HP Performance Manager

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

Software Version: 9.20

PDF version of Online Help

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Contents

Chapter 1: Introduction to Performance Manager

HP Performance Manager (Performance Manager) is a web-based graphical analysis tool available on Windows, HP-UX, Solaris, and Linux operating systems. Performance Manager provides preformatted graphs and reports that you can use to evaluate system performance, to analyze usage trends and make system performance comparisons. You can use Performance Manager to analyze historic and real-time performance data available from connected data sources. This enable you take decisions while troubleshooting and help improve system performance.

HP Performance Manager performs the following functions:

- It enables you to design your own graphs, to compare metrics across various nodes and to compare multiple instances of a resource on the same node.

- It helps you visualize data from different data sources such as HP Performance Agent, HP Operations Agent, HP Reporter, Real-Time Measurement (RTM) and HP SiteScope.

- It enables you to draw and design performance graphs and tables for analyzing usage trend and correlation.

- It supports different output types such as XML, CSV, TSV and XLS.

- It enables you to perform administrative tasks such as restricted access through user logons.

- It provides you an Admin User Interface to manage nodes, define and manage customers and users.

Add Performance Manager to the List of Trusted Sites

You must enable JavaScript support in your browser by adding Performance Manager to your list of trusted sites. To add Performance Manager to your list of trusted sites for Internet Explorer or Mozilla Firefox browser perform the following tasks:

For Internet Explorer

1. On the **Tools** menu , click **Internet Options**. The **Internet Options** dialog box opens.

2. Click the **Security** tab. Click the **Trusted Sites** icon.

3. Click **Sites**. The **Trusted Sites** dialog box appears.

4. Enter the Performance Manager web server URL, and click **Add**. The URL you entered appears in the list of trusted sites.

5. Click **Close**.

6. Click **OK**.

For Mozilla Firefox

1. On the **Tools** menu, click **Options.** The **Options** dialog box appears.

2. Click the **Privacy** tab.

3. Click the **Exceptions** button.

4. Enter the Performance Manager web server URL in the box under Address of web site.

5. Click **Allow**.

6. Click **Close**.

7. Click **OK**.

8. Restart the browser.

Browser Settings

Before using HP Performance Manager, you need to install Adobe Flash Player and configure JavaScript support in your browser to be able to view the HP Performance Manager home page.

You also need to configure your browser settings to display Microsoft Excel and TSV files.

Configure Browser Settings to Display Microsoft Excel and TSV Files

You must check if the download option is enabled in the browser security settings. To check these settings in the Internet Explorer browser perform the following tasks:

For Internet Explorer

1. On the **Tools** menu of Internet Explorer, click **Internet Options**. The **Internet Options** dialog box appears.

2. Click the **Security** tab. Check if the security level in your browser settings is set to low.

3. Select the **Internet** icon, and click **Custom Level**. The **Security Settings** pop up appears.

> **Note:** If you are using Performance Manager as Local Intranet application, select the Local Intranet icon.

4. Scroll down to the Downloads section and select the **Enable** option under **File Download**.

5. Click **OK** and close the **Internet Options** dialog box.

6. In Control Panel, click **Folder Options**.

7. Click the **File Types** tab to display the list of registered file types.

8. Select **XLS** from the Registered file types list. For **TSV**, select the TSV file format from the list and click the **Advanced** button. The **Edit File Type** pop up appears.

9. Clear the **Confirm Open After Download** check box.

10. Click **OK**.

> **Note:** If TSV is not added to the list of registered file types, you need to add it first and then edit the file type settings.

Configure Support for JavaScript

If JavaScript is not enabled in your browser the HP Performance Manager home page does not appear. The browser displays a message "JavaScript is not enabled in your browser. Enable JavaScript to view this page".

To configure JavaScript support for your Internet Explorer or Mozilla Firefox browser perform the following tasks:

For Internet Explorer

1. On the **Tools** menu of Internet Explorer, click Internet Options. The **Internet Options** dialog boxappears.

2. Click the **Security** tab. Check if the security level in your browser settings is set to high.

3. Select the **Internet** icon, and click **Custom Level**. The **Security Settings** pop up appears.

> **Note:** If you are using Performance Manager as Local Intranet application, select the Local Intranet icon.

