

# System Resource Report Pack

Software Version: 4.2

HP OpenView Performance Insight

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## User Guide

June 2007



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# 1 Overview

This chapter covers the following topics:

- OVPI and system resources
- Enhancements in version 4.2
- Folders and reports
- Integration with HP OpenView Operations (OVO)
- Ways to customize reports
- Sources for additional information

## OVPI and System Resources

HP OpenView Performance Insight (OVPI) is a performance management and reporting application. Long-term data collection, in-depth analysis, and interactive web-based reporting are this application's primary strengths. If desired, you can integrate OVPI with network management or system management applications. Integration enhances fault isolation, problem diagnosis, and capacity planning.

The System Resource Report Pack installs on OVPI. 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 plentiful and limited, and you will be able to compare yesterday's utilization to weekly and monthly trends. If you have systems that are seeing higher utilization, the forecast report will let you know when you can expect a performance threshold to be reached.

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 OpenView agents, one that polls OpenView 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, see [Chapter 4, Data Collection](#).

## Enhancements in Version 4.2

Version 4.2 includes new features, new upgrade packages, and defect fixes.

### New Features

- Location Independent Reporting (LIR)
- Supports **Management Console > Copy Policy Manager**
- Long Term Retention (data archiving)

## New Upgrade Packages

- UPGRADE\_SR\_CPU\_to\_42.ap
- UPGRADE\_SR\_to\_42.ap
- UPGRADE\_SR\_DISK\_to\_43.ap
- UPGRADE\_SR\_LV\_to\_43.ap
- UPGRADE\_SR\_NI\_to\_43.ap
- UPGRADE\_SR\_PROC\_to\_42.ap
- UPGRADE\_SR\_OVPA\_to\_31.ap
- UPGRADE\_RFC1514\_to\_41.ap

For a complete list of defect fixes, see [Appendix A, Version History](#).

## Folders and Reports

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 System CPU, Memory, and Swap Utilization Exception Hot Spots
- 7 System CPU, Memory, and Swap Utilization QuickView
- 8 System CPU, Memory, and Swap Utilization QuickView - Snapshot
- 9 System CPU, Memory, and Swap Utilization QuickView - Near Real Time
- 10 System CPU, Memory, and Swap Utilization QuickView - Near Real Time - Snapshot
- 11 Service Level Management Executive Summary
- 12 System Availability
- 13 System Inventory
- 14 Systems Performing Each Application — Snapshot
- 15 System Volume and CPU Utilization Top Ten
- 16 Top Ten Transaction
- 17 Transactions per System — Snapshot

## 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. Forecast reports provide the following details:

- 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

## Integration with OVO

You can isolate faults and diagnose problems faster by integrating System Resource with HP OpenView Operations (OVO). 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 OVO. To make this change, open the SNMP Trap Action Definition form, fill in the necessary information, and save your changes. In addition, you or your OVO administrator must create a trap template definition for OVO. For details about defining the trap template, see *The Thresholds Module User Guide*.

# Ways to Customize Reports

You can customize reports by importing properties, by applying group filters, by applying constraints, and by editing tables and graphs. Service providers use group filters to produce customer-specific reports. Any user can apply a constraint to report, and any user can edit tables and graphs. For details about editing tables and graphs (selecting view options), see [Appendix B, Editing Tables and Graphs](#).

## Group Filters

You can share reports with customers by configuring OVPI to generate customer-specific reports. You configure OVPI 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 *OVPI 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**.

## Adding Customized Property Data

The reports in System Resource 4.1 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*.

## 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*
- *OVPI Report Packs, CD-ROM Release Notes, July 2007*

You can download the documents listed above from this site:

**[http://ovweb.external.hp.com/lpe/doc\\_serv/](http://ovweb.external.hp.com/lpe/doc_serv/)**

The user guides for OVPI are listed under **Performance Insight**. The user guides for report packs and datapipes are listed under **Performance Insight Reporting Solutions**. 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 compare the date on your PDF to the date on the web edition of this document and use the web edition if it is newer.



## 2 The Upgrade Install

This chapter covers the following topics:

- [Guidelines for a Smooth Upgrade](#)
- [Upgrading to System Resource Version 4.2](#)
- [Post-Installation Steps](#)
- [Package Removal](#)

### Guidelines for a Smooth 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, become familiar with the following topics:

- [Software prerequisites for System Resource](#)
- [Datapipes and remote pollers](#)
- [Deleting custom table view](#)

### Software Prerequisites

System Resource has the following prerequisites:

- [OVPI 5.2](#)
- [All service packs available for OVPI 5.2](#)
- [Common Property Tables 3.6](#)

If you are running an earlier version of Common Property Tables, upgrade to Common Property Tables 3.6 by installing the upgrade package. Upgrade Common Property Tables before upgrading the System Resource Report Pack.

### Common Property Tables

If you are running an earlier version of Common Property Tables (version 3.5 or earlier), upgrade to version 3.6. Installing the upgrade package for Common Property Tables is no different from installing any other upgrade package; however, you cannot install other packages when you install this upgrade package. Install the upgrade package for Common Property Tables and *only* the upgrade package for Common Property Tables.

## 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 existing 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 OVPI 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 OVPI 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.

## Upgrading to System Resource Version 4.2

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**
- Sun: **sh /etc/init.d/ovpi\_timer stop**

- 3 If necessary, upgrade Common Property Tables by installing the 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 this upgrade package:

- *UPGRADE\_System\_Resource\_to\_41*

- 5 Install these upgrade sub-packages:

- *UPGRADE\_SR\_CPU\_to\_42*
- *UPGRADE\_SR\_DISK\_to\_43*
- *UPGRADE\_SR\_LV\_to\_43*
- *UPGRADE\_SR\_NI\_to\_43*
- *UPGRADE\_SR\_PROC\_to\_42*

- 6 Install these upgrade datapipes:

- *UPGRADE\_SR\_OVPA\_to\_31*

**or**

- *UPGRADE\_RFC1514\_to\_41*

- 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**
- Sun: **sh /etc/init.d/ovpi\_timer start**

The following is a list of the packages and datapipes and their latest versions:

<b>Package</b>	<b>Version</b>
SystemResource	4.2
SR_CPU	4.2
SR_DISK	4.3
SR_FS	4.2
SR_LV	4.3
SR_NetIf	4.3
SR_PROC	4.2
SR_OVPA datapipe	3.1
RFC1514 datapipe	4.1
OVPA_Collection_Datapipe	1.0

## 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.

## Package Removal

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**
- Sun: **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**

Sun: **sh /etc/init.d/ovpi\_timer start**



# 3 The New Install

This chapter covers the following topics:

- Guidelines for a smooth install
- Installing System Resource
- Accessing deployed reports
- Seeing performance data in reports
- Package removal

## Guidelines for a Smooth Install

An OVPI reporting solution has at least two main ingredients, a report pack and a datapipe. Some OVPI reporting solutions include multiple datapipes. When you install the datapipe, you configure OVPI to create tables and to collect a specific type of performance data at a specific interval. When you install the report pack, you configure OVPI 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, datapipes, and shared packages. 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:

- OVPI 5.2
- All service packs available for OVPI 5.2
- Common Property Tables 3.6

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 the upgrade package. Upgrade Common Property Tables *before* installing the System Resource Report Pack.

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. Installing at least one datapipe is mandatory. These are your choices:

- SR OVPA Datapipe
- RFC 1514 Datapipe (host resources MIB)
- OVPA Collection Datapipe [for agent discovery]

## Thresholding and Integration with OpenView Operations (OVO)

If you want to implement thresholding for this package, install `SystemResource_Thresholds`, a sub-package that comes with System Resource. The thresholds sub-package contains customized thresholds. Installing the thresholds sub-package configures OVPI to monitor the database for threshold conditions and respond to a breach condition by taking one of several possible actions.

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 Network Node Manager (NNM), you must configure the Thresholds Module to send breach traps to OpenView Operations for Windows (OVOW) or OpenView Operations for UNIX (OVOU). For details about the procedure for modifying category, severity, and destination parameters, refer to 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
- SystemResource\_Thresholds (optional)
- Thresholds Module (optional)

The thresholds sub-package reports exceptions on aggregated data, or hourly data, or both aggregated data and hourly data. 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**
- Sun: **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 OVPI Application Server.
- 4 Click **Next**. The Package Selection window opens. Click the check box next to:
  - *System Resource 4.2*
  - *SR\_LV sub-package 4.3* (optional)

- *SR\_PROC sub-package 4.2* (optional)
- *SR\_NetIf sub-package 4.3* (optional)
- *SR\_CPU sub-package 4.2* (optional)
- *SR\_DISK sub-package 4.3* (optional)
- Datapipes:
  - *SysRes OVPA Datapipe 3.1*
  - *OVPA Collection Datapipe 1.0*
 or
  - *SysRes RFC1514 Datapipe 4.1*
- *SystemResource\_Thresholds* (optional)

- ▶ Installing the thresholds sub-package 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**

Sun: **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 OVPI Application Server. Once reports reside on the OVPI Application Server, you can view them on the web or you can view them using the OVPI client applications.

The OVPI application clients are Report Viewer, Report Builder, and the Management Console. If the client components are not installed on your system, you must use a web browser to view reports. For more information about the OVPI application clients, see the

*OVPI 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 *OVPI 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 this will take several weeks.

## Package Removal

Uninstalling System Resource removes any datapipe that depends on System Resource. Follow these steps to uninstall System Resource from OVPI.

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to stop running.

On 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**.

On UNIX, as root, do one of the following:

- HP-UX: **sh /sbin/init.d/ovpi\_timer stop**
- Sun: **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**
- Sun: **sh /etc/init.d/ovpi\_timer start**





## 4 Data Collection

This chapter covers the following topics:

- SysRes RFC 1514 Datapipe 4.0
- OVPA Collection Datapipe 1.0
- SysRes OVPA Datapipe 3.0
- Collections performed by the sub-packages

### SysRes RFC 1514 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 OVPA or EPC performance agents
- Inserts `pa_collect` statements into the `trendtimer.sched` file
- Populates the OVPA 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 OVPA 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 OVPI. The data is placed in the `K_padasources` table.

# 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. The metrics collected for System Resource by the SysRes OVPA Datapipe come from two agents:

- HP OpenView Performance Agent (OVPA)
- Embedded Performance Component of OpenView Operations (OVOA)

OVOA, also known as EPC, ships with OVOU 7.0 and OVOW 7.0. If you are using OVOU 7.0 (or later) or OVOW 7.0 (or later), the SysRes OVPA Datapipe collects metrics from EPC. If you are using an earlier version of OVO, the SysRes OVPA Datapipe collect metrics from OVPA.

The metrics gathered by OVPA are different from the metrics gathered by EPC. For details about how the metrics vary, refer to *Metrics for HP OV 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* and 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:

- CPU
- Process
- Disk
- Logical Volume
- Network Interface

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_suptime` 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 OVPA type group will be collected for the CPU collection.

### Data Table Matrix

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

### Property Table Matrix

<b>Table/File</b>	<b>Name</b>
Property Table	K_OVPA_CPU
Teel File	prop_OVPA_CPU.teel

### History Property Table Matrix

<b>Table/File</b>	<b>Name</b>
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 OVPA to EPC agents.

<b>Metric</b>	<b>Description</b>
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 OVPA type group will be collected for the Logical Volume collection.

## Data Table Matrix

<b>Table/File</b>	<b>Name</b>
Raw Table	xSR_OVPA_LV
Rate Table	RSR_OVPA_LV
Property Table	K_OVPA_LogicalVolume
Teel File	SysResOVPA_LogicalVolume.teel

## Property Table Matrix

<b>Table/File</b>	<b>Name</b>
Property Table	K_OVPA_LogicalVolume
Teel File	prop_OVPA_LogicalVolume.teel

## History Property Table Matrix

<b>Table/File</b>	<b>Name</b>
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 OVPA agent only.

<b>Metric</b>	<b>Description</b>
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 OVPA 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 OVPA 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 OVPA type group will be collected for the Disk collection.



## Data Table Matrix.

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

## Property Table Matrix

<b>Table/File</b>	<b>Name</b>
Property Table	K_OVPA_Disk
Teel File	prop_OVPA_Disk.teel

## History Property Table Matrix

<b>Table/File</b>	<b>Name</b>
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 OVPA to EPC agents.

<b>Metric</b>	<b>Description</b>
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.
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.

