

HP OpenView Performance Insight

System Resources Report Pack User Guide

Software Version: 4.0

Reporting and Network Solutions 7.0



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Overview

This chapter covers the following topics:

- OVPI and system resources
- Folders and reports
- Data collection
- Integration with Network Node Manager (NNM)
- Ways to customize reports
- Sources for additional information

OVPI and System Resources

The 22 interactive reports in System Resources 4.0 are designed to provide the information you need to anticipate resource issues before they become serious. Use this package to find rapid answers to the following questions:

- Are system resources in plentiful supply, limited supply, or somewhere in between?
- How does yesterday's utilization compare to historic trends?
- In how many days, approximately, will a resource reach a performance threshold?

The System Resource Report Pack consists of a main package and five optional sub-packages. The following table highlights recent enhancements to the package.

Version	RNS Release	Features/Enhancements
3.0	RNS 3.0 - May 2003	OVPI Object Manager support <i>new change forms:</i> <ul style="list-style-type: none"> • Update System • Update Filesystem <i>new datapipe:</i> <ul style="list-style-type: none"> • SR_OVPA Datapipe 1.0
3.0	RNS 4.0 - October 2003	SR_OVPA Datapipe 2.0

Version	RNS Release	Features/Enhancements
4.0	RNS 5.0 - April 2004	Oracle support Improvements to existing reports <i>new reports:</i> <ul style="list-style-type: none"> • CPU Resource Utilization Forecast • CPU Performance QuickView • Disk Details QuickView • Logical Volume Details QuickView • Network Interface Details QuickView • Process Details QuickView • Top Ten Transactions • Transactions per System Snapshot • System Availability (downtime/uptime) • System Inventory • Systems Performing Each Application/ Snapshot
4.0	RNS 6.0 - August 2004	<i>new upgrade packages:</i> <ul style="list-style-type: none"> • UPGRADE_SR_3.0_to_4.0.ap • UPGRADE_SR_CPU_1.0_to_1.5.ap • UPGRADE_SR_DISK_1.0_to_1.5.ap
4.0	RNS 7.0 - November 2004	No changes

Improvements to Existing Reports in SR 4.0

The following reports have changed:

- Service Level Management — Executive Summary Report
 - Customer selection table: added Total Exceptions
 - Location selection table: removed Total Volume and Average Daily Volume
 - Total Exceptions graph: added Daily tab and Monthly tab
 - Total Exceptions graph: removed references to volume
- System Volume and CPU Utilization Top Ten Report
 - Highest CPU table: added Queue Length
 - Highest Volume table: added Total Network Utilization
- Memory Resource Optimization
 - Overutilized System Memory table: added Average Page Outs per Second
- CPU Forecast
 - DTT selection table: added 30 and 60 day forecast
- Memory Forecast
 - DTT selection table: added 30 and 60 day forecast

- Filesystem Forecast
 - DTT selection table: added 30 and 60 day forecast

Changes to CPU and DISK Sub-Packages

- Modified TEEL files (history table name is now uppercase)
- Modified bcpg file (history table name is now uppercase; bcpg file name is lowercase)
- Modified the report in UPGRADE_SR_DISK

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

System Resources 4.0 contains the following sub-packages:

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

The following table provides a list of QuickView reports.

Sub-Package	QuickView Report
Disk	Disk Performance per System QuickView
CPU	CPU Details per System QuickView
Network Interface	Network Interface Details per System QuickView
Process	Process Details per System QuickView
Logical Volume	Logical Volume Details per System QuickView

Generic Reports

System Resources 4.0 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 overutilization, 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

Data Collection

System Resources has two datapipe:

- RFC1514 Datapipe
- SR_OVPA Datapipe

The RFC1514 Datapipe collects the following data from the Host Resources MIB:

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

The SR_OVPA Datapipe collects data from two agents:

- HP OpenView Performance Agent
- HP OpenView Operation Agent [Embedded Performance Component]

The following table provides a list of the metric classes collected by the OVPA Datapipe and the default polling frequency.

Metric Class	Polling Frequency
Global [includes uptime & downtime]	Hourly
Filesystem	Hourly
Configuration	Daily
Application	Hourly
Transaction	Hourly

Integration with Network Node Manager

If you use NNM, you can enhance your diagnostic capability by integrating NNM and OVPI. Integrating these systems allows you to manage faults and analyze performance trends from one system. If NNM and OVPI are integrated, you will find a list of System Resource reports in the Report Launchpad window. You can reach this window from multiple NNM interfaces, including:

- NNM ovw
- Home Base Dynamic Views
- NNM alarms browser

You can enhance integration further by installing `SystemResource_Thresholds`, an optional thresholds sub-package that is bundled with System Resources. If you install this sub-package, OVPI will deliver threshold traps to NNM whenever OVPI detects an exception condition. Thresholds traps sent to NNM display as alarms in the NNM alarm browser.

The Threshold and Event Generation Module, also known as the Thresholds Module, is a prerequisite for the thresholds sub-package. If you install the thresholds sub-package, Package Manager will install the Thresholds Module for you, automatically. The Threshold Module directs OVPI to take an action in response to an exception. Although the default action is to send a threshold trap to NNM, other actions can be configured. See the *Threshold Module 5.0 User Guide* for details.

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 [Chapter 10, Editing Tables and Graphs](#).

Group Filters

If you intend to share your reports with customers, you must produce customer-specific reports by creating and applying group filters, one per customer. Creating and apply group filters involves the following steps:

- 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 creating filters for group accounts, refer to the *Performance Insight 5.0 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 once. System Resources 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 Resources 4.0 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 3.5 User Guide*.

Sources for Additional Information

This user guide includes samples of some of the reports in System Resources. The demo package that comes with System Resources 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 4.0 Release Statement*
- *System Resource OVPA Datapipe 2.5 Release Statement*
- *Thresholds Module 5.0 User Guide*
- *RFC1514 Datapipe 4.0 Release Statement*
- *RNS 7.0 Release Notes, November 2004*

Manuals for the core product, OVPI, and manuals for the reporting solutions that run on the core product can be downloaded from the following web site:

<http://www.hp.com/managementsoftware>

Select **Support > Product Manuals** to reach the **Product Manuals** page. The user guides for OVPI are listed under **Performance Insight**. The user guides for reporting solutions and NNM components (SPIs and correlators) are listed under **Reporting and Network Solutions**.

The manuals listed under **Reporting and Network Solutions** indicate the month and year of publication. If a manual is revised and reposted, the date of publication will change even if the software version number does not change. Since we post updated manuals on a regular basis, you should search **Product Manuals** for updates before using an outdated manual.

Package Installation

This chapter covers the following topics:

- Guidelines for a smooth install
- Installing System Resources 4.0
- Post-installation steps pertaining to upgrades only
- Accessing deployed reports
- Seeing performance data in reports
- Package removal

Guidelines for a Smooth Install

Each reporting solution that runs on OVPI consists of a report pack and at least one datapipe. When you install the datapipe, you configure OVPI to collect a specific type of performance data at a specific polling interval. When you install the report pack, you configure OVPI to summarize and aggregate performance data in a specific way.

The RNS 7.0 CD contains NNM components as well as OVPI report packs. When you insert the CD, launch the package extraction interface, and select OVPI report packs for installation, the install script extracts every OVPI package from the CD and copies the results to the Packages directory on your system. After the package extraction step finishes, the install script prompts you to start Package Manager. Before running Package Manager, review the following guidelines.

Software Prerequisites

System Resources 4.0 has the following prerequisites:

- OVPI 5.0
- Common Property Tables 3.5

If you are not running any version of Common Property Tables, let Package Manager install Common Property Tables for you. If you are running Common Property Tables 2.2, your upgrade is a two-step process. First upgrade to Common Property Tables 3.0, then upgrade to Common Property Tables 3.5. Make sure that Common Property Tables is upgraded *before* installing System Resources for the first time or upgrading to System Resources 3.0.

Datapipes

The datapipes that collect data for System Resources are not prerequisites. You may install the datapipes when you install SR 4.0 or you may install the datapipes after you install SR 4.0. Installing at least one datapipe is mandatory. If you are currently running an older version of either datapipe listed above, remove the older version before installing the new version. When you remove the older datapipe does not matter; just make sure you remove the old datapipe before installing the new datapipe.

Thresholding and Integration with NNM

If you want to implement thresholding for this package, install `SystemResource_Thresholds`, the thresholds sub-package that comes with System Resources. The thresholds sub-package contains customized thresholds. If a threshold is breached, OVPI will respond to the breach by sending a threshold trap to your NNM server.

If you select the thresholds sub-package for installation, Package Manager will automatically install `Thresholds Module 5.0`, a prerequisite for the thresholds sub-package. The `Threshold Module` controls the actions taken in response to a threshold breach. For details about modifying the default action, refer to the *Thresholds Module 5.0 User Guide*.

Distributed Environments

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

- System Resources 4.0
- Optional sub-packages (SR_CPU, SR_DISK, etc.)
- Common Property Tables 3.5

Install the following packages on each satellite server:

- System Resources 4.0
- Optional sub-packages (SR_CPU, SR_DISK, etc.)
- Common Property Tables 3.5
- RFC1514 Datapipe / SR_OVPA Datapipe
- `SystemResource_Thresholds` (optional)
- `Thresholds Module 5.0` (optional)

The thresholds sub-package can report exceptions on aggregated data, hourly data, or both aggregated data and hourly data. If you are only interested in seeing alarms on hourly data, you do not need to install the thresholds sub-package on the central server. If you want to set thresholds on aggregated data, you must install the thresholds sub-package on the central server.

When you are done installing packages, you have to use the Add Database Wizard to set up connections with satellite server databases. You also have to configure trendcopy pull commands and switch off daily aggregations on satellite servers. For details, see [Chapter 3, Distributed Systems](#).

Upgrading From SR 3.0 to SR 4.0

If you are running System Resources 3.0, you can upgrade to System Resources 4.0. Datapipes cannot be upgraded. You must delete the existing datapipe, then install the new datapipe. Follow these steps when upgrading to System Resources 4.0:

- 1 Upgrade Common Property Tables.
 - If you are running Common Property Tables 2.2:
 - Install the 2.2 to 3.0 upgrade package
 - Install the 3.0 to 3.5 upgrade package
 - If you are running Common Property Tables 3.0:
 - Install the 3.0 to 3.5 upgrade package
- 2 Remove the datapipes that were installed when System Resources 3.0 was installed.
- 3 Install the SR 3.0-to-4.0 upgrade package.
- 4 If desired, install the optional sub-packages:
 - SR_CPU
 - SR_DISK
 - SR_PROC
 - SR_NetIf
 - SR_LV
- 5 Install at least one new datapipe.

