

AS400 Agent Version 2.6

Installation and User's Guide

STOREWAY DPA



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AS400 Agent Version 2.6

Installation and User's Guide

Software

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Chapter 1. StoreWay DPA AS/400 agent overview

The StoreWay DPA AS/400 agent enables the backup of an AS/400 machine over a network to a StoreWay DPA.

The backup and restoration is performed using several parallel data flows. Through its simplicity of use and the backup, the StoreWay DPA AS/400 agent brings the user the flexibility to backup management.

This document aims to explain how to configure the StoreWay DPA in order to perform backups on your AS/400 system. It explains how to:

- > Select the components of an AS/400 system.
- > Back up les trois types de composants d'un system AS/400: IFS, QDLS, QSYS.LIB.
- > Restore with or without redirection the different AS/400 components:
 - IFS arborescence,
 - DLO folders or documents,
 - libraries,
 - all types of associated objects: member sources, member data, pgm, dtaara, ...

WARNING: The StoreWay DPA AS/400 agent only performs applicative backups. The StoreWay DPA AS/400 agent cannot write data to peripherals directly connected to the AS/400.

Technical Prerequisites

- > AS/400 on Versions OS/400 V5R1M0 or higher.
- > A StoreWay DPA version 2.6.200 or higher.

NOTE: To find out the version of StoreWay DPA you are using, open the StoreWay DPA interface and check the version under the StoreWay DPA logo in the top left hand of the home page.

- > Installation of the AS/400 agent avec les droits QSECOFR.
- > 50 MB available disk space for the installation of the ESAVE library.
- > During backup, restrict the use of CPU by open applications.
- > TCP/IP Protocol installed and correctly configured: the StoreWay DPA must «recognize» (via the ping command) the AS/400 agent. The opposite must also be true; you should be able to ping the StoreWay DPA from the AS/400 machine.

StoreWay DPA AS/400 agent features

The StoreWay DPA AS/400 agent backs up and restores your system application data:

- > Libraries *ALLUSR (QSYSLIB).
- > Folders or documents DLO (QDLS).
- > The IFS file tree.

NOTE: To ensure the complete data backup, the subsystem stoppage mechanism (except for the StoreWay DPA AS/400 agent subsystem) will need to be managed.

StoreWay DPA AS/400 agent features

The following table shows the main features and limitations of the StoreWay DPA AS/400 agent.

General features of the StoreWay DPA AS/400 agent	
Selection of the complete machine.	YES
Detailed selection of components via the StoreWay DPA interface.	YES
Backup of system data.	NO
Backup of application data.	YES
Parallel backup of components of the same machine (family) (*).	YES
Incremental backup.	YES
Occasional backup.	YES
Scheduled backup.	YES
Encryption.	NO
Execute processing on the StoreWay DPA AS/400agent before and after backup.	YES

*: ESAVE_ variables are not modifiable in the StoreWay DPA. It is set to 1. The agent is mono-flow.

** : The SAVNOBKP file must be created in **/backupappliance/esave/config**.

Chapter 2. Installation

Installation of the StoreWay DPA AS/400 agent

- 1 Insert the CD into the I'AS/400 (minimum version V5R1M0).
- 2 Use the following command to load the installation pack from the CD drive «**OPT01** » (or «**OPT02** » if the disk is "virtual").
- 3 In a command line, enter:
LODRUN DEV(OPT01) DIR('/PACKS/AS/400')
- 4 Specify the name of the installation library ("ESAVE" by default).

NOTE: This name will be used to create a profile of the same name in the distribution spool. This distribution does not support certain characters «_» or «à» for example. This name will be included in the distribution package which requires a name limited to 8 characters.

Data installed on the AS/400 machine after the LODRUN

- 1 Creation of the library specified at installation (ESAVE by default). This library contains the data and programmes required for the StoreWay DPA AS/400 agent.
- 2 Creation of a subsystem with the same name as the installation library in this same installation library. The job **ESAVDAEMON** will run in this subsystem to ensure dialogue with the StoreWay DPA. The **ESAVSTRSBS** command enables us to start the subsystem and submit the **ESAVDAEMON** job.
- 3 Creation of a profile and queue message with the same name as the installation library.
- 4 Creation of a «backupappliance» directory (in the IFS layer visible via the native command **OS400 WRKLNK '/'**), containing another directory which has the same name as the installation library, (ESAVE by default). It contains the following directories:
 - **config**: configuration agent.
 - **log**: history of actions and events. Files can be consulted using the **EDTF** command in the installation library.
 - **tables**: ascii to ebcdic conversion.