<b>Metric</b>	<b>Description</b>
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

## Process Sub-Package

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

## Data Table Matrix.

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

## Property Table Matrix

<b>Table/File</b>	<b>Name</b>
Property Table	K_ProcOVPA_proc
Teel File	prop_ProcOVPA_proc.teel

## History Property Table Matrix

<b>Table/File</b>	<b>Name</b>
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 OVPA agent.

<b>Metric</b>	<b>Description</b>
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



# 5 Setting Up a Distributed System

This chapter covers the following topics:

- Installing System Resource on multiple servers
- Central server configuration
- Satellite server configuration
- System clocks

## 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 per-server is the same.

Central Server	Satellite Server
System Resource 4.2	System Resource 4.2
SystemResource_Thresholds	SystemResource_Thresholds
Thresholds Module 5.1	Thresholds Module 5.1
Common Property Tables 3.6	Common Property Tables 3.6
	SysRes RFC1514 Datapipe 4.1
	SysRes OVPA Datapipe 3.1
	OVPA Collection Datapipe 1.0

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.

## 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 OVPI 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: 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 OVPI Databases folder and select the central server.
- 4 Click **LIR Configuration**.
- 5 Select the **LIR enabled** check box.

#### Task 3: 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 OVPI 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 Volume
  - Process
  - Network Interface
  - CPU
  - Disk



- 12 If you have more than one satellite server, click **Add to list** 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 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 OVPI 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\_volume.pro

All six process files are found here:

```
{DPIPE_HOME}/scripts/
```

where `{DPIPE_HOME}` is the directory in which OVPI is installed.

In each file, find and comment out the following lines:

```
begin:block 1 wait
end:
```

# 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 OVPI 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_volume.pro`

The files are located here:

```
{DPIPE_HOME}/scripts/
```

where `{DPIPE_HOME}` is the directory in which OVPI is installed.

Make the following changes:

- Find and comment out the following lines:

```
begin:block2 wait
end:block2
```

- Find and uncomment the following lines:

```
begin:block3 wait
end:block3
```

## 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 Archiving Data

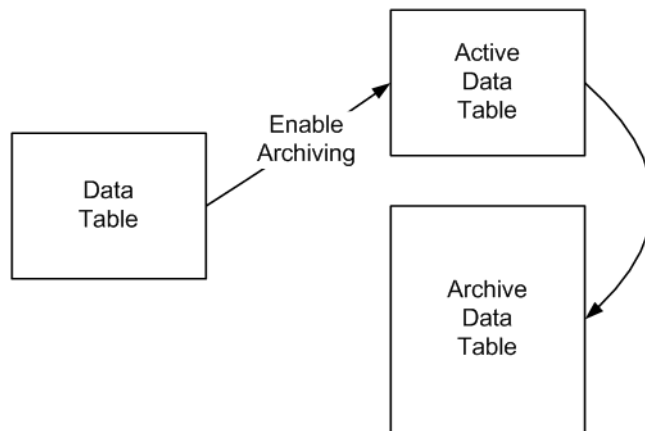
This chapter covers the following topics:

- Data Archiving
- Viewing Current Retention Profiles List
- Enabling Archiving
- Creating a Custom Retention Profile
- Viewing Archive Data Reports

## Data Archiving

The data archiving feature allows you to store large amounts of data in archive tables without affecting the summarization and reporting performance of OVPI.

By default, archiving is disabled. When archiving is enabled, a data table becomes an active data table. Data is retained in the active table for a specified amount of time (defined in the retention profile) before it is moved to an archive table. An active table can archive data to one and only one archive table.



Data from an active table and data from an archive table cannot be displayed in the same report.

When you installed the report pack, a retention profile was created for each data table (using information from the TEEL file). The retention profile defines the name and description of the retention profile, how long (in days) data remains in the active data table, how long (in days) data remains in the archive table, and if archiving is enabled. You enable archiving of a data table by modifying its retention profile. A retention profile can be assigned to more than one data table, but a data table can only have one retention profile assigned to it.

For more detailed information about data archiving, refer to the *HP OpenView Performance Insight Administration Guide*.

## Viewing Current Retention Profiles List

To view all retention profiles:

- 1 Start the Management Console (log on with Administrator privileges).
- 2 Click the **Tables** icon in the navigation pane to display the Table Manager navigation pane.
- 3 Select **File->Retention Profiles->Manage Retention Profiles**. The Manage Retention Profiles dialog displays the current retention profiles list. You can create, modify, and remove retention profiles from the Manage Retention Profiles dialog.



You cannot modify the default profiles created during the product installation, remove a default profile, nor remove a profile that is in use.

## Enabling Archiving

To enable archiving, either select a data table to modify its retention profile or modify a retention profile. A table has archiving enabled if the `Archive On` check box is selected in the Table Manager navigation pane.

### Selecting a Data Table to Modify

To modify the retention profile of a selected table, do the following:

- 1 From the Management Console, click the **Tables** icon in the navigation pane to display the Table Manager navigation pane.
- 2 In the Table Manager navigation pane, double-click a table. The Data Table Details dialog displays.
- 3 Select the **Retention Profile** tab.
- 4 Modify any of the fields in the dialog.
- 5 Select the **Archive On** check box.
- 6 Click **OK**.

### Modifying the Retention Profile

To modify a retention table, do the following:



You cannot modify the default retention profiles created during the report pack installation.

- 1 From the Management Console, click the **Tables** icon in the navigation pane.
- 2 Select **File->Retention Profiles->Manage Retention Profiles**. The Manage Retention Profiles dialog displays.
- 3 Select the retention profile to modify and click **Edit**.
- 4 Modify any of the fields in the dialog.
- 5 Select **Yes** in the Enable Archiving field.
- 6 Click **OK**.

## Creating a Custom Retention Profile

To create a custom retention profile and assign it to a active data table, do the following:

- 1 From the Management Console, click the **Tables** icon in the navigation pane.
- 2 Select **File->Retention Profiles->Manage Retention Profiles**. The Manage Retention Profiles dialog displays.
- 3 Click **Create**. The Create Retention Profile dialog displays.
- 4 Enter the following information:

Field	Description
Profile Name	The name of the retention profile. Maximum length is 64 characters.
Retention Days	The number of days to retain data in the active data table before moving the data to the archive data table. Select Yes for the permanently field if you want to retain all data in the active data table (do not move any data to the archive data table).
Archive Retention Days	The number of days to retain data in the archive data table before the data is removed. Select Yes for the permanently field if you want to retain all data in the archive data table (do not remove any data from the archive data table).
Description	A description of the retention profile. Maximum length is 255 characters.
Enable Archiving?	Default: No. Select Yes to enable archiving and create the active and archive data tables.

- 5 Click **OK**.
- 6 Assign the custom retention profile to a table:
  - a From the Management Console, click the **Tables** icon in the navigation pane.
  - b To filter the tables listed, you can select a specific category (such as System\_Resource) and/or a specific type (such as Rate) from the pull down lists above the list of tables.
  - c Select the table(s) to which you want to assign the retention profile
  - d Select **File->Retention Profiles->Assign Retention Profile**. The View Retention Profiles dialog displays.
  - e Select the retention profile you created.
  - f Click **Assign Retention Profile**.

## Viewing Archive Data Reports

Archive data reports are viewable anywhere active data reports are viewable (archiving must be enabled and there must be data in the archive data tables before you can view archive data reports). From the Web Access Server, the reports are available in the Archive folder.



Data from an active table and data from an archive table cannot be displayed in the same report.



# 7 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 (including multiple threshold settings)
  - Update filesystem properties (including one threshold setting)

## Default Settings for Thresholds

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

<b>Metric</b>	<b>Default Threshold</b>	<b>Severity</b>
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 OVPI takes in response to an exception condition, configure the Thresholds Module. For details, see the *Thresholds Module 5.0 User Guide*.

## Change Forms

The system and filesystem objects maintained for System Resource 4.1 can be modified using two change forms. 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.

## Update System Properties

To launch the Update System Properties 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, **Update <Object Type> Information** will appear under **Object Specific Tasks**. Double-click the update task to open Update System Properties, shown below.

The screenshot shows a web browser window with the URL `/admin/SystemResourceForms/update_system.frep`. The page title is "System Resources" and the main heading is "Update System Properties". The HP logo is visible in the top right corner. Below the heading, there is a brief instruction: "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." The form contains several input fields:

- Device Name:** ultra
- Maximum Processes:** 1,034.00
- Memory Size:** 655,360.00
- Description:** (empty)
- Customer Name:** Customer Unassigned
- Location Name:** Location Unassigned

Below these fields is a section titled "System Threshold Limits" with the subtext "The level where exceptions are recorded and threshold events may be generated." This section contains five input fields:


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

At the bottom of the form are three buttons: "OK", "Apply", and "Cancel".

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.

## 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.

**System Resources**  **Update Filesystem Properties** invent

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

<b>Device Name</b>	<input type="text" value="ultra"/>
<b>Mount Point</b>	<input type="text" value="/"/>
<b>Remote Mount Point</b>	<input type="text"/>
<b>Last Full Backup</b>	<input type="text" value="0000 0000 0001 0001 0000 0000 0000 0000"/>
<b>Last Partial Backup</b>	<input type="text" value="0000 0000 0001 0001 0000 0000 0000 0000"/>
<b>Type</b>	<input type="text" value="1.3.6.1.2.1.25.3.9.3"/>
<b>Customer Name</b>	<input type="text" value="Customer Unassigned"/>
<b>Location Name</b>	<input type="text" value="Location Unassigned"/>

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

<b>Utilization Threshold %</b>	<input type="text" value="70.00"/>
--------------------------------	------------------------------------

## 8 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.

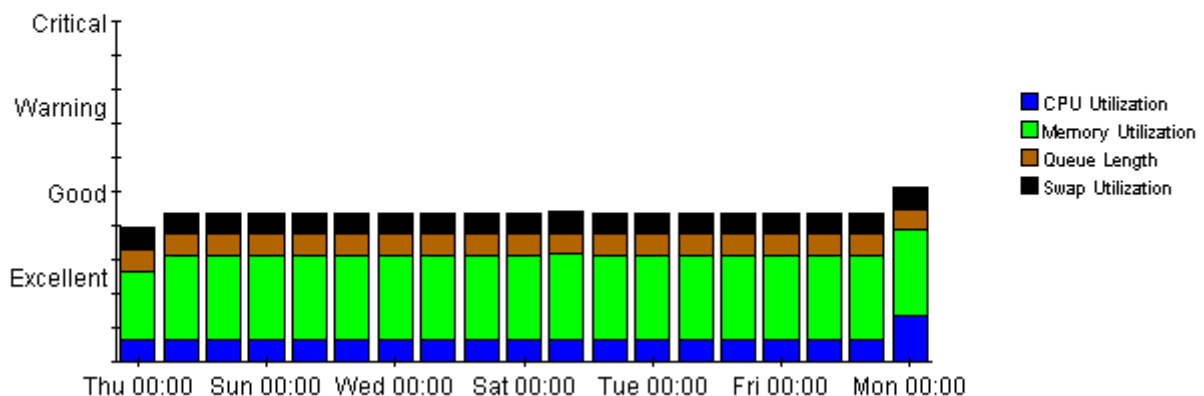
### Overutilized Filesystems Projected to Exceed 90% Utilization within 90 Days

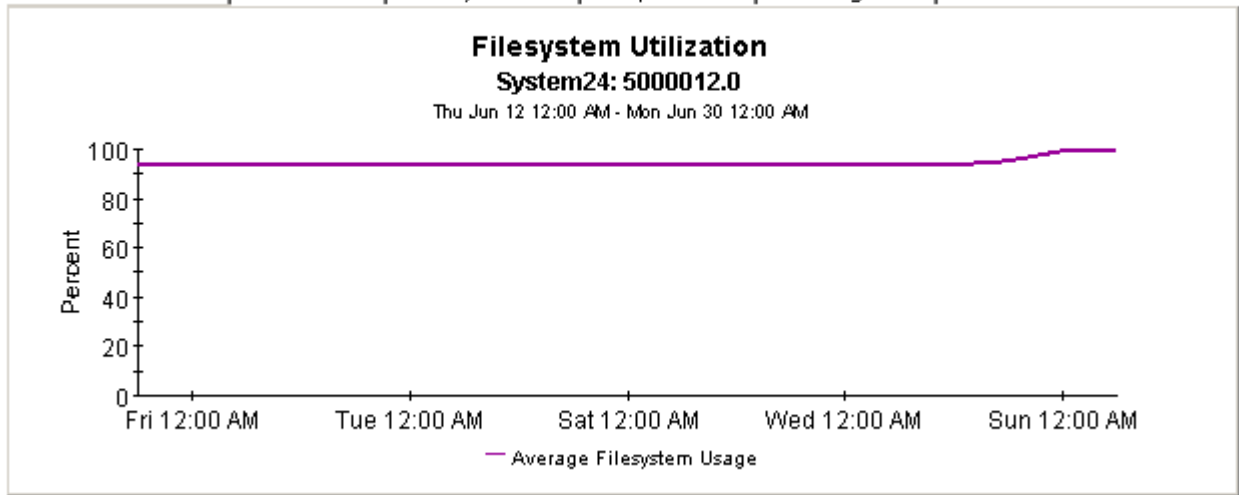
System	Filesystem	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
System4	/usr	94.62	94.62	94.63	94.63
System24	/	94.23	103.90	111.17	118.44
System1	/export/home3	90.62	92.45	93.70	94.96
System1	/export/home4	89.30	97.03	102.21	107.40
System4	/var	50.86	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





