

Bull Performance Report Server Edition

User's Guide



ESCALA

Bull Performance Report

Server Edition

User's Guide

Software

June 2007

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Preface

Scope and Objectives

The purpose of this guide is to explain how to install, configure and use *Bull Performance Report Server Edition* (BPRse) on Bull Escala SP-LPAR-capable (Shared Processor Logical Partition) systems, running AIX 5.3 or later.

Intended Readers

This guide is for AIX administrators of Bull Escala systems.

Structure

This guide is organized as follows:

- Chapter 1 *Concepts and Components Overview*, describes the functionalities and the different components of the *Bull Performance Report Server Edition* product.
- Chapter 2 *Installation and Configuration*, describes how to install, set up and configure *Bull Performance Report Server Edition* (BPRse) product on **BPRse server** and **BPRse client(s)**.
- Chapter 3 *Using BPR Watch*, User Interface explains how to use the BPR Watch application, which is the Web interface of the BPRse product.
- Chapter 4 *Internal Architecture* describes the different processes used by the **BPRse client** and **server** to collect, analyse and build statistics and graphs from collected files.
- Chapter 5 *Administration and Troubleshooting* describes some tips and tricks you should be aware of, as administrator of BPRse.

Related publications

- The *Software Release Bulletin for AIX 5.3 and Bull Enhancement* (SRB) provides release-specific information, restrictions and known problems for BPRse and other Bull products.

Highlighting

- Commands entered by the user are in a frame in "Courier" font. Example:
`mkdir /var/lib/newdir`
- Commands, files, directories and other items whose names are predefined by the system are in "Bold". Example:
The **/etc/sysconfig/dump** file.

- Text and messages displayed by the system to illustrate explanations are in "Courier New" font. Example:
BIOS Intel
- *Italics* identifies referenced publications, chapters, sections, figures, and tables.
- < > identifies parameters to be supplied by the user. Example:
<node_name>

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Chapter 1. Concepts and Components Overview

1.1 Functionalities

Bull Performance Report Server Edition (BPRse) is a web-based application, providing daily, weekly and monthly statistics and graphs of shared processor pool utilization on SP-LPAR-capable Escala systems. Statistics and graphs are based on metrics collected from one of the partitions of the SP-LPAR-capable system (collecting partition) by the use of topas Cross-Partition Recording tool.

Abnormal conditions are highlighted to make easier the detection of potential problems.

1.2 Bull Performance Report Server Edition Architecture

The *Bull Performance Report Server Edition* is composed of two parts:

- A client part running on one of the partitions of each SP-LPAR-capable Escala system to monitor; the client executes the collects of metrics from all other partitions of the system.
- A server part running on one standalone AIX machine or partition; the server builds graphs, statistics and html pages.

Terminology

- **BPRse client** refers to a single partition of a SP-LPAR-capable system where daily metrics are effectively collected and recorded. The term **collecting partition** is also used to designate the **BPRse client**.
- **Collected partitions** refer to other partitions of the SP-LPAR-capable system.
- **BPRse server** refers to the machine where collected data from client machines is stored, analysed and where html pages are generated to show graphs and statistics.

1.2.1 BPRse Client

The **BPRse client** runs the Topas Cross-Partition Recording Tool (**topas -R** option) to collect and record metrics from all the partitions of the SP-LPAR-capable system.

The **topas** command is executed in the background (with no display) and records the cross-Partition data. Recording files are stored in the **/etc/perf** directory in the form **topas_cec.YYMMDD**. Recordings cover single-day period (24 hours) and are retained for 8 days before being automatically deleted. This allows a week worth of data to be retained on the system at all times. The **topasout** command is used to convert these recordings into text-based reports (**topas_cec.YYMMDD_01**).

The **BPRse client** sends collected reports (**topas_cec.YYMMDD_01**) to the **BPRse server** every day, using FTP (or SSH)

1.2.2 BPRse Server

The **BPRse server** receives the daily collected reports from each **BPRse client**.

The **BPRse server** stores the reports in a directory hierarchy, then analyses the reports to calculate statistics and generates graphs showing (for a day, a week and a month):

- the shared processor pool utilization of each SP-LPAR-capable monitored system.
- the physical CPU utilization of the shared partitions of the SP-LPAR-capable system.



CAUTION:

Full-system partitions and dedicated partitions are not taken into account.

Then the **BPRse server** builds the html pages presenting the daily, weekly and monthly statistics and graphs and highlights abnormal situations (red for critical, orange for warning). This is performed once a day, using a cron.

You must use a Web browser to navigate through all the statistics and graphs views.

1.3 Hardware Requirements

The *Bull Performance Report Server Edition* product can monitor any SP-LPAR-capable Escala system.

The **BPRse server** can run on a AIX standalone server or partition.

The **BPRse client** can only run in a partition of a SP-LPAR-capable system.

1.4 Software Requirements

The minimum required AIX level is AIX 5.3 Technical Level 05.

See also *Prerequisites* on page 2-1 for required software.

Chapter 2. Installation and Configuration

This chapter describes how to install, set up and configure *Bull Performance Report Server Edition* (BPRse) product on **BPRse server** and **BPRse client(s)**.

2.1 Installing Bull Performance Report Server Edition

Bull Performance Report Server Edition product is not factory pre-loaded. The software is composed of two filesets, **bprse.server** and **bprse.client**, to be installed respectively on **BPRse server** and each **BPRse client**.

2.1.1 Prerequisites

On BPRse server

The **bprse.server** fileset requires:

- Virtual Frame Buffer for AIX windows (**X11.vfb** fileset)
- Java 1.4 Software Development Kit (**Java14.sdk** fileset)
- gawk utility (**gawk** rpm)
- unzip utility (**unzip** rpm)
- md5sum utility (**coreutils** rpm)

In addition, a HTTP server is required. If no HTTP server is installed, we recommend to install the IBM HTTP Server (**IHS2** fileset).

On BPRse client

Bull Performance Report Server Edition software requires AIX 5L for POWER V5.3 TL 05 or higher on **BPRse client(s)**.

The **bprse.client** fileset requires **perfagent.tools** fileset.

Optional software

If you plan to use **ssh** instead of **ftp** for transferring collected data from **BPRse client(s)** to **BPRse server**, the following software must be installed on **BPRse server** and **BPRse client(s)**:

- Open Secure Shell (**openssh.base** fileset)
- Secure Sockets Layer and cryptography libraries and tools (**openssl** rpm)

2.1.2 Read the Software Release Bulletin

Read the SRB (*Software Release Bulletin for Bull Enhancement*) that comes with the software. It includes environment requirements and restrictions as well as late-breaking news. The SRB also includes the procedure to install the software.

2.1.3 AIX Files Modified by Bull Performance Report Server Edition Scripts

The *Bull Performance Report Server Edition* software installation modifies the following AIX files.

On BPRse server

<code>/etc/inittab</code>	To automatically start Virtual frame Buffer for AIXwindows.
<code>/var/spool/cron/crontabs/bpr</code>	To daily, weekly and monthly process data collected by BPRse client(s) and generate graphs, statistics and html pages.
<code>/etc/passwd, /etc/group</code>	To create bpr group and bpr user.

On BPRse client

<code>/etc/inittab</code>	To automatically start metrics collecting and recording (execute command <code>topas -R</code>)
<code>/var/spool/cron/crontabs/root</code>	To daily transfer collected data to BPRse server

2.2 Configuring Bull Performance Report Server Edition

You must configure **BPRse server** first, then **BPRse client(s)**.

2.2.1 Configuring BPRse Server

This section explains how to set up **BPRse server** and how to get started.

At installation time, **BPRse server** is configured as follows:

- The **bpr** user and **bpr** group are created
- The working directories in the home directory of the **bpr** user are created
- The default configuration files are created
- The **crontab** entry for **bpr** user is updated to execute daily, weekly and monthly processing on stored collects
- The **inittab** is updated for launching virtual frame buffer for AIXwindows.

You have to complete the configuration as follows:

- Set up the **bpr** user password
- Edit/modify configuration files
- Check disk space
- Set up/start HTTP server.

**Note:**

If you encounter problems to configure **BPRse server**, refer to *Administration and Troubleshooting*, on page 5-1.

2.2.1.1 Setting Up the bpr User Password

The **bpr** AIX user is created at *Bull Performance Report Server Edition* installation time. This user will be used for processing collects and generating graphs and html pages.

To set up the **bpr** password:

1. Login as **root** user.
2. Use a standard AIX method to set an AIX password for the **bpr** user.
3. Logout.
4. Login as **bpr** user and set the password again.
5. Logout.

2.2.1.2 Editing Configuration Files

There are three configuration files, located in the `/home/bpr/bpr_conf` directory:

- **machines.list**
- **bpr.conf**
- **thresholds.default**

Login as **bpr** user to edit these files and modify the default values, if necessary, as explained below.

machines.list

You must create a **machines.list** file. This file lists the machines to monitor and the collecting partition for each of them. An example is available (**machines.list.sample** file).

syntax:

```
<collecting_partition_hostname>=<machine_name>
```

**Note:**

machine_name is the name of the machine as displayed in the html pages and graphs. It is recommended to use the name defined in Hardware Management Console (**Properties** menu of the Managed Server).

Create and edit the **machines.list** file to set correct values.

For example, you want to monitor two machines (p11650 and p16450). The collecting partition for p16450 is `partitionA` and the collecting partition for p11650 is `partitionB`. The `machines.list` file is as follows:

```
partitionA=p16450
partitionB=p11650
```

`bpr.conf`

This file indicates how long daily, weekly and monthly graphs and stored collects are kept.

Default values are:

```
keep_day=62
keep_week=52
keep_month=12
keep_collect=1
```

- | | |
|---------------------|--|
| keep_day | Number of daily graphs to keep in the <code>/home/bpr/bpr_graphes</code> directory (expressed in number of days). |
| keep_week | Number of weekly graphs to keep in the <code>/home/bpr/bpr_graphes</code> directory (expressed in number of weeks). |
| keep_month | Number of monthly graphs to keep in the <code>/home/bpr/bpr_graphes</code> directory (expressed in number of months). |
| keep_collect | Number of processed collects to keep in the <code>/home/bpr/bpr_process/<machine>/DAY</code> directories and number of collects to keep in the <code>/home/bpr/bpr_output</code> directories (expressed in months).
Example: <code>keep_collect=1</code> means that two months are kept (the currently processed month and the previous month). |

`thresholds.default`

This file contains thresholds values for monitoring shared processor pool utilization and partition processor utilization.