Chapter 3. Configure the AS/400 system

Modification of the «ESAVEINI » member

WARNING: Use 10 characters maximum when defining the member. This member is contained in the file «ESAVEINI » in the library created during the installation.

NOTE: If the ESAVEINI file does not exist in the installation library (ESAVE by default) run the command:

```
CRTDUPOBJ OBJ(ESAVEINI) FROMLIB(QTEMP) OBJTYPE(*FILE)
TOLIB(<library_install>) NEWOBJ(ESAVEINI) DATA(*YES)
```

Replace <library_install> with the name of the installation library (ESAVE by default):

With the command **STRPDM + enter**.

- > **Option 3: Member management + enter.** Enter the ESAVEINI file, the installation library and the member **ESAVEINI + enter**.

```
Selection of members
Enter your choice and select ENTER.
File . . . . . ESAVEINI Name, F4 for list
Library . . . . . <library_install> *LIBL, *CURLIB, name
Member:
Name . . . . . ESAVEINI *ALL, name, *generic*
Type . . . . . *ALL *ALL, type, *generic*, *BLANK
```

- > **Option 2: Edit the source + enter.**

```
PDM - Member management SYSTEML
File . . . . . ESAVEINI
Library . <library_install> Display from.
Enter your options, then press ENTER.
2=Edit 3=Copy 4=Delete 5=Display 6=Print 7=Rename
8=Description 9=Back up 13=Modify text 14=Compile 15=Create module...
Opt Member Type Text
2 ESAVEINI TXT configuration file for ESAVE AS/400
End
Parameters or command
===>
```

- > Navigate to the installation library:

/< library_install>.LIB (by default: ESAVE.LIB)

```
SEU==> ESAVEINI
FMT ** .+. 1 .+. 2 .+. 3 .+. 4 .+. 5 .+. 6 .+. 7 .+. 8 .+. 9 .+. 0 .+.
1 .+. 2
***** Data begin *****
0001.00 [ESAVE]
0002.00 INSTALL_DIR=/backupappliance/esave
0003.00
***** Data end*****
```

Use the EDTF command

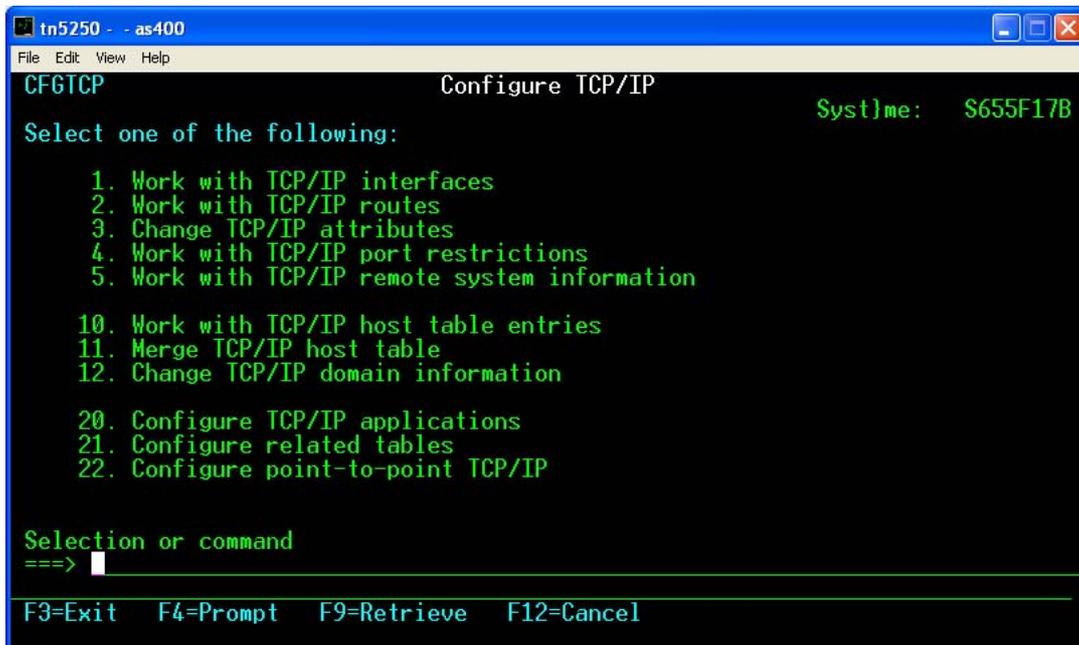
- > Enter the name of the master backup server: **/backupappliance/ <library_install>/config/admin.cfg,**

