System Resource Report Pack

For the Windows®, HP-UX, Solaris, and Linux operating systems

Software Version: 4.52

HP Performance Insight 5.41

User Guide

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Contents

1 Overview

HP Performance Insight

HP Performance Insight collects data from many sources, performs in-depth trend analysis, maintains performance baselines, and provides users with convenient, web-based reporting. Following is a partial list of product features:

- Distributed architecture
- Easy to scale (supports data collection from thousands of agents)
- CODA/PA agent support
- Multi-company security model
- Data warehousing
- Near Real Time reporting
- Forecasting
- Extensive aggregation (by day, week, month; by location, by customer)
- Thresholding and alerting
- Easy identification of bottlenecks
- Easy assessment of capacity trends
- Accurate and timely documentation for management
- Integration with NNM
- Integration with HP Operations

The reporting solutions created for Performance Insight cover many areas of business technology optimization and several new reporting solutions are added every year.

System Resource Report Pack

The reports in System Resource will help you anticipate resource issues before they become serious. You will know whether resources are plentiful, limited, or somewhere in between, and you will be able to make useful comparisons. For example, you can look at hourly utilization levels for yesterday, and if something does not look quite right, you can easily compare yesterday's performance to weekly and monthly trends. You can also compare total CPU utilization to the amount of CPU used by a single process. If your systems are seeing high utilization, you can use the forecast reports to predict when a performance threshold will be reached if current trends continue.

The System Resource Report Pack includes a main package, multiple sub-packages, and multiple datapipes. There are actually three datapipes for the main package—one that discovers HP agents, one that polls HP agents, and one that collects data from any system that supports the Host Resources MIB. Each sub-package has its own built-in datapipe. For more information about datapipes and the metrics each datapipe collects, see Chapter 4, Data Collection.

HP Performance Agents and HP Operations Agents support HTTPS protocol for secure communication. As HTTPS communication is certificate-based, you must install certificates must be installed on your PI system (including remote pollers) that collects data from agents. PI utilizes the client certificates already installed for the agents. The PI system acts as a certificate client and the certificate server (certificate authority) is provided by the HP management server or HP Performance Agent systems. The client certificates must be exchanged to establish HTTPS communication. In some network configurations, multiple certificate servers may supply the required certificates for the agents. In this scenario, you should obtain trusted certificates from all the certificate servers for the respective agents. This can be performed using the Certificate Management application provided in the PI Management Console. For more information on the Certificate Management application, see *HP Performance Insight Administration Guide*.

Following is an alphabetical list of reports in the main package:

1   CPU Utilization Resource Forecast

2   Filesystem Utilization Resource Forecast

3   Filesystem Resource Optimization

4   Memory Utilization Resource Forecast

5   Memory Resource Optimization

6   Service Level Management Executive Summary

7   System Availability

8   System CPU, Memory, and Swap Utilization Exception Hot Spots

9   System CPU, Memory, and Swap Utilization QuickView

10 System CPU, Memory, and Swap Utilization QuickView - Snapshot

11 System CPU, Memory, and Swap Utilization QuickView - Near Real Time

12 System CPU, Memory, and Swap Utilization QuickView - Near Real Time - Snapshot

13 System Inventory

14 System Performing Each Application — Snapshot

15 System Volume and CPU Utilization Top Ten

16 Top Ten Transaction

Generic Reports

System Resource includes the following generic report types:

- Top Ten
- Hot Spots
- QuickView
- Near Real Time
- Executive Summary
- Forecast

If you want to find out where volume and utilization are the heaviest, open the **Top Ten** report. This report sorts systems by volume (highest to lowest), by CPU utilization (highest to lowest), and by filesystem utilization (highest to lowest), allowing you to see which systems, if any, are experiencing unusual activity.

If you see a system in the Top Ten report that needs further investigation, open the **Snapshot** version of the **QuickView** and select the system or systems that interest you. This report provides utilization averages for yesterday, shows you what the exception thresholds are, and provides graphs that track utilization levels on an hourly basis.

If you want to see recent performance data that has not been aggregated into hourly averages, open the **Near Real Time** version of the QuickView. By looking at actual sample data collected over the previous six hours, you can find out whether a bad condition is improving or worsening. If the QuickView is showing over-utilization, use the **Optimization** reports to see whether simple load balancing might be the easiest way to improve service quality.

If you suspect that utilization levels are high and getting worse, use the **Forecast** reports to pinpoint systems that may be headed toward high utilization. Look for these metrics:

- Days to Threshold (DTT)
- Estimated utilization 30, 60, and 90 days from today
- Grade of Service scores for the previous 24 hours
- CPU, memory, swap, and filesystem utilization trends over the previous 24 hours

Enhancements in Version 4.52

New Prerequisites:

- Performance Insight 5.41
- Common Property Tables 3.92

Upgrade Package Name	Version Number
SR_Upgrade_to_452	4.52
SR_CPU_Upgrade_to_431	4.31
SR_DISK_Upgrade_to_451	4.51
SR_FS_Upgrade_to_111	1.11
SR_LS_Upgrade_to_112	1.12
SR_LV_Upgrade_to_441	4.41
SR_PROC_Upgrade_to_431	4.31
SR_NI_Upgrade_to_441	4.41

Integration with HP Operations

You can isolate faults and diagnose problems faster by integrating System Resource with HP Operations. To do that, install the thresholds sub-package that comes with System Resource. The thresholds sub-package contains a thresholds policy used by the Thresholds Module to monitor the database for threshold breaches.

When the Thresholds Module detects a breach, it takes one of several possible actions. The default action is to send a breach trap to Network Node Manager (NNM). When the condition clears, the default action is to send a clear trap to NNM.

Because NNM is the default destination for traps, you must configure the Thresholds Module to send traps to HP Operations. To make this change, open the SNMP Trap Action Definition form, fill in the necessary information, and save your changes. In addition, your HP Operations administrator must create a trap template definition for HP Operations. For details about defining the trap template, see *The Thresholds Module User Guide*.

Sources for Additional Information

This user guide includes samples of some of the reports in System Resource. The demo package that comes with System Resource contains a sample of every report in the package. If you have access to the demo package and you want to know what fully-populated reports look like, install the demo package. Like real reports, demo reports are interactive; unlike real reports, demo reports are static.

The following documents are related to this manual:

*   *System Resource Report Pack Release Notes*

*   *SysRes OVPA Datapipe User Guide* (formerly *Understanding the OVPA Datapipe*)

*   *SysRes OVPA Datapipe Release Notes*

*   *OVPA Collection Datapipe Release Notes*

*   *SysRes RFC1514 Datapipe Release Notes*

*   *Metrics for HP OV Performance Agent and Operations Agent*

*   *PI Report Packs, CD-ROM Release Notes, February 2009*

You can download the documents listed above from this site:

http://h20230.www2.hp.com/selfsolve/manuals

The user guides for PI are listed under **Performance Insight**. The user guides for report packs and datapipes are listed under **Performance Insight Report Packs**. Each document indicates the date. If a document is revised and reposted, the date will change. Since we post revised manuals on a regular basis, you should check this site for updates.

2 Upgrade or Install

Guidelines for Upgrade

The report pack CD contains datapipes, report packs, and several shared packages. When you insert the report pack CD in the CD-ROM drive and launch the package extraction program, the install script extracts every package from the CD and copies the results to the Packages directory on your system. After the extract finishes, the install script prompts you to start Package Manager. Before using Package Manager, review the following topics:

- Software prerequisites for System Resource
- Datapipes and remote pollers
- Deleting custom table view
- Latest version numbers for packages and sub-packages

Software Prerequisites

System Resource has the following prerequisites:

- Performance Insight 5.41
- All service packs available for PI 5.41
- Common Property Tables 3.92

If you are running an earlier version of Common Property Tables, upgrade to Common Property Tables 3.92 by installing its version 3.92 upgrade package. Upgrade Common Property Tables before upgrading the System Resource Report Pack.

Datapipes and Remote Pollers

Datapipes cannot be upgraded. You must remove the existing datapipe, then re-install the latest version of the datapipe after the upgrade is complete. When you uninstall an existing datapipe, the following information will be lost:

- The polling policy for a single remote poller
- Cloned polling policies for multiple remote pollers
- Polling groups you created yourself

To export existing polling policy configurations and customized polling group, use the collection_manager and group_manager commands.

Exporting Polling Policy Configurations

If your environment contains polling policies for remote pollers, use the collection_manager command to export exiting policy configurations to a file.

UNIX: As user trendadm, run the following command:

```
cd $DPIPE_HOME

./bin/collection_manager -export -file /tmp/savePollingPolicy.lst
```

Windows: As Administrator, launch a command window. Navigate to the PI install directory and execute the following command:

```
bin\collection_manager -export -file \temp\savePollingPolicy.lst
```

Exporting Customized Polling Groups

If your environment contains customized polling groups, use the group_manager command to export groups to individual .xml files.

UNIX: As user trendadm, execute the following command:

```
cd $DPIPE_HOME

./bin/group_manager -export_all -outfile /tmp/savePollingGroups
```

Windows: As Administrator, launch a command window, then navigate to the PI install directory and execute the following command:

```
bin\group_manager -export_all -outfile \temp\savePollingGroups
```

Custom Table Views

If you created custom table views, the views you created may interfere with the report pack upgrade, causing the upgrade to fail. Whether or not your custom table views interfere with the upgrade depends on how you created them. If you created them using SQL, the upgrade will succeed but your custom views will not be available once the upgrade is complete. If you created them using Datapipe Manager, the upgrade is likely to fail. To prevent the upgrade from failing, delete your custom table views before upgrading the report pack, then recreate these views after the upgrade is complete.

Version Numbers for Packages and Datapipes

Base Package Name	Version Number
SystemResource	4.52
SystemResourceCPU	4.31
SystemResource_Disk	4.51
SystemResource_FileSystem	1.11
SystemResourceLS	1.12
SystemResourceProcess	4.41
SysRes_OVPA_Datapipe	4.31
SysRes_RFC1514_Datapipe	4.41

Upgrading to System Resource Version 4.52

Follow these steps to upgrade the System Resource Report Pack. Since your existing datapipes cannot be upgraded, they must be uninstalled before you upgrade the report pack, then reinstalled after the report pack is upgraded.

1 Log in to the system. On UNIX systems, log in as root.

2 Stop OVPI Timer and wait for processes to stop running.

   Windows NT:

   a Select **Control Panel > Administrative Tools > Services**

   b Select OVPI Timer from the list of services.

   c From the Action menu, select **Stop**.

   UNIX: As root, do one of the following:

   — HP-UX: `sh /sbin/init.d/ovpi_timer stop`

   — Solaris: `sh /etc/init.d/ovpi_timer stop`

3 If necessary, upgrade Common Property Tables by installing its version 3.92 upgrade package. When you install the upgrade, do not install other packages at the same time. Install the upgrade for Common Property Tables and *only* the upgrade for Common Property Tables. If you need help with the upgrade, refer to the *Common Property Tables User Guide*.

4 Install the upgrade package for the SR report pack:

   • *SystemResource_Upgrade_452*

5 Install these upgrade sub-packages:

   • *SystemResourceCPU_Upgrade_to_431*

   • *SystemResource_Disk_Upgrade_to_451*

   • *SystemResource_FileSystem_Upgrade_to_111*

   • *SystemResourceLS_Upgrade_to_112*

   • *SystemResource_LogicalVolume_Upgrade_to_441*

   • *SystemResourceProcess_Upgrade_to_431*

   • *SystemResource_NetInterface_Upgrade_to_441*

   • *SystemResource_Thresholds_Upgrade_31_to_32*

6 Install one of these upgrade packages:

   • *SysRes_OVPA_Datapipe_Upgrade_to_34*

   or

   • *SysRes_RFC1514_Datapipe_Upgrade_to_42*

7 Restart OVPI Timer.

   Windows NT: Select **Settings** → **Control Panel** → **Administrative Tools** → **Services**

   UNIX: As root, type one of the following:

   HP-UX: `sh /sbin/init.d/ovpi_timer start`

   Solaris: `sh /etc/init.d/ovpi_timer start`

Post-Installation Steps

Reconfigure any polling policies and customized group definitions that need to be restored. Do not re-import the configurations you exported. Because the old datapipe may be incompatible with the new datapipe you just installed, re-importing the configurations you exported could lead to data corruption. In addition, if you dropped any custom table views, you may recreate those custom views now.

3 The New Install

Guidelines for Install

The applications that run on Performance Insight have two ingredients, a report pack and at least one datapipe. When you install the datapipe, you configure PI to create tables and to collect a specific type of performance data at a specific interval. When you install the report pack, you configure PI to create tables, process data collected by the datapipe, and aggregate data in some manner, for example, by month, by location, or by customer.

The report pack CD-ROM contains report packs and datapipes. When you insert the CD in the CD-ROM drive and launch the package extraction program, the install script extracts every package from the CD and copies the results to the Packages directory on your system. After the extract finishes, the install script prompts you to start Package Manager and follow the on-screen instructions. Before using Package Manager, review the following guidelines.

Software Prerequisites

System Resource has the following prerequisites:

- Performance Insight 5.41
- All service packs available for PI 5.41
- Common Property Tables 3.92

If you are not running any version of Common Property Tables, let Package Manager install Common Property Tables for you. If you are running an earlier version of Common Property Tables, upgrade to the latest version by installing its 3.92 upgrade package. Upgrade Common Property Tables *before* installing the System Resource Report Pack.

Datapipes and Datapipe Dependencies

The datapipes that collect data for System Resource are not prerequisites. You may install the datapipes when you install System Resource or you may install the datapipes after you install System Resource. These are your options:

- RFC 1514 Datapipe (host resources MIB)
- SR OVPA Datapipe

Because the SR OVPA Datapipe depends on the OVPA Collection Datapipe to perform agent discovery, the OVPA Collection Datapipe is a prerequisite for the SR OVPA Datapipe. If you select the SR OVPA Datapipe for installation, Package Manager will select and install the OVPA Collection Datapipe for you, automatically.

If desired, you may install all three datapipes. If you install all three, do not allow the RFC 1514 Datapipe and the SR OVPA Datapipe to collect data from the same node. Node configuration must be set for one datapipe exclusively, not both. If node configuration is not exclusive, you could get multiple fsindex values for the same node_fk.

Thresholding and Integration with HP Operations

If you want to implement thresholding for the reports in the main package, install SystemResource_Thresholds. The package contains customized thresholds. Installing the thresholds sub-package configures PI to monitor the database for threshold conditions and respond to a breach condition by taking one of several possible actions.

The thresholds sub-package reports exceptions on aggregated data, on hourly data, or on both aggregated data and hourly data.

The thresholds sub-package requires the Thresholds Module. If you select the thresholds sub-package for installation, Package Manager will select and install the Thresholds Module for you, automatically. Because the Thresholds Module includes defaults designed for NNM, you must configure the Thresholds Module to send breach traps to HPOU or HPOW. For details about destination parameters, as well as category and severity parameters, see the *Thresholds Module User Guide*.

Distributed Environments

Central server software requirements are different from satellite server software requirements. Install the following packages on the central server:

- System Resource
- Optional sub-packages (SR_CPU, SR_DISK, etc.)
- Common Property Tables

Install the following packages on each satellite server:

- System Resource
- Optional sub-packages (SR_CPU, SR_DISK, etc.)
- Common Property Tables
- Datapipes:
  - SysRes OVPA Datapipe *and*
  - OVPA Collection Datapipe

    or

  - SysRes RFC 1514
- (*Optional*) SystemResource_Thresholds
- (*Optional*) Thresholds Module

If you are only interested in seeing alarms on hourly data, installing the thresholds sub-package on the central server is not necessary. If you want to set thresholds on aggregated data, you must install the thresholds sub-package on the central server.

When you finish installing packages, configure your central server and each satellite server. For details, see Chapter 5, Setting Up a Distributed System.

Installing System Resource

Follow these steps to install System Resource:

- Task 1: Stop OVPI Timer and extract packages from the report pack CD.
- Task 2: Install System Resource, optional sub-packages, and at least one datapipe
- Task 3: Restart OVPI Timer.

Task 1:   Stop OVPI Timer and extract packages from the report pack CD

1   Log in to the system. On UNIX systems, log in as root.

2   Stop OVPI Timer and wait for processes to terminate.

Windows: Do the following:

a   Select **Control Panel > Administrative Tools > Services**

b   Select OVPI Timer from the list of services.

c   From the Action menu, select **Stop**.

UNIX: As root, do one of the following:

— HP-UX: **sh /sbin/init.d/ovpi_timer stop**

— Solaris: **sh /etc/init.d/ovpi_timer stop**

3   Insert the report pack CD in the CD-ROM drive.

Windows: A menu displays automatically.

UNIX:

a   Mount the CD (if the CD does not mount automatically).

b   Navigate to the top level directory on the CD.

c   Run **./setup**

4   Type **1** in the choice field and press **Enter**.

The install script displays a percentage complete bar. When the copy is complete, the install script starts Package Manager. The Package Manager welcome window opens.

Task 2:   Install System Resource and at least one datapipe

1   Click **Next.** The Package Location window opens.

2   Click **Install.** Approve the default destination directory or browse to a different directory if necessary.

3   Click **Next.** The Report Deployment window opens. Type your username and password for the PI Application Server.

4   Click **Next.** The Package Selection window opens. Click the check box next to:

- *System Resource 4.52*
- *SR_LS sub-package 1.11* (optional)
- *SR_LS_Thresholds 1.12* (optional)
- *SR_LV sub-package 4.41* (optional)
- *SR_PROC sub-package 4.31* (optional)
- *SR_NetIf sub-package 4.41* (optional)
- *SR_CPU sub-package 4.31* (optional)
- *SR_DISK sub-package 4.51* (optional)
- Datapipes:
  - — *SR OVPA Datapipe 3.3*
  - — *OVPA Collection Datapipe 1.00*
  - — *SysRes RFC1514 Datapipe 4.10*
- *SystemResource_Thresholds 3.20*(optional)

> ▶ Installing SystemResource_Thresholds is optional. If you install the thresholds sub-package, Package Manager will install Thresholds Module for you.

> ▶ If you are not currently running any version of Common Property Tables, Package Manager will select and install Common Property Tables for you, automatically.

> ▶ The demo package is optional. You can install the demo package and nothing else, or you can install the demo package along with everything else.

5   Click **Next.** The Type Discovery window opens. Disable the default and click **Next**. The Selection Summary window opens.

6   Click **Install.** The Installation Progress window opens and the install begins. When the install finishes, a package installation complete message appears.

7   Click **Done** to return to the Management Console.

Task 3:   Restart OVPI Timer

Windows NT: Select **Settings > Control Panel** > **Administrative Tools > Services**

UNIX: As root, type one of the following:

HP-UX: **sh /sbin/init.d/ovpi_timer start**

Solaris: **sh /etc/init.d/ovpi_timer start**

Accessing Deployed Reports

When you installed this report pack, you enabled the Deploy Reports option. As a result, the reports in this package (as well as any forms that come with this package) are now deployed to the PI Application Server. Once reports reside on the PI Application Server, you can view them on the web or you can view them using the PI client applications.

The clients are Report Viewer, Report Builder, and the Management Console. If the clients are not installed on your system, you must use a web browser to view reports. For more information about the application clients, see the *PI Installation Guide*. For more information about the Management Console, including how to use the Object/Property Management view to launch reports specific to a selected object, see the *PI Administration Guide*.

Seeing Performance Data in Reports

Some reports populate with data sooner than others. The first report to populate with data is the Near Real Time report. You will begin to see data in this report immediately after the first data collection completes.

Any report that begins with an analysis of yesterday's performance will need at least one full day's worth of data before results are viewable. You will begin to see forecast data soon, within a few days. However, reliable forecast data will not be available until the baseline is complete, and completing the baseline will take several weeks.

4 Data Collection

SysRes RFC1514 Datapipe

The SysRes RFC 1514 Datapipe collects the following data from the Host Resources MIB:

- CPU utilization
- Memory utilization
- Number of page outs
- Run queue length
- Swap utilization

OVPA Collection Datapipe

The OVPA Collection Datapipe performs the following tasks:

- Discovers PA or EPC performance agents
- Inserts pa_collect statements into the trendtimer.sched file

  > In a distributed environment, remote pollers sometimes do not refresh the trendtimer.sched file with new pa_collect statements at different intervals.

  To configure a remote poller for refreshing the pa_collect entries, you must edit the trendtimer.sched file on remote poller with the following entries:

  ```
  5 - - {DPIPE_HOME}/bin/pa_collect -n -i 5 -E 5

  10 - - {DPIPE_HOME}/bin/pa_collect -n -i 10 -E 10

  15 - - {DPIPE_HOME}/bin/pa_collect -n -i 15 -E 15

  20 - - {DPIPE_HOME}/bin/pa_collect -n -i 20 -E 20

  60 - - {DPIPE_HOME}/bin/pa_collect -n -i 60

  24:00+1:00 - - {DPIPE_HOME}/bin/pa_collect -n -i 1440
  ```

- Populates the PA type group for use in the collection process

The discovery process runs once a day. In accordance with directives in the OVPA_Collection_Daily.pro file, the discovery process attempts to check all of the nodes in ksi_managed_node table. Since SNMP discovery can only discover SNMP-pollable devices, you may want to add PA or EPC systems using the create node tool.

Once the discovery process starts, it writes to the pa_discovery.data file in the DPIPE_HOME/data directory. The pa_discovery.data file contains the systems the discovery process finds. Once the discovery process is complete, ee_collect loads the pa_discovery.data file into PI. The data is placed in the K_padatasources table.

⚠️ Sometimes data batches collected every 15 seconds from PA agents using SR_OVPA Datapipe fails to sum up correctly. This happens when the SR_OVPA Datapipe collects data every 15 seconds from PA agents. However, while summarizing the data by ta_period, trend_sum utility sums four batches of fifteen second data samples to one minute data. This often causes data to be represented wrongly. For example, if four batches of CPU utilization data are summed up, the CPU utilization for one minute often shows to be greater than 100%.

To solve this problem:

1 Run the following command:

   trend_sum –U

   The option **–U** enables trend_sum to process all the data residing in the source table ignoring the timestamps of data batches. For more information about this option refer to trend_sum in *HP Performance Insight Reference Guide*.

2 Check the data generated by trend_sum.

   • If this data is correct,

   a Open the OVPA_Collection_Daily.pro file.

   b Update the entry for the trend_sum utility as follows:

   trend_sum -P 60

   The option **–P 60** compels trend_sum to wait for 60 minutes before processing the collected data. This option ensures that trend_sum would process the data batches with timestamps older than 60 minutes. For more information about this option refer to trend_sum in *HP Performance Insight Reference Guide*.

   • If the result generated by trend_sum is not correct, trend_sum utility may not be running correctly. In such case contact HP Support.