Polling Policies for Remote Pollers

When you uninstall an existing datapipe, the following information will be lost:

- Polling policies for remote pollers
- Multi-poller policies
- Customized polling groups

You can export existing polling policy configurations and customized polling groups by using 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 Polling Group Configurations

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
```

Dropping Customized Data Table Views

If you created custom data table views using existing property table views, drop the custom data table views now, prior to upgrading the report pack. Dropping custom table views will not lose data.

Installing System Resources 4.0

Follow these steps to install System Resources:

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

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

- 1 Log in to the system. On UNIX[®] systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

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/ovpi_timer stop**
- Sun: **sh /etc/init.d/ovpi_timer stop**

- 3 Insert the RNS CD.

Windows: The Main Menu automatically displays.

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 Resources 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 4.0*
 - *SR_LV sub-package* (optional)
 - *SR_PROC sub-package* (optional)
 - *SR_NetIf sub-package* (optional)
 - *SR_CPU sub-package* (optional)
 - *SR_DISK sub-package* (optional)
 - At least one of the following datapipes
 - *RFC1514*
 - *SR_OVPA Datapipe 2.5*
 - *SystemResource_Thresholds* (optional)
 - Installing the thresholds sub-package is optional. If you install the thresholds sub-package, Package Manager will install Thresholds Module 5.0 for you.
 - If you are not currently running any version of Common Property Tables, Package Manager will select and install Common Property Tables 3.5 for you, automatically.
 - Installing 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. To run Type Discovery immediately after package installation, accept 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/ovpi_timer start
Sun: sh /etc/init.d/ovpi_timer start
```

Post-Installation Steps Pertaining to Upgrades Only

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.

If you dropped any customized data table views that were based on existing report pack property table views, you can recreate those custom views now.

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) were deployed to the OVPI Application Server. Once reports and forms reside on the OVPI Application Server, you have two ways to view them:

- OVPI clients
- Web browser

If the client components are installed on the user's system, the user has access to Report Viewer, Report Builder, and the Management Console. If the client components are not installed on the user's system, using a web browser to view reports is the only way the user can view reports.

For more information about the client components, refer to the *Performance Insight 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, refer to the *Performance Insight Administration Guide*.

Seeing Performance Data

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

When you uninstall a report pack, you delete the tables associated with the report pack as well as all the data in those tables. If you want to preserve the data in tables, archive the data before removing the package.

Removing System Resources removes any datapipe that depends on System Resources. Follow these steps to remove System Resources 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/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 4.0. 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/ovpi_timer start**
- Sun: **sh /etc/init.d/ovpi_timer start**

Distributed Systems

This chapter covers the following topics:

- Proper package installation for distributed environments
- Central server configuration
- Satellite server configuration
- System clocks

Package Installation

If you intend to run System Resources as a distributed system across multiple servers, you must configure each server in your system. Before doing that, verify that all packages are installed where they need to be installed. The report pack and Common Property Tables must be installed on every server; the datapipes must be installed on every satellite server.

Central Server	Satellite Server
System Resources 4.0 (deploy reports)	System Resources 4.0
SystemResource_Thresholds	SystemResource_Thresholds
Thresholds Module 5.0	Thresholds Module 5.0
Common Property Tables 3.5	Common Property Tables 3.5
	RFC1514 Datapipe
	SR_OVPA Datapipe

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

Once package installation is complete, you are ready to configure the central server and each satellite server.

Central Server Configuration

Perform the following tasks:

- Set up connections between the central server and satellite server databases
- Configure trendcopy pull commands on the central server for hourly data
- Configure trendcopy pull commands on the central server for rate data (optional)

Task 1: Set up connections with satellite server databases

- 1 Select **HP OpenView > Performance Insight > Management Console**.
- 2 Click the **Systems** icon on the lower left. The **System/Network Administration** pane opens.
- 3 Right-click the **Databases** folder. When prompted, select **Add OVPI Database**. The Add Database Wizard opens.
- 4 Click **Next**.
- 5 Type the hostname and port number for the database you want to add; click **Next**.
- 6 Review the Summary. Repeat Steps 4 and 5 for each additional database.
- 7 Click **Finish** when you are done.

Task 2: Configure trendcopy pull commands for hourly data

- 1 Open the following file:
`$DPIPE_HOME/scripts/SR_Hourly_Reporting.pro`
- 2 Uncomment the copy commands in the hourly_copy block and modify them as follows:
 - Replace *SATELLITE_SERVER_1_DATABASE* with the satellite server name
 - Replace *THIS_MACHINE_DATABASE* with the central server name
- 3 If there is more than one satellite server, create and configure new hourly copy commands for each additional machine.
- 4 Comment out the hourly trendsums in the `SystemResourceReporting_Hourly.pro` file.

Task 3: Configure trendcopy pull commands for rate data (optional)

If you want to view Near Real Time reports on the central server, rate data must be available on the central server. Follow these steps to pull rate data from satellite servers:

- 1 Open the following file:
`$DPIPE_HOME/scripts/SR_Hourly_Reporting.pro`
- 2 Uncomment the copy commands in the rate_copy block and modify them as follows:
 - Replace *SATELLITE_SERVER_1_DATABASE* with the satellite server name
 - Replace *THIS_MACHINE_DATABASE* with the central server name

- 3 If there is more than one satellite server, create and configure new hourly copy commands for each additional machine.

▶ Copying polled rate data from each satellite has two unavoidable consequences. The amount of traffic between satellite servers and the central server increases, and the central server's processing load increases.

Satellite Server Configuration

Follow these steps to configure a satellite server:

▶ Do not follow these steps if you want the satellite server to perform local reporting, or if the thresholds sub-package is not installed on the satellite server.

- 1 Switch off daily aggregations by commenting out the lines referencing `SR_Server_Reporting.pro` in the `$DPIPE_HOME/lib/trendtimer.sched` file.
- 2 Modify the `SR_Hourly_Reporting.pro` `trendtimer` entry in the `$DPIPE_HOME/lib/trendtimer.sched` file. By default, this process starts at 40 minutes after the hour. To make sure the satellite server completes hourly summarizations before the central server begins hourly summarizations, change the start time from `1:00+40` to `1:00+25`.
- 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.

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.

:

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.

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

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

No intervention on your part is required to implement these defaults. Simply install the thresholds sub-package. If you want to change one or more default settings, use the change forms described later in this chapter. If you want to modify the action that 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 Resources 4.0 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 address bar containing `/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 the following fields:

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

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

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.

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

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

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

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.

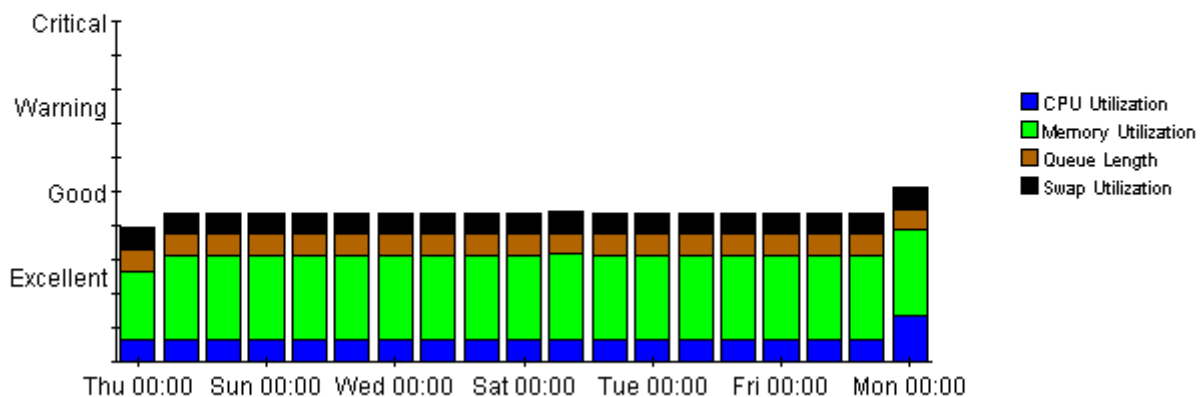
Overutilized Filesystems Projected to Exceed 90% Utilization within 90 Days

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

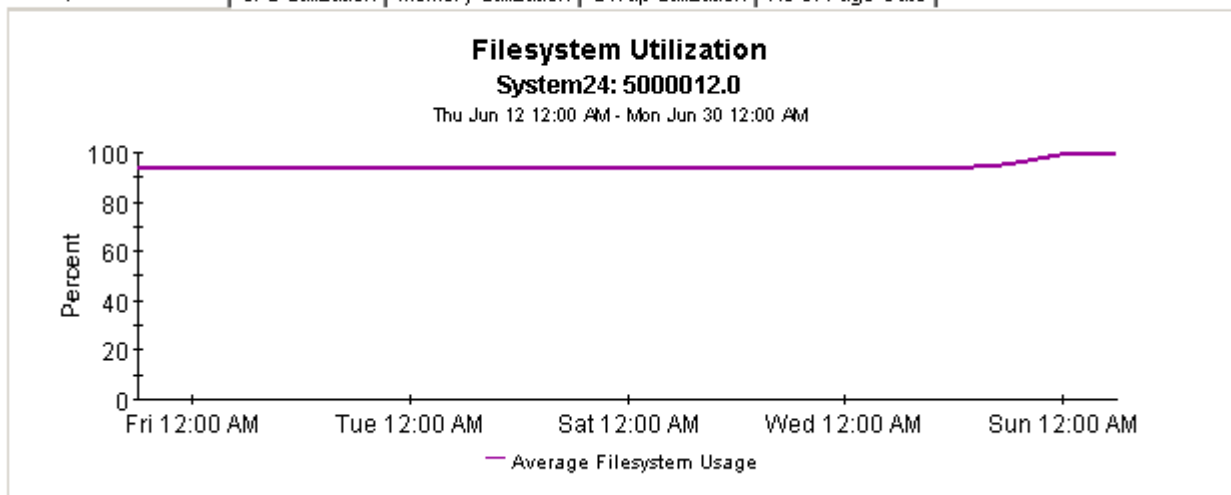
Grade of Service (GOS) System24

Thu Jun 12 2003 - Mon Jun 30 2003



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



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

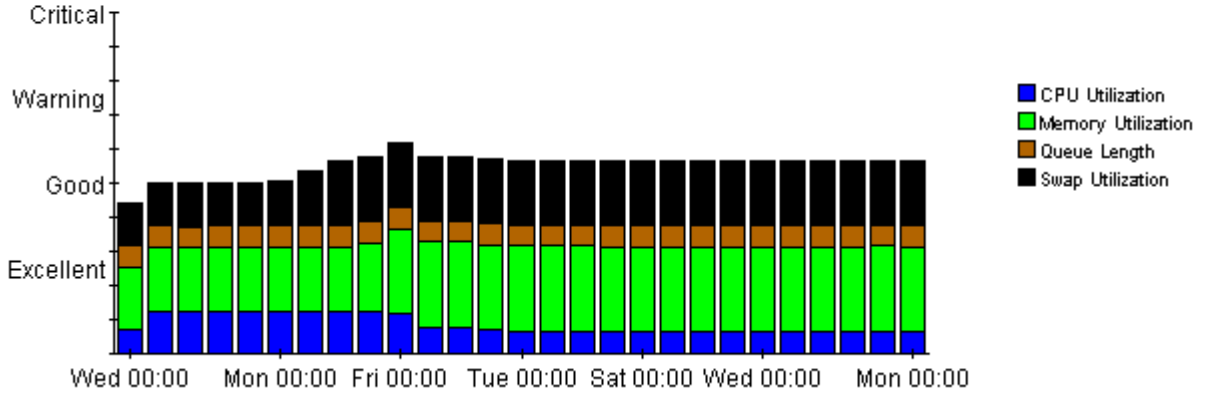
System	File System	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
System23	/home	12.76	12.76	12.76	12.76
System7	/stand	13.72	13.96	14.11	14.27
System7	/	16.13	6.30	0.00	0.00
System8	/	17.97	17.97	17.97	17.97
System23	/	17.97	17.97	17.97	17.97
System4	/stand	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