NOTE: «library_install» refers to the name of the library specified at the time of installation.

- > Ensure that the StoreWay DPA is known to the AS/400 with the command:
PING <backup server name> and inversely.
- > See below for details of option 10 of the **CFGTCP** command.

Check your TCP configuration:

With the QSECOFR profile, enter the command
CFGTCP + enter:

A screenshot of a terminal window titled "tn5250 - - as400". The window displays the "Configure TCP/IP" menu. At the top, it says "CFGTCP" and "Configure TCP/IP". On the right, it shows "Sys}me: S655F17B". The main text says "Select one of the following:" followed by a list of 22 options. Option 10, "Work with TCP/IP host table entries", is highlighted. Below the list, it says "Selection or command" and "===>" with a cursor. At the bottom, it lists function keys: "F3=Exit F4=Prompt F9=Retrieve F12=Cancel".

```
tn5250 - - as400
File Edit View Help
CFGTCP                      Configure TCP/IP                      Sys}me: S655F17B
Select one of the following:
1. Work with TCP/IP interfaces
2. Work with TCP/IP routes
3. Change TCP/IP attributes
4. Work with TCP/IP port restrictions
5. Work with TCP/IP remote system information
10. Work with TCP/IP host table entries
11. Merge TCP/IP host table
12. Change TCP/IP domain information
20. Configure TCP/IP applications
21. Configure related tables
22. Configure point-to-point TCP/IP
Selection or command
===>
F3=Exit F4=Prompt F9=Retrieve F12=Cancel
```

- > Option 10: **Work with TCP/IP Host Table Entries + enter:**

```

tn5250 - - as400
File Edit View Help
Work with TCP/IP Host Table Entries
Systeme: S655F17B
Type options, press Enter.
 1=Add  2=Change  4=Remove  5=Display  7=Rename

Internet      Host
Opt  Address   Name
---
 127.0.0.1    LOOPBACK
             LOCALHOST
 172.16.XX.XXX DEVXDT
 172.16.XX.XXX MBPROTO2
 172.16.XX.XXX LBTEST
 172.16.XX.XXX MB26200

F3=Exit  F5=Refresh  F6=Print list  F12=Cancel  F17=Position to
Fin
5250                      MW                      003/008

```

- > Check the list and add, if necessary, the name of the backup server in line with the following selected configuration:
- > Option 03: **Change TCP/IP attributes (CHGTCPA)**

```

TCP keep alive . . . . . 120 1-40320, *SAME, *DFT
TCP urgent pointer . . . . . *BSD *SAME, *BSD, *RFC
TCP receive buffer size . . . . . 8192 512-8388608, *SAME, *DFT
TCP send buffer size . . . . . 8192 512-8388608, *SAME, *DFT
TCP R1 retransmission count . . . 3 1-15, *SAME, *DFT
TCP R2 retransmission count . . . 16 2-16, *SAME, *DFT
TCP minimum retransmit time . . . 250 100-1000, *SAME, *DFT
TCP closed timewait timeout . . . 120 0-14400, *SAME, *DFT
TCP close connection message . . *THRESHOLD *SAME, *THRESHOLD, *ALL...
UDP checksum . . . . . *YES *SAME, *YES, *NO
Path MTU discovery:
  Enablement . . . . . *YES *SAME, *DFT, *NO, *YES
  Interval . . . . . 10 5-40320, *ONCE
IP datagram forwarding . . . . . *NO *SAME, *YES, *NO
IP source routing . . . . . *YES *SAME, *YES, *NO
IP reassembly time-out . . . . . 10 5-120, *SAME, *DFT

```

Two methods to configure TCP:

First method: The AS/400 address is configured in the tables. The StoreWay DPA needs a domain name.

- > Option 10. **Work with TCP/IP Host Table Entries + enter**
Check the list and add, if necessary, the name of the backup server.
- > Option 12: **Change TCP/IP domain information + enter**
Parameters:

HOSTNAME	Machine name
Domain name	> Domain name (for example ibm.com)
Domain search list	> *DFT
Hostname Search Priority	> *LOCAL *REMOTE *SAME
Domain name server Internet address	> DNS IP address

Second method: The address is not given in the tables, but you need "LOOPBACK & LOCALHOST".

- > Option 10. **Work with TCP/IP Host Table Entries + enter.**
Need Host Name LOOPBACK & LOCALHOST (details given in option 01 "Work with TCP/IP interfaces").

Add the profile which has the name <library_install>

In the distribution package, use the command

- > **ADDIRE USRID(<name library_install> LOCAL) USRD('ESAVE') USER(<name library_install>).**

NOTE: The <name library_install> of the USRID parameter must be 8 characters long (OS/400 constraints for versions before V5R1M0).

Modify prestart jobs QANEAGNT in the QSYSWRK subsystem

Use the command:

DSPSBSD QSYSWRK + enter

- > Option 10: **Workstations prestart + enter.**

The **CHGPJE** command enables you to modify this information

CHGPJE SBSD(QSYS/QSYSWRK) PGM(QSYS/QANEAGNT) MAXUSE(1)

- > Return to the prestart jobs management commands by entering the command:

GO CMDPJE

- > Add the subsystem restart command (**ESAVSTRSBS**) in the referenced source programme in the system value **QSTRUPPGM** and compile.

WARNING: The installation library must be online before running the **ESAVSTRSBS** command. (WRKSYSVAL QSTRUPPGM enables you to identify the name of the programme and its library).

- > The **ESAVSTRSBS** command allows you to start the subsystem and submit the **ESAVDAEMON** job.
- > Line times can have an incidence on backup times.
- > Check the line parameters with the **WRKLIND** command:
- > Select Option 5 to display the description of the line.

- > **Line speed:** *AUTO. the value of the line speed is set by the equipment using the automatic negotiation.
- > **Bidirectionnel:** *AUTO. the duplex value is set by the equipment which uses the automatic negotiation.

WARNING: The following procedure will enable you to change the IP line configuration but will stop the TCP. Do not forget to warn users of this.

ENDHOSTSRV *ALL

ENDTCPSRV *ALL

ENDTCP

Ensure that the line is down before performing the change with option 2:
«modification ».

STRTCP

STRTCPSRV *ALL

STRHOSTSRV *ALL

Chapter 4. AS/400 system backup

See:

[Perform an AS/400 system backup" on page 18.](#)

[AS/400 backup follow-up" on page 19.](#)

Perform an AS/400 system backup

- 1 In the StoreWay DPA interface, open the **configuration/Systems** page.
- 2 Click on the button **Create a new system** () and complete the fields on the page which opens in the central pane.
- 3 Once the StoreWay DPA AS/400 agent is installed on your system AS/400, this machine will be auto detected by the StoreWay DPA. You need to declare it then associate it with a backup profile.
 - In the **Description** section, select **Type: OS/400**.
 - In the **Backup** section you can select a Synthetic backup. A synthetic backup combines the last total backup of selected data and all subsequent incremental backups.
 - In the section **Data to back up** add a directory name (for example /IFS/QSR).
 - **WARNING:** The option **Data to exclude** is not activated for the AS/400.
 - Select a backup profile for this system.

For more information on system creation please consult the StoreWay DPA online help system.