SysRes OVPA Datapipe

The SysRes OVPA Datapipe collects metrics from the following classes:

- Global
- Filesystem
- Application
- Transaction
- Configuration

Metrics in the configuration class are collected once daily. The other classes are collected hourly. All class are collected from two agents:

- HP Performance Agent (PA)
- Embedded Performance Component of HP Operations (HP OA)

HP OA, also known as EPC, ships with HPOU 7.0 and HPOW 7.0. If you are using HPOU 7.0 (or later) or HPOW 7.0 (or later), the SysRes OVPA Datapipe collects metrics from EPC. If you are using an earlier version of HP Operations, the SysRes OVPA Datapipe collect metrics from PA.

The metrics gathered by PA are different from the metrics gathered by EPC. For details about how the metrics vary, refer to *Metrics for HP Performance Agent and Operations Agent.* You can download this document from the Product Manuals website. Look for it in one of two places, under *Operations for Windows* or under *Operations for UNIX.*

For more information about the SysRes OVPA Datapipe, including information about tables, metrics, and mapping, refer to *System Resource OVPA Datapipe User Guide*.

Collections Performed by Sub-Packages

The following sub-packages can be installed with the System Resource Report Pack:

1 CPU
2 Process
3 Disk
4 Logical Volume
5 Network Interface
6 Logical System

Each sub-package provides a built-in data collection. Each collection takes place hourly. In addition, each collection is a history-styled collection. When the system is polled, the datapipe returns multiple rows, with each row having a distinct ta_period. The first time the collection runs, all rows from midnight of the previous day will be returned. Each collection thereafter will only return data that has not already been collected.

Limiting subsequent collections to data that has not already been collected is accomplished using history property tables. These tables contain the last *ta_sysuptime* value in the *lastPoll* column. Each collection after the first collection asks for data with a time stamp value greater than the value in *lastPoll*.

CPU Sub-Package

The CPU sub-package collects data from the CPU class. All systems in the PA type group will be collected for the CPU collection.

Data Table Matrix

Table/File	Name
Raw Table	xSR_OVPA_CPU
Rate Table	RSR_OVPA_CPU
Property Table	K_OVPA_CPU
Teel File	SysResOVPA_CPU.teel

Property Table Matrix

Table/File	Name
Property Table	K_OVPA_CPU
Teel File	prop_OVPA_CPU.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_CPU_History
History Property Table	K_OVPA_CPU_History
History Teel File	prop_OVPA_CPU_history.teel

Collected CPU Metrics

The collection table is RSR_OVPA_CPU. Supported metrics vary from platform to platform and from PA to EPC agents.

Metric	Description
BYCPU_ID	CPU ID
BYCPU_CPU_SYS_MODE_UTIL	The percent of time CPU was in System Mode.
BYCPU_CPU_USER_MODE_UTIL	The percent of time CPU was in User Mode.
BYCPU_CPU_TOTAL_UTIL	The percent CPU utilization.
BYCPU_STATE	CPU State
BYCPU_INTERRUPT_RATE	Average number of device interrupts.
BYCPU_CSWITCH_RATE	Context switch rate

Daily Processing

The SR_Daily_CPU.pro file is invoked at 2:00 every morning. The daily processing consists of running the SD_SR_CPU.sum file.

Hourly Processing

The SR_Hourly_CPU.pro file is invoked every hour.

The hourly processing handles new systems, updates the CPU property table, and data mapping from the datapipe rate table to the System Resource CPU Report Pack base table.

When new systems are found they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPACPU_SetIDs. The stored procedure is invoked using the SQL script execute_SR_OVPACPU_SetIDs.sql. The stored procedure populates K_Node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node.

The CPU update populates the K_System_CPU property table with the CPU state.

Mapping RSR_OVPA_CPU to SH_SR_CPU

Purpose: Map system metrics from RSR_OVPA_CPU to the System Resource CPU base table SH_SR_CPU.

File: SH_SR_CPU.sum source table: RSR_OVPA_CPU destination table: SH_SR_CPU by variable: node_fk by variable: CPUid by variable: hour column: CPUSystemMode=BYCPU_CPU_SYS_MODE_UTIL:avg column: CPUUserMode=BYCPU_CPU_USER_MODE_UTIL:avg column: CPUUtil=BYCPU_CPU_TOTAL_UTIL:avg column: CSRate=BYCPU_CSWITCH_RATE:avg column: IntRate=BYCPU_INTERRUPT_RATE:avg

Source Metric	Destination Metric	Summary Type
BYCPU_CPU_SYS_MODE_UTIL	AVGCPUSystemMode	avg
BYCPU_CPU_USER_MODE_UTIL	AVGCPUUserMode	avg
BYCPU_CPU_TOTAL_UTIL	AVGCPUUtil	avg
BYCPU_CSWITCH_RATE	AVGCSRate	avg
BYCPU_INTERRUPT_RATE	AVGIntRate	avg

Logical Volume Sub-Package

The Logical Volume sub-package collects data from the Logical Volume class. All systems in the PA type group are collected for the Logical Volume collection.

Data Table Matrix

Table/File	Name
Raw Table	xSR_OVPA_LV
Rate Table	RSR_OVPA_LV
Property Table	K_OVPA_LogicalVolue
Teel File	SysResOVPA_LogicalVolume.teel

Property Table Matrix

Table/File	Name
Property Table	K_OVPA_LogicalVolume
Teel File	prop_OVPA_LogicalVolume.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_LV_History
History Property Table	K_OVPA_LV_History
History Teel File	prop_SysResOVPA_LV_history.teel

Collected Logical Volume Metrics

The collection table is RSR_OVPA_LogicalVolume. Supported metrics vary from platform to platform and are supported on the PA agent only.

Metric	Description
LV_DIRNAME	The absolute path name of Logical volume on HP OS.
LV_READ_RATE	Number of physical reads per second for this logical volume during the interval.
LV_WRITE_RATE	Number of physical writes per second for this logical volume during the interval.
LV_SPACE_UTIL	Percent of the logical volume file system space in use during the interval.

Daily Processing

The SR_Daily_LogicalVolume.pro file is invoked at 2:00 every morning. The daily processing consists of running the SD_SR_LogicalVolume.sum file.

Hourly Processing

The SR_Hourly_LogicalVolume.pro file is invoked every hour.

The hourly processing handles new systems and data mapping from the datapipe rate table to the System Resource Logical Volume Report Pack base table.

When new systems are found, they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPALogicalVolume_SetIDs. The stored procedure is invoked using the SQL script execute_SR_OVPALogicalVolume_SetIDs.sql. The stored procedure populates K_Node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node.

Mapping RSR_OVPA_LogicalVolume to SH_SR_LogicalVolume

Purpose: Map metrics from RSR_OVPA_LogicalVolume to the LogicalVolume base table
SH_SR_LogicalVolume.

File: SH_SR_LogicalVolume.sum
source table: RSRV_OVPA_LogicalVolume
destination table: SH_SR_LogicalVolume
by variable: node_fk
by variable: LV_DIRNAME
by variable: hour

Source Metric	Destination Metric	Summary Type
LV_READ_RATE	AVGReadRate	avg
LV_WRITE_RATE	AVGWriteRate	avg
LV_SPACE_UTIL	AVGSpaceUtil	avg

Network Interface Sub-Package

The Network Interface sub-package collects data from the Network Interface class. All
systems in the PA type group will be collected for the Network Interface collection.

Data Table Matrix

Table/File	Name
Raw Table	xSR_OVPA_NetIf
Rate Table	RSR_OVPA_NetIf
Property Table	K_OVPA_NetInterface
Teel File	SysResOVPA_NetInterface.teel

Property Table Matrix

Table/File	Name
Property Table	K_OVPA_NetInterface
Teel File	prop_OVPA_NetInterface.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_NetInterface_History
History Property Table	K_OVPA_NETIF_History
History Teel File	prop_SysResOVPA_NetIf_history.teel

Collected Network Interface Metrics

The collection table is RSR_OVPA_NetIf. Supported metrics vary from platform to platform and from PA to EPC agents.

Metric	Description
BYNETIF_COLLISION_RATE	The name of the network interface.
BYNETIF_IN_PACKET_RATE	The number of physical collisions per second on the network interface during the interval.
BYNETIF_OUT_PACKET_RATE	The number of successful physical packets per second received through the network interface during the interval.
BYNETIF_IN_BYTE_RATE	The number of successful physical packets per second sent through the network interface during the interval.
BYNETIF_OUT_BYTE_RATE	The number of KBs per second received to the network via this interface during the interval.
BYNETIF_ERROR_RATE	Number of KBs per second sent to the network via this interface during the interval.
BYNETIF_NET_SPEED	Number of physical errors per second on the network interface during the interval.
BYNETIF_COLLISION_RATE	The speed of this interface.

Daily Processing

The SR_Daily_NetInterface.pro file is invoked at 2:00 every morning. The daily processing consists of running the SD_SR_NetInterface.sum file.

Hourly Processing

The SR_Hourly_NetInterface.pro file is invoked every hour.

The hourly processing handles new systems and data mapping from the datapipe rate table to the System Resource Network Interface Report Pack base table.

When new systems are found, they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPANetIf_SetIDs. The stored procedure is invoked using the SQL script execute_SR_OVPANetIf_SetIDs.sql. The stored procedure populates K_Node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node.

Mapping RSR_OVPA_NetIf to SH_SR_NetInterface

Purpose: Map system metrics from RSR_OVPA_NetIf to the Network Interface base table SH_SR_NetInterface.

File: SH_SR_NetInterface.sum
source table: RSR_OVPA_NetIf
destination table: SH_SR_NetInterface
by variable: node_fk
by variable: prop_netif_name
by variable: hour

column: CollisionRate=BYNETIF_COLLISION_RATE:avg
column: InPackets=BYNETIF_IN_PACKET_RATE:avg
column: OutPackets=BYNETIF_OUT_PACKET_RATE:avg
column: InBytes=BYNETIF_IN_BYTE_RATE:avg
column: OutBytes=BYNETIF_OUT_BYTE_RATE:avg
column: ErrorRate=BYNETIF_ERROR_RATE:avg
column: NetSpeed=BYNETIF_NET_SPEED:avg

Source Metric	Destination Metric	Summary Type
BYNETIF_COLLISION_RATE	AVGCollisionRate	avg
BYNETIF_IN_PACKET_RATE	AVGInPackets	avg
BYNETIF_OUT_PACKET_RATE	AVGOutPackets	avg
BYNETIF_IN_BYTE_RATE	AVGInBytes	avg
BYNETIF_OUT_BYTE_RATE	AVGOutBytes	avg
BYNETIF_ERROR_RATE	AVGErrorRate	avg
BYNETIF_NET_SPEED	AVGNetSpeed	avg

Disk Sub-Package

The Disk sub-package collects data from the Disk class. All systems in the PA type group will be collected for the Disk collection.

Data Table Matrix.

Table/File	Name
Raw Table	xSR_OVPA_Disk
Rate Table	RSR_OVPA_Disk
Property Table	K_OVPA_Disk
Teel File	SysResOVPA_Disk.teel

Property Table Matrix

Table/File	Name
Property Table	K_OVPA_Disk
Teel File	prop_OVPA_Disk.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_Disk
History Property Table	K_OVPA_DISK_History
History Teel File	prop_SysResOVPA_Disk_history.teel

Collected Disk Metrics

The collection table is RSR_OVPA_Disk. Supported metrics vary from platform to platform and from PA to EPC agents.

Metric	Description
BYDSK_DEVNAME	Name identifying the specific disk.
BYDSK_DIRNAME	Name of the file system directory mounted on this disk device. Displays Multiple FS if more than one exists.
BYDSK_AVG_SERVICE_TIME	Average time, in milliseconds, that this disk spent in processing each disk request during the interval
BYDSK_PHYS_IO_RATE	Average number of physical IO requests per second for this disk device during the interval.

Metric	Description
BYDSK_UTIL	Utilization, or percent of the time busy servicing requests for this device.
BYDSK_FS_READ_RATE	Number of physical file system reads per second from this disk device during the interval.
BYDSK_FS_WRITE_RATE	Number of physical file system writes per second from this disk device during the interval.
BYDSK_VM_IO_RATE	Number of virtual memory IOs per second to this disk device during the interval.
BYDSK_RAW_READ_RATE	Number of raw reads per second from this disk device during the interval.
BYDSK_RAW_WRITE_RATE	Number of raw writes per second to this disk device during the interval.
BYDSK_SYSTEM_IO_RATE	Number of physical system reads or writes per second to this disk device during the interval.

Daily Processing

The SR_Daily_Disk.pro file is invoked at 2:00 every morning. The daily processing consists of running the SD_SR_Disk.sum file.

Hourly Processing

The SR_Hourly_Disk.pro file is invoked every hour. Hourly processing handles new systems and data mapping from the datapipe rate table to the Disk Sub-Package base table.

When new systems are found, they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPADisk_SetIDs. The stored procedure is invoked using the SQL script execute_SR_OVPADisk_SetIDs.sql. The stored procedure populates K_Node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node.

Mapping RSR_OVPA_Disk to SH_SR_Disk

Purpose: Map metrics from RSR_OVPA_Disk to the SH_SR_Disk base table.

File: SH_SR_Disk.sum
source table: RSR_OVPA_Disk
destination table: SH_SR_Disk
by variable: node_fk
by variable: prop_disk_name
by variable: hour

column: ServiceTime=BYDSK_AVG_SERVICE_TIME:avg
column: DiskUtil=BYDSK_UTIL:avg
column: PhysicalIORate=BYDSK_PHYS_IO_RATE:avg
column: FSReadRate=BYDSK_FS_READ_RATE:avg
column: FSWriteRate=BYDSK_FS_WRITE_RATE:avg
column: RawReadRate=BYDSK_RAW_READ_RATE:avg
column: RawWriteRate=BYDSK_RAW_WRITE_RATE:avg
column: c=BYDSK_VM_IO_RATE:avg
column: SystemIORate=BYDSK_SYSTEM_IO_RATE:avg

Source Metric	Destination Metric	Summary Type
BYDSK_AVG_SERVICE_TIME	AVGServiceTime	avg
BYDSK_UTIL	AVGDiskUtil	avg
BYDSK_PHYS_IO_RATE	AVGPhysicalIORate	avg
BYDSK_FS_READ_RATE	AVGFSReadRate	avg
BYDSK_FS_WRITE_RATE	AVG FSWriteRate	avg
BYDSK_RAW_READ_RATE	AVGRawReadRate	avg
BYDSK_RAW_WRITE_RATE	AVGRawWriteRate	avg
BYDSK_VM_IO_RATE	AVGVMIORate	avg
BYDSK_SYSTEM_IO_RATE	AVGSystemIORate	avg

The `SystemResourceDiskDetails.rep` file for System Resource report pack 4.4 does not work when PI 5.30 and later is using a Sybase database. PI, in this case, generates empty Details table and graphs.

The problem occurs because of the following incorrectly capitalized column names in the `SystemResourceDiskDetails.rep` file:

- AVGDiskUtil_Formatted
- AVGPHYSReadRate
- AVGPHYSWriteRate

We strongly recommend you to test each report on both Sybase and Oracle systems every time you create or update it.

To solve this problem,

1 Download the `UPGRADE_SR_CPU_to_43.ap.tar` hotfix.

   Note that the hotfix is available only for PI version 5.30 and later.

2 Copy the hotfix to `{DPIPE_HOME}/packages/SystemResource` directory.

3 Extract the `UPGRADE_SR_DISK_to_45.ap` file from the TAR file.

4 Run the Package Manager utility to install the `UPGRADE_SR_DISK_to_45.ap`.

Note that this hotfix works on all operating systems supported by PI.

Process Sub-Package

The Process sub-package performs an hourly collection. The Process collection collects all systems in the PA type group.

Data Table Matrix.

Table/File	Name
Raw Table	xSR_OVPA_process
Rate Table	RSR_OVPA_process
Property Table	K_ProcOVPA_proc
Teel File	SysResOVPA_Process.teel

Property Table Matrix

Table/File	Name
Property Table	K_ProcOVPA_proc
Teel File	prop_ProcOVPA_proc.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_proc
History Property Table	K_OVPA_PROC_HISTORY
History Teel File	prop_ProcOVPA_proc_history.teel

Collected Process Metrics

The collection table is RSR_OVPA_process. Supported metrics vary from platform to platform and are only supported by the PA agent.

Metric	Description
PROC_CPU_TOTAL_TIME	Total CPU Time consumed in seconds.
PROC_PROC_NAME	Process name.
PROC_CPU_TOTAL_UTIL	Percentage of CPU Time Consumed.
PROC_THREAD_COUNT	Total number of threads.
PROC_MEM_VIRT	Sum of virtual memory used.

Daily Processing

The SR_Daily_Process.pro file is invoked at 2:00 every morning. The daily processing consists of running the SD_SR_proc.sum file.

Hourly Processing

The SR_Hourly_Process.pro file is invoked every hour.

The hourly processing handles new systems and data mapping from the datapipe rate table to the System Resource Disk Report Pack base table.

When new systems are found, they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPAProc_SetIDs. The stored procedure is invoked using the SQL script execute_SR_OVPAProc_SetIDs.sql. The stored procedure populates K_Node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node.

Mapping RSR_OVPA_process to SH_SR_Process

Purpose: Maps metrics from RSR_OVPA_process to the SH_SR_Process base table.

File: SH_SR_proc.sum
source table: xSR_OVPA_process
destination table: SH_SR_Process
by variable: node_fk
by variable: Process_Name
by variable: hour

column: CPUTime=PROC_CPU_TOTAL_TIME:tot
column: CPUUtil=PROC_CPU_TOTAL_UTIL:avg
column: ThreadCount=PROC_THREAD_COUNT:tot
column: VirtualMem=PROC_MEM_VIRT:tot

Source Metric	Destination Metric	Summary Type
PROC_CPU_TOTAL_TIME	TOTCPUTime	tot
PROC_CPU_TOTAL_UTIL	AVGCPUUtil	avg
PROC_THREAD_COUNT	TOTThreadCount	tot
PROC_MEM_VIRT	TOTVirtualMem	tot

Logical System Sub-Package

The Logical System sub-package performs an hourly summary, a daily summary, and a monthly summary. The Logical System collection collects all systems in the PA type group.

Data Table Matrix.

Table/File	Name
Raw Table	xSR_OVPA_LS
Rate Table	RSR_OVPA_LS
Property Table	K_OVPA_LS
Teel File	SysResOVPA_LS.teel

Property Table Matrix

Table/File	Name
Property Table	K_OVPA_LS
Teel File	prop_OVPA_LS.teel

History Property Table Matrix

Table/File	Name
Property Table	K_OVPA_LS_HISTORY
History Property Table	K_OVPA_LS_HISTORY
History Teel File	prop_OVPA_LS_history.teel

Collected Metrics

The SR_LS module collects virtualization metrics from OVPA 4.6. The metrics collected by OVPA 4.6 are coming from HPVM, or AIX LPARS, or both.

Daily Processing

The SR_Daily_LS.pro file is invoked at 2:00 a.m. every morning. The daily processing consists of running the SD_SR_LS.sum and SM_SR_LS.sum.

Hourly Processing

The SR_Hourly_LS.pro file is invoked every hour.

The hourly processing handles new systems, updates the Logical System property table, and maps data from the datapipe rate table to the System Resource Logical System Report Pack base table.

When new systems are found, they need to be added to K_Node before the summaries take place. This is done using the stored procedure ppSR_OVPALS_SetIDs. The stored procedure populates K_node with the new system and populates the node_fk column in the datapipe property table with the dsi_key_id value for that system from K_Node. The update_K_System_LS.sql populates the K_System_LS property table with the Logical System state.

The Hourly processing consists of running SH_SR_LS.sum and SH_SR_LS_byHost.sum.

Mapping RSR_OVPA_LS to SH_SR_LS

Purpose: Map system metrics from RSR_OVPA_LS to SH_SR_LS base table.

| File: SH_SR_LS.sum
source table: xSR_OVPA_LS
destination table: SH_SR_LS
by variable: dsi_target_name
by variable: dsi_table_key
by variable: hour | File: SH_SR_LS_byHost.sum
source table: xSR_OVPA_LS
destination table: SH_SR_LS
by variable: dsi_target_name
by variable: hour | |

column: UP=(case when ((BYLS_LS_STATE like "on") or (BYLS_LS_STATE like "Up")) then 1 else 0 end):cnt,lst

column: !NUM_CPU=BYLS_NUM_CPU:wav

column: !NUM_DISK=BYLS_NUM_DISK:wav

column: !NUM_NETIF=BYLS_NUM_NETIF:wav

column: !CPU_Entl=BYLS_CPU_ENTL_MAX:wav

column: UpTime=case when (INTERVAL>delta_time) then delta_time else INTERVAL end:tot

column: !LSResourceMode=BYLS_LS_MODE:lst

column: !SysUpTime=BYLS_UPTIME_SECONDS:lst

column: PhysCPUTime=BYLS_CPU_PHYS_TOTAL_TIME:tot

column: PhysCPUUtil=BYLS_CPU_PHYS_TOTAL_UTIL:min,avg,max

column: LSCPUTotalUtil=BYLS_CPU_TOTAL_UTIL:avg

column: PhysMemUsed=BYLS_MEM_ENTL:min,avg,max

column: LSMemEntilUtil=BYLS_MEM_ENTL_UTIL:min,avg,max

column: !Mem_Entl=(case when (BYLS_MEM_ENTL_MAX is not null) then BYLS_MEM_ENTL_MAX else BYLS_MEM_ENTL end):wav

column: LSRunQue=BYLS_RUN_QUEUE:avg

Source Metric	Destination Metric	Summary Type
BYLS_LS_STATE	CNTUP	cnt
BYLS_LS_STATE	LSTUP	lst
BYLS_NUM_CPU	NUM_CPU	wav
BYLS_NUM_DISK	NUM_DISK	wav
BYLS_NUM_NETIF	NUM_NETIF	wav

BYLS_CPU_ENTL_MAX	CPU_Entl	wav
INTERVAL UpTime	case when (INTERVAL>delta_time) then delta_time else INTERVAL end	tot
BYLS_UPTIME_SECONDS	SysUpTime	lst
BYLS_CPU_PHYS_TOTAL_UTIL	MINPhysCPUUtil	min
BYLS_CPU_PHYS_TOTAL_UTIL	AVGPhysCPUUtil	avg
BYLS_CPU_PHYS_TOTAL_UTIL	MAXPhysCPUUtil	max
BYLS_CPU_TOTAL_UTIL	AVGLSCPUTotalUtil	avg
BYLS_MEM_ENTL	MINPhysMemUsed	min
BYLS_MEM_ENTL	MAXPhysMemUsed	max
BYLS_MEM_ENTL	AVGPhysMemUsed	avg
BYLS_MEM_ENTL_UTIL	MINLSMemEntilUtil	min
BYLS_MEM_ENTL_UTIL	MAXLSMemEntilUtil	max
BYLS_MEM_ENTL_UTIL	AVGLSMemEntilUtil	avg
BYLS_MEM_ENTL	Mem_Entl	wav
BYLS_RUN_QUEUE	AVGLSRunQue	avg
BYLS_LS_MODE	LSResourceMode	lst

5 Setting Up a Distributed System

These are the steps to follow when setting up a distributed system:

- Decide whether or not you want local reporting

- Install the right set of packages on each server (a central server that is not polling will not need datapipes; the satellite servers will need datapipes)

- Verify that the system clocks in your environment are synchronized

- Register your satellite servers

- If you are not copying rate data to the central server, enable LIR on the central server

- If you enable LIR, add LIR mapping with the time type set to rate

- Verify that you have all the copy policies you need

- Configure the central server (manual edits to trendtimer.sched and .pro files)

- Configure each satellite server (manual edits to trendtimer.sched and .pro files)

If you want to set up a distributed system, you can implement local reporting or you can implement centralized reporting. If you want local reporting, you need to deploy reports when you install the report pack on each satellite server, and you need to allow summarizations to run on each satellite server. If you do not want local reporting, then you do not need to deploy reports when you install a report pack on a satellite server and you can disable the scripts that run summarizations on each satellite server.