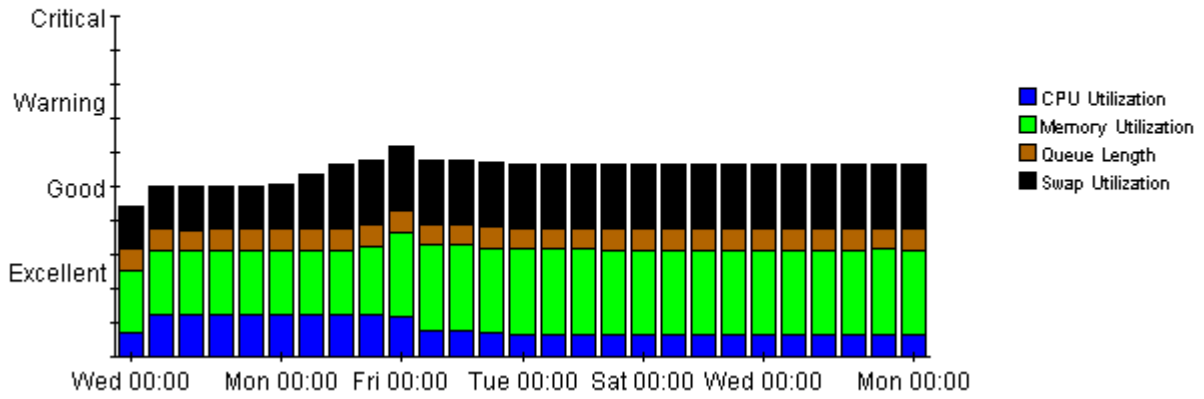
**Underutilized Filesystems**  
Projected to be Utilized Less than 30% within 90 Days

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

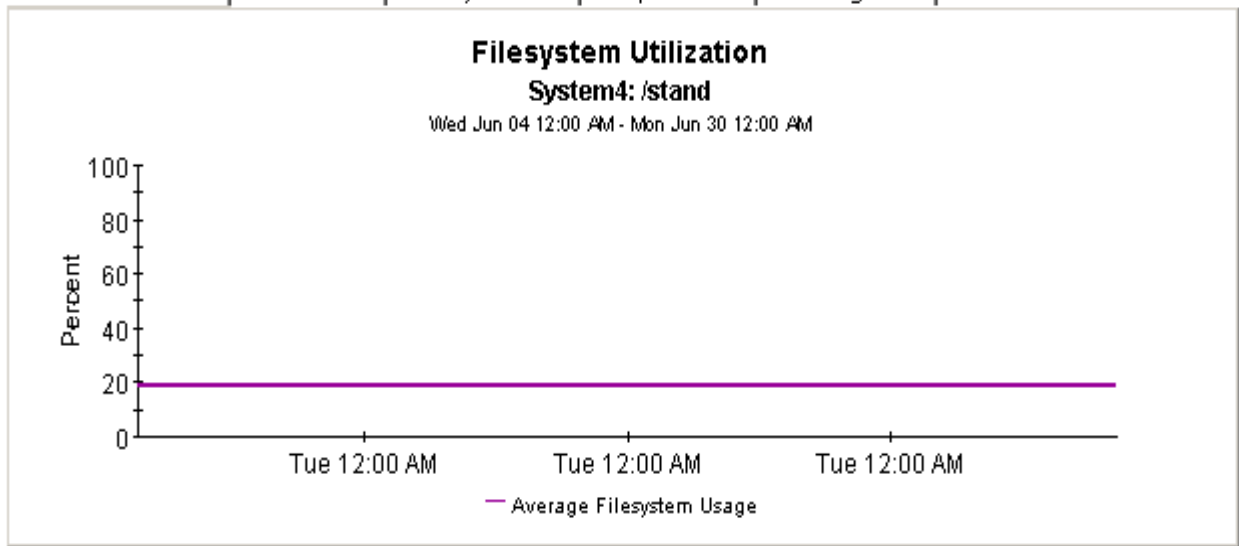
Vendor	Model	O/S	Customer	Location	Filesystem Threshold
Hewlett Packard	9000/893	HP-UX B.11.11 U	Customer Unassigned	Location Unassigned	70.00

### Grade of Service (GOS) System4

Wed Jun 04 2003 - Mon Jun 30 2003



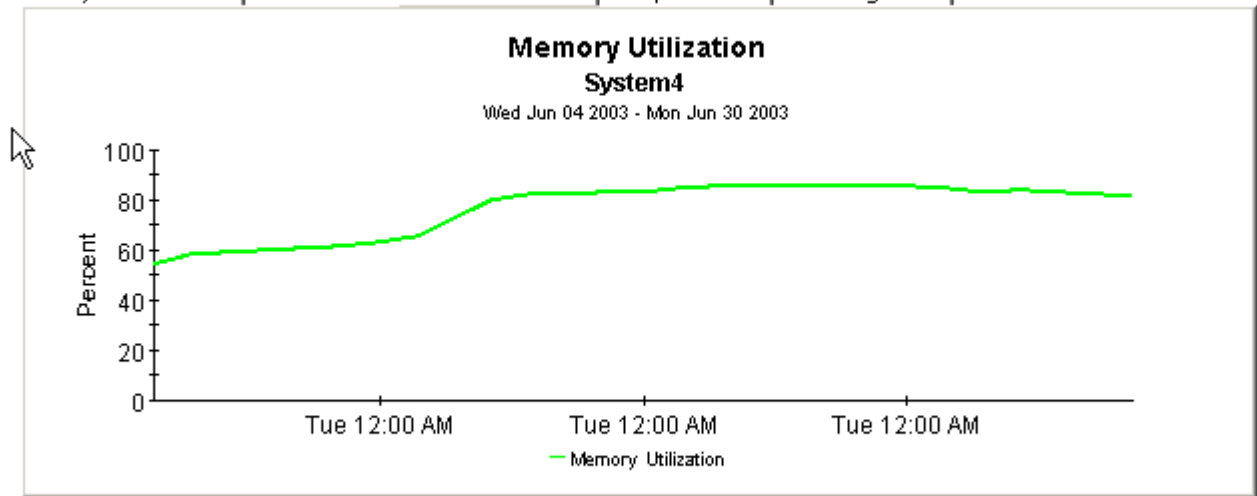
Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs



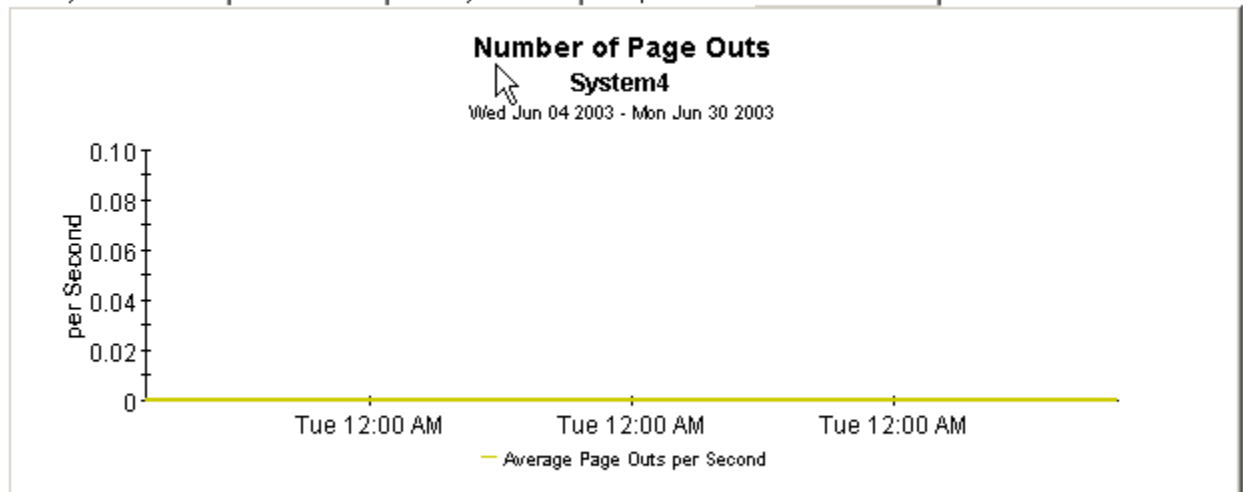
continues on next page



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



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



# 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.

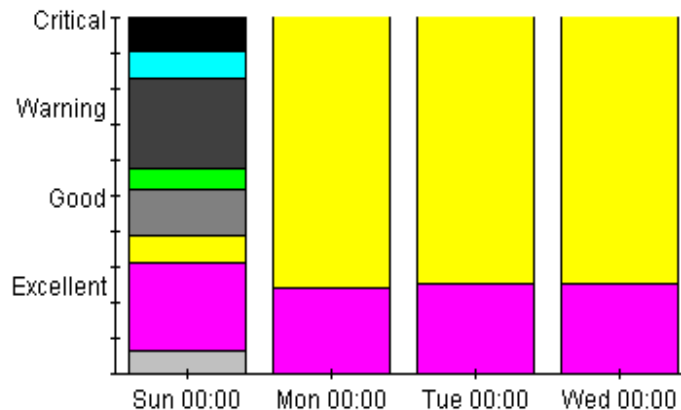
### Overutilized System Memory Projected to Exceed 90% Utilization within 90 Days

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
hpfcjm.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

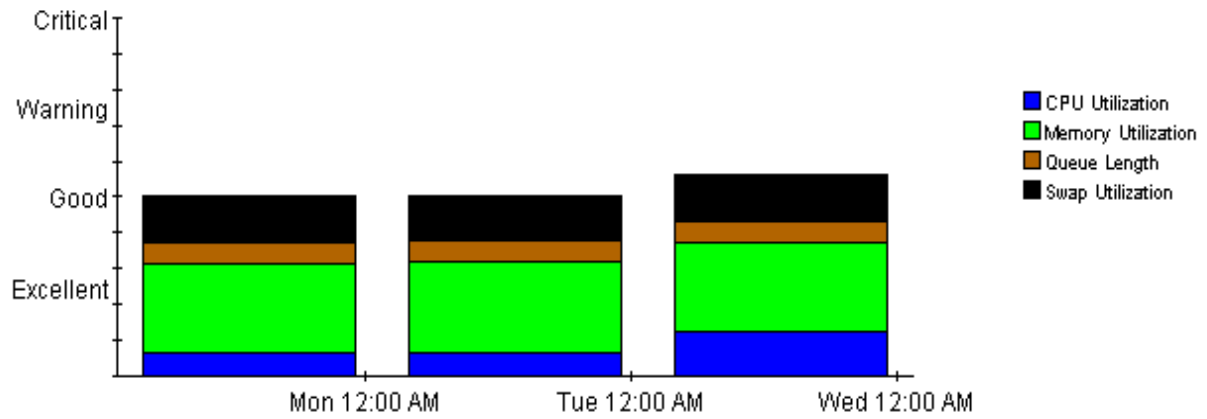


- CPU Utilization: 15.70.186.76: All
- Memory Utilization: 15.70.186.76: All
- Queue Length: 15.70.186.76: All
- Swap Utilization: 15.70.186.76: All
- CPU Utilization: tthp166.cnd.hp.com: All
- Memory Utilization: tthp166.cnd.hp.com: All
- Queue Length: tthp166.cnd.hp.com: All
- Swap Utilization: tthp166.cnd.hp.com: 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