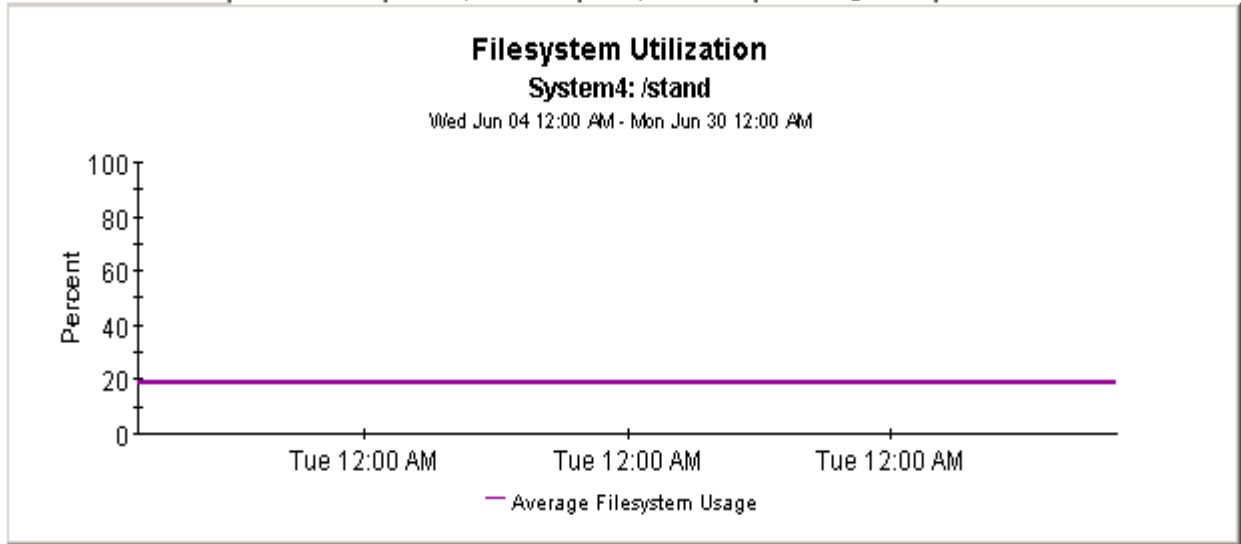
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Grade of Service (GOS)
System4

Wed Jun 04 2003 - Mon Jun 30 2003

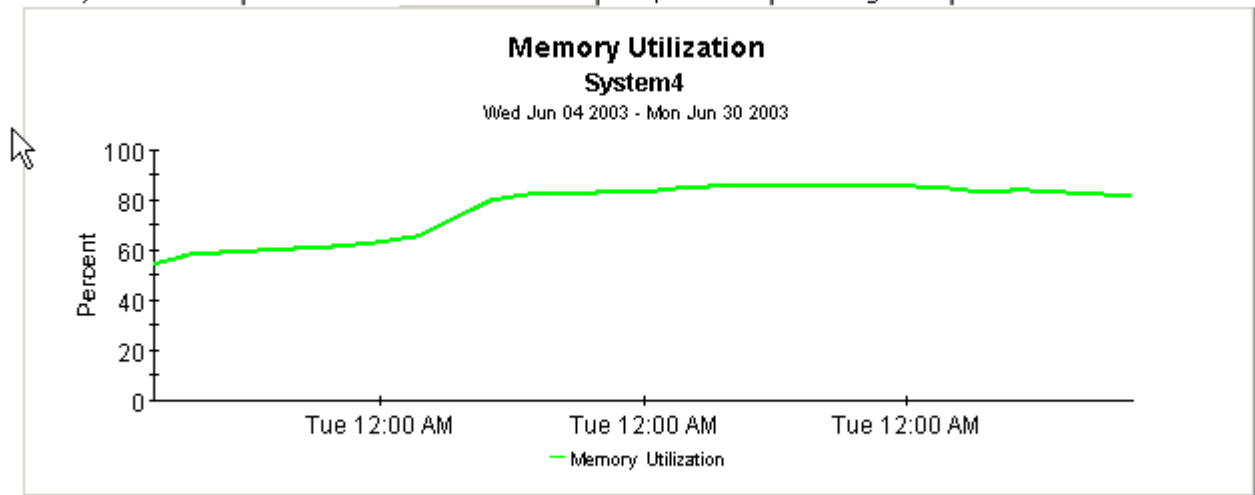


Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs

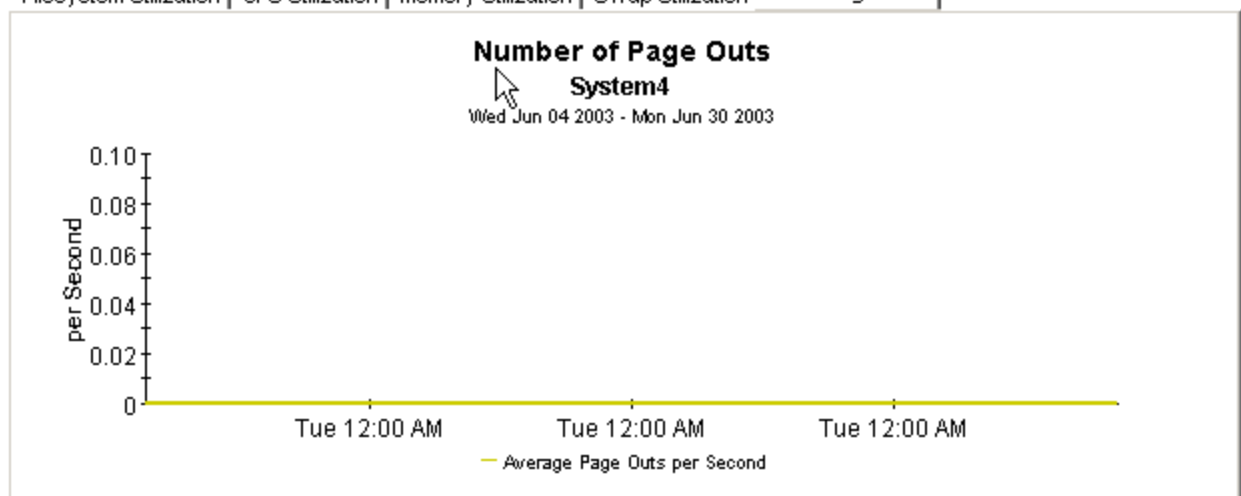


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Filesystem Utilization | CPU Utilization | Memory Utilization | Swap Utilization | No of Page Outs



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

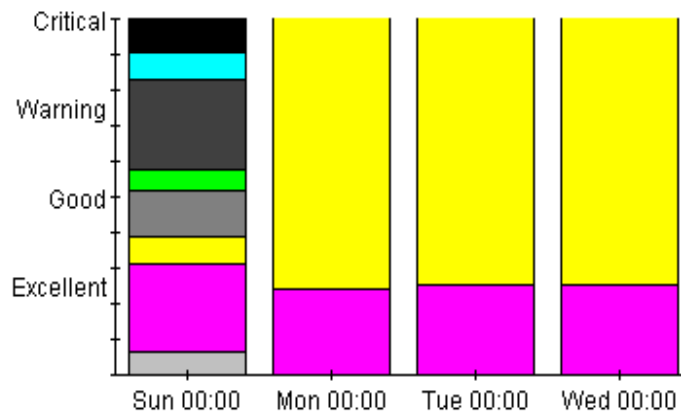
System	Current Utilization	Projected Utilization 30	Projected Utilization 60	Projected Utilization 90
15.2.115.172	98.74	101.18	103.51	105.83
15.2.125.15	89.92	110.65	130.39	150.14
solcent	82.74	102.99	122.58	142.18
tshp39.cnd.hp.com	79.04	88.78	98.05	107.32
biotite.cnd.hp.com	74.05	89.64	104.49	119.34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



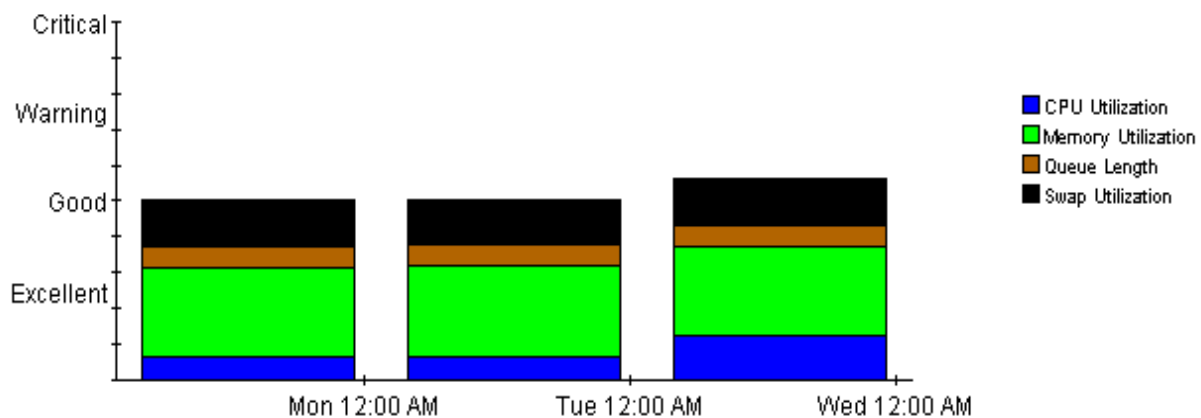
- CPU Utilization: 15.70.186.76: All
- Memory Utilization: 15.70.186.76: All
- Queue Length: 15.70.186.76: All
- Swap Utilization: 15.70.186.76: All
- CPU Utilization: tthp166.cnd.hp.com: All
- Memory Utilization: tthp166.cnd.hp.com: All
- Queue Length: tthp166.cnd.hp.com: All
- Swap Utilization: tthp166.cnd.hp.com: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