Default values are:

```
warn=70
high=90
low=0
limit=100
```

- Parameters/values related to the shared pool utilization:

Shared pool utilization is computed from shared physical busy and pool size (`shr_physb` and `poolsize` metrics in the collected file).

- | | |
|-------------|--|
| warn | Warning threshold value expressed in percentage of the shared processor pool. The values greater than this threshold appear in ORANGE color. |
| high | High threshold value expressed in percentage of the shared processor pool. The values greater than this threshold appear in RED color. |

The values under these thresholds values appear in GREEN color.

- Parameters/values related to the partition processor utilization
Partition CPU utilization is computed from the number of physical processors consumed and the maximum of CPU usable by the partition (**physc**, **entc**, **lcpu**, **smt** and **capped** metrics in the collected file)

low	Low threshold value expressed in percentage of the shared processor pool. Partitions for which the average utilization is less than this threshold are indicated by a blue square.
limit	Value expressed in percentage of the shared processor pool. Partitions for which the average utilization (day or night) is greater than this value are indicated by a red square.

The default values (0 and 100) disable threshold activation for partitions.

2.2.1.3 Checking Disk Space



Important:

It is recommended to create file systems for the storing and processing of the collected files. (Respectively with mounting points `/home/bpr/bpr_output`, `/home/bpr/bpr_process` and `/home/bpr/bpr_graphes`).

You have to check if there is enough space in the `/home/bpr` directory where the collected files from the monitored machines are stored, analysed and where graphs are generated:

- `/home/bpr/bpr_output` directory
- `/home/bpr/bpr_process` directory
- `/home/bpr/bpr_graphes` directory

The required disk space depends on:

- the number of machines,
- the number of partitions,
- the number of graphs to keep (**keep_day**, **keep_week** and **keep_month** values in **bpr.conf** file),
- the number of processed collects to keep (**keep_collect** value in **bpr.conf** file).

Refer to *Editing Configuration Files*, on page 2-3 for more details.

`/home/bpr/bpr_output`

This directory contains collected files (**topas_cec.YYMMDD_01**) of all machines to monitor. The directory hierarchy is the following:

`/home/bpr/bpr_output/<collecting partition hostname>/topas_cec.*`

The size of the collected files depends on the number of partitions of the SP-LPAR-capable system. The estimated size is about **2MB** per day for one partition.

- A machine with 8 partitions requires **16MB** for one **topas_cec.YYMMDD_01** file.
- A machine with 24 partitions requires **48MB** for one **topas_cec.YYMMDD_01** file.

For **one** machine, the estimated size for **2 months** of collect (default duration) is:

`2MB x number of partitions x 60 days`

For a machine with 8 partitions, if you keep default values in **bpr.conf** file, the estimated sizes are:

960 MB for `/home/bpr/bpr_output/<collecting partition hostname>`
(if you delete oldest collects *.done)

The oldest collected files are renamed into `topas_cec.YYMMDD_01.done`. You can backup them on any support and delete them from the `/home/bpr/bpr_output/<collecting partition hostname>` directory.

Refer also to *Checking Disk Space*, on page 2-8 and to *Saving Disk Space*, on page 5-4. for more information.

[/home/bpr/bpr_process](#)

This directory contains the results of analysis of collected files (for day, week and month). The directory hierarchy is the following:

`/home/bpr/bpr_process/<machine name>/DAY/bpr_/YY/MM/DD`
`/home/bpr/bpr_process/<machine name>/WEEK`
`/home/bpr/bpr_process/<machine name>/MONTH`

In addition, there is a directory for logs files:

`/home/bpr/bpr_process/.LOGS`

The size for the result of one day of analysis is about **0,5 MB** for one partition.

For **one** machine, the estimated size for **2 months** of analysis (`keep_collect=1`) is:

$0,5\text{MB} \times \text{number of partitions} \times 60 \text{ days}$

For a machine with 8 partitions, if you keep default values in **bpr.conf** file, the estimated sizes are:

240 MB for `/home/bpr/bpr_process/<machine name>`

[/home/bpr/bpr_graphes](#)

This directory contains the graphs and statistics files (for day, week and month).

The directory hierarchy is the following:

`/home/bpr/bpr_graphes/<machine name>/DAY`
`/home/bpr/bpr_graphes/<machine name>/WEEK`
`/home/bpr/bpr_graphes/<machine name>/MONTH`

The size for the graph and statistics of one day (or one week or one month) is about **0,04 MB** for one partition.

For **one** machine, the estimated size for **2 months** of daily graphs (`keep_day=62`) is:

$0,04\text{MB} \times \text{number of partitions} \times 62 \text{ days}$

For a machine with 8 partitions, if you keep default values in **bpr.conf** file, the estimated sizes are:

40 MB for `/home/bpr/bpr_graphes/<machine name>`

For **one** machine, the estimated size for **1 year** of weekly and monthly graphs (keep_week=52 and keep_month=12) is:

(0,04MB x number of partitions x 52 weeks) + (0,04MB x number of partitions x 12 months)

2.2.1.4 Setting up/Starting HTTP Server

The **BPRse server** Web interface relies on the mechanisms of IBM HTTP server, including its password-related features.

Setting up HTTP server

To configure HTTP server for **BPRse server**, add the following directive in HTTP Server configuration file (usually in `/usr/HTTPServer/conf/httpd.conf` file):

```
include /usr/lpp/bprse.server/bprw-httpd.conf
```

This file contains all needed information for HTTP Server configuration such as user, directory index, alias, script alias, password management ...)

BPRse server Web interface prompts for a user ID and a password. You must always specify **bprw** for user ID. Default password is **bprw**. To change the password, refer to *Changing BPR Watch Password*, on page 5-1.

Start or restart HTTP Server

Usually, run the following commands to start / restart HTTP Server:

```
/usr/HTTPServer/bin/apachectl start  
/usr/HTTPServer/bin/apachectl restart
```

If you encounter difficulties, refer to *Dealing with the IBM HTTP Server*, on page 5-1.

2.2.2 Configuring BPRse Client(s)

This section explains how to set up **BPRse client(s)** and how to get started. The configuration steps explained in this section must be done on each **BPRse client**.



Note:

Configuration information is also available in the **README.bprse.client** file in the `/usr/lpp/bprse.client` directory.

After **BPRse client** software installation (**bprse.client** fileset), you can find configuration files and scripts in the `/usr/lpp/bprse.client` directory.

Configuring a **BPRse client** consists in:

- Edit/update the **topasR.conf** configuration file.
- Execute the **config_topasR** script.
- Install/configure **ssh** (only if you plan to use scp as transfer method between **BPRse client(s)** and **BPRse server**).

2.2.2.1 Checking Disk Space



Note:

Increase the / file system size or create a new file system mounted on `/etc/perf`.

Before starting collecting, you have to check if there is enough space in the `/etc/perf` directory where collected files (`topas_cec.YMMMDD`) are stored.

The size of the collected files depends on the number of partitions of the SP-LPAR-capable system:

- A machine with 8 partitions requires **4MB** for one `topas_cec.YMMMDD` file.
- A machine with 24 partitions requires **12MB** for one `topas_cec.YMMMDD` file.

The estimated size is **0,5MB** for one partition.

Collected files in the `/etc/perf` directory are retained for 8 days before being deleted. You have also to take into account the text-based file size (output of `topasout` command on a collected file: `topas_cec.YMMMDD_01`) which is about 4 x size of `topas_cec.YMMMDD`.

You can estimate the total size required for collected files according to the following rule:
(0,5MB x number of partitions x 8 days) + (0,5MB x number of partitions x 4)

For a machine with 8 partitions, you need:

$$4\text{MB} \times 8 \text{ days} + 4\text{MB} \times 4 = 48 \text{ MB}$$

For a machine with 24 partitions, you need:

$$12\text{MB} \times 8 + 12 \text{ MB} \times 4 = 144 \text{ MB}$$

2.2.2.2 Editing/updating the `topasR.conf` Configuration File

Two samples of configuration file are provided:

- `topasR.conf.sample`
- `topasR.conf.sample1`

If you plan to use `ftp` to transfer collected files to **BPR server**, use the `topasR.conf.sample` file as template.

If you plan to use `scp` to transfer collected files to **BPR server**, use the `topasR.conf.sample1` file as template.

To create the configuration file:

- Copy the selected sample file to `/usr/sbin/bpr/bin/topasR.conf`
- Edit/modify the file to define the values described below.

Values to set are the following:

<code>USE_SSH</code>	Transfer method to use between BPRse client and BPRse server . Enter 0 for <code>ftp</code> , 1 for <code>scp</code> . To use <code>scp</code> , <code>ssh</code> key must be exchanged between BPRse client
----------------------	---

	(root user) and BPRse server (bpr user). Refer to <i>Installing/Configuring SSH</i> (optional), on page 2-9.
BPR_LOGIN	bpr user on BPR server (default: <i>bpr</i>).
BPR_PASSWD	bpr user password on BPR server (default: <i>bpr</i>). This implies to have already set a password on BPRse server . Refer to <i>Setting Up the bpr User Password</i> , on page 2-3. The value is not significant for scp transfer.
SERVER_NAME_OR_IP	BPR server IP label or IP address. This address must be set to 127.0.0.1 if BPRse server and client are installed on the same machine and if you plan to use ftp for transfer.

2.2.2.3 Executing the config_topasR Script

Starting collecting and reporting

To start topas Cross-Partition collecting and recording (**topas -R**) for **Bull Performance Report Server Edition**, execute the script:

```
/usr/sbin/bpr/bin/config_topasR add
```

This script automatically:

- Updates the **/etc/inittab** file to execute Cross-Partition recording and collecting on startup.
- Launches the Cross-Partition recording and collecting (see note below).
- Updates the **root crontab** to transfer collected files to BPR server each day at 00h15.

Stopping collecting and reporting

To stop collecting and reporting, execute the command:

```
/usr/sbin/bpr/bin/config_topasR delete
```

This script automatically:

- Removes the **/etc/inittab** entry for Cross-Partition recording and collecting.
- Stops the Cross-Partition recording and collecting process.
- Removes the **crontab** entry for collected files transfer to BPR server.