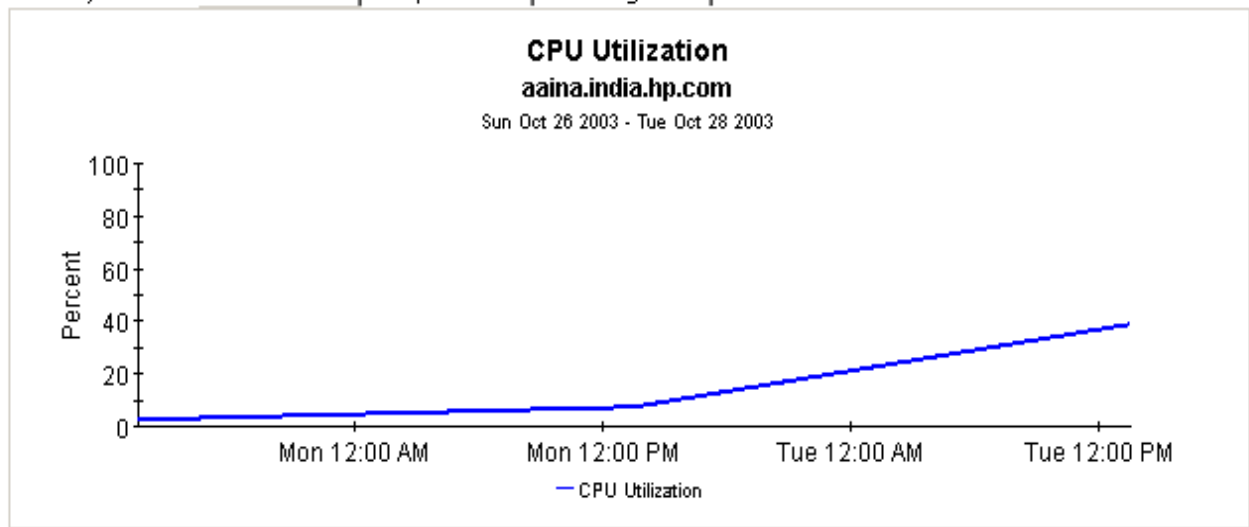
### Grade of Service (GOS)

aaina.india.hp.com

Sun Oct 26 2003 - Tue Oct 28 2003



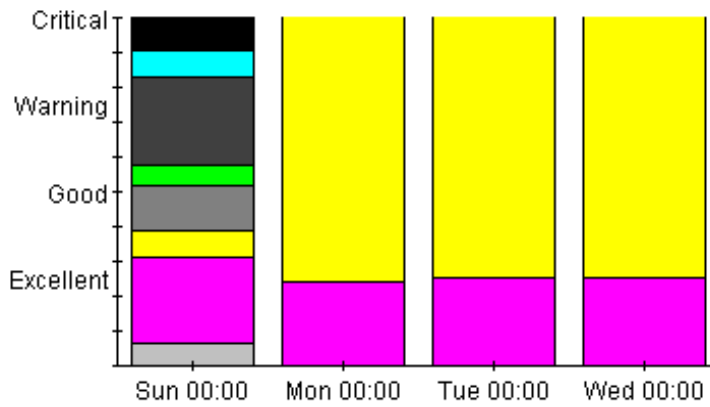
Memory Utilization | CPU Utilization | Swap Utilization | No of Page Outs



### Grade of Service (GOS)

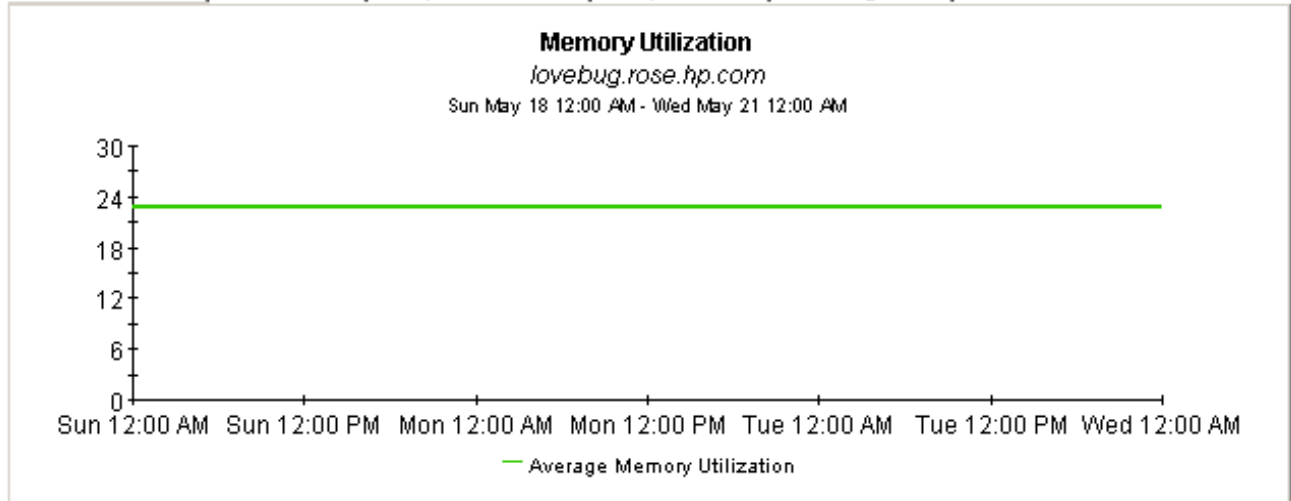
lovebug.rose.hp.com

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



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## 9 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.

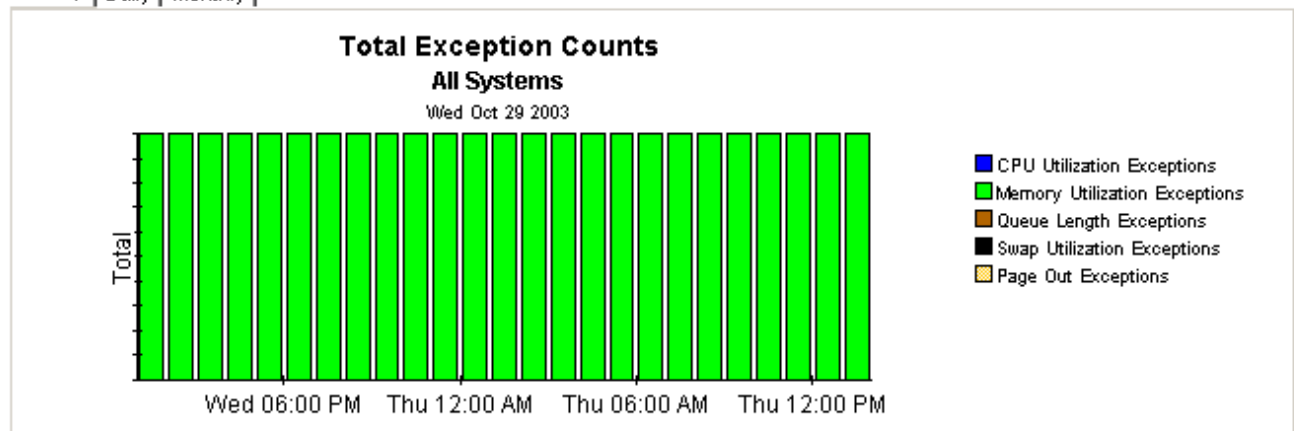
### Customers Wed Oct 29 2003

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

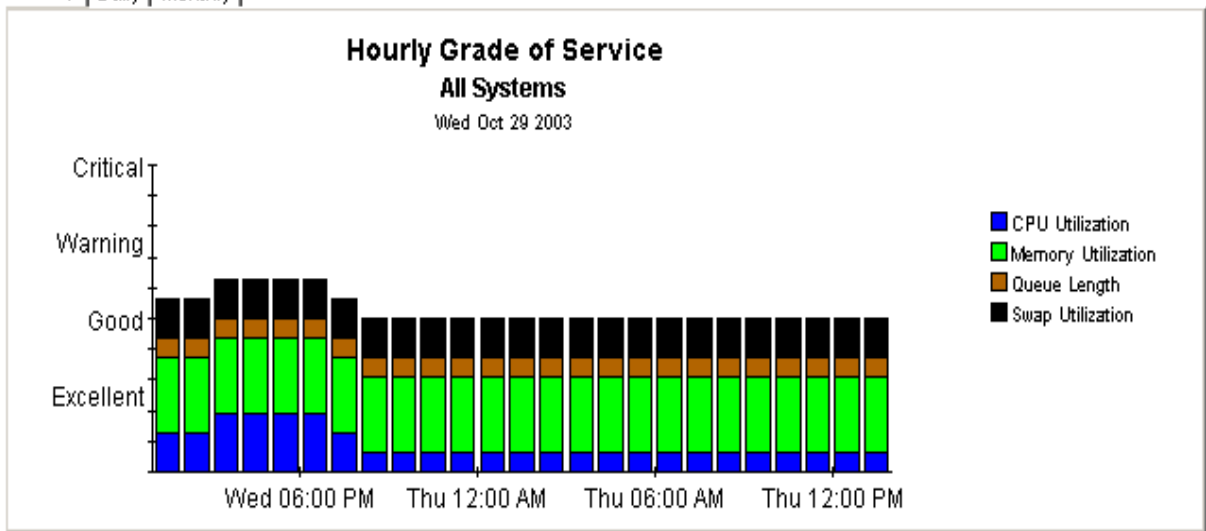
### Locations Wed Oct 29 2003

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



Hourly | Daily | Monthly







# 10 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

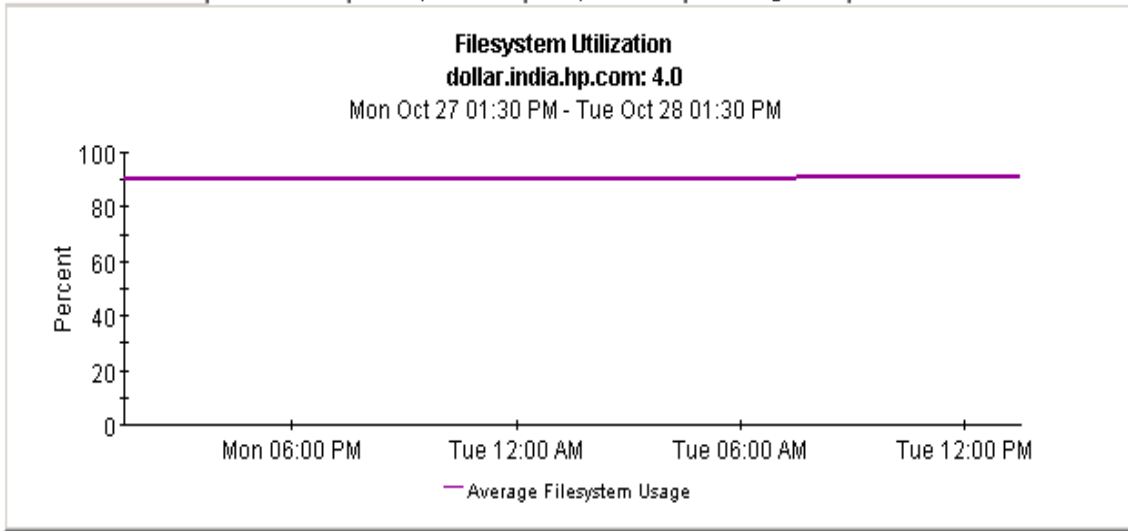
System	Filesystem	DTT Utilization	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
dollar.india.hp.com	/home	0	90.60	120.61	149.87	179.14

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





# 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.

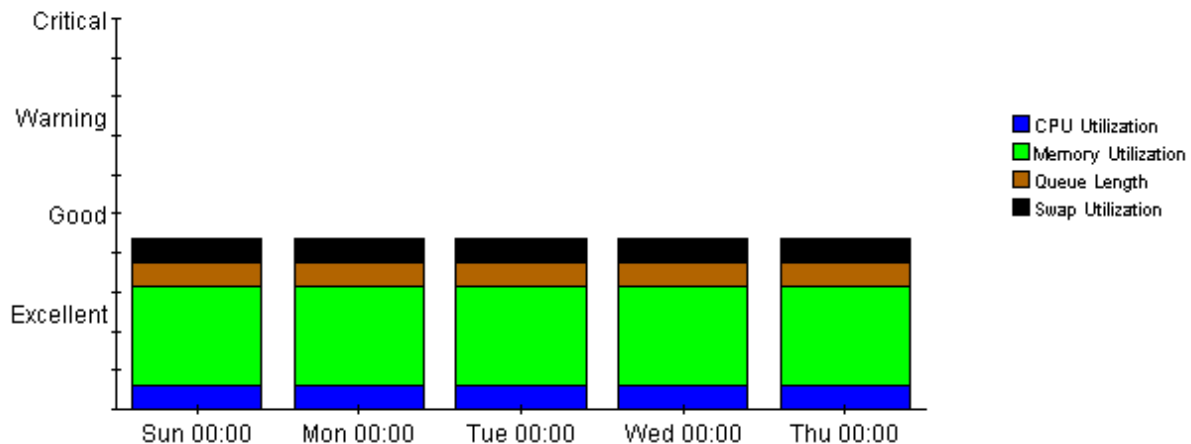
### Estimated Days to Threshold (DTT) Systems Projected to be within 90 Days of 100% Utilization