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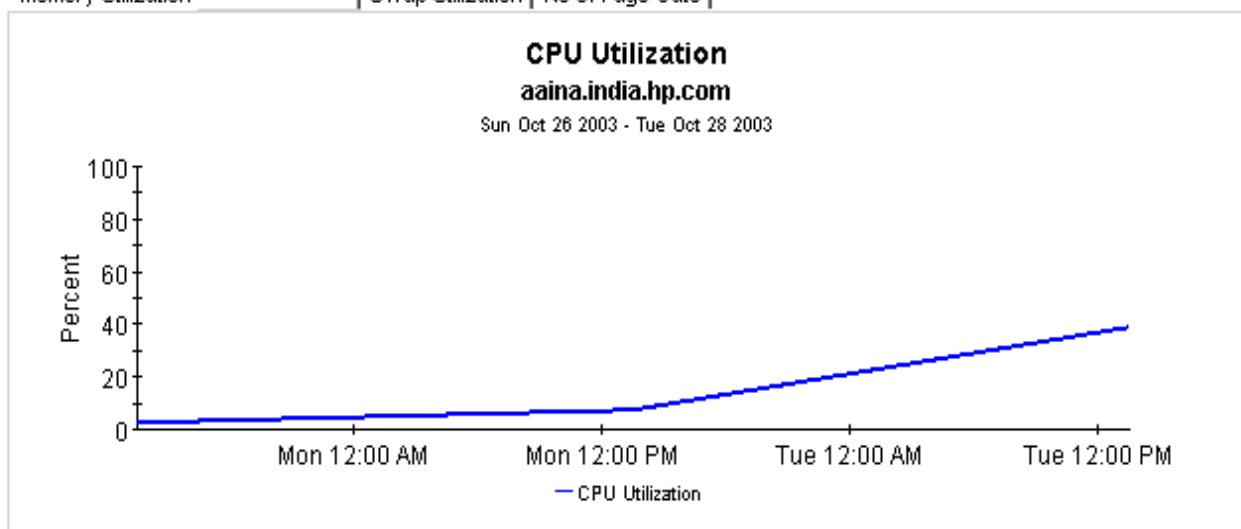
Grade of Service (GOS)

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Sun Oct 26 2003 - Tue Oct 28 2003



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

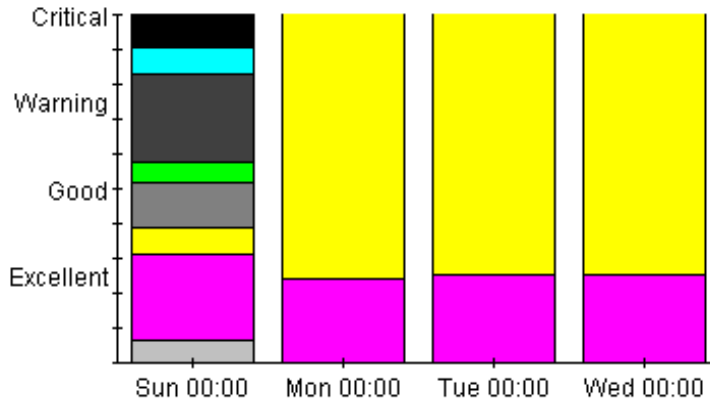


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Grade of Service (GOS)

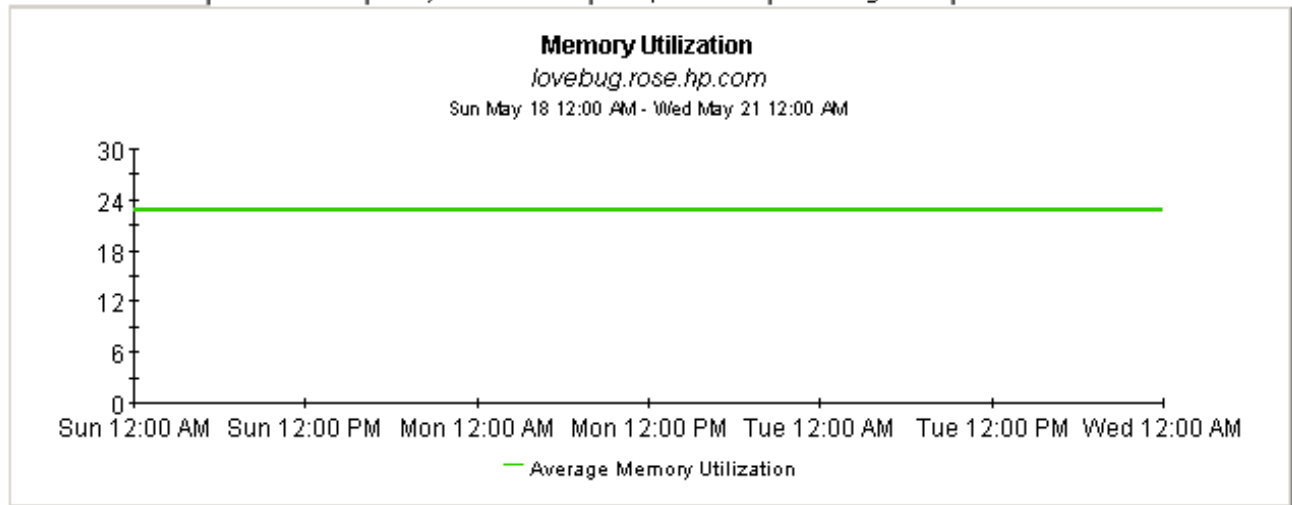
lovebug.rose.hp.com

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- 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



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.

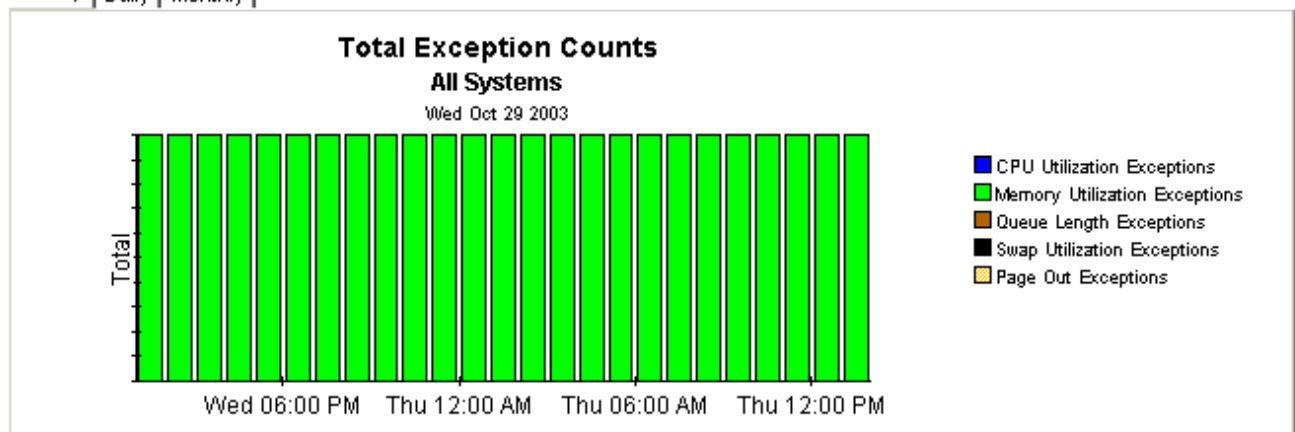
Customers Wed Oct 29 2003

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

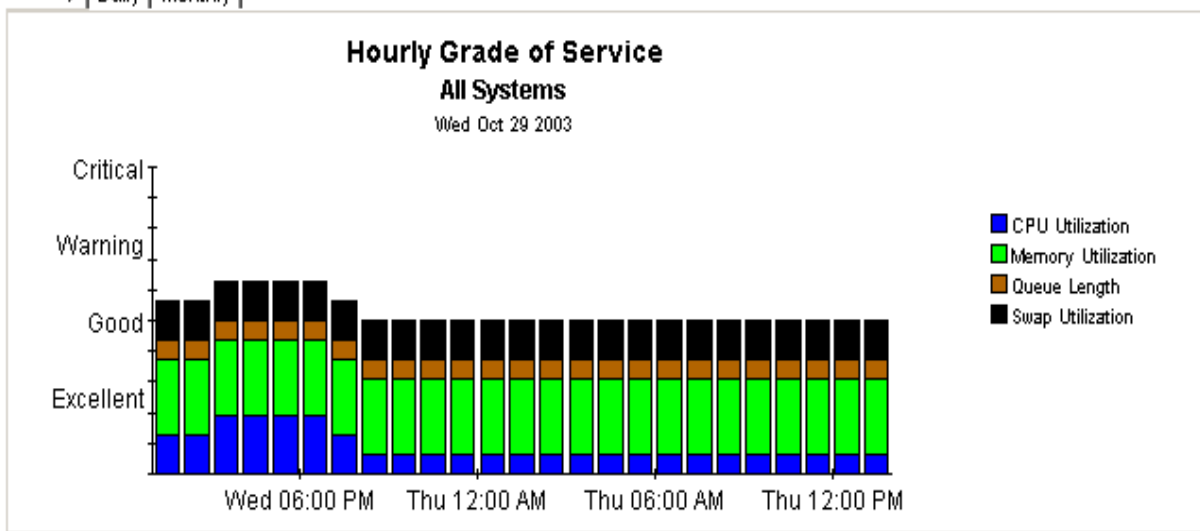
location_name	Total Exceptions	Queue Length Exceptions	CPU Utilization Exceptions	Memory Utilization Exceptions	Swap Utilization Exceptions	Page Out Exceptions
All Locations	24.00	0.00	0.00	24.00	0.00	0.00
Location Unassigned	24.00	0.00	0.00	24.00	0.00	0.00

Hourly | Daily | Monthly



continues on next page

Hourly | Daily | Monthly



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.

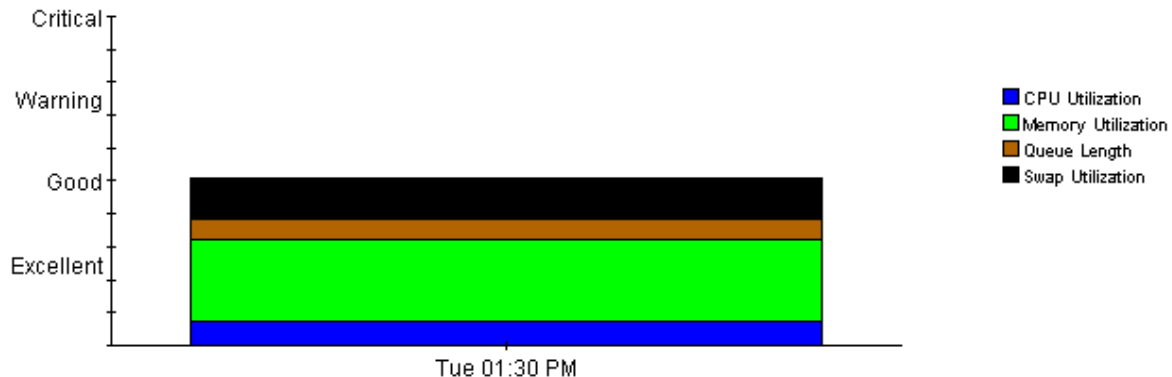
Estimated Days To Threshold (DTT) Filesystems Projected to be within 90 Days of 100% Utilization