4. Scroll down to Scripting section and select the **Enable** option under **Active Scripting**.

5. Click **OK**.

6. Click **Apply**.

For Mozilla Firefox

1. On the **Tools** menu, click **Options**.

2. Click **Content** (in Firefox version 3.5 and 3.6).

3. Select the **Enable JavaScript** check box.

4. Click **OK**.

Install Adobe Flash Player

If Adobe Flash Player is not installed on your browser, Performance Manager Home page does not appear. The browser displays a message "Install Adobe Flash Player to view the Performance Manager Home Page", you can click the message to install Adobe Flash Player.

Chapter 2: Getting Started with HP Performance Manager

You do not require any user name or password to log on to Performance Manager by default. If there is no password assigned for the blank user logon, the home page appears on starting Performance Manager. If you want to have a user name and password created, contact your Performance Manager administrator. If your Performance Manager is configured with Microsoft Active Directory server, the home page will prompt you enter your user name and password to enable access to Performance Manager. For more information on Microsoft Active Directory Configuration, see *HP Performance Manager Administrator Guide*.

After you log on to HP Performance Manager, the Home Page appears. The home page consists of Standard View and Diagnostic View.

The Home Page displays helpful tips on using Performance Manager under the Tip of the Day section. If you do not want to view these tips, select the Don't Show Tips check box, and then click ☒.

The tip reappears if you launch the Home Page after clearing the history of your web browser. To completely disable the Tip of the Day feature, set the `SHOW_TIP_OF_THE_DAY` variable in the `OVPMConfig.ini` file to `false`. See the *Performance Manager Administrator Guide* for more information.

> **Note:** You can configure the time period after which Performance Manager browser session expires. The default session time-out value is one hour.

Standard View

The Standard View shows the node list tree on the left and graph list on the right.

The nodes in the node tree are sorted alphabetically. Only nodes which are added to Performance Manager and imported from Operations Manager are sorted alphabetically. The nodes imported from Reporter, and SiteScope Server are not sorted alphabetically.

> **Note:** If the Performance Manager administrator makes any changes to a node group, the node group appears collapsed. Expand the node group to view any new changes to the list of nodes or groups.

From this page, you can perform the following tasks based on your profile:

- Search Nodes

- Add Nodes Temporarily

- Import Nodes from HP Operations Manager, HP Reporter and HP SiteScope Server

- Configure Instance Selection Option for Multi-Instance Class of Metrics

- Reload Graphlist

- View Graphs

- Modify Default Date, Time and, Summarization Settings for Graphs

- View System Information

- Change Password

- Administer Performance Manager if you are an Administrator

You can also perform the following graph related functions

- Drawing Graphs

- Designing Graphs

- Editing Graphs

- Editing Graphs (if user-defined)

- Managing Favorite Graphs

- Using the Design Wizard

Search Nodes

You can search for a node using the Search feature.

- Type the name of the node in the text box and click Search 🔍. You can also press **ENTER** to search for the node.

- If the node you are searching for is available, the node is highlighted.

- If the node you are searching for is present within a node group, the node group expands and the node is highlighted.

- You can search for a node by typing the first alphabet of the node name or you can also search for a node by typing in any of the characters of the node name. The text you type in the text box is not case- sensitive.

- If the node you are searching is not available, a message stating that the node is not found appears. You can add the node entered in the text box directly to the node list tree by clicking the Add a Node icon 🖼️.

Note: In the **Manage Nodes** option of the **Admin** menu you cannot search for HP Operations

Manager, HP Reporter, and HP SiteScope nodes. Only the respective node groups are visible. However, you can search for Performance Manager nodes and node groups.

Add Nodes Temporarily

To add a node temporarily:

1. Click **Add Nodes** icon 🖥️ . The **Add a Node** window appears.

2. Type the name of the node which you want to add in the text box.

3. Click **Add**.

Alternatively, you can also add a node temporarily by entering the name of the node in the search text box and clicking the 🖥️ icon. The newly added node is displayed at the bottom of the node list and appears highlighted.

The Performance Manager administrator can enable or disable the option to temporