *LocalFile* parameter is not specified or is a − (hyphen), the **dir** subcommand displays the listing on the local terminal.
disconnect	Ends the file−transfer session but does not exit the **ftp** command. Defined macros are erased. Same as the **close** subcommand.
ebcdic	Synonym for the **type ebcdic** subcommand.
exp_cmd	Toggles between conventional and experimental protocol commands. The default is off.
file	Synonym for the **struct file** subcommand.
form [**carriage−control** | **non−print** | **telnet**]	Specifies the form of the file transfer. The **form** subcommand modifies the **type** subcommand to send the file transfer in the indicated form. Valid arguments are **carriage−control**, **non−print**, and **telnet**.
	carriage−control Sets the form of the file transfer to carriage−control.
	non−print Sets the form of the file transfer to non−print.
	telnet Sets the form of the file transfer to Telnet. Telnet is a Transmission Control Protocol/Internet Protocol (TCP/IP) protocol that opens connections to a system.
get *RemoteFile* [*LocalFile*]	Copies the remote file to the local host. If the *LocalFile* parameter is not specified, the remote file name is used locally and is altered by any settings made by the **case**, **ntrans**, and **nmap** subcommands**.** The **ftp** command uses the current settings for the **type**, **form**, **mode**, and **struct** subcommands while transferring the file.
glob	Toggles file−name expansion (globbing) for the **mdelete**, **mget**, and **mput** subcommands. If globbing is disabled, file−name parameters for these subcommands are not expanded. When globbing is enabled and a pattern−matching character is used in a subcommand that expects a single file name, results may be different than expected. For example, the **append** and **put** subcommands perform file−name expansion and then use only the first file name generated. Other **ftp** subcommands, such as **cd**, **delete**, **get**, **mkdir**, **rename**, and **rmdir**, do not perform file−name expansion and take the pattern−matching characters literally. Globbing for the **mput** subcommand is done locally in the same way as for the **csh** command. For the **mdelete** and **mget** subcommands, each file name is expanded separately at the remote machine and the lists are not merged. The expansion of a directory name can be different from the expansion of a file name, depending on the remote host and the **ftp** server. To preview the expansion of a directory name, use the

	mls subcommand: `mls RemoteFile` To transfer an entire directory subtree of files, transfer a **tar** archive of the subtree in binary form, rather than using the **mget** or **mput** subcommand.
hash	Toggles hash sign (#) printing. When the **hash** subcommand is on, the **ftp** command displays one hash sign for each data block (1024 bytes) transferred.
help [*Subcommand*]	Displays help information. See the **?** subcommand.
image	Synonym for the **type image** subcommand.
lcd [*Directory*]	Changes the working directory on the local host. If you do not specify a directory, the **ftp** command uses your home directory.
local*M*	Synonym for the **type local***M* subcommand.
ls [*RemoteDirectory*] [*LocalFile*]	Writes an abbreviated file listing of a remote directory to a local file. If the *RemoteDirectory* parameter is not specified, the **ftp** command lists the current remote directory. If the *LocalFile* parameter is not specified or is a − (hyphen), the **ftp** command displays the listing on the local terminal.
macdef *Macro*	Defines a subcommand macro. Subsequent lines up to a null line (two consecutive line feeds) are saved as the text of the macro. Up to 16 macros, containing at most 4096 characters for all macros, can be defined. Macros remain defined until either redefined or a **close** subcommand is executed. The $ (dollar sign) and \ (backslash) are special characters in **ftp** macros. A $ symbol followed by one or more numbers is replaced by the corresponding macro parameter on the invocation line (see the **$** subcommand). A $ symbol followed by the letter i indicates that the macro is to loop, with the $i character combination being replaced by consecutive parameters on each pass. The first macro parameter is used on the first pass, the second parameter is used on the second pass, and so on. A \ symbol prevents special treatment of the next character. Use the \ symbol to turn off the special meanings of the $ and \\. (backslash period) symbols.
mdelete *RemoteFiles*	Expands the files specified by the *RemoteFiles* parameter at the remote host and deletes the remote files.
mdir [*RemoteDirectoriesLocalFile*]	Expands the directories specified by the *RemoteDirectories* parameter at the remote host and writes a listing of the contents of those directories to the file specified in the *LocalFile* parameter. If the *RemoteDirectories* parameter contains a pattern−matching character, the **mdir** subcommand prompts for a local file if none is specified. If the *RemoteDirectories* parameter is a list of remote directories separated by blanks, the last argument in the list must be either a local file name or a −

	(hyphen). If the *LocalFile* parameter is − (hyphen), the **mdir** subcommand displays the listing on the local terminal. If interactive prompting is on (see the **prompt** subcommand), the **ftp** command prompts the user to verify that the last parameter is a local file and not a remote directory.
mget *RemoteFiles*	Expands the *RemoteFiles* parameter at the remote host and copies the indicated remote files to the current directory on the local host. See the **glob** subcommand for more information on file−name expansion. The remote file names are used locally and are altered by any settings made by the **case**, **ntrans**, and **nmap** subcommands. The **ftp** command uses the current settings for the **form**, **mode**, **struct**, and **type** subcommands while transferring the files.
mkdir [*RemoteDirectory*]	Creates the directory specified in the *RemoteDirectory* parameter on the remote host.
mls [*RemoteDirectoriesLocalFile*]	Expands the directories specified in the *RemoteDirectories* parameter at the remote host and writes an abbreviated file listing of the indicated remote directories to a local file. If the *RemoteDirectories* parameter contains a pattern−matching character, the **mls** subcommand prompts for a local file if none is specified. If the *RemoteDirectories* parameter is a list of remote directories separated by blanks, the last argument in the list must be either a local file name or a − (hyphen). If the *LocalFile* parameter is − (hyphen), the **mls** subcommand displays the listing on the local terminal. If interactive prompting is on (see the **prompt** subcommand), the **ftp** command prompts the user to verify that the last parameter is a local file and not a remote directory.
mode [**stream** | **block**]	Sets file−transfer mode. If an argument is not supplied, the default is **stream**. **block** Sets the file−transfer mode to block. **stream** Sets the file−transfer mode to stream.
modtime	Shows the last modification time of the specified file on the remote machine. If the **ftp** command is not connected to a host prior to execution, the **modtime** subcommand terminates with an error message. The **ftp** command ignores parameter beyond the first parameter. If the *FileName* parameter is not specified, the **ftp** command prompts for a file name. If no file name is given, the **ftp** command sends a usage message to standard output and terminates the subcommand. If the name specified by the *FileName* parameter exists on the remote host, and the name specifies a file, then the **ftp** command sends a message containing the last modification time of the file to standard output and terminates the subcommand. If *FileName* specifies a

	directory, the **ftp** command sends an error message to standard output and terminates the subcommand. **Note:** The **modtime** subcommand interprets metacharacters when allowed.
mput [*LocalFiles*]	Expands the files specified in the *LocalFiles* parameter at the local host and copies the indicated local files to the remote host. See the **glob** subcommand for more information on file−name expansion. The local file names are used at the remote host and are altered by any settings made by the **ntrans** and **nmap** subcommands. The **ftp** command uses the current settings for the **type**, **form**, **mode**, and **struct** subcommands while transferring the files.
nlist [*RemoteDirectory*][*LocalFile*]	Writes a listing of the contents of the specified remote directory (*RemoteDirectory*) to the specified local file (*LocalFile*). If the *RemoteDirectory* parameter is not specified, the **nlist** subcommand lists the contents of the current remote directory. If the *LocalFile* parameter is not specified or is a − (hyphen), the **nlist** subcommand displays the listing on the local terminal.
nmap [*InPattern OutPattern*]	Turns the file−name mapping mechanism On or Off. If no parameters are specified, file−name mapping is turned off. If parameters are specified, source file names are mapped for the **mget** and **mput** subcommands and for the **get** and **put** subcommands when the destination file name is not specified. This subcommand is useful when the local and remote hosts use different file−naming conventions or practices. Mapping follows the pattern set by the *InPattern* and *OutPattern* parameters. The *InPattern* parameter specifies the template for incoming file names, which may have already been processed according to the **case** and **ntrans** settings. The template variables `$1` through `$9` can be included in the *InPattern* parameter. All characters in the *InPattern* parameter other than the $ (dollar sign) and the \$ (backslash, dollar sign) define the values of the template variables. For example, if the *InPattern* parameter is `$1.$2` and the remote file name is `mydata.dat`, the value of `$1` is `mydata` and the value of `$2` is `dat`. The *OutPattern* parameter determines the resulting file name. The variables `$1` through `$9` are replaced by their values as derived from the *InPattern* parameter, and the variable `$0` is replaced by the original file name. Additionally, the sequence [*Sequence1*,*Sequence2*] is replaced by the value of *Sequence1*, if *Sequence1* is not null; otherwise, it is replaced by the value of *Sequence2*. For example, the subcommand: `nmap $1.$2.$3 [$1,$2].[$2,file]` would yield `myfile.data` from `myfile.data` or `myfile.data.old`, `myfile.file` from `myfile`, and `myfile.myfile` from `.myfile`. Use the \

	(backslash) symbol to prevent the special meanings of the $ (dollar sign), [(left bracket),] (right bracket), and , (comma) in the *OutPattern* parameter.
non−print	Synonym for the **form non−print** subcommand.
ntrans [*InCharacters* [*OutCharacters*]]	Turns the file−name character translation mechanism On and Off. If no parameters are specified, character translation is turned off. If parameters are specified, characters in source file names are translated for **mget** and **mput** subcommands and for **get** and **put** subcommands when the destination file name is not specified. This subcommand is useful when the local and remote hosts use different file−naming conventions or practices. Character translation follows the pattern set by the *InCharacters* and *OutCharacters* parameter. Characters in a source file name matching characters in the *InCharacters* parameter are replaced by the corresponding characters in the *OutCharacters* parameter. If the string specified by the *InCharacters* parameter is longer than the string specified by the *OutCharacters* parameter, the characters in the *InCharacters* parameter are deleted if they have no corresponding character in the *OutCharacters* parameter.
open *HostName* [*Port*]	Establishes a connection to the FTP server at the host specified by the *HostName* parameter. If the optional port number is specified, the **ftp** command attempts to connect to a server at that port. If the automatic login feature is set (that is, the **−n** flag was not specified on the command line), the **ftp** command attempts to log in the user to the FTP server. You must also have a **$HOME/.netrc** file with the correct information in it and the correct permissions set. The **.netrc** file must be in your home directory.

privateSets the protection level to "private." At this level, data is integrity and confidentially protected.**prompt** Toggles interactive prompting. If interactive prompting is on (the default), the **ftp** command prompts for verification before retrieving, sending, or deleting multiple files during the **mget**, **mput**, and **mdelete** subcommands. Otherwise, the **ftp** command acts accordingly on all files specified.**protect**This command returns the current level of protection.**proxy** [*Subcommand*] Executes an **ftp** command on a secondary control connection. This subcommand allows the **ftp** command to connect simultaneously to two remote FTP servers for transferring files between the two servers. The first **proxy** subcommand should be an **open** subcommand to establish the secondary control connection. Enter the **proxy ?** subcommand to see the other **ftp** subcommands that are executable on the secondary connection.

The following subcommands behave differently when prefaced by the **proxy** subcommand:

- The **open** subcommand does not define new macros during the automatic login process.
- The **close** subcommand does not erase existing macro definitions.
- The **get** and **mget** subcommands transfer files from the host on the primary connection to the host on the secondary connection.
- The **put**, **mput**, and **append** subcommands transfer files from the host on the secondary connection to the host on the primary connection.
- The **restart** subcommand can be handled by the **proxy** command.

- The **status** subcommand displays accurate information.

File transfers require that the FTP server on the secondary connection must support the PASV (passive) instruction.

put *LocalFile* [*RemoteFile*] Stores a local file on the remote host. If you do not specify the *RemoteFile* parameter, the **ftp** command uses the local file name to name the remote file, and the remote file name is altered by any settings made by the **ntrans** and **nmap** subcommands. The **ftp** command uses the current settings for the **type**, **form**, **mode**, and **struct** subcommands while transferring the files.
pwd Displays the name of the current directory on the remote host.**quit** Closes the connection and exits the **ftp** command. Same as the **bye** subcommand.**quote** *String* Sends the string specified by the *String* parameter verbatim to the remote host. Execute the **remotehelp** or **quote help** subcommand to display a list of valid values for the *String* parameter.

Note: "Quoting" commands that involve data transfers can produce unpredictable results.

record Synonym for the **struct record** subcommand.**recv** *RemoteFile* [*LocalFile*] Copies the remote file to the local host. Same as the **get** subcommand.**reinitialize** Reinitializes an FTP session by flushing all I/O and allowing transfers to complete. Resets all defaults as if a user had just started an FTP session without logging in to a remote host.**remotehelp** [*Subcommand*] Requests help from the remote FTP server.**rename** *FromName ToName* Renames a file on the remote host.**reset** Clears the reply queue. This subcommand resynchronizes the command parsing.**restart get** | **put** | **append** Restarts a file transfer at the point where the last checkpoint was made. To run successfully, the subcommand must be the same as the aborted subcommand, including structure, type, and form. Valid arguments are **get**, **put**, and **append**.**rmdir** *RemoteDirectory* Removes the remote directory specified by the *RemoteDirectory* parameter at the remote host.**runique** (ReceiveUnique) Toggles the facility for creating unique file names for local destination files during **get** and **mget** subcommands. If this facility is Off (the default), the **ftp** command overwrites local files. Otherwise, if a local file has the same name as that specified for a local destination file, the **ftp** command modifies the specified name of the local destination file with `.1`. If a local file is already using the new name, the **ftp** command appends the postfix .2 to the specified name. If a local file is already using this second name, the **ftp** command continues incrementing the postfix until it either finds a unique file name or reaches .99 without finding a unique file name. If the **ftp** command cannot find a unique file name, the **ftp** command reports an error and the transfer does not take place. Note that the **runique** subcommand does not affect local file names generated from a shell command.**safe**Sets the protection level to "safe." At this level, data is integrity protected.**send** *LocalFile* [*RemoteFile*] Stores a local file on the remote host. Same as the **put** subcommand.**sendport** Toggles the use of FTP PORT instructions. By default, the **ftp** command uses a PORT instruction when establishing a connection for each data transfer. When the use of PORT instructions is disabled, the **ftp** command does not use PORT instructions for data transfers. The PORT instruction is useful when dealing with FTP servers that ignore PORT instructions while incorrectly indicating the instructions have been accepted.**site***Args* Displays or sets the idle time−out period, displays or sets the file−creation umask, or changes the permissions of a file, using the **chmod** command. Possible values for the *Args* parameter are **umask** and **chmod**.**size***RemoteFile* Displays the size in bytes of the remote file specified by the *RemoteFile* parameter.**status** Displays the current status of the **ftp** command as well as the status of the subcommands.**stream** Synonym for the **mode stream** subcommand.**struct** [**file** | **record**]Sets the data transfer structure type. Valid arguments are **file** and **record**.

file	Sets the data−transfer structure type to file.
record	Sets the data−transfer structure type to record.

sunique (Send/Store Unique) Toggles the facility for creating unique file names for remote destination files during **put** and **mput** subcommands. If this facility is off (the default), the **ftp** command overwrites remote files. Otherwise, if a remote file has the same name as that specified for a remote destination file, the remote FTP server modifies the name of the remote destination file. Note that the remote server must support the STOU instruction.**system** Shows the type of operating system running on the remote machine.**telnet** Synonym for the **form telnet** subcommand.**tenex** Synonym for the **type**

tenex subcommand.**trace** Toggles packet tracing.**type** [**ascii** | **binary** | **ebcdic** | **image** | **local** *M* | **tenex**] Sets the file−transfer type. Valid arguments are **ascii**, **binary**, **ebcdic**, **image**, **local***M*, and **tenex**. If an argument is not specified, the current type is printed. The default type is **ascii**; the **binary** type can be more efficient than **ascii**.

ascii	Sets the file−transfer type to network ASCII. This type is the default. File transfer may be more efficient with binary−image transfer. See the **binary** argument for further information.
binary	Sets the file−transfer type to binary image. This type can be more efficient than an ASCII transfer.
ebcdic	Sets the file−transfer type to EBCDIC.
image	Sets the file−transfer type to binary image. This type can be more efficient than an ASCII transfer.
local*M*	Sets the file−transfer type to local. The *M* parameter defines the decimal number of bits per machine word. This parameter does not have a default.
tenex	Sets the file−transfer type to that needed for TENEX machines.

user *User* [*Password*] [*Account*] Identifies the local user (*User*) to the remote FTP server. If the *Password* or *Account* parameter is not specified and the remote server requires it, the **ftp** command prompts for the password or account locally. If the *Account* parameter is required, the **ftp** command sends it to the remote server after the remote login process completes.

> **Note:** Unless automatic login is disabled by specifying the **−n** flag on the command line, the **ftp** command sends the *User*, *Password*, and *Account* parameters automatically for the initial connection to the remote server. You also need a **.netrc** file in your home directory in order to issue an automatic login.

verbose Toggles verbose mode. When the verbose mode is on (the default), the **ftp** command displays all responses from the remote FTP server. Additionally, the **ftp** command displays statistics on all file transfers when the transfers complete.

Examples

1. To invoke the **ftp** command, log in to the system `canopus`, display local help information, display remote help information, display status, toggle the **bell**, **prompt**, **runique**, **trace**, and **verbose** subcommands, and then quit, enter:

```
$ ftp canopus
Connected to canopus.austin.century.com.
220 canopus.austin.century.com FTP server (Version 4.1 Sat Nov 23 12:52:09 CST 1991) rea
Name (canopus:eric): dee
331 Password required for dee.
Password:
230 User dee logged in.
ftp> help
Commands may be abbreviated. Commands are:
!          delete          mdelete          proxy          runique
$          debug           mdir             sendport       send
account    dir             mget             put            size
append     disconnect      mkdir            pwd            status
ascii      form            mls              quit           struct
bell       get             mode             quote          sunique
binary     glob            modtime          recv           system
bye        hash            mput             remotehelp     tenex
case       help            nmap             rstatus        trace
cd         image           nlist            rhelp          type
cdup       lcd             ntrans           rename         user
close      ls              open             reset          verbose
cr         macdef          prompt           rmdir          ?
clear      private         protect          safe
ftp> remotehelp
```

```
214−The following commands are recognized(* =>'s unimplemented).
 USER   PORT   RETR   MSND*  ALLO   DELE   SITE*  XMKD   CDUP
 PASS   PASV   STOR   MSOM*  REST*  CWD    STAT*  RMD    XCUP
 ACCT*  TYPE   APPE   MSAM*  RNFR   XCWD   HELP   XRMD   STOU
 REIN*  STRU   MLFL*  MRSQ*  RNTO   LIST   NOOP   PWD
 QUIT   MODE   MAIL*  MRCP*  ABOR   NLST   MKD    XPWD
 AUTH   ADAT   PROT   PBSZ   MIC    ENC    CCC
214 Direct comments to ftp−bugs@canopus.austin.century.com.
ftp> status
Connected to canopus.austin.century.com.
No proxy connection.
Mode: stream; Type: ascii; Form: non−print; Structure: file
Verbose: on; Bell: off; Prompting: on; Globbing: on
Store unique: off; Receive unique: off
Case: off; CR stripping: on
Ntrans: off
Nmap: off
Hash mark printing: off; Use of PORT cmds: on
ftp> bell
Bell mode on.
ftp> prompt
Interactive mode off.
ftp> runique
Receive unique on.
ftp> trace
Packet tracing on.
ftp> verbose
Verbose mode off.
ftp> quit
$
```

2. To invoke the **ftp** command, log in to the system `canopus`, print the working directory, change the working directory, set the file transfer type to ASCII, send a local file to the remote host, change the working directory to the parent directory, and then quit, enter:

```
$ ftp canopus
Connected to canopus.austin.century.com.
220 canopus.austin.century.com FTP server (Version 4.1 Sat Nov 23 12:52:09 CST 1991) rea
Name (canopus:eric): dee
331 Password required for dee.
Password:
230 User dee logged in.
ftp> pwd
257 "/home/dee" is current directory.
ftp> cd desktop
250 CWD command successful.
ftp> type ascii
200 Type set to A.
ftp> send typescript
200 PORT command successful.
150 Opening data connection for typescript (128.114.4.99,1412).
226 Transfer complete.
ftp> cdup
250 CWD command successful.
ftp> bye
221 Goodbye.
$
```

3. To invoke the **ftp** command with automatic logon (using the **.netrc** file), open a session with the system `canopus`, log in, change the working directory to the parent directory, print the working directory, list the contents of the current directory, delete a file, write a listing of the contents of the current directory to a local file, close the session, and then quit, enter:

```
$ ftp canopus
Connected to canopus.austin.century.com.
220 canopus.austin.century.com FTP server (Version 4.1 Sat Nov 23 12:52:09 CST 1991) rea
331 Password required for dee.
```

```
230 User dee logged in.
ftp> cdup
250 CWD command successful.
ftp> pwd
257 "/home" is current directory.
ftp> dir
200 PORT command successful.
150 Opening data connection for /usr/bin/ls (128.114.4.99,1407)
(0 bytes).
total 104
drwxr−xr−x   2 system        32 Feb 23 17:55 bin
Drwxr−xr−x  26 rios        4000 May 30 17:18 bin1
drwxr−xr−x   2 system        32 Feb 23 17:55 books
drwxrwxrwx  18 rios        1152 Jun  5 13:41 dee
−r−−r−−r−−   1 system      9452 May 17 12:21 filesystems
drwxr−xr−x   2 system        32 Feb 23 17:55 jim
drwxr−xr−x   5 system        80 Feb 23 17:55 krs
drwxrwxrwx   2 rios       16432 Feb 23 17:36 lost+found
−rwxr−xr−x   1 rios        3651 May 24 16:45 oldmail
drwxr−xr−x   2 system       256 Feb 23 17:55 pubserv
drwxrwxrwx   2 system       144 Feb 23 17:55 rein989
drwxr−xr−x   2 system       112 Feb 23 17:55 reinstall
226 Transfer complete.
ftp> delete oldmail
250 DELE command successful.
ftp> mdir /home/dee/bin binlist
output to local−file: binlist? y
200 PORT command successful.
150 Opening data connection for /usr/bin/ls (128.114.4.99,1408) (0 bytes).
226 Transfer complete.
ftp> close
221 Goodbye.
ftp> quit
$
```

Files

/usr/lpp/tcpip/samples/.netrc	Contains the sample **.netrc** file.
/etc/syslog.conf	Contains configuration information for the **syslogd** daemon.

Related Information

The **csh** command, **kill** command, **rcp** command, **refresh** command, **rlogin** command, **rsh** command, **stty** command, **telnet** command, **tftp** command.

The **ftpd** daemon, the **syslogd** daemon.

The **.netrc** file format.

Copying Files Using the ftp Command in *AIX Version 4.3 System User's Guide: Communications and Networks*.

Network Overview in *AIX Version 4.3 System Management Guide: Communications and Networks*.

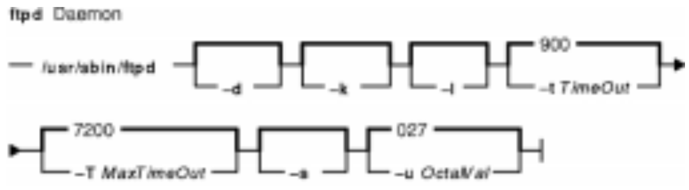
Secure Rcmds in *AIX Version 4.3 System User's Guide: Communications and Networks*.

ftpd Daemon

Purpose

Provides the server function for the Internet FTP protocol.

Syntax



> **Note:** The **ftpd** daemon is normally started by the **inetd** daemon. It can also be controlled from the command line, using SRC commands.

/usr/sbin/ftpd [**−d**] [**−k**] [**−l**] [**−t***TimeOut*] [**−T***MaxTimeOut*] [**−s**] [**−u***OctalVal*]

Description

The **/usr/sbin/ftpd** daemon is the DARPA Internet File Transfer Protocol (FTP) server process. The **ftpd** daemon uses the Transmission Control Protocol (TCP) to listen at the port specified with the **ftp** command service specification in the **/etc/services** fil.

Changes to the **ftpd** daemon can be made using the System Management Interface Tool (SMIT) or System Resource Controller (SRC), by editing the **/etc/inetd.conf**or /**etc**/**services** file. Entering `ftp` at the command line is not recommended. The **ftpd** daemon is started by default when it is uncommented in the **/etc/inetd.conf** file.

The **inetd** daemon gets its information from the /**etc**/**inetd.conf** file and the /**etc**/**services** file.

If you change the **/etc/inetd.conf** or /**etc**/**services** file, run the **refresh−s inetd** or **kill −1** *InetdPID* command to inform the **inetd** daemon of the changes to its configuration files.

The **ftpd** daemon expands file names according to the conventions of the **csh** command. This command allows you to use such metacharacters as the * (asterisk), the ? (question mark), [ ] (left and right brackets), { } (left and right braces), and the ~ (tilde).

If Standard AIX is the current authentication method:

Before the **ftpd** daemon can transfer files for a client process, it must authenticate the client process. The **ftpd** daemon authenticates client processes according to these rules:

- The user must have a password in the password database, **/etc/security/passwd**. (If the user's password is not null, the client process must provide that password.)
- The user name must not appear in the **/etc/ftpusers** file.
- The user's login shell must appear in the shells attribute of the **/etc/security/login.cfg** file.
- If the user name is `anonymous` or `ftp`, an anonymous FTP account must be defined in the password file. In this case, the client process is allowed to log in using any password. By convention, the password is the name of the client host. The **ftpd** daemon takes special measures to restrict access

by the client process to the anonymous account.

If Kerberos 5 is the current authentication method:

The **ftpd** daemon allows access only if all of the following conditions are satisfied:

- The local user of the ftp client has current DCE credentials.
- The local and remote systems both support the **AUTH** command.
- The remote system accepts the DCE credentials as sufficient for access to the remote account. See the **kvalid_user** function for additional information.

File Transfer Protocol Subtree Guidelines

When handling an anonymous FTP user, the server performs the **chroot** command in the home directory of the FTP user account. For greater security, implement the following rules when you construct the FTP subtree:

~ftp	Make the home directory owned by root and mode r−xr−xr−x (555).
~ftp/bin	Make this directory owned by the root user and unwritable by anyone. The **ls** program must be present in this directory to support the list command. This program should have mode 111.
~ftp/etc	Make this directory owned by the root user and unwritable by anyone.
~ftp/pub	Make this directory mode 777 and owned by FTP. Users should then place files that are to be accessible through the anonymous account in this directory.

Note: The shell script **/usr/samples/tcpip/anon.ftp** uses the above rules to set up the anonymous FTP account for you.

The server must run as the root user to create sockets with privileged port numbers. The server maintains an effective user ID of the logged−in user, reverting to the root user only when binding addresses to sockets.

Supported File Transfer Protocol Requests

The **ftpd** daemon currently supports the following FTP requests:

ABOR	Terminates previous command.
ACCT	Specifies account (ignored).
ADAT	Specifies the Authentication/Security Data.
ALLO	Allocates storage (vacuously).
APPE	Appends to a file.
AUTH	Specifies the Authentication/Security Mechanism.
CCC	Specifies the Clear Command Channel.
CDUP	Changes to the parent directory of the current working directory.
CWD	Changes working directory.
DELE	Deletes a file.
ENC	Specifies the Privacy Protected Command.
HELP	Gives help information.

LIST	Gives list files in a directory (this FTP request is the same as the **ls −lA** command).
MKD	Makes a directory.
MDTM	Shows last modification time of file.
MIC	Specifies the Integrity Protected Command.

MODE	Specifies data transfer mode.
NLST	Gives a name list of files in directory (this FTP request is the same as the **ls** command).
NOOP	Does nothing.
PASS	Specifies a password.
PASV	Prepares for server−to−server transfers.
PBSZ	Specifies the Protection Buffer Size.
PORT	Specifies a data connection port.
PROT	Specifies the Data Channel Protection Level.
PWD	Prints the current working directory.
QUIT	Terminates session.
RETR	Retrieves a file.
RMD	Removes a directory.
RNFR	Specifies rename−from file name.
RNTO	Specifies rename−to file name.
SITE	The following nonstandard or UNIX−specific commands are supported by the **SITE** request:

UMASK	Changes umask (**SITE UMASK 002**).
IDLE	Sets idler time (**SITE IDLE 60**).
CHMOD	Changes mode of a file (**SITE CHMOD 755** *FileName*).
HELP	Gives help information (**SITE HELP**).

SIZE	Returns size of current file.
STAT	Returns the status of the server.
STOR	Stores a file.
STOU	Stores a file using a unique file name.
STRU	Specifies the structure of data transfer as a file structure.
SYST	Shows operating system type of server system.
TYPE	Specifies data transfer type with the *Type* parameter.
USER	Specifies user name.
XCUP	Changes the parent directory of the current working directory (not normally used).
XCWD	Changes current directory (not normally used).
XMKD	Creates a directory (not normally used).
XPWD	Prints the current working directory (not normally used).
XRMD	Removes a directory (not normally used).

The remaining FTP requests defined in Internet RFC 959 are recognized, but not implemented. The **MDTM** and **SIZE** requests are not specified by RFC 959, but are scheduled to appear in the next updated FTP RFC.

If a **STAT** request is received during a data transfer and preceded by both a Telnet **IP** signal and **SYNCH** signal, transfer status is returned.

The **ftpd** daemon should be controlled using the System Management Interface Tool (SMIT) or by changing the **/etc/inetd.conf** file. Entering `ftpd` at the command line is not recommended.

Manipulating the ftpd Daemon with the System Resource Controller

The **ftpd** daemon is a subserver of the **inetd** daemon, which is a subsystem of the System Resource Controller (SRC). The **ftpd** daemon is a member of the **tcpip** SRC subsystem group. This daemon is enabled by default in the **/etc/inetd.conf** file and can be manipulated by the following SRC commands:

startsrc	Starts a subsystem, group of subsystems, or a subserver.
stopsrc	Stops a subsystem, group of subsystems, or a subserver.
lssrc	Gets the status of a subsystem, group of subsystems, or a subserver.

Flags

−d
: Sends debugging information about **ftpd** daemon operations to the **syslogd** daemon. If you specify the **−d** flag, you must edit the **/etc/syslog.conf** file and add the following entry:

```
daemon.debug FileName
```

Note: The **syslogd** daemon's `debug` level includes `info` level messages.

If you do not edit the **/etc/syslog.conf** file, no messages are produced. After changing the **/etc/syslog.conf** file, run the **refresh−s syslogd** command or **kill −1** *SyslogdPID* command to inform the **syslogd** daemon of the changes to its configuration file. For more information about debug levels, refer to the **/etc/syslog.conf** file.

−k
: Sets the **SO_KEEPALIVE** option defined in the **sys/socket.h** file on the data transfer socket to enable the data transfer to time out in the event TCP/IP hangs. The idle interval time is based on systemwide values designated by the `tcp_keepidle` and `tcp_keepintvl` options of the **no** command. Without the flag, **ftpd** data transfer will not time out.

−l
: Sends logging information about **ftpd** daemon operations to the **syslogd** daemon. If you specify the **−l** flag, you must edit the **/etc/syslog.conf** file and add the following entry:

```
daemon.info FileName
```

If you do not edit the **/etc/syslog.conf** file, no messages are produced. After changing the **/etc/syslog.conf** file, run the **refresh−s syslogd** command or **kill −1** *SyslogdPID* command to inform the **syslogd** daemon of the changes to its configuration file. For more information about debug levels, refer to the **/etc/syslog.conf** file.

−t *TimeOut*
: Logs out inactive sessions after the number of seconds specified by the *TimeOut* variable. The default limit is 15 minutes (900 seconds).

−T *MaxTimeOut*
: Logs out inactive client sessions after a maximum number of seconds specified by the *MaxTimeOut* variable. The default limit is 2 hours (7200 seconds).

−s
: Turns on socket−level debugging.

−u*OctalVal*
: Sets the **ftpd** daemon's umask. The *OctalVal* variable must be specified as an octal value to define the umask. The default umask is an octal value of 027, which results in file permissions of **rw−r−−−−−**.

Examples

Note: The arguments for the **ftpd** daemon can be specified by using SMIT or by editing the **/etc/inetd.conf** file.

1. To start the **ftpd** daemon, enter the following:

   ```
   startsrc −t ftp
   ```

   The **startsrc** command with the **−t** flag starts the **ftpd** subserver. You must use the **−t** flag to specify a subserver. Otherwise, the command does not execute properly.

2. To stop the **ftpd** daemon normally, enter the following:

   ```
   stopsrc −t ftp
   ```

The **stopsrc** command with the **−t** flag stops the **ftpd** subserver. The **stopsrc** command allows all pending connections to start and all existing connections to complete, but prevents new connections from starting. You must use the **−t** flag to specify a subserver. Otherwise, the command does not execute properly.

3. To force the **ftpd** daemon and all **ftpd** connections to stop, enter the following:

   ```
   stopsrc −t −f ftp
   ```

   The **stopsrc** command with the **−t** and **−f** flags forces the **ftpd** subserver to stop. It terminates all pending connections and existing connections immediately.

4. To display a short status report about the **ftpd** daemon, enter the following:

   ```
   lssrc −t ftp
   ```

The **lssrc** command with the **−t** flag returns the daemon's name, process ID, and state (active or inactive). You must use the **−t** flag to specify a subserver. Otherwise, the command does not execute properly.

Files

/etc/locks/ftpd	Contains interlock and process ID (PID) storage.
/etc/group	Contains passwords for groups.
/etc/passwd	Contains passwords for users.
/etc/security/login.cfg	Contains configuration information for login and user authentication.
/etc/security/passwd	Contains encrypted passwords.
/etc/syslog.conf	Contains configuration information for the **syslogd** daemon.
/usr/samples/tcpip/anon.ftp	Contains the example shell script with which to set up an anonymous FTP account. This file also contains directions for its use.

Related Information

The **ftp** command, **lssrc** command, **kill** command, **no** command, **rcp** command, **refresh** command, **rlogin** command, **rsh** command, **startsrc** command, **stopsrc** command, **telnet** command.

The **inetd** daemon, **syslogd** daemon.

The **kvalid_user** function.

The **/etc/ftpusers** file format, **/etc/inetd.conf** file format, **/etc/services**, $HOME/.k5login file format.

TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

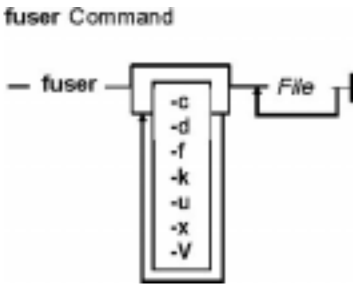
Secure Rcmds in *AIX Version 4.3 System User's Guide: Communications and Networks*.

fuser Command

Purpose

Identifies processes using a file or file structure.

Syntax



fuser [**−c** | **−d** | **−f**] [**−k**] [**−u**] [**−x**] [**−V**]*File ...*

Description

The **fuser** command lists the process numbers of local processes that use the local or remote files specified by the *File* parameter. For block special devices, the command lists the processes that use any file on that device.

Each process number is followed by a letter indicating how the process uses the file:

c	Uses the file as the current directory.
e	Uses the file as a program's executable object.
r	Uses the file as the root directory.
s	Uses the file as a shared library (or other loadable object).

The process numbers are written to standard output in a line with spaces between process numbers. A new line character is written to standard error after the last output for each file operand. All other output is written to standard error.

Flags

−c	Reports on any open files in the file system containing *File*.
−d	Implies the use of the **−c** and **−x** flags. Reports on any open files which haved been unlinked from the file system (deleted from the parent directory). When used in conjunction with the **−V** flag, it also reports the inode number and size of the deleted file.
−f	Reports on open instances of *File* only.
−k	Sends the **SIGKILL** signal to each local process. Only the root user can kill a process of another user.
−u	Provides the login name for local processes in parentheses after the process number.
−V	Provides verbose output.
−x	Used in conjunction with **−c** or **−f**, reports on executable and loadable objects in addition to the standard fuser output.

Examples

1. To list the process numbers of local processes using the **/etc/passwd** file, enter:

   ```
   fuser /etc/passwd
   ```

2. To list the process numbers and user login names of processes using the **/etc/filesystems** file, enter:

   ```
   fuser −u /etc/filesystems
   ```

3. To terminate all of the processes using a given file system, enter:

   ```
   fuser −k −x −u /dev/hd1 −OR−


   fuser −kxuc /home
   ```

   Either command lists the process number and user name, and then terminates each process that is using the **/dev/hd1 (/home)** file system. Only the root user can terminate processes that belong to another user. You might want to use this command if you are trying to unmount the **/dev/hd1** file system and a process that is accessing the **/dev/hd1** file system prevents this.

4. To list all processes that are using a file which has been deleted from a given file system, enter:

   ```
   fuser −d /usr
   ```

Files

/dev/kmem	Used for the system image.
/dev/mem	Also used for the system image.

Related Information

The **killall** command, **mount** command, and **ps** command.

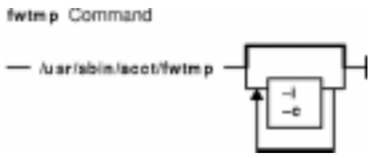
For more information about the identification and authentication of users, discretionary access control, the trusted computing base, and auditing, refer to Security Administration in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

fwtmp Command

Purpose

Manipulates connect−time accounting records by reading binary records in **wtmp** format from standard input, converting them to formatted ASCII records.

Syntax



/usr/sbin/acct/fwtmp [**−i**] [**−c**]

Description

The **fwtmp** command reads binary records in **wtmp** format from standard input, converts them to formatted ASCII records, and writes the ASCII records to standard output. This command is usually entered from the keyboard.

Flags

−i	Accepts ASCII records in the **utmp** format as input.
−c	Converts output to **utmp** formatted binary records.
−ic	Converts ASCII **utmp** formatted input records to binary output records.

Security

Access Control: These commands should grant execute (x) access only to members of the **adm** group.

Examples

1. To convert a binary record in **wtmp** format to an ASCII record called `dummy.file`, enter:

   ```
   /usr/sbin/acct/fwtmp < /var/adm/wtmp > dummy.file
   ```

   The content of a binary **wtmp** file is redirected to a dummy ASCII file.
2. To convert an ASCII `dummy.file` to a binary file in **wtmp** format called `/var/adm/wtmp`, enter the `fwtmp` command with the `−ic` switch:

   ```
   /usr/sbin/acct/fwtmp −ic < dummy.file  > /var/adm/wtmp
   ```

The dummy ASCII file is redirected to a binary **wtmp** file.

Files

/usr/sbin/acct/fwtmp	Contains the **fwtmp** command.
/var/adm/wtmp	Contains records of date changes that include an old date and a new date.

/usr/include/utmp.h	Contains history records that include a reason, date, and time.

Related Information

The **acctcon1** or **acctcon2** command, **acctmerg** command, **acctwtmp** command, **runacct** command, **wtmpfix** command.

Setting Up an Accounting System in *AIX Version 4.3 System Management Guide: Operating System and Devices* describes the steps you must take to establish an accounting system.

See the Accounting Overview in *AIX Version 4.3 System Management Concepts: Operating System and Devices* for a list of accounting commands that can be run automatically or entered from the keyboard and about the preparation of daily and monthly reports, and the accounting files.

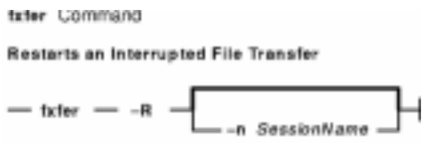
fxfer Command

Purpose

Transfers files between a local system and a host computer connected by HCON.

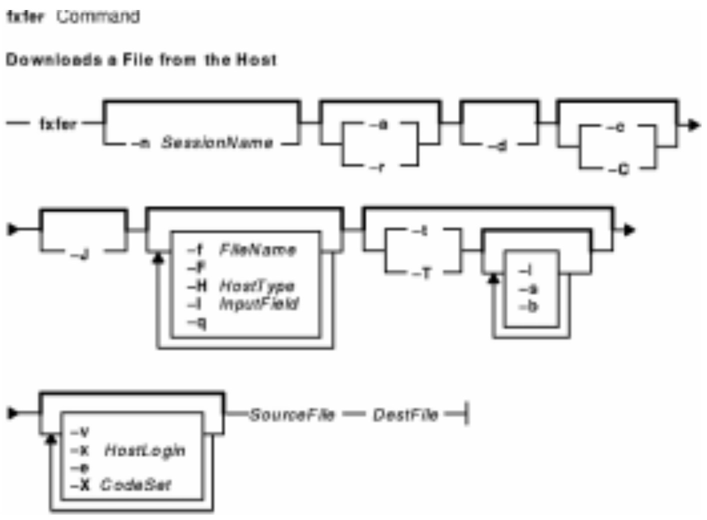
Syntax

To Restart an Interrupted File Transfer



fxfer−R [**−n** *SessionName*]

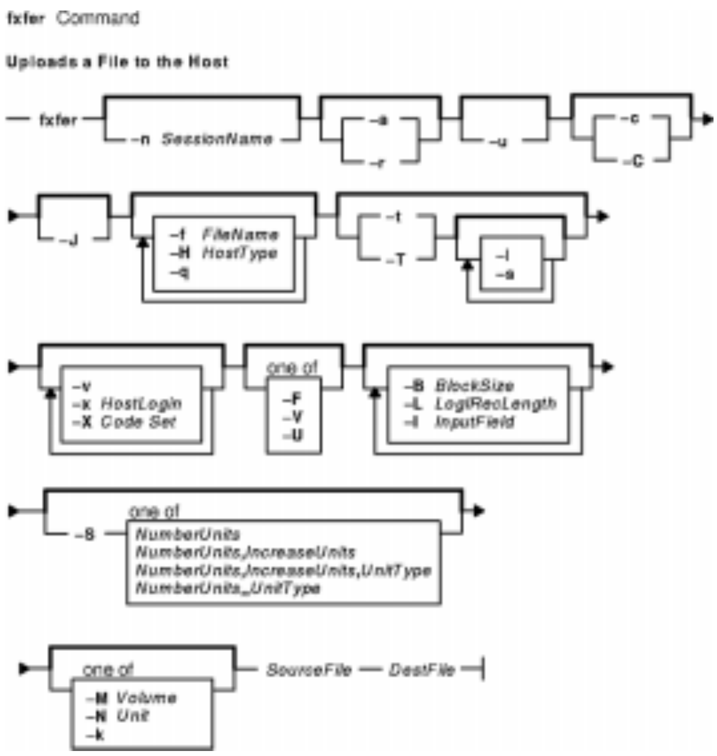
To Download a File from the Host



fxfer [**−n** *SessionName*] [**−a** | **−r**] [**−d**] [**−c** | **−C**] [**−J**] [**−f** *FileName*] [**−F**] [**−H** *HostType*][**−I***InputField*] [**−q**] [**−t** [[**−l**] [**−s**] [**−b**]] | **−T** [[**−l**] [**−s**] [**−b**]]]

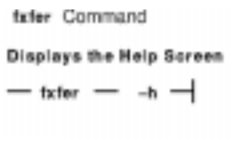
[**−v**] [**−x** *HostLogin*] [−**e**] [**−X***CodeSet*] *SourceFileDestFile*

To Upload a File to the Host



fxfer [**−n** *SessionName*] [**−a** | **−r**] [**−u**] [**−c** | **−C**] [**−J**] [**−f** *FileName*] [**−H** *HostType*] [**−q**] [**−t** [[**−l**] [**−s**]] | **−T** [[**−l**] [**−s**]]] [**−l**] [**−s**] [**−v**] [**−x** *HostLogin*] [**−X***CodeSet*] [**−F** | **−V** | **−U**] [**−B** *BlockSize*] [**−L** *LoglRecLength*] [**−I** *InputField*] [**−S** *NumberUnits* [**,***IncreaseUnits* | **,***IncreaseUnits***,***UnitType* | **,,***UnitType*]] [**−M***Volume*] [**−N***Unit*] [**−k**] *SourceFileDestFile*

To Display the Help Screen



fxfer −h

Description

The **fxfer** command transfers files between local system and mainframe hosts connected by the Host Connection Program (HCON). Files may transfer from a local system to the host (uploading) or from the host to a local system (downloading). The **fxfer** command transfers the file named by the *SourceFile* parameter to the file named by the *DestFile* parameter. The transfer occurs over an HCON session requiring a specific session profile or an existing session.

The host operating system may be VM/CMS, MVS/TSO, CICS/VS (for CICS/MVS or CICS/VSE), VSE/ESA, or VSE/SP, with the corresponding version of the 3270 File Transfer Program (**IND$FILE** or its equivalent) installed. The version of the host file transfer program is determined by the File Transfer Program value in the session profile. The **fxfer** command supports transfer of either text or binary data. Files will transfer to or from the host with or without ASCII or EBCDIC translation.

Security mechanisms prevent unauthorized access, the destruction of existing files, or the loss of data. If a non−HCON user issues the **fxfer** command, the command fails. If the **fxfer** command is interrupted before completion, the state of the transfer is saved in a RESTART file.

If the **fxfer** command is issued with the **−h** flag, it displays a help screen. If the command is issued with the **−R** flag, it searches the **$HOME** directory for a restart file. If a restart file exists, the restart menu displays, enabling a restart of the file transfer. If the **−h** and **−R** flags are not specified, the command attempts to perform the specified file transfer.

The **fxfer** command information includes:

- Flags
- Flags for Host File Characteristics
- Examples
- Files

This command requires:

- One or more adapters used to connect to a mainframe host.
- One of the following mainframe operating systems be installed on the host:
    - ♦ VM/SP CMS
    - ♦ VM/XA CMS
    - ♦ MVS/SP TSO/E
    - ♦ MVS/XA TSO/E
    - ♦ CICS/VS (for CICS/MVS or CICS/VSE)
    - ♦ VSE/ESA
- The mainframe Host−Supported File Transfer Program (**IND$FILE** or equivalent) be installed on the mainframe.

Session Profiles for Using the fxfer Command

The **fxfer** command communicates with an HCON session and may require a specific session profile. The session profile defines:

- Communication path to the host
- Host type
- Default file transfer direction (down or up)
- Recovery time
- File transfer wait period

When the **fxfer** command is performing an automatic logon, the profile can also define:

- Host logon ID
- AUTOLOG node ID
- Whether the AUTOLOG trace is on
- AUTOLOG time out value

The user usually specifies a session profile when invoking the **fxfer** command. The exception occurs when the command is run from a subshell of an existing session. In this case, if the user does not specify a session profile, the **fxfer** command uses the existing session. If the appropriate session is not running, the **fxfer** command attempts to invoke a new session.

The **fxfer** command searches for an HCON session as follows:

- When issued without the **−n***SessionName* flag:
    - ♦ If the **fxfer** command is issued from a subshell of an existing session, the command uses the session associated with the subshell (defined by the **$SNAME** environment variable).
    - ♦ If *not* issued from a subshell of an emulator session, the **fxfer** command issues an error message and terminates.
- When issued with the **−n***SessionName* flag, the file transfer performs over the specified session. If the specified session does not exist, the command searches for a session profile for that session. If the specified session profile cannot be found, the **fxfer** command issues an error message and terminates.

If the specified profile exists, the **fxfer** command attempts an automatic logon to the host using either the AUTOLOG values defined in the session profile, the values defined with the **−x** flag, or by prompting the user for the necessary logon information.

Interrupted and Restarted File Transfers

The **fxfer** command can be interrupted by the operator or an unrecoverable communication error, before completion. If interrupted, the command saves the state of the transfer in a RESTART file. The transfer can be restarted from the beginning without loss of data.

If you run a new file transfer after an interrupted transfer, the **fxfer** command signals that a RESTART file has been created and displays these choices:

- Restart the interrupted file transfer.
- Save the RESTART file and exit the file transfer program.
- Delete the RESTART file and exit the file transfer program.
- Delete the RESTART file and continue the present transfer.

The **fxfer** command with the **−R** flag also restarts an interrupted file transfer.

If the host communication is lost or disconnected during a file transfer started with an automatic logon, the file transfer attempts to recover by reconnecting and logging back on to the host. The recovery time for this attempt is determined by the File Transfer Recovery Time value in the session profile. Once the host connection is re−established, the file transfer resumes from the start. If communication cannot be re−established, the file transfer program generates a RESTART file.

When an explicit file transfer loses communication with the host, the user must restart the emulator session and log back in to the host before attempting to restart the file transfer.

Source and Destination Files

The **fxfer** command *SourceFile* and *DestFile* parameters are required. The *SourceFile* parameter specifies the source file for a file transfer. The *DestFile* parameter specifies the destination file for a file transfer. The local system file names are in the normal format. The host file names conform to the host naming convention, which is one of the following formats:

Host Type	**File Name Format**
VM/CMS	**"***FileNameFileType FileMode***"** **Note:** The " " (double quotation marks) are required for all VM/CMS file names to ensure proper file transfer.
MVS/TSO	**"**[**'**]*DataSetName* [**(***MemberName***)**] [*/Password*][**'**]**"**

where:

DataSetName	Indicates either a physical sequential data set or a partitioned data set.
(*MemberName***)**	Indicates the name of one of the members in the directory of an existing partitioned data set. The **()** (parentheses) enclosing the *MemberName* are required.
/Password	Required if password protection is specified for the MVS/TSO data set. The **/** (slash) preceding the *Password* is required.

Notes:

1. The **" "** (double quotation marks) are required for all MVS/TSO file names to ensure proper file transfer.

2. When specifying a complete path name for MVS/TSO file names, use ' (single quotation marks) within the " (double quotation marks). Do not put spaces between the double and single quotation marks or between the quotation marks and the file names.

CICS/VS "*FileName*"

VSE/ESA "*FileName FileType*"

Notes:

1. The " " (double quotation marks) are required for all CICS/VS, VSE/ESA, and VSE/SP file names to ensure proper file transfer.
2. CICS/VS, VSE/ESA, and VSE/SP file name conventions allow for a file name up to 8 characters long.
3. In a DBCS environment, HCON does not support a VSE host.

Flags

Note: For Double−Byte Character Set (DBCS) support that includes either Japanese−English, Japanese Katakana, Korean, or Traditional Chinese, these considerations apply:

- If the DBCS **−l** or **−s** flag is specified, one of the translate flags (**−t**, **−T**, or **−J**) must also be specified or the DBCS flags are ignored.
- The **−M**, **−N**, and **−k** flags are used only with MVS/TSO hosts.
- The **−e** flag is valid only with CICS for downloading.
- The **−b** flag is valid only for downloading.

−a Appends the file designated by *SourceFile* to the file designated by *DestFile*, if the destination file exists. This flag is ignored and the destination file is created if the file designated by *DestFile* does not exist.

Note: The **−a** flag is not valid when uploading a file to a CICS/VS host. For VSE/ESA, the **−a** flag is valid only for uploading to CICS temporary storage (FILE=TS).

−b Retains the blanks at the end of each record when used with the **−t**, **−T**, **−c**, or **−C** flags. The **−b** flag is only supported in the DBCS environment.

−c In a DBCS environment, the **−c** flag changes LF (line−feed) code of a file to CRLF (carriage return line−feed) code if the file transfer is an upload. For a downloading file transfer, the **−c** flag changes the CRLF code of a file to LF code.

−C In a DBCS environment, the **−C** flag inhibits the sending of the EOF (end−of−file) code of a PC−DOS file if the file transfer is an upload. For a downloading file transfer, the **−C** flag appends an EOF code: `X'1A` at the end of a PC−DOS file.

−d Downloads the file by transferring it from the host to the local system. If neither this flag nor the **−u** flag is specified, the File Transfer Direction characteristic in the session profile determines the direction of the transfer.

Note: When downloading a translated file from a VSE/ESA host file transfer (FILE=HTF) the file is deleted from the host system unless you specify the **−I** `"KEEP"` flag.

−e Deletes the temporary storage queue at the completion of the file transfer. Use this flag only with the CICS host for downloading. The **−e** flag is only supported in the DBCS environment.

−f *FileName* Places the file transfer process diagnostic output (or file transfer status) in the file specified by the *FileName* variable.

If the **−f** flag is not specified for an asynchronous transfer, messages are placed in the **$HOME/hconerrors** file. If the **−f** flag is not specified for a synchronous transfer, messages are sent to standard output.

Messages due to errors in specifying file transfer parameters or file names, or failures in the file transfer process, are directed to standard output (if it is a local system screen) or to the **$HOME/hconerrors** file (if standard output is not a local system screen).

−h
Displays a help screen for the **fxfer** command. This screen summarizes each available command flag and command operation. When this flag is specified all other flags are ignored and no files are transferred.

Notes:

1. If the **−h** flag is used, all other flags are ignored. No files transfer.
2. If the **fxfer** command is not initiated from a subshell of an existing HCON session, either the **−h** flag or the **−n** flag is required.

−H *HostType*
Specifies the type of host. The *HostType* variable may have any of these values:

CMS	VM/SP CMS or VM/XA CMS
TSO	MVS/SP TSO or MVS/XA TSO
CICS	CICS/VS (The CICS host type includes CICS/VSE, CICS/MVS, CICS/ESA, and CICS/MVS/ESA.)
VSE	VSE/ESA (Not supported in a DBCS environment.)

If the **−H** flag is omitted, the value specified by the Host Type characteristic in the session profile is used. The user must specify the correct host operating system.

Notes:

1. If you specified the **CICS** or **VSE** value and the system returns an error, retry the command with the alternate value. The CICS and VSE **IND$FILE** programs are functionally interchangeable; however, there is a 6−byte header−size discrepancy that makes the versions operationally incompatible. The destination host may be using the alternate version of the program.
2. To transfer files to an MVS/TSO host, you may need to leave session manager mode before initiating the file transfer.

−I*InputField*
Specifies host file transfer options placed directly within the **IND$FILE** command. Also allows comments within the **IND$FILE** command placed after a) (right parentheses). The value specified by the *InputField* variable is placed in quotation marks, as follows:

```
-I   "FILE=TS)   This   is   a   comment"
```

Note: The **−I** field is not supported in a DBCS environment.

−J
Allows data conversion between EBCDIC and ASCII, and normalization of SI/SO characters. The translation depends on the direction of the transfer:

Upload	Translates 1−byte characters of a file to EBCDIC code. For DBCS countries, the extended code is translated to the appropriate DBCS code. SO/SI characters are inserted into DBCS fields containing DBCS characters. If the file contains control codes 0x1E or 0x1F, they are replaced with SO and SI characters respectively.
Download	Translates EBCDIC code to 1−byte characters of a file; For DBCD, the DBCS code is translated to extended code. Deletes SO/SI characters from DBCS fields.

Note: The **−J** field is only supported in a DBCS environment.

−k
Releases unused records in the dataset at the completion of file transfer. Use this flag only in the MVS/TSO environment. The **−k** flag is only supported in the DBCS environment.

−l
Specifies the host language in the DBCS environment. This option must be used with one of the translate flags (**−t**, **−T**, or **−J**). If **−t**, **−T**, or **−J** is omitted, the **−l** flag is ignored. If the **−l** flag is not specified, the host language defined in the session profile is used. If the **−l** flag is specified, the host language used is the alternate language of the language defined in the session profile. For example, if the Language characteristic in the session profile is JPK

	(Japanese Katakana), the host language used for file transfer will be Japanese−English. The **−l** flag is only supported in the DBCS environment.
−M *Volume*	Specifies the volume serial number of the host disk for dataset allocation. Use this flag only in the MVS/TSO environment. The **−M** flag is only supported in the DBCS environment.
−n*SessionName*	Specifies the name of a previously defined session whose characteristics control the file transfer. The session name is a single character in the range of a to z. Capital letters are interpreted as lowercase letters. The **−n** *SessionName* flag is required except when the user is initiating the **fxfer** command from a subshell of an existing session. In this case, if the **−n** flag is not used the **fxfer** command defaults to the existing session. **Notes:** 1. The specified session must have been previously defined using the Web−based System Manager, the **smithcon** fast path command or the **mkhcons** command. 2. If the **fxfer** command is not initiated from a subshell of an existing HCON session, either the **−h** flag or the **−n** flag is required.
−N *Unit*	Specifies the unit type of the host disk for dataset allocation. Use this flag only in the MVS/TSO environment. The **−N** flag is only supported in the DBCS environment.
−q	Runs the file transfer asynchronously as a background process. If any file transfers are not completed, the current transfer request is queued. If the **−q** flag is not specified, the file transfer operation is synchronous. If the **−f** flag is not specified, diagnostic output and status is placed in the **$HOME/hconerrors** file. **Note:** The system limits the number of bytes allowed in one Interprocess Communication (IPC) message queue. As a result, the maximum number of file transfers that can be queued at any one time is approximately 580.
−r	Specifies replacement of an existing file on the host (upload) or an existing file on the local system (download). On downloads, the replacement is done only when the transfer is successful. This ensures the existing file is not lost or destroyed if the transfer does not complete for any reason. If the **−r** flag is specified and the file does not exist, it is created during the file transfer. If the **−r** flag is *not* specified and the destination file exists, an error message is produced. For uploading, the **−r** flag must be specified when using a version of the host file transfer program below PTF UR20455 for MVS/TSO or PTF UR90118 for VM/CMS. For VSE and CICS the **−r** flag is ignored. **Note:** The host file transfer program usually defaults to replace for a file. If it does not, add `−I "replace"` to the **fxfer** command to specify replace. **Attention:** When replacing a file on the host, you must specify a logical record length (**−L** flag) and a record format (**−F** or **−V** flag) equal to the logical record length and record format of the existing file. If you do not do this, data corruption may result. This does not apply to VSE/ESA.
−R	Restarts a previous file transfer (which was interrupted by the user or an unsuccessful recovery attempt) using the information saved in one of the RESTART files: the **$HOME/x_fxfer.r** file or the **$HOME/i_fxfer.r** file. If the file transfer is not invoked from the subshell of an existing session, the **−n***SessionName* flag must be included to specify the session to be used. If the **−R** flag is specified in conjunction with any other file transfer flags, those flags are ignored and the RESTART file transfer menu is displayed. **Note:** With the **−R** flag, all other flags except the **−n***SessionName* flag are

ignored. The RESTART file transfer menu displays.

−s	Specifies the SO/SI handling in the DBCS environment. The **−s** flag must be used with one of the translate flags (**−t**, **−T**, or **−J**). If **−t**, **−T**, or **−J** is omitted, the **−s** flag is ignored. When the **−s** flag is specified, the following functions are performed for file transfer: Upload: SO/SI characters are not inserted in DBCS fields. Download: SO/SI characters are replaced with control characters (0x1E/0x1F) in DBCS fields. The **−s** flag is only supported in the DBCS environment.

−s Specifies the SO/SI handling in the DBCS environment. The **−s** flag must be used with one of the translate flags (**−t**, **−T**, or **−J**). If **−t**, **−T**, or **−J** is omitted, the **−s** flag is ignored. When the **−s** flag is specified, the following functions are performed for file transfer:

Upload	SO/SI characters are not inserted in DBCS fields.
Download	SO/SI characters are replaced with control characters (0x1E/0x1F) in DBCS fields.

The **−s** flag is only supported in the DBCS environment.

−t Performs ASCII−EBCDIC translation for a file. If downloading, the **fxfer** command translates EBCDIC to ASCII. If uploading, the **fxfer** command translates ASCII to EBCDIC. The language is specified by the Language characteristic in the session profile. The **−t** flag assumes the file is a text file. The new−line character is the line delimiter.

When the **−t** flag is used in a DBCS environment with other DBCS supported flags, the behavior of the **−t** flag changes as follows:

Upload	Translates JISCII (Japan) or ASCII (Korean, Traditional Chinese) to EBCDIC. Inserts SO/SI characters in DBCS fields.
Download	Translates EBCDIC to JISCII (Japan) or ASCII (Korean, Traditional Chinese). Deletes SO/SI characters from DBCS fields.

−T Performs ASCII−EBCDIC translation for a disk operating system file. The character sequence, CRLF, used as the line delimiter, and a disk operating system EOF (end−of−file) character are inserted at the end of the downloaded file. The language to be used for EBCDIC to ASCII translation is specified by the Language characteristic in the session profile. The **−T** flag is used to translate disk operating system files.

Note: If neither the **−T**, **−t**, nor the **−J** flag is specified, the file transfer assumes no translation and transfers the information in binary form.

−u Uploads the file by transferring the file from the local system to the host. If neither this flag nor the **−d** flag is specified, the File Transfer Direction characteristic in the session profile determines the direction of the transfer.

−v Periodically writes the current status of the file transfer to the screen or to the status file specified by the **−f** flag. The status includes the number of bytes transferred and the elapsed time since the file transfer process began transferring data.

−x *HostLogin* Uses the login ID specified by the *HostLogin* variable to log in to the host. The user is prompted to enter the password.

The *HostLogin* string consists of the host login ID, the AUTOLOG node ID, and other optional AUTOLOG values. The string cannot contain any blanks and must contain the AUTOLOG node ID. Format the AUTOLOG string as:

```
UserID,AutologNodeID[,Trace,Time   .   .   .]
```

If the **−x** flag is not specified, the information for the *HostLogin* string is taken from the session profile as follows:

- If the host login ID is set in the session profile, you are prompted for the password. The remaining parameters are retrieved from the profile.
- If the host login ID is not set in the profile, you are prompted for both the host login string and the password.
- Your response to a prompt always overrides a profile parameter. For example, if the AUTOLOG time is set in the profile but you enter a different value at the prompt, the value entered at the prompt is used.

If you omit certain parameters from the host login string, they are retrieved from the profile, if defined there. For example, if the you set the AUTOLOG Node ID, AUTOLOG Trace, and AUTOLOG Time parameters in the profile, only the host login ID must be entered at the prompt.

The file transfer process logs in to the host and establishes an emulation session using the session profile specified with the **−n** flag. Once the process is successfully logged in, the file transfer begins.

The File Transfer Wait Period parameter in the session profile determines how long the login session is maintained. Using this parameter, the host login session is maintained for subsequent file transfers. The need to log in again is eliminated.

−X *CodeSet* Specifies an alternate code set to use for ASCII−EBCDIC translation. If the **−X** flag is omitted, the code set specified by the system locale is used. The following code sets are supported:

`Default`	Uses current system ASCII code page.
`IBM−850`	Uses IBM code page 850 for translation in an SBCS environment.
`IBM−932`	Uses IBM code page 932 for translation in a DBCS environment.
`ISO8859−1`	Uses ISO 8859−1 Latin alphabet number 1 code page.
`ISO8859−7`	Uses ISO 8859−7 Greek alphabet.
`ISO8859−9`	Uses ISO 8859−9 Turkish alphabet.
`IBM−eucJP`	Uses IBM Extended UNIX Code for translation in the Japanese Language environment.
`IBM−eucKR`	Uses IBM Extended UNIX Code for translation in Korean Language environment.
`IBM−eucTW`	Uses IBM Extended UNIX Code for translation in Traditional Chinese Language environment.

Flags for Host File Characteristics

The following flags specify host file characteristics and can be used only to upload files (with the exception of the **−F** flag, which can be used when downloading from a VSE host):

−B *BlockSize* Specifies the block size of the host data set. The **−B** flag can only be used in the MVS/TSO environment and only for sequential data sets. The *BlockSize* variable cannot exceed the capacity of a single track. The **−B** flag is ignored if the file is being appended. A block size value of 0 causes an error.

−F Specifies fixed−length records. This is the default if neither the **−V**, **−t**, **−T**, **−c**, nor **−C** flag is specified. The **−F** flag is ignored if the file is being appended.

On a CICS or VSE host, one of the translate flags (**−t** or **−T**) or one of the CRLF flags (**−c** or **−C**) must be specified along with the **−F** flag, since the CICS and VSE host file transfer programs do not support fixed record lengths. The combination of the **−F** flag and the translate flag causes the transfer program to pad the records with blanks to the end of the logical record length. The default is 80.

Note: Use the **−F** flag when downloading from a VSE host to prevent the deletion of trailing blanks from the translated file.

−L *LoglRecLength*
: Specifies the logical record length in bytes of the host file. For new files, the default is 80. For variable−length records, *LoglRecLength* is the maximum size of the record. The **−L** flag is ignored if the file is being appended. A *LoglRecLength* value of 0 causes an error.

Because of MVS overhead, the actual number of bytes stored in the variable length records on an MVS/TSO host is four bytes less than the value specified by the *LoglRecLength* variable.

The CICS and VSE host file transfer programs do not support logical record lengths. For transfers to or from a CICS or VSE host the **−L** flag must be accompanied by the **−F** flag. The combination of the **−F** and **−L** flags causes the transfer program to pad the records with blanks to the end of the logical record length. The default is 80.

> **Note:** The **−L** flag is required if a record length is greater than the default record length of 80.

−S *NumberUnits* [***,****IncreaseUnits* | ***,****IncreaseUnits****,****UnitType* | ***,,****UnitType*]
: Specifies the amount of space to be allocated for a new sequential data set on TSO. For large MVS files, the maximum block size permissible on the host is used to ensure that the whole disk track is filled. The **−S** flag can be used only with MVS/TSO hosts.

The following variables can be used with the **−S** flag. If used, they must be specified in the order given and separated by commas. If a variable preceding another variable is omitted, a comma must be included as a placeholder. A space is required between the **−S** flag and the *NumberUnits* variable. However, no spaces can appear in the variable string.

NumberUnits	Specifies the number of units of space to be added initially. A value of 0 or a negative value cannot be specified for the *NumberUnits* variable.
IncreaseUnits	Specifies the number of units of space to be added to the data set each time the previously allocated space is filled (optional).
UnitType	Defines the unit of space and may be `T` for tracks, `C` for cylinders, or a number specifying the average block size (in bytes) of the records written to the data set. If the *UnitType* variable is not specified, the default is the value specified by the **−B** flag. If the **−B***BlockSize* flag is not specified, the default value is 80.

Following are the possible combinations of variables used with the **−S** flag:

```
−S   NumberUnits,IncreaseUnits,UnitType
```

```
−S   NumberUnits,IncreaseUnits
```

```
−S   NumberUnits
```

	−S *NumberUnits,,UnitType*
−U	Specifies records of undefined length. The **−U** flag can only be used in the MVS/TSO environment. The **−U** flag is ignored if the file is being appended.
−V	Specifies records of variable length. This is the default if the **−F** flag is not specified, and either the **−t**, **−T**, **−c**, or **−C** flag is specified. The **−V** flag is ignored if the file is being appended. The **−V** flag is not supported by the CICS or VSE host file transfer programs, since variable record lengths are the default.

Examples

The following examples assume the session profile for session a is:

```
Session   type         DFT
Communication   device         3270c0
Language         English   (U.S.A.)
Host   type         CMS
File   transfer   direction         up
File   transfer   wait   period         10
File   transfer   recovery   time         30
```

where:

- The host type is VM/CMS.
- The connection is made using the DFT 3270 connection device.
- The file transfer default direction is upload (to use session profile a for downloading files, the user must specify the **−d** flag with the **fxfer** command).
- The file transfer process stays logged in for 10 minutes.
- If a transfer is interrupted, the process attempts recovery for 30 minutes before saving information in the RESTART file for later transfer.
- The translation language is U.S.A. ASCII−EBCDIC.
  1. To upload the `samplefile` file (in the current directory) to the host and translate it to EBCDIC using the U.S.A. translation table, enter:

     ```
     fxfer   −n   a   −t   samplefile   "test   file   a"
     ```

     ◊ **−n** instructs the **fxfer** command to use session a to transfer the file.
     ◊ **−t** instructs the command to translate using the new−line character.

  The translated data is placed in the `test file a` on the host. Because the host file name contains spaces, quotation marks around the file name are required.
- To upload the `file2` file to the VM/CMS host `test file b`, enter:

  ```
  fxfer   −urv   −L   132   −V   −H   CMS   file2   "test   file   b"
  ```

  - ♦ **−u** instructs the **fxfer** command to upload the file.
  - ♦ **−H** indicates that the host type is a VM/CMS host. If the destination file exists, it is replaced (since the **−r** flag is specified) by the transferred file.
  - ♦ **−v** causes **fxfer** to display the number of bytes transferred and elapsed time. The status or diagnostic output is displayed on the terminal.
  - ♦ If the host file does not exist, the host file maximum logical record length is set to 132 bytes (**−L** flag).
  - ♦ The host file record format is variable (**−V** flag). No translation is performed.
- To upload, from a subshell of emulator session a, the local system **/etc/motd** file to the CICS motdfile host file with translation and padding of blanks, enter:

```
fxfer  −utFH  CICS  −I  ")This  is  a  comment"  /etc/motd  "motdfile"
```

- ♦ **−u** instructs the command to upload the file.
- ♦ **−t** causes translation from ASCII to EBCDIC.
- ♦ **−F** causes the transfer program to pad the uploaded file with blanks to column 80 (the default record length). To change the default column, use the **−L** flag with a different record length (column).
- ♦ **−H** specifies the host as type CICS.
- ♦ **−I** specifies that the *InputField* value be added to the **IND$FILE** command.

In this example, `"This is a comment"` is a host comment field.

To upload or download files with the **fxfer** command, to or from a TSO environment other than your current environment, you must have authorization for the other environment. You must completely qualify the file (or dataset) within single quotes ('), then double quotes (" ").

- For example, to upload the file `newfile` to a TSO environment where the complete qualified name is `sys4.parmlib.samplefile`, enter:

```
fxfer  −urtvH  TSO  'newfile'  "sys4.parmlib.samplefile"
```

  - ♦ **−u** instructs the command to upload the file.
  - ♦ If the `sys4.parmlib.samplefile` file exists, it is replaced (**−r** flag) with the translated contents of the `newfile` file (**−t** flag).
  - ♦ **−v** instructs the **fxfer** command to write the file transfer status to the local screen every few seconds.
  - ♦ **−H** instructs the **fxfer** command that the host is a MVS/TSO host.

    Note: This example assumes that the **fxfer** command is issued from a subshell of an established session (use the **e789** command to establish a session).
- To download the file `spfuser.test` from the MVS/TSO host to the local system, enter:

```
fxfer  −n  a  −d  −r  −H  TSO  spfuser.test  samplefile1
```

  - ♦ **−n** instructs the **fxfer** command to use session `a` to transfer the file. If session `a` has not already been established, the command attempts an automatic login. Since no host login ID is specified, the **fxfer** command checks the session profile for a login ID. If one is not specified there, the user is prompted for the login ID and password.
  - ♦ **−d** overrides the default file transfer direction of upload.
  - ♦ If the `samplefile1` file already exists, it is replaced (**−r** flag) with the downloaded file from the host.
  - ♦ **−H** instructs the **fxfer** command that the host is an MVS/TSO host instead of VM/CMS (the default from the session profile).

  The transferred file is placed in the `samplefile1` file on the local system. The file transfer is performed synchronously.
- To download the VM/CMS host `test file a` and append it to the local system `mydir/samplefile` file, using session profile `a` and automatic login, enter:

```
fxfer  −n  a  −dat  −q  −f  status.out
−x  laura,vm1,trace  "test  file  a"  mydir/samplefile
```

  - ♦ **−n** instructs the **fxfer** command to use session profile `a` to transfer the file.
  - ♦ **−x** provides the host login ID. The **fxfer** command first checks to see if session is established on the local system. If so, the command transfers the file over the existing session. If session `a` is not established, the **fxfer** command performs an automatic login using the host logon ID `laura` and the AUTOLOG script `vm1`, and traces the login activity. The user is prompted for the password. The command transfers the file.
  - ♦ **−dat** instruct the **fxfer** command to download the file (**−d** flag), translate the data from

EBCDIC to ASCII (**−t** flag) using the U.S.A. translation table (defined in the session profile), and append (**−a** flag) the translated file to the `mydir/samplefile` file on the local system. If the `mydir/samplefile` file does not already exist, the **fxfer** command ignores the **−a** flag and creates the file.

- The status or diagnostic output is placed in the `status.out` file in the current local directory (**−f** flag).
- **−q** instructs the **fxfer** command to transfer the file asynchronously.

When the user enters the password, the prompt is returned and the file transfer is performed in the background.

To queue another file transfer to be performed by the same file transfer process, enter:

```
fxfer   −n   a   −daq   −f   status.out   "test   file   b"
mydir/samplefile
```

- **−n** instructs the **fxfer** command to use session `a` to transfer the file. Since session `a` has been established by the previous command, the **fxfer** command does not need to log in to the host again.
- **−d** instructs the command to download a file from the host.
- **−a** instructs the command to append the `test file b` host file to the `mydir/samplefile` file on the local system.
- **−q** instructs the **fxfer** command to transfer the file asynchronously.

The **fxfer** command continues to send status information to the `status.out` file on the local system (**−f** flag).

Notes:

a. If the text for the **fxfer** command extends beyond the limit of the screen, the text wraps automatically to the next line. Pressing the Enter key to wrap the text causes an error.
b. Attempting to start a synchronous file transfer when there is an asynchronous transfer in the queue causes an error.
c. The user will not be prompted for a login ID or a password as long as the session remains running and the **dfxfer** process remains logged in to the host. The amount of time the process remains logged in is determined by the File Transfer Wait Period in the session profile.

- To restart an interrupted file transfer from an emulator subshell, enter:

```
fxfer   −R
```

−R instructs the **fxfer** command to use the information saved in one of the RESTART files to execute a file transfer. The RESTART file is the **$HOME/x_fxfer.r** explicit restart file or **$HOME/i_fxfer.r** implicit restart file. If the **−R** flag is specified in conjunction with other file transfer flags, the other flags are ignored. The RESTART file transfer menu is displayed. Using this menu, instruct the **fxfer** command to transfer the interrupted file.

- To restart the file transfer from the command line instead of from an emulator subshell, enter:

```
fxfer   −R   −n   a
```

The **−n** flag instructs the **fxfer** command to use session `a` to perform the restarted transfer.

Files

/usr/bin/fxfer	Contains the **fxfer** command.
/usr/bin/dfxfer	Contains the **dfxfer** process.
$HOME/i_fxfer.r	Contains RESTART information for automatic login queues. Temporary file created

	by the **fxfer** command.
$HOME/x_fxfer.r	Contains RESTART information for manual login queues. Temporary file created by the **fxfer** command.
$HOME/hconerrors	Contains HCON diagnostic output and file transfer status. Temporary file created by any HCON command.
/usr/lib/libfxfer.a	Contains the library for programmatic file transfers.

Related Information

The **e789** command, **hconutil** command, **smithcon** command.

HCON File Transfers and Recovering from Interrupted HCON File Transfers in *3270 Host Connection Program 2.1 and 1.3.3 for AIX: Guide and Reference*.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

Programming HCON Overview in *3270 Host Connection Program 2.1 and 1.3.3 for AIX: Guide and Reference*.

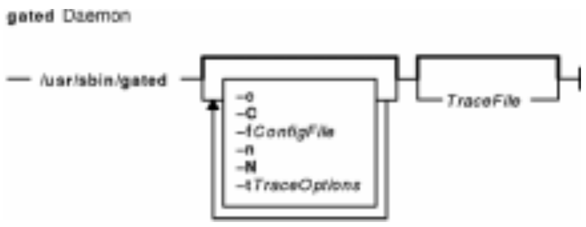
gated Daemon

Purpose

Provides gateway routing functions for the RIP, RIPng, EGP, BGP, BGP4+, HELLO, IS−IS, ICMP, ICMPv6, and SNMP protocols.

> **Note:** Use SRC commands to control the **gated** daemon from the command line. Use the **rc.tcpip** file to start the daemon with each system startup.

Syntax



/usr/sbin/gated [**−c**] [**−C**] [**−n**][**−N**] [**−t** *TraceOptions*] [**−f** *ConfigFile*] [*TraceFile*]

Description

The **/usr/sbin/gated** daemon handles multiple routing protocols and replaces **routed** and any routing daemon that speaks the (HELLO) routing protocol. The **/usr/sbin/gated** daemon currently handles the Routing Information Protocol (RIP), Routing Information Protocol Next Generation (RIPng), Exterior Gateway Protocol (EGP), Border Gateway Protocol (BGP) and BGP4+, Defense Communications Network Local−Network Protocol (HELLO), and Open Shortest Path First (OSPF), Intermediate System to Intermediate System (IS−IS), and Internet Control Message Protocol (ICMP) / Router Discovery routing protocols. In addition, the **gated** daemon supports the Simple Network Management Protocol (SNMP). The **gated** process can be configured to perform all of these protocols or any combination of them. The default configuration file for the **gated** daemon is the **/etc/gated.conf** file. The **gated** daemon stores its process ID in the **/etc/gated.pid** file.

> **Note:** Unpredictable results may occur when the **gated** and **routed** daemons are run together on the same host.

If on the command line a trace file is specified, or no trace flags are specified, the **gated** daemon detaches from the terminal and runs in the background. If trace flags are specified without specifying a trace file, **gated** assumes that tracing is desired to **stderr** and remains in the foreground.

Signals

The **gated** server performs the following actions when you use the **kill** command to send it signals.

SIGHUP Re−read configuration.

A **SIGHUP** causes gated to reread the configuration file. The **gated** daemon first performs a clean−up of all allocated policy structures. All BGP and EGP peers are flagged for deletion and the configuration file is reparsed.

If the reparse is successful, any BGP and EGP peers that are no longer in the configuration are

	shut down, and new peers are started. The **gated** daemon attempts to determine if changes to existing peers require a shutdown and restart. **Note:** Reconfiguration is disable when OSPF (Open Shortest Path First) is enabled.
SIGINT	Snap−shot of current state. The current state of all gated tasks, timers, protocols and tables are written to **/var/tmp/gated_dump**. On AIX systems, this is done by forking a subprocess to dump the table information so as not to impact the **gated** daemon's routing functions.
SIGTERM	Graceful shutdown. Upon receiving a **SIGTERM** signal, the **gated** daemon attempts a graceful shutdown. All tasks and protocols are asked to shutdown. Most will terminate immediately, the exception being EGP peers which wait for confirmation. It may be necessary to repeat the **SIGTERM** once or twice if this process takes too long. All protocol routes are removed from the kernel's routing table on receipt of a **SIGTERM**. Interface routes, routes with **RTF_STATIC** set (from the **route** command where supported) and static routes specifying **retain** will remain. To terminate the **gated** daemon with the exterior routes intact, use the **SIGKILL** or **SIGQUIT** signals (which causes a core dump).
SIGUSR1	Toggle tracing. Upon receiving a **SIGUSR1** signal, the **gated** daemon will close the trace file. A subsequent **SIGUSR1** will cause it to be reopened. This will allow the file to be moved regularly. **Note:** It is not possible to use the **SIGUSR1** signal if a trace file has not been specified, or tracing is being performed to **stderr**.
SIGUSR2	Check for interface changes. Upon receiving a **SIGUSR2** signal, the **gated** daemon rescans the kernel interface list looking for changes.

The gated and snmpd Daemons

The **gated** daemon is internally configured to be an SNMP multiplexing (SMUX) protocol peer, or proxy agent, of the **snmpd** daemon. For more information, refer to "SNMP Daemon Processing" in *AIX Version 4.3 System Management Guide: Communications and Networks*.

Manipulating the gated Daemon with the System Resource Controller

The **gated** daemon can be controlled by the System Resource Controller (SRC). The **gated** daemon is a member of the SRC **tcpip** system group. This daemon is disabled by default and can be manipulated by the following SRC commands:

startsrc	Starts a subsystem, group of subsystems, or a subserver.
stopsrc	Stops a subsystem, group of subsystems, or a subserver.
refresh	Causes the subsystem or group of subsystems to reread the appropriate configuration file.
lssrc	Gets the status of a subsystem, group of subsystems, or a subserver.

Note: On initial startup from the **startsrc** command, the **gated** daemon does not start responding to other SRC commands until all **gated** initialization is completed. A very large

/etc/gated.conf file can require a minute or more to parse completely.

Flags

−c	Specifies parsing of the configuration file for syntax errors after which the **gated** daemon exits. If no errors occur, the **gated** daemon puts a dump file into the **/var/tmp/gated_dump** file. The **−c** flag implies the **−tgeneral,kernel,nostamp** flag. If the **−c** flag is specified, the **gated** daemon ignores all **traceoption** and **tracefile** clauses in the configuration file.
−C	Specifies that the configuration file is parsed only for syntax errors. The **gated** daemon exists with a status of **1** if it finds any errors and with a status of **0** if it does not. The **−C** flag implies the **−tnostamp** flag.
−f*ConfigFile*	Specifies an alternate configuration file. By default, the **gated** daemon uses the **/etc/gated.conf** file.
−n	Specifies that the **gated** daemon will not modify the kernel's routing table. This is used for testing **gated** configurations with actual routing data.
−N	Specifies that the **gated** daemon does not daemonize. Normally, if tracing to **stderr** is not specified and the parent process ID is not 1, the **gated** daemon daemonizes. This flag allows the use of a method similar to **/etc/inittab** of invoking the **gated** daemon that does not have a process ID of 1.
−t*TraceOptions*	Specifies which trace options are enabled at system startup. When used without the *TraceOptions* variable, this flag starts the **general** trace options. Separate each trace option from another with a comma. Do not insert a space between the flag and the first trace option. The **−t** flag must be used to trace events that take place before the **/etc/gated.conf** file is parsed, such as determining the interface configuration and reading routes from the kernel. The **gated.conf** file article describes the available trace options.

Examples

1. To start the **gated** daemon, enter a command similar to the following:

   ```
   startsrc −s gated −a "−tall /var/tmp/gated.log"
   ```

   This command starts the **gated** daemon and logs messages. Messages are sent to the **/var/tmp/gated.log** file.

2. To stop the **gated** daemon normally, enter:

   ```
   stopsrc −s gated
   ```

   This command stops the daemon. The **−s** flag specifies that the subsystem that follows is to be stopped.

3. To get short status from the **gated** daemon, enter:

   ```
   lssrc −s gated
   ```

This command returns the name of the daemon, the process ID of the daemon, and the state of the daemon (active or inactive).

Files

/etc/gated.pid	Contains the **gated** process ID.
/var/tmp/gated_dump	Specifies the memory dump file.
/var/tmp/gated.log	Specifies the log file for error messages.

Related Information

The **kill** command, **gdc** command, **ospf_monitor** command, and **ripquery** command,

The **routed** daemon.

The **gated.conf** file format.

How to Configure the gated Daemon in *AIX Version 4.3 System Management Guide: Communications and Networks*.

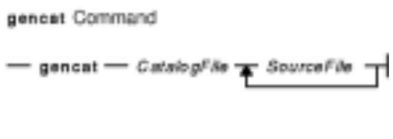
TCP/IP Routing, TCP/IP Protocols, TCP/IP Daemons in *AIX Version 4.3 System Management Guide: Communications and Networks*.

gencat Command

Purpose

Creates and modifies a message catalog.

Syntax



gencat *CatalogFile SourceFile ...*

Description

The **gencat** command creates a message catalog file (usually ***.cat**) from message text source files (usually ***.msg**). The **gencat** command merges the message text source files, specified by the *SourceFile* parameter, into a formatted message catalog, specified by the *CatalogFile* parameter. After entering messages into a source file, use the **gencat** command to process the source file to create a message catalog. The **gencat** command creates a catalog file if one does not already exist. If the catalog file does exist, the **gencat** command includes the new messages in the catalog file.

You can specify any number of message text source files. The **gencat** command processes multiple source files, one after another, in the sequence specified. Each successive source file modifies the catalog. If the set and message numbers collide, the new message text defined in the *SourceFile* parameter replaces the old message text currently contained in the *CatalogFile* parameter. Message numbers must be in the range of 1 through **NL_MSGMAX**. The set number must be in the range of 1 through **NL_SETMAX**.

The **gencat** command does not accept symbolic message identifiers. You must run the **mkcatdefs** command if you want to use symbolic message identifiers.

> **Note:** Standard output is used if the **−** (dash) character is specified as the *CatalogFile* parameter. Standard input is used if the **−** (dash) character is specified as the *SourceFile* parameter.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

To generate a `test.cat` catalog from the source file `test.msg`, enter:

```
gencat test.cat test.msg
```

The `test.msg` file does not contain symbolic identifiers.

Files

/usr/bin/gencat Contains the **gencat** command.

Related Information

The **dspcat** command, **dspmsg** command, **mkcatdefs** command, **runcat** command.

The **catclose** subroutine, **catgets** subroutine, **catopen** subroutine.

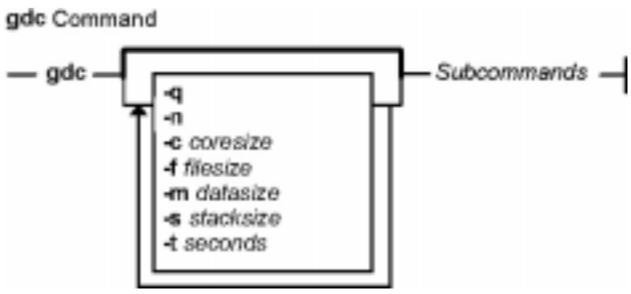
For more information about the Message Facility, see Message Facility Overview for System Management in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

gdc Command

Purpose

Provides an operational user interface for **gated**.

Syntax



gdc [**−q**] [**−n**] [**−c***coresize*] [**−f***filesize*] [**−m***datasize*] [**−s***stacksize*] [**−t***seconds*] *Subcommands*

Description

The **gdc** command provides a user−oriented interface for the operation of the **gated** routing daemon. It provides support for:

- starting and stopping the daemon
- the delivery of signals to manipulate the daemon when it is operating
- the maintenance and syntax checking of configuration files
- for the production and removal of state dumps and core dumps.

The **gdc** command can reliably determine **gated**'s running state and produces a reliable exit status when errors occur, making it advantageous for use in shell scripts which manipulate **gated**. Commands executed using **gdc** and, optionally, error messages produced by the execution of those commands, are logged via the same **syslogd** facility which **gated** itself uses, providing an audit trail of operations performed on the daemon.

Flags

−n	Runs without changing the kernel forwarding table. This is useful for testing, and when operating as a route server which does no forwarding.
−q	Runs quietly. With this flag informational messages which are normally printed to the standard output are suppressed and error messages are logged with **syslogd** instead of being printed to the standard error output. This is convenient when running **gdc** from a shell script.
−t*seconds*	Specifies the time in seconds that **gdc** waits for **gated** to complete certain operations, in particular at termination and startup. By default this value is set to 10 seconds.
−c*coresize*	Sets the maximum size of a core dump a **gated** started with **gdc** produces. This is useful on systems where the default maximum core dump size is too small for **gated** to produce a full core dump on errors.
−f*filesize*	Sets the maximum file size a **gated** started with **gdc** will produce. Useful on systems where the default maximum file dump size is too small for **gated** to produce a full state dump when requested.
−m*datasize*	Sets the maximum size of the data segment of a **gated** started with **gdc**. Useful on systems where the default data segment size is too small for **gated** to run.

−s*stacksize*	Sets the maximum size of stack of a **gated** started with **gdc**. Useful on systems where the default maximum stack size is too small for **gated** to run.

Subcommands

The following subcommands cause signals to be delivered to **gated** for various purpose:

COREDUMP	Sends an abort signal to **gated**, causing it to terminate with a core dump.
dump	Signals **gated** to dump its current state into the file **/var/tmp/gated_dump**.
interface	Signals **gated** to recheck the interface configuration. **gated** normally does this periodically in any event, but the facility can be used to force the daemon to check interface status immediately when changes are known to have occured.
KILL	Causes **gated** to terminate ungracefully.
reconfig	Signals **gated** to reread its configuration file, reconfiguring its current state as appropriate.
term	Signals **gated** to terminate after shutting down all operating routing protocols gracefully. Executing this command a second time causes **gated** to terminate even if some protocols have not yet fully shut down.
toggletrace	Causes tracing to be suspended, and if **gated** is currently tracing to a file, closes the trace file. If **gated** tracing is current suspended, this subcommand causes the trace file to be reopened and tracing initiated. This is useful for moving trace files.

The following subcommands perform operations related to configuration files:

checkconf	Check **/etc/gated.conf** for syntax errors. This is usefully done after changes to the configuration file but before sending a **reconfig** signal to the currently running **gated**, to ensure that there are no errors in the configuration which would cause the running **gated** to terminate on reconfiguration. When this command is used, **gdc** issues an informational message indicating whether there were parse errors or not, and if so saves the error output in a file for inspection.
checknew	Like **checkconf** except that the **new** configuration file, **/etc/gated.conf+**, is checked instead.
newconf	Move the **/etc/gated.conf+** file into place as **/etc/gated.conf**, retaining the older versions of the file as described above. **gdc** will decline to do anything when given this command if the **new** configuration file doesn't exist or otherwise looks suspect.
backout	Rotate the configuration files in the **newer** direction, in effect moving the **old** configuration file to **/etc/gated.conf**. The command will decline to perform the operation if **/etc/gated.conf−** doesn't exist or is zero length, or if the operation would delete an existing, non−zero length **/etc/gated.conf+** file.
BACKOUT	Perform a **backout** operation even if **/etc/gated.conf+** exists and is of non−zero length.
modeconf	Set all configuration files to mode 664, owner root, group system.
createconf	If **/etc/gated.conf+** does not exist, create a zero length file with the file mode set to 664, owner root, group system.

The following subcommands provide support for starting and stopping **gated**, and for determining its running state:

running	Determine if **gated** is currently running. This is done by checking to see if **gated** has a lock on the file containing its pid, if the pid in the file is sensible and if there is a running process with that pid. Exits with zero status if **gated** is running, non−zero otherwise.
start	Start **gated**. The command returns an error if **gated** is already running. Otherwise it executes the **gated** binary and waits for up to the delay interval (10 seconds by default, as set with the **−t** option otherwise) until the newly started process obtains a lock on the pid file. A non−zero exit status is returned if an error is detected while executing the binary, or if a lock is not obtained on the pid file within the specified wait time.

stop	Stop **gated**, gracefully if possible, ungracefully if not. The command returns an error (with non−zero exit status) if **gated** is not currently running. Otherwise it sends a terminate signal to **gated** and waits for up to the delay interval (10 seconds by default, as specified with the **−t** option otherwise) for the process to exit. Should **gated** fail to exit within the delay interval it is then signaled again with a second terminate signal. Should it fail to exit by the end of the second delay interval it is signalled for a third time with a kill signal. This should force immediate termination unless something is very broken. The command terminates with zero exit status when it detects that **gated** has terminated, non−zero otherwise.
restart	If **gated** is running it is terminated via the same procedure as is used for the **stop** command above. When the previous **gated** terminates, or if it was not running prior to command execution, a new **gated** process is executed using the procedures described for the **start** command above. A non−zero exit status is returned if any step in this procedure appears to have failed.

The following subcommands allow the removal of files created by the execution of some of the commands above:

rmcore	Removes any existing **gated** core dump file.
rmdump	Removes any existing **gated** state dump file.
rmparse	Removes the parse error file generated when a **checkconf** or **checknew** command is executed and syntax errors are encountered in the configuration file being checked.

The following subcommand allows the version information for **gated** to be displayed:

version	Show the version information for **gated**. **gated** cannot already be running at the time this command is executed. No options of **gdc** are used with this command.

By default **gated** obtains its configuration from a file normally named **/etc/gated.conf**. The **gdc** program also maintains several other versions of the configuration file, in particular named:

/etc/gated.conf+	The new configuration file. When **gdc** is requested to install a new configuration file, this file is renamed **/etc/gated.conf**.
/etc/gated.conf−	The old configuration file. When **gdc** is requested to install a new configuration file, the previous **/etc/gated.conf** is renamed to this name.
/etc/gated.conf−−	The really old configuration file. **gdc** retains the previous **old** configuration file under this name.

Files

/usr/sbin/gated	The **gated** binary.
/etc/gated.conf	Current **gated** configuration file.
/etc/gated.conf+	Newer configuration file.
/etc/gated.conf−	Older configuration file
/etc/gated.conf−−	Much older configuration file
/etc/gated.pid	Where **gated** stores its pid.
/var/tmp/gated_dump	**gated**'s state dump file
/var/tmp/gated.log	Where config file parse errors go.

Related Information

The **gated** Daemon, and **syslogd** Daemon.

genfilt Command

Purpose

Adds a filter rule.

Syntax

genfilt−v 4|**6** [**−n***fid*] [**−a***D*|*P*] **−s***s_addr***−m***s_mask***[−d***d_addr*] [**−M***d_mask*] [**−gY**|**N**] [**−c***protocol*] [**−o***s_opr*] [**−p***s_port*] [**−O***d_opr*] [**−P***d_port*] [**−rR**|**L**|**B**] [**−wI**|**O**|**B**] [**−lY**|**N**] [**−fY**|**N**|**O**|**H**] [**−t***tid*] [**−i***interface*]

Description

Use the **genfilt** command to add a filter rule to the filter rule table. The filter rules generated by this command are called manual filter rules.

Flags

−v	IP version of the filter rule. Valid values are **4** and **6**.
−n	Filter rule ID. The new rule will be added BEFORE the filter rule you specify. For IP version 4, the ID must be greater than 1 because the first filter rule is a system generated rule and cannot be moved. If this flag is not used, the new rule will be added to the end of the filter rule table.
−a	Action. The value of Deny (**D**) will block traffic, and the value of Permit (**P**) will allow traffic. The default is **D**.
−s	Source address. It can be an IP address or a host name. If a host name is specified, the first IP address returned by the name server for that host will be used. This value along with the source subnet mask will be compared against the source address of the IP packets.
−m	Source subnet mask: This will be used in the comparison of the IP packet's source address with the source address of the filter rule.
−d	Destination address. It can be an IP address or a host name. If a host name is specified, the first IP address returned by the name server for that host will be used. This value along with the destination subnet mask will be compared against the destination address of the IP packets.
−M	Destination subnet mask: This will be used in the comparison of the IP packet's destination address with the destination address of the filter rule.
−g	Apply to source routing? Must be specified as **Y** (yes) or **N** (No). If **Y** is specified, this filter rule can apply to IP packets that use source routing. The default value is yes (**Y**). This field only applies to permit rules.
−c	Protocol. The valid values are: **udp**, **icmp**, **icmpv6**, **tcp**, **tcp/ack**, **ospf**, **ipip**, **esp**, **ah**, and **all**. Value **all** indicates that the filter rule will apply to all the protocols. The protocol can also be specified numerically (between 1 and 252). The default value is **all**.
−o	Source port or ICMP type operation. This is the operation that will be used in the comparison between the source port/ICMP type of the packet with the source port or ICMP type(**−p** flag) specified in this filter rule. The valid values are: **lt**, **le**, **gt**, **ge**, **eq**, **neq**, and **any**. The default value is **any**. This value must be **any** when the **−c** flag is **ospf**.
−p	Source port or ICMP type. This is the value/type that will be compared to the source port (or ICMP type) of the IP packet.
−O	Destination port or ICMP code operation. This is the operation that will be used in the comparison between the destination port/ICMP code of the packet with the destination port or ICMP code (**−P** flag). The valid values are: **lt**, **le**, **gt**, **ge**, **eq**, **neq**, and **any**. The default value is **any**. This value must be

any when the **−c** flag is **ospf**.

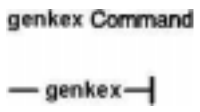
−P	Destination port/ICMP code. This is the value/code that will be compared to the destination port (or ICMP code) of the IP packet.
−r	Routing. This specifies whether the rule will apply to forwarded packets (**R**), packets destined or originated from the local host (**L**), or both (**B**). The default value is **B**.
−w	Direction. This specifies whether the rule will apply to incoming packets (**I**), outgoing packets (**O**), or both (**B**). The default value is **B**.
−l	Log control. Must be specified as **Y**(yes) or **N** (No). If specified as **Y**, packets that match this filter rule will be included in the filter log. The default value is **N** (no).
−f	Fragmentation control. This flag specifies that this rule will apply to either all packets (**Y**), fragment headers and unfragmented packets only (**H**), fragments and fragment headers only (**O**), or unfragmented packets only (**N**). The default value is **Y**.
−t	ID of the tunnel related to this filter rule. All the packets that match this filter rule must go through the specified tunnel. If this flag is not specified, this rule will only apply to non−tunnel traffic.
−i	The name of IP interface(s) to which the filter rule applies. The examples of the name are: **all**, **tr0**, **en0**, **lo0**, and **pp0**. The default value is **all**.

genkex Command

Purpose

The **genkex** command extracts the list of kernel extensions currently loaded onto the system and displays the address, size, and path name for each kernel extension in the list.

Syntax



genkex

Description

For kernel extensions loaded onto the system, the kernel maintains a linked list consisting of data structures called loader entries. A loader entry contains the name of the extension, its starting address, and its size. This information is gathered and reported by the **genkex** command.

Note: Only the root user and members of the security group should have execute (x) access to this command.

Examples

To generate the list of loaded kernel extensions, enter:

```
genkex
```

Related Information

The **genkld** command, **genld** command.

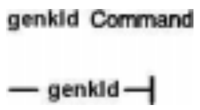
AIX Performance Monitoring and Tuning Commands in *AIX Versions 3.2 and 4 Performance Tuning Guide*

genkld Command

Purpose

The **genkld** command extracts the list of shared objects currently loaded onto the system and displays the address, size, and path name for each object on the list.

Syntax



genkld

Description

For shared objects loaded onto the system, the kernel maintains a linked list consisting of data structures called loader entries. A loader entry contains the name of the object, its starting address, and its size. This information is gathered and reported by the **genkld** command.

Note: Only the root user and members of the security group should have execute (x) access to this command.

Examples

To obtain a list of loaded shared objects, enter:

```
genkld
```

Related Information

The **genkex** command, **genld** command.

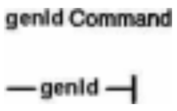
AIX Performance Monitoring and Tuning Commands in *AIX Versions 3.2 and 4 Performance Tuning Guide*

genld Command

Purpose

The **genld** command extracts a list of loaded objects for each process currently running on the system.

Syntax



genld

Description

For each process currently running, the **genld** command will print a report consisting of the process ID and name, followed by the list of objects loaded for that process. The object's address and path name are displayed. For members of libraries, the pathname of the library is shown as a directory, with the name of the loaded member shown as a file in that directory; for example, as `/usr/lib/libc.a/shr.o`, where `shr.o` is a loaded member of `libc.a`.

Note: Only the root user and members of the security group should have execute (x) access to this command.

Examples

To obtain the list of loaded objects for each running process, enter:

```
genld
```

Related Information

The **genkex** command, **genkld** command.

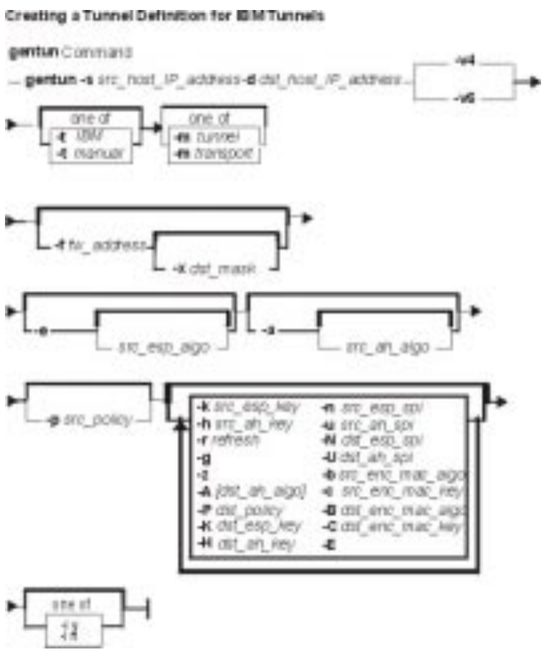
AIX Performance Monitoring and Tuning Commands in *AIX Versions 3.2 and 4 Performance Tuning Guide*

gentun Command

Purpose

Creates a tunnel definition in the tunnel database.

Syntax



gentun **−s***src_host_IP_address* **−d***dst_host_IP_address* **−v4**|**6** [**−t***tun_type*] [**−m***pkt_mode*] [**−t***IBM*] [**−t***manual*] [**−m***tunnel*] [**−m***transport*] [**−f***fw_address*] [**−x** dst_mask]] [**−e** [*src_esp_algo*]] [**−a** [*src_ah_algo*]] [**−p***src_policy*] [**−A** [*dst_ah_algo]*] [**−P***dst_policy*] [**−k***src_esp_key*] [**−h***src_ah_key*] [**−K***dst_esp_key*] [**−H***dst_ah_key*] [**−r***refresh*] [**−iy**|**n**] [**−n***src_esp_spi*] [**−u***src_ah_spi*] [**−N***dst_esp_spi*] [**−U***dst_ah_spi*] [**−b***src_enc_mac_algo*] [**−c***src_enc_mac_key*] [**−B***dst_enc_mac_algo*] [**−C***dst_enc_mac_key*] [**−g**] [**−z**] [**−E**]

Description

The **gentun** command creates a definition of a tunnel between a l ocal host and a tunnel partner host. The associated auto−generated filter rules for the tunnel can be optionally generated by this command.

Flags

−a Authentication algorithm, used by source for IP packet authentication. The valid values for **−a** depend on which authentication algorithms have been installed on the host. The list of all the authentication algorithms can be displayed by issuing the **ipsecstat −A** command. The default value is HMAC_MD5 for **manual** tunnels or KEYED_MD5 for **IBM** tunnels, if the algorithms are installed. For an **IBM** tunnel, this algorithm will be used for both inbound and outbound traffic through this tunnel.

−A (**manual** tunnel only) Authentication algorithm, used by destination for IP packet authentication. The valid values for **−A** depend on which authentication algorithms have been installed on the host. The list of all the authentication algorithms can be displayed by issuing the **ipsecstat −A** command. If this flag is not used, the value used by the **−a** flag is used. This flag does not apply to **IBM** tunnels.

−b (**manual** tunnel only) Source ESP Authentication Algorithm (New header format only). The valid values for **−b** depend on which authentication algorithms have been installed on the host. The list of all the authentication algorithms can be displayed by issuing the **ipsecstat −A** command.

−B (**manual** tunnel only) Destination ESP Authentication Algorithm (New header format only). The valid values for **−B** depend on which authentication algorithms have been installed on the host. The list of all the authentication algorithms can be displayed by issuing the **ipsecstat −A** command. If this flag is not used, it is set to the same value as the **−b** flag.

−c (**manual** tunnel only) Source ESP Authentication Key (New header format only). It must be a hexdecimal string started with "0x". If this flag is not used, the system will generate one for you.

−C (**manual** tunnel only) Destination ESP Authentication Key (New header format only). It must be a hexdecimal string started with "0x". If this flag is not used, it is set to the same value as the **−c** flag.

−d Destination Host IP address. In host−host case, this is the IP address of the destination host interface to be used by the tunnel. In host−firewall−host case, this is the IP address of the destination host behind the firewall. A host name is also valid and the first IP address returned by name server for the host name will be used.

−e Encryption algorithm, used by source for IP packet encryption. The valid values for **−e** depend on which encryption algorithms have been installed on the host. The list of all the encryption algorithms can be displayed by issuing the **ipsecstat −E** command. CDMF, if it has been installed, is the default. For an **IBM** tunnel, this algorithm will be used for both inbound and outbound traffic through this tunnel.

−E (**manual** tunnel only) Encryption algorithm, used by destination for IP packet encryption. The valid values for **−E** depend on which encryption algorithms have been installed on the host. The list of all the encryption algorithms can be displayed by issuing the **ipsecstat −E** command. If this flag is not used, the value used by the **−e** flag is used. This flag does not apply to **IBM** tunnels.

−f IP address of the firewall that is between the source and destination hosts. A tunnel will be established between this host and the firewall. Therefore the corresponding tunnel definition must be made on the firewall host. A host name may also be used for this flag and the first IP address returned by the name server for that host name will be used.

−g System auto−generated filter rule flag. If this flag is not used, the command will generate two filter rules for the tunnel automatically. The auto−generated filter rules will allow IP traffic between the two end points of the tunnel to go through the tunnel. If the **−g** flag is specified, the command will only create the tunnel definition, and the user will have to add user defined filter rules to let the tunnel work.

−h This is the AH Key String for a **manual** tunnel or the MAC key string for an **IBM** tunnel. The input must be a hexdecimal string started with "0x". If this flag is not used, the system will generate a key using a random number generator.

−H (**manual** tunnel only) The Key String for destination AH. The input must be a hexdecimal string started with "0x". If this flag is not used, the system will generate a key using a random number generator.

−i (**IBM** tunnel only) Initiator Flag, identifies which partner starts the **IBM** session key negotiations. Specifying a value of **y** causes the local host to try to initiate a session with the target host. That session is used to run the session key exchange protocol. A value of **n** causes the local host to wait for the target host to initiate the session. If both partners are identified as the tunnel initiator, a deadlock resolution algorithm resolves the conflict. At least one of the partners must be set as the initiator in order for the tunnel to operate.

−k This is the ESP Key String for a **manual** tunnel or the pseudo random function key for an **IBM** tunnel. It is used by the source to create the tunnel as well as the session key if **IBM** tunnel is used. The input must be a hexdecimal string started with "0x". If this flag is not used, the system will generate a key using a random number generator.

−K (**manual** tunnel only) The Key String for destination ESP. The input must be a hexdecimal string started with "0x". If this flag is not used, the system will generate a key using a random number generator.

−l Key Lifetime, specified in minutes.

For **IBM** tunnels, this value indicates the time in minutes each session key may be used. The value specified affects performance of the tunnel. For example, the smaller the value, the more often a new session key is computed and exchanged with the tunnel partner. Generally, values used for CDMF should be smaller than those used for DES due to the strength of the encryption algorithms.

In **IBM** tunnels, a new session key is automatically generated after every key life expires. The generated session keys are used by the encryption (ESP) and authentication (AH) algorithms. The old and new keys are valid for an overlapped period of time determined by the Session Key Refresh Overlap Time (specified in the **−r** flag). This is so that messages generated with the old key, which are in−transit in the network, can be decrypted or validated on arrival even after a new key computation. If the key lifetime is n minutes, both the old key and the new key are valid during the last Refresh Overlap Time minutes of the n minutes.

The valid values for **IBM** tunnels are 1 − 1440. The default value for **IBM** tunnels is 30.

For **manual** tunnels, this value indicates the time of operability before the tunnel expires.

The valid values for **manual** tunnels are 0 − 44640. Value 0 indicates that the **manual** tunnel will never expire. The default value for **manual** tunnels is 480.

−m Secure Packet Mode. This value must be specified as **tunnel** or **transport**. The default value is **tunnel**. Tunnel mode will encapsulate the entire IP packet, while the transport mode only encapsulates the data portion of the IP packet. When generating a host−firewall−host tunnel (for host behind a firewall), the value of **tunnel** must be used for this flag.

The −m flag is forced to use default value (**tunnel**) if the **−f** flag is specified.

−n (**manual** tunnel only) Security Parameter Index for source ESP. This is a numeric value that, along with the destination IP address, identifies which security association to use for packets using ESP. If this flag is not used, the system will generate an SPI for you.

−N (**manual** tunnel only) Security Parameter Index for the destination ESP. It must be entered for a **manual** tunnel if the policy specified in the **−P** flag includes ESP. This flag does not apply to **IBM** tunnels.

−p Source policy, identifies how the IP packet authentication and/or encryption is to be used by this host. If specified as **ea**, the IP packet gets encrypted before authentication. If specified as **ae**, it gets encrypted after authentication, whereas specifying **e** alone or **a** alone corresponds to the IP packet being encrypted only or authenticated only. The default value for this flag will depend on if the **−e** and **−a** flags are supplied. The default policy will be **ea** if either both or neither the **−e** and **−a** flags are supplied. Otherwise the policy will reflect which of the **−e** and **−a** flags were supplied. For an **IBM** tunnel, this policy will apply to both inbound and outbound traffic through this tunnel.

−P (**manual** tunnel only) Destination policy, identifies how the IP packet authentication and/or encryption is to be used by destination. If specified as **ea**, the IP packet gets encrypted before authentication. If specified as **ae**, it gets encrypted after authentication, whereas specifying **e** or **a** corresponds to the IP packet being encrypted only or authenticated only. The default policy will be **ea** if either both or neither the **−E** and **−A** flags are supplied. Otherwise, the policy will reflect which of the **−E** and **−A** flags were specified. This flag does not apply to **IBM** tunnels.

−r (**IBM** tunnel only) This is the Session Key Refresh Overlap Time that determines the amount of overlap time in minutes of the new session key start and the end of the lifetime of an old session key . The value specified will be the amount of time in minutes that a previous session key will still be valid after a key refresh has been done. The value specified cannot be greater than the Key Lifetime. The valid values are 1 − 720. The default value is 1.

−s Source Host IP address, IP address of the local host interface to be used by the tunnel. A host name is also valid and the first IP address returned by name server for the host name will be used.

−t Type of the tunnel. Must be specified as **IBM** or **manual**. The default value is **IBM**.

The **IBM** tunnel uses Session Key Refresh Method, which provides automatic key updates based on the **−l**, **−r**, and **−i** flags. The **IBM** tunnel is supported only on IP version 4. The key update protocol is an **IBM** unique implementation and cannot be used when establishing an IP security tunnel with a non−IBM tunnel end−point or any IP version 6 end−point.

The initial tunnel key and any subsequent key updates need to be performed manually when using the

manual tunnel. Once a key is installed manually, that same key is used for all tunnel operations until it is changed manually.

The **manual** tunnel value should be selected when you want to construct a tunnel with a non−IBM IP Security host or any IP version 6 end−point, where the end−point either supports RFCs 1825−1829 or the IETF drafts for the new IP Security encapsulation formats for IP tunnels.

−u (**manual** tunnel only) Security Parameter Index for source AH. Use SPI and the destination IP address to determine which security association to use for AH. If this flag is not used, the value of the −n SPI will be used.

−U (**manual** tunnel only) Security Parameter Index for the destination AH. If this flag is not used, the −N spi will be used.

−v The IP version for which the tunnel is created. For IP version 4 tunnels, use the value of **4**. For IP version 6 tunnels, use the value of **6**.

−x Network mask for the secure network behind a firewall. The Destination host is a member of the secure network. The combination of **−d** and **−x** allows the source host to communicate with multiple hosts in the secure network through the source−firewall tunnel, which must be in tunnel mode.

This flag is valid only when the **−f** flag is used.

−y (**manual** tunnel only) Replay prevention flag. Replay prevention is valid only when the ESP or AH header is using the new header format (see the **−z** flag). The valid values for the **−y** flag are Y (yes) and N (no). All encapsulations that are used in this tunnel (AH, ESP, sending, and receiving) will use the replay field if the value of this flag is Y. The default value is N.

−z (**manual** tunnel only) New header format flag. The new header format preserves a field in the ESP and AH headers for replay prevention and also allows ESP authentication. The replay field will only be used when the replay flag (**−y**) is set to Y. The valid values for the **−z** flag are Y (yes) and N (no). The default value when the **−z** flag is not used depends on the algorithms you've chosen for the tunnel. It will default to N unless either an algorithm other than KEYED_MD5 is used for either the **−a** or **−A** flags, or if the **−b** or **−B** flags are used.

Related Information

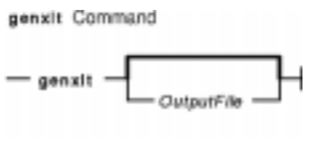
The **chtun** command, **exptun** command, **imptun** command, **lstun** command, **mktun** command, and **rmtun** command.

genxlt Command

Purpose

Generates a code set conversion table for use by the **lconv** library.

Syntax



genxlt [OutputFile]

Description

The **genxlt** command reads a source code set conversion table file from standard input and writes the compiled version to the file specified by the *OutputFile* parameter. If a value is not specified for the *OutputFile* parameter, standard output is used. The source code set conversion table file contains directives that are acted upon by the **genxlt** command to produce the compiled version.

The format of a code set conversion table source file is:

- Lines whose initial nonwhite space character is the # (pound sign) are treated as comment lines.
- Null lines and lines consisting only of white−space characters are treated as comment lines.
- Non−comment lines have to be of the following form:

```
%token <blank>   # <tab> and <space>
%token <hex>     # <zero>, <one>, <two>, <three>, <four>,
               # <five>, <six>, <seven>, <eight>, <nine>,
               # <a>, <b>, <c>, <d>, <e>, <f>,
               #  <A>, <B>, <C>, <D>, <E>, <F>,
%token <any>     # any character but '\n'
line    :  offset  blank  value  blank  comment  '\n'
        | 'SUB'  blank  value  blank  comment  '\n'
        ;

blank    : <blank>
        | blank <blank>
        ;

offset   :  '0x'  <hex>
        |  offset  <hex>
        ;


value    :  offset
        |  'invalid'
        |  'substitution'
        ;


comment  :  '#'  <any>
        |  comment  <any>
        ;
```

A line where the offset is `'SUB'` is used to specify the default substitution character.

If the table is set to `'substitution'`, the **iconv** converter using this table uses the `SUB` value for this offset.

If the value is set to `'invalid'`, the **iconv** converter using this table returns error for its offset.

If the offset is found in the source code set conversion table file multiple times, the last entry is used in the compilation of the translation table.

The offset and value must be in the range of 0x00 through 0xff, inclusive.

The following is an excerpt of a code set conversion table:

```
SUB     0x1a     substitute character
0x80    0xc7     C  cedilla
0x81    0xfc     u  diaeresis
0x82    0xe9     e  acute
0x83    0xe2     a  circumflex
0x84    0xe4     a  diaeresis
0x85    0x40     a  grave
0x9F            substitution
0xff            invalid
```

If successful, the **genxlt** command exits with a value of 0. If the output file cannot be opened, the **genxlt** command is unsuccessful and exits with a value of 1. If a syntax error is detected in the input stream, the **genxlt** command will exit immediately with a value of 2, and write to standard error the line numbers where the syntax error occurred.

The name of the file generated by the **genxlt** command must follow the naming convention below in order for the **iconv** subsystem to recognize it as a conversion file:

```
fromcode: "IBM−850"
tocode: "ISO8859−1"
conversion table file: "IBM−850_ISO8859−1"
```

The conversion table file name is formed by concatenating the `tocode` file name onto the `fromcode` file name, with an underscore between the two.

Example

To generate a non−English, user−defined code set conversion table, enter:

```
cp  /usr/lib/nls/loc/iconvTable/ISO8859−1_IBM−850_src  $HOME
vi  $HOME/ISO8859−1_IBM−850_src
genxlt  <  $HOME/ISO8859−1_IBM−850_src  >  cs1_cs2
```

Related Information

The **iconv** command.

The **iconv_open** subroutine, **iconv** subroutine, and **iconv_close** subroutine provide a method to use the conversion service from within a program.

National Language Support Overview for Programming in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

Converters Overview for System Management in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

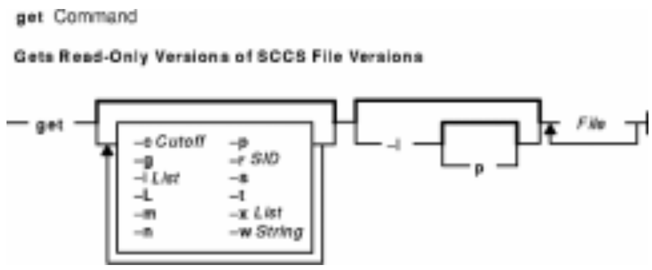
get Command

Purpose

Creates a specified version of a SCCS file.

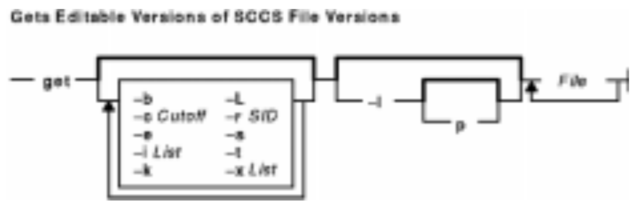
Syntax

To Get Read−Only Versions of SCCS Files



get [**−g**] [**−m**] [**−n**] [**−p**] [**−s**] [**−c** *Cutoff*] [**−i** *List*] [**−r** *SID*] [**−t**] [**−x** *List*] [**−w** *String*] [**−l** [**p**]] [**−L**] *File ...*

To Get Editable Versions of SCCS Files



get [**−e**] [**−k**] [**−b**] [**−s**] [**−c** *Cutoff*] [**−i** *List*] [**−r** *SID*] [**−t**] [**−x** *List*] [**−l** [**p**]] [**−L**] *File ...*

Description

The **get** command reads a specified version of the Source Code Control System (SCCS) file and creates an ASCII text file according to the specified flags. The **get** command then writes each text file to a file having the same name as the original SCCS file but without the **s.** prefix (the g−file).

Flags and files can be specified in any order, and all flags apply to all named files. If you specify a directory for the *File* parameter, the **get** command performs the requested actions on all files in the directory that begin with the **s.** prefix. If you specify a **−** (minus sign) for the *File* parameter, the **get** command reads standard input and interprets each line as the name of an SCCS file. The **get** command continues to read input until it reads an end−of−file character.

If the effective user has write permission in the directory containing the SCCS files but the real user does not, then only one file can be named when the **−e** flag is used.

> **Note:** The **get** command supports the Multibyte Character Set (MBCS) for the file name and string data specified with the **w** flag.

Getting Read−Only File Versions

The **get** command creates both read−only versions and editable versions of a file. Read−only versions of files should be used if the application does not require changes to the file contents. Read−only versions of source code files can be compiled. Text files can be displayed or printed from read−only versions.

The difference between an editable and a read−only version is important when using identification keywords. *Identification keywords* are symbols expanded to some text value when the **get** command retrieves the file as read−only. In editable versions, keywords are not expanded. Identification keywords can appear anywhere in an SCCS file. See the **prs** command for further information on identification keywords.

SCCS Files

In addition to the file with the **s.** prefix (the s−file), the **get** command creates several auxiliary files: the g−file, l−file, p−file, and z−file. These files are identified by their tag, which is the letter before the hyphen. The **get** program names auxiliary files by replacing the leading **s.** in the SCCS file name with the appropriate tag, except for the g−file, which is named by removing the **s.** prefix. So, for a file named **s.sample**, the auxiliary file names would be **sample**, **l.sample**, **p.sample**, and **z.sample**.

These files serve the following purposes:

s−file
: Contains the original file text and all the changes (deltas) made to the file. It also includes information about who can change the file contents, who has made changes, when those changes were made, and the nature of changes made. You cannot edit this file directly since it is read−only. However, it contains the information needed by the SCCS commands to build the g−file, which you can edit.

g−file
: An ASCII text file that contains the text of the SCCS file version that you specify with the **−r** flag (or the latest trunk version by default). You can edit this file directly. When you have made all your changes and want to make a new delta to the file, you can then run the **delta** command on the file. The **get** command creates the g−file in the current directory.

  Whenever it runs the **get** command creates a g−file, unless the **−g** flag or the **−p** flag is specified. The real user owns it (not the effective user). If you do not specify the **−k** or **−e** flag, the file is read−only. If the **−k** or **−e** flag is specified, the owner has write permission for the g−file. You must have write permission in the current directory to create a g−file.

l−file
: The **get** command creates the l−file when the **−l** flag is specified. The l−file is a read−only file. It contains a table showing which deltas were applied in generating the g−file. You must have write permission in the current directory to create an l−file. Lines in the l−file have the following format:

  - A blank character if the delta was applied; otherwise, an asterisk.
  - A blank character if the delta was applied, or was not applied and ignored. An asterisk appears if the delta was not applied and not ignored.
  - A code indicating a special reason why the delta was or was not applied:

Blankspace	Included or excluded normally
I	Included using the **−i** flag
X	Excluded using the **−x** flag
C	Cut off using the **−c** flag

  - The SID.
  - The date and time the file was created.

- The login name of person who created the delta.

Comments and Modification Requests (MR) data follow on subsequent lines, indented one horizontal tab character. A blank line ends each entry. For example, for a delta cutoff with the **−c** flag, the entry in the l−file might be:

```
**C 1.3 85/03/13 12:44:16 pat
```

and the entry for the initial delta might be:

```
1.1 85/02/27 15:42:20 pat
date and time created 85/02/27 15:42:20 by pat
```

p−file
The **get** command creates the p−file when the **−e** or **−k** flag is specified. The p−file passes information resulting from a **get −e** command to a **delta** command. The p−file also prevents a subsequent execution of a **get−e** command for the same SID until a **delta** command is run or the joint edit key letter (**j**) is set in the SCCS file. The **j** key letter allows several **get** commands to be run on the same SID. The p−file is created in the directory containing the SCCS *File*. To create a p−file in the SCCS directory, you must have write permission in that directory. The permission code of the p−file is read−only to all but its owner, and it is owned by the effective user. The p−file should not be directly edited by the owner. The p−file contains:

- Current SID
- SID of new delta to be created
- User name
- Date and time of the **get** command
- **−i** flag, if present
- **−x** flag, if present

The p−file contains an entry with the preceding information for each pending delta for the file. No two lines have the same new delta SID.

z−file
The z−file is a lock mechanism against simultaneous updates. The z−file contains the binary process number of the **get** command that created it. This file is created in the directory containing the SCCS file and exists only while the **get** command is running.

When you use the **get** command, it displays the SID being accessed and the number of lines created from the SCCS file. If you specify the **−e** flag, the SID of the delta to be made appears after the SID is accessed and before the number of lines created. If you specify more than one file, a directory, or standard input, the **get** command displays the file name before each file is processed. If you specify the **−i** flag, the **get** command lists included deltas below the word `Included`. If you specify the **−x** flag, the **get** command lists excluded deltas below the word `Excluded`.

The following table illustrates how the **get** command determines both the SID of the file it retrieves and the pending SID. The SID Specified column shows various ways the SID can be specified with the **−r** flag. The next two columns illustrate various conditions that can exist, including whether or not the **−b** flag is used with the **get −e** command. The SID Retrieved column indicates the SID of the file that makes up the g−file. The SID of Delta to Be Created column indicates the SID of the version that will be created when the **delta** command is applied.

SID Determination				
SID Specified	**−b Used**	**Other Conditions**	**SID Retrieved**	**SID of Delta to Be Created**
none [1]	no	R defaults to mR [2]	mR.mL	mR.(mL+1)
none [1]	yes	R defaults to mR	mR.mL	mR.mL.(mB+1).1
R	no	R>mR	mR.mL	R.1 [3]
R	no	R=mR	mR.mL	mR.(mL+1)
R	yes	R>mR	mR.mL	mR.mL.(mB+1).1
R	yes	R=mR	mR.mL	mR.mL.(mB+1).1
R	N/A	R<mR and R does not exist	hR.mL [4]	hR.mL.(mB+1) .1
R	N/A	Trunk successor in release > R and R exists	R.mL	R.mL.(mB+1).1
R.L.	no	No trunk successor	R.L.	R.(L+1)
R.L.	yes	No trunk successor	R.L.	R.L(mB+1).1
R.L.	N/A	Trunk successor in release > or = R	R.L.	R.L.(mB+1).1
R.L.B.	no	No branch successor	R.L.B.mS	R.L.B.(mS+1)
R.L.B.	yes	No branch successor	R.L.B.mS	R.L.(mB+1).1
R.L.B.S.	no	No branch successor	R.L.B.S.	R.L.B.(S+1)
R.L.B.S.	yes	No branch successor	R.L.B.S.	R.L.(mB+1).1
R.L.B.S.	N/A	Branch successor	R.L.B.S.	R.L.(mB+1).1

Note: In the SID Determination table, the letters R, L, B, and S are the release, level, branch, and sequence components of the SID. The letter m signifies maximum.

[1] Applies only if the **−d** (default SID) flag is not present in the file (see the **admin** command).

[2] The mR indicates the maximum existing release.

[3] Forces creation of the first delta in a new release.

[4] The hR is the highest existing release lower than the specified, nonexistent release R.

Identification Keywords

Identifying information is inserted into the text retrieved from the SCCS file by replacing identification keywords with their value wherever they occur. The following keywords may be used in the text stored in an SCCS file:

Keyword	**Value**
%M%	Module name: either the value of the **m** flag in the file, or, if absent, the name of the SCCS file with the **s.** removed.
%I%	SCCS identification (SID) (*%R%.%L%* or *%R%.%L%.%B%.%S%*) of the retrieved text.

%R%	Release.
%L%	Level.
%B%	Branch.
%S%	Sequence.
%D%	Current date, formatted as *YY/MM/DD.*
%H%	Current date, formatted as *MM/DD/YY.*
%T%	Current time, formatted as *HH:MM:SS.*
%E%	Date newest applied delta was created, formatted as *YY/MM/DD.*
%G%	Date newest applied delta was created, formatted as *MM/DD/YY.*
%Y%	Module type: value of the **t** flag in the SCCS file.
%F%	SCCS file name.
%P%	SCCS absolute path name.
%Q%	The value of the **−q** flag in the file.
%C%	Current line number. This keyword is intended for identifying messages output by the program, such as `"this should not have happened"` error messages. **%C%** is not intended to be used on every line to provide sequence numbers.
%Z%	The four−character string `@(#)` recognizable by *what.*
%W%	A shorthand notation for constructing *what* strings: `%W% = %Z%%M%<tab>%I%`
%A%	Another shorthand notation for constructing *what* strings: `%A% = %Z%%Y% %M% %I%%Z%`

Flags

−b
Specifies that the delta to be created should have an SID in a new branch. The new SID is numbered according to the rules given in the SID determination table. You can use the **−b** flag only with the **−e** flag. It is only necessary when you want to branch from a leaf delta (a delta without a successor). Attempting to create a delta at a nonleaf delta automatically results in a branch, even if the **b** header flag is not set. If you do not specify the **b** header flag in the SCCS file, the **get** command ignores the **−b** flag because the file does not allow branching.

−c*Cutoff*
Specifies a cutoff date and time, in the form *YY[MM[DD[HH[MM[SS]]]]].* The **get** command includes no deltas to the SCCS file created after the specified cutoff in the g−file. The values of any unspecified items in the *Cutoff* variable default to their maximum allowable values. Thus, a cutoff date and time specified with only the year (YY) would specify the last month, day, hour, minute, and second of that year. Any number of nonnumeric characters can separate the two−digit items of the *Cutoff* variable date and time. This allows you to specify a date and time in a number of ways, as follows:

```
−c85/9/2,9:00:00
−c"85/9/2 9:00:00"
"−c85/9/2 9:00:00"
```

−e
Indicates that the g−file being created is to be edited by the user applying the **get** command. The changes are recorded later with the **delta** command. The **get −e** command creates a p−file that prevents other users from issuing another **get −e** command and editing a second g−file on the same SID before the **delta** command is run. The owner of the file can override this restriction by allowing joint editing on the same SID through the use of the

	admin command with the **−fj** flag. Other users, with permission, can obtain read−only copies by using the **get** command without the **−e** flag. The **get−e** command enforces SCCS file protection specified with the ceiling, floor, and authorized user list in the SCCS file. See the **admin** command. **Note:** If you accidentally ruin the g−file created using the **get−e** command, you can recreate the file with the **get −k** command.
−g	Suppresses the actual creation of the g−file. Use the **−g** flag primarily to create an l−file or to verify the existence of a particular SID. Do not use it with the **−e** flag.
−i*List*	Specifies a list of deltas to be included in the creation of a g−file. The SID list format consists of a combination of individual SIDs separated by commas and SID ranges indicated by two SIDs separated by a hyphen. You can specify the same SIDs with either of the following command lines: `get −e −i1.4,1.5,1.6 s.file` `get −e −i1.4−1.6 s.file` You can specify the SCCS identification of a delta in any form shown in the SID Specified column of the previous table. The **get** command interprets partial SIDs as shown in the SID Retrieved column.
−k	Suppresses replacement of identification keywords in the g−file by their value. The **−k** flag is implied by the **−e** flag. If you accidentally ruin the g−file created using the **get−e** command, you can recreate the file by reissuing the **get** command with the **−k** flag instead of the **−e** flag.
−l[**p**]	Writes a delta summary to an l−file. If you specify **−lp**, the delta summary is written to standard output, and the **get** command does not create the l−file. Use this flag to determine which deltas were used to create the g−file currently in use. See the **sccsfile** file for the format of the l−file. See also the **−L** flag.
−L	Writes a delta summary to standard output. Specifying the **−L** flag is the same as using the **−lp** flag.
−m	Writes before each line of text in the g−file the SID of the delta that inserted the line into the SCCS file. The format is: `SID tab line of text`
−n	Writes the value of the **%M%** keyword before each line of text in the g−file. The format is the value of **%M%**, followed by a horizontal tab, followed by the text line. When both the **−m** and **−n** flags are used, the format is: `%M% value tab SID tab line of text`
−p	Writes the text created from the SCCS file to standard output and does not create a g−file. All informative output normally sent to standard output is sent to standard error, unless you specify the **−s** flag with the **−p** flag. In this case, output normally sent to standard output does not appear anywhere.
−r*SID*	Specifies the SCCS identification string (SID) of the SCCS file version to be created. The SID determination table shows the version of the created file and the SID of the pending delta as

	functions of the specified SID.
−s	Suppresses all output normally written to standard output. Error messages (written to standard error output), remain unaffected.
−t	Accesses the most recently created delta in a given release or for a given release and level.
−w*String*	Substitutes the *String* value for the **%W%** keyword in g−files not intended for editing.
−x*List*	Excludes the specified list of deltas in the creation of the g−file. See the **−i** flag for the SID list format.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

The following descriptions and examples illustrate the differences between read−only and editable versions of files.

1. To print the current date and SID in a file, put the following symbols in the file:

   ```
   %H% %I%
   ```

   %H% is the symbol for the current date and **%I%** is the symbol for the SID. When the **get** command retrieves a file as editable, it leaves the symbols in the file and does not perform text value substitution.

2. The following example of the **get** command builds the version with the highest SID, because the example does not specify a version of the file:

   ```
   $ li
   s.test.c
   $ get s.test.c
   3.5
   59 lines
   $ li
   s.test.c test.c
   ```

3. In the next two examples, the **−r** flag specifies which version to get:

   ```
   $ get −r1.3 s.test.c
   1.3
   67 lines

   $ get −r1.3.1.4 s.test.c
   1.3.1.4
   50 lines
   ```

4. If you specify just the release number of the SID, the **get** command finds the file with the highest level within that release number.

   ```
   $ get −r2 s.test.c
   2.7
   21 lines
   ```

5. If the SID specified is greater than the highest existing SID, the **get** command gets the highest existing SID. If the SID specified is lower than the lowest existing SID, SCCS writes an error message. In the following example, release 7 is the highest existing release:

   ```
   $ get −r9 s.test.c
   7.6
   400 lines
   ```

6. The **−t** flag gets the top version in a given release or level. The top version is the most recently created delta, independent of its location. In the next example, the highest existing delta in release 3 is 3.5, while the most recently created delta is 3.2.1.5.

   ```
   $ get −t −r3 s.test.c
   3.2.1.5
   46 lines
   ```

7. The previous examples use the **get** command to get a read−only file. To create a copy of the file that can be edited and used to create a new delta, use the **get** command with the **−e** flag. Use **unget** to undo the effect of the **get −e** command and discard any changes made to the file before a delta is created. The following example shows how to use the **−e** flag:

   ```
   $ li
   s.test.c
   $ get −e s.test.c
   1.3
   new delta 1.4
   67 lines
   $ li
   p.test.c s.test.c test.c
   ```

   The working file is `test.c`. If you edit this file and save the changes with the **delta** command, SCCS creates a new delta with an SID of `1.4`. The file `p.test.c` is a temporary file used by SCCS to keep track of file versions.

   In the previous example, you could have used the **−r** flag to get a specific version. Assuming release `1` is the highest existing release and that delta `1.3` already exists and is the highest delta in release, the following three uses of the **get** command are equivalent:

   ```
   $ get −e s.test.c
   $ get −e −r1 s.test.c
   $ get −e −r1.3 s.test.c
   ```

8. To start using a new (higher in value) release number, get the file with the **−r** flag and specify a release number greater than the highest existing release number. In the next example, release 2 does not yet exist:

   ```
   $ get −e −r2 s.test.c
   1.3
   new delta 2.1
   67 lines
   ```

   Notice that the **get** command indicates the version of the new delta that will be created if the **delta** command stores changes to the SCCS file.

9. To create a branch delta, use the **−r** flag and specify the release and level where the branch occurs. In the next example, deltas `1.3` and `1.4` already exist.

   ```
   $ get −e −r1.3 s.test.c
   1.3
   new delta 1.3.1.1
   67 lines
   ```

Creates deltas on branches using the same methods.

To edit a file, get the file version using the **get −e** command and save the changes with the **delta** command. Several different editable versions of an SCCS file can exist as long as each one is in a different directory. If you try to put duplicates of an editable file version into a directory (using the **get** command) without using the **delta** command, SCCS writes an error message.

To get the same editable file version more than once, set the **j** header flag in the SCCS file with the **admin** command. Set the **j** option by using the **−f** flag. You can then get the same SID several times from different directories, creating a separate file for each **get** command. Although the files originate from a single SID, SCCS gives each of them a unique new SID.

10. In the following example, the **pwd** command displays the current directory. Then the **j** option is set with the **admin** command:

    Note: You must have write access in both directories to issue the commands in this example.

```
$ pwd
/home/marty/sccs
$ admin −fj s.test.c
```

11. Then use the **get** command to retrieve the latest version of the file:

    Note: You must have write access in both directories to issue the commands in this example.

```
$ get −e s.test.c
1.1
new delta 1.2
5 lines
```

12. Change to the /home/new directory, and issue the **get** command again.

    Note: You must have write access in both directories to issue the commands in this example.

```
$ cd /home/new
$ get −e /home/marty/sccs/s.test.c
1.2
new delta 1.1.1.1
5 lines
```

Notice that SCCS creates two deltas, `1.2` and `1.1.1.1`, from the single original file version of `1.1`. Look at the **p.test.c** file. It shows a separate entry for each version currently in use. The **p.test.c** file remains in the directory until you take care of both file versions with either the **delta** command or the **unget** command.

Files

/usr/bin/get Contains the **get** command.

Related Information

The **admin** command, **delta** command, **prs** command, and **sact** command, **sccshelp** command, **unget** command, **what** command.

The **sccsfile** file format in *AIX Version 4.3 Files Reference*.

List of SCCS Commands in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

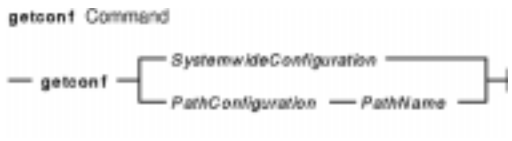
Source Code Control System (SCCS) Overview in *AIX Version 4.3 General Programming Concepts: Writing* *and Debugging Programs*.

getconf Command

Purpose

Writes system configuration variable values to standard output.

Syntax



getconf [**−v***specification*] [*SystemwideConfiguration* | *PathConfigurationPathName*]

Description

The **getconf** command, invoked with the *SystemwideConfiguration* parameter, writes the value of the variable, as specified by the *SystemwideConfiguration* parameter, to standard output.

The **getconf** command, invoked with the *PathConfiguration* and *Pathname* parameters, writes the value of the variable, as specified by the *PathConfiguration* parameter for the path specified by the *PathName* parameter, to standard output.

If the specified variable is defined on the system and its value is described to be available from the **confstr** subroutine, the value of the specified variable is written in the following format:

```
"%s\n", <value>
```

Otherwise, if the specified variable is defined on the system, its value is written in the following format:

```
"%d\n", <value>
```

If the specified variable is valid but undefined on the system, the following is written to standard output:

```
"undefined\n"
```

If the variable name is invalid or an error occurs, a diagnostic message is written to the standard error.

Flags

−v*specification*	Indicates a specific specification and version for which configuration variables are to be determined. If this flag is not specified, the values returned will correspond to an implementation default XBS5 conforming compilation environment.

Parameters

PathName	Specifies a path name for the *PathConfiguration* parameter.
SystemwideConfiguration	Specifies a system configuration variable.
PathConfiguration	Specifies a system path configuration variable.

When the symbol listed in the first column of the following table is used as the **system_var** operand,

getconf will yield the same value as **confstr** when called with the value in the second column:

system_var	**confstr Name Value**
PATH	_CS_PATH
XBS5_ILP32_OFF32_CFLAGS	_CS_XBS5_ILP32_OFF32_CFLAGS
XBS5_ILP32_OFF32_LDFLAGS	_CS_XBS5_ILP32_OFF32_LDFLAGS
XBS5_ILP32_OFF32_LIBS	_CS_XBS5_ILP32_OFF32_LIBS
XBS5_ILP32_OFF32_LINTFLAGS	_CS_XBS5_ILP32_OFF32_LINTFLAGS
XBS5_ILP32_OFFBIG_CFLAGS	_CS_XBS5_ILP32_OFFBIG_CFLAGS
XBS5_ILP32_OFFBIG_LDFLAGS	_CS_XBS5_ILP32_OFFBIG_LDFLAGS
XBS5_ILP32_OFFBIG_LIBS	_CS_XBS5_ILP32_OFFBIG_LIBS
XBS5_ILP32_OFFBIG_LINTFLAGS	_CS_XBS5_ILPBIG_OFF32_LINTFLAGS
XBS5_LP64_OFF64_CFLAGS	_CS_XBS5_LP64_OFF64_CFLAGS
XBS5_LP64_OFF64_LDFLAGS	_CS_XBS5_LP64_OFF64_LDFLAGS
XBS5_LP64_OFF64_LIBS	_CS_XBS5_LP64_OFF64_LIBS
XBS5_LP64_OFF64_LINTFLAGS	_CS_XBS5_LP64_OFF64_LINTFLAGS
XBS5_LPBIG_OFFBIG_CFLAGS	_CS_XBS5_LPBIG_OFFBIG_CFLAGS
XBS5_LPBIG_OFFBIG_LDFLAGS	_CS_XBS5_LPBIG_OFFBIG_LDFLAGS
XBS5_LPBIG_OFFBIG_LIBS	_CS_XBS5_LPBIG_OFFBIG_LIBS
XBS5_LPBIG_OFFBIG_LINTFLAGS	_CS_XBS5_LPBIG_OFFBIG_LINTFLAGS

Environment Variables

The following environment variables affect the execution of **getconf**:

`LANG`	Provide a default value for the internationalisation variables that are unset or null. If `LANG` is unset or null, the corresponding value from the implementation−dependent | default locale will be used. If any of the internationalisation variables contains an invalid setting, the utility will behave as if none of the variables had been defined.
`LC_CALL`	If set to a non−empty string value, override the values of all the other internationalisation variables.
`LC_CTYPE`	Determine the locale for the interpretation of sequences of bytes of text data as characters (for example, single− as opposed to multi−byte characters in arguments).
`LC_MESSAGES`	Determine the locale that should be used to affect the format and contents of diagnostic messages written to standard error.
`NLSPATH`	Determine the location of message catalogues for the processing of LC_MESSAGES.

Systemwide Configuration Variables

The *SystemwideConfiguration* parameter specifies system configuration variables whose values are valid throughout the system. There are two kinds of system configuration variables:

- Systemwide configuration variables
- System standards configuration variables

Systemwide Configuration Variables

Systemwide configuration variables contain the minimum values met throughout all portions of the system. The following list defines the systemwide configuration variables used with the **getconf** command:

_CS_PATH	Value for the **PATH** environment variable used to find commands.
ARG_MAX	Maximum length, in bytes, of the arguments for one of the **exec** subroutines, including environment data.
BC_BASE_MAX	Maximum value allowed for the **obase** variable with the **bc** command.
BC_DIM_MAX	Maximum number of elements permitted in an array by the **bc** command.
BC_SCALE_MAX	Maximum value allowed for the **scale** variable with the **bc** command.
BC_STRING_MAX	Maximum length of a string constant accepted by the **bc** command.
CHARCLASS_NAME_MAX	Maximum number of bytes in a character class name.
CHAR_BIT	Number of bits in a type **character**.
CHAR_MAX	Maximum value of a type **character**.
CHAR_MIN	Minimum value of a type **character**.
CHILD_MAX	Maximum number of simultaneous processes for each real user ID.
CLK_TCK	Number of clock ticks per second returned by the **time** subroutine.
COLL_WEIGHTS_MAX	Maximum number of weights that can be assigned to an entry in the **LC_COLLATE** locale stanza in a locale−definition file.
CS_PATH	Value of the **PATH** environment variable used to find commands.
EXPR_NEST_MAX	Maximum number of expressions that can be nested within parentheses by the **expr** command.
INT_MAX	Maximum value of a type **int**.
INT_MIN	Minimum value of a type **int**.
LINE_MAX	Maximum length, in bytes, of a command's input line (either standard input or another file) when the utility is described as processing text files. The length includes room for the trailing new−line character.
LONG_BIT	Number of bits in a type **long int**.
LONG_MAX	Maximum value of a type **long int**.
LONG_MIN	Minimum value of a type **long int**.
MB_LEN_MAX	Maximum number of bytes in a character for any supported locale.
NGROUPS_MAX	Maximum number of simultaneous supplementary group IDs for each process.
NL_ARGMAX	Maximum value of digit in calls to the **printf** and **scanf** subroutines.
NL_LANGMAX	Maximum number of bytes in a LANG name.
NL_MSGMAX	Maximum message number.
NL_NMAX	Maximum number of bytes in an N−to−1 collation mapping.
NL_SETMAX	Maximum set number.
NL_TEXTMAX	Maximum number of bytes in a message string.
NZERO	Default process priority.
OPEN_MAX	Maximum number of files that one process can have open at one time.
PATH	Sequence of colon−separated path prefixes used to find commands.
RE_DUP_MAX	Maximum number of repeated occurrences of a regular expression permitted when using the interval−notation parameters, such as the *m* and *n* parameters with the **ed** command.
SCHAR_MAX	Maximum value of a type **signed char**.
SCHAR_MIN	Minimum value of a type **signed char**.

SHRT_MAX	Maximum value of a type **short**.
SHRT_MIN	Minimum value of a type **short**.
SSIZE_MAX	Maximum value of an object of type **ssize_t**.
STREAM_MAX	Number of streams that one process can have open at one time.
TMP_MAX	Minimum number of unique path names generated by the **tmpnam** subroutine. Maximum number of times an application can reliably call the **tmpnam** subroutine.
TZNAME_MAX	Maximum number of bytes supported for the name of a time zone (not the length of the **TZ** environment variable).
UCHAR_MAX	Maximum value of a type **unsigned char**.
UINT_MAX	Maximum value of a type **unsigned int**.
ULONG_MAX	Maximum value of a type **unsigned long int**.
USHRT_MAX	Maximum value of a type **unsigned short int**.
WORD_BIT	Number of bits in a word or type **int**.

System Standards Configuration Variables

System standards configuration variables contain the *minimum* values required by a particular system standard. The **_POSIX_**, **POSIX2_**, and **_XOPEN_** prefixes indicate that the variable contains the minimum value for a system characteristic required by the POSIX 1003.1, POSIX 1003.2, and X/Open system standards, respectively. System standards are systemwide minimums that the system meets to support the particular system standard. Actual Configuration values may exceed these standards. The system standards configuration variables for the **getconf** command are defined as follows:

_POSIX_ARG_MAX	Maximum length, in bytes, of the arguments for one of the **exec** subroutines, including environment data.
_POSIX_CHILD_MAX	Maximum number of simultaneous processes for each real user ID.
_POSIX_JOB_CONTROL	Value of 1 if the system supports job control.
_POSIX_LINK_MAX	Maximum number of links to a single file.
_POSIX_MAX_CANON	Maximum number of bytes in a terminal canonical input queue.
_POSIX_MAX_INPUT	Maximum number of bytes allowed in a terminal input queue.
_POSIX_NAME_MAX	Maximum number of bytes in a file name (not including terminating null).
_POSIX_NGROUPS_MAX	Maximum number of simultaneous supplementary group IDs for each process.
_POSIX_OPEN_MAX	Maximum number of files that one process can have open at one time.
_POSIX_PATH_MAX	Maximum number of bytes in a path name.
_POSIX_PIPE_BUF	Maximum number of bytes guaranteed to be atomic when writing to a pipe.
_POSIX_SAVED_IDS	Value of 1. Each process has a saved set−user−ID and a saved set−group−ID.
_POSIX_SSIZE_MAX	Maximum value that can be stored in an object of type **ssize_t**.
_POSIX_STREAM_MAX	Number of streams that one process can have open at one time.
_POSIX_TZNAME_MAX	Maximum number of bytes supported for the name of a time zone (not the length of the **TZ** environment variable).
_POSIX_VERSION	Version of the POSIX 1 standard (C Language Binding) to which the AIX system conforms.
_XOPEN_CRYPT	Value of 1 if the system supports the X/Open Encryption Feature Group.

_XOPEN_ENH_I18N	Value of 1 if the system supports the X/Open Enhanced Internationalisation Feature Group.
_XOPEN_SHM	Value of 1 if the system supports the X/Open Shared Memory Feature Group.
_XOPEN_VERSION	Version of the X/Open Portability Guide to which the AIX system conforms.
_XOPEN_XCU_VERSION	Version of the X/Open Commands and Utilities specification to which the AIX system conforms.
_XOPEN_XPG2	Value of 1 if the system supports the X/Open Portability Guide, Volume 2, January 1987, XVS System Calls and Libraries, otherwise undefiined.
_XOPEN_XPG3	Value of 1 if the system supports the X/Open Specification, February 1992, System Interfaces and Headers, Issue 3, otherwise undefined.
_XOPEN_XPG4	Value of 1 if the system supports the X/Open CAE Specification, July 1992, System Interfaces and Headers, Issue 4, otherwise undefined.
POSIX2_BC_BASE_MAX	Maximum value allowed for the **obase** variable with the **bc** command.
POSIX2_BC_DIM_MAX	Maximum number of elements permitted in an array by the **bc** command.
POSIX2_BC_SCALE_MAX	Maximum value allowed for the **scale** variable with the **bc** command.
POSIX2_BC_STRING_MAX	Maximum length of a string constant accepted by the **bc** command.
POSIX2_CHAR_TERM	Value of 1 if the system supports at least one terminal type; otherwise it has the value −1.
POSIX2_COLL_WEIGHTS_MAX	Maximum number of weights that can be assigned to an entry of the **LC_COLLATE** locale variable in a locale−definition file.
POSIX2_C_BIND	Value of 1 if the system supports the C Language Binding Option from POSIX 2; otherwise, it has the value −1.
POSIX2_C_DEV	Value of 1 if the system supports the C Language Development Utilities from POSIX 2; otherwise, it has the value −1.
POSIX2_C_VERSION	Version of the POSIX 2 standard (C Language Binding) to which the AIX system conforms.
POSIX2_EXPR_NEST_MAX	Maximum number of expressions that can be nested within parentheses by the **expr** command.
POSIX2_FORT_DEV	Value of 1 if the system supports the FORTRAN Development Utilities Option from POSIX 2; otherwise, it has the value −1.
POSIX2_FORT_RUN	Value of 1 if the system supports the FORTRAN Runtime Utilities Option from POSIX 2; otherwise, it has the value −1.
POSIX2_LINE_MAX	The maximum length, in bytes, of a command's input line (either standard input or another file) when the command is described as processing text files. The length includes room for the trailing new−line character.
POSIX2_LOCALEDEF	Value of 1 if the system supports the creation of the locales by the **localedef** command; otherwise, it is undefined.
POSIX2_RE_DUP_MAX	Maximum number of repeated occurrences of a regular expression permitted when using the interval−notation parameters, such as the *m* and *n* parameters with the **ed** command.
POSIX2_SW_DEV	Value of 1 if the system supports the Software Development Utilities Option; otherwise, it has the value −1.
POSIX2_UPE	Value of 1 if the system supports the User Portability Utilities Option from POSIX 2; otherwise, it as the value −1.
POSIX2_VERSION	Date of approval of the most current version of the POSIX 2 standard

which the system supports. The date is a six−digit number, with the first four digits signifying the year and the last two digits the month. Different versions of the POSIX 2 standard are periodically approved by the IEEE Standards Board, and the date of approval is used to distinguish between different versions.

System Path Configuration Variables

The *PathConfiguration* parameter specifies system path configuration variables whose values contain information about paths and path structures in the system. The following list defines these variables:

_POSIX_CHOWN_RESTRICTED	The **chown**() subroutine is restricted to a process with appropriate privileges, and to changing the group ID of a file only to the effective group ID of the process or to one of its supplementary group IDs. If the *PathName* parameter refers to a directory, the value returned applies to any files except directories that exist or can be created within the directory.
_POSIX_NO_TRUNC	Path names longer than the limit specified by the *NAME_MAX* variable will generate an error. If the *PathName* parameter refers to a directory, the value returned applies to file names within the directory.
_POSIX_VDISABLE	Terminal special characters, defined in the **termios.h** file, can be disabled using this character value.
LINK_MAX	Maximum number of links to a single file. If the *PathName* parameter refers to a directory, the value returned applies to the directory.
MAX_CANON	Maximum number of bytes in a terminal canonical input line.
MAX_INPUT	Maximum number of bytes for which space is available in a terminal input queue.
NAME_MAX	Maximum number of bytes in a file name (not including terminating null). If the *PathName* parameter refers to a directory, the value returned applies to the file names within the directory.
PATH_MAX	Maximum number of bytes in a path name, including the terminating null character. If the *PathName* parameter refers to a directory, the value returned is the maximum length of a relative path name when the specified directory is the working directory.
PIPE_BUF	Maximum number of bytes guaranteed to be atomic when writing to a pipe. If the *PathName* parameter refers to a FIFO or a pipe, the value returned applies to the referenced object. If the *PathName* parameter refers to a directory, the value returned applies to any FIFO that exists or can be created within the directory.

Exit Status

This command returns the following exit values:

0	The specified variable is valid and information about its current state was successfully written.
>**0**	An error occurred.

1. To display the value of the **ARG_MAX** variable, enter:

   ```
   getconf ARG_MAX
   ```

2. To display the value of the **NAME_MAX** variable for the **/usr** directory, enter:

```
getconf NAME_MAX /usr
```

3. The following sequence of shell commands shows how to handle unspecified results:

```
if value=$(getconf PATH_MAX /usr)
then
     if [ "$value" = "undefined" ]
     then
                echo
                     The value of PATH_MAX in /usr is undefined.
     else

                     The value of PATH_MAX in /usr is $value.
     fi
else
                echo
                     Error in the getconf command.
fi
```

Examples

1. To display the value of the **ARG_MAX** variable, enter:
   ```
   getconf ARG_MAX
   ```
2. To display the value of the **NAME_MAX** variable for the **/usr** directory, enter:
   ```
   getconf NAME_MAX /usr
   ```
3. The following sequence of shell commands shows how to handle unspecified results:
   ```
   if value=$(getconf PATH_MAX /usr)
   then
        if [ "$value" = "undefined" ]
        then
                echo
                      The value of PATH_MAX in /usr is undefined.
        else
                echo
                      The value of PATH_MAX in /usr is $value.
        fi
   else
        echo Error in the getconf command.
   fi
   ```
4. If the command:
   ```
   getconf _XBS5_ILP32_OFF32
   ```

   does not write `−1\n` or `undefined\n` to standard output, then commands of the form:

   ```
   getconf −v XBS5_ILP32_OFF32 ...
   ```

   will determine values for configuration variables corresponding to the `XBS5_ILP32_OFF32` compilation environment specified in **c89**, Extended Description.
5. If the command:
   ```
   getconf _XBS5_ILP32_OFFBIG
   ```

   does not write `−1\n` or `undefined\n` to standard output, then commands of the form:

   ```
   getconf −v XBS5_ILP32_OFFBIG ...
   ```

   will determine values for configuration variables corresponding to the `XBS5_ILP32_OFFBIG` compilation environment specified in **c89**, Extended Description.
6. If the command:

```
getconf _XBS5_LP64_OFF64
```

does not write `−1\n` or `undefined\n`" to standard output, then commands of the | form:

```
getconf −v XBS5_LP64_OFF64 ...
```

will determine values for configuration variables corresponding to the XBS5_LP64_OFF64 compilation environment specified in c89, Extended Description.

7. If the command:
   ```
   getconf _XBS5_LPBIG_OFFBIG
   ```
   does not write `−1\n` or `undefined\n` to standard output, then commands of the form:
   ```
   getconf −v _XBS5_LPBIG_OFFBIG
   ```
   will determine values for configuration variables corresponding to the XBS5_LPBIG_OFFBIG compilation environment specified in c89, Extended Description.

Files

/usr/bin/getconf	Contains the **getconf** command.
/usr/include/limits.h	Defines system configuration variables.
/usr/include/unistd.h	Defines system configuration variables.

Related Information

The **confstr** subroutine, **pathconf** subroutine, **sysconf** subroutine.

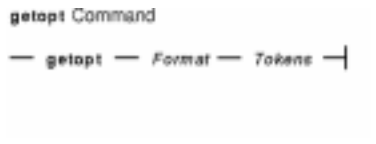
Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

getopt Command

Purpose

Parses command line flags and parameters.

Syntax



getopt*FormatTokens*

Description

The **getopt** command parses a list of tokens using a format that specifies expected flags and arguments. A flag is a single ASCII letter and when followed by a : (colon) is expected to have an argument that may or may not be separated from it by one or more tabs or spaces. You can include multibyte characters in arguments, but not as a flag letter.

The **getopt** command completes processing when it has read all tokens or when it encounters the special token −− (double hyphen). The **getopt** command then outputs the processed flags, a −− (double hyphen), and any remaining tokens.

If a token fails to match a flag, the **getopt** command writes a message to standard error.

Examples

The **getopt** command can be used in a skeleton shell script to parse options, as in the following example:

```
#!/usr/bin/bsh
# parse command line into arguments
set −− `getopt a:bc $*`
# check result of parsing
if [ $? != 0 ]
then
        exit 1
fi
while [ $1 != −− ]
do
        case $1 in
        −a)     # set up the −a flag
                AFLG=1
                AARG=$2
                shift;;
        −b)     # set up the −b flag
                BFLG=1;;
        −c)     # set up the −c flag
                CFLG=1;;
        esac
        shift   # next flag
done
shift   # skip −−
# now do the work
```

```
.
.
.
```

Note: In the C shell, use the following command to run the **getopt** command:

```
set argv=`getopt OptionString $*`
```

In each of the following examples, the **getopt** command would process the flags and arguments in the same way:

- `−a ARG −b −c`
- `−a ARG −bc`
- `−aARG −b −c`
- `−b −c −a ARG`

Files

/usr/bin/getopt Contains the **getopt** command.

Related Information

The **bsh** command, **csh** command.

The **getopt** subroutine.

Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

getopts Command

Purpose

Processes command−line arguments and checks for valid options.

Syntax

getopts Command
getopts
OptionString
Name
Argument

getopts *OptionStringName* [*Argument* ...]

Description

The **getopts** command is a Korn/POSIX Shell built−in command that retrieves options and option−arguments from a list of parameters. An option begins with a **+** (plus sign) or a **−** (minus sign) followed by a character. An option that does not begin with either a **+** or a **−** ends the *OptionString*. Each time the **getopts** command is invoked, it places the value of the next option in *Name* and the index of the next argument to be processed in the shell variable **OPTIND**. Whenever the shell is invoked, **OPTIND** is intialized to 1. When an option begins with +, a **+** is prepended to the value in *Name*.

If a character in *OptionString* is followed by a **:** (colon), that option is expected to have an argument. When an option requires an option−argument, the **getopts** command places it in the variable **OPTARG**.

When an option character not contained in *OptionString* is found, or an option found does not have the required option−argument:

- If *OptionString* does not begin with a **:** (colon),
    - ♦ *Name* will be set to a **?** (question mark) character,
    - ♦ **OPTARG**. will be unset, and
    - ♦ a diagnostic message will be written to standard error.

This condition is considered to be an error detected in the way arguments were presented to the invoking application, but is not an error in the processing of the **getopts** command; a diagnostic message will be written as stated, but the exit status will be zero.

- If *OptionString* begins with a **:** (colon),
    - ♦ *Name* will be set to a **?** (question mark) character for an unknown option or to a **:** (colon) character for a missing required option,
    - ♦ **OPTARG** will be set to the option character found, and
    - ♦ no output will be written to standard error.

Any of the following identifies the end of options: the special option **−−,** finding an argument that does not begin with a **−**, or **+**, or encountering an error.

When the end of options is encountered:

- the **getopts** command will exit with a return value greater than zero,
- **OPTARG** will be set to the index of the first non−option−argument, where the first **−−** argument is

considered to be an option−argument if there are no other non−option−arguments appearing before it, or the value $#+1 if there are no non−option−arguments,
- *Name* will be set to a **?** (question mark) character.

Parameters

OptionString	Contains the string of option characters recognized by the **getopts** command. If a character is followed by a colon, that option is expected to have an argument, which should be supplied as a separate argument. The options can be separated from the argument by blanks. The first character in *OptionString* determines how the **getopts** command behaves if an option character is not known or an option−argument is missing. **Note:** The characters question mark and colon must not be used as option characters by an apllication. The use of other characters that are not alphanumeric produces unspecified results.
Name	Set by the **getopts** command to the option character that was found.
Argument ...	One or more strings separated by white space, checked by the **getopts** command for legal options. If *Argument* is omitted, the positional parameters are used. See Parameter Substitution in the Korn Shell for more information on positional parameters. **Note:** Generally, you won't specify *Argument* as part of the **getopts** command, but it may be helpful when debugging your script.

Exit Status

This command returns the following exit values:

0	An option, specified or unspecified by *OptionString*, was found.
>0	The end of options was encountered or an error occurred.

Examples

1. The following **getopts** command specifies that `a`, `b`, and `c` are valid options, and that options `a` and `c` have arguments:

   ```
   getopts a:bc: OPT
   ```

2. The following **getopts** command specifies that `a`, `b`, and `c` are valid options, that options `a` and `b` have arguments, and that **getopts** set the value of `OPT` to **?** when it encounters an undefined option on the command line:

   ```
   getopts :a:b:c OPT
   ```

3. The following script parses and displays it arguments:

   ```
   aflag=
   bflag=

   while getopts ab: name
   do
               case $name in
               a)     aflag=1;;
               b)     bflag=1
                             bval="$OPTARG";;
               ?)     printf "Usage: %s: [−a] [−b value] args\n" $0
                             exit 2;;
              esac
   done

   if [ ! −z "$aflag" ]; then
   ```

```
                  printf "Option −a specified\n"
        fi

        if [ ! −z "$bflag" ]; then
                  printf 'Option −b "%s" specified\n' "$bval"
        fi

        shift $(($OPTIND −1))
        printf "Remaining arguments are: %s\n" "$*"
```

Related Information

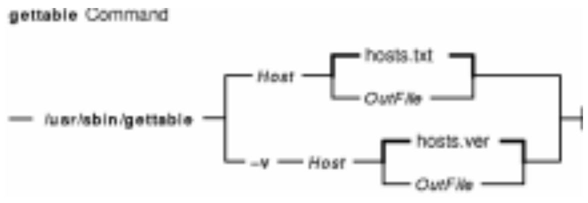
Korn Shell in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

gettable Command

Purpose

Gets Network Information Center (NIC) format host tables from a host.

Syntax



/usr/sbin/gettable [**−v**] *Host* [*OutFile*]

Description

The **/usr/sbin/gettable** command is used to obtain the NIC standard host tables from a server indicated by the *Host* parameter. The tables, if retrieved, are placed in the file indicated by the *OutFile* parameter.

The **gettable** command opens a Transmission Control Protocol (TCP) connection to the port indicated in the service specification for the *Host* parameter. A request is then made for all names, and the resultant information is placed in the output file.

The **gettable** command is best used in conjunction with the **htable** command, which converts the NIC standard file format to that used by the network library lookup routines.

Flags

−v Gets just the version number instead of the complete host table and puts the output in *OutFile* or, by default, in a file named **hosts.ver**.

Parameters

Host Specifies the server that provides the host table information.

OutFile Specifies the file where you want to place the host table information. If you use the **gettable** command without the **−v** flag, the default file name is **hosts.txt**.

Related Information

The **htable** command.

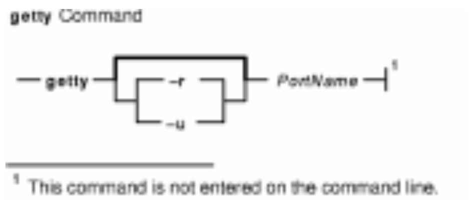
Transmission Control Protocol (TCP) and TCP/IP Protocols in *AIX Version 4.3 System Management Guide: Communications and Networks*.

getty Command

Purpose

Sets the characteristics of ports.

Syntax



getty [**−r** | **−u**] *PortName*

Description

The **getty** command sets and manages terminal lines and ports. The **getty** command is run by the **init** command. The **getty** command is linked to the Terminal State Manager program. The Terminal State Manager program provides combined terminal control and login functions.

> **Note:** The **getty** command is not entered on the command line.

When invoked as the **getty** command, the Terminal State Manager program provides the normal port management functions that include:

Bidirectional use	Allows terminal lines to be used to initiate and accept connections.
Line speed	Sets the baud rates for sending and receiving.
Parity	Sets the parity to be even, odd or none.
Delays	Sets the delays for carriage return, tab, new line, and form feed.
Character set mapping	Sets the character set mapping for case, tabs, and carriage control.
Logger Program	Specifies the program used to log the user into the system. If the attribute is set, the Secure Attention Key (SAK) processing is disabled. If the attribute is not set, it defaults to **/usr/sbin/login**. The **logger** attribute is contained within the Object Data Manager (ODM) database.
Character and line erase	Sets the keystroke used for character and line erase.
Echoing mode	Sets the echo to local or remote.

When the **getty** command is invoked, the following steps occur:

1. The port protection is set according to the **owner** and **protection** attributes in the ODM database. If these attributes are not specified, they default to root and 622.
2. The port specified by the *PortName* parameter is opened. If the carrier detection is available on the port, the open does not complete until the carrier is present or another process has lost the carrier with the port.
3. The specified port might be locked. If the **getty** command is run with the **−u** or **−r** flag, it attempts to lock the port. If the port is already locked the command waits until the port is available and then exits. If the **−r** flag was specified, the **getty** command waits for a byte of data to be received on the port before continuing.

4. The terminal attributes are set according to the configuration information for the specified port. Secure Attention Key processing can be enabled at this point depending on the system configuration.
5. The herald message is written to the specified port.
6. The login name is read from the specified port. If a framing error or a break occurs, the **getty** command repeats steps four and five with the next group of configured terminal attributes. This is most commonly used to cycle the baud rates for modems. But any ODM field (except `logmodes` and `runmodes`) may be cycled by entering a list of comma separated values in the ODM database.
7. The terminal modes are reset according to the `runmodes` parameter and the login name. If the login name is terminated by a new line, the **getty** command turns on the carriage−return to new line mapping. If all alphabetic characters are in uppercase, the user is prompted to log in using lowercase characters if possible, and mapping from lowercase to uppercase is turned on.
8. If a program is specified by the logger parameter, it is executed and Secure Attention Key processing is disabled. Otherwise, the Terminal State Manager program performs a standard system login.

    Note: If the Secure Attention Key sequence is typed during a user login, the user is logged into the trusted shell (if the system is configured where that port is trusted and the user is allowed on the trusted path).

Flags

−r	Makes the port available for shared (bi−directional) use. If the lock is unsuccessful, the **getty** command waits until the lock is available and then exits. If the lock is successful, the **getty** command waits for a byte of data on the port after locking the port.
−u	Makes the port available for shared (bi−directional) use. If the lock is unsuccessful, the **getty** command waits until the lock is available and then exits.

Security

Access Control: This program should be installed as a program in the Trusted Computing Base, executable by any user and **setuid** to root.

Example

To enable logging onto tty0, add the following line to the **/etc/inittab** file:

```
tty0:2:respawn: /usr/sbin/getty /dev/tty0
```

This command initializes the port `/dev/tty0` and sets up the characteristics of the port.

Files

/usr/sbin/getty	Contains the **getty** command.
/etc/locks	Contains lock files that prevent multiple uses of communications devices and multiple calls to remote systems.
/usr/sbin/login	The **login** command.
/usr/bin/setmaps	The **setmaps** command.

Related Information

The **login** command, **setgroups** command, **shell** command, **su** command, **telinit or init** command, **tsm** command.

Object Data Manager (ODM) Overview for Programmers in *AIX Version 4.3 General Programming*

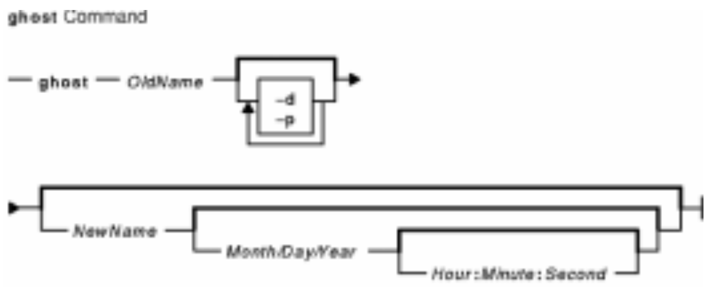
Concepts: Writing and Debugging Programs.

ghost Command

Purpose

Reconstructs previous versions of an INed structured file.

Syntax



ghost*OldName* [**−d**] [**−p**] [*NewName* [*Month/Day/Year* [*Hour***:***Minute:Second*]]]

Description

The **ghost** command reads a structured file and reconstructs a previous version of it in the output file. If you specify only the old file name using the *OldName* parameter, that will also be the name of the reconstructed version. The old file is backed up by appending a **.bak** file, making it the *OldName***.bak** file.

> **Note:** If your locale is not set to **En_US**, the date and time parameters may not be in the *Month/Day/Year* and *Hour***:***Minute***:***Second* format. The **ghost** command expects the date and time in the format specified by the current locale.

The *Month/Day/Year* parameter specifies a version date for the reconstruction. The *Hour***:***Minute*:*Second* parameter specifies the version time for the reconstruction. The default is the current date and time. If only the month and day are specified, the current year is assumed. If only the date is specified, the time is set to a value of 0 (midnight). If only the hour and minute are specified, the seconds are set to a value of 0. The hours are based on a 24−hour clock.

You can use the **versions** command to display the modification dates and times.

Flags

−d Deletes the **.bak** file after reconstructing the previous version.
−p Includes versions prior to, but not including, the date and time specified.

Examples

1. To reconstruct the current version of the `menu2` file as the `newmenu` file, enter:

   ```
   ghost menu2 newmenu
   ```

   This is useful if the `menu2` file is damaged.

2. To do the same thing as in example 1 but put the output in the `menu2` file, enter:

```
ghost menu2
```

The old file is saved as the `menu2.bak` file.

3. To reconstruct the July 15 version of the `menu2` file as the `newmenu` file, enter:

   ```
   ghost menu2 newmenu 7/15
   ```
4. To reconstruct the version of the `menu2` file that existed on July 15, 1980 at 3:10 in the afternoon, enter:

   ```
   ghost menu2 newmenu 7/15/80 15:10
   ```
5. To reconstruct the same version of the `menu2` file down to the second, enter:

   ```
   ghost menu2 newmenu 7/15/80 15:10:45
   ```

This is useful if several changes were made to a file in a very short time.

Related Information

The **e** command, **history** command, **newfile** command, **readfile** command, **rmhist** command, **versions** command.

INed Editor Overview in *AIX Version 4.3 INed Editor User's Guide*.

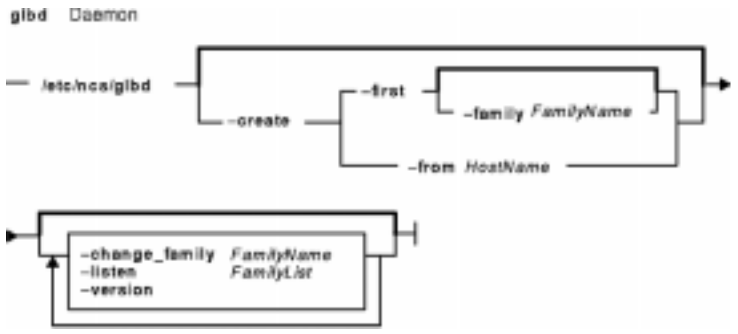
How to Access Previous Versions of a File with the INed Editor.

glbd Daemon

Purpose

Manages the global location broker database.

Syntax



/etc/ncs/glbd [**−create** { **−first** [**−family** *FamilyName*] | **−from** *HostName* }]
[**−change_family***FamilyName*] [**−listen***FamilyList*] [**−version**]

Description

The **glbd** daemon manages the global location broker (GLB) database. The GLB database, part of the Network Computing System (NCS), helps clients to clients to locate servers on a network or internet. The GLB database stores the locations (specifically, the network addresses and port numbers) of servers on which processes are running. The **glbd** daemon maintains this database and provides access to it.

There are two versions of the GLB daemon, **glbd** and **nrglbd**.

You can replicate the GLB database to increase its availability. Copies of the database can exist on several hosts, with a **glbd** running on each of those hosts to maintain the consistency of the database replicas. (In an internet, at least one **glbd** must be running in each network.) Each replica of the GLB keeps a list of all the other GLB replicas. The **drm_admin** tool administers the replication of the GLB database and of the replica list.

Currently, **glbd** supports both the DARPA IP and Domain DDS network protocols. A GLB replica can allow access to its database from both IP and DDS clients. However, when communicating with each other to maintain replication of the GLB database, GLB replicas should use only one protocol family. You choose which family the GLBs will use. In an internet, all routing nodes must support this family.

The **glbd** daemon can be started in one of two ways:

- Through the System Resource Controller (the recommended method), by entering on the command line:

  ```
  startsrc −s glbd
  ```

- By a person with root user authority entering on the command line:

  ```
  /etc/ncs/glbd &
  ```

TCP/IP must be configured and running on your system before starting the **glbd** daemon. The **llbd** daemon must also be started and running before you start the **glbd** daemon.

Flags

−create
: Creates a replica of the GLB. This option creates a GLB database in addition to starting a broker process. It must be used with either −first or −from.

    −first
    : Creates the first replica (that is, the very first instance) of the GLB on your network or internet. This option can be used only with the **−create** option.

        −family*FamilyName*
        : Specifies the address family that the first GLB replica will use to identify itself on the replica list. This option can be used only in conjunction with the **−first** option. Any subsequently created replicas must use this family to communicate with this replica. Currently, *FamilyName* can be either **dds** or **ip**. If this option is not used, the replica will be identified on the replica list by its DDS address.

    −from*HostName*
    : Creates additional replicas of the GLB. This option can be used only with the **−create** option. A replica of the GLB must exist at *HostName*. The database and replica list for the new replica are initialized from those at *HostName*. The replica at *HostName* adds an entry for the new replica to its replica list and propagates the entry to the other GLB replicas.

      A *HostName* takes the form family:host, where the host can be specified either by its name or by its network address. For example, `ip:jeeves`, `ip:bertie`, and `ip:#192.5.5.5` are acceptable host names.

      The new replica will use the same address family as *HostName* in identifying itself on the replica list. For example, if *HostName* is an IP address, the new replica will be listed by its IP address on the replica list.

−change_family*FamilyName*
: Changes the address family of every GLB replica. Use this option only if network reconfigurations require that you make such a change. Currently, *FamilyName* can be either **dds** or **ip**.

−listen*FamilyList*
: Restricts the address families on which a GLB listens. Use it only if you are creating a special configuration where access to a GLB is restricted to a subset of hosts in the network or internet.

  The *FamilyList* is a list of the address families on which the GLB will listen. Names in this list are separated by spaces. Possible family names include **dds** and **ip**.

  The GLB will always listen for requests from the family by which it is listed on the replica list, even if that family is not specified in *FamilyList*.

  If **glbd** is started without the **−listen** option, the GLB will listen on all address families that are supported both by NCS and by the local host. On Apollo systems, this set of families always includes **dds** and may also include **ip**. On

	most other systems, **ip** is currently the only family.
−version	Displays the version of NCS that this **glbd** belongs to, but does not start the daemon.

Files

/etc/ncs/glb_log	Contains diagnostic output from **glbd**.
/etc/rc.ncs	Contains commands to start the NCS daemons.

Examples

1. Create and start for the first time the first replica of the GLB on this network or internet:

   ```
   /etc/ncs/glbd −create −first −family ip &
   ```

2. Start for the first time a subsequent replica of the GLB, initializing its database from host `jeeves`:

   ```
   /etc/ncs/glbd −create −from ip:jeeves &
   ```

3. Restart an existing replica of the GLB:

   ```
   /etc/ncs/glbd &
   ```

Related Information

The **drm_admin** command, **lb_admin** command, **startsrc** command.

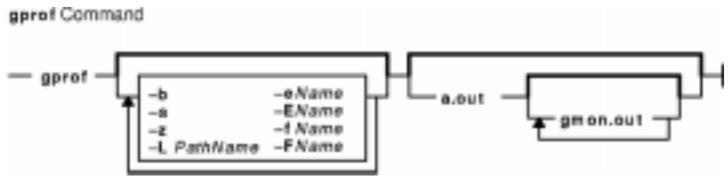
The **llbd** daemon.

gprof Command

Purpose

Displays call graph profile data.

Syntax



/usr/ucb/gprof [**.−b**] [**−e***Name*] [**−E** *Name*] [**−f** *Name*] [**−F** *Name*] [**−L** *PathName*] [**−s**] [**−z**] [**a.out** [**gmon.out** ...]]

Description

The **gprof** command produces an execution profile of C, Pascal, FORTRAN, or COBOL programs. The effect of called routines is incorporated into the profile of each caller. The **gprof** command is useful in identifying how a program consumes CPU resource. To find out which functions (routines) in the program are using the CPU, you can profile the program with the **gprof** command.

The profile data is taken from the call graph profile file (**gmon.out** by default) created by programs compiled with the **cc** command using the **−pg** option. The **−pg** option also links in versions of library routines compiled for profiling, and reads the symbol table in the named object file (**a.out** by default), correlating it with the call graph profile file. If more than one profile file is specified, the **gprof** command output shows the sum of the profile information in the given profile files.

The **−pg** option causes the compiler to insert a call to the **mcount** subroutine into the object code generated for each recompiled function of your program. During program execution, each time a parent calls a child function the child calls the **mcount** subroutine to increment a distinct counter for that parent−child pair. Programs not recompiled with the **−pg** option do not have the **mcount** subroutine inserted, and therefore keep no record of who called them.

Note: Symbols from C++ object files have their names demangled before they are used.

The **gprof** command produces three items:

1. First, a flat profile is produced similar to that provided by the **prof** command. This listing gives total execution times and call counts for each of the functions in the program, sorted by decreasing time. The times are then propagated along the edges of the call graph. Cycles are discovered, and calls into a cycle are made to share the time of the cycle.
2. A second listing shows the functions sorted according to the time they represent, including the time of their call−graph descendents. Below each function entry are its (direct) call−graph children, with an indication of how their times are propagated to this function. A similar display above the function shows how the time of the function and the time of its descendents are propagated to its (direct) call−graph parents.
3. Cycles are also shown, with an entry for the cycle as a whole and a listing of the members of the cycle and their contributions to the time and call counts of the cycle.

Profiling with the fork and exec Subroutines

Profiling using the **gprof** command is problematic if your program runs the **fork** or **exec** subroutine on multiple, concurrent processes. Profiling is an attribute of the environment of each process, so if you are profiling a process that forks a new process, the child is also profiled. However, both processes write a **gmon.out** file in the directory from which you run the parent process, overwriting one of them. The **tprof** command is recommended for multiple−process profiling.

If you must use the **gprof** command, one way around this problem is to call the **chdir** subroutine to change the current directory of the child process. Then, when the child process exits, its **gmon.out** file is written to the new directory. The following example demonstrates this method:

```
cd /u/test   # current directory containing forker.c program
pg forker.c
main()
{
int i, pid;
static char path[]="/u/test2";
pid=fork();             /* fork a child process */
if(pid==0) {            /* Ok, this is the child process */
   chdir (path);        /* create new home directory so
                           gmon.out isn't clobbered! */
   for (i=0; i<30000; i++) sub2();  /* 30000 calls to sub2
                                       in child profile */
   }
else                   /* Parent process... leave gmon.out
                          in current directory */
   for (i=0;i<1000; i++) sub1(pid);   /* 1000 calls to sub1
                                         in parent profile */
}
int sub1(pid)   /* silly little function #1, called
                   by parent 1000 times */
int pid;
{
int i;
printf("I'm the parent, child pid is %i.\n",pid);
}
int sub2()     /* silly little function #2, called
                  by child 30,000 times */
{
printf("I'm the child.\n");
}
cc −pg forker.c −o forker   # compile the program
mkdir /u/test2              # create a directory for childi
                              to write gmon.out in
forker >/dev/null           # Throw away forker's many,
                              useless output lines
gprof forker   >parent.out  # Parent process's gmon.out is
                              in current directory
gprof forker ../test2/gmon.out >child.out
                            # Child's gmon.out is in test2
                              directory
```

At this point, if you compare the two **gprof** command output listings in directory `test`, `parent.out`, and `child.out`, you see that the `sub1` subroutine is called 1,000 times in the parent and 0 times in the child, while the `sub2` subroutine is called 30,000 times in the child and 0 times in the parent.

Processes that run the **exec** subroutine do not inherit profiling. However, the program executed by the **exec** subroutine should be profiled if it was compiled with the **−pg** option. As with the preceding `forker.c` example, if both the parent and the program run by the **exec** subroutine program are profiled, one overwrites the other's **gmon.out** file unless you use the **chdir** subroutine in one of them.

Profiling without Source Code

If you do not have source for your program, you can profile using the **gprof** command without recompiling. You must, however, be able to relink your program modules with the appropriate compiler command (for example, **cc** for C). If you do not recompile, you do not get call frequency counts, although the flat profile is still useful without them. As an added benefit, your program runs almost as fast as it usually does. The following explains how to profile:

```
cc −c dhry.c         # Create dhry.o without call counting code.
cc −pg dhry.o −L/lib −L/usr/lib −o dhryfast
                     # Re−link (and avoid −pg libraries).
dhryfast             # Create gmon.out without call counts.
gprof >dhryfast.out  # You get an error message about no call counts
                     #  -- ignore it.
```

A result of running without call counts is that some quickly executing functions (which you know had to be called) do not appear in the listing at all. Although nonintuitive, this result is normal for the **gprof** command. The **gprof** command lists only functions that were either called at least once, or which registered at least one clock tick. Even though they ran, quickly executing functions often receive no clock ticks. Since call−counting was suspended, these small functions are not listed at all. (You can get call counts for the runtime routines by omitting the **−L** options on the **cc −pg** command line.)

Using Less Real Memory

Profiling with the **gprof** command can cause programs to page excessively since the **−pg** option dedicates pinned real−memory buffer space equal to one−half the size of your program's text. Excessive paging does not affect the data generated by profiling, since profiled programs do not generate ticks when waiting on I/O, only when using the CPU. If the time delay caused by excessive paging is unacceptable, we recommend using the **tprof** command.

Flags

−b	Suppresses the printing of a description of each field in the profile.
−E *Name*	Suppresses the printing of the graph profile entry for routine *Name* and its descendants, similar to the **−e** flag, but excludes the time spent by routine *Name* and its descendants from the total and percentage time computations. (**−E***MonitorCount***−E***MonitorCleanup* is the default.)
−e *Name*	Suppresses the printing of the graph profile entry for routine *Name* and all its descendants (unless they have other ancestors that are not suppressed). More than one **−e** flag can be given. Only one routine can be specified with each **−e** flag.
−F *Name*	Prints the graph profile entry of the routine *Name* and its descendants similar to the **−f** flag, but uses only the times of the printed routines in total time and percentage computations. More than one **−F** flag can be given. Only one routine can be specified with each **−F** flag. The **−F** flag overrides the **−E** flag.
−f *Name*	Prints the graph profile entry of the specified routine *Name* and its descendants. More than one **−f** flag can be given. Only one routine can be specified with each **−f** flag.
−L *PathName*	Uses an alternate pathname for locating shared objects.
−s	Produces the **gmon.sum** profile file, which represents the sum of the profile information in all the specified profile files. This summary profile file may be given to subsequent executions of the **gprof** command (using the **−s** flag) to accumulate profile data across several runs of an **a.out** file.
−z	Displays routines that have zero usage (as indicated by call counts and accumulated time).

Examples

1. To obtain profiled output, enter:

   ```
   gprof
   ```

2. To get profiling output from a command run earlier and possibly moved, enter:

   ```
   gprof −L/home/score/lib runfile runfile.gmon
   ```

   This example uses the given **runfile.gmon** file for sample data and the **runfile** file for local symbols, and checks the **/u/score/lib** file for loadable objects.

3. To profile the sample program **dhry.c**:
   a. Recompile the application program with the **cc −pg** command, as follows:

      ```
      cc −pg dhry.c −o dhry # Re−compile to produce gprof output.
      ```
4. Run the recompiled program. A file named `gmon.out` is created in the current working directory (not the directory in which the program executable resides).

   ```
   dhry    # Execute program to generate ./gmon.out file.
   ```

5. Run the **gprof** command in the directory with the `gmon.out` file to produce the CALL−GRAPH and FLAT PROFILE reports.

   ```
   gprof >gprof.out     # Name the report whatever you like
   vi gprof.out         # Read flat profile first.
   ```

Throughout this description of the **gprof** command, most of the examples use the C program **dhry.c**. However, the discussion and examples apply equally to FORTRAN, Pascal, or COBOL modules by substituting the appropriate compiler name in place of the C compiler, **cc**, and the word *subroutine* for the word *function*. For example, the following AIX commands show how to profile a FORTRAN program named `matrix.f`:

```
xlf −pg matrix.f −o matrix # FORTRAN compile of matrix.f program
matrix                     # Execute with gprof profiling,
                           #   generating gmon.out file
gprof > matrix.out         # Generate profile reports in
                           #   matrix.out from gmon.out
vi matrix.out              # Read flat profile first.
```

Files

a.out	Name list and text space
gmon.out	Dynamic call graph and profile
gmon.sum	Summarized dynamic call graph and profile
/usr/ucb/gprof	Contains the **gprof** command.

Related Information

The **cc** command, **prof** command.

The **exit** subroutine, **monitor** subroutine, **profil** subroutine.

AIX Performance Monitoring and Tuning Commands in the *AIX Versions 3.2 and 4 Performance Tuning Guide*.

The Commands Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

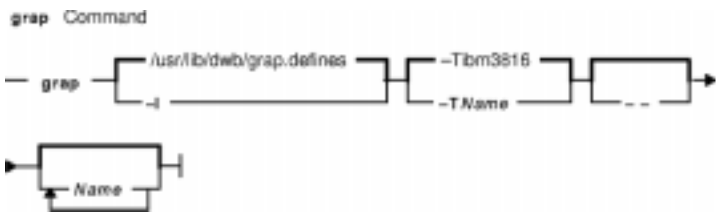
The Subroutines Overview in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

grap Command

Purpose

Typesets graphs to be processed by the **pic** command.

Syntax



grap [**−l**] [**−T** *Name*] [**−−**] [*File* ...]

Description

The **grap** command processes grap language input files and generates input to the **pic** command. The grap language is a language for typesetting graphs. A typical command line is:

```
grap  File  |  pic  |  troff  |  Typesetter
```

Graphs are surrounded by the **.G1** and **.G2 troff** command requests. Data enclosed by these requests are scaled and plotted, with tick marks automatically supplied. Commands exist to modify the frame, add labels, override the default ticks, change the plotting style, define coordinate ranges and transformations, and include data from files. In addition, the **grap** command provides the same loops, conditionals, and macroprocessing as the **pic** command.

Grap language files contain grap programs. A grap program is written in the form:

```
.G1
grap Statement
grap Statement
grap Statement
.G2
```

Parameter

File Specifies grap language files (grap programs) to be processed by the **grap** command for input to the **pic** command.

grap Statements Summary

Following is a summary of the grap statements you can use to create a grap program:

frame Defines the frame that surrounds the graph. The syntax is:

```
frame [ht Expression] [wid Expression] [[Side] LineDescription]
```

The attributes are defined as follows:

- *Side*: `top`, `bot`, `left`, `right`
- *LineDescription*: `solid`, `invis`, `dotted [Expression], dashed[Expression]`

Height defaults to 2 inches, width defaults to 3 inches, sides default to solid. If `side` is omitted, the *linedesc* applies to the entire frame.

label Places a label on a specified side of the graph. The syntax is:

```
label Side StringList ... Shift
```

The attributes are defined as follows:

- *Shift*: `left`, `right`, `up`, or `down`*expression*
- *StringList*: str ... `rjust`, `ljust`, `above, below[size(+)Expression] ...`
- *String*: `"..."`

coord Defines an overriding system. The syntax is:

```
coord [Name] [x Expression,Expression] [y  Expression,Expression] [[log x] [log y] [log l
```

ticks Places tick marks on one side of the frame. The syntax is:

```
ticks side [[in] [out] [Expression]] [Shift] [TickLocations]
```

The attributes are defined as follows:

- *Shift*: `left`, `right`, `up`, `downExpression`
- *TickLocations*: at [*Name*] *Expression* [*String*], *Expression* [*String*], ... from [*Name*] *Expression* to *Expression* [by [*Operation*] *Expression*] *String*

If no ticks are specified, they will be provided automatically; `ticks off` suppresses automatic ticks.

grid Produces grid lines along (that is, perpendicular to) the named side. The syntax is:

```
grid Side [LineDescription] [Shift] [TickLocations]
```

Grids are labeled by the same mechanism as ticks.

plot Places text at a point. The syntax is:

```
StartList at Point plot Expression [Start] at Point
```

The attributes are defined as follows:

- *StringList*: str ... `rjust`, `ljust`, `above, below[size +)Expression] ...`
- *Point*: `[Name] ExpressionExpression`

line Draws a line or arrow from one point to another. The syntax is:

```
{line | arrow} from Point to Point [LineDescription]
```

The attributes linedesc are defined as follows:

- *Point*: [*Name*] *ExpressionExpression*
- *LineDescription*: `solid`, `invis`, `dotted[Expression],dashed Expression]`

circle Draws a circle. The syntax is:

```
circle at Point [radius Expression]
```

The radius is in inches; the default size is small.

draw Defines a sequence of lines. The syntax is:

```
draw [Name] at Point[LineDescription]
```

next Continues a sequence. The syntax is:
`next [Name] at Point [LineDescription]`

new Starts a new sequence. The syntax is:
`new [Name] at Point [LineDescription]`

numberlist Creates a line from a given set of numbers. The numbers are treated as points *x*, *y*1, *y*2, and so on; and plot
`number x, y1, y2 ...`

for Creates a loop. The syntax is:
`for Variable {from | =} Expression to Expression [by [arithmetic or multiplicative op`

X is any single character that does not appear in the string. If `X` is a left brace {, then the string may contai right brace}. The text `Anything` is repeated as the `Variable` takes on values from the first `Expressi`

if Creates a conditional evaluation. The syntax is:
`if Expression then X Anything X [else X Anything X]`

define Provides the same macroprocessor that Priority Interrupt Controller (PIC) does. The syntax is:
`define MacroName X Anything X`

copy Copies a file; includes the current contents of the file. The syntax is:
`copy Filename`

copy−thru Copies the file through the macro.
`copy Filename thru MacroName`

Each number or quoted string is treated as an argument. Copying continues until end of file or the next `.G` `untilString` causes copying to stop when a line whose first field is `String` occurs.

The following statement copies subsequent lines through the macro:

```
copy thru MacroName
```

In all cases, you can specify the macro by inline rather than by name:

```
copy thru x MacroBody x
```

sh Passes text through to the UNIX shell. The syntax is:
`sh x Anything x`

The variable `Anything` is scanned for macros. The **pid** macro is built−in. It is a string consisting of the it to generate unique file names.

pic Passes text through to **pic** with the `pic` removed. Variables and macros are not evaluated. Lines beginnin passed through literally, under the assumption that they are **troff** commands.

graph Defines a new graph named *Picname*, and resets all coordinate systems. The syntax is:
`graph Picname [pic−text]`

If **graph** commands are used in a grap program, the statement after the `.G1` must be a **graph** command. Y graph relative to previous graphs by referring to their Frames as in the following example.

```
graph First
 ...
graph Second with .Frames.w at First.Frame.e + [0.1,0]
```

Macros and expressions in `pic−text` are not evaluated. `Picnames` must begin with a capital letter acc

print Writes on `stderr` as grap processes its input. This statement can be helpful in debugging. The syntax is:
`print [Expression | String]`

grap Language Conventions

The following conventions apply:

- The # (pound sign) introduces a comment. The comment ends automatically at the end of a line.
- Statements that continue for more than one line must be preceded by a \ (backslash character) at the beginning of each new line.

- Multiple statements appearing on one line must be separated by semicolons.
- The grap language ignores blank lines.
- Predefined strings include `bullet`, `plus`, `box`, `star`, `dot`, `times`, `htick`, `vtick`, `square`, and `delta`.
- Built−in functions available in grap include `log` (base 10), `exp` (base 10), `int`, `sin`, `cos`, `atan2`, `sqrt`, `min`, `max`, and `rand`.

Flags

−l	Stops the **grap** command from looking for the **/usr/lib/dwb/grap.defines** library file of macro definitions.
−T*Name*	Specifies the value of the *Name* variable as the **grap** command output device. The default value is **−Tibm3816**.
− −	(Double dash) Indicates the end of flags.

File

/usr/lib/dwb/grap.defines Contains definitions of standard plotting characters.

Related Information

The **pic** command.

AT&T Bell Laboratories Computing Science Technical Report No. 14, *GRAP − A Language for Typesetting Graphs. Tutorial and User Manual* by John L Bentley and Brian W. Kernighan.

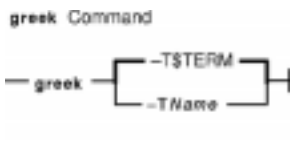
UNIX System V Documentor's Workbench Reference Manual. ISBN 0−13−943580−8. Prentice Hall.

greek Command

Purpose

Converts English−language output from a Teletype Model 37 workstation to output for other workstations.

Syntax



greek [**−T** *Name*]

Description

The **greek** command reinterprets the Teletype Model 37 character set, including reverse and half−line motions, for display on other workstations. It simulates special characters, when possible, by overstriking. The **greek** command reads standard input and writes to standard output.

Flags

−T*Name*	Uses the specified workstation name. If you omit the **−T** flag, the **greek** command attempts to use the workstation specified in the **$TERM** environment variable). The value of the *Name* variable can be any one of the following:
300	DASI 300
300−12	DASI 300 in 12−pitch
300s	DASI 300s
300s−12	DASI 300s, in 12−pitch
450	DASI 450
450−12	DASI 450, in 12−pitch
2621	Hewlett−Packard 2621, 2640, and 2645
2640	Hewlett−Packard 2621, 2640, and 2645
2645	Hewlett−Packard 2621, 2640, and 2645
4014	Tektronix 4014
hp	Hewlett−Packard 2621, 2640, and 2645
tek	Tektronix 4014.

Environment Variables

$TERM Specifies a workstation name.

Related Information

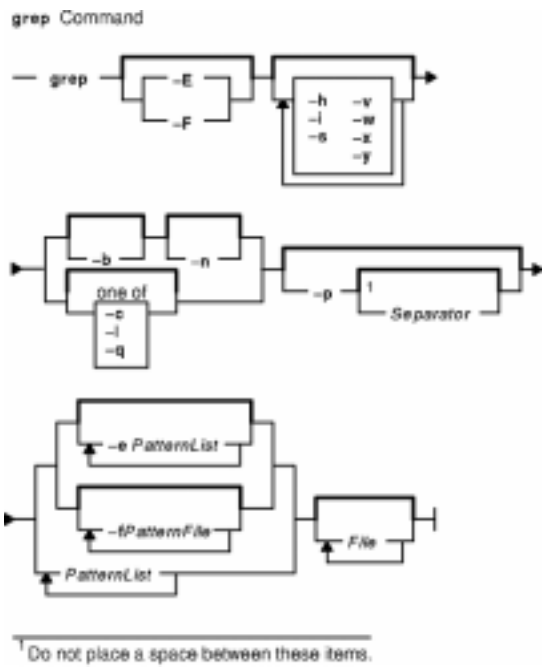
The **eqn** command, **hp** command, **mm** command, **neqn** command, **nroff** command, , **troff** command.

grep Command

Purpose

Searches a file for a pattern.

Syntax



grep [**−E** | **−F**] [**−i**] [**−h**] [**−s**] [**−v**] [**−w**] [**−x**] [**−y**] [[[**−b**] [**−n**]] | [**−c** | **−l** |**−q**]] [**−p** [*Separator*]] { [**−e** *PatternList* ...] [**−f** *PatternFile* ...] | *PatternList* ... } [*File* ...]

Description

The **grep** command searches for the pattern specified by the *Pattern* parameter and writes each matching line to standard output. The patterns are limited regular expressions in the style of the **ed** or **egrep** command. The **grep** command uses a compact non−deterministic algorithm.

The **grep** command displays the name of the file containing the matched line if you specify more than one name in the *File* parameter. Characters with special meaning to the shell ($, *, [, |, ^, (,), \ ) must be in quotation marks when they appear in the *Pattern* parameter. When the *Pattern* parameter is not a simple string, you usually must enclose the entire pattern in single quotation marks. In an expression such as `[a−z]`, the − (minus sign) cml specifies a range, according to the current collating sequence. A collating sequence may define equivalence classes for use in character ranges.

Notes:

1. Lines are limited to 2048 bytes.
2. Paragraphs (under the **−p** flag) are currently limited to a length of 5000 characters.
3. Do not run the **grep** command on a special file because it produces unpredictable results.
4. Input lines should not contain the NULL character.
5. Input files should end with the new−line character.

6. The new−line character will not be matched by the regular expressions.
7. Although some flags can be specified simultaneously, some flags override others. For example, the **−l** option takes precedence over all other flags. And if you specify both the **−E** and **−F** flags, the last one specified takes priority.

Flags

−b	Precedes each line by the block number on which it was found. Use this flag to help find disk block numbers by context. The **−b** flag cannot be used with input from stdin or pipes.
−c	Displays only a count of matching lines.
−E	Treats each pattern specified as an extended regular expression (ERE). A NULL value for the ERE matches every line. **Note:** The **grep** command with the **−E** flag is the same as the **egrep** command, except that error and usage messages are different and the **−s** flag functions differently.
−e *PatternList*	Specifies one or more search patterns. This works like a simple pattern but is useful when the pattern begins with a − (minus). Patterns should be separated by a new−line character. A NULL pattern can be specified by two adjacent new−line characters or a quotation mark followed by a new−line character ("\n). Each pattern is treated like a basic regular expression (BRE) unless the **−E** or **−F** flag is also specified.
−F	Treats each specified pattern as a string instead of a regular expression. A NULL string matches every line. **Note:** The **grep** command with the **−F** flag is the same as the **fgrep** command, except that error and usage messages are different and the **−s** flag functions differently.
−f *PatternFile*	Specifies a file containing search patterns. Each pattern should be separated by a new−line character, and an empty line is considered a NULL pattern. Each pattern is treated like a basic regular expression (BRE), unless the **−E** or **−F** flag is also specified.
−h	Suppresses file names when multiple files are specified.
−i	Ignores the case (uppercase or lowercase) of letters when making comparisons.
−l	Lists just the names of files (once) which contain matching lines. Each file name is separated by a new−line character. If standard input is searched, a path name of `(StandardInput)` is returned. The **−l** flag with any combination of the **−c** and **−n** flags behaves like the **−l** flag only.
−n	Precedes each line with the relative line number in the file. Each file starts at line 1, and the line counter is reset for each file processed.
−p[*Separator*]	Displays the entire paragraph containing matched lines. Paragraphs are delimited by paragraph separators, as specified by the *Separator* parameter, which are patterns in the same form as the search pattern. Lines containing the paragraph separators are used only as separators; they are never included in the output. The default paragraph separator is a blank line.
−q	Suppresses all writing to standard output, regardless of matching lines. Exits with a zero status if an input line is selected. The **−q** flag with any combination of the **−c**, **−l** and **−n** flags behaves like the **−q** flag only.
−s	Suppresses error messages ordinarily written for nonexistent or unreadable files. Other error messages are not suppressed.
−v	Displays all lines not matching the specified pattern.
−w	Does a word search.
−x	Displays lines that match the specified pattern exactly with no additional characters.
−y	Ignores the case of letters when making comparisons.

PatternList	Specifies one or more patterns to be used during the search. The patterns are treated as if they were specified using the **−e** flag.
File	Specifies a name of a file to be searched for patterns. If no *File* variable is given, the standard input is used.

Exit Status

This command returns the following exit values:

0	A match was found.
1	No match was found.
>1	A syntax error was found or a file was inaccessible (even if matches were found).

Examples

1. To use a pattern that contains some of the pattern−matching characters *, ^, ?, [,], \(, \), \{, and \}, enter:

   ```
   grep  "^[a−zA−Z]"  pgm.s
   ```

   This displays every line in `pgm.s` whose first character is a letter.

2. To display all lines that do not match a pattern, enter:

   ```
   grep  −v  "^#" pgm.s
   ```

   This displays every line in `pgm.s` whose first character is not a # (pound sign).

3. To display all lines in the `file1` file that match either the `abc` or `xyz` string, enter:

   ```
   grep  −E  "abc|xyz"  file1
   ```

4. To search for a `$` (dollar sign) in the file named `test2`, enter:
   ```
   grep \\$ test2
   ```

The `\\` (double backslash) characters are necessary in order to force the shell to pass a `\$` (single backslash, dollar sign) to the **grep** command. The `\` (single backslash) character tells the **grep** command to treat the following character (in this example the `$`) as a literal character rather than an expression character. Use the **fgrep** command to avoid the necessity of using escape characters such as the backslash.

Files

/usr/bin/grep Contains the **grep** command.

Related Information

The **ed** command, **egrep** command, **fgrep** command, **sed** command.

File Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

National Language Support Overview for Programming in *AIX Version 4.3 General Programming Concepts: Writing and Debugging Programs*.

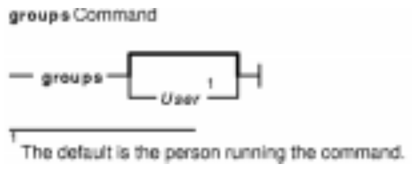
Shells Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

groups Command

Purpose

Displays group membership.

Syntax



groups [*User*]

Description

The **groups** command without a *User* parameter writes to standard output the group membership of the current process. If the *User* parameter is specified, then the group membership for that *User* is displayed.

The **groups** command does not run successfully if the specified user does not exist or if it cannot read the user or group information.

Security

Access Control: This program should be installed as a normal user program in the Trusted Computing Base.

Examples

To display your current group membership, enter:

```
groups
```

Files

/usr/bin/groups	Contains the **groups** command
/usr/ucb/groups	Symbolic link to the **groups** command
/etc/group	Group file; contains group IDs
/etc/ogroup	Previous version of the group file
/etc/passwd	Password file; contains user IDs
/etc/opasswd	Previous version of the password file.

Related Information

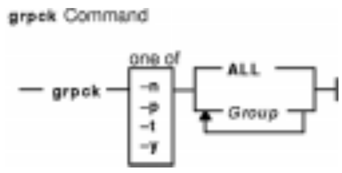
The **getty** command, **login** command, **setgroups** command, **su** command, **tsm** command.

grpck Command

Purpose

Verifies the correctness of a group definition.

Syntax



grpck { **−n** | **−p** | **−t** | **−y** } { **ALL** | *Group* ... }

Description

The **grpck** command verifies the correctness of the group definitions in the user database files by checking the definitions for **ALL** the groups or for the groups specified by the *Group* parameter. If more than one group is specified, there must be a space between the groups.

Note: This command writes its messages to **stderr**.

You must select a flag to indicate whether the system should try to fix erroneous attributes. The following attributes are checked:

name	Checks the uniqueness and composition of the group name. The group name must be a unique string of eight bytes or less. It cannot begin with a + (plus sign), a : (colon), a − (minus sign), or a ~ (tilde). It cannot contain a colon (:) in the string and cannot be the **ALL** or **default** keywords. No system fix is possible.
groupID	Checks the uniqueness and composition of the group ID. The ID must not be null and must consist of decimal digits only. No system fix is possible.
users	Checks the existence of the users listed in the group database files. If you indicate that the system should fix errors, it will delete all the users that are not found in the user database files.
adms	Checks the existence of the users listed as group administrators in the group database files. If you indicate that the system should fix errors, it will delete all the administrators that are not found in the user database files.

admin	Checks for a valid admin attribute for each group in the **/etc/security/group** file. No system fix is available.

Generally, the **sysck** command calls the **grpck** command as part of the verification of a trusted−system installation. In addition, the root user or a member of the security group can enter the command.

The **grpck** command checks to see if the database management security files (**/etc/passwd.nm.idx**, **/etc/passwd.id.idx**, **/etc/security/passwd.idx**, and **/etc/security/lastlog.idx**) files are up−to−date or newer than the corresponding system security files. Please note, it is alright for the **/etc/security/lastlog.idx** to be not newer than **/etc/security/lastlog**. If the database management security files are out−of−date, a warning message appears indicating that the root user should run the **mkpasswd** command.

Flags

−n	Reports errors but does not fix them.
−p	Fixes errors but does not report them.
−t	Reports errors and asks if they should be fixed.
−y	Fixes errors and reports them.

Security

Access Control: This command should grant execute (x) access to the root user and members of the security group. The command should be **setuid** to the root user and have the **trusted computing base** attribute.

Files Accessed:

Mode	File
r	**/etc/passwd**
r	**/etc/security/user**
rw	**/etc/security/group**
rw	**/etc/group**

Auditing Events:

Event	Information
GROUP_User	user, groups, attribute | error, status
GROUP_Adms	user, groups, attribute | error, status

Examples

1. To verify that all the group members and administrators exist in the user database, and have any errors reported (but not fixed), enter:

   ```
   grpck −n ALL
   ```

2. To verify that all the group members and administrators exist in the user database and to have errors fixed, but not reported, enter:

   ```
   grpck −p ALL
   ```

3. To verify the uniqueness of the group name and group ID defined for the `install` group, enter:

   ```
   grpck −n install
   ```

   OR

   ```
   grpck −t install
   ```

   OR

   ```
   grpck −y install
   ```

The **grpck** command does not correct the group names and IDs. Therefore, the **−n, −t** and **−y** flags report problems with group names and group IDs, but do not correct them.

Files

/usr/sbin/grpck	Contains the **grpck** command.
/etc/passwd	Contains the basic attributes of users.
/etc/security/user	Contains the extended attributes of users.
/etc/group	Contains the basic attributes of groups.
/etc/security/group	Contains the extended attributes of groups.

Related Information

The **pwdck** command, **sysck** command, **usrck** command.

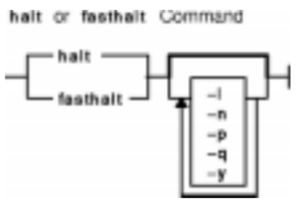
For more information about the identification and authentication of users, discretionary access control, the trusted computing base, and auditing, refer to Security Administration in *AIX Version 4.3 System Management Concepts: Operating System and Devices*.

halt or fasthalt Command

Purpose

Stops the processor.

Syntax



{ **halt** | **fasthalt** } [**−l**] [**−n**] [**−p**] [**−q**] [**−y**]

Description

The **halt** command writes data to the disk and then stops the processor. The machine does not restart. Only a root user should run this command. Do not use this command if other users are logged into the system. If no other users are logged in, the **halt** command can be used. Use the **halt** command if you are not going to restart the machine immediately. When the message `....Halt completed....` is displayed, you can turn the power Off.

The **halt** command logs the shutdown using the **syslogd** command and places a record of the shutdown in **/var/adm/wtmp**, the login accounting file. The system also writes an entry into the error log which states that the system was shut down.

The **fasthalt** command stops the system by calling the **halt** command. The **fasthalt** command provides BSD compatibility.

Flags

−l Does not log the halt in the accounting file. The **−l** flag does not suppress accounting file update. The **−n** and **−q** flags imply the **−l** flag.

−n Prevents the **sync** before stopping.

−p Halts the system without a power down.

Note: The **−p** flag will have no effect if used in combination with flags not requiring a permanent halt. Power will still be turned off if other operands request a delayed poweron and reboot

−q Causes a quick halt.

Note: Running **halt** command with **−q** flag does not issue **sync**, so the system will halt immediately.

−y Halts the system from a dial−up operation.

Examples

1. To halt the system without logging the halt in the accounting file, enter:
```
halt −l
```

2. To halt the system quickly, enter:
   ```
   halt -q
   ```
3. To halt the system from a dial−up, enter:
   ```
   halt -y
   ```

Files

/etc/rc	Specifies the system startup script.
/var/adm/wtmp	Specifies the login accounting file.

Related Information

The **fastboot** command, **fsck** command, **rc** command, **shutdown** command, **sync** command.

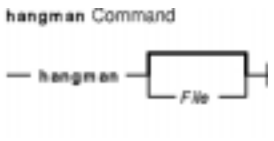
The **syslogd** daemon.

hangman Command

Purpose

Starts the hangman word−guessing game.

Syntax



hangman [*File*]

Description

The **hangman** command chooses a word of at least seven letters from a standard dictionary. The *File* parameter specifies an alternate dictionary. You guess the word by guessing letters one at a time. You are allowed seven mistakes.

When you start hangman, the game displays:

```
guesses: word: ....... errors: 0/7
guess:
```

The `guesses` displays the letters you have used as guesses. Every letter you guess is listed after `guesses`. The `word: .......` displays the number of letters in the mystery word. In this case there are seven `.` (periods) so there are seven letters in the word. As you correctly guess letters, the game replaces the appropriate `.` with the correct letter. The `errors: 0/7` displays the number of incorrect guesses. You enter your letter guess at the `guess:` prompt. For example:

```
guesses: word: .......... errors: 0/7
guess: q
guesses: q word: .......... errors: 1/7
guess: a
guesses: aq word: .a....a... errors: 1/7
guess: b
guesses: abq word: .a....a... errors 2/7
guess: j
guesses: abjq word: .a....a... errors: 3/7
guess: s
guesses: abjqs word: .a....a..s errors: 3/7
guess: z
guesses: abjqsz word: .a....a..s errors: 4/7
guess: y
guesses: abjqsyz word: .a....a..s errors: 5/7
guess: k
guesses: abjkqsyz word: .a....a..s errors: 6/7
guess: x
the answer was calculates, you blew it
```

To quit the game, press the Interrupt (Ctrl−C) or End Of File (Ctrl−D) key sequence.

Files

/usr/games Location of the system's games.

Related Information

The **arithmetic** command, **back** command, **bj** command, **craps** command, **fish** command, **fortune** command, **moo** command, **number** command, **quiz** command, **ttt** command, **turnoff** command, **turnon** command, **wump** command.

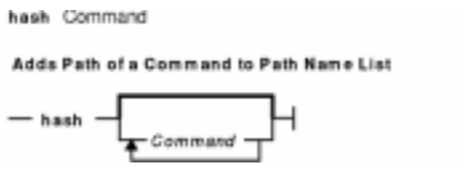
hash Command

Purpose

Remembers or reports command path names.

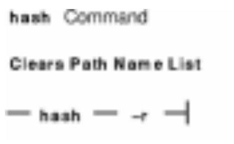
Syntax

To Add the Path of a Command to the Path Name List:



hash [*Command* ...]

To Clear Path Name List:



hash −r

Description

The **hash** command affects the way the current shell remembers a command's path name, either by adding a path name to a list or purging the contents of the list.

When no parameter or flag is specified, the **hash** command reports to standard output the contents of the path name list. The report includes the path name of commands in the current shell environment that were found by previous **hash** command invocations. The display may also contain those commands invoked and found through the normal command search process.

> **Note:** Shell built−in commands are not reported by the **hash** command.

You can use the **−r** flag to clear the contents of the command path name list. Path names can also be cleared from the list by resetting the value of the **PATH** environment variable. In the simplest form, this would be achieved by entering:

```
PATH="$PATH"
```

If the *Command* parameter is used, the **hash** command searches for the path name of the specified command and adds this path to the list. Do not use a / (slash) when you specify the command.

Since the **hash** command affects the current shell environment, it is provided as a Korn shell or POSIX shell regular built−in command. If the **hash** command is called in a separate command execution environment, as in the following examples, it will not affect the command search process of the caller's environment:

```
nohup hash −r
find . −type f | xargs hash
```

Using the **hash** command is equivalent to using the **alias−t** command.

Flag

−r Clears the contents of the path name list.

Parameter

Command Specifies the *Command* to add to the path name list.

Exit Status

The following exit values are returned:

0	Successful completion.
>0	An error occurred.

Examples

1. To find the path name of the **wc** command and add it to the path name list, enter:

   ```
   hash wc
   ```

2. To clear the contents of the path name list, enter:

   ```
   hash −r
   ```

Files

/usr/bin/ksh	Contains the Korn shell **hash** built−in command.
/usr/bin/hash	Contains the **hash** command.

Related Information

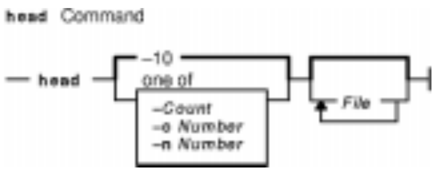
The **alias** command, **bsh** command, **ksh** command.

head Command

Purpose

Displays the first few lines or bytes of a file or files.

Syntax



head [**−***Count* | **−c***Number* | **−n** *Number*] [*File* ...]

Description

The **head** command writes to standard output a specified number of lines or bytes of each of the specified files, or of the standard input. If no flag is specified with the **head** command, the first 10 lines are displayed by default. The *File* parameter specifies the names of the input files. An input file must be a text file.

Flags

−*Count*	Specifies the number of lines from the beginning of each specified file to be displayed. The *Count* variable must be a positive decimal integer. This flag is equivalent to the **−n** *Number* flag, but should not be used if portability is a consideration.
−c*Number*	Specifies the number of bytes to display. The *Number* variable must be a positive decimal integer.
−n *Number*	Specifies the number of lines from the beginning of each specified file to be displayed. The *number* variable must be a positive decimal integer. This flag is equivalent to the **−***Count* flag.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Examples

To display the first five lines of the `Test` file, enter:

```
head −5 Test
```

OR

```
head −n 5 Test
```

Related Information

The **tail** command.

Files Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

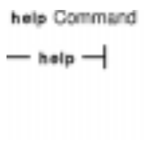
Input and Output Redirection Overview in *AIX Version 4.3 System User's Guide: Operating System and Devices*.

help Command

Purpose

Provides information for new users.

Syntax



help

Description

The **help** command presents a one−page display of information for new users. Information is available for the following topics:

- Concatenating or displaying files.
- Editing lines interactively.
- Sending and receiving mail.
- Reading system messages.
- Changing password file information.
- Identifying current users of the system.
- Sending messages to the other users on the system.
- Displaying the contents of directories.
- Viewing information on the Source Code Control System.
- Setting terminal modes.

Examples

To obtain help, type `help` and the following appears:

```
The commands:
        man  −k  keyword lists commands relevant to a keyword
        man  command  prints out the manual pages for a command;
Other basic commands are:
        cat     −concatenates files (and just prints them out)
        ex      −text editor
        finger  −user information lookup directory
        ls      −lists contents of a directory
        mail    −sends and receives mail
        msgs    −system messages and junk mail
        passwd  −changes login password
        sccshelp −views  information on Source Code Control System
        tset    −sets terminal modes
        who     −who is on the system
        write   −writes  to  another  user
You could find programs about mail with the command:   man  −k  mail
And print out the man command documentation by way of:  man  mail
You can log out by typing:  exit.
```

Related Information

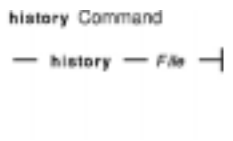
The **cat** command, **ex** command, **finger** command, **ls** command, **mail** command, **msgs** command, **passwd** command, **sccshel**p command, **tset** command, **who** command, **write** command.

history Command

Purpose

Displays the history of an INed structured file.

Syntax



history*File*

Description

The **history** command displays the incremental changes made to the specified structured file since that file's creation. The **history** command does not work with text files.

Each information record contains the type, user ID, group ID, and time.

The format of a structured file is record−oriented. For a structured file that contains only text, these records are the lines of text in the file. Extra information accompanies the records and is used for inserting lines, deleting lines, setting the current index, specifying start information, storing user comments, and specifying the start of an array. Information located at the end of the file specifies where in the file the current records are located so the file can be opened quickly.

Related Information

The **e** command, **ghost** command, **newfile** command, **readfile** command, **rmhist** command.

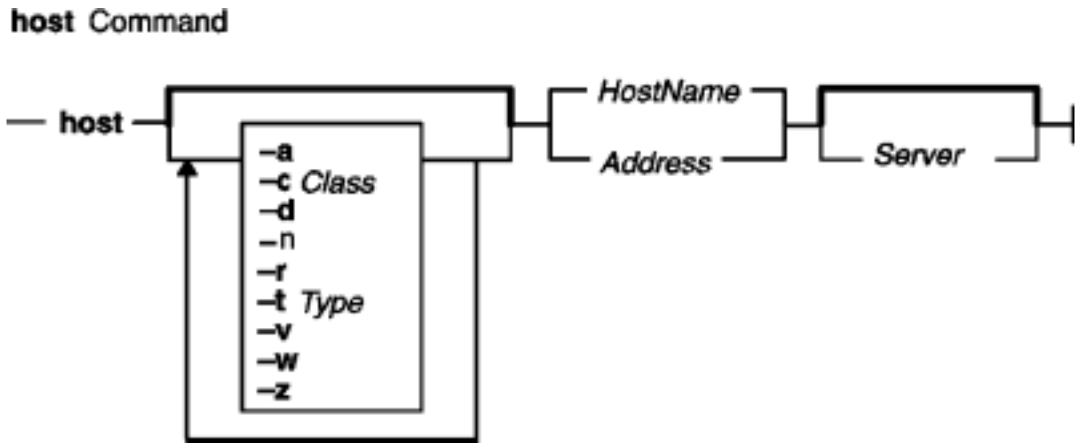
INed Editor Overview in *AIX Version 4.3 INed Editor User's Guide* introduces general concepts about the INed editor.

host Command

Purpose

Resolves a host name into an Internet address or an Internet address into a host name.

Syntax



host [**−a**] [**−c** *Class*] [**−d**] [**−n**] [**−r**] [**−t***Type*] [**−v**] [**−w**] [**−z**] [*Hostname* | *Address*] [*Server*]

Description

The **/usr/bin/host** command returns the Internet address of a host machine when the *HostName* parameter is specified and the name of the host when the *Address* parameter is specified. The **host** command also displays any aliases associated with the *HostName* parameter.

If the local host is using the DOMAIN protocol, the local or remote name server database is queried before searching the local **/etc/hosts** file.

The **host** command may also return other name records found in the DNS (Domain Name System). The **−z** flag specifies this mode. The other flags allow for the customization of the query.

Flags

−a	Equivalent to using "**−v −t ***"
−c*Class*	Specifies the class to look in when searching non−Internet data. Valid classes are:

IN	Internet class
CHAOS	Chaos class
HESIOD	MIT Althena Hesiod class
ANY	Wildcard (any of the above)
*****	Wildcard (any of the above)

−d	Turns on debugging mode.
−n	Equivalent to issuing the **/usr/bin/hostnew** command.
−r	Disables recursive processing.
−t*Type*	Specifies the type of record to query for. Valid types are:

A	Host's Internet address
CNAME	Canonical name for an alias
HINFO	Host CPU and operating system type
KEY	Security Key Record
MINFO	Mailbox or mail list information
MX	Mail exchanger
NS	Nameserver for the named zone
PTR	Host name if the query is an Internet address; otherwise, the pointer to other information
SIG	Signature Record
SOA	Domain's "start−of−authority" information
TXT	Text information
UINFO	User information
WKS	Supported well−known services

−v	Verbose mode.
−w	Waits forever for a reply from the DNS server.
−z	Uses the new output that displays resource record information.

Parameters

Address	Specifies the Internet address of the host machine to use in resolving the host name. The *Address* parameter must be a valid Internet address in dotted decimal format.
HostName	Specifies the name of the host machine to use in resolving the Internet address. The *HostName* parameter can be either a unique host name or a well−known host name (such as *nameserver*, *printserver*, or *timeserver*, if these exist).
Server	Specifies the nameserver to query.

Examples

1. To display the address of a host machine named `mephisto`, enter:

   ```
   host mephisto
   ```

   Information similar to the following is displayed:

   ```
   mephisto is 192.100.13.5, Aliases: engr, sarah
   ```

2. To display the host whose address is `192.100.13.1`, enter:

   ```
   host 192.100.13.1
   ```

   Information similar to the following is displayed:

   ```
   mercutio is 192.100.13.1
   ```

Files

/etc/hosts Contains the Internet Protocol (IP) name and addresses of hosts on the local network.

Related Information

The **hostname** command.

The **named** daemon.

Network Overview in *AIX Version 4.3 System Management Guide: Communications and Networks*.

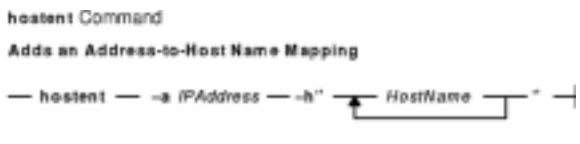
hostent Command

Purpose

Directly manipulates address−mapping entries in the system configuration database.

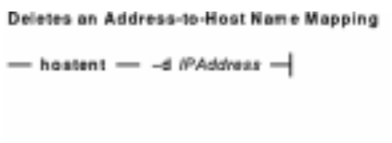
Syntax

To Add an Address−to−Host Name Mapping



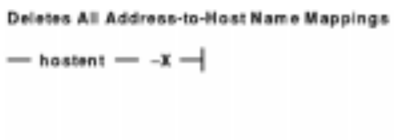
hostent −a *IPAddress* **−h** **"***HostName...***"**

To Delete an Address−to−Host Name Mapping



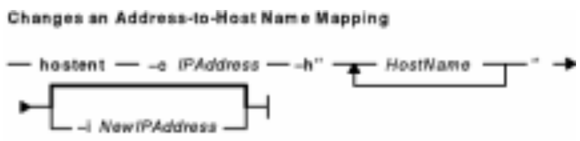
hostent −d *IPAddress*

To Delete All Address−to−Host Name Mappings



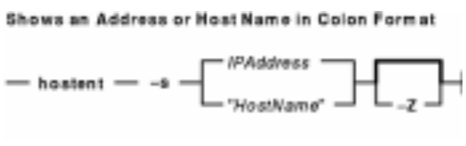
hostent −X

To Change an Address−to−Host Name Mapping



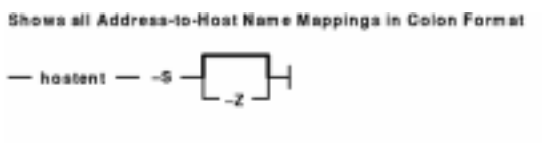
hostent −c *IPAddress***−h** **"***HostName...***"** [**−i** *NewIPAddress*]

To Show an Address or Host Name in Colon Format



hostent −s { *IPAddress* | **"***HostName***"** } [**−Z**]

To Show all Address−to−Host Name Mappings in Colon Format



hostent −S [**−Z**]

Description

The **hostent** low−level command adds, deletes, or changes address−mapping entries in the system configuration database. Entries in the database are used to map an Internet Protocol (IP) address (local or remote) to its equivalent host names.

The **hostent** command can show one or all address−to−host name mapping entries in the **/etc/hosts** file. An Internet Protocol (IP) address of a given local or remote host may be associated with one or more host names. Represent an IP address in dotted decimal format. Represent a host name as a string with a maximum length of 255 characters, and use no blank characters. Each entry must be contained on one line. Multiple *HostNames* (or aliases) can be specified.

> **Note:** Valid host names or alias host names must contain at least one alphabetic character. If you choose to specify a host name or alias that begins with an `x` followed by any hexadecimal digit (`0−f`), the host name or alias must also contain at least one additional letter that cannot be expressed as a hexadecimal digit. The system interprets a leading `x` followed by a hexadecimal digit as the base 16 representation of an address unless there is at least one character in the host name or alias that is not a hexadecimal digit. Thus, `xdeer` would be a valid host name, whereas `xdee` would not.

You can use a Web−based System Manager System application (**wsm system** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit hostent** fast path to run this command.

Flags

> **Note:** The **−a**, **−d**, **−c**, and **−s** flags cannot be used together.

−a *IPAddress*	Adds an IP address−to−host name mapping entry for the given Internet Protocol address in the database. Specify the host names with the **−h** flag.
−c *IPAddress*	Changes an IP address−to−host name mapping entry in the database that corresponds to the given address specified by the *IPAddress* variable. Specify the changed host names with the **−h** flag. If you want to change the current IP address to a new address (*IPAddress*), use the **−i** flag.
−d *IPAddress*	Deletes the IP address−to−host name mapping entry in the database that corresponds to the given address specified by the *IPAddress* variable.
−h"*HostName...*"	Specifies a list of host names. Entries in the list should be separated by blanks. The **−h**"*HostName...*" flag should be used with the **−a** flag. The **−c** flag may also require the **−h**"*HostName...*" flag.
−i *NewIPAddress*	Specifies a new IP address. This flag is required by the **−c** flag if an existing IP address is to be replaced by the *NewIPAddress* variable.
−S	Shows all entries in the database.
−s"*HostName*"	Shows an IP address−to−host name mapping entry matching the host name specified by the "*HostName*" variable.
−s *IPAddress*	Shows an IP address−to−host name mapping entry matching the entry specified by the

	IPAddress variable.
−X	Deletes all IP address−to−host name mapping entries in the database.
−Z	Generates the output of the query in colon format. This flag is used when the **hostent** command is invoked from the SMIT usability interface.

Note: The **hostent** command does recognize the following addresses: .08, .008, .09, and .009. Addresses with leading zeros are interpreted as octal, and numerals in octal cannot contain 8s or 9s.

Examples

1. To add an entry in the database associating an address with a series of host names, enter the command in the following format:
   ```
   hostent −a 192.100.201.7 −h "alpha bravo charlie"
   ```

   In example 1, the IP address `192.100.201.7` is specified as the address of the host that has a primary host name of `alpha` with synonyms of `bravo` and `charlie`.

   Note: If you attempt to use .08, .008, .09, or .009 in an address to add, you will get an error message that states `"IP Address Address already exists,"` although the address is not in the **/etc/hosts** file.

2. To show an entry in the database matching a host name, enter the command in the following format:
   ```
   hostent −s alpha
   ```

   In example 2, the entry to be shown matches the host name `alpha`.

3. To change the IP address of an entry to a new IP address, enter the command in the following format:
   ```
   hostent −c 192.100.201.7 −i 192.100.201.8
   ```

In example 3, the old IP address is `192.100.201.7` and the new address is `192.100.201.8`.

Files

/etc/hosts	Contains host names and addresses for the network.

Related Information

The **hostname** command.

Naming in *AIX Version 4.3 System Management Guide: Communications and Networks*.

The SMIT Interface for TCP/IP in *AIX Version 4.3 System Management Guide: Communications and Networks*.

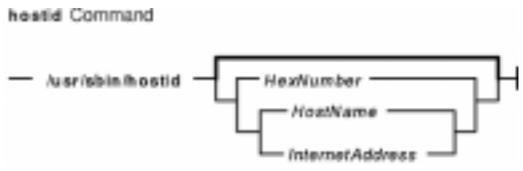
Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

hostid Command

Purpose

Sets or displays the identifier of the current local host.

Syntax



/usr/sbin/hostid [*HexNumber* | *InternetAddress* | *HostName*]

Description

The **/usr/sbin/hostid** command displays the identifier (either a unique host name or a numeric argument) of the current local host as a hexadecimal number. This numeric value is expected to be unique across all hosts and is commonly set to the address of the host specified by the *InternetAddress* or *HostName* parameter. The root user can set the **hostid** command by specifying a hexadecimal number for the *HexNumber*, *InternetAddress*, or *HostName* parameter. The host identifier is set to the hostname by the **/etc/rc.net** file.

Parameters

HexNumber	Specifies a unique hexadecimal number representing the current local host.
InternetAddress	Specifies an Internet address representing the current local host.
HostName	Specifies a symbolic name that maps to a unique host.

Examples

1. To set the identifier of the local host to the local Internet address with the **hostid** command, enter the command in the following format:
   ```
   hostid   192.9.200.3
   0xc009c803
   ```
   The **hostid** command converts the Internet address `192.9.200.3` into the hexadecimal representation `0xc009c803`, and then sets the local host (your workstation connected to a network) to this address.

2. To display the identifier of the local host, enter:
   ```
   hostid
   0xc009c803
   ```

The **hostid** command displays the identifier of the host as a hexadecimal number.

Related Information

The **hostname** command.

The **gethostid** subroutine, **sethostid** subroutine.

The **rc.net** file format.

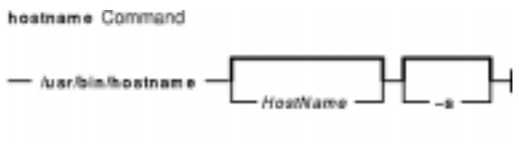
TCP/IP Addressing in *AIX Version 4.3 System Management Guide: Communications and Networks*.

hostname Command

Purpose

Sets or displays the name of the current host system.

Syntax



/usr/bin/hostname [*HostName*] [**−s**]

Description

The **/usr/bin/hostname** command displays the name of the current host system. Only users with root user authority can set the host name. The **mkdev** command and the **chdev** commands also set the host name permanently. Use the **mkdev** command when you are defining the TCP/IP instance for the first time.

You can use a Web−based System Manager System application (**wsm system** fast path) to run this command. You could also use the System Management Interface Tool (SMIT) **smit mkhostname** fast path to run this command.

Flags

−s Trims any domain information from the printed name.

Parameters

HostName Sets the primary name of the host.

> **Note:** You must have root user authority to use the *HostName* parameter.

Related Information

The **chdev** command, **mkdev** command.

The **gethostname** subroutine, **sethostname** subroutine.

Setting up and running Web−based System Manager in *AIX Version 4.3 System Management Guide: Operating System and Devices*.

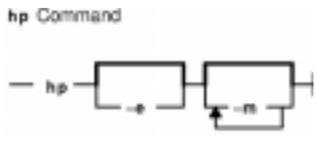
Naming in *AIX Version 4.3 System Management Guide: Communications and Networks*.

hp Command

Purpose

Handles special functions for the HP2640− and HP2621−series terminals.

Syntax



hp [**−e**] [**−m** ...]

Description

The **hp** command reads standard input (usually output from the **nroff** command), and writes to standard output, which is usually Hewlett−Packard 2640− and 2621−series terminal displays.

If your terminal has the display enhancement feature, you can display subscript characters and superscript characters. With the mathematical−symbol feature, you can display Greek characters and other special characters, with two exceptions. The **hp** command approximates the logical operator NOT with a right arrow and shows only the top half of the integral sign.

Overstrike characters are characters followed by a backspace and another character. They appear underlined or in inverse video (depending on terminal enhancements) if either the overwritten character or the character typed after the backspace is an underscore character.

> **Note:** Some sequences of control characters (reverse line−feeds and backspaces) can make text disappear from the display. Tables with vertical lines generated by the **tbl** command may be missing lines of text containing the bottom of a vertical line. You may be able to avoid these problems by first piping the input through the **col** command and then through the **hp** command.

Flags

−e	Shows overstruck characters underlined, superscript characters in half−bright, and subscript characters in half−bright underlined. Otherwise, all overstruck characters, subscript characters, and superscript characters appear in inverse video (dark−on−light). Use this flag only if your display has the display enhancements feature.
−m	Produces only one blank line for any number of successive blank lines in the text.

Related Information

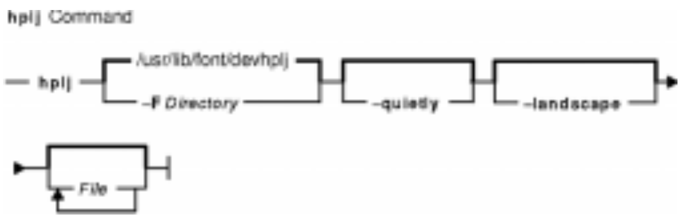
The **col** command, **eqn** command, **greek** command, **nroff** command, **tbl** command.

hplj Command

Purpose

Postprocesses the **troff** command output for the HP LaserJet Series printers.

Syntax



hplj [**−F** *Directory*] [**−quietly**] [**−landscape**] [*File* ...]

Description

The **hplj** command processes the output of the **troff** command for output to Hewlett−Packard LaserJet Series printers.

If given one or more files as options, the **hplj** command processes those files. If no files are specified, it acts as a filter interpreting standard input. The parameter *File* specifies files the **hplj** command processes to output on an HP Laser Jet Series printer.

> **Note:** The **hplj** command can use the K cartridge or Text−Equations cartridge if installed in the printer. (The Text−Equations cartridge, HP part number C2053A #C07, supersedes the K cartridge.) The default font files assume one of the cartridges is installed. If you do not have a K cartridge, use the downloaded bit−mapped fonts instead. To do this, run the **no_cart** shell script in the font directory for the HP printer (**/usr/lib/font/devhplj**).

Incorrect output can occur if your font files assume either cartridge is mounted when it is not. Incorrect output can also occur if other cartridges or soft fonts are installed, in addition to the K cartridge or Text−Equations cartridge.

The **hplj** command depends on the files with names ending in **.out** in the **/usr/lib/font/devhplj** file. This command does not produce reasonable output unless these files have been properly set up. See the **troff** font file format document for more information.

Flags

−F*Directory*	Identifies the specified directory as the place to find the font file. By default, the **hplj** command looks for font files in the **/usr/lib/font/devhplj** directory.
−quietly	Suppresses all nonfatal error messages.
−landscape	Prints the specified file in landscape format. A landscape page is oriented so that for normal reading, the width of the page is greater than its length. By default, the **hplj** command prints in portrait orientation. **Note:** Landscape is only available in the

Courier font on the Hewlett−Packard Jet II printer. Therefore, **troff** documents must be formatted in the Courier font. To accomplish this, insert the following lines at the beginning of the **troff** input file:

```
.fp 1 C
.fp 2 C
.fp 3 CB
```

The Courier font is loaded onto font positions #1 & #2 and Courier−Bold onto position #3.

Examples

1. To print a **troff** file named `foo` on the printer called `hp` using the **lp** command, enter:

   ```
   troff −mm −Thplj foo | hplj | lp −dhp −o −dp
   ```

2. To print a **troff** file named `boo` on printer called `hp` using the **qprt** command, enter:

   ```
   troff −mm −Thplj boo | hplj | qprt −dp −Php
   ```

   Note: The **−dp** flag in both examples sends the printer data to the print device in pass−through (unmodified) mode.

File

/usr/lib/font/devhpl/*.out Contains font files.

Related Information

The **troff** command formats text for printing on typesetting devices.

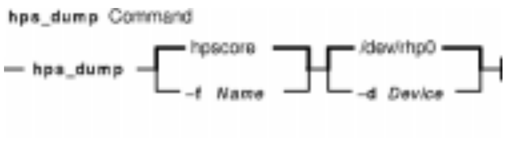
The **troff** font file format specifies description files for the troff command.

hps_dump Command

Purpose

Dumps contents of Network Terminal Accelerator (NTX) adapter memory to a host file. This command only applies to AIX Version 4.2.1 or later.

Syntax



hps_dump [**−f** *Name*] [**−d** *Device*]

Description

The **hps_dump** command uses the loader interface to upload all of the memory from the adapter board into a file. This produces a snapshot of a system for later analysis and debugging. The first 1024 bytes of the file contains the following:

80	Identification string, includes version.
80	Time and date of dump from host system.
80	Comments.
268	Log table from the host adapter.
32	System address table.
8	Starting and ending address range of dump.
476	Padding to 1024 bytes total.

Flags

−f *Name*	Specifies the name of the dump. Use this option to override the default filename **./hpscore**.
−d *Device*	Specifies the raw device file name of the adapter. Use this option to override the default device name **/dev/rhp0**.

Exit Status

This command returns the following exit values:

0	Successful completion.
>**0**	An error occurred.

Security

Access Control: You must have root authority to run this command.

Auditing Events: N/A

Examples

1. To get a dump of memory of the default adapter to the file **hpscore** in the current directory, enter:
   ```
   hps_dump
   ```
2. To get a dump of memory of the default adapter to the file **hpsdebug** in the current directory of the default adapter, enter:
   ```
   hps_dump -f hpsdebug
   ```
3. To get a dump of memory of the adapter **/dev/rhp1** to the file **hpsdebug** in the current directory of the default adapter, enter:
   ```
   hps_dump -f hpsdebug -d /dev/rhp1
   ```

Files

/usr/bin/hps_dump	Contains the **hps_dump** command.
/dev/rhp0	Default NTX raw device file name.

Related Information

The **/dev/rhp** file.

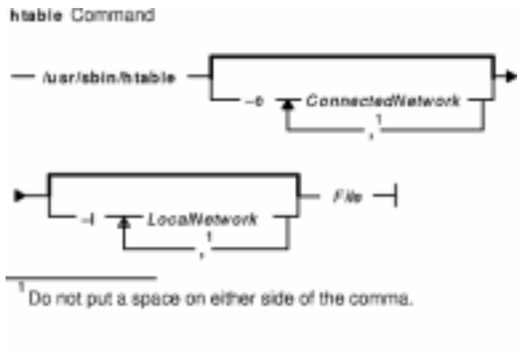
Network Terminal Accelerator Overview in *AIX Versions 3.2 and 4 Asynchronous Communications Guide*.

htable Command

Purpose

Converts host files to the format used by network library routines.

Syntax



/usr/sbin/htable [**−c** *ConnectedNetwork* [**,***ConnectedNetwork* ...]] [**−l** *LocalNetworks* [**,***LocalNetworks* ...]] *File*

Note: Do not put a space on either side of the comma.

Description

The **htable** command converts host files in the format specified in RFC 810 to the format used by the network library routines. The conversion creates three files: the **/etc/hosts** file, the **/etc/networks** file, and the **/etc/gateways** file.

The **gethostbyname** subroutine uses the **hosts** file for mapping host names to addresses when the **named** daemon is not used. The **getnetent** subroutine uses the **networks** file for mapping network names to numbers.

The **gateways** file may be used by the **routed** daemon in identifying passive Internet gateways.

If any local **hosts**, **networks**, or **gateways** files (**localhosts**, **localnetworks**, or **localgateways** respectively) exist in the current directory, that file's contents are prepended to the output file. Of these, the **htable** program only interprets the **gateways** file. Prepending the contents allows sites to maintain local entries that are not normally present in the master database.

Flags

−c*ConnectedNetwork*	Specifies a list of networks to which the host is directly connected if the network routing daemons use the **gateways** file. Separate the networks with commas, and use the network name or standard Internet dot notation (for example, `−c arpanet,128.32,LocalEthernet`). The **htable** command only includes gateways that are directly connected to one of the networks specified or that can be reached from another gateway on a connected network.
−l*LocalNetworks*	Specifies a list of networks for the **htable** command to treat as local. Take information about hosts on local networks only from the **localhosts** file. Separate the networks

with commas, and use the network name or standard Internet dot notation (for example, `-l 128.32,local-ether-net`). Entries for local hosts from the main database are omitted so that the **localhosts** file can override entries in the input file (the file you specify on the command line).

Files

/*CurrentDirectory*/**localgateways**	Contains local gateway information.
/*CurrentDirectory*/**localhosts**	Contains local host name information.
/*CurrentDirectory*/**localnetworks**	Contains local network information.

Related Information

The **gettable** command.

The **named** daemon, **routed** daemon.

The **gateways** file format, **hosts** file format, **networks** file format.

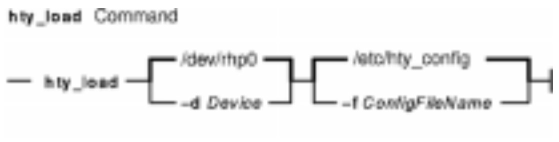
Gateways in *AIX Version 4.3 System Management Guide: Communications and Networks*.

hty_load Command

Purpose

Displays or downloads Network Terminal Accelerator (NTX) adapter configurations.

Syntax



hty_load [**−d***Device*] [**−f***ConfigFileName*]

Description

The **hty_load** command displays or downloads adapter configurations. If you issue this command without any flags, the system displays the current adapter configuration for the **/dev/rhp0** device file. Given a *Device* parameter, the **hty_load** command loads a configuration file into the tty driver. The tty driver uses the file to configure both the host presentation services (HPS) and the adapters.

Typically, the **hty_load** command is invoked from the **/etc/rc.ntx** file. For more information about adapter configurations, see "Network Terminal Accelerator Installation and Configuration" in *AIX Versions 3.2 and 4 Asynchronous Communications Guide*.

The Configuration File

The **hty_load** command uses a single configuration file to configure the adapters. Each entry is on a separate line. Entries are separated by new−line characters. Fields in an entry are separated by tabs or space characters. Entries in the configuration file have the following fields.:

```
MinorNumber Cluster NumberOfPorts
```

These fields have the following values:

MinorNumber	Specifies the board's minor device number.
Cluster	This field is always 1.
NumberOfPorts	Specifies the number of hty devices. The number depends on the model of adapter you are using. The number of available channels is from 1 to 256 for a 2MB board or from 1 to 2048 for an 8MB board.

The configuration file also supports comments. Comment lines begin with a # (pound sign). Everything to the right of the comment character is ignored. Comment lines end with new−line characters.

Flags

−d*Device*	Specifies the raw device file name of the adapter. Use this option to override the default device name **/dev/rhp0**.
−f*ConfigFileName*	Specifies the driver configuration file name. The default configuration file is the

/etc/hty_config file.

Exit Status

This command returns the following exit values:

0	Successful completion.
>0	An error occurred.

Security

Access Control: You must have root authority to run this command.

Auditing Events: N/A

Examples

To load the system configuration and use the default driver configuration file, enter:

```
hty_load -d /dev/rhp0
```

Files

/usr/bin/hty_load	Contains the **hty_load** command.
/etc/rc.ntx	Invokes the **hty_load** command.
/etc/hty_config	Default NTX driver configuration file name.
/dev/rhp0	Default NTX raw device file name.

Related Information

The **/dev/rhp** file.

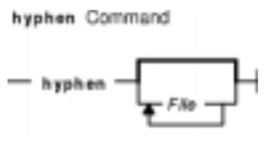
"Network Terminal Accelerator Installation and Configuration" in *AIX Versions 3.2 and 4 Asynchronous Communications Guide*.

hyphen Command

Purpose

Finds hyphenated words.

Syntax



hyphen [*File* ...]

Description

The **hyphen** command reads one or more English−language files, finds all the lines ending with hyphenated words, and writes those words to standard output. The parameter *File* specifies English−language files to be read by the **hyphen** command. The default is standard input. If no file is specified or if the − (hyphen) is specified as the last file name, the **hyphen** command reads standard input. The **hyphen** command can be used as a filter.

> **Note:** The **hyphen** command cannot read hyphenated words that are italic or underlined. The **hyphen** command sometimes gives unnecessary output.

Examples

To check the hyphenation performed by a text−formatting program on a file, enter:

```
mm [Flag...] [File...] | hyphen
```

Related Information

The **mm** command, **troff** command.

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