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

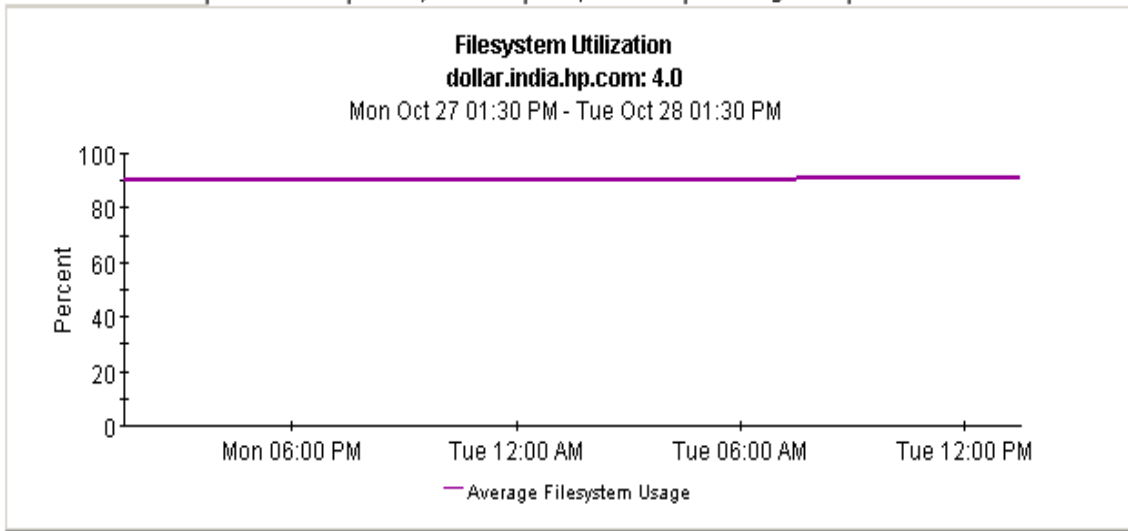
Grade of Service (GOS) dollar.india.hp.com

Tue Oct 28 2003 - Tue Oct 28 2003



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



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

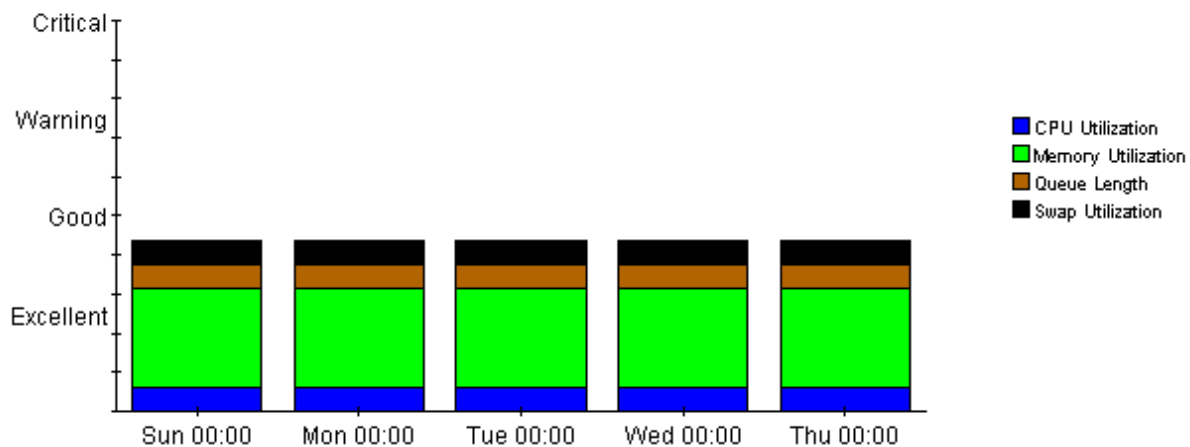
System	DTT Utilization	Current Utilization	Projected Utilization 90
15.2.125.15	12.00	90.32	156.74
biotite.cnd.hp.com	60.00	74.22	113.05
hpcb.rose.hp.com	57.00	65.38	119.65
tshp39.cnd.hp.com	32.00	79.49	135.06
gorilla.cnd.hp.com	6.00	50.83	650.40
hpfcljm.cnd.hp.com	29.00	54.17	194.47
solcent	53.00	82.79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

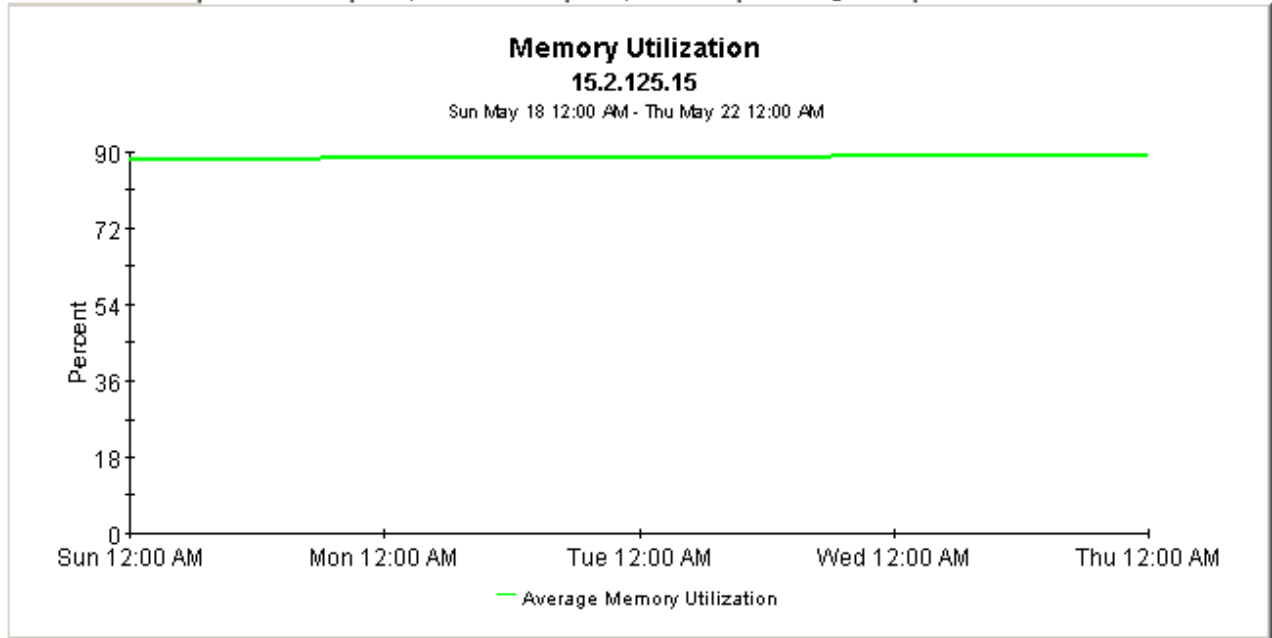
Grade Of Service (GOS)

15.2.125.15

Sun May 18 2003 - Thu May 22 2003



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Exception Hot Spots and QuickViews

This chapter covers the following reports:

- Exception Hot Spots
- QuickView
- Near Real Time

Exception Hot Spots

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

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

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

QuickView

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

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

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

QuickView - Near Real Time

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

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

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

QuickView - Near Real Time - Snapshot

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

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

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

System Resource



Hot Spots

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

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

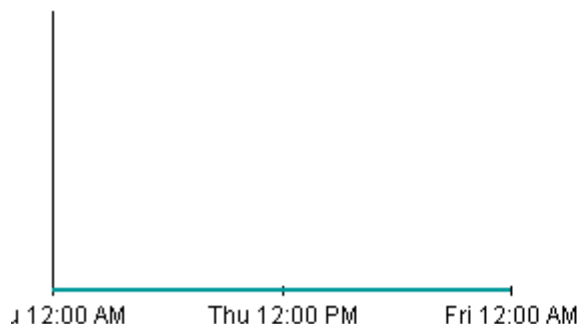
System	Total Exceptions	Queue Length Exception	CPU Utilization Exceptions	Memory Utilization Exceptions	Swap Utilization Exceptions	Page Out Exceptions
solcent	96	0	0	96	0	0
ultra	94	0	11	83	0	0
15.2.118.118	72	24	24	24	0	0
15.70.186.76	44	22	0	22	0	0
15.2.114.242	24	0	0	24	0	0
15.2.125.15	24	0	0	24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

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

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

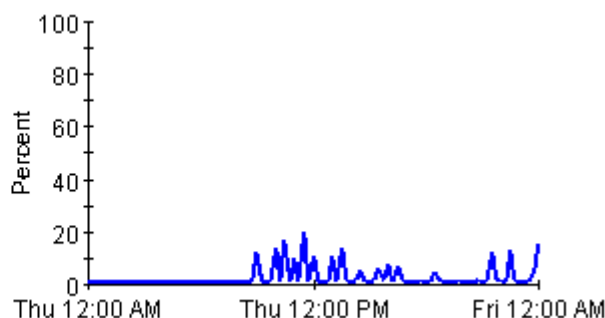
Run Queue solcent

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



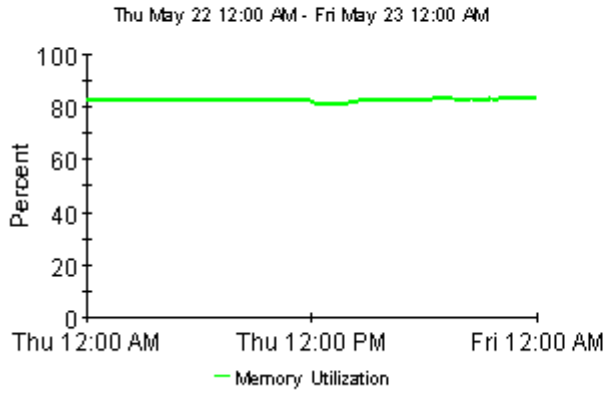
CPU Utilization solcent

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

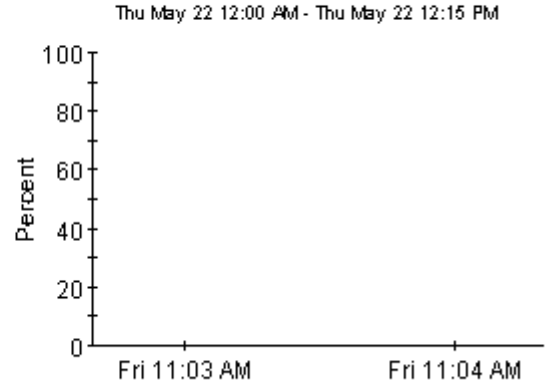


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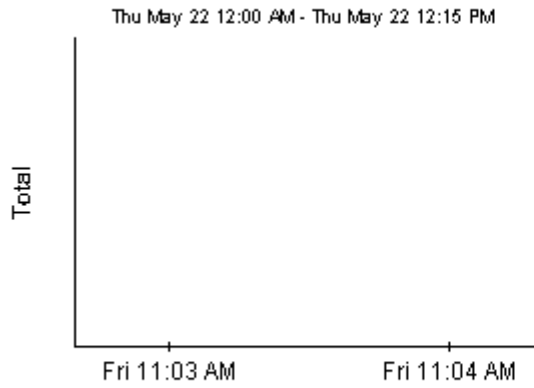
Memory Utilization
solcent