Before Location Independent Reporting (LIR) was available, our recommendation to anyone setting up a distributed system was to deploy reports on satellite servers, keep rate data on satellite servers, copy hourly data to the central server, and disable summarizations above the hourly level on satellite servers. The advantage to this approach was that it kept a large volume of rate data off the network and it decreased the processing load on the central server. The disadvantage is that the central server could not display a Near Real Time (NRT) report. The only NRT report was a local NRT report, on a satellite server. LIR overcomes this disadvantage. With LIR, now you can open an NRT report on the central server and drill-down on any selection you make. The selection you make prompts the central server to query a satellite server for locally aggregated data. Of course, if you would rather copy rate data to the central server, you can. If you do that, then enabling LIR is not necessary.

System Resource includes a copy policy import file. When you install System Resource, the core product uses the copy policy import file to generate copy policies. As a result, you do not need to create copy policies yourself using the Management Console. Instead, your only task related to copy policies is to verify that the copy policies you need already exist.

Because you are likely to have multiple satellite servers, we designed the trendtimer.sched file and the .pro files to accommodate satellite server requirements. This means that most of the time most of the defaults are correct. But some defaults will be incorrect, or less than optimal, and to improve performance you should change them. These manual edits, as well as the other steps listed above, are spelled out in detail below.

Installing System Resource on Multiple Servers

If you intend to run System Resource as a distributed system across multiple servers, each server must be configured. Before configuring the servers, verify that everything is installed where it needs to be installed. As shown in the following table, the datapipes belong on the satellite servers, otherwise package installation is the same across all servers.

Central Server	Satellite Server
System Resource 4.52	System Resource 4.52
SystemResource_Thresholds 3.20	SystemResource_Thresholds 3.20
Thresholds Module 5.10	Thresholds Module 5.10
Common Property Tables 3.92	Common Property Tables 3.92
	SysRes RFC1514 Datapipe 4.10
	SR OVPA Datapipe 3.40
	OVPA Collection Datapipe 1.00

If you do not need local reporting, do not deploy reports when you install the report pack on a satellite server. If you want to view reports locally, deploy reports.

Where you install the optional thresholds sub-package depends on how you want thresholding to work. If you want to set thresholds on hourly data, install the thresholds sub-package on satellite servers. If you want to set thresholds on aggregated data, install the thresholds sub-package on the central server.

➤ If you intend to collect System Resource / PA type group data in a distributed environment, disable `execute_SR_OVPA_SetOVPAType.sql` in all servers. This process automatically populates type groups in the collection process. However, for a distributed environment, it is better to have manual control over the type groups so as to avoid duplicate polling.

Central Server Configuration

To configure the central server, perform the following tasks:

- Task 1: Register the satellite server by setting the database role
- Task 2: Enable LIR
- Task 3: Add LIR mappings
- Task 4: Verify the automatically generated copy policies
- Task 5: Delete LIR mappings for rate tables
- Task 6: Modify the `SR_Hourly_Reporting.pro` file

Task 1: Register the satellite server by setting the database role

1. Start the Management Console (log on with Administrator privileges).
2. Click the **Systems** icon in the navigation pane.
3. Navigate to the PI Databases folder and select the database system.
4. Click **Database Properties**.
5. From the Database Role list, select the Satellite Server role.
6. Enter any information necessary to configure the Satellite Server role.

> To add a new database reference, you can use the Add Database Reference Wizard in the System and Network Administration application.

Task 2: If you are not copying rate data to the central server, enable LIR.

1. Start the Management Console (log on with Administrator privileges).
2. Click the **Systems** icon in the navigation pane.
3. Navigate to the PI Databases folder and select the central server.
4. Click **LIR Configuration**.
5. Select the **LIR enabled** check box.

Task 3: If you enable LIR, add LIR mappings.

1. Start the Management Console (log on with Administrator privileges).
2. Click the **Systems** icon in the navigation pane.
3. Navigate to the PI Databases folder and select the central server.
4. Click **LIR Configuration**.
5. Click **Add Mapping**.
6. From the Select Satellite Server list, select a satellite server to which to add a mapping.
7. Select the **Category** data table option.
8. Select **System Resource** from the drop down list.
9. Select the **rate** data type.
10. Click **Add to List**.
11. Repeat steps 8 through 10 for each SR sub-package:

- Logical System

- Logical Volume

- Process

- Network Interface

- CPU

- Disk

12 If you have more than one satellite server, click **Add Mapping** and repeat step 6 through step 10 for each server.

13 Click **OK**.

14 Click **Apply**.

A copy policy is automatically generated for the hourly data and for each LIR mapping that you add. The data type selected when adding an LIR mapping (in step 9 above) determines the type of data copied (defined in the generated copy policy). The type of data copied (defined in the generated copy policy) is one summarization level greater than the data type selected in the LIR mapping. For example, if you select an hourly data type, you will generate a daily data copy policy.

Task 4: Verify the automatically generated copy policies

Verify that a copy policy has been generated for the following tables and that the copy type is set correctly (to Property and Data):

1 Start the Management Console (log on with Administrator privileges).

2 Click the **Copy Policy** icon in the navigation pane to start the Copy Policy Manager.

3 Find the following tables and verify the copy type is set to Property and Data:

SystemResource.ap

- SH_SR_SysXcep

- SH_SR_SysVolXcep

- SH_SR_SysUp

- SH_AppOVPA_SysApp

- SRTran_Transaction

- SR_SR_FileSystem

- SR_SR_Kernel

SysRes OVPA CPU

- SH_SR_CPU

SysRes OVPA Disk

- SH_SR_Disk

SysRes OVPA Logical Volume

- SH_SR_Logicalvolume

SysRes OVPA Logical System

- SH_SR_LS

SysRes OVPA Net Interface

- SH_SR_Netinterface

SysRes OVPA Process

- SH_SR_Process

If a copy policy has not been generated for a table, do the following:

1   Click the **New Copy Policy** icon or select **File > New Copy Policy** from the Copy Policy
    Manager. The Copy Policy Wizard displays.

2   Click **Next**. The Satellite Server and Copy Policy Selection Page displays.

3   Select a satellite server from the pull down list. This is the satellite server from which
    data is copied to the central server.

4   Select **Single Table** and select the table from the pull down list.

5   Click **Next**. The Copy Type Selection Page displays.

6   Select **Property and Data**.

7   Click **Next**. The Summary page displays.

8   Verify the information in the summary window. If the information is not correct, you can
    modify it by clicking **Back**.

9   Click **Finish**.

10 Repeat step 4 - step 9 for all missing tables.

If the copy type is not set to Property and Data, do the following:

1   Double-click the copy policy.

2   Select the **Property and Data** copy type.

3   Click **OK**.

Task 5:   Delete LIR Mappings for Rate Tables

Delete the LIR mappings for SRTran_Transaction, SR_SR_FileSystem and SR_SR_Kernel
(the data is being copied to the central server).

1   Start the Management Console (log on with Administrator privileges).

2   Click the **Systems** icon in the navigation pane.

3   Navigate to the PI Databases folder and select the central server.

4   Click **LIR Configuration**.

5   Unselect the Rate check box for K_SR_FileSystem and K_SR_System.

6   Click **Apply**.

Task 6:   Modify the following six process files:

- SR_Hourly_Reporting.pro file

- SR_Hourly_CPU.pro

- SR_Hourly_Disk.pro

- SR_Hourly_Logicalvolume.pro

- SR_Hourly_Netinterface.pro

- SR_Hourly_LS.pro

All six process files are found here:

{DPIPE_HOME}/scripts/

where *{DPIPE_HOME}* is the directory in which PI is installed.

Open each file and edit it based on the comments provided within the script.

Satellite Server Configuration

Follow these steps to configure each satellite server.

1   Modify the `trendtimer.sched` file.

The `trendtimer.sched` file is found in the *{DPIPE_HOME}*/lib/ directory where *{DPIPE_HOME}* is the directory in which PI is installed.

Make the following changes:

- Find and comment out the following line:

  ```
  24:00+2:00 - - {DPIPE_HOME}/bin/trend_proc -f
  {DPIPE_HOME}/scripts/SR_Server_Reporting.pro
  ```

- Find and change the following line (modify the daily processing time):

  ```
  1:00+40 - - {DPIPE_HOME}/bin/trend_proc -f
  {DPIPE_HOME}/scripts/SR_Hourly_Reporting.pro
  ```

  to

  ```
  1:00+25 - - {DPIPE_HOME}/bin/trend_proc -f
  {DPIPE_HOME}/scripts/SR_Hourly_Reporting.pro
  ```

2   Modify the following process files:

- SR_Hourly_Reporting.pro file
- SR_Hourly_CPU.pro
- SR_Hourly_Disk.pro
- SR_Hourly_Logicalvolume.pro
- SR_Hourly_Netinterface.pro
- SR_Hourly_LS.pro

The files are located here:

{DPIPE_HOME}/scripts/

where *{DPIPE_HOME}* is the directory in which PI is installed.

Open each file and edit it based on the comments provided within the script.

3   Configure datapipe polling policies, making sure that each system is polled by one satellite server only.

4   If the satellite server has two or more pollers, create separate polling policies for each poller and use views and types to separate the devices.

5   If remote pollers are being used, be sure to avoid duplicate polling across the pollers and duplicate polling between the satellite and the pollers.

System Clocks

Make sure the system clock on each satellite server is synchronized with the system clock on the central server.

6 Thresholds and Change Forms

This chapter covers the following topics:

- Default thresholds set by the thresholds sub-package
- Using change forms to:
    - Update system properties (multiple thresholds to set)
    - Update filesystem properties (one threshold to set)
    - Update logical system properties (muliple thresholds to set)

When you modify the default settings in a property form, you modify a thresholds policy. Changes to the Update System Properties form or the Update FileSystem Properties form update the SystemResource_Thresholds subpackage, while changes to the Logical System Properties form update the SR_LS_Thresholds subpackage.

Default Settings for Thresholds

The thresholds sub-package imposes a sets of thresholds for systems and filesystems. When performance reaches a default, PI sends a trap to the network management system. The following table indicates the threshold and severity level.

Metric	Default Threshold	Severity
cpuutil_threshold	80%	MEDIUM
swaputil_threshold	70%	MEDIUM
memutil_threshold	70%	MEDIUM
runq_threshold	3	MEDIUM
pageout_threshold	5	MEDIUM
FSutil_threshold	70%	MEDIUM

The first 5 threshold values are defined in the `K_SR_System.teel` file. The last threshold value is defined in the `K_SR_FileSystem.teel` file. Every system that is discovered will be initialized to the default values shown here.

No intervention on your part is required to implement these defaults. Simply install the thresholds sub-package. If you want to change one or more default settings, use the change forms described later in this chapter. If you want to modify the action that PI takes in response to an exception condition, configure the Thresholds Module. For details, see the *Thresholds Module 5.10 User Guide*.

Using Change Forms to Update Properties

Using forms, you can modify the system, filesystem, and logical system objects maintained for System Resource. These forms do not allow you to create new objects, only to modify existing objects. The forms are context-sensitive, which means they will modify every object that you selected before you launched the form. So be sure to use forms carefully. Know in advance whether you intend to change one object or multiple objects.

➤ To create new nodes, locations or customers, or modify existing nodes, locations, or customers, use the forms in Common Property Tables.

To launch any form, click the **Objects** icon in the panel on the left side of the Management Console window. The Object/Property Management view opens. Object Manager will present a list of objects. The type of object presented depends on which Object Manager View is open.

The default view is the Device view, showing a list of devices. The Customer view shows a list of customers, and the Location view shows a list of locations. To change the view, select **View > Change View** and use the pop-up window to select a different view.

Once the type of object you are interested in updating appears, select the particular object you would like to update. When you select the object, the name of the property form will appear under **Object Specific Tasks**. To open the form, double-click.

Update System Properties

To update system information, type the changes in the fields provided. Note that the customer name field and the location name field are disabled. The other fields can be modified. To save your changes, click **Apply**. When you finish making changes, click **OK** to save your changes and close the form.

/admin/SystemResourceForms/update_system.frep

System Resources
Update System Properties

This form allows system property information to be modified. Click the OK or Apply button to save any changes. Click the Cancel button to cancel.

Device Name	ultra
Maximum Processes	1,034.00
Memory Size	655,360.00
Description	
Customer Name	Customer Unassigned
Location Name	Location Unassigned

System Threshold Limits   The level where exceptions are recorded and threshold events may be generated.

CPU %	80.00	**Run Queue**	3.00
Memory %	70.00	**Page Outs**	5.00
Swap %	70.00		

OK   Apply   Cancel

Update Filesystem Properties

To update filesystem properties, type the changes in the fields provided. The customer name field and the location name field are disabled. The other fields can be modified. To save your changes, click **Apply**. When you finish making changes, click **OK** to save your changes and close the form.

Logical System Properties

Use the LS Properties form to modify thresholds limits for:

- Physical CPU %

- Logical CPU %

- Entitled Memory

- Run Queue

➤ Default thresholds cannot be updated globally. The changes you make must be made on a node-by-node basis. If you are collecting data from HPVM, ignore values the following defaults:

- Entitled Memory
- Run Queue

These defaults do not apply to HPVM. No matter what value is in these fields, no threshold breech will be triggered.

7 Optimizing Resources

Filesystems Resource Optimization brings into focus the most overutilized and the most underutilized filesystems. Use this report to see where load balancing, as opposed to investing in additional resources, might be the easiest way to improve service quality.

The selection table at the top of the report provides a list of systems that are expected to reach 90% utilization within 90 days. The grade of service bar chart beneath the selection table provides a picture of utilization over the last few days, allowing you to track recent increases and decreases and determine whether a critical situation is getting better or worse. The plot beneath the grade of service chart tracks daily ups and downs in utilization (CPU, memory, swap, filesystem, page outs, and run queue length).

Information about underutilized filesystems comes next. This time the selection table includes filesystems that are expected to be less than 30% utilized within 90 days.

Memory Resource Optimization pinpoints the most overutilized and underutilized system memory, indicating opportunities where service levels could be improved through better load balancing. Select a system from the top table to display detailed information for that system.

All aggregation for this report occurs at the daily level. The top selection table lets you see which systems will have a memory utilization greater than 90% in 90 days. You can also see an estimate for memory utilization 30, 60 and 90 days from now. The table directly below the top selection table provides provisioning details for the selected system:

- Customer
- Location
- Vendor
- Model
- Operating system
- Memory utilization threshold

A grade of service stacking bar chart details the overall health of the system, including CPU utilization, memory utilization, swap utilization and run queue length. A linked, tabbed plot pinpoints daily CPU utilization, memory utilization, swap utilization, filesystem utilization, number of page outs, and run queue length for the selected system. The top selection table and linked drill downs are repeated for systems that are projected to have less than 30% memory utilization in 90 days.

System Resource

Filesystems Resource Optimization

The System Resource Filesystems Resource Optimization Report details the most over- and under-utilized filesystems, indicating opportunities for load balancing to improve service levels without additional investment. Select a system from the top table to display detailed information for that system.
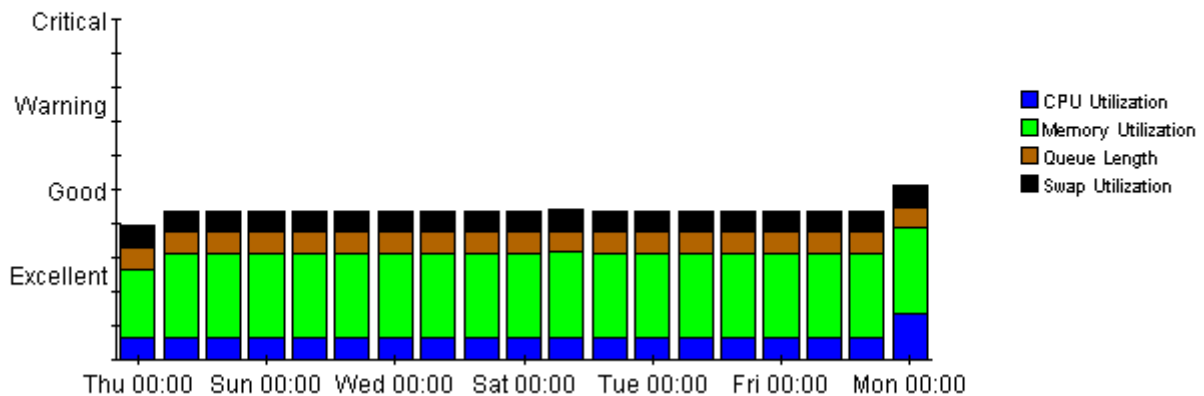
Overutilized Filesystems
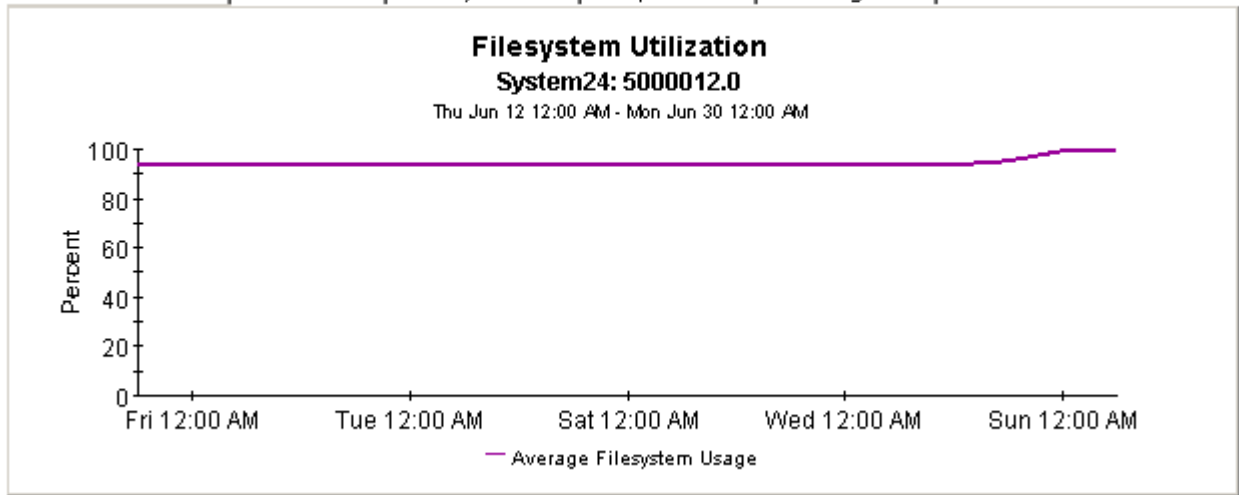#### Projected to Exceed 90% Utilization within 90 Days

System	Filesystem	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
System4	/usr	94.62	94.62	94.63	94.63
System24	/	94.23	103.90	111.17	118.44
System1	/export/home3	90.62	92.45	93.70	94.96
System1	/export/home4	89.30	97.03	102.21	107.40
System4	/var	50.86	151.83	220.29	288.75
System25	/opt	42.31	111.83	164.06	216.29

Vendor	Model	O/S	Customer	Location	Filesystem Utilization Threshold
Unassigned	i686	Linux 2.4.2-2 #1 Sun Apr	Customer Unassigned	Location Unassigned	70.00

Grade of Service (GOS)
System24
Thu Jun 12 2003 - Mon Jun 30 2003

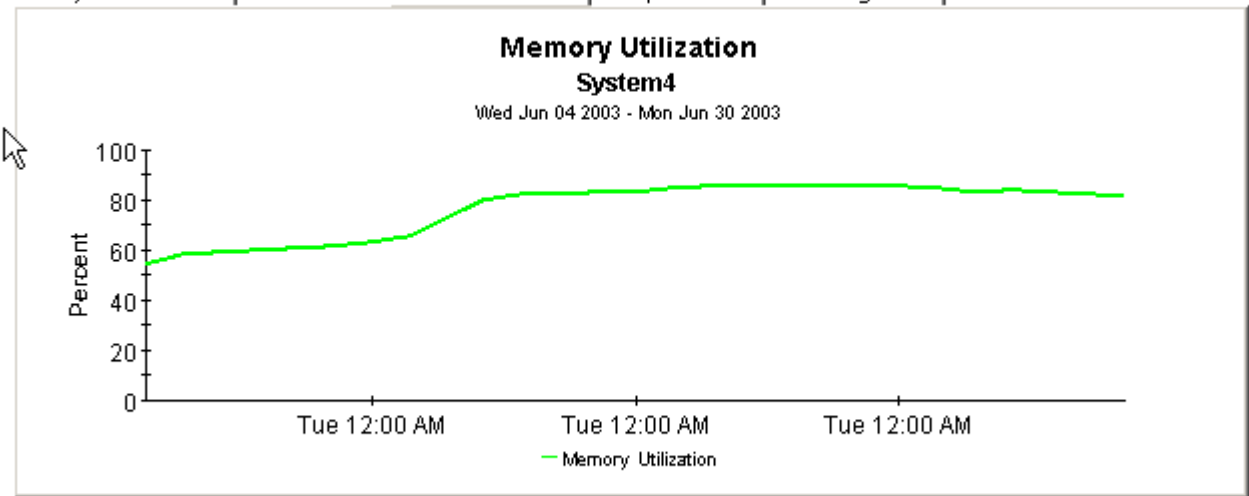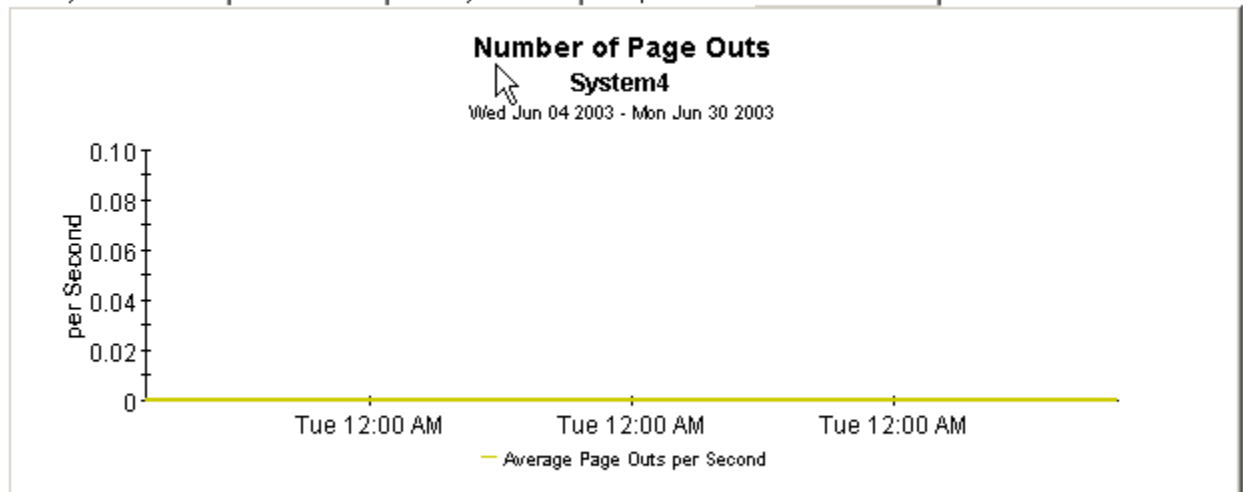Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs

Filesystem Utilization
System24: 5000012.0
Thu Jun 12 12:00 AM - Mon Jun 30 12:00 AM

— Average Filesystem Usage

Underutilized Filesystems
Projected to be Utilized Less than 30% within 90 Days

System	File System	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
System23	/home	12.76	12.76	12.76	12.76
System7	/stand	13.72	13.96	14.11	14.27
System7	/	16.13	6.30	0.00	0.00
System8	/	17.97	17.97	17.97	17.97
System23	/	17.97	17.97	17.97	17.97
System4	/stand	18.53	18.51	18.50	18.49
System27	/boot	19.87	19.87	19.87	19.87
	C:\	20.34	19.48	18.84	18.21
System11	C:\ Label: Serial Number 58ae8b0d	22.54	22.54	22.54	22.54
System13	C:\ Label: Serial Number 58ae8b0d	22.54	22.54	22.54	22.54

Vendor	Model	O/S	Customer	Location	Filesystem Threshold
Hewlett Packard	9000/893	HP-UX B.11.11 U	Customer Unassigned	Location Unassigned	70.00

Grade of Service (GOS)

System4

Wed Jun 04 2003 - Mon Jun 30 2003
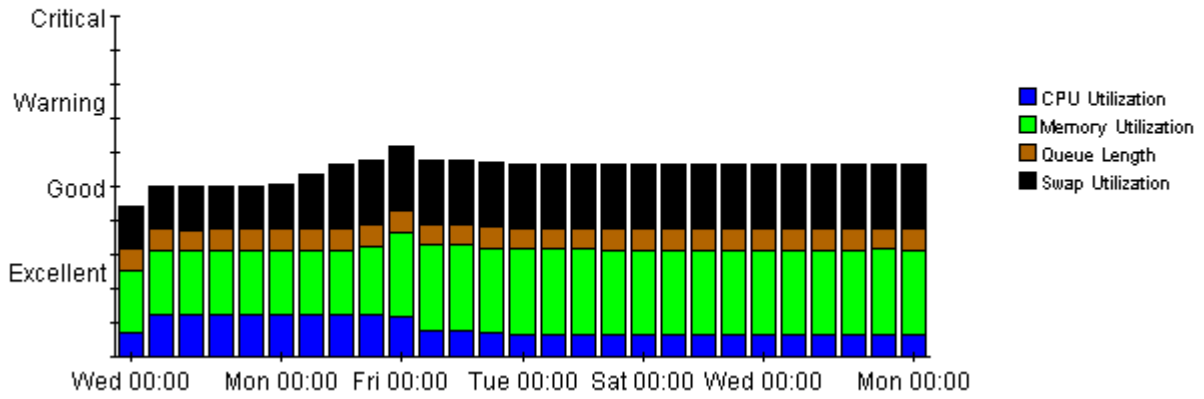
Legend:
- CPU Utilization
- Memory Utilization
- Queue Length
- Swap Utilization

Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs

Filesystem Utilization

System4: /stand

Wed Jun 04 12:00 AM - Mon Jun 30 12:00 AM

— Average Filesystem Usage

continues on next page

Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs

Memory Utilization
System4
Wed Jun 04 2003 - Mon Jun 30 2003

— Memory Utilization

Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs

Number of Page Outs
System4
Wed Jun 04 2003 - Mon Jun 30 2003

— Average Page Outs per Second

System Resource

Memory Resource Optimization

The System Resource Memory Resource Optimization Report details the most over- and under-utilized filesystems, indicating opportunities for load balancing to improve service levels without additional investment. Select a system from the top table to display detailed information for that system.

Overutilized System Memory
Projected to Exceed 90% Utilization within 90 Days

System	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
15.2.115.172	98.74	101.18	103.51	105.83
15.2.125.15	89.92	110.65	130.39	150.14
solcent	82.74	102.99	122.58	142.18
tshp39.cnd.hp.com	79.04	88.78	98.05	107.32
biotite.cnd.hp.com	74.05	89.64	104.49	119.34
hpcb.rose.hp.com	65.38	103.12	139.06	175.00
hpfcjjm.cnd.hp.com	53.36	98.15	140.81	183.47

Vendor	Model	O/S	Location	Customer	Memory Utilization Threshold
Hewlett-Packard	Unassigned		Location Unassigned	Customer Unassigned	70.00

Grade of Service (GOS)
15.2.115.172
Sun May 18 2003 - Wed May 21 2003

CPU Utilization: 15.70.186.76: All
Memory Utilization: 15.70.186.76: All
Queue Length: 15.70.186.76: All
Swap Utilization: 15.70.186.76: All
CPU Utilization: tthp166.cnd.hp.com: All
Memory Utilization: tthp166.cnd.hp.com: All
Queue Length: tthp166.cnd.hp.com: All
Swap Utilization: tthp166.cnd.hp.com: All
CPU Utilization: 15.2.114.242: All
Memory Utilization: 15.2.114.242: All
Queue Length: 15.2.114.242: All
Swap Utilization: 15.2.114.242: All
CPU Utilization: 15.2.115.172: All
Memory Utilization: 15.2.115.172: All
Queue Length: 15.2.115.172: All
Swap Utilization: 15.2.115.172: All
CPU Utilization: 15.2.125.15: All
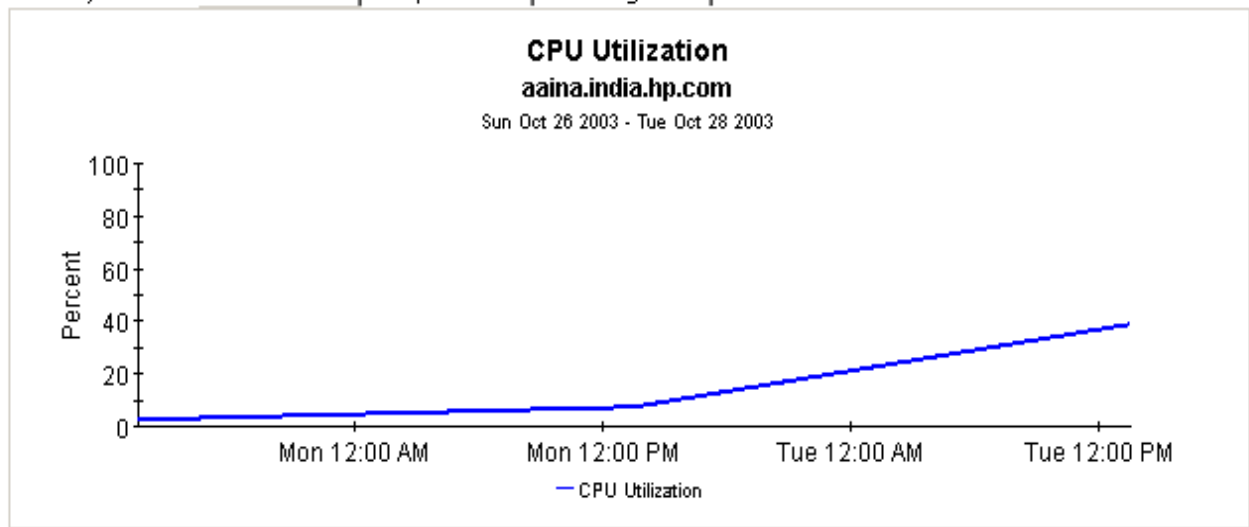Memory Utilization: 15.2.125.15: All
Queue Length: 15.2.125.15: All

Grade of Service (GOS)

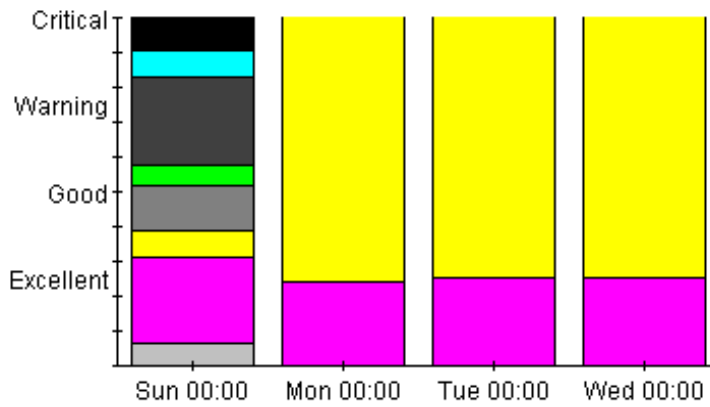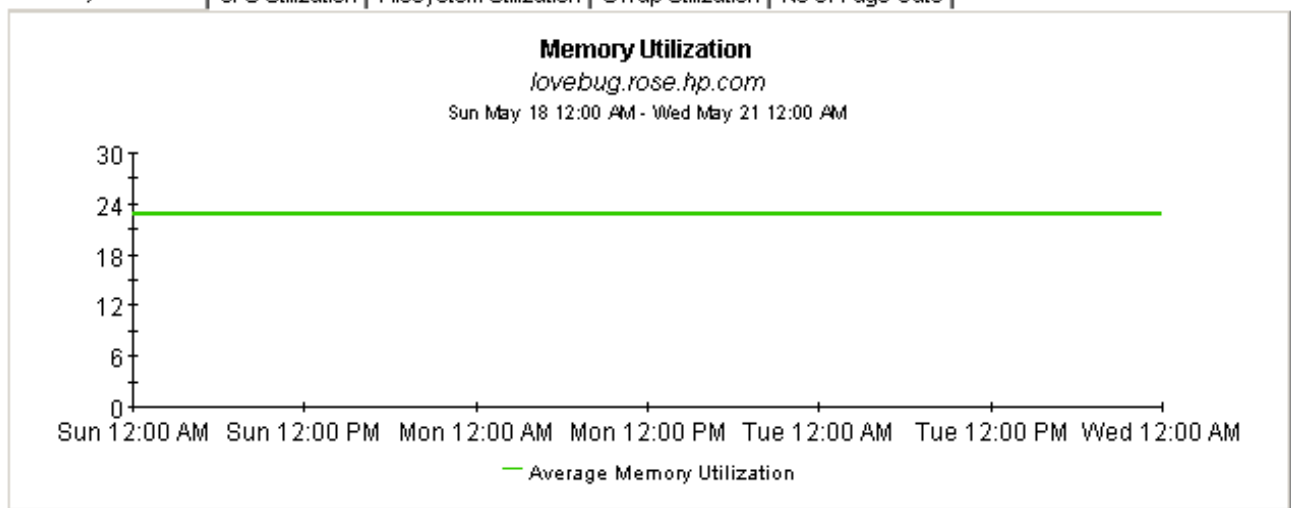aaina.india.hp.com

Sun Oct 26 2003 - Tue Oct 28 2003

Legend:
- CPU Utilization
- Memory Utilization
- Queue Length
- Swap Utilization

Tabs: Memory Utilization | CPU Utilization | Swap Utilization | No of Page Outs

CPU Utilization

aaina.india.hp.com

Sun Oct 26 2003 - Tue Oct 28 2003
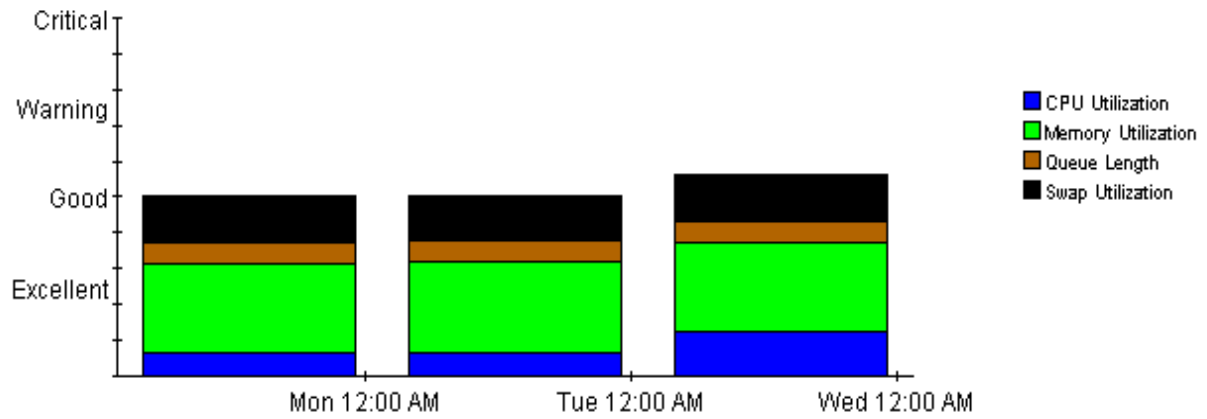
— CPU Utilization

Grade of Service (GOS)
lovebug.rose.hp.com
Sun May 18 2003 - Wed May 21 2003

CPU Utilization: 15.70.186.76: All
Memory Utilization: 15.70.186.76: All
Queue Length: 15.70.186.76: All
Swap Utilization: 15.70.186.76: All
CPU Utilization: tthp166.cnd.hp.com: All
Memory Utilization: tthp166.cnd.hp.com: All
Queue Length: tthp166.cnd.hp.com: All
Swap Utilization: tthp166.cnd.hp.com: All
CPU Utilization: 15.2.114.242: All
Memory Utilization: 15.2.114.242: All
Queue Length: 15.2.114.242: All
Swap Utilization: 15.2.114.242: All
CPU Utilization: 15.2.115.172: All
Memory Utilization: 15.2.115.172: All
Queue Length: 15.2.115.172: All
Swap Utilization: 15.2.115.172: All
CPU Utilization: 15.2.125.15: All
Memory Utilization: 15.2.125.15: All
Queue Length: 15.2.125.15: All

Memory Utilization | CPU Utilization | Filesystem Utilization | Swap Utilization | No of Page Outs

Memory Utilization
lovebug.rose.hp.com
Sun May 18 12:00 AM - Wed May 21 12:00 AM

Average Memory Utilization

8 Service Level Management

The **Service Level Management - Executive Summary** looks at yesterday's Grade of Service and yesterday's exception counts. This report analyzes performance data for multiple systems, aggregated by customer and location, hence the term *summary*.

Use the SLM report to verify whether service quality is meeting expectations. The top selection table provides a list of customers ranked by number of exceptions, highest to lowest. The data for each customer provides exceptions statistics all of the systems owned by that customer. The second selection table provides a list of locations ranked by number of exceptions, highest to lowest. The location selection table is linked to the top selection table, and separates out the total exceptions for each location.

This report allows you to drill down from information about yesterday's distribution of exceptions to a stacked bar chart showing hourly, daily, and monthly views of exceptions and how they are distributed. The stacked bar chart shows total exceptions for all systems at the location selected above. At the end of the report, a grade of service chart provides an hourly assessment of health. This chart is aggregating data from all of the systems at the location highlighted in the location table.

System Resource

Executive Service Level Management Summary

The Executive Service Level Management Summary Report provides an overview of system performance. Each chart details key metrics aggregated for all systems. Key indicators of performance are shown individually and combined into a Grade of Service chart to reveal system health at a glance.
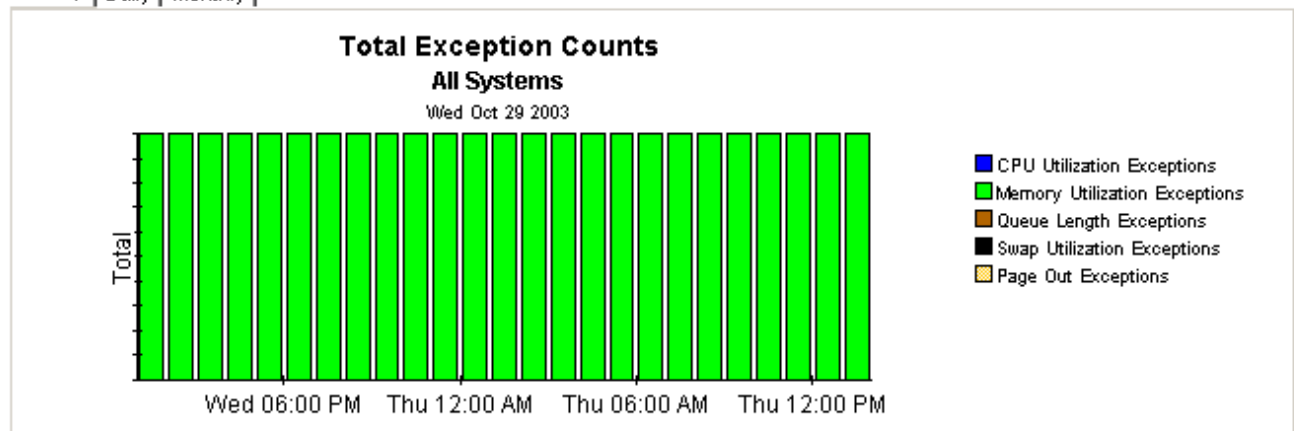
Customers
Wed Oct 29 2003

Customer Name	Total Exceptions	Queue Length Exceptions	CPU Utilization Exceptions	Memory Utilization Exceptions	Swap Utilization Exceptions	Page Out Exceptions
All Customers	24.00	0.00	0.00	24.00	0.00	0.00
Customer Unassigned	24.00	0.00	0.00	24.00	0.00	0.00

Locations
Wed Oct 29 2003

location_name	Total Exceptions	Queue Length Exceptions	CPU Utilization Exceptions	Memory Utilization Exceptions	Swap Utilization Exceptions	Page Out Exceptions
All Locations	24.00	0.00	0.00	24.00	0.00	0.00
Location Unassigned	24.00	0.00	0.00	24.00	0.00	0.00

Hourly | Daily | Monthly

Total Exception Counts
All Systems
Wed Oct 29 2003

Legend:
- CPU Utilization Exceptions
- Memory Utilization Exceptions
- Queue Length Exceptions
- Swap Utilization Exceptions
- Page Out Exceptions

(X-axis: Wed 06:00 PM, Thu 12:00 AM, Thu 06:00 AM, Thu 12:00 PM)
(Y-axis: Total)

Hourly | Daily | Monthly |

Hourly Grade of Service
All Systems
Wed Oct 29 2003

CPU Utilization
Memory Utilization
Queue Length
Swap Utilization

Critical

Warning

Good

Excellent

Wed 06:00 PM   Thu 12:00 AM   Thu 06:00 AM   Thu 12:00 PM

9 Resource Forecasting

You have two reports in the resource forecasting area:

- Filesystem Forecast
- Memory Forecast

Both reports have very similar formats. The **Filesystem Forecast** begins with a selection table that provides a list of all the filesystems that are headed towards 100% utilization and are expected to reach this level within 90 days. The entries in the table sort by Days to Threshold (DTT). Filesystems nearest to the threshold sort at the top of the table.

In addition to indicating the value for DTT, the selection table shows:

- Current utilization (the rolling baseline average)
- Projected utilization 90 days from today

Select an entry in the table to display the following provisioning details:

- Vendor
- Model
- O/S
- Customer
- Location
- Filesystem utilization threshold level

From the selection table you may drill down to a daily Grade of Service chart that shows increases and decreases in a composite score based on individual scores for utilization (CPU, memory, and swap) and queue length. The series of tabbed line graphs below the GOS chart track utilization levels and the number of page outs. These graphs track utilization for the following resources:

- Filesystem
- CPU
- Memory
- Swap

The **Memory Forecast** begins with a selection table that provides a list of all the systems headed towards 100% utilization and projected to reach this level within the next 90 days. The entries in the table sort by DDT, lowest number to highest number, or nearest to threshold at the top, furthest from threshold at the bottom. In addition to indicating DDT, the selection table shows:

- Current utilization (the rolling baseline average)
- Projected utilization 90 days from today

Select an entry in the table to display the following details for the system:

- Vendor

- Model

- Operating system

- Customer

- Location

- Memory utilization threshold

From the selection table you may drill down to a daily Grade of Service chart that shows increases and decreases in an overall score throughout the baseline period. The overall score is a composite based on individual scores for CPU utilization, memory utilization, swap utilization, and run queue length.

The tabbed charts below the GOS chart provide daily analysis of trends. These charts show how the following variables have behaved over the baseline period:

- Memory utilization

- CPU utilization

- Swap utilization

- Number of page outs

See below for a sample of the Filesystem Forecast report followed by a sample of the Memory Forecast report.