2.2.3 Installing/Configuring SSH (optional)

If you plan to use **scp** transfer method between **BPRse client(s)** and **BPRse server**, **ssh** must be installed and configured on the **BPRse server** and each **BPRse client**.

Installing SSH

openssh fileset and its prerequisite rpm package **openssl** must be installed on **BPRse server** and each **BPRse client**.

Read the SRB (*Software Release Bulletin for Bull Enhancement*) for installation procedure.

Generating SSH key

On **BPRse client**, use the following steps to generate an RSA key pair of the SSH protocol. This is the default starting with OpenSSH.

1. Log in as **root** user and go to the `/.ssh` directory.
2. Enter the `ssh-keygen -t rsa` command.
3. Accept default location key file and do not enter passphrase.
4. The output is the following:

```
Generating public/private rsa key pair.
Enter file in which to save the key (//.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in //.ssh/id_rsa.
Your public key has been saved in //.ssh/id_rsa.pub.
The key fingerprint is:
d6:3f:11:da:44:63:ee:17:0a:e0:98:ca:3b:16:4d:fe root@lpar2
```

Repeat these steps on each **BPRse client**.

Enabling no password mode

1. On BPRse client:
 - a. Transfer the key file `/.ssh/id_rsa.pub` of user **root** from **BPRse client** to the `/tmp` directory of the **BPRse server** using the `scp` command (user **bpr**):
`scp id_rsa.pub bpr@<BPRse_server_IP_address>:/tmp`
 - b. Enter **bpr** password when asked.
2. On BPRse Server
 - a. Login as **bpr** user and go to `.ssh` directory
 - b. Append the file `/tmp/id_rsa.pub` to the `authorized_keys2` file:
`cat /tmp/id_rsa.pub >> authorized_keys2`
 - c. Remove the `/tmp/id_rsa.pub` file:
`rm /tmp/id_rsa.pub`
 - d. Verify the communication from **BPRse client** to **BPRse server** by entering the command (no password prompt):
`ssh bpr@<BPRse_server_IP_address> date`

Repeat these steps for each **BPRse client**.

Chapter 3. Using BPR Watch User Interface

This chapter explains how to use the BPR Watch User Interface, which is the Web interface of the BPRse product.

3.1 BPR Watch Components

3.1.1 Web Browser

The Web browser is the interface through which the user requests information.

The user can run the Web browser from any host or station on the network, as long as the **BPRse server** is known and reachable through the network.

Any Web browser that supports frames can be used (Mozilla, Internet Explorer ...)

3.1.2 Web Server

The Web server is in charge of gathering and displaying information requested by the user through the Web browser. It mainly consists of programs (including CGI scripts) that build the html pages to display through the Web browser.

The related fileset is **bprse.server.gui** delivered on *Bull Enhancement* CD-ROM.

The Web server relies on IBM HTTP Server product, which is the recommended software for BPR Watch.

3.1.3 Accessing BPR Watch and specifying URLs

You can access BPR Watch from your Web browser by specifying an URL that has the following format:

<http://<IP-spec>/bprw>

In this URL, **IP-spec** is an IP label or an IP address that is valid and reachable to connect to the **BPRse server**.

BPR Watch relies on mechanisms provided by the IBM HTTP server product, which implements a protection scheme based on password.

When an appropriate URL is specified, you are prompted to enter a **user ID** and a **password**. You must always specify **bprw** for user ID. Default password is **bprw**. To change the password, see *Changing BPR Watch Password*, on page 5-1.

Once the correct password is entered, BPR Watch main view page is built and displayed.

3.2 BPR Watch Pages description

3.2.1 Main View

The figure below shows the **Main View** information page.

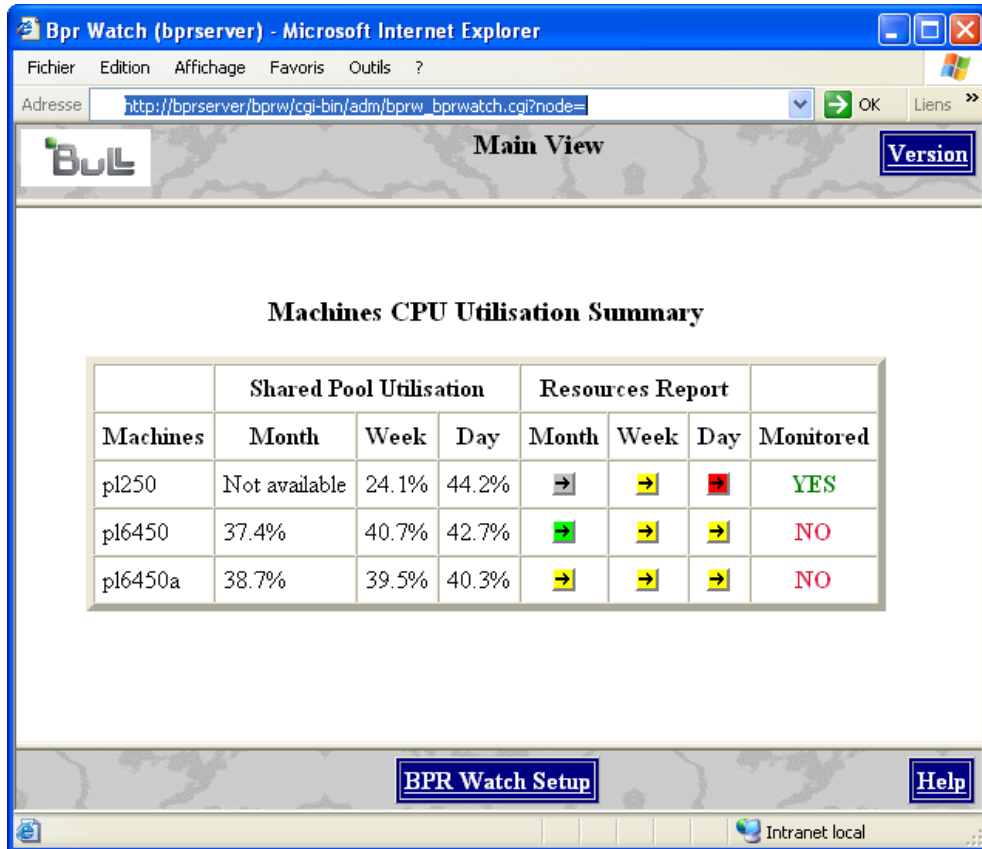


Figure 3-1. Main View page

The welcome page displays the following information for each monitored SP-LPAR-capable system:

Machines:

name of the SP-LPAR-capable system as defined in the **machines.list** file (refer to *Editing Configuration Files*, on page 2-3).

Shared Pool Utilisation:

percentage of the shared pool utilisation for the previous month, the previous week and the day before.

Resources Report:

colour arrows indicating if thresholds (**warning** threshold and **high** threshold) have been reached or not for the previous month, week or day. Click the arrows to display detailed graphs and statistics for the machine and for the corresponding timeframe.

The metrics taken into account to calculate the utilisation of the resources are:

- **shr_physb** (shared pool busy): a value per minute
- **shr_physb_avg**: a value = moving average of **shr_physb** for a 30 minutes period

The arrows are colored according to the following rules:

- ORANGE
 - a peak value has been detected : **max(shr_physb) > high threshold**
or
 - the moving average maximum is greater than the warning threshold:
max(shr_physb_avg) > warning threshold
- RED
 - the moving average maximum is greater than the high threshold:
max(shr_physb_avg) > high threshold
- GREEN
 - no peak detected :
max(shr_physb) < warning threshold
and
 - the moving average maximum is less than the warning threshold:
max(shr_physb) < warning threshold

The thresholds values are defined in the **thresholds.default** file (see *Editing Configuration Files*, on page 2-3).

Monitored:

flag indicating if there is a report for the day before:

- **YES** if there is a daily report for day before (green)
- **NO** if there is no daily report for day before (red)

3.2.2 Daily Report for a Machine

If you click an arrow in the **Day** column of the Main View page, the displayed page shows the last processed day for the corresponding machine, with:

- the shared pool utilization graph
- the shared pool utilization statistics
- the list of partitions
- the list of available daily reports