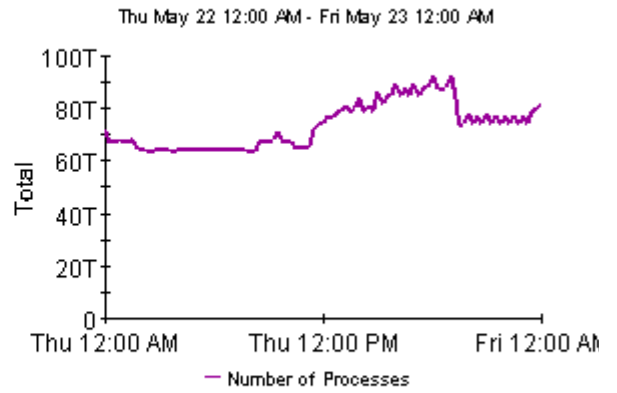
Swap Utilization
solcent



Page Outs per Second
solcent



Number of Processes
solcent



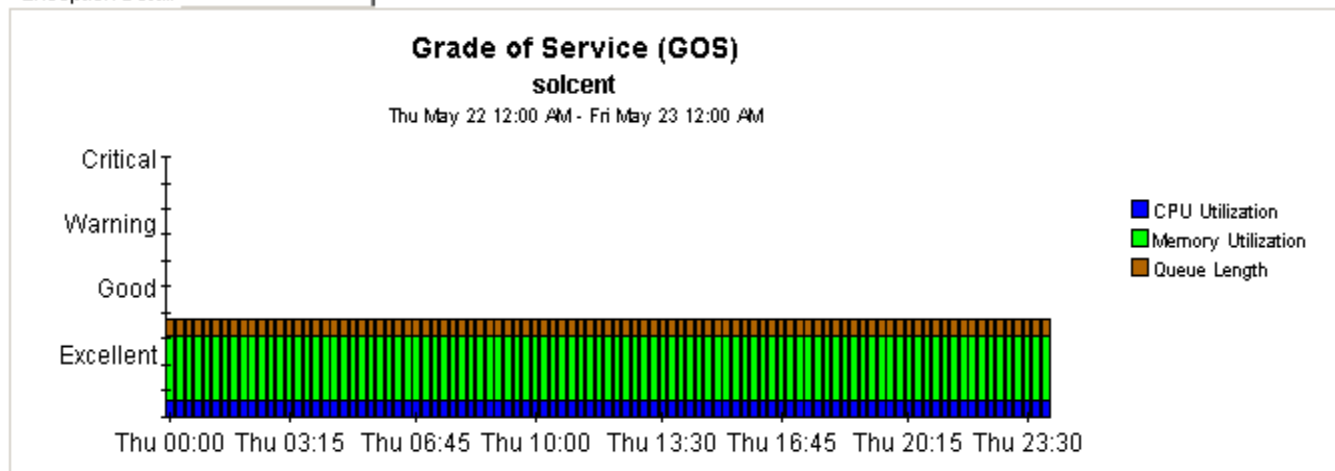
Exception Detail | Grade of Service

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	

continues on next page

Exception Detail | **Grade of Service**



System Resource Quickview



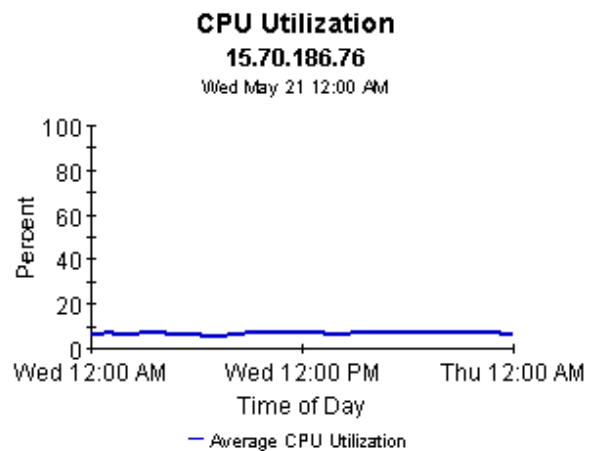
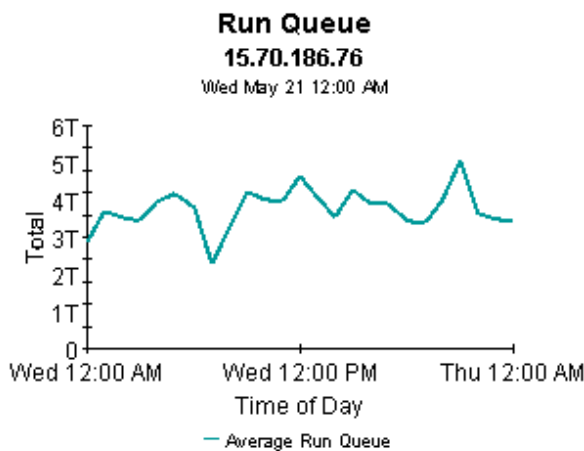
The System Resource QuickView Report gives the system management staff a detailed look at the performance of individual systems. Select a system from the top chart to display detailed information for that system.

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

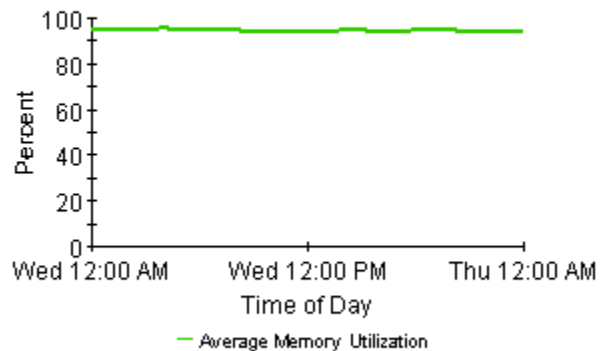
Run Queue Threshold: 3.00
 CPU Utilization Threshold: 80.00
 Memory Utilization Threshold: 70.00
 Swap Utilization Threshold: 70.00
 Pageout Threshold: 5.00



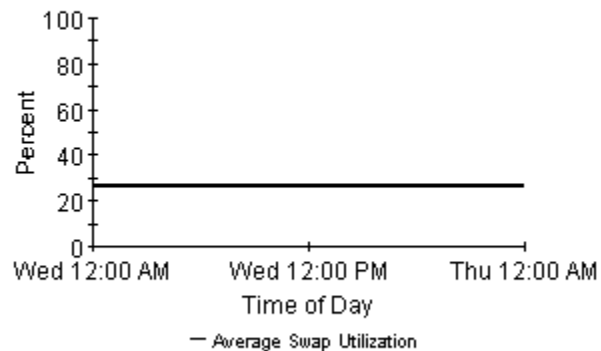
continues on next page

Memory Utilization**15.70.186.76**

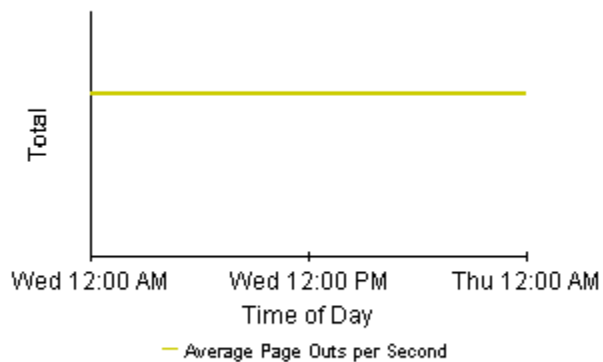
Wed May 21 12:00 AM

**Swap Utilization****15.70.186.76**

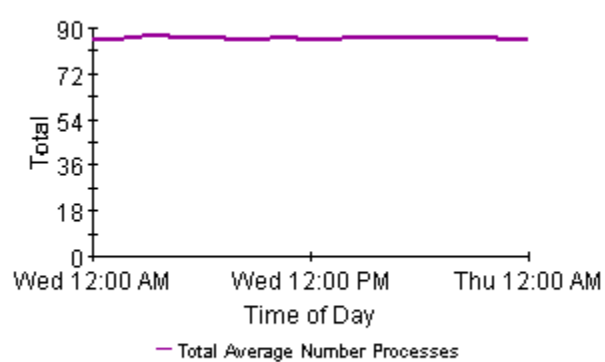
Wed May 21 12:00 AM

**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



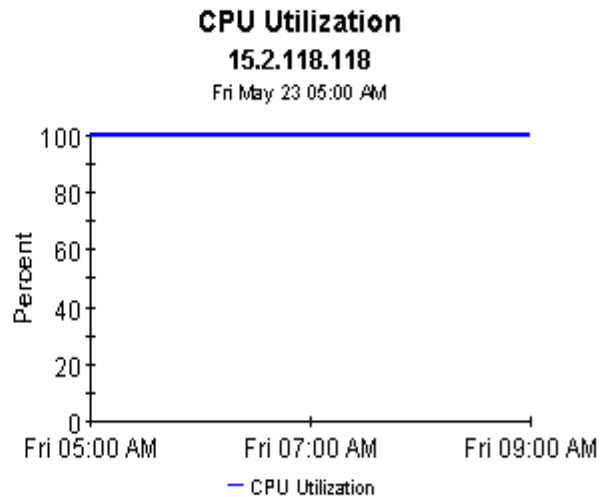
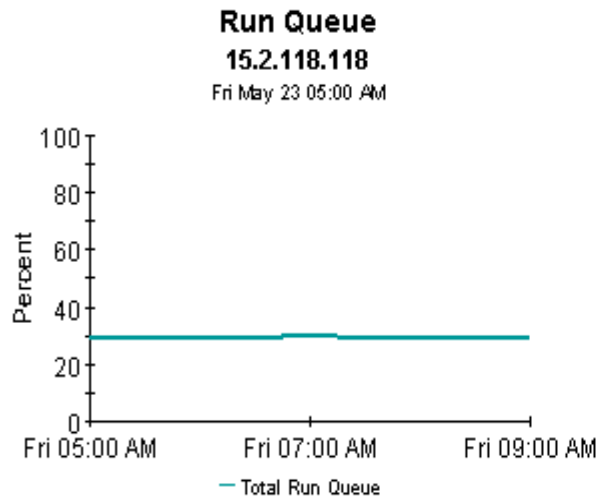
The System Resource Near Real Time QuickView gives the system management staff an up to date view of the performance of individual systems. By selecting a system from the top table, current system performance (up to the most recent data collection) can be investigated in detail.