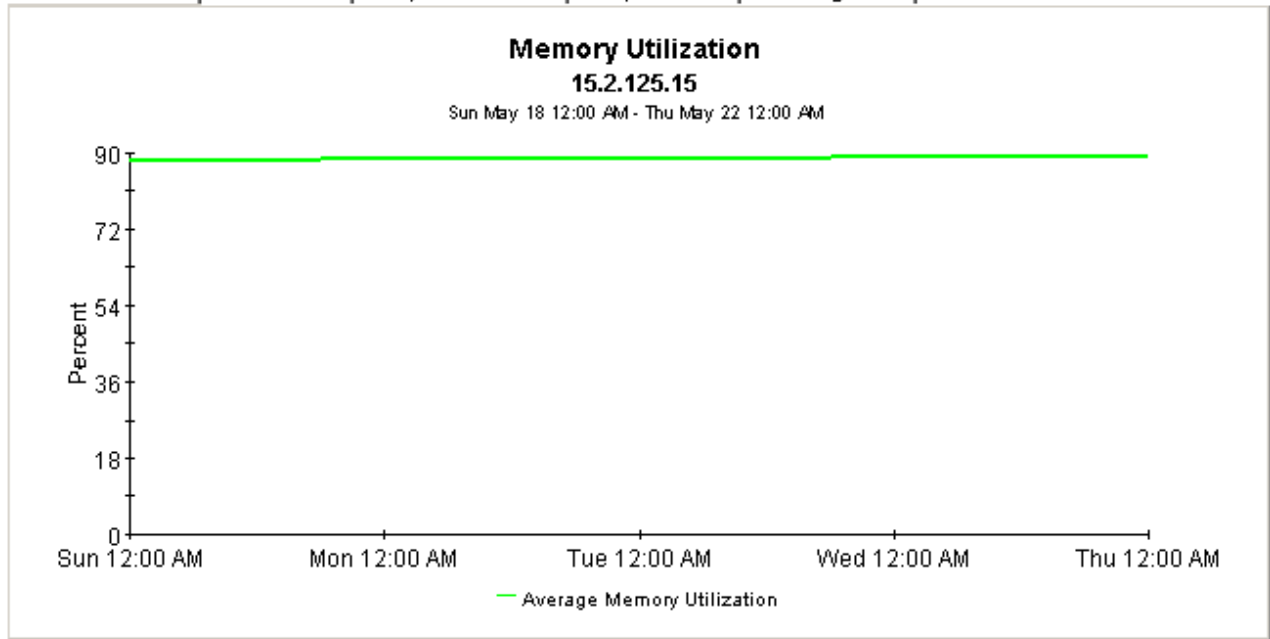
System	DTT Utilization	Current Utilization	Projected Utilization 90
15.2.125.15	12.00	90.32	156.74
biotite.cnd.hp.com	60.00	74.22	113.05
hpcb.rose.hp.com	57.00	65.38	119.65
tshp39.cnd.hp.com	32.00	79.49	135.06
gorilla.cnd.hp.com	6.00	50.83	650.40
hpfcjim.cnd.hp.com	29.00	54.17	194.47
solcent	53.00	82.79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





# 11 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

<b>Vendor</b> Cisco	<b>Model</b> Unassigned	<b>O/S</b>	<b>Location</b> Location Unassigned	<b>Customer</b> Customer Unassigned
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<b>CPU Utilization Threshold</b> 80.00	<b>Memory Utilization Threshold</b> 70.00	<b>Swap Utilization Threshold</b> 70.00	<b>Run Queue Threshold</b> 3.00	<b>Pageout Threshold</b> 5.00
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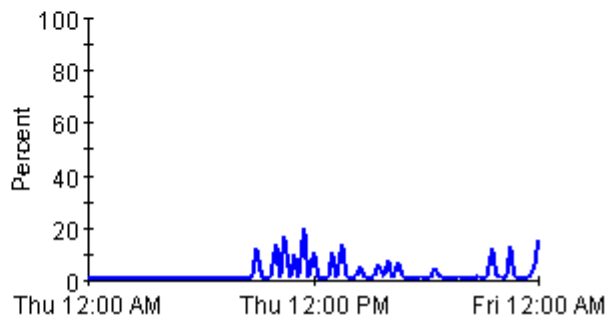
#### Run Queue solcent

Thu May 22 12:00 AM - Fri May 23 12:00 AM

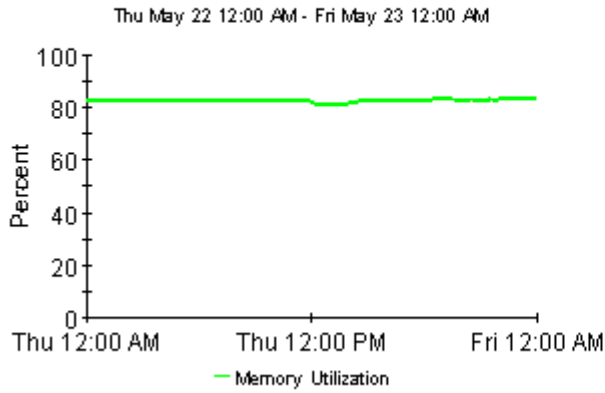


#### CPU Utilization solcent

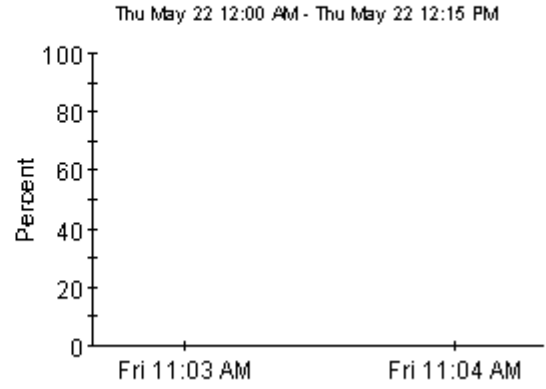
Thu May 22 12:00 AM - Fri May 23 12:00 AM



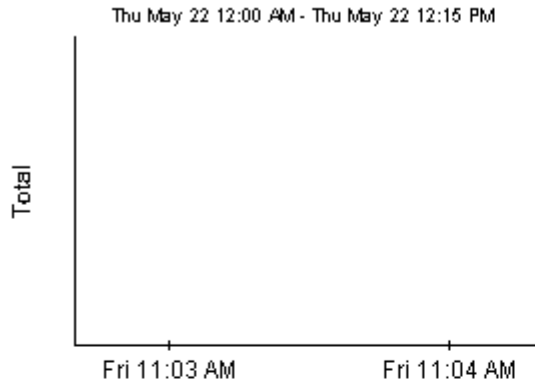
### Memory Utilization solcent



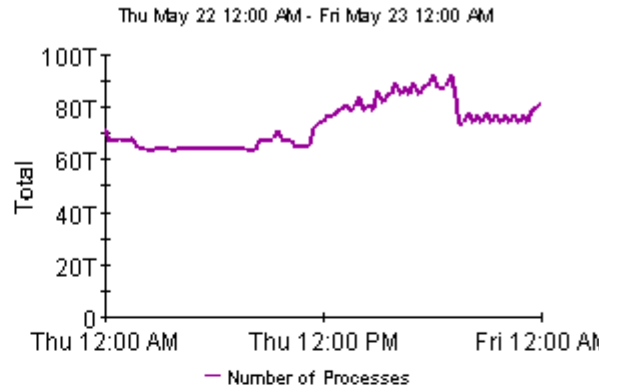
### Swap Utilization solcent



### Page Outs per Second solcent



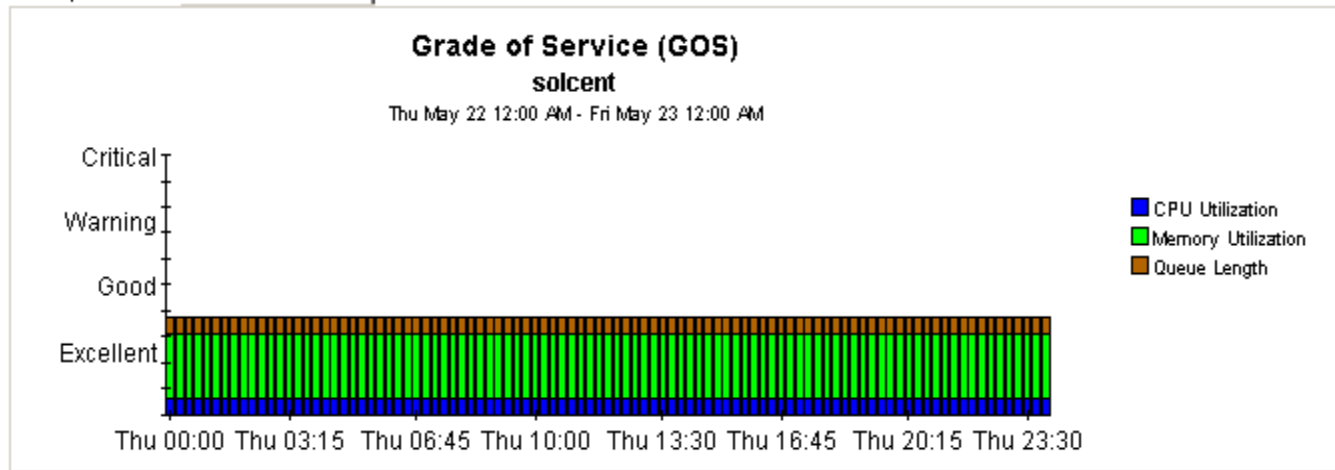
### Number of Processes solcent



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	



# System Resource Quickview



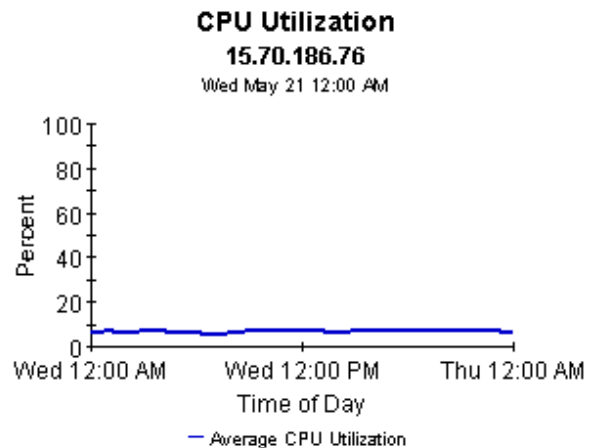
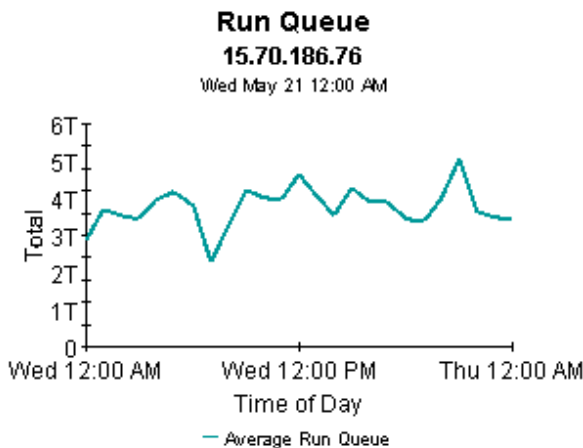
The System Resource QuickView Report gives the system management staff a detailed look at the performance of individual systems. Select a system from the top chart to display detailed information for that system.