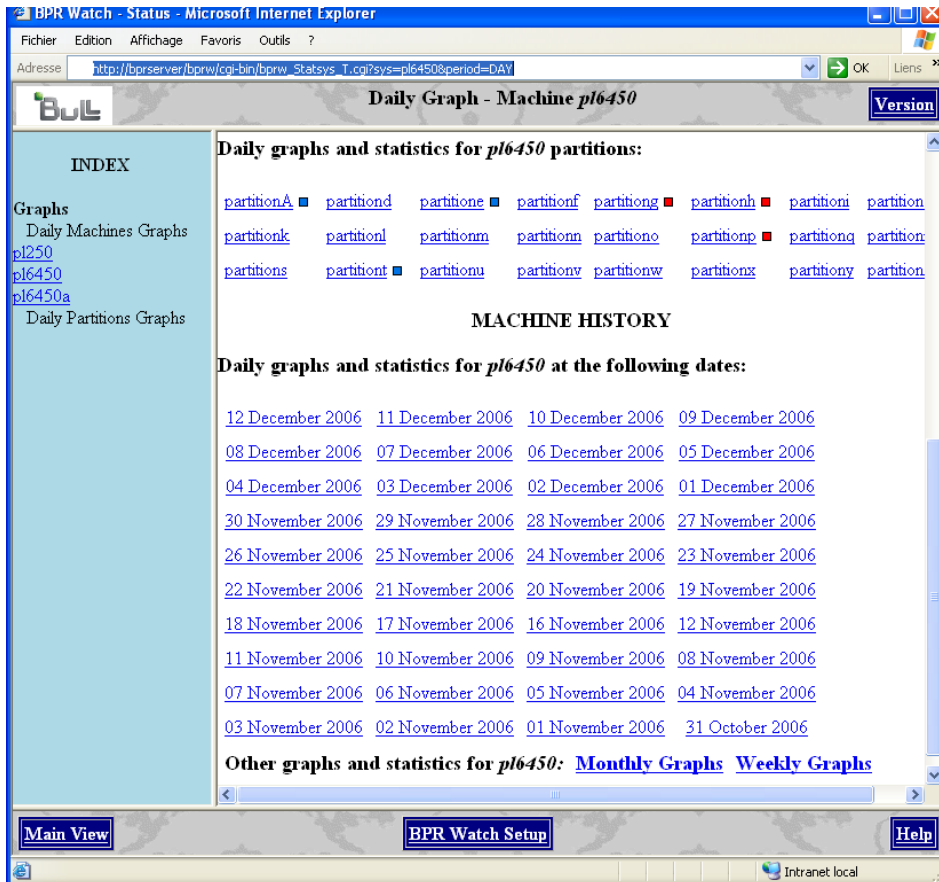
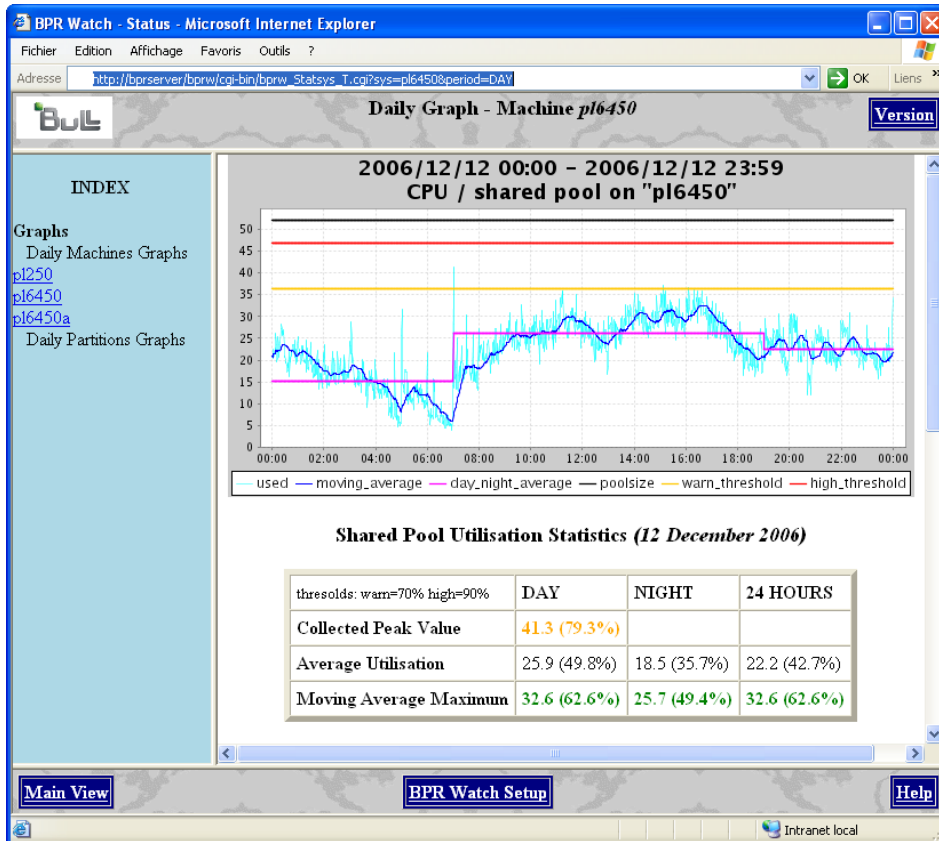


Figure 3-2. Daily Report - Machine page (top and bottom parts)

Shared pool utilization graph

The graph shows the shared pool utilization (expressed in number of physical processors) on a 24-hour period.

The moving average is computed on a 30-minutes period based.

The 24-hour period is split into a day period (7h00-19h00) and a night period (19h00-07h00).

Two lines indicate the warning and high thresholds (set in the `thresholds.default` configuration file).

The black line shows the shared pool size.

Shared pool utilization statistics

The array displays the following statistics (expressed in number of physical processors and percentage):

Collected Peak Value:

maximum number of physical processors consumed in the 24-hour period. It indicates if the peak has appeared during the day or night and if it is greater than the warning threshold (ORANGE) or not (GREEN).

Average Utilisation:

average on day, night and 24-hour period.

Moving Average Maximum:

maximum value of moving average on day, night and 24-hour period.

According to the thresholds set in the `thresholds.default` configuration file the value is displayed in:

GREEN (< warning threshold)

ORANGE (> warning threshold and < high threshold)

RED (> high threshold) .

List of partitions

Each partition name is a link to the partition page. If the low and limit thresholds are configured in the `thresholds.default` file, the partitions names may be followed by a BLUE square for a low CPU use (< low threshold) or a RED square for a high CPU use (> limit).

List of available daily reports

Each date is a link to the corresponding daily report for the machine (daily graph and statistics).

Other graphs

These are links to last weekly and monthly graphs and statistics for the machine.

Links to daily reports of other machines n are available on left hand.

3.2.3 Daily Report for a Partition

If you click on a partition name on the previous page, the displayed page shows the last processed day for that partition, with:

- the physical CPU utilization graph
- the physical CPU utilization statistics
- the list of available daily reports

Partition CPU utilization graph

The graph shows the partition CPU utilization (expressed in number of physical processors) on a 24-hour period.

The moving average is computed on a 10-minutes period based.

The 24-hour period is split into a day period (7h00-19h00) and a night period (19h00-07h00).

The GREEN line shows the entitled capacity of the partition.

The BLACK line shows the maximum number of processors for the partition.

Physical CPU utilization statistics

The array displays the following statistics related to the CPU utilization of the partition (expressed in number of physical processors and percentage):

Collected Peak Value:

maximum number of physical CPU consumed in the 24-hour period. It indicates if the peak has appeared during the day or night.

Average Utilisation:

average on day, night and 24-hour period. The day or night average utilization appears in RED if it is greater than the limit value set in the configuration file **thresholds.default** (limit=50 by default). An average utilization greater than the limit is also highlighted at the machine page level by a RED square.

The 24-hour average appears in ORANGE if it is less than the low value set in the **thresholds.default** configuration file (low=10 by default). An average utilization less than the limit is also highlighted at the machine page level by a BLUE square.

Moving Average Maximum:

maximum value of moving average on day, night and 24-hour period.

List of available daily reports

Each date is a link to the corresponding daily graph and statistics for the partition.

Other graphs

These are links to last weekly and monthly graphs and statistics for the partition.

A link at the bottom goes back to the daily machine report.

Links in left hand go to daily reports of other partitions.

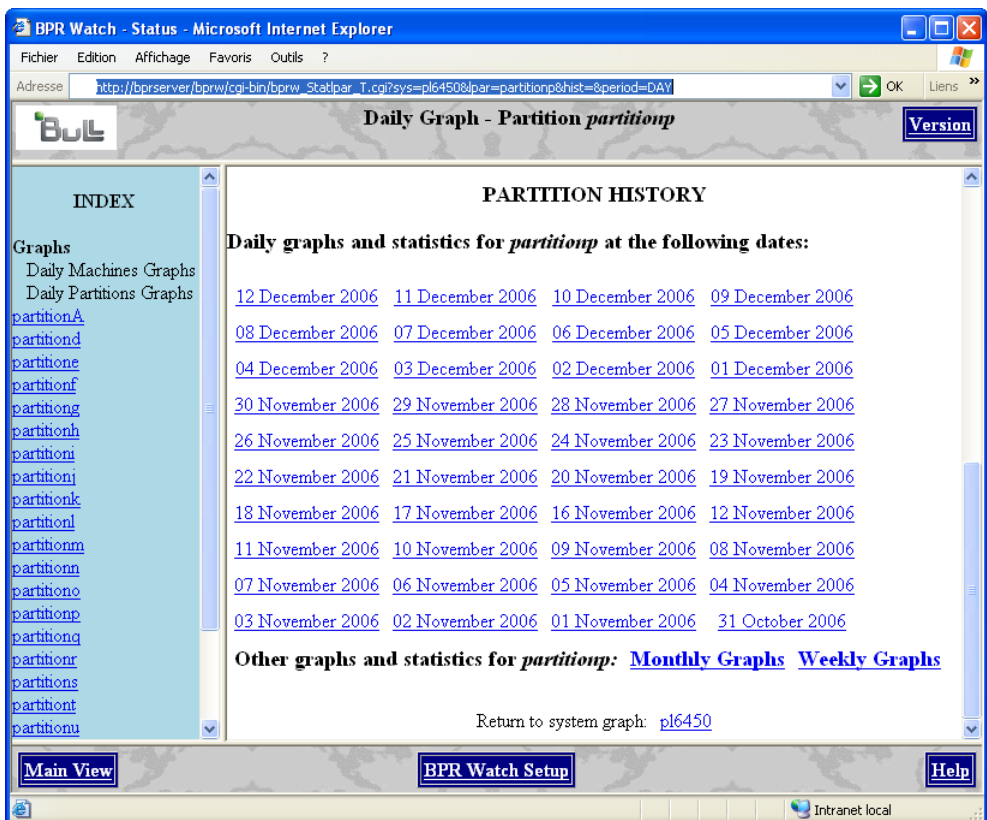
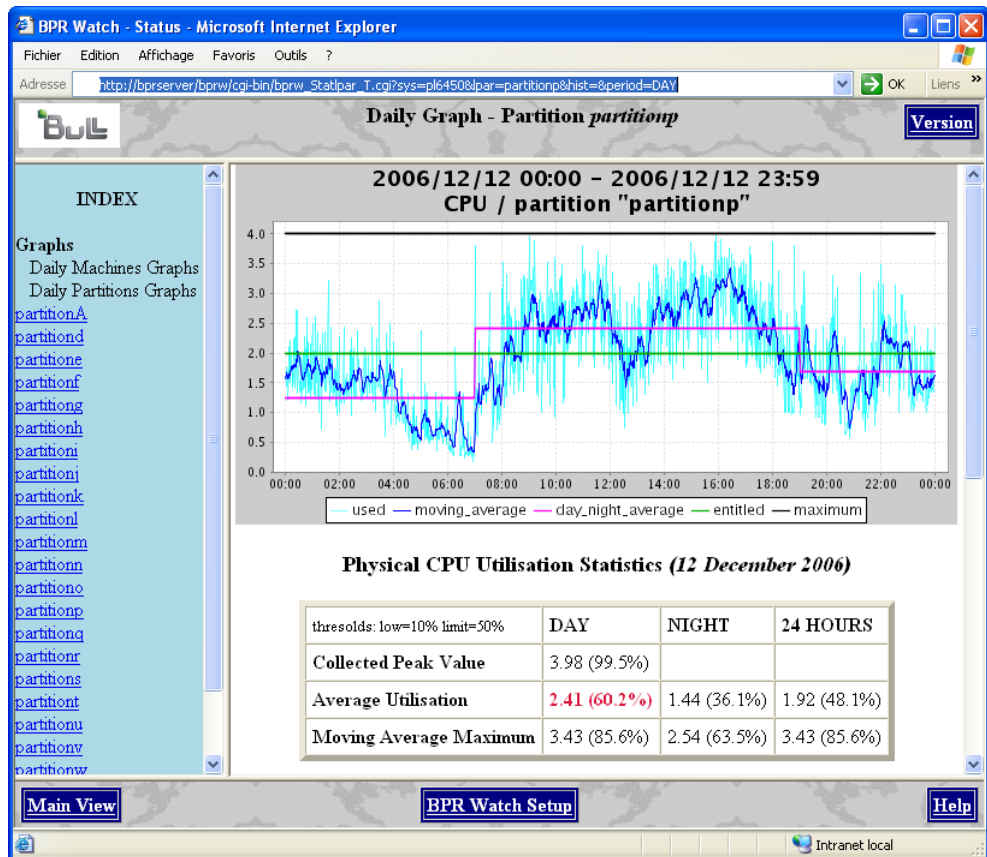


Figure 3-3. Daily Report - Partition page (top and bottom parts)

3.2.4 Weekly Report for a Machine

If you click an arrow under the **Week** column of the main view page (or the **Weekly Graphs** link in the daily report page of a machine) the displayed page shows the last processed week for the corresponding machine.