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

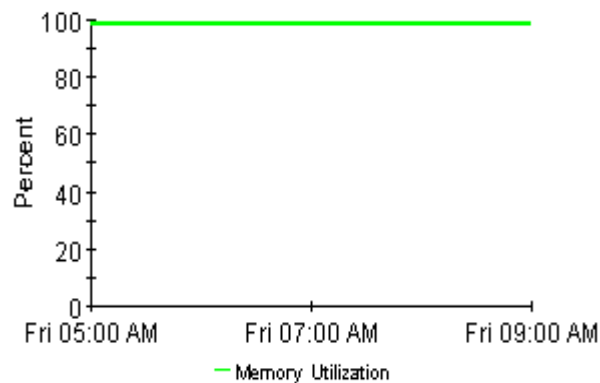


continues on next page

Memory Utilization

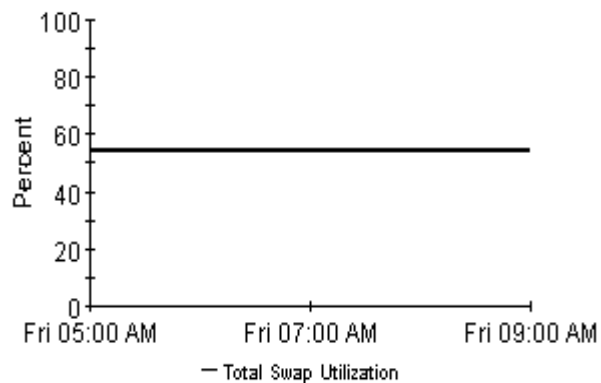
15.2.118.118

Fri May 23 05:00 AM

**Swap Utilization**

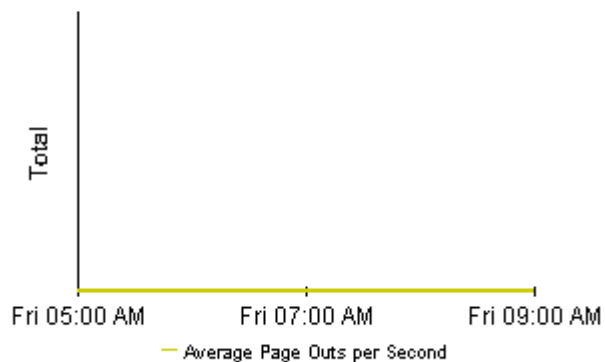
15.2.118.118

Fri May 23 05:00 AM

**Number of Page Outs**

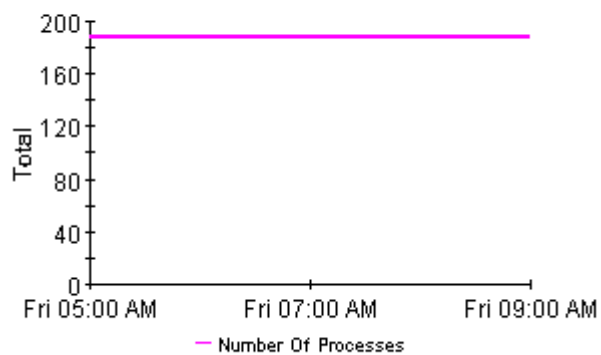
15.2.118.118

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.

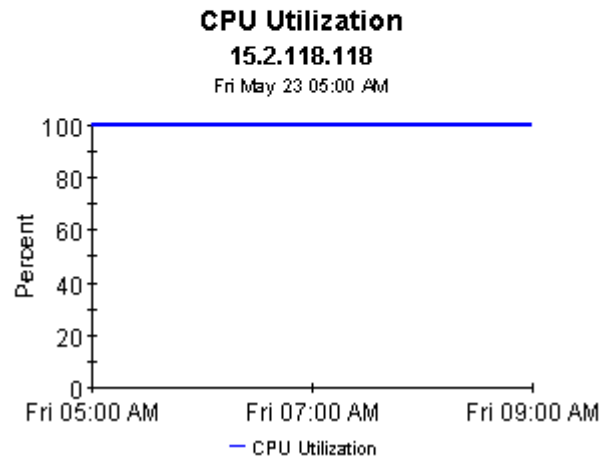
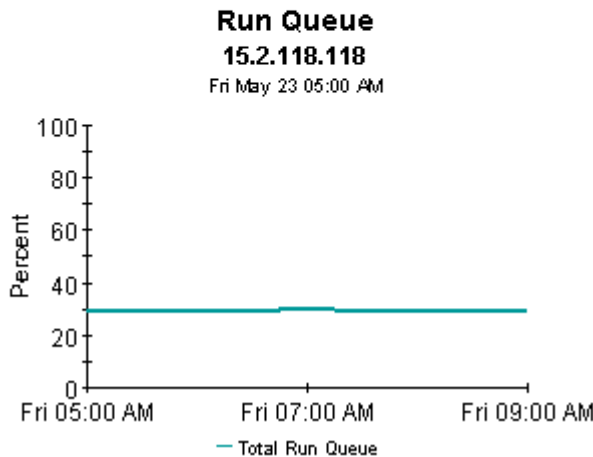
System Selection List

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

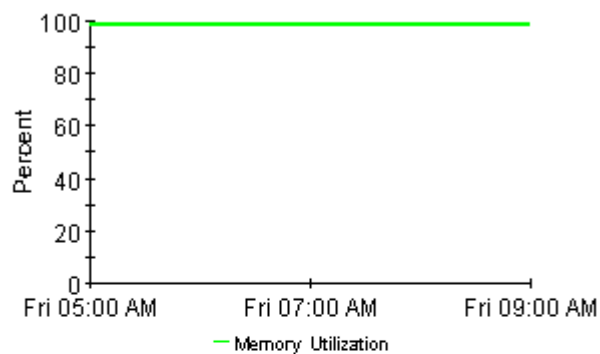


continues on next page

Memory Utilization

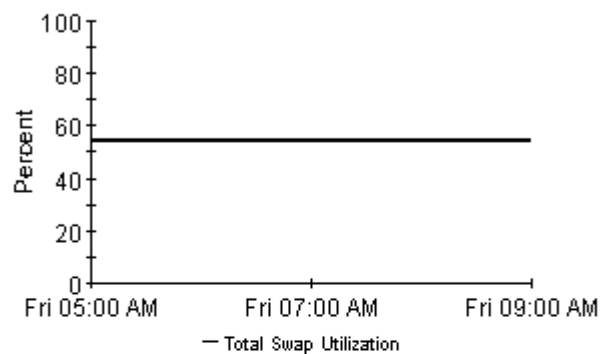
15.2.118.118

Fri May 23 05:00 AM

**Swap Utilization**

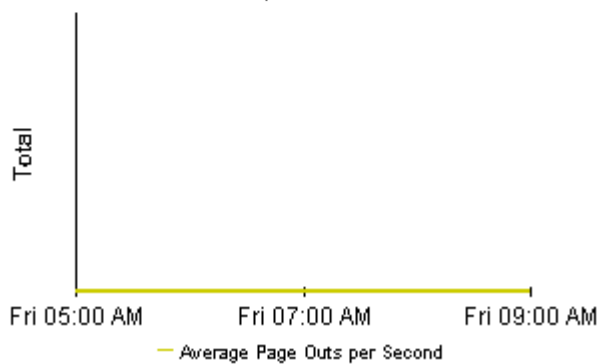
15.2.118.118

Fri May 23 05:00 AM

**Number of Page Outs**

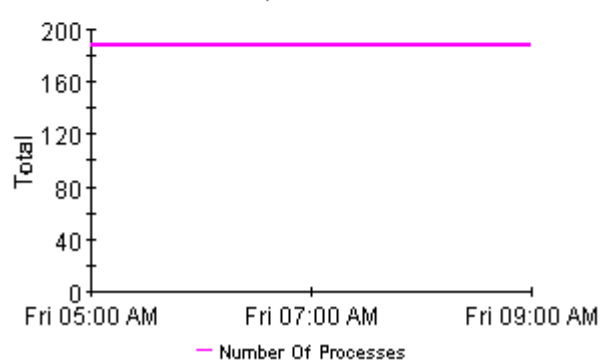
15.2.118.118

Fri May 23 05:00 AM

**Number of Processes**

15.2.118.118

Fri May 23 05:00 AM



Top Ten Reports

System Resources 4.0 contains two Top Ten reports:

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

Both reports perform ranking. The first one contains three tables and no graphs or charts. This report brings into sharp 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

continues on next page

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



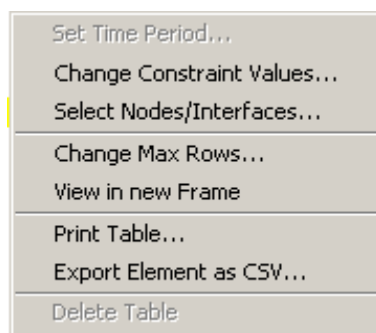
Editing Tables and Graphs

Any table or graph can be viewed in several ways. While the default view is usually adequate, you can easily change to a different view. If you are using the Report Viewer application, right-click the object to display a list of view options. If you are looking at a report using a web browser, follow these steps:

- 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 a Table

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.

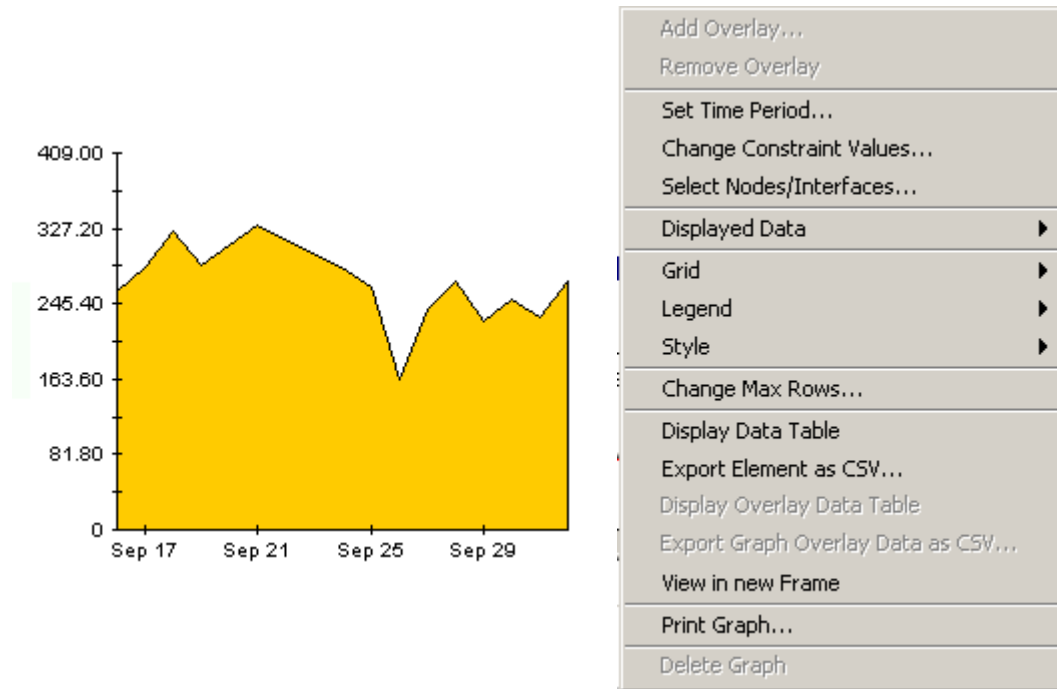
Change Max Rows increases or decreases the number of rows in a table. The default is 50. If you expand the default, the table may take more time to open. If you are trending a large network, using the default ensures that the table opens as quickly as possible.

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.

Table Viewer					
Polled IP QoS Statistics Data - Input Over Previous 6 Hours					
Direction	IpPrecedence	Switched Bytes	Switched Pkts	Time Period	
Input	0	105,688	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	
Input	5	0	0	Tue Oct 29 06:45 AM	
Input	6	0	0	Tue Oct 29 06:45 AM	
Input	7	0	0	Tue Oct 29 06:45 AM	
Input	0	97,539	648	Tue Oct 29 06:30 AM	
Input	1	0	0	Tue Oct 29 06:30 AM	
Input	2	0	0	Tue Oct 29 06:30 AM	
Input	3	0	0	Tue Oct 29 06:30 AM	
Input	4	0	0	Tue Oct 29 06:30 AM	
Input	5	0	0	Tue Oct 29 06:30 AM	
Input	6	120	1	Tue Oct 29 06:30 AM	
Input	7	0	0	Tue Oct 29 06:30 AM	
Input	0	90,744	564	Tue Oct 29 06:15 AM	
Input	1	0	0	Tue Oct 29 06:15 AM	
Input	2	0	0	Tue Oct 29 06:15 AM	
Input	3	0	0	Tue Oct 29 06:15 AM	
Input	4	0	0	Tue Oct 29 06:15 AM	
Input	5	0	0	Tue Oct 29 06:15 AM	
Input	6	0	0	Tue Oct 29 06:15 AM	
Input	7	0	0	Tue Oct 29 06:15 AM	
Input	0	103,775	656	Tue Oct 29 06:00 AM	
Input	1	0	0	Tue Oct 29 06:00 AM	
Input	2	0	0	Tue Oct 29 06:00 AM	
Input	3	0	0	Tue Oct 29 06:00 AM	
Input	4	0	0	Tue Oct 29 06:00 AM	
Input	5	0	0	Tue Oct 29 06:00 AM	
Input	6	0	0	Tue Oct 29 06:00 AM	

View Options for a Graph

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.