## 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

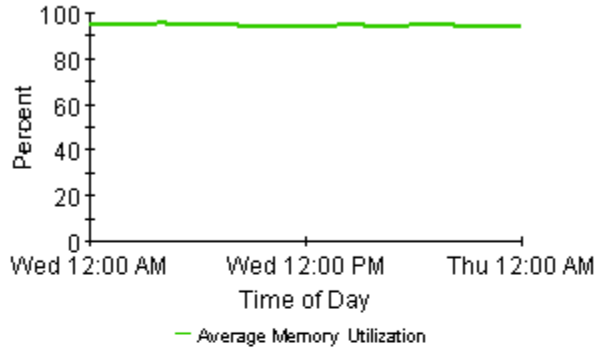
Run Queue Threshold	CPU Utilization Threshold	Memory Utilization Threshold	Swap Utilization Threshold	Pageout Threshold
3.00	80.00	70.00	70.00	5.00



### Memory Utilization

15.70.186.76

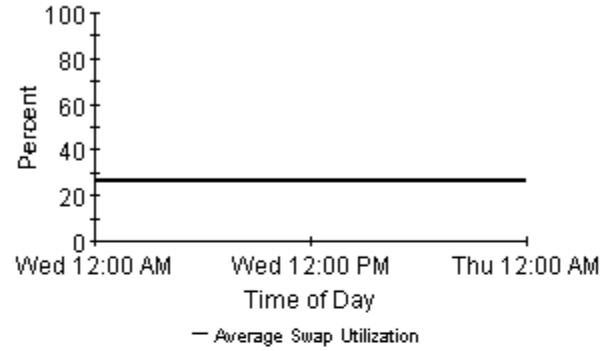
Wed May 21 12:00 AM



### Swap Utilization

15.70.186.76

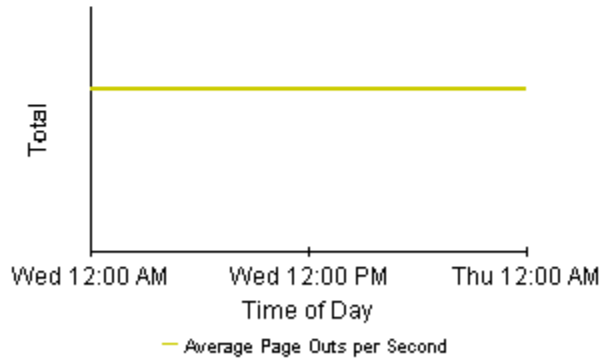
Wed May 21 12:00 AM



### Number of Page Outs

15.70.186.76

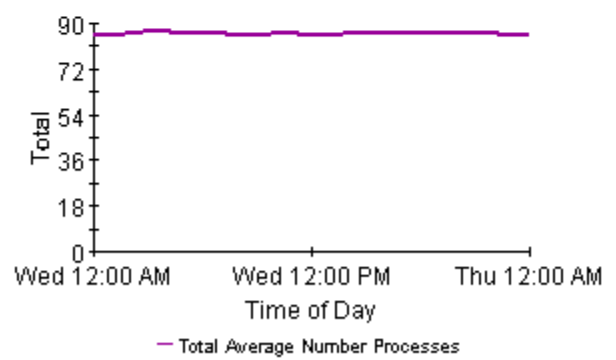
Wed May 21 12:00 AM



### 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.

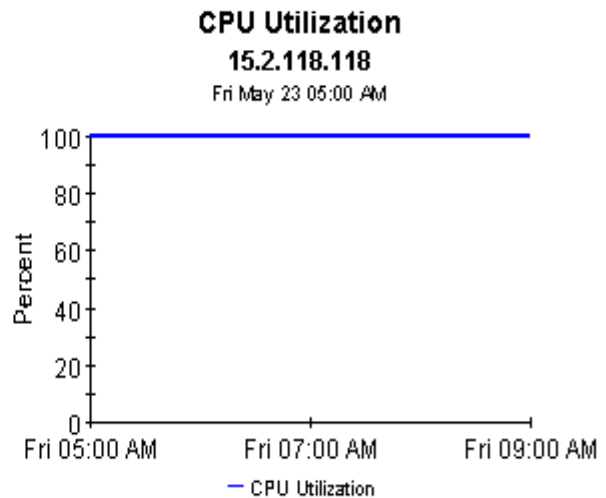
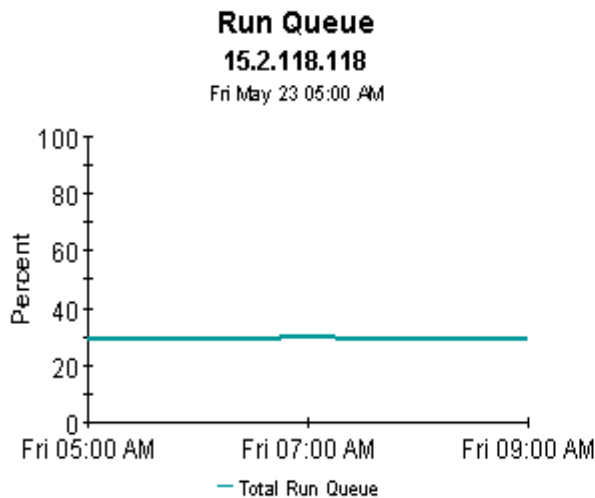
### System Selection List

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:** Hewlett-Packard     
**Model:** Unassigned     
**O/S:**     
**Location:** Location Unassigned     
**Customer:** Customer Unassigned

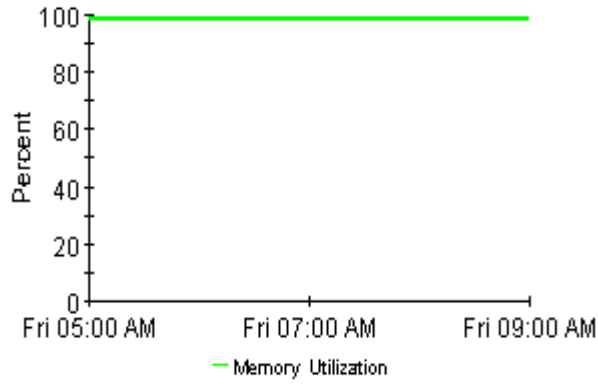
**Run Queue Threshold:** 3.00     
**CPU Utilization Threshold:** 80.00     
**Memory Utilization Threshold:** 70.00     
**Swap Utilization Threshold:** 70.00     
**Pageout Threshold:** 5.00



### Memory Utilization

15.2.118.118

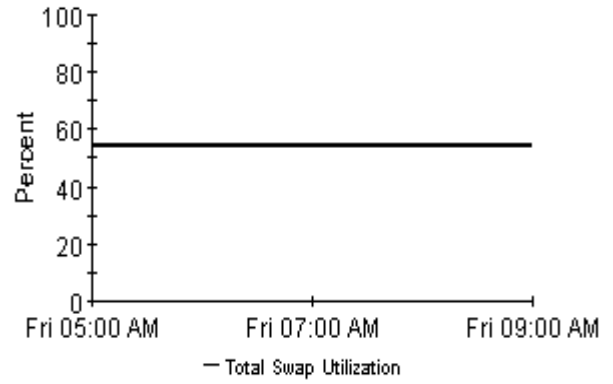
Fri May 23 05:00 AM



### Swap Utilization

15.2.118.118

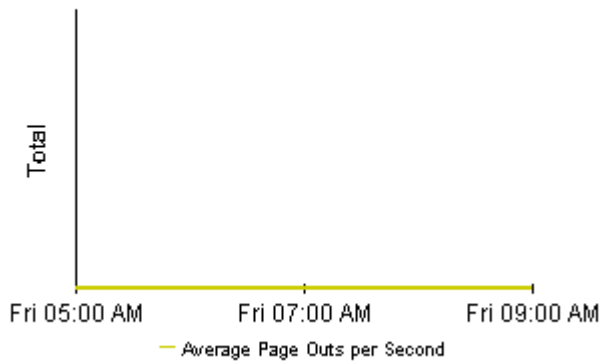
Fri May 23 05:00 AM



### Number of Page Outs

15.2.118.118

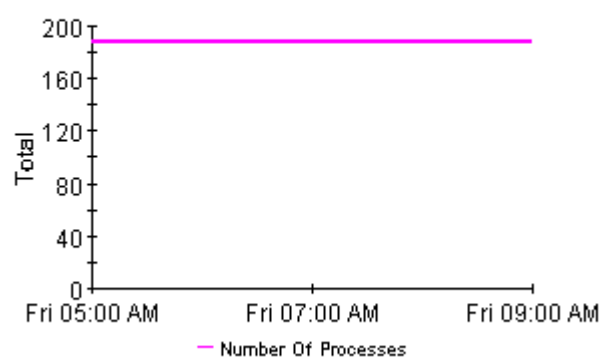
Fri May 23 05:00 AM



### Number of Processes

15.2.118.118

Fri May 23 05:00 AM



# 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.

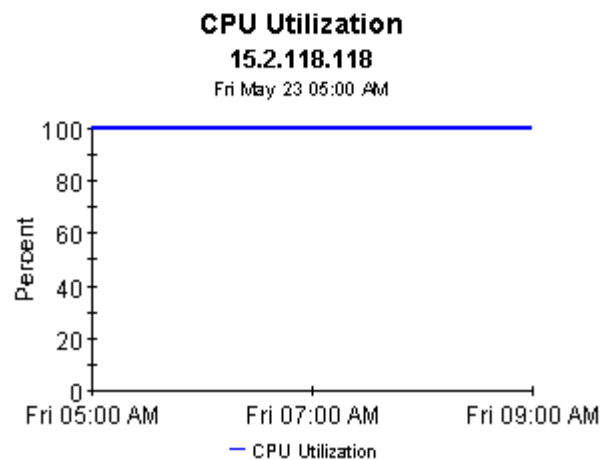
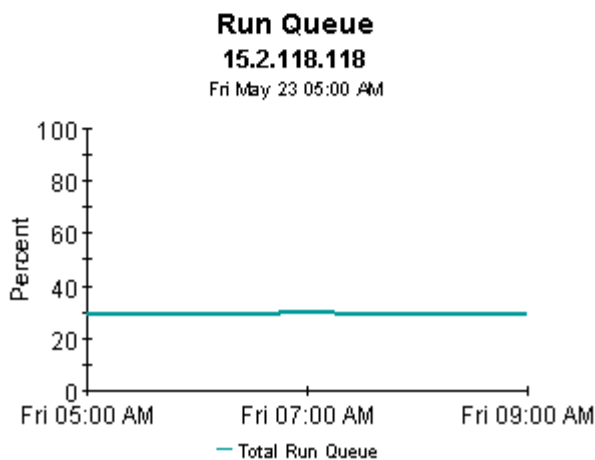
### System Selection List

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

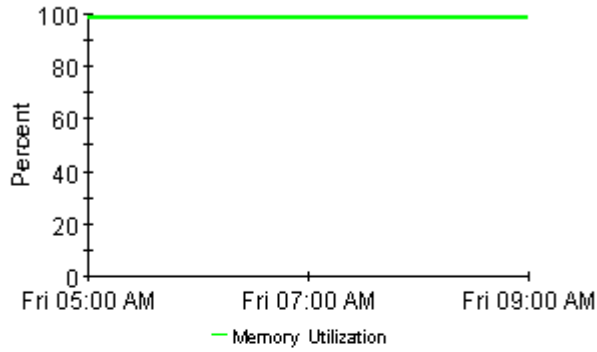




### Memory Utilization

15.2.118.118

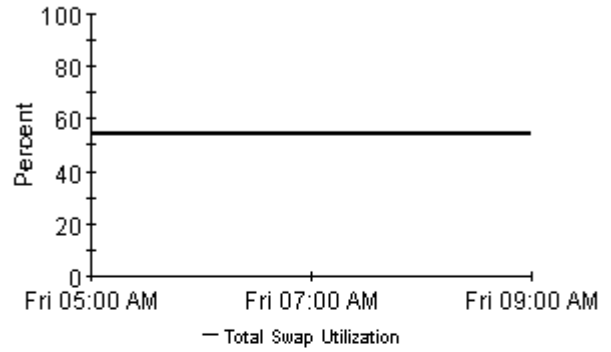
Fri May 23 05:00 AM



### Swap Utilization

15.2.118.118

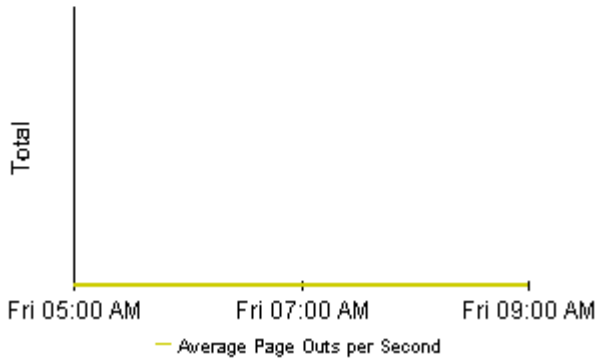
Fri May 23 05:00 AM



### Number of Page Outs

15.2.118.118

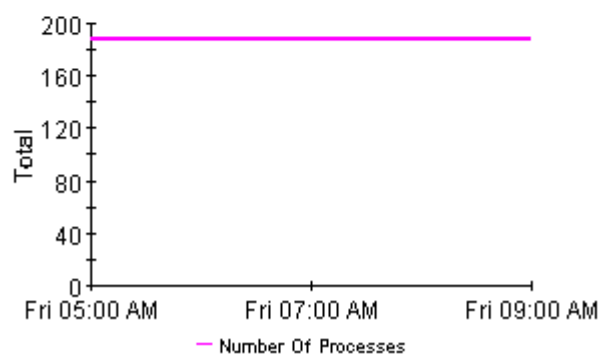
Fri May 23 05:00 AM



### Number of Processes

15.2.118.118

Fri May 23 05:00 AM





# 12 Top Ten Reports

System Resource 4.1 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	Location
surya.india.hp.com	22,551,950.00	22,559,202.00	2,267.71		Customer Unassigned	Location Unassigned
aaina.india.hp.com	6,442,713.00	9,018,749.00	428.95		Customer Unassigned	Location Unassigned
dollar.india.hp.com	1,131,713.00	998,315.00	1.77		Customer Unassigned	Location Unassigned