The page shows:

- The shared pool utilization graph for a week (from Monday to Sunday).
- The shared pool utilization statistics for a week (from Monday to Sunday).
- The list of partitions. Each partition name is a link to the partition page.
- The history graph of shared pool utilization for all processed weeks (peaks, average utilization, moving average maximum for day and night).
- The list of other available weekly reports for the machine. Each date is a link to the corresponding weekly graph and statistics.
- Links to last daily and monthly graphs and statistics for the machine.

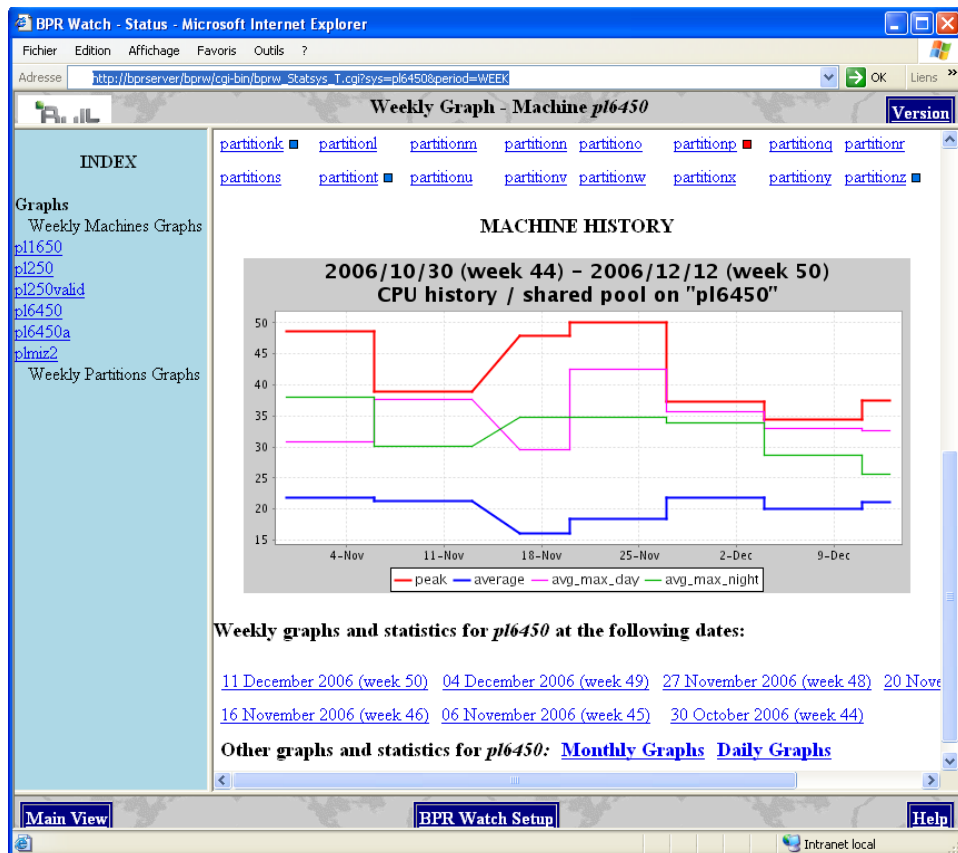
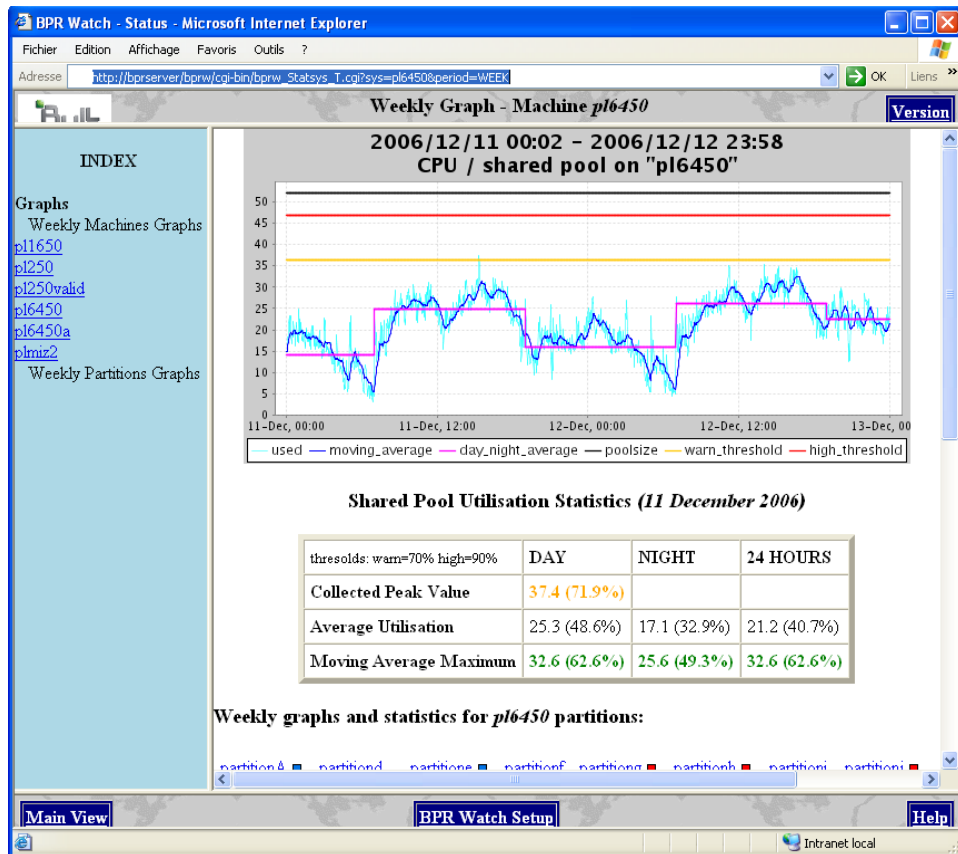


Figure 3-4. Weekly Report - Machine page (top and bottom parts)

3.2.5 Weekly Report for a Partition

If you click a partition name on the previous page, the displayed page shows the last processed week for that partition.

The page shows:

- The physical CPU utilization graph for the week.
- The physical CPU utilization statistics for the week.
- The list of other available weekly reports for the partition. Each date is a link to the corresponding weekly graph and statistics.
- Links to last daily and monthly graphs and statistics for the partition.
- Link to go back to the weekly machine report.

Links in left hand go to weekly reports of other partitions.