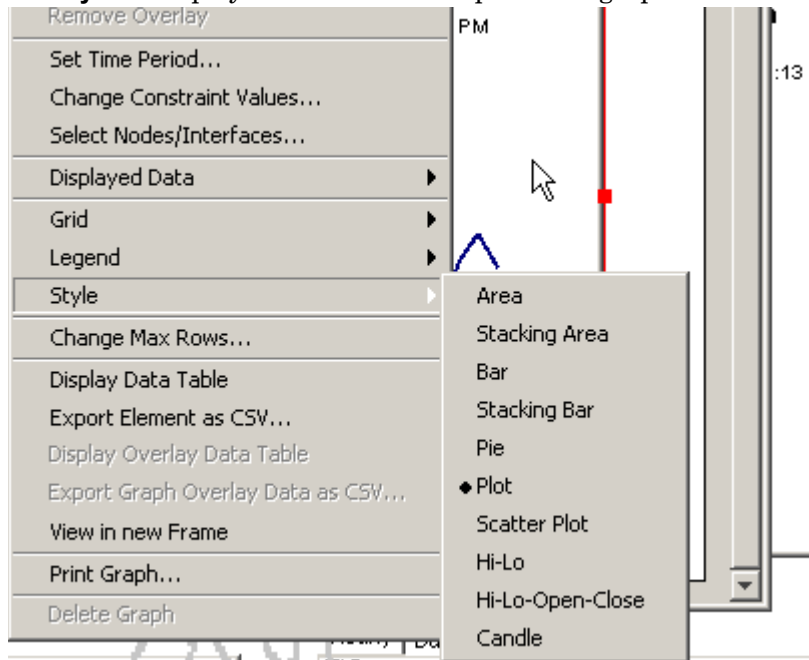
The following table provides details about each option.

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.

Option	Function
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.

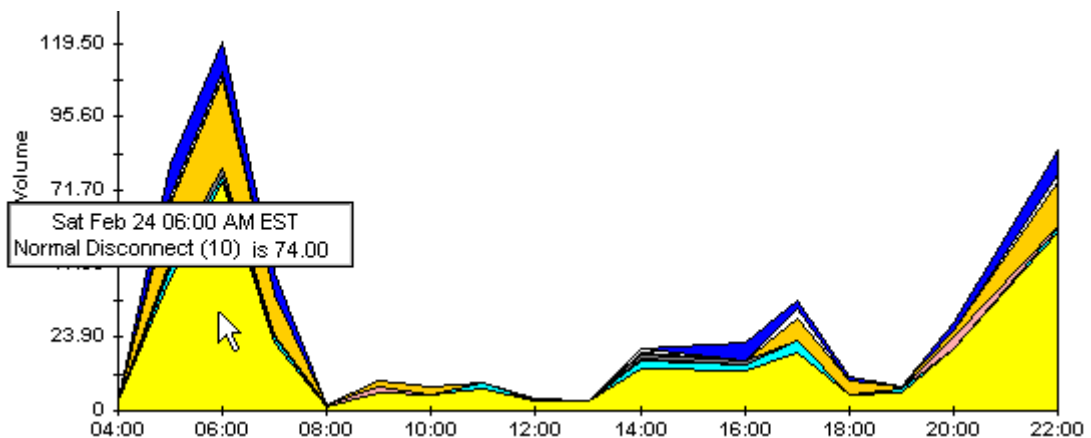
Style Options

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



Style > Area

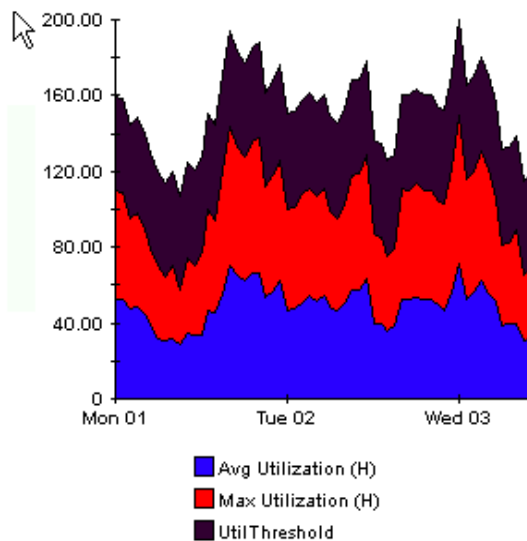
The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location



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.

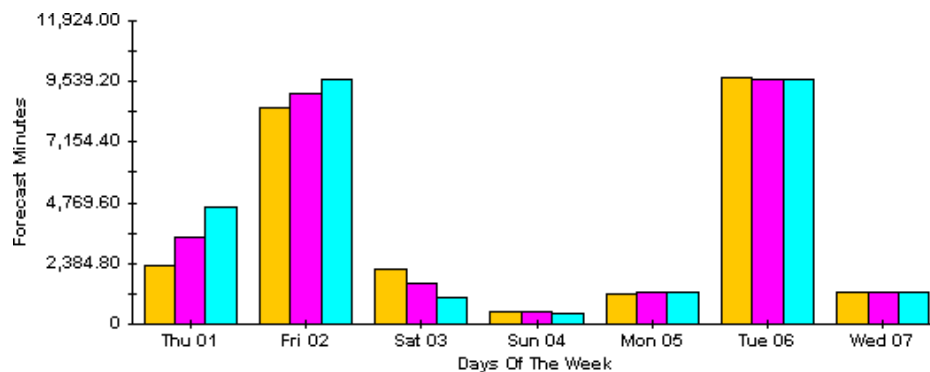
Style > Stacking Area

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



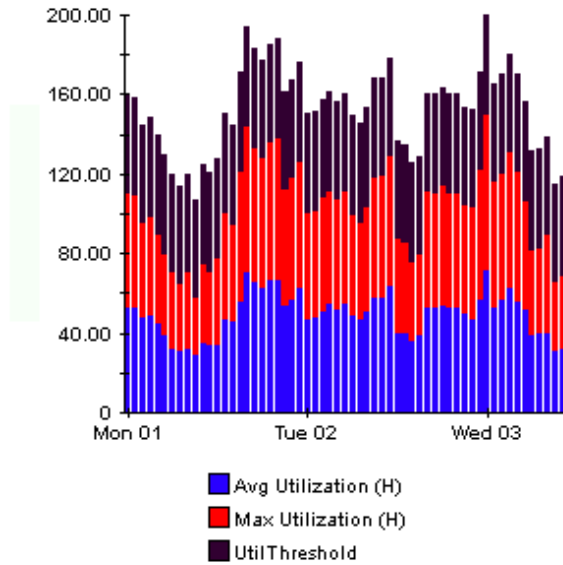
Style > Bar

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.



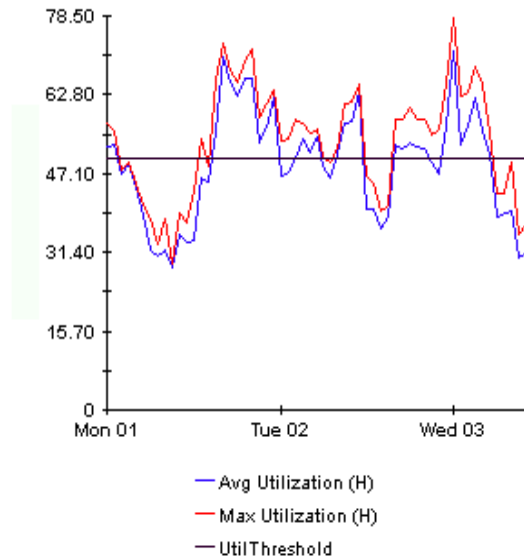
Style > Stacking Bar

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.



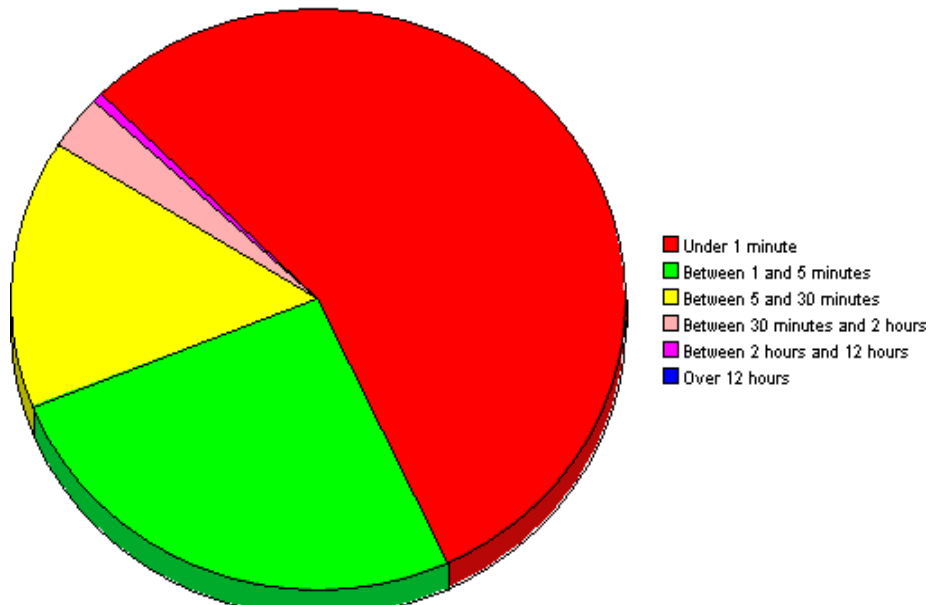
Style > Plot

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.

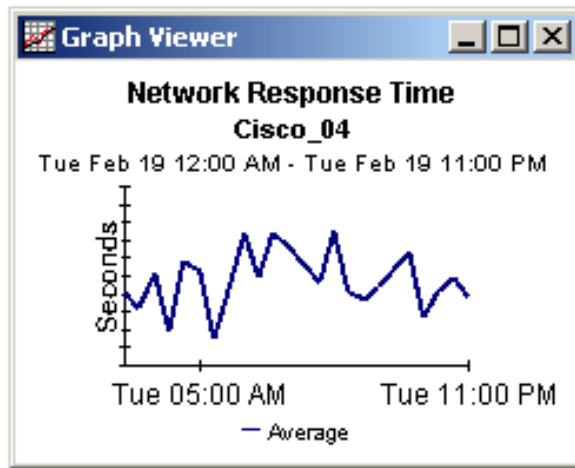
Display Data Table

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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