### Systems with Highest CPU Utilization Tue Oct 28 2003

System	Average CPU Utilization	Average Queue Length	Customer	Location	Make	Model
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 Pack
dollar.india.hp.com	87.82	/	Customer Unassigned	Location Unassigned	Hewlett Pack
surya.india.hp.com	81.77	lvm swap device	Customer Unassigned	Location Unassigned	Hewlett Pack
dollar.india.hp.com	51.00	/ClearCase	Customer Unassigned	Location Unassigned	Hewlett Pack
surya.india.hp.com	44.22	/ClearCase/vobs2	Customer Unassigned	Location Unassigned	Hewlett Pack
dollar.india.hp.com	43.82	/tmp	Customer Unassigned	Location Unassigned	Hewlett Pack
surya.india.hp.com	42.30	/	Customer Unassigned	Location Unassigned	Hewlett Pack
surya.india.hp.com	31.84	/stand	Customer Unassigned	Location Unassigned	Hewlett Pack
dollar.india.hp.com	23.58	/stand	Customer Unassigned	Location Unassigned	Hewlett Pack





# A Version History

The following table describes this history of enhancements to the System Resource Report Pack, beginning with version 3.0.

<b>Version</b>	<b>Release Date</b>	<b>Features/Enhancements</b>
3.0	May 2003	OVPI Object Manager support <i>new change forms:</i> <ul style="list-style-type: none"><li>• Update System</li><li>• Update Filesystem</li></ul> <i>new datapipe:</i> <ul style="list-style-type: none"><li>• SysRes OVPA Datapipe 1.0</li></ul>
3.0	October 2003	<i>new datapipe:</i> SysRes OVPA Datapipe 2.0
4.0	April 2004	Oracle support <i>new reports:</i> <ul style="list-style-type: none"><li>• CPU Resource Utilization Forecast</li><li>• CPU Performance QuickView</li><li>• Disk Details QuickView</li><li>• Logical Volume Details QuickView</li><li>• Network Interface Details QuickView</li><li>• Process Details QuickView</li><li>• Top Ten Transactions</li><li>• Transactions per System Snapshot</li><li>• System Availability (downtime/uptime)</li><li>• System Inventory</li><li>• Systems Performing Each Application/Snapshot</li></ul>
4.0	April 2004	<i>changes to existing reports:</i> <ol style="list-style-type: none"><li>1. SLM—Executive Summary Report<ul style="list-style-type: none"><li>• Customer selection table: added Total Exceptions</li><li>• Location table: removed Total Vol + Avg Daily Volume</li><li>• Total Exceptions graph: added daily and monthly tabs</li><li>• Total Exceptions graph: removed references to volume</li></ul></li><li>2. System Volume and CPU Utilization Top Ten Report<ul style="list-style-type: none"><li>• Highest CPU table: added Queue Length</li><li>• Highest Volume table: added Total Network Util</li></ul></li></ol>

<b>Version</b>	<b>Release Date</b>	<b>Features/Enhancements</b>
4.0	April 2004	3. Memory Resource Optimization Report <ul style="list-style-type: none"> <li>• Overutilized Sys Memory table: added Avg Page Outs</li> </ul> 4. CPU Forecast Report <ul style="list-style-type: none"> <li>• DTT selection table: added 30 and 60 day forecast</li> </ul> 5. Memory Forecast Report <ul style="list-style-type: none"> <li>• DTT selection table: added 30 and 60 day forecast</li> </ul> 6. Filesystem Forecast Report <ul style="list-style-type: none"> <li>• DTT selection table: added 30 and 60 day forecast</li> </ul>
4.0	August 2004	<i>new upgrade packages:</i> <ul style="list-style-type: none"> <li>• UPGRADE_SR_3.0_to_4.0.ap</li> <li>• UPGRADE_SR_CPU_1.0_to_1.5.ap</li> <li>• UPGRADE_SR_DISK_1.0_to_1.5.ap</li> <li>• UPGRADE_SR_PROC_1.0_to_1.5.ap</li> <li>• UPGRADE_SR_NetIf_1.0_to_1.5.ap</li> <li>• UPGRADE_SR_LV_1.0_to_1.5.ap</li> </ul>
4.0	November 2004	<i>new datapipe:</i> <ul style="list-style-type: none"> <li>• OVPA Collection Datapipe 1.0</li> <li>• SysRes OVPA Datapipe 2.6</li> </ul>
4.1	June 2005	Report linking Launch Point page Ad hoc selector reports Color-coded graphics in selection tables <i>new upgrade packages:</i> <ul style="list-style-type: none"> <li>• UPGRADE_SR_to_4.1</li> <li>• UPGRADE_SR_CPU_to_4.1</li> <li>• UPGRADE_SR_DISK_to_4.1</li> <li>• UPGRADE_SR_PROC_to_4.1</li> <li>• UPGRADE_SR_NetIf_to_4.1</li> <li>• UPGRADE_SR_LV_to_4.1</li> </ul> <i>new datapipe:</i> <ul style="list-style-type: none"> <li>• SysRes OVPA Datapipe 2.8</li> </ul>
4.1	May 2006	<i>sub-packages with new version numbers:</i> <ul style="list-style-type: none"> <li>• SR_DISK 4.2</li> <li>• SR_LV 4.2</li> <li>• SR_NetIf 4.2</li> </ul> <i>upgrade packages and defect fixes:</i> <ul style="list-style-type: none"> <li>• UPGRADE_SR_LV_to_4.2               <ul style="list-style-type: none"> <li>— QXCR1000329115: defective view (RSRV_OVPA_LOGICALVOLUME)</li> </ul> </li> <li>• UPGRADE_SR_DISK_to_4.2               <ul style="list-style-type: none"> <li>— QXCR1000239305: size of prop_disk_name column changed from 32 to 255</li> </ul> </li> </ul>



Version	Release Date	Features/Enhancements
4.1	May 2006	<ul style="list-style-type: none"> <li>• UPGRADE_SR_NetIf_to_4.2 <ul style="list-style-type: none"> <li>— QXCR1000235473: size of prop_netif_name column changed from 32 to 255</li> </ul> </li> </ul> <p><i>datapipe defect fix:</i></p> <ul style="list-style-type: none"> <li>• SysRes OVPA Datapipe 3.0 <ul style="list-style-type: none"> <li>— QXCR1000247763: config file defect</li> </ul> </li> </ul>
4.2	April 2007	<p>Location Independent Reporting (LIR) Copy Policies Top level table of NRT reports no longer shows rate data Long Term Retention (LTR)/Data archiving UPGRADE_SR_CPU_to_42.ap UPGRADE_SR_to_42.ap UPGRADE_SR_DISK_to_43.ap UPGRADE_SR_LV_to_43.ap UPGRADE_SR_NI_to_43.ap UPGRADE_SR_PROC_to_42.ap UPGRADE_SR_OVPA_to_31.ap UPGRADE_RFC1514_to_41.ap</p> <p><i>The following defects are fixed:</i></p> <ul style="list-style-type: none"> <li>• QXCR1000187641</li> <li>• QXCR1000282592</li> <li>• QXCR1000305835</li> <li>• QXCR1000317552</li> <li>• QXCR1000332277</li> <li>• QXCR1000333100</li> <li>• QXCR1000349074</li> <li>• QXCR1000349423</li> <li>• QXCR1000350295</li> <li>• QXCR1000351698</li> <li>• QXCR1000351779</li> <li>• QXCR1000353093</li> <li>• QXCR1000353117</li> <li>• QXCR1000368670</li> <li>• QXCR1000371772</li> <li>• QXCR1000380955</li> <li>• QXCR1000393303</li> <li>• QXCR1000396234</li> <li>• QXCR1000409662</li> </ul>



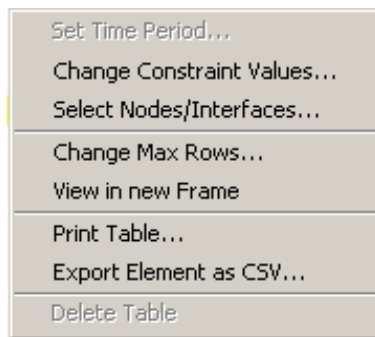
## B Editing Tables and Graphs

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.



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.

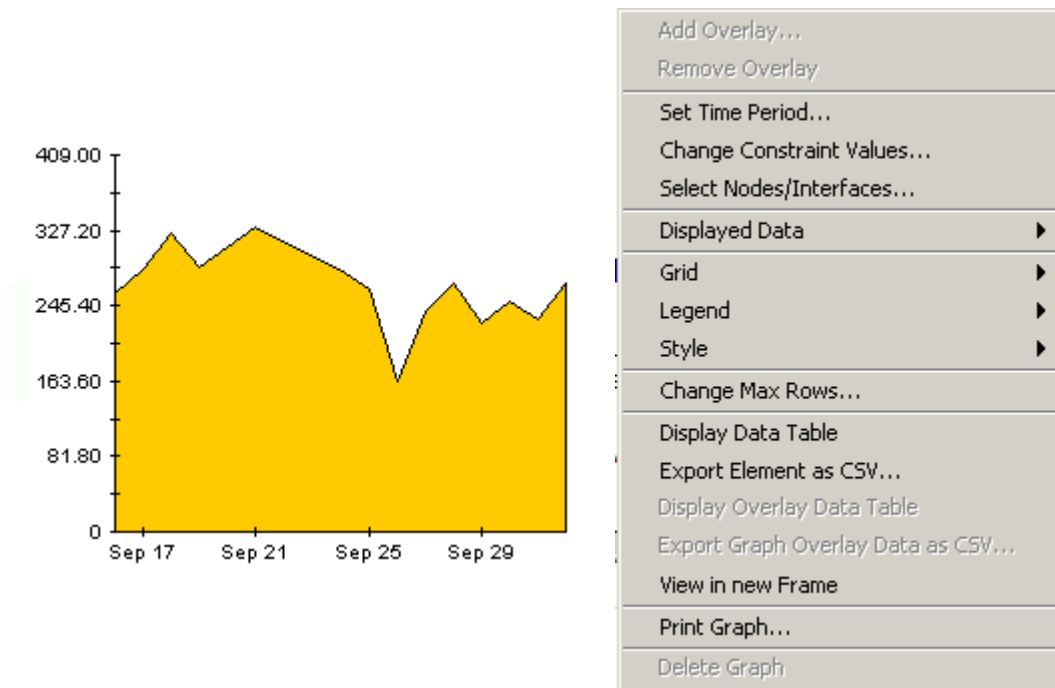
**Change Max Rows** increases or decreases the number of rows in a table. The default is 50. If you expand the default, the table may take more time to open. If you are trending a large network, using the default ensures that the table opens as quickly as possible.