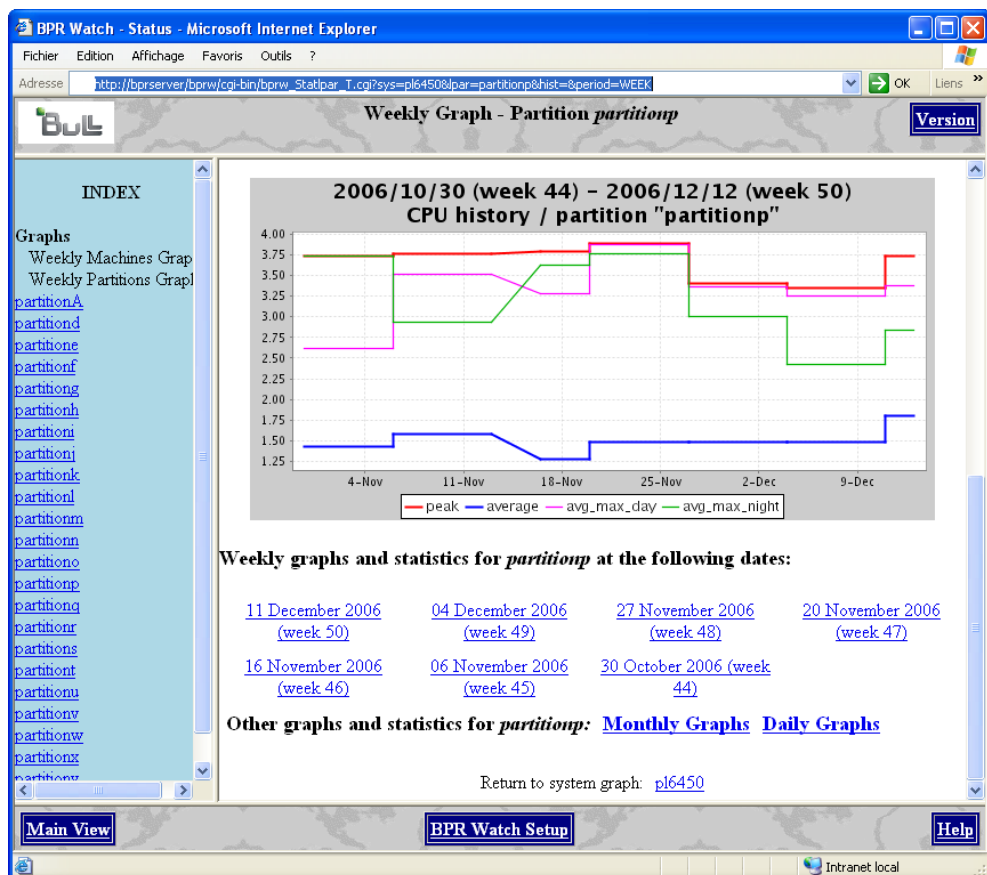
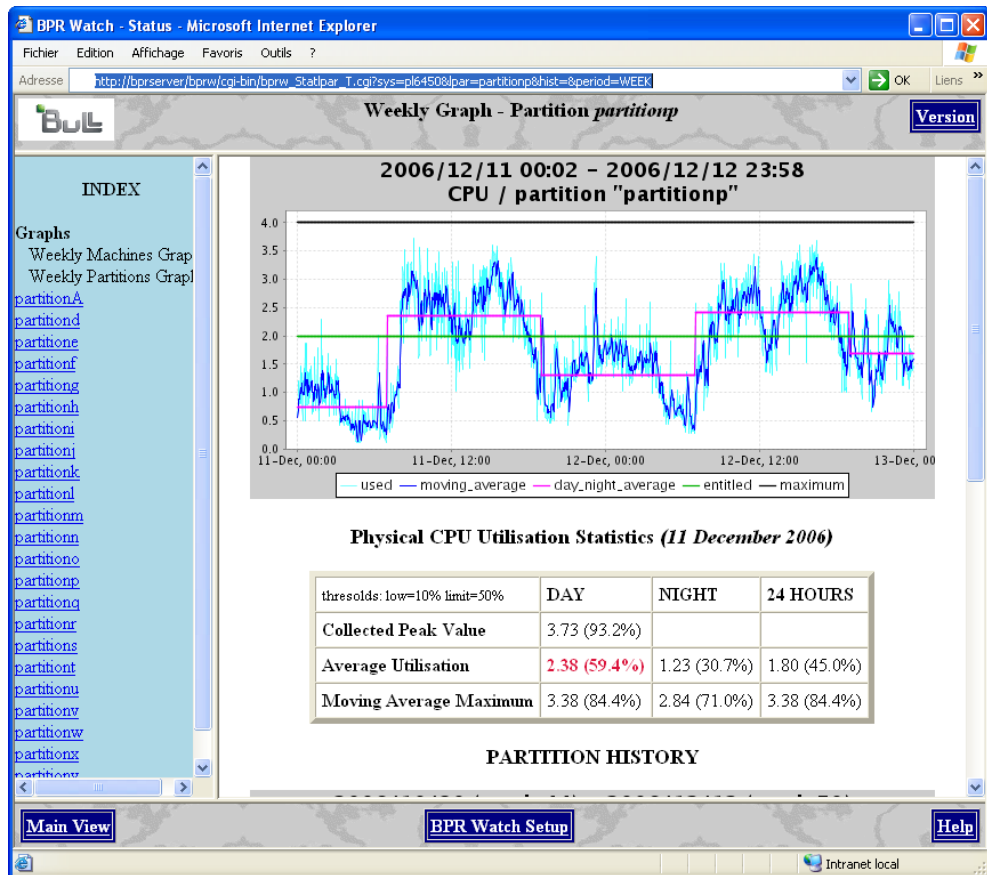


Figure 3-5. Weekly Report – Partition page (top and bottom parts)

3.2.6 Monthly Report for a Machine

If you click an arrow under the **Month** column of the Main View page (or the **Monthly Graphs** link in the daily or weekly report page of a machine) the displayed page shows the last processed month for the corresponding machine.

The page shows:

- The shared pool utilization graph for a month (from the first day of the month to the last day of the month).
- The shared pool utilization statistics for a month (from the first day of the month to the last day of the month).
- The list of partitions. Each partition name is a link to the partition page.
- The history graph of shared pool utilization for all processed months (peaks, average utilization, moving average maximum for day and night).
- The list of other available monthly reports for the machine. Each date is a link to the corresponding monthly graph and statistics.
- Links to last daily and weekly graphs and statistics for the machine.

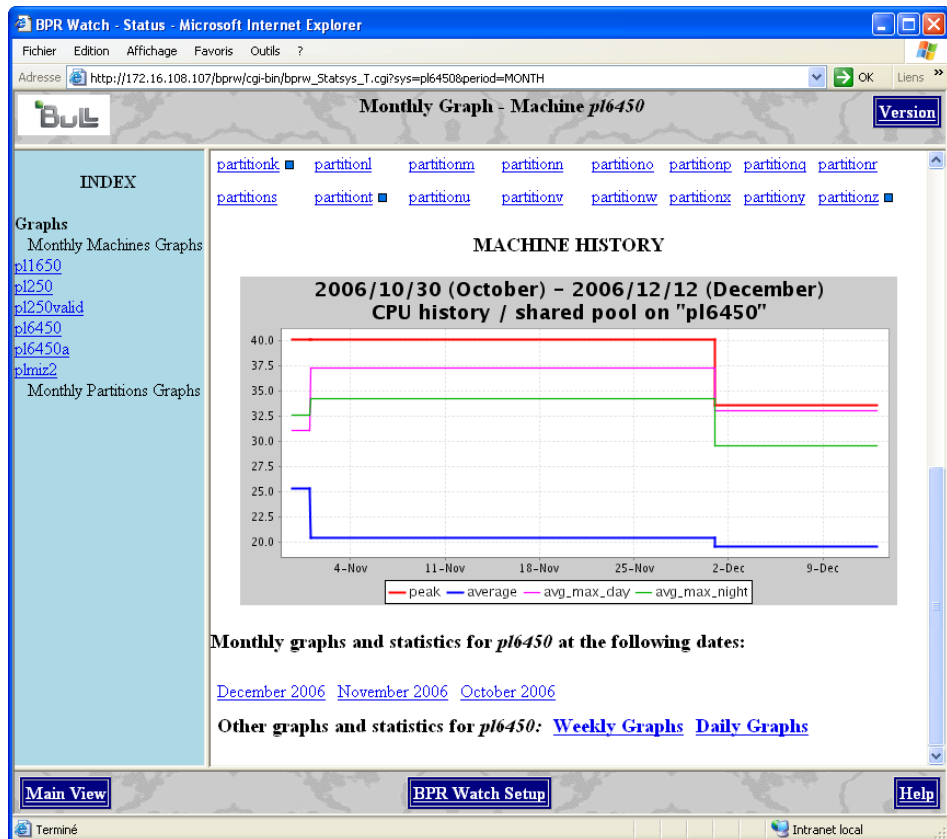
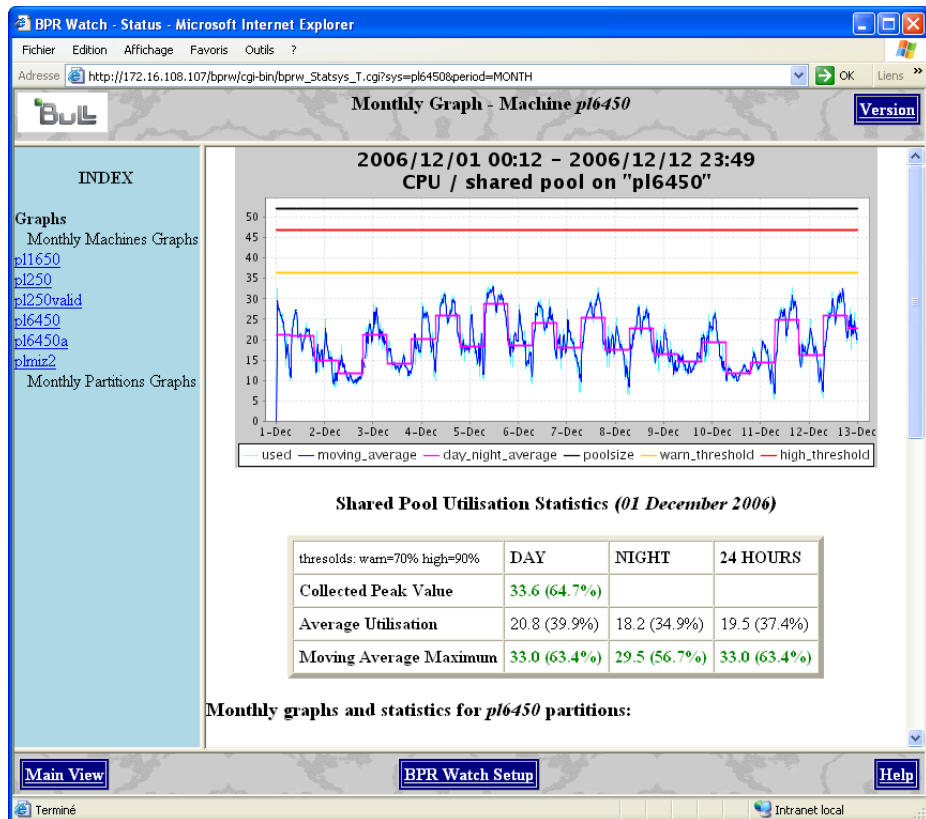


Figure 3-6. Monthly Report – Machine page (top and bottom parts)

3.2.7 Monthly Report for a Partition

If you click a partition name on the previous page, the displayed page shows the last processed month for that partition.