System Resource
Filesystem Forecast

The System Resource Filesystem Forecast report lists all filesystems within 90 days of a utilization threshold, those closest to a threshold listed first. The report arms the system manager with the information required to assess performance and take preventive action. Select a system from the top table to display detailed information for that system.
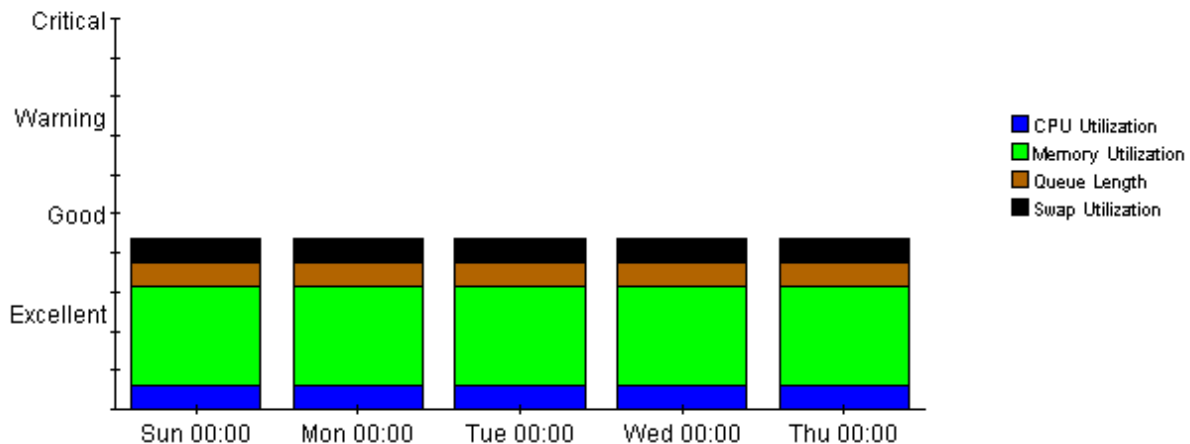
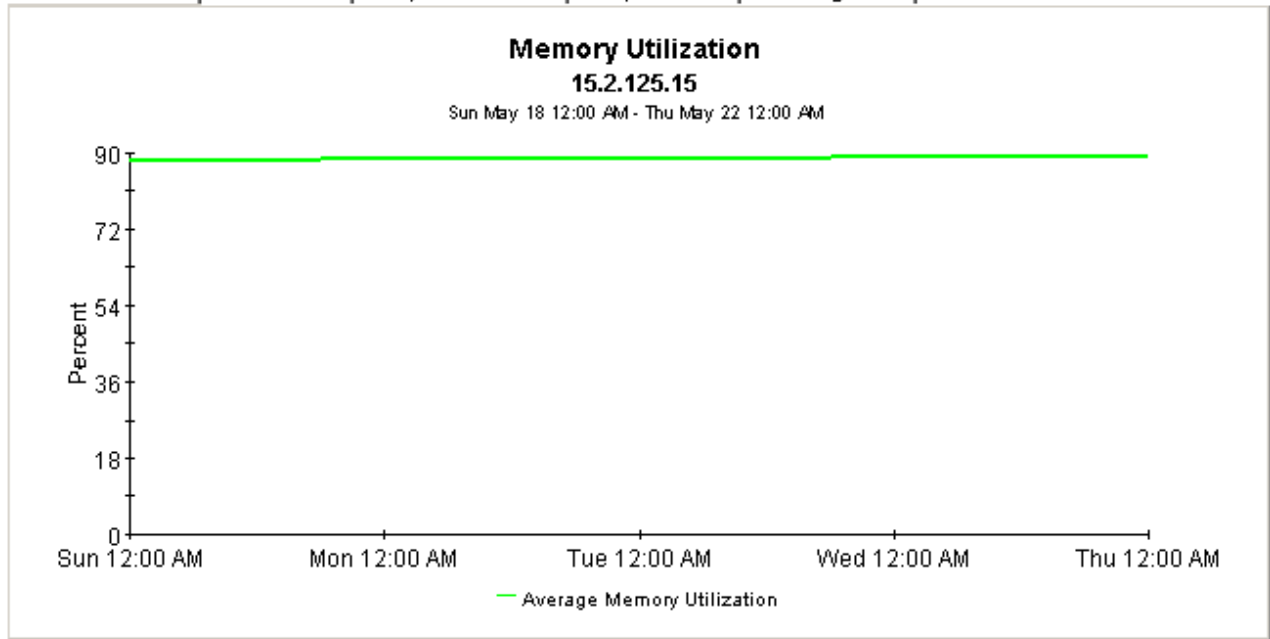### Estimated Days To Threshold (DTT)
Filesystems Projected to be within 90 Days of 100% Utilization

System	Filesystem	DTT Utilization	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
dollar.india.hp.com	/home	0	90.60	120.61	149.87	179.14

Vendor	Model	O/S	Customer	Location	Filesystem Utilization Threshold
Hewlett Packard	9000/879	HP-UX B.11.00 A	Customer Unassigned	Location Unassigned	70.00

Grade of Service (GOS)
dollar.india.hp.com
Tue Oct 28 2003 - Tue Oct 28 2003

Tue 01:30 PM

Legend:
- CPU Utilization
- Memory Utilization
- Queue Length
- Swap Utilization

Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs |

Filesystem Utilization
dollar.india.hp.com: 4.0
Mon Oct 27 01:30 PM - Tue Oct 28 01:30 PM

— Average Filesystem Usage
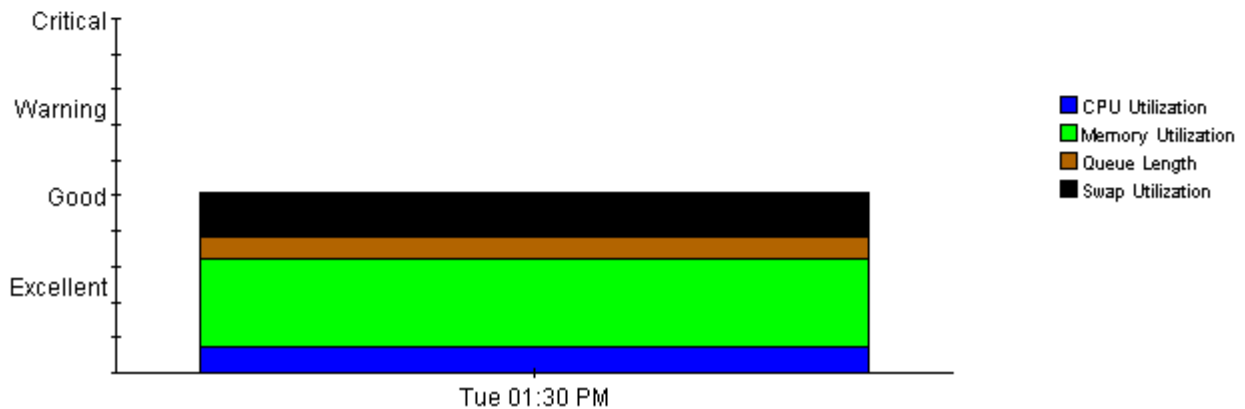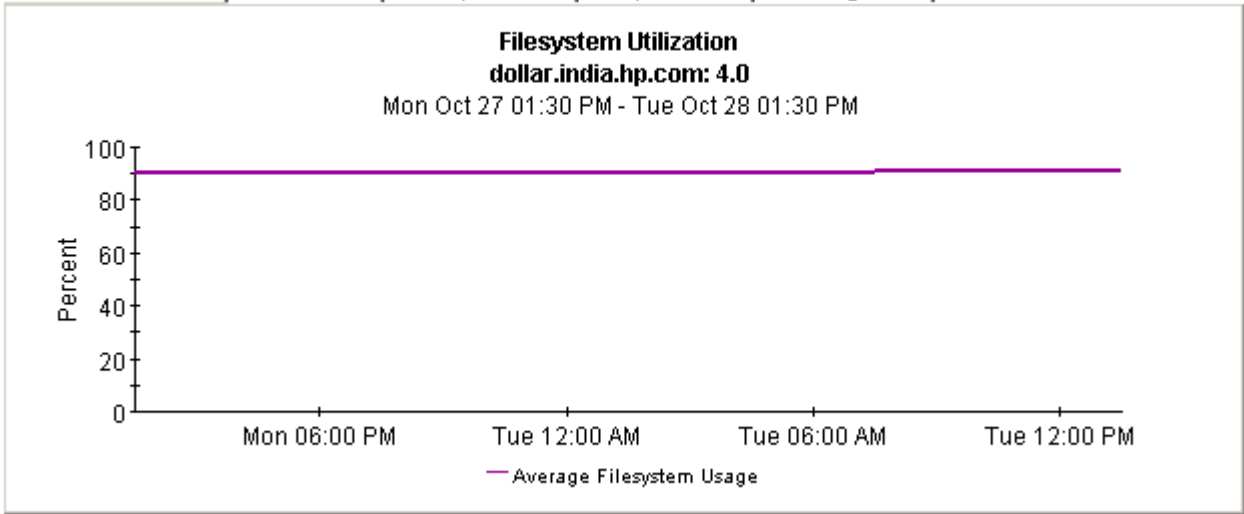
System Resource

Memory Forecast

The System Resource System Memory Forecast report lists all systems within 90 days of a memory utilization threshold, those closest to a threshold listed first. The report arms the system manager with the information required to assess performance and take preventive action. Select a system from the top table to display detailed information for that system.

Estimated Days to Threshold (DTT)
Systems Projected to be within 90 Days of 100% Utilization

System	DTT Utilization	Current Utilization	Projected Utilization 90
15.2.125.15	12.00	90.32	156.74
biotite.cnd.hp.com	60.00	74.22	113.05
hpcb.rose.hp.com	57.00	65.38	119.65
tshp39.cnd.hp.com	32.00	79.49	135.06
gorilla.cnd.hp.com	6.00	50.83	650.40
hpfcjjm.cnd.hp.com	29.00	54.17	194.47
solcent	53.00	82.79	112.10

Vendor	Model	O/S	Location	Customer	Memory Utilization Threshold
Sun	sun4u	SunOS 5.8 Generic_108528-16	Location Unassigned	Customer Unassigned	70.00

Grade Of Service (GOS)
15.2.125.15
Sun May 18 2003 - Thu May 22 2003

Legend:
- CPU Utilization
- Memory Utilization
- Queue Length
- Swap Utilization

Memory Utilization | CPU Utilization | Filesystem Utilization | Swap Utilization | No of Page Outs |

Memory Utilization
15.2.125.15
Sun May 18 12:00 AM - Thu May 22 12:00 AM

— Average Memory Utilization

10 Exception Hot Spots and QuickViews

This chapter covers the following reports:

- Exception Hot Spots
- QuickView
- QuickView — Near Real Time

Exception Hot Spots

The Hot Spots report provides a list of the systems that exceeded at least one threshold condition at some time yesterday. Systems that did not exceed any thresholds will not appear in this report. This report is particularly useful for identifying systems with the most exceptions and looking at exceptions in more detail. The selection table indicates which exceptions took place, and how many of each type took place during the 24-hour period that ended last night at midnight. Select an entry to display the following data:

- System-level provisioning details (vendor, model, customer, location, and o/s)
- Exception thresholds for each resource

Beneath the selection table is a series of charts that track yesterday's resource utilization levels on an hour-by-hour basis, allowing you to see exactly when exceptions took place. Near the bottom of the report you have an Exception Details chart and a Grade of Service chart. The first chart shows the data that was captured by each poll, throughout the day. The second chart provides an overall grade of service score for each poll. The overall score is a composite based on CPU utilization, memory utilization, and queue length.

QuickView

The QuickView has a broader scope than Hot Spots. This report includes every system, whether or not the system recorded exceptions yesterday. (By default, the selection table is limited to 50 rows.) The selection table provides utilization averages for yesterday, covering run queue, CPU, memory, swap, and page outs per second. The default sort order is CPU utilization. Select an entry in the table to display the following data:

- System-level provisioning details (vendor, model, customer, location, and o/s)
- The exception threshold for each resource

The line graphs below the exception threshold information provide hourly data for each resource, allowing you to track increases and decreases throughout the day.

QuickView - Near Real Time

The format of the QuickView - Near Real Time is exactly the same as the QuickView:

- Selection table that sorts all systems by CPU utilization
- System-level provisioning details
- Exception thresholds for each resource
- Line graphs for each resource

In the QuickView, you are looking at data for yesterday. In the Near Real Time, you are looking at data for the previous six hours. Use the Near Real Time version of the QuickView to spot problem areas before the condition begins to affect your users.

QuickView - Near Real Time - Snapshot

The format of the QuickView - Near Real Time - Snapshot is exactly the same as the QuickView - Near Real Time:

- Selection table that sorts entries by CPU utilization over the last six hours
- System-level provisioning details
- Exception thresholds for each resource
- Line graphs for each resource covering the last six hours

In the QuickView - Near Real Time, you are looking at data for the last six hours. In the Snapshot version of the Near Real Time you are looking at the same data, but only for the specific systems you specify when you open the report. Use the Snapshot version of the Near Real Time report whenever you know in advance exactly which system or systems you are interested in.

System Resource

Hot Spots

The System Resource Hot Spots Report provides a listing of systems that have exceeded threshold conditions during the previous day. Offending systems are ranked by total number of exceptions. Select a system from the top table to display detailed information for that system.

Problem Summary for the Day
Systems with Most Exceptions for the Day
Thu May 22 2003

System	Total Exceptions	Queue Length Exception	CPU Utilization Exceptions	Memory Utilization Exceptions	Swap Utilization Exceptions	Page Out Exceptions
solcent	96	0	0	96	0	0
ultra	94	0	11	83	0	0
15.2.118.118	72	24	24	24	0	0
15.70.186.76	44	22	0	22	0	0
15.2.114.242	24	0	0	24	0	0
15.2.125.15	24	0	0	24	0	0
biotite.cnd.hp.com	24	0	0	24	0	0
tshp18.cnd.hp.com	24	0	0	24	0	0
tshp39.cnd.hp.com	24	0	0	24	0	0

Vendor	Model	O/S	Location	Customer
Cisco	Unassigned		Location Unassigned	Customer Unassigned

CPU Utilization Threshold	Memory Utilization Threshold	Swap Utilization Threshold	Run Queue Threshold	Pageout Threshold
80.00	70.00	70.00	3.00	5.00

Run Queue
solcent
Thu May 22 12:00 AM - Fri May 23 12:00 AM

CPU Utilization
solcent
Thu May 22 12:00 AM - Fri May 23 12:00 AM

Memory Utilization
solcent
Thu May 22 12:00 AM - Fri May 23 12:00 AM

Swap Utilization
solcent
Thu May 22 12:00 AM - Thu May 22 12:15 PM

Page Outs per Second
solcent
Thu May 22 12:00 AM - Thu May 22 12:15 PM
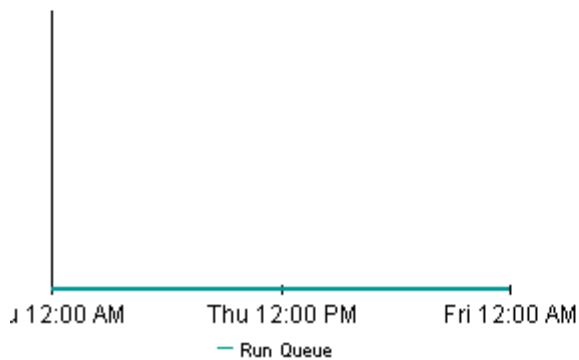
Number of Processes
solcent
Thu May 22 12:00 AM - Fri May 23 12:00 AM
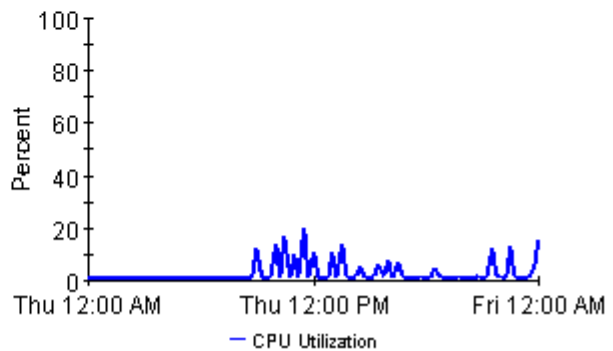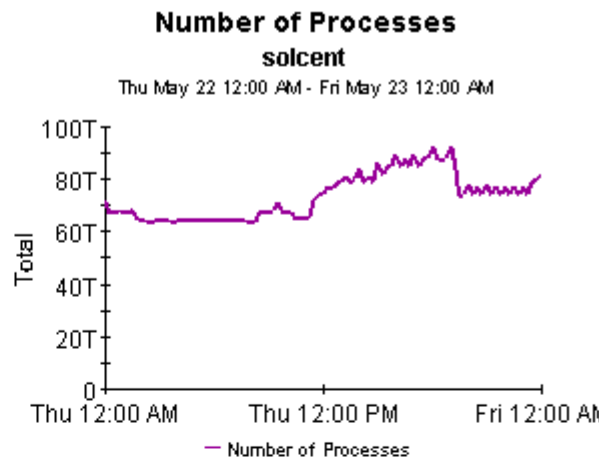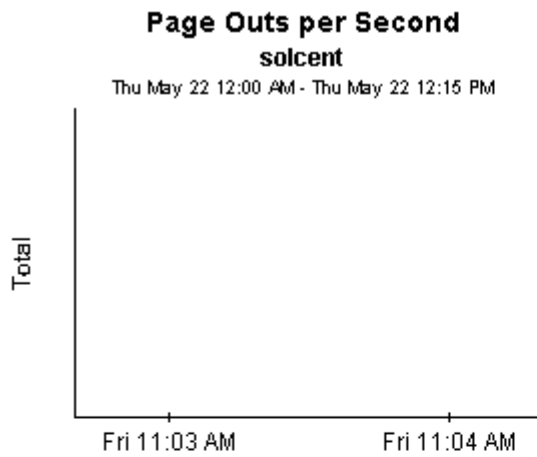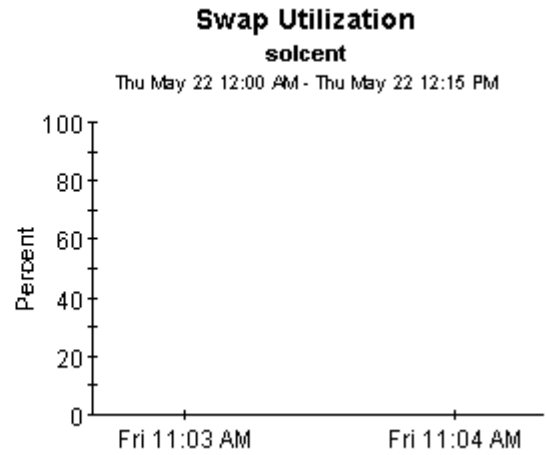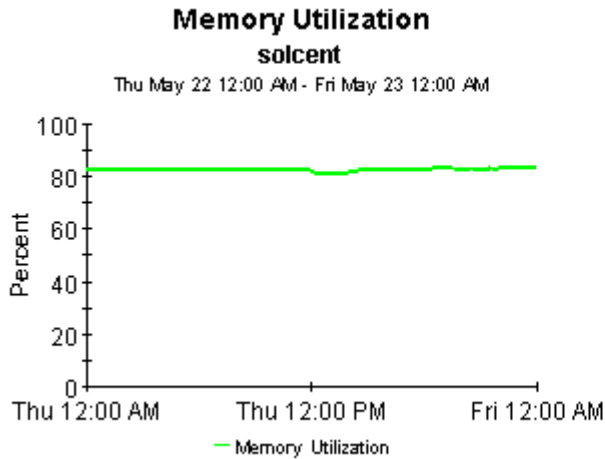
Exception Detail | Grade of Service

Exception Details
solcent

Time of the Exception	CPU Utilization	Memory Utilization	Queue Length	Swap Utilization
Thu May 22 12:00 AM	1.00	82.38	0.00	
Thu May 22 12:15 AM	0.75	82.34	0.00	
Thu May 22 12:30 AM	0.50	82.34	0.00	
Thu May 22 12:45 AM	1.00	82.34	0.00	
Thu May 22 01:00 AM	1.00	82.34	0.00	
Thu May 22 01:15 AM	0.75	82.34	0.00	
Thu May 22 01:30 AM	1.00	82.35	0.00	
Thu May 22 01:45 AM	0.75	82.33	0.00	

Grade of Service (GOS)
solcent
Thu May 22 12:00 AM - Fri May 23 12:00 AM

■ CPU Utilization
■ Memory Utilization
■ Queue Length
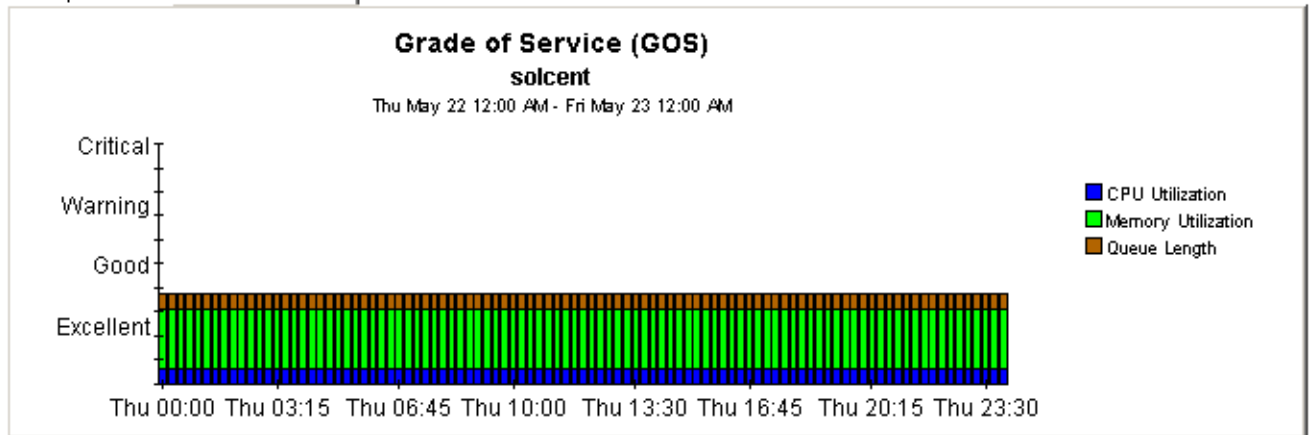
System Resource

Quickview

The System Resource QuickView Report gives the system management staff a detailed look at the performance of individual systems. Select a system from the top chart to display detailed information for that system.