**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.

Polled IP QoS Statistics Data - Input Over Previous 6 Hours					
Direction	IpPrecedence	Switched Bytes	Switched Pkts	Time Period	
Input	0	105,888	675	Tue Oct 29 07:00 AM	
Input	1	0	0	Tue Oct 29 07:00 AM	
Input	2	0	0	Tue Oct 29 07:00 AM	
Input	3	0	0	Tue Oct 29 07:00 AM	
Input	4	0	0	Tue Oct 29 07:00 AM	
Input	5	0	0	Tue Oct 29 07:00 AM	
Input	6	600	5	Tue Oct 29 07:00 AM	
Input	7	0	0	Tue Oct 29 07:00 AM	
Input	0	98,334	638	Tue Oct 29 06:45 AM	
Input	1	0	0	Tue Oct 29 06:45 AM	
Input	2	0	0	Tue Oct 29 06:45 AM	
Input	3	0	0	Tue Oct 29 06:45 AM	
Input	4	0	0	Tue Oct 29 06:45 AM	

## 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.

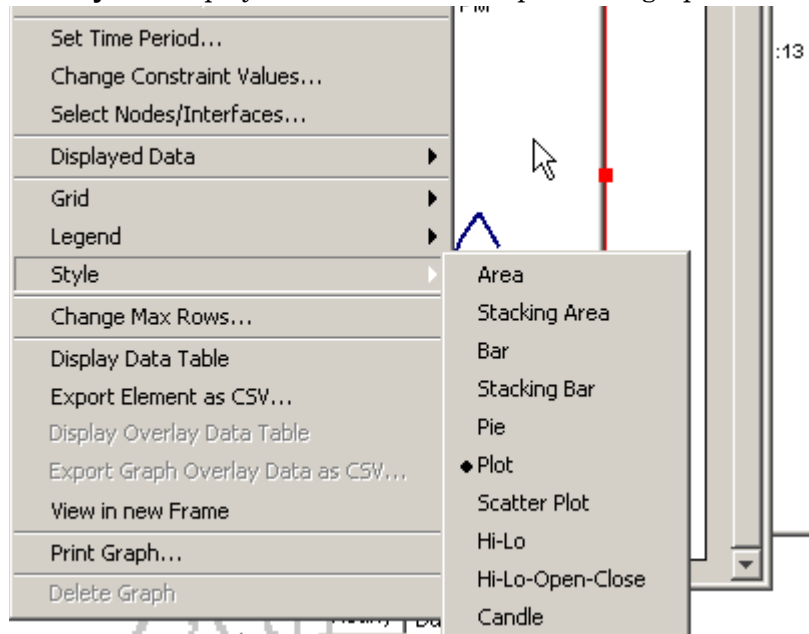


The following table provides details about each option.

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.

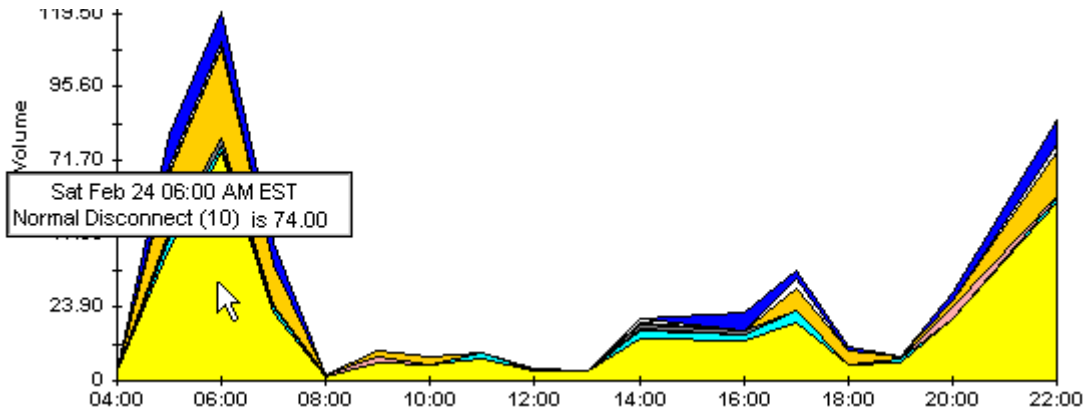
## Style Options

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



## Style > Area

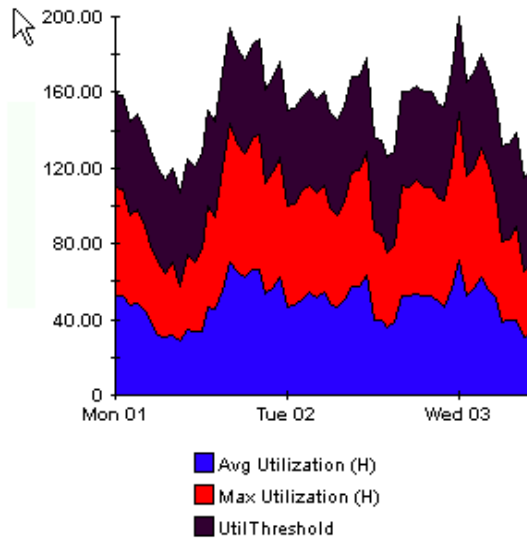
The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location



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.

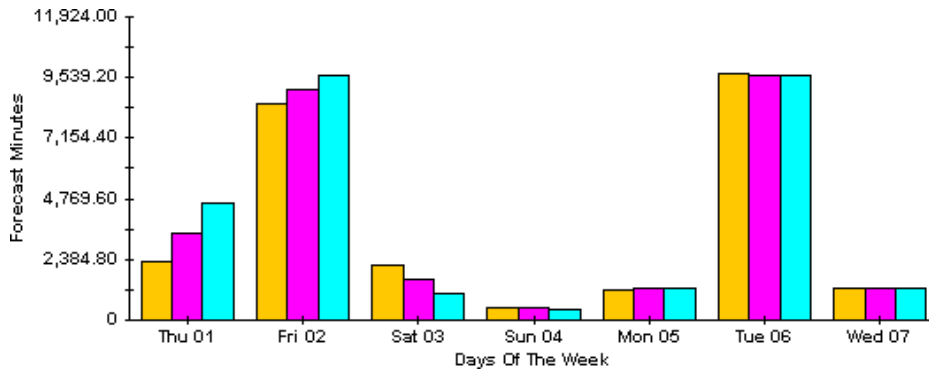
## Style > Stacking Area

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



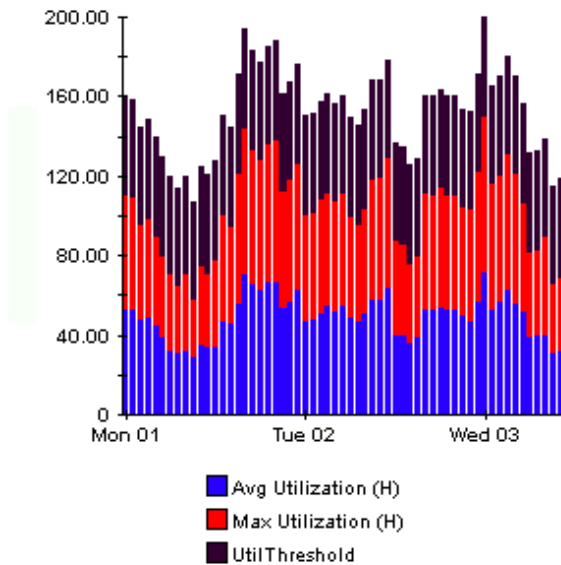
## Style > Bar

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.



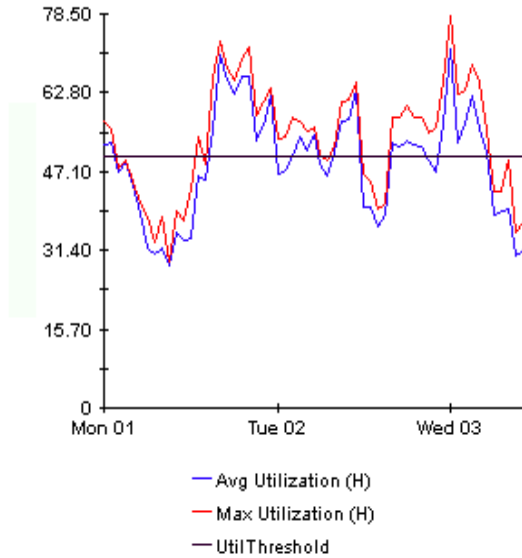
## Style > Stacking Bar

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.



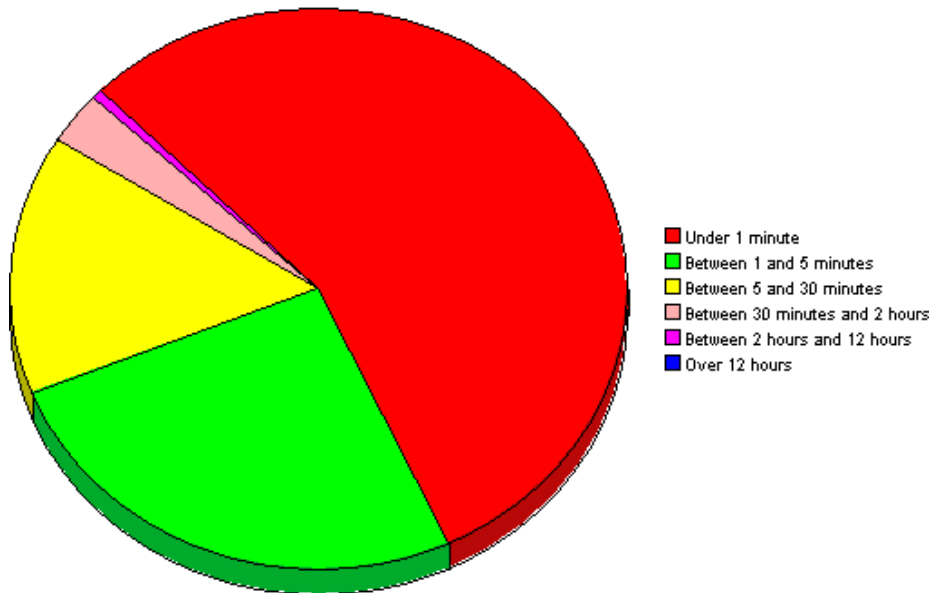
## Style > Plot

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.

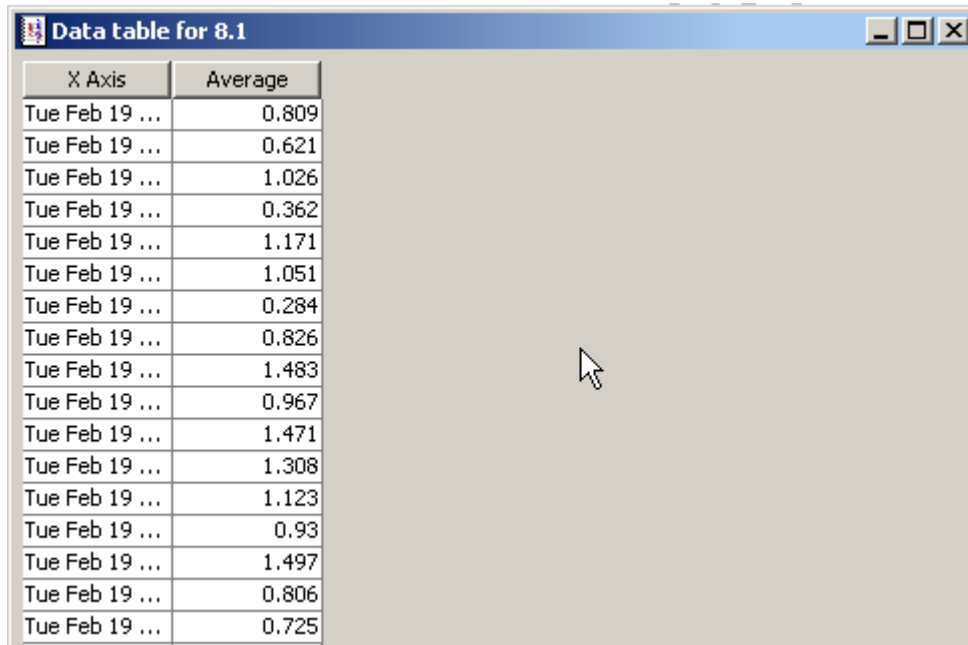


If you are looking at data for more than one day, you will see multiple pie graphs, one for each day.



## Display Data Table

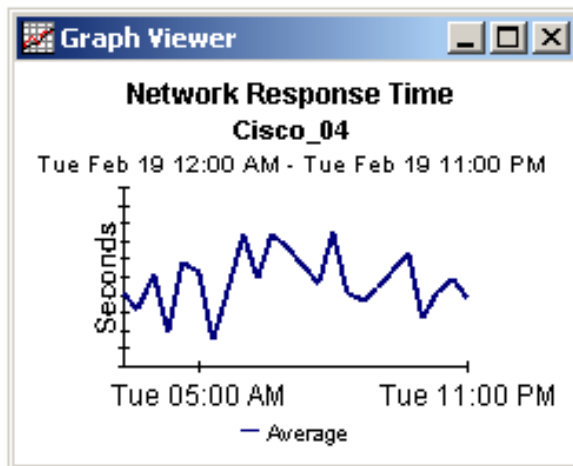
This option changes a graph into a spreadsheet.



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.





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