The page shows:

- The physical CPU utilization graph for the month.
- The physical CPU utilization statistics for the month.
- The list of other available monthly reports for the partition. Each date is a link to the corresponding monthly graph and statistics.
- Links to last daily and weekly graphs and statistics for the partition.
- Link to go back to the monthly machine report.
- Links in left hand allow going to monthly reports of other partitions

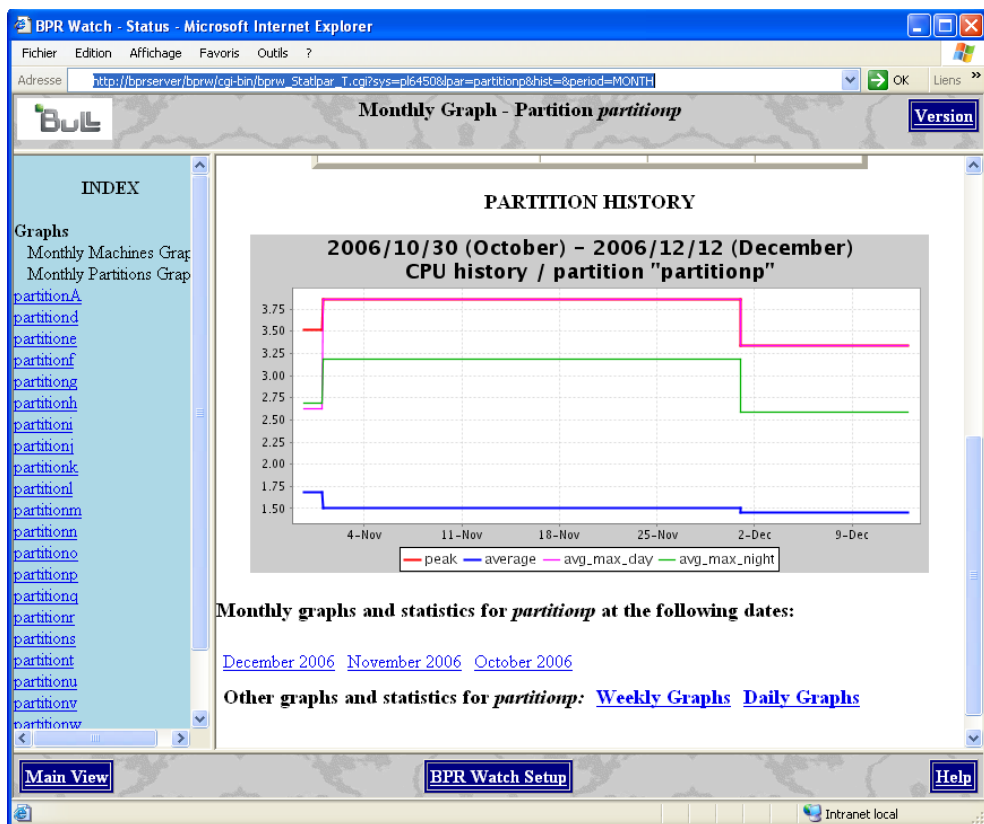
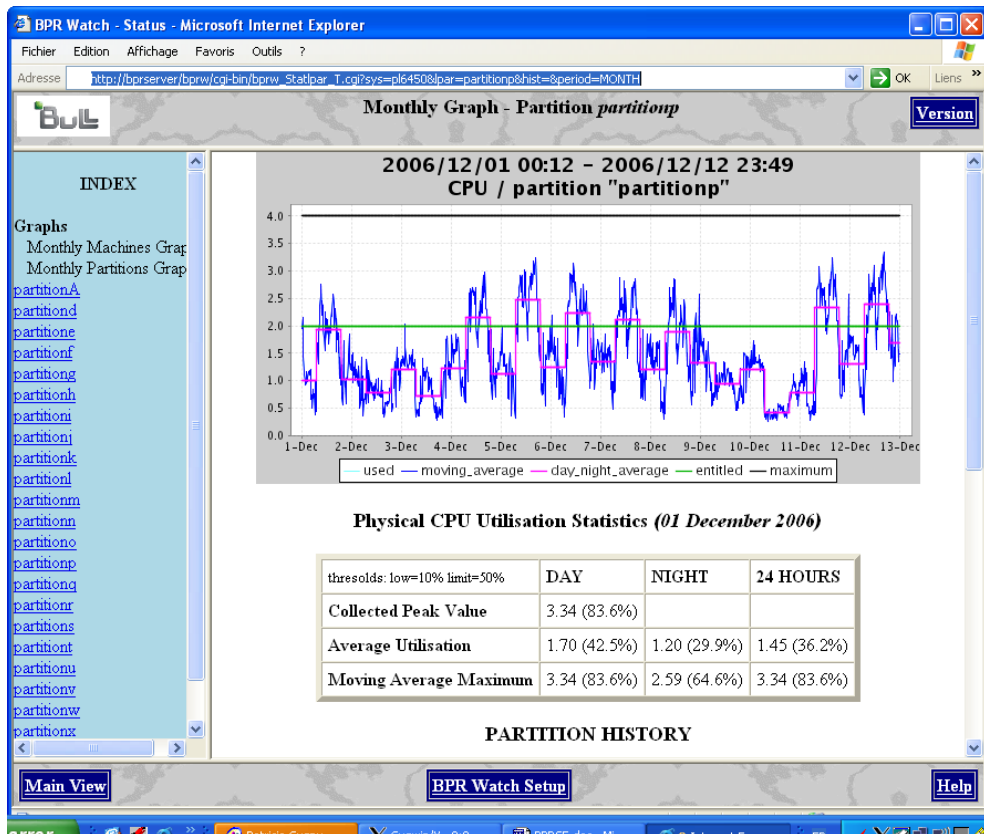


Figure 3-7. Monthly Report – Partition page (top and bottom parts)

3.2.8 BPR Watch Setup

You can change the BPR Watch passwords and preferences in the **BPR Watch Setup** page. This page is available using the **BPR Watch Setup** button at the bottom of each page.

If you want to change the default password (**bprw**), enter the new password twice in the form and click **Submit New Password** to update the password.

Changing the **Preferences** such as **Number of days**, **Number of weeks**, **Number of months** will affect the displayed information in all the pages.

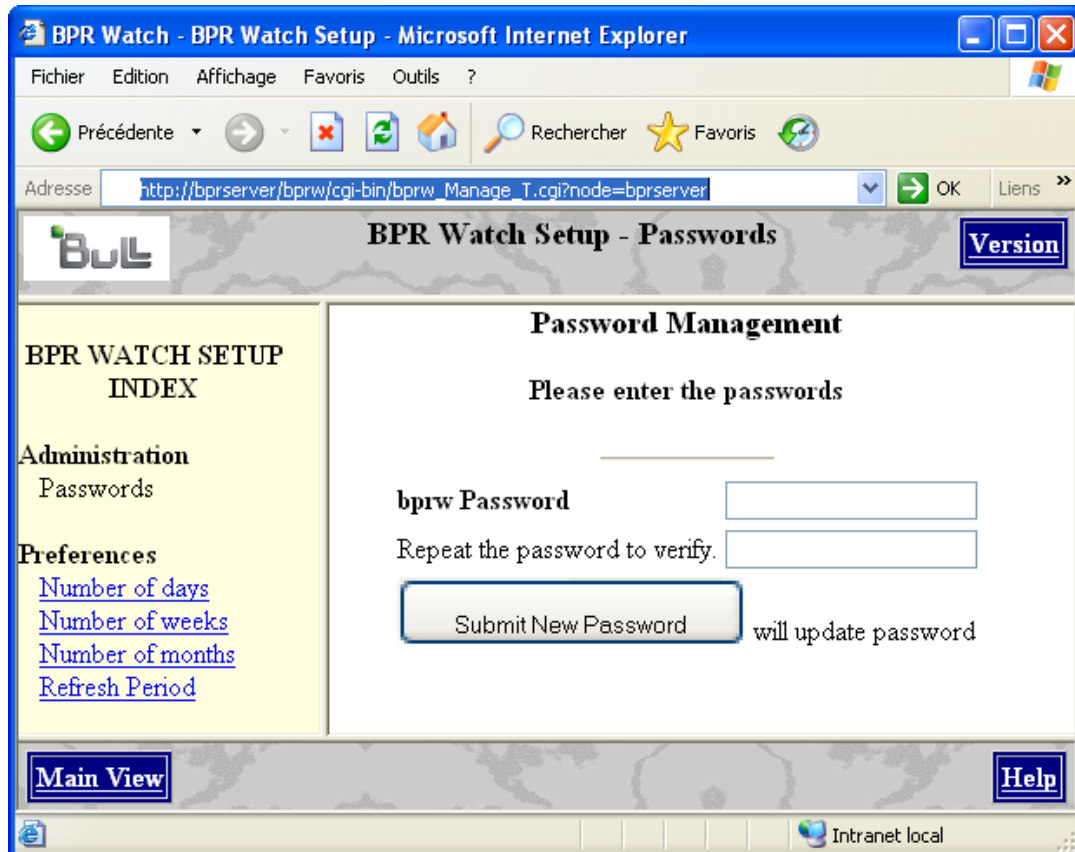


Figure 3-8. BPR Watch Setup - Passwords page

Chapter 4. Internal Architecture

This chapter describes the different processes used by the **BPRse client** and **server** to collect, analyse and build statistics and graphs from collected files.

4.1 Process on BPRse Client

4.1.1 Collecting and Recording

Collecting and recording is done on only one partition of each SP-LPAR-capable system to monitor. That partition is known as **BPRse client** (or collecting partition).

A **BPRse client** is configured using:

- `/usr/sbin/bpr/bin/config_topasR` script
- `/usr/sbin/bpr/bin/topasR.conf` file

The `topas` cross-partition recording tool (`topas -R`) is launched on that partition to collect and record metrics for all the partitions of the SP-LPAR-capable system:

`/usr/sbin/bpr/bin/launch_topasR` script

The collect recording is done in:

`/etc/perf/topas_cec.YYMMDD` file.

4.1.2 Transfer to the BPRse Server

Each day at 00h15 (cron process), the collect is formatted on the **BPRse client** by the `topasout` command:

`/etc/perf/topas_cec.YYMMDD_01`

The formatted collect is sent to the **BPRse server** by `ftp` or `ssh`:

`/usr/sbin/bpr/bin/upload_topasR` script (crontab entry of root user)

4.2 Process on BPRse Server

Once the **BPRse server** is configured (configuration files in `/home/bpr/bpr_conf`), the **BPRse server** can process the collected files.

The collects (`topas_cec.YYMMDD_01` files) from all the **BPRSE clients** are stored on the **BPRse server** in the directory:

`/home/bpr/bpr_output/<collecting partition hostname>`

where `<collecting partition hostname>` is the hostname of the partition. (Refer to *Editing Configuration Files*, on page 2-3, for more details).

4.2.1 Analysing the Collect and Generating Graphs

There are 3 types of processes:

daily process:

each day at 01h00 (`/usr/sbin/bpr/bin/bpr_process_day` script)

weekly process:

each Monday at 02h00 (`/usr/sbin/bpr/bin/bpr_process_week` script)

monthly process:

the first day of each month at 03h00 (`/usr/sbin/bpr/bin/bpr_process_month` script)

These processes are **crontab** entries of user **bpr**.