AS/400 backup follow-up

To display available backup history:

- 1 Log on to the StoreWay DPA and click on the **operations/Backup** menu.
- 2 In left-hand menu, select your AS/400 system.
- 3 Select the **Backup activity** tab; you can visualize backups performed on your system.
- 4 Click on an icon in the **Status** column to display more information on this particular backup.

Chapter 5. System restoration

Perform a restoration of the AS/400 system

See Chapter 6 of the Quick Start guide for more information on how to perform a restoration using your StoreWay DPA.

Chapter 6. StoreWay DPA AS/400 agent: limitations

List of omitted objects

This version does not enable you to omit:

- > objects from a Library backup (Commands **SAVLIB** – **SAVOBJ** - **SAVCHGOBJ**, parameter: **OMITOBJ**),
- > sub-folders during folder backups (Command **SAVDLO**, parameter **OMITFLR**).

The omission of libraries is set in the **/backupappliance/esave/config/SAVNOBKP** file. This feature is only implemented for *ALLUSR library backups and IFS backups – in other words, when the object navigator selects the following objects:

- > machine_name:/QSYS.LIB
- > machine_name:/IFS

```
Edit File: /backupappliance/esave/config/SAVNOBKP
```

```
Record .: 1 of 5 by 10 Column: 1 of 59 by 126
```

```
Control:
```

```
*****Data begins*****
```

```
/IFS/QOpenSys
```

```
/IFS/QOPT
```

```
/IFS/QSR
```

```
/IFS/QTCPTMM
```

```
/QSYS.LIB/TOTO.LIB
```

```
/QSYS.LIB/MPRTESTSV.LIB
```

```
/QSYS.LIB/MPRAVE.LIB
```

```
/QSYS.LIB/MPRAUTO.LIB
```

```
/QSYS.LIB/MPR_NEARTK.LIB
```

```
*****Data ends*****
```

Filter errors in the master server log (noerror.bkp)

Certain objects on the AS/400 cannot be backed up as they are systematically locked during backup.

To avoid including this information in the log, you can configure the «noerror.bkp» file which is located in «< install_dir>/esave/config».

```
Browse: /backupappliance/esave/config/noerror.bkp
```

```
Record .: 54 of 61 by 18 Column: 1 of 78 by 131
```

```
Control:
```

```
#####
```

```
# Files located in the $(TMP) directory.
```

```
#####
```

```
#
```

```
$(TMP)
```

```
/QSYS.LIB/FG.LIB/ABC.PGM
```

```
/QSYS.LIB/FG.LIB/DTAAREA.DTAARA
```

```
/IFS/backupappliance
```

```
/IFS/backupappliance/ESAVE/log
```

```
/QSYS.LIB/QUSRSYS.LIB
```

```
/QSYS.LIB/QMPGDATA.LIB
```

```
/IFS/QSR
```

```
/IFS/QFileSvr.400
```

/IFS/QOPT

Restoration with redirection of a library (with a different name)

The library must be created on the AS/400 in question because the QaneRsta API does not do this. Request the creation of the library thanks to the preference variable "ESAVE_AS400_CREATE_LIB" "1".

Restoration of objects from within a specified date

Object restoration must be launched for each date of the backups in question.

Backup/Restoration of a member file

The full or incremental backup of a member file (example: /QSYS.LIB/malib.LIB/monfile.FILE/my_member.MBR) is performed but the restoration fails because the MBROPT parameter on the QSYS/RSTOBJ command is specified with the default value *MATCH.

However, if you need to restore a member file, follow this procedure:

- 1 Modify the default value of the QSYS/RSTOBJ command for the parameter: MBROPT(*xxx) xxx being the value to use.
Command: **CHGCMDDFT CMD(QSYS/RSTOBJ) NEWDFT('MBROPT(*xxx)')**
Same procedure for a library restoration which contains member files.
- 2 Start the restoration from the StoreWay DPA interface.
- 3 Return the parameter MBROPT to its initial state with the command **QSYS/RSTOBJ**

History of operations in the StoreWay DPA interface

Some IFS folders cannot be saved:

- > /QFileSvr.400
- > /QNTC
- > /QOPT
- > /QSR

It is possible to omit these objects at the time of backup by specifying them on the AS/400 agent in the SAVNOBKP file /**backupappliance/esave/config**.

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