Quickview Selection
Thu May 22 2003

System	Average Run Queue	Average CPU Utilization	Average Memory Utilization	Average Swap Utilization	Number of Page Outs Per Second	Number of Processes
lovebug.rose.hp.com	0.15	10.43	22.75	6.00	0.00	1,674.00
tthp166.cnd.hp.com	1.82	9.94	87.46	61.00	0.00	3,289.00
15.70.186.76	3.77	6.59	94.46	26.10	0.20	1,974.00

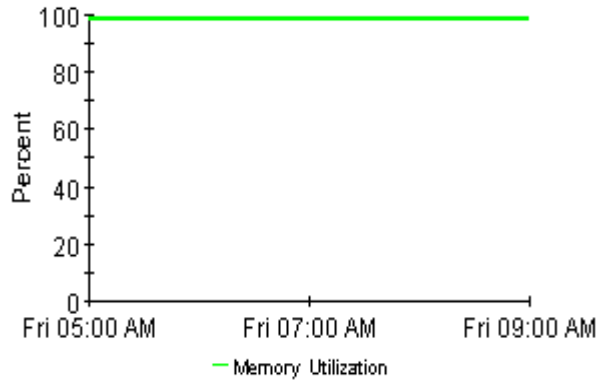| Vendor	Model	O/S	Location	Customer
Hewlett-Packard	Unassigned		Location Unassigned	Customer Unassigned

Run Queue Threshold	CPU Utilization Threshold	Memory Utilization Threshold	Swap Utilization Threshold	Pageout Threshold
3.00	80.00	70.00	70.00	5.00

Run Queue
15.70.186.76
Wed May 21 12:00 AM

CPU Utilization
15.70.186.76
Wed May 21 12:00 AM

Memory Utilization
15.70.186.76
Wed May 21 12:00 AM

Swap Utilization
15.70.186.76
Wed May 21 12:00 AM
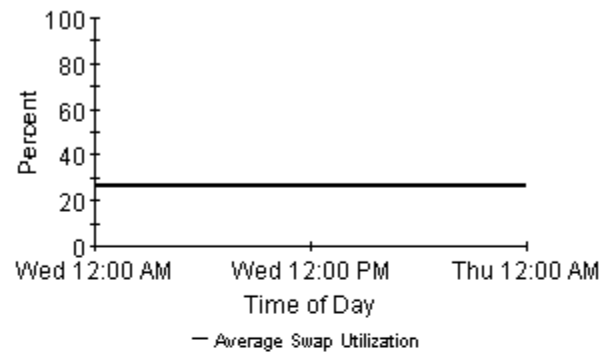
Number of Page Outs
15.70.186.76
Wed May 21 12:00 AM
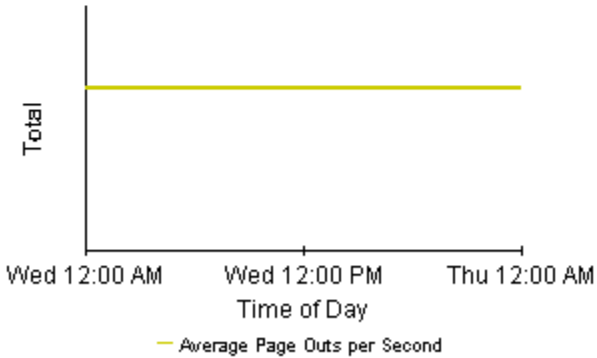
Number of Processes
15.70.186.76
Wed May 21 12:00 AM
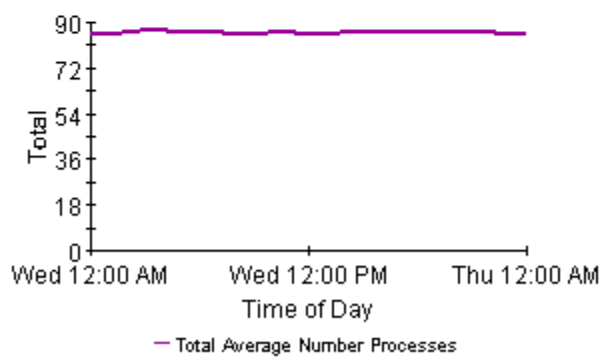
System Resource

Quickview – Near Real Time

The System Resource Near Real Time QuickView gives the system management staff an up to date view of the performance of individual systems. By selecting a system from the top table, current system performance (up to the most recent data collection) can be investigated in detail.

System Selection List
Select System to See Near Real Time Information

System	Total Run Queue	Total CPU Utilization	Total Memory Utilization	Total Swap Utilization	Average Page Outs per Second	Number of Processes
15.2.118.118	29.32	99.99	98.14	54.53	0.00	188.00
tthp10.cnd.hp.com	1.28	16.16	89.89	20.00	0.00	128.20
gorilla.cnd.hp.com	5.45	13.90	64.65	22.00	0.00	188.60
tshp39.cnd.hp.com	0.37	12.35	81.60	61.00	0.00	461.00
tthp25.cnd.hp.com	0.16	12.00	31.95	7.00	0.00	122.00

Vendor	Model	O/S	Location	Customer
Hewlett-Packard	Unassigned		Location Unassigned	Customer Unassigned

Run Queue Threshold	CPU Utilization Threshold	Memory Utilization Threshold	Swap Utilization Threshold	Pageout Threshold
3.00	80.00	70.00	70.00	5.00

Run Queue
15.2.118.118
Fri May 23 05:00 AM

CPU Utilization
15.2.118.118
Fri May 23 05:00 AM

Memory Utilization
15.2.118.118
Fri May 23 05:00 AM

— Memory Utilization

Swap Utilization
15.2.118.118
Fri May 23 05:00 AM

— Total Swap Utilization

Number of Page Outs
15.2.118.118
Fri May 23 05:00 AM
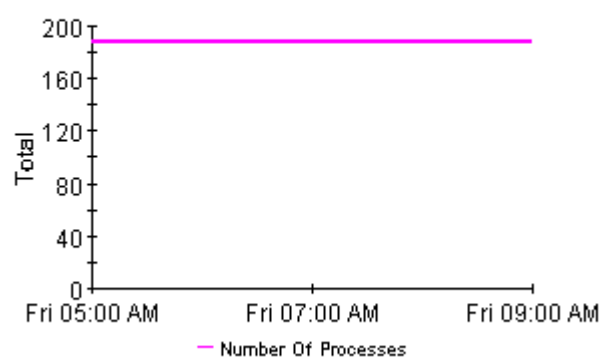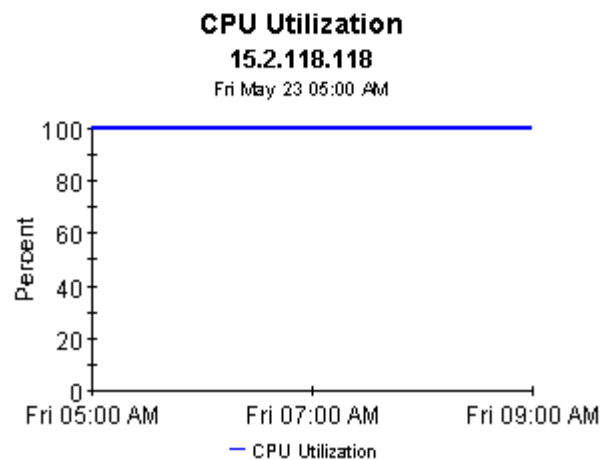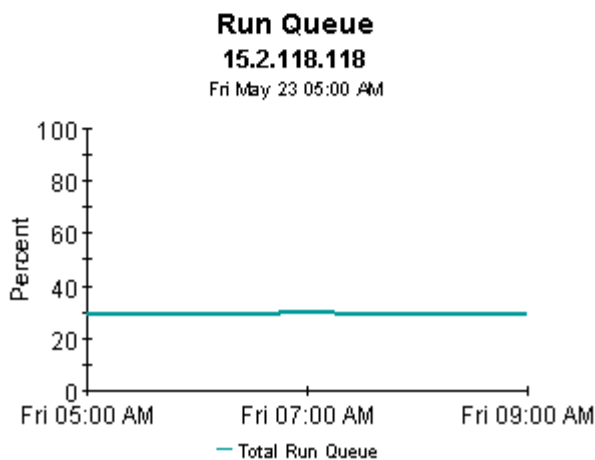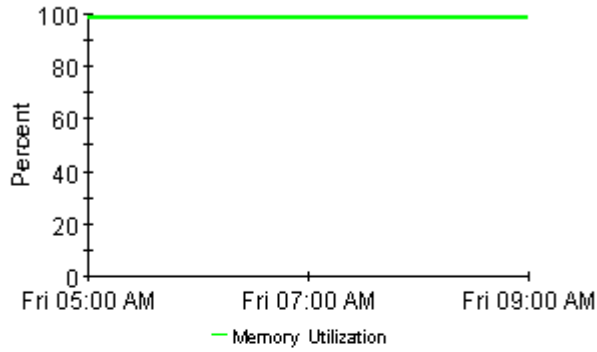

— Average Page Outs per Second
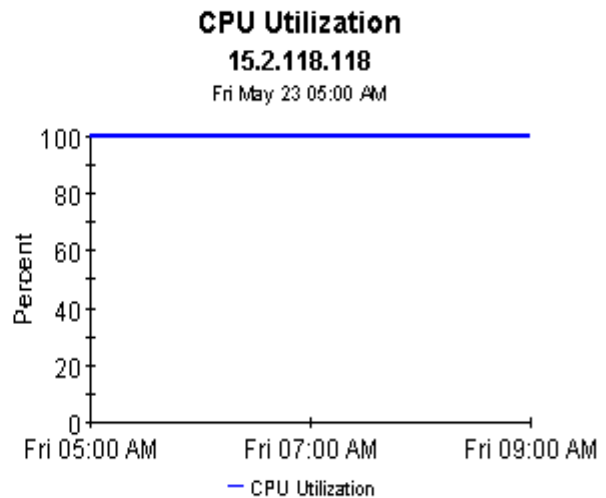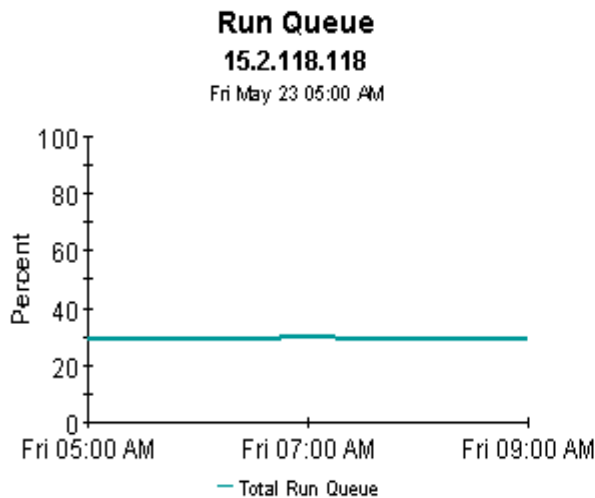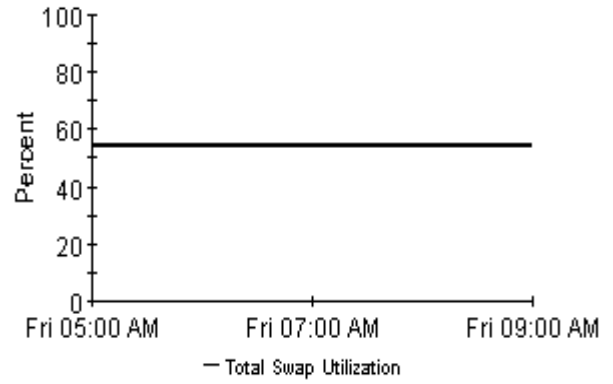
Number of Processes
15.2.118.118
Fri May 23 05:00 AM

— Number Of Processes
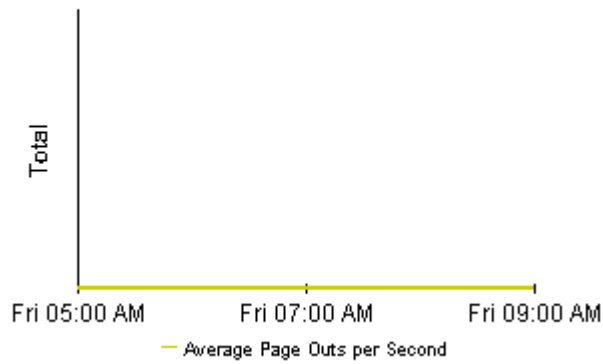
System Resource

Snapshot – Near Real Time

The System Resource Near Real Time Snapshot Report gives the system management staff an up to date view of the performance of individual systems. By selecting a system from the top table, current system performance (up to the most recent data collection) can be investigated in detail.

System Selection List
Select System to See Near Real Time Information

System	Total Run Queue	Total CPU Utilization	Total Swap Utilization	Total Memory Utilization	Average Page Outs per Second	Number of Processes
15.2.118.118	29.32	99.99	54.53	98.14	0.00	188.00
tthp10.cnd.hp.com	1.28	16.16	20.00	89.89	0.00	128.20
gorilla.cnd.hp.com	5.45	13.90	22.00	64.65	0.00	188.60
tshp39.cnd.hp.com	0.37	12.35	61.00	81.60	0.00	461.00
tthp25.cnd.hp.com	0.16	12.00	7.00	31.95	0.00	122.00

Vendor	Model	O/S	Location	Customer
Hewlett-Packard	Unassigned		Location Unassigned	Customer Unassigned

Run Queue Threshold	CPU Utilization Threshold	Memory Utilization Threshold	Swap Utilization Threshold	Pageout Threshold
3.00	80.00	70.00	70.00	5.00

Run Queue
15.2.118.118
Fri May 23 05:00 AM

CPU Utilization
15.2.118.118
Fri May 23 05:00 AM

Memory Utilization
15.2.118.118
Fri May 23 05:00 AM

(chart: Memory Utilization — green line at 100 Percent; y-axis Percent 0–100; x-axis Fri 05:00 AM, Fri 07:00 AM, Fri 09:00 AM)

— Memory Utilization

Swap Utilization
15.2.118.118
Fri May 23 05:00 AM

(chart: Total Swap Utilization — black line near 55 Percent; y-axis Percent 0–100; x-axis Fri 05:00 AM, Fri 07:00 AM, Fri 09:00 AM)

— Total Swap Utilization

Number of Page Outs
15.2.118.118
Fri May 23 05:00 AM

(chart: Average Page Outs per Second — yellow line at 0; y-axis Total; x-axis Fri 05:00 AM, Fri 07:00 AM, Fri 09:00 AM)

— Average Page Outs per Second

Number of Processes
15.2.118.118
Fri May 23 05:00 AM

(chart: Number Of Processes — magenta line near 185; y-axis Total 0–200; x-axis Fri 05:00 AM, Fri 07:00 AM, Fri 09:00 AM)

— Number Of Processes

11 Top Ten Reports

System Resource contains two Top Ten reports:

- Top Ten (Exception Volume, CPU Utilization, Filesystem Utilization)
- Top Ten Transactions

Both reports perform a ranking function. The first one contains three tables and no graphs or charts. This report brings into focus yesterday's exception volume, yesterday's CPU utilization, and yesterday's filesystem utilization. Use this report to spot systems with high exception volume, systems with high CPU utilization, and systems with high filesystem utilization.

In addition to ranking systems, each table in this report provides the following provisioning details:

- Customer
- Location
- Make
- Model
- Operating system

The systems that appear in this report may not be exceeding thresholds and generating exceptions. The volume and utilization levels that appear in this report may be over threshold levels, or they may be well under threshold levels. If you are interested in knowing which systems are producing the most exceptions, use the Hot Spots report.

System Resource

Top Ten

The System Resource Top Ten Report lists up to ten top volume contributors and ten systems exhibiting the poorest health for the day. Servers with the largest change in volume or health from the previous day are also listed, indicating unstable conditions that warrant further investigation.   Select a system from the top chart to display detailed information for that system.

Systems with Highest Volume
Tue Oct 28 2003

System	Total InPackets	Total OutPackets	Average Collision Rate per min	Average Error Rate per min	Customer	Locatio
surya.india.hp.com	22,551,950.00	22,559,202.00	2,267.71		Customer Unassigned	Location Una:
aaina.india.hp.com	6,442,713.00	9,018,749.00	428.95		Customer Unassigned	Location Una:
dollar.india.hp.com	1,131,713.00	998,315.00	1.77		Customer Unassigned	Location Una:

Systems with Highest CPU Utilization
Tue Oct 28 2003

System	Average CPU Utilization	Average Queue Length	Customer	Location	Make	Moc
aaina.india.hp.com	38.35	0.80	Customer Unassigned	Location Unassigned	Hewlett Packard	9000
surya.india.hp.com	17.79	0.28	Customer Unassigned	Location Unassigned	Hewlett Packard	9000
dollar.india.hp.com	9.75	0.35	Customer Unassigned	Location Unassigned	Hewlett Packard	9000

Systems with Highest Filesystem Utilization
Tue Oct 28 2003

System	Average Filesystem Utilization	Filesystem	Customer	Location	Make
dollar.india.hp.com	90.83	/home	Customer Unassigned	Location Unassigned	Hewlett Packa
dollar.india.hp.com	87.82	/	Customer Unassigned	Location Unassigned	Hewlett Packa
surya.india.hp.com	81.77	lvm swap device	Customer Unassigned	Location Unassigned	Hewlett Packa
dollar.india.hp.com	51.00	/ClearCase	Customer Unassigned	Location Unassigned	Hewlett Packa
surya.india.hp.com	44.22	/ClearCase/vobs2	Customer Unassigned	Location Unassigned	Hewlett Packa
dollar.india.hp.com	43.82	/tmp	Customer Unassigned	Location Unassigned	Hewlett Packa
surya.india.hp.com	42.30	/	Customer Unassigned	Location Unassigned	Hewlett Packa
surya.india.hp.com	31.84	/stand	Customer Unassigned	Location Unassigned	Hewlett Packa
dollar.india.hp.com	23.58	/stand	Customer Unassigned	Location Unassigned	Hewlett Packa

12 Logical System

The SR_LS subpackage collects metrics from the BYLS virtualization class. This class was added to OVPA in release 4.6. The BYLS metrics collected by OVPA 4.6 and later come from these two sources:

- HPVM
- AIX LPARS

Installing the Logical System subpackage deploys four reports and one form:

- Logical System Details
- Logical System Availability
- Logical System Physical CPU and Memory
- Logical System "What If"
- Logical System Properties (form)

Use the properties form to modify thresholds. When you modify a threshold, you modify the thresholds policy in the SR_LS_Thresholds subpackage.

LS Details Report

The system administrator assigns CPU and memory resources to each logical system. Although it is clear to the administrator what was assigned to the logical system, it is less clear what portion of the assigned amount is actually being used. The LS Details Report addresses this problem. This report will help you anticipate bottlenecks in the host system operating system that could degrade the performance of virtual machines and the applications these machine are running. With access to this data, balancing the vm load per server should be much easier.

If you select a physical system, the report responds by populating the Latest Information table with the following details about each LS:

- Up Time (days)
- State
- # CPU
- RAM (MB)
- # Disks
- # LANs
- Record Last Updated

You will find data about logical CPU, memory, and run queue in the following graphs:

- Logical CPU % of Logical System (tabs for hourly, daily, monthly)

- Logical Memory % of Logical System (tabs for hourly, daily, monthly)
- Logical Run Queue (tabs for hourly, daily, monthly)

In the graphs, you can look at data for a single LS, or you can look at data for all the logical systems at once. The composite view is the default. By default, the graphs provide a composite view of performance covering every logical system associated with the physical system. To view data for a single LS, use the LS selector drop-down.

➤ The value for memory assigned is in the Latest Information table. Because AIX LPARS and HPVM do not record CPU metrics the same way (initial CPU unit assigned for AIX LPARS, min and max allowed for HPVM), deriving a value for CPU assigned, and adding that metric to the Latest Information table, is not feasible.

Availability Per Logical System

A logical system with availability problems could indicate that users are having a problem running certain applications. Use LS Availability per Logical System to monitor the availability of each logical system.

The Latest Information table is the same as the Latest Information table in the Details report. To display hourly, daily, or monthly availability statistics for a single LS, select a Logical System in the selection table. The hourly graph contains data for 7 days; the daily graph contains data for 30 days.

LS Physical CPU and Memory Report

The physical CPU and Physical Memory report shows the impact of individual logical systems on physical resources. To populate the Latest Information table, select a physical system. If you do not select an individual LS using the LS selector, the following graphs will show a composite view of resource consumption:

- Physical CPU % per LS
- Physical Memory % per LS
- Point in Time Physical CPU %
- Point in Time Physical Memory %

LS "What If" Report

The What If report is intended to help administrators spread the LS workload evenly between physical machines. For example, if you have two physical machines, and one appears to be overloaded, you may need to move some logical systems to the other machine. What you can do with this report is add logical systems to the other machine to see what the impact would be. In the case of CPU, you the impact may not be that easy to determine, since the other physical machine may have a different CPU configuration. However, if the machines have the same configuration, then the results shown in this report will be accurate and reliable.

System Resource
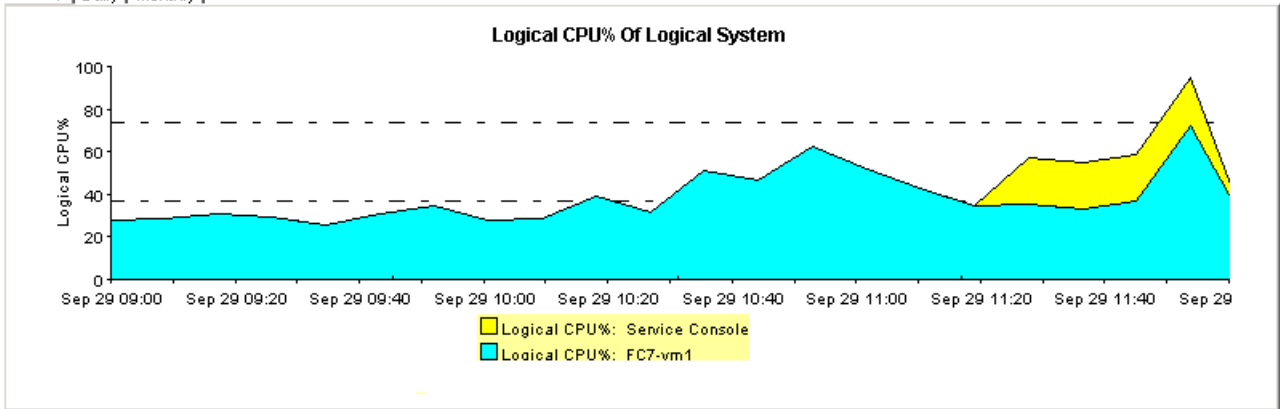
Logical System Detail

The System Resource Logical System Details Report details the logical system on each System. Select a system from the top table to display detailed information of logical systems in that system.