Daily process

The collects of the day before, received from all **BPRse clients**, are analysed, each day, to generate daily statistics and graphs.

The result of the analysis and the corresponding graphs are stored in the `/home/bpr/bpr_process/<machine name>/DAY/bpr_/YYYY/MM/DD` directory. (Refer to *Editing Configuration Files*, on page 2-3, for more details about <machine name>).

The statistics and final graphs are then computed in the `/home/bpr/bpr_graphes/<machine name>/DAY/YMMMDD` directory. They are used to build the html pages.

Finally, old graphs in the `/home/bpr/bpr_graphes/<machine name>/DAY/` are deleted according to the **keep_day** value set in the configuration file **bpr.conf** (refer to *Editing Configuration Files*, on page 2-3, for more details).

Weekly process

The first day of the week (on Monday), the different results of analysis related to a week, in the `/home/bpr/bpr_process/<machine name>/DAY/bpr_/YYYY/MM/` directory are merged from Monday to Sunday to prepare the weekly analysis. The result of merging is stored in the `/home/bpr/bpr_process/<machine name>/WEEK` directory.

The weekly statistics and graphs and the historical graph of weeks since the beginning of the collects are then computed in the `/home/bpr/bpr_graphes/<machine name>/WEEK/YMMMDD` directory where **YMMMDD** is the first day of the week. They are used to build the html pages.

Finally, old graphs in the `/home/bpr/bpr_graphes/<machine name>/WEEK/` directory are deleted according to the **keep_week** value set in the configuration file **bpr.conf** (refer to *Editing Configuration Files*, on page 2-3, for more details).

Monthly process

The first day of the month, all the results of analysis in the `/home/bpr/bpr_process/<machine name>/DAY/bpr_/YYYY/MM` directory are merged to prepare the monthly analysis. The result of merging is stored in the `/home/bpr/bpr_process/<machine name>/MONTH` directory.

The monthly statistics and graphs and the historical graph of months since the beginning of the collects are then computed in the `/home/bpr/bpr_graphes/<machine name>/MONTH/YMMMDD` directory where `YMMMDD` is the first day of the month. They are used to build the html pages.

Finally, old graphs in the `/home/bpr/bpr_graphes/<machine name>/MONTH/` directory are deleted according to the `keep_month` value set in the configuration file `bpr.conf`.

In addition, each month, the files `topas_cec.YMMMDD_01` stored in the `/home/bpr/bpr_output/<collecting partition hostname>` directory are moved to `topas_cec.YMMMDD_01.done` and collects analysis in the `/home/bpr/bpr_process/<machine name>/DAY/bpr_/YYYY/MM` directory are deleted according to the `keep_collect` value set in the configuration file `bpr.conf` (refer to *Editing Configuration Files*, on page 2-3, for more details).

4.2.2 Generating HTML pages

The html pages showing the daily, weekly and monthly statistics and graphs related to the shared processor pool utilization and the physical CPU utilization per partition are built in 2 different ways:

- Each day at 04h00, for the main html page and the machine html pages of the day before: `/usr/sbin/bpr/bin/bpr_build_html` script (crontab entry of user `bpr`)
- Dynamically for all other html pages if they do not already exist in html pages repository `/usr/sbin/bpr/bprw/web/html`.

4.3 Log Files

Information on the processing is logged in several files on **BPRse client** and **BPRSE server**.

BPRse client

`/usr/sbin/bpr/bin/launch_topasR.log:`

log file when the topas cross-partition recording tool is launched.

`/tmp/upload_topasR.log:`

log file when recording files `topas_cec.*` are sent to the **BPRse server**.

BPRse server

- Log files in the `/home/bpr/bpr_process/.LOGS` directory:
 - `<machine name>_YYMMDD_split.log`: log of daily collect analysis
 - `<machine name>_YYMMDD_process.log`: log of daily statistics and graph generation
 - `<machine name>_YYMMDD_merge_week.log`: log of collects merging for the week
 - `<machine name>_YYMMDD_process_week.log`: log of weekly statistics and graph generation
 - `<machine name>_YYMMDD_merge_month.log`: log of collects merging for the month
 - `<machine name>_YYMMDD_process_month.log`: log of monthly statistics and graph generation
- Log files in the `/tmp` directory:
 - `bprday.log`: log of daily process
 - `bprweek.log`: log of weekly process
 - `bprmonth.log`: log of monthly process
 - `bprhtml.log`: log of html pages generation

Chapter 5. Administration and Troubleshooting

This chapter describes some tips and tricks you should be aware of, as administrator of BPRse.

5.1 BPR Watch

5.1.1 Customizing BPR Watch Behavior

Using the BPR Watch Setup – Preferences page, you can customize some features of the BPR Watch behavior.

For details, refer to the BPR Watch online help and to *BPR Watch Setup*, on page 3-16.

5.1.2 Changing BPR Watch Password

Using the BPR Watch Setup – Passwords page, you can modify BPR Watch password. The default password set at installation time is **bprw**. The **bprw** user is the Web server user. It is different from the **bpr** user.

For details, refer to the BPR Watch online help and to *BPR Watch Setup*, on page 3-16.

5.1.3 Dealing with the IBM HTTP Server

We recommend to use the IBM HTTP server.

5.1.3.1 HTTP Server Start/Stop

For BPR Watch to work, the IBM HTTP Server must be running on **BPRse server**.

- If the server is not running, you can start it by the command:

```
/usr/HTTPServer/bin/apachectl start
```

- If the server is running but you have modified its configuration file, you have to restart it by the command:

```
/usr/HTTPServer/bin/apachectl restart
```

- Check, using the **ps** command, that the HTTP server is running (process **/usr/HTTPServer/bin/httpd**)
- If the HTTP server does not start or if you have problems with some BPR Watch pages, you can examine the HTTP server log file **error_log** in the **/usr/HTTPServer/logs** directory and try to correct the problem.
- To stop the server, run the command:

```
/usr/HTTPServer/bin/apachectl stop
```

5.1.3.2 HTTP server configuration for BPR Watch

At **BPRse server** installation time, the specific configuration for BPR Watch such as user, directory index, alias, script alias, password management is provided in the **bprw-httpd.conf** file in the **/usr/lpp/bprse.server** directory.

This file contains all needed information for HTTP server configuration.

This file must be included in the standard HTTP configuration file (**httpd.conf**) in the **/usr/HTTPServer/conf** directory (directive **Include /usr/lpp/bprse.server/bprw-httpd.conf**).

- Content of **bprw-httpd.conf**

```
User bpr
Group bpr
DirectoryIndex BPRWatch.html
ScriptAlias /bprw/cgi-bin/adm/ "/usr/sbin/bpr/bprw/web/cgi-
bin/adm/"
ScriptAlias /bprw/cgi-bin/ "/usr/sbin/bpr/bprw/web/cgi-bin/"
Alias /graph/ "/home/bpr/bpr_graphes/"
Alias /bprw "/usr/sbin/bpr/bprw/web/"
Alias /bprw/img/ "/usr/sbin/bpr/bprw/web/img/"
<Directory /usr/sbin/bpr/bprw/web/cgi-bin>
AllowOverride AuthConfig
#AllowOverride None
</Directory>
SetEnv ODMDIR "/etc/objrepos"
SetEnv BPRWDIR "/home/bpr"
```

- If you want to suppress the password prompt at BPR Watch startup, do as follows:
 - Edit the **bprw-httpd.conf** file.
 - Comment the line:
`AllowOverride AuthConfig`
 - And uncomment the line:
`AllowOverride None`
 - Then restart the HTTP server.

5.2 X11 Virtual Frame Buffer not running

In order to generate graphs, a virtual frame buffer is configured on the BPRse server at installation time.

1. Check that the X11 Virtual Frame Buffer process is running by the command:
`ps -ef | grep vfb`
(by default, the Virtual Frame Buffer is associated to the display :1)
2. If the process is not running, try to launch it manually:
`/usr/bin/X11/X -force -vfb -x abx -x dbe -x GLX :1`
3. If it does not run, try to launch it with another display parameter (with N=2 or 3 or 4...):
`/usr/bin/X11/X -force -vfb -x abx -x dbe -x GLX :N`

4. If it works:
 - modify the **xvfb** entry in **/etc/inittab** to take into account the correct value,
 - edit **/usr/sbin/bpr/bin/bpr_lib** file:
 - replace:


```
export DISPLAY=:1
```
 - with:


```
export DISPLAY=:N
```

5.3 Monitored value is NO

In the main html page, a monitored value set to **NO** indicates that no collect is processed for the day before for the machine.

To determine why there is no processed collect for the day before, you have to check if a collected file **topas_cec.YYMMDD_01** exists in the **/home/bpr/bpr_output/<collecting partition name>** directory.

- If the file exists:
 - check the **/tmp/bprday.log** log file for potential errors during the daily processing
 - check also log files in the **/home/bpr/bpr_output/.LOGS** directory:
 - <machine name>_YYMMDD_split.log**
 - <machine name>_YYMMDD_process.log**
- If the file exists but is named **topas_cec.YYMMDD_01.err**, this means that the collected file has an incorrect format and cannot be processed.
- If the file does not exist :

There is a potential communication problem between the **BPRse client** and **BPRse** server or with the topas cross_partition tool (**topas -R**).

On the **BPRse client**, do the following:

 - check log file **/tmp/upload_topasR.log**
 - check crontab entry of user root
 - check that **topas_cec.YYMMDD** file exists in the **/etc/perf** directory
 - check also that the topas cross-partition tool (**topas -R process**) is running.

5.4 No metrics collected for a shared partition

- Log on that partition.
- Check that **perfagent.tools** LPP is installed; if not install it from AIX media.
- Check that **xmtopas** process is running:


```
ps -ef |grep xmtopas
```
- If it is not running, then:
 - Check the presence of the following line in **/etc/inetd.conf**:


```
xmquery dgram udp wait root /usr/bin/xmtopas xmtopas -p3
```

- Refresh the **inetd** by the command:
`refresh -s inetd`

5.5 Saving Disk Space

Unused and oldest files are automatically deleted according to the parameters values in `/home/bpr/bpr_conf/bpr.conf` file.

The oldest collected files `topas_cec.YYMMDD_01` in `/home/bpr/bpr_output/<collecting partition hostname>` are renamed in `topas_cec.YYMMDD_01.done`.

To save disk space on the BPRse server, delete the `*.done` files.

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