Physical System	hpovnt1.aus.hp.com ▼	Node Name	Make	Model	OS
		hpovnt1.aus.hp.com	Linux	i686	Linux 2.4.21-47. #1 Thu Jul
Logical System	Select Logical System ▼				

Logical System Latest Information

LS Name	Hosted On	Up Time (days)	State	#CPU	RAM (MB)	#DISK	#LAN	Record Last Updated
Service Console	hpovnt1.aus.hp.com	0.04	UP	0	0	0	0	Sat, Sep 29 12:00 PM
FC7-vm1	hpovnt1.aus.hp.com	0.04	UP	1	6,384	1	1	Sat, Sep 29 12:00 PM
FC7-vm2	hpovnt1.aus.hp.com	0.04	UP	1	3,072	1	1	Sat, Sep 29 12:00 PM

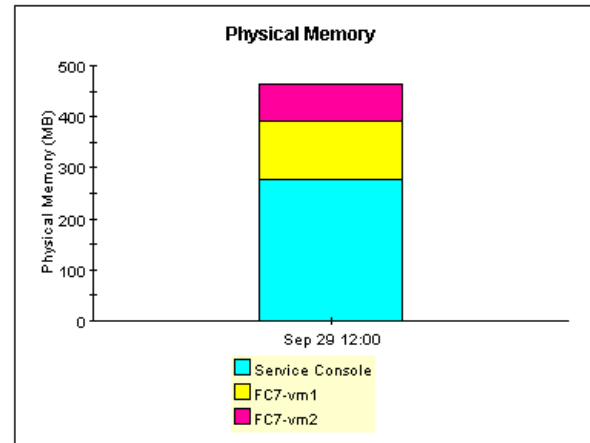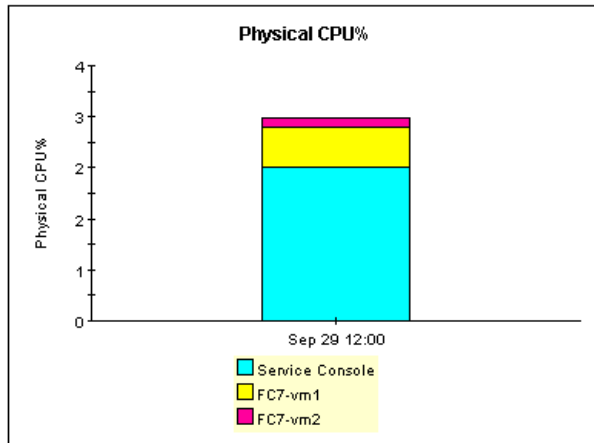Hourly | Daily | Monthly

Hourly | Daily | Monthly

Hourly | Daily | Monthly

System Resource

Availability Per Logical System

This report present the Availability for each logical system (aka Virtual Machine or Guest).

Physical System	hpovnt1.aus.hp.com ▼		Node Name	Make	Model	OS
			hpovnt1.aus.hp.com	Linux	i686	Linux 2.4.21-47. #1 Thu Jul
Logical System	FC7-vm1 ▼					

Logical System Latest Information

LS Name	Hosted On	Up Time (days)	State	#CPU	RAM (MB)	#DISK	#LAN	Record Last Updated
Service Console	hpovnt1.aus.hp.com	0.04	UP	0	0	0	0	Sat, Sep 29 12:00 PM
FC7-vm1	hpovnt1.aus.hp.com	0.04	UP	1	6,384	1	1	Sat, Sep 29 12:00 PM
FC7-vm2	hpovnt1.aus.hp.com	0.04	UP	1	3,072	1	1	Sat, Sep 29 12:00 PM

Hourly | Daily | Monthly

Availability per Logical System

■ Availability: FC7-vm1
☒ UnAvailability: FC7-vm1

System Resource
Physical CPU And Memory Per Logical

This report present the impact on the phsyical host by each logical system (aka Virtual Machine or Guest) running on it.

Physical System	hpovnt1.aus.hp.com ▼	
Logical System	Select Logical System ▼	

	Node Name	Make	Model	OS
	hpovnt1.aus.hp.com	Linux	i686	Linux 2.4.21-47. #1 Thu Jul

Logical System Latest Information

LS Name	Hosted On	Up Time (days)	State	#CPU	RAM (MB)	#DISK	#LAN	Record Last Updated
Service Console	hpovnt1.aus.hp.com	0.04	UP	0	0	0	0	Sat, Sep 29 12:00 PM
FC7-vm1	hpovnt1.aus.hp.com	0.04	UP	1	6,384	1	1	Sat, Sep 29 12:00 PM
FC7-vm2	hpovnt1.aus.hp.com	0.04	UP	1	3,072	1	1	Sat, Sep 29 12:00 PM

Hourly | Daily | Monthly |

Physical CPU% per Logical System

Physical CPU%

□ Physical CPU%: Service Console ■ Physical CPU%: All
■ Physical CPU%: FC7-vm1
■ Physical CPU%: FC7-vm2

Hourly | Daily | Monthly |

Physical Memory per Logical System

Physical Memory (MB)

□ Physical Memory: Service Console ■ Physical Memory: All
■ Physical Memory: FC7-vm1
■ Physical Memory: FC7-vm2

Point in time CPU and Memory quick view

Select a physical system and an hourly time period

Physical System hpovnt1.aus.hp.com ▼

Time Period Sat, Sep 29 12:00 PM ▼

Physical CPU%

Service Console
FC7-vm1
FC7-vm2

Physical Memory

Service Console
FC7-vm1
FC7-vm2

System Resource

Logical System "What If" Report

This report allows the user to perform some basic "what if" comparisons to help spread the virtual machine workload acro

| Service Console ▼ | Select Logical System ▼ | meov27 ▼ | Select L |

Physical CPU% per Logical System

CPU%

20

16

12

8

4

0

Memory Used per Logical System

Memory (MB)

300

240

180

120

60

0
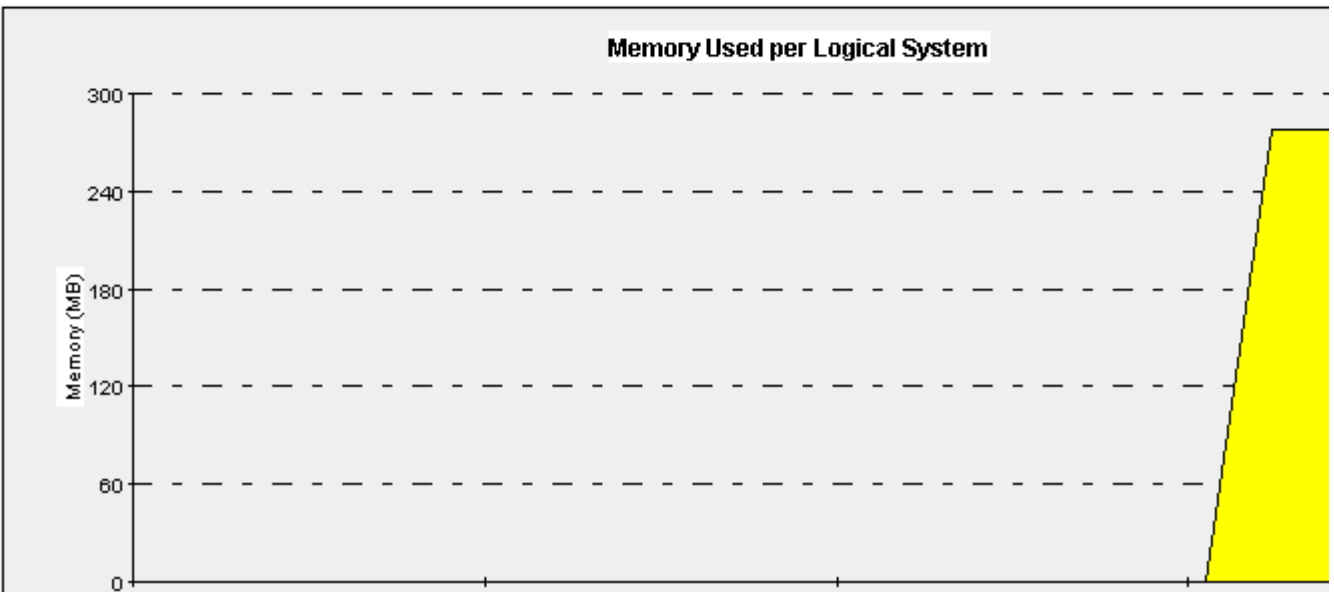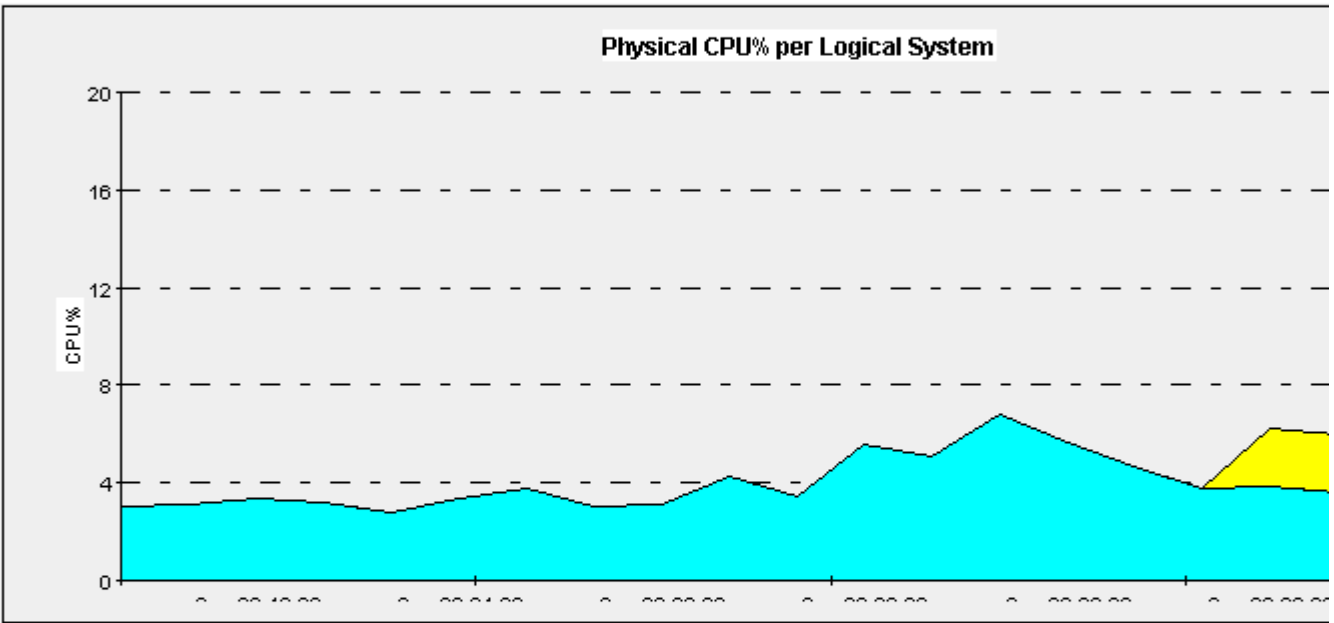
Integration with HP Performance Agent 5.00

PI now supports data collection from PA version 5.00. PA 5.00 supports ESXi environment Some of the changes in PA 5.00 affect the data collection, and in turn reporting, of the System Resource and the System Resource LS (Logical Systems) report packs.

PI can collect data from PA 5.00 and display the reports properly. But PI does not collect any new metrics or provide new reports for logical system. All the existing functionalities works for PA 5.00.

Limitations

PI's support for PA 5.00 has the following limitations:

- In case of ESXi, vMA can monitor multiple physical hosts. Therefore, the agent running on the vMA system can collect and provide both virtualization metrics corresponding to the virtual systems on those hosts as well as other global metrics (APPL, NETIF, DISK, CPU, etc.) corresponding to the physical hosts. The changes recommended here are limited to the SR_LS sub-package in System Resource report pack that collects only virtualization metrics from the BYLS class. Since other sub-packages in the System Resource report pack collect and report only on systems on which an agent is running, the global metrics for physical hosts managed by vMA will not be collected and reported by PI. This is because in some deployments, it is not necessary to install agent on the hosts managed by vMA. To overcome ths limitation, you must install the agent locally on every physical host, even if it is managed by a vMA.

- AIX: No virtualization reporting on AIX LPAR because AIX LPAR does not have the concept of a physical host, or atleast is not exposed by AIX. The BYLS_HOST_HOSTNAME field collected from the agent will be NA). This limitation exists even when collecting data from PA 4.70.

  Also, PI cannot distinguish between AIX LPAR and AIX WPAR.

A PI Report Packs

Business Technology	Reporting Solution
Application	Application Report Pack: • WebLogic SPI • WebSphere SPI
Database	Database SPI Report Pack
HP Business Process Insight	BPI Integration Report Pack
HP Internet Services	Internet Services Report Pack
HP Network Node Manager	NNM Event & Availability Report Pack
HP Operations	OVO Report Pack
HP SiteScope	SiteScope Integration Report Pack
IP Telephony	• Cisco IP Telephony Call Detail • Cisco IP Telephony Gateway Statistics
MPLS VPN	MPLS VPN Report Pack
Networking	**Infrastructure Usage** • Interface Reporting • Device Resource Report Pack **LAN/WAN Edge** • Frame Relay (SNMP only) • ATM (SNMP only) **WAN Core** • Frame Relay (multiple switch vendors) • ATM (multiple switch vendors) **Traffic Profiling** • RMON II • NetFlow Interface • NetFlow Global View • IP QoS Report Pack • Class-Based QoS

Business Technology	Reporting Solution
Networking (continued)	Quality Assurance • Cisco Ping Report Pack • Service Assurance • IP Access Rate
System Resources	• System Resource Report Pack

B Logical System Metrics

Configuration Class	Description
GBL_SYSTEM_ID	The network node hostname of the system.uname -n
GBL_OSNAME	A string representing the name of the operating system.uname -s
GBL_OSRELEASE	The current release of the operating system. On most Unix systems, this is the same as the output from the **uname -r** command. AIX: Actual patch level of the operating system. This is similar to what is returned by the command: **lslpp -l bos.rte**
GBL_OSVERSION	A string representing the version of the operating system.
GBL_LS_TYPE	The virtulization technology, if applicable. The value of this metric is: • HPVM on HP-UX host • LPAR on AIX LPAR Otherwise, the value is: NoVM.
GBL_LS_ROLE	Indicates whether PA is installed on Logical system or host or standalone system. This metric will be either: • GUEST • HOST • STAND
GBL_NUM_CPU (BYLS_NUM_CPU)	The number of physical CPUs on the system
BYLS_CPU_ENTL	The entitlement or the CPU units granted to a logical system at startup. AIX SPLPAR: indicates the cpu units allocated by hypervisor to a logical system at the time of starting. This metric is equivalent to "Entitled Capacity" field of **lparstat -i** command.

Configuration Class	Description
BYLS_CPU_ENTL_MAX	The maximum CPU units configured for a logical system.
	HP-UX HPVM: indicates the maximum percentage of physical CPU that a virtual CPU of this logical system is guaranteed.
	AIX SPLPAR: equivalent to Maximum Capacity field of **lparstat -i** command.
BYLS_CPU_ENTL_MIN	The minumum CPU units configured for this logical system.
	HP-UX HPVM: indicates the minimum percentage of physical CPU that a virtual CPU of this logical system is guaranteed.
	AIX SPLPAR: equivalent to Minimum Capacity field of **lparstat -i** command.
BYLS_CPU_ENTL_UTIL	Percentage of entitled processing units (guaranteed processing units allocated to this logical system) consumed by the logical system.
	HP-UX HPVM host: indicates the logical system's CPU utilization with regard to minimum CPU entitlement. This metric is calculated as:
	BYLS_CPU_ENTL_UTIL = (BYLS_CPU_PHYSC / BYLS_CPU_ENTL_MIN) * 100
	AIX: calculated as:
	BYLS_CPU_ENTL_UTIL = (BYLS_CPU_PHYSC / BYLS_CPU_ENTL) * 100
BYLS_CPU_MT_ENABLED	Indicates whether the CPU hardware threads are enabled or not for a logical system.
BYLS_CPU_PHYSC	This metric indicates the number of physical processors utilized by the logical system.
	On an Uncapped logical system, this value will be equal to the physical processor capacity used by the logical system during the interval. This can be more than the value entitled for a logical system.
BYLS_CPU_PHYS_SYS_MODE_UTIL	The percentage of time the physical CPU was in system mode (kernel mode) for the logical system during the interval.
	AIX LPAR: value is equivalent to "%sys" field reported by the **lparstat** command.

Configuration Class	Description
BYLS_CPU_PHYS_TOTAL_UTIL	Percentage of total time the physical CPUs were utilized by this logical system during the interval.
	AIX: equivalent to sum of BYLS_CPU_PHYS_USER_MODE_UTIL and BYLS_CPU_PHYS_SYS_MODE_UTIL.
	The metric is calculated with regard to the available physical CPUs in the pool to which this LPAR belongs to.
BYLS_CPU_PHYS_USER_MODE_UTIL	The percentage of time the physical CPU was in user mode for the logical system during the interval.
	AIX LPAR: this value is equivalent to %user field reported by the **lparstat** command.
BYLS_CPU_SHARES_PRIO	This metric indicates the weightage/priority assigned to a Uncapped logical system. This value determines the minimum share of unutilized processing units that this logical system can utilize.
	AIX SPLPAR: value is dependent on the available processing units in the pool and can range from 0 to 255.
BYLS_CPU_TOTAL_UTIL	Percentage of total time the logical CPUs were not idle during this interval. This metric is calculated against the number of logical CPUs comfigured for this logical system.
BYLS_HYPCALL	The number of hypervisor calls made by a logical system during the interval.
BYLS_HYP_UTIL	Percentage of time spent in hypervisor by a logical system during the interval.
BYLS_IP_ADDRESS	This metric indicates IP Address of the particular logical system.
BYLS_LS_ID	An unique identifier of the logical system.
	HPVM: this metric is a numeric id and is equivalent to VM # field of **hpvmstatus** command.
	AIX LPAR: this metric indicates partition number and is equivalent to Partition Number field of **lparstat -i** command.

Configuration Class	Description
BYLS_LS_MODE	This metric indicates whether the CPU entitlement for the logical system is capped or uncapped.
	HPUX HPVM: metric is always uncapped as maximum CPU entitlement (BYLS_CPU_ENTL_MAX) is always 100%.
	The value Uncapped indicates that the logical system can utilize idle cycles from the shared pool of CPUs beyond its CPU entitlement.
	AIX SPLPAR: same as Mode field of **lparstat -i** command.
BYLS_LS_NAME	This is the name of the computer.
	HPVM: metric indicates the Virtual Machine name of the logical systemand is equivalent to Virtual Machine Name field of **hpvmstatus** command.
	AIX: value is as returned by the command **uname -n** (that is, the string returned from the "hostname" program).
BYLS_LS_SHARED	This metric indicates whether the physical CPUs are dedicated to this logical system or shared.
	HPUX HPVM: metric is always Shared.
	AIX SPLPAR: equivalent to Type field of **lparstat -i** command.
BYLS_MEM_ENTL	The minimum memory configured for this logical system.
BYLS_MEM_ENTL_UTIL	The percentage of entitled memory in use during the interval. This includes system memory (occupied by the kernel), buffer cache and user memory.
BYLS_NUM_CPU	The number of virtual CPUs configured for this logical system. This metric is equivalent to GBL_NUM_CPU on the corresponding logical system.
	HPVM: the maximum CPUs a logical system can have is 4 with regard to HPVM 2.0.
	AIX SPLPAR: the number of CPUs can be configured irrespective of the available physical CPUs in the pool this logical system belongs to.
BYLS_NUM_DISK	Local disk devices are counted in this metric.

Configuration Class	Description
BYLS_NUM_NETIF	The number of network interfaces configured for this logical system. This also includes the loopback interface.
BYLS_RUN_QUEUE	The 1-minute load average for processors available for a logical system. AIX LPAR: the load average is the total number of runnable and running threads summed over all processors during the interval.
BYLS_VCSWITCH_RATE	Number of virtual context switches per second for a logical system during the interval.

C Options for Customizing Reports

These are some of the way you can customize reports:

- Apply group filters
- Apply constraints
- Modify the time period (so that you can view archive data in archive reports)
- Add customized property data (customers and locations)
- Change the default view of tables and graphs

Although creating group filters is a task for an administrator, any user looking at a report can apply constraints, switch from active data to archive data, and change view options for tables and graphs. For details about view options for tables and graphs, see Editing Tables and Graphs.

Group Filters

You can share reports with customers by configuring PI to generate customer-specific reports. You configure PI to generate customer-specific report by creating and applying group filters. Creating group filters involves the following tasks:

- Importing custom property information (customers, locations, IP addresses for nodes, and host names for nodes) using Common Property Tables
- Creating a group account for all of the users affiliated with a particular customer
- Creating a group filter for the group account

For more information about group filters, refer to the *PI Administration Guide.*

Applying Constraints

When you edit a parameter, you apply a constraint. The constraint removes data you are not interested in seeing. If you edit the Customer_Name parameter, data for every customer except the customer you typed in the Customer_Name field will drop from the report. If you edit the Location_Name parameter, data for all locations except the location you typed in the Location_Name field will drop from the report.

You can apply multiple constraints at the same time. System Resource supports the following parameters:

- Customer_Name

- Location_Name

- Device

If you are using the Web Access Server to view reports, apply a constraint by clicking the Edit Parameters icon at the bottom right-hand corner of the report. When the Edit Parameters window opens, enter the constraint in the field and click **Submit.**

If you are using the Report Viewer application, apply a constraint by selecting **Edit > Parameter Values** from the menu bar. When the Modify Parameter Values window opens, click **Current Value**. Enter a new value and click **OK**.

Viewing Archive Reports

If you are using the Web Access Server to view reports containing active data, you can switch to archive data by following these steps:

1 Click **Preferences.**

2 Expand the Deployed Items folder.

3 Click **View.** The View Settings panel opens.

4   Click the box next to **Allow Element Editing.**
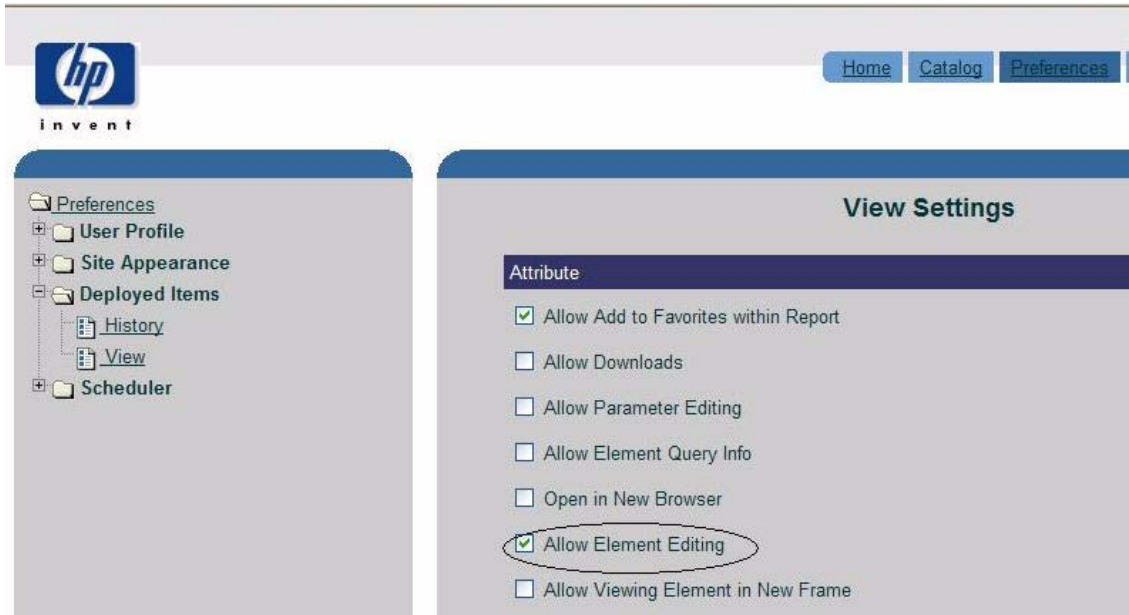
5   Click **Apply.** The system displays the following message:

    You have successfully updated your report view settings.

6   Click **Catalog.**

7   Expand the **System** folder.

8   Expand the **SystemResource** folder.

9   Expand the **Archive** folder.

10   Double-click any report in the folder.

11   When the report opens, click the paint icon in the upper right. The Table Edit window
     opens.

12   Click **Absolute** and enter a start time and an end time.

13 Click **Submit**.

Adding Customized Property Data

The reports in System Resource can be populated with the following properties:

- IP address for the device

- Host name for the device

- Name of the customer associated with the device

- Location associated with the device

When this information appears in a report, the report is reading database tables maintained by the Common Property Tables package. If you are about to install Common Property Tables for the first time, you can import properties by using the batch-mode property import utility that comes with Common Property Tables. Once you import properties in batch mode, you have two ways to modify existing properties:

- Use the batch-mode property import utility (edit a file, then import the edited file)

- Use the change forms that come with Common Property Tables

For details about both approaches, refer to the *Common Property Tables User Guide*.

D Editing Tables and Graphs

Any table or graph can be viewed in several ways. Although the default view is usually adequate, you can easily change to a different view. If you are using Report Viewer, right-click the object to open a list of view options. If you are using the Web Access Server, follow these steps to change the default view of a table or graph:

1   Click **Preferences** on the links bar.

2   Expand **Reports** in the navigation frame.

3   Click **Viewing**.

4   Select the **Allow element editing** box.

5   Click **Apply**.

6   Click the Edit icon next to the table or graph.

View Options for Tables

Right-clicking a table, or selecting the Edit Table icon if you are using the Web Access Server, opens a list of table view options.

Set Time Period…
Change Constraint Values…
Select Nodes/Interfaces…
Change Max Rows…
View in new Frame
Print Table…
Export Element as CSV…
Delete Table
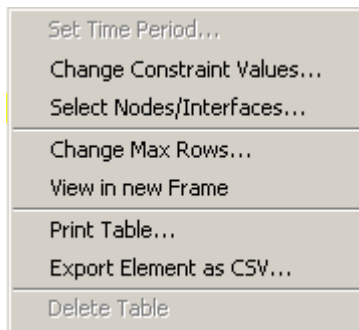
Select **Set Time Period** to alter the relative time period (relative to now) or set an absolute time period. The Set Time Period window opens.

You may shorten the period of time covered by the table from, for example, 42 days to 30 days or to 7 days. If you are interested in a specific period of time that starts in the past and stops *before* yesterday, click **Use Absolute Time** and select a Start Time and an End Time.

Select **Change Constraint Values** to loosen or tighten a constraint, thereby raising or lowering the number of elements that conform to the constraint. The Change Constraint Values window opens. To loosen a constraint, set the value lower; to tighten a constraint, set the value higher.

The **Select Nodes/Interfaces** allows you to change the scope of the table by limiting the table to specific nodes, specific interfaces, or a specific group of nodes or interfaces. The Select Node Selection Type window opens.

Change Max Rows increases or decreases the number of rows in a table. The default is 50. If you expand the default, the table may take more time to open. If you are trending a large network, using the default ensures that the table opens as quickly as possible.

View in new Frame opens the table in a Table Viewer window, shown below. If necessary, make the data in the table more legible by resizing the window.

View Options for Graphs

Right-clicking a graph, or clicking the Edit Graph icon if you are using the Web Access Server, opens the following list of view options.
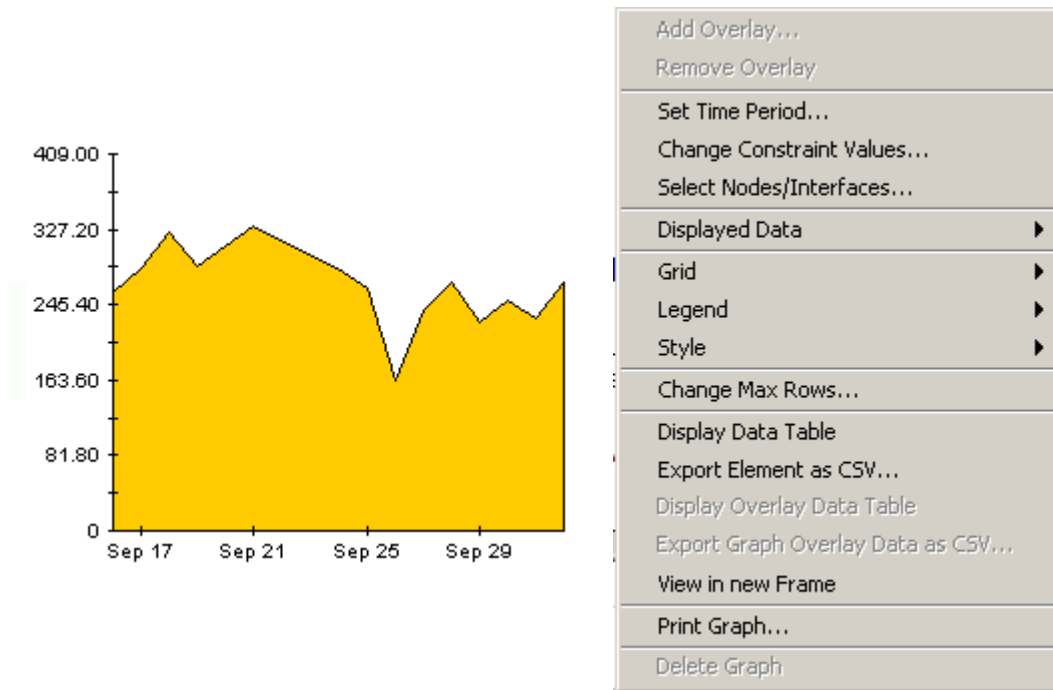
The following table provides details about each option.

Option	Function
Set Time Period	Same as the table option shown above.
Change Constraint Values	Same as the table option shown above.
Select Nodes/Interfaces	Same as the table option shown above.
Displayed Data	For every point on a graph, display data in a spreadsheet.
Grid	Add these to the graph: X axis grid lines Y axis grid lines X and Y axis grid lines
Legend	Delete or reposition the legend.
Style	See the illustrations below.
Change Max Rows...	Same as the table option shown above.
Display Data Table	See below.
Export Element as CSV...	Same as the table option shown above.
View in New Frame	Opens graph in a Graph Viewer window.
Print Graph	Same as the table option shown above.

Style Options

Select **Style** to display a list of seven view options for graphs.
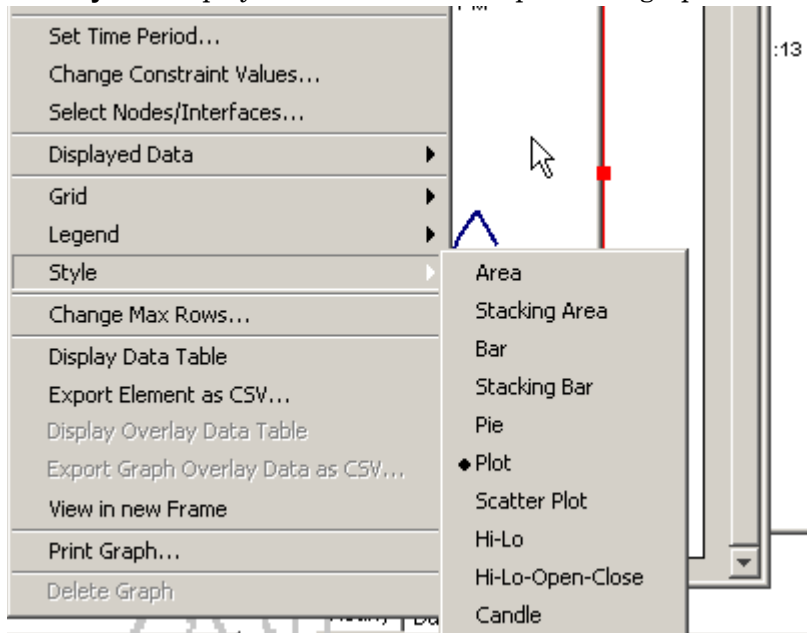
Style > Area

The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location
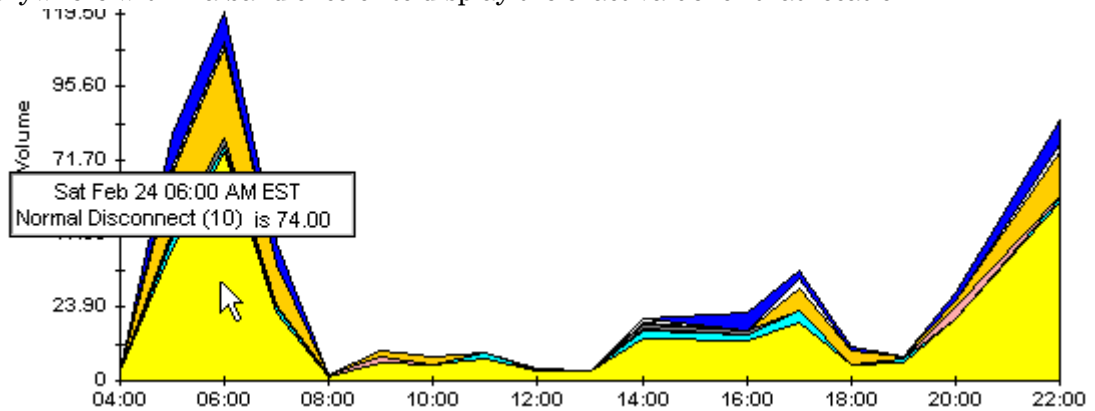
To shorten the time span of a graph, press SHIFT+ALT and use the left mouse button to highlight the time span you want to focus on. Release the mouse button to display the selected time span.

Style > Stacking Area

The area or plot graph changes to a stacking area graph. This view is suitable for displaying a small number of variables.
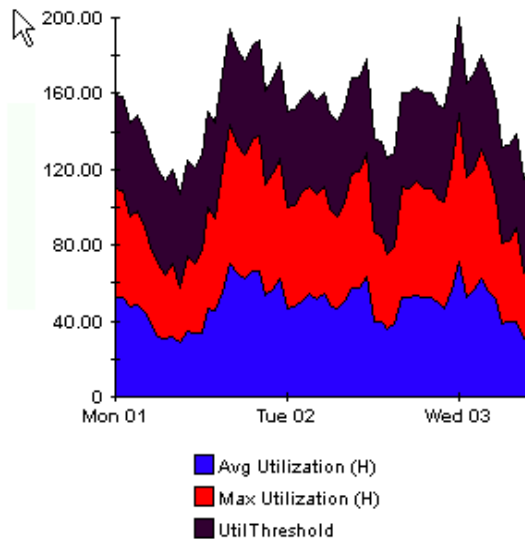
Style > Bar

The graph changes to a bar chart. This view is suitable for displaying relatively equal values for a small number of variables. There are three variables in the graph below.
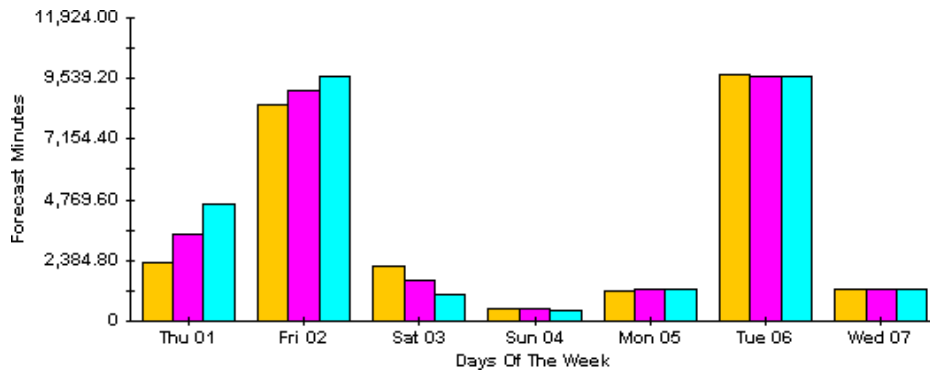
Style > Stacking Bar

The plot or area graph changes to a stacking bar chart. If you increase the width of the frame, the time scale becomes hourly. If you increase the height of the frame, the call volume shows in units of ten.
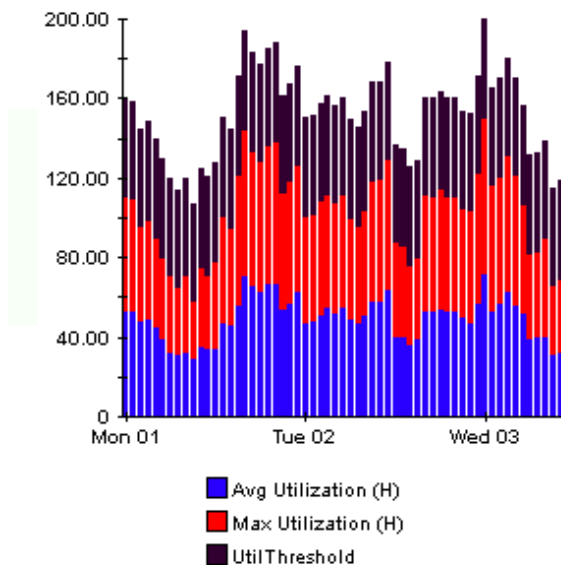
Style > Plot

Bands of color in an area graph change to lines. If you adjust the frame width, you can make the data points align with hour; if you adjust the frame height, you can turn call volume into whole numbers.
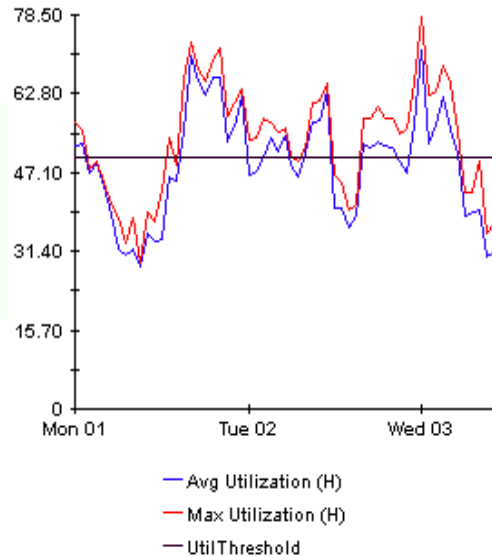
Style > Pie
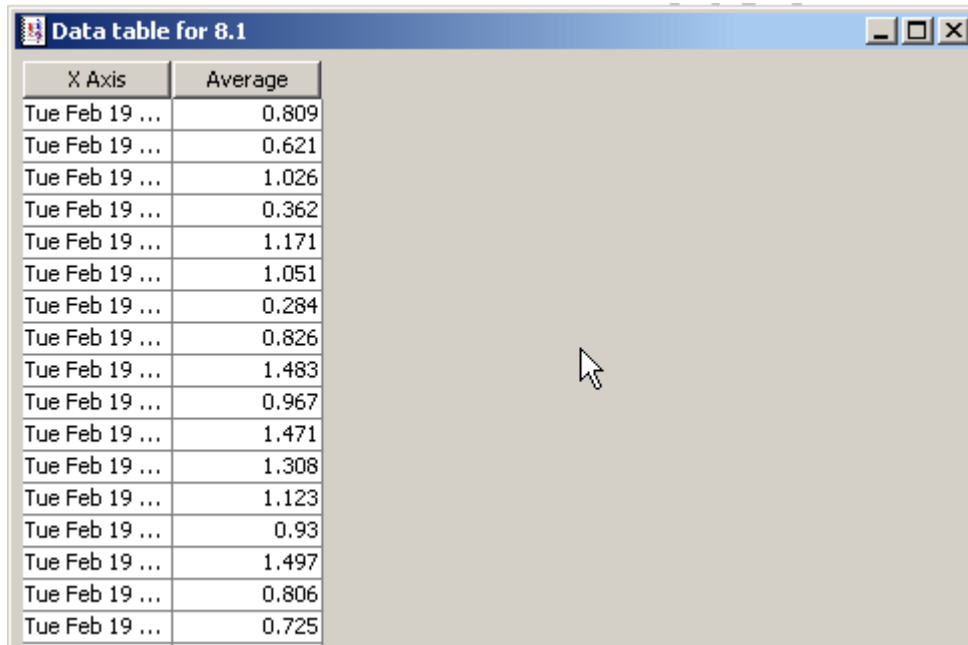
An area graph becomes a pie chart. Bands in an area graph convert to slices of a pie and the pie constitutes a 24-hour period. This view is helpful when a small number of data values are represented and you are looking at data for one day.
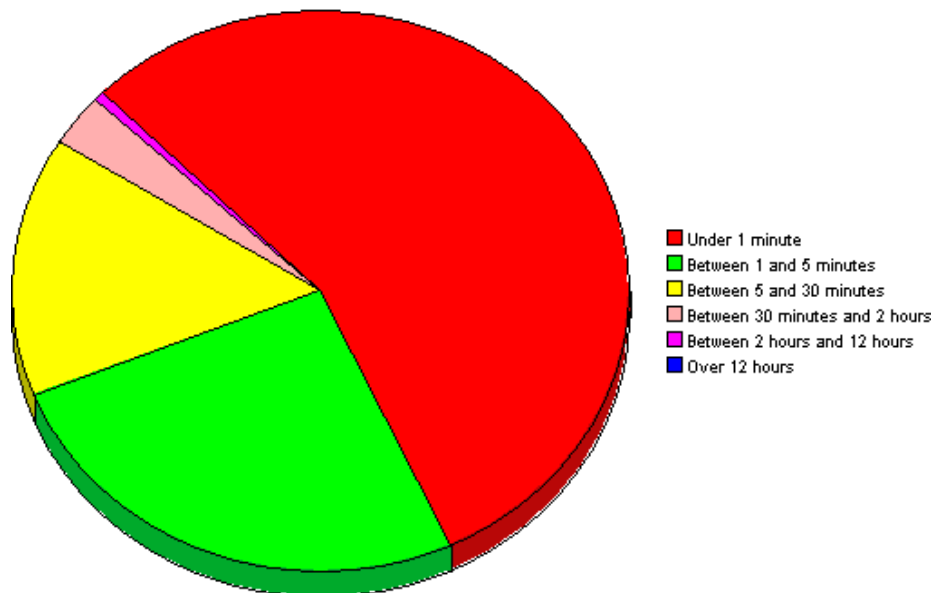
If you are looking at data for more than one day, you will see multiple pie graphs, one for each day.

Display Data Table

This option changes a graph into a spreadsheet.

X Axis	Average
Tue Feb 19 ...	0.809
Tue Feb 19 ...	0.621
Tue Feb 19 ...	1.026
Tue Feb 19 ...	0.362
Tue Feb 19 ...	1.171
Tue Feb 19 ...	1.051
Tue Feb 19 ...	0.284
Tue Feb 19 ...	0.826
Tue Feb 19 ...	1.483
Tue Feb 19 ...	0.967
Tue Feb 19 ...	1.471
Tue Feb 19 ...	1.308
Tue Feb 19 ...	1.123
Tue Feb 19 ...	0.93
Tue Feb 19 ...	1.497
Tue Feb 19 ...	0.806
Tue Feb 19 ...	0.725

View in New Frame

The graph opens in a Graph Viewer window. Improve legibility by resizing the window.
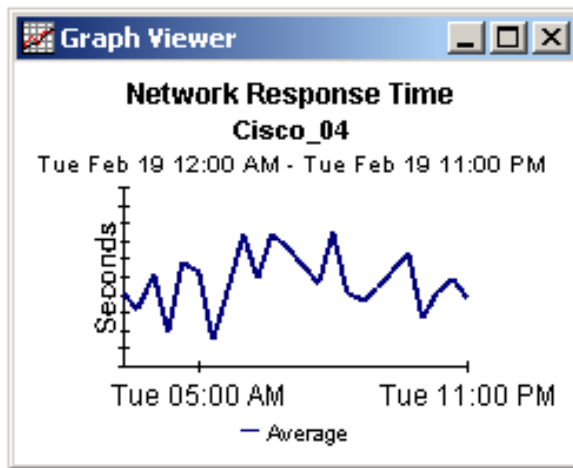
E   Uninstalling the SR Report Pack

Uninstalling System Resource also uninstalls any datapipe that depends on System Resource. Follow these steps to uninstall the System Resource Report Pack:

1   Log in to the system. On UNIX systems, log in as root.

2   Stop OVPI Timer and wait for processes to stop running.

    Windows NT:

    a   Select **Control Panel** → **Administrative Tools** → **Services**.

    b   Select OVPI Timer from the list of services.

    c   From the Action menu, select **Stop**.

        UNIX: As root, do one of the following:

        —   HP-UX: **sh /sbin/init.d/ovpi_timer stop**

        —   Solaris: **sh /etc/init.d/ovpi_timer stop**

3   Launch Performance Insight and start Package Manager. The Package Manager welcome window opens.

4   Follow the on-screen instructions for uninstalling packages. When the Selection Summary window opens, select *System Resource*. When the uninstall process finishes, a package removal complete message appears.

5   Click **Done** to return to the Management Console.

6   Restart OVPI Timer.

    Windows NT: Select **Settings** → **Control Panel** → **Administrative Tools** → **Services**.

    UNIX: As root, type one of the following:

        HP-UX: **sh /sbin/init.d/ovpi_timer start**

        Solaris: **sh /etc/init.d/ovpi_timer start**

Index

SR_LS_Thresholds 1.0, 24

SR_LS sub-package 1.0, 24

SR_LV sub-package 4.3, 24

SR_NetIf sub-package 4.3, 24

SR_PROC sub-package 4.2, 24

style options for graphs, 119

SysRes OVPA Datapipe, 21, 29

SysRes RFC 1514 Datapipe, 21, 27

U

Use Absolute Time, 117

V

view in new frame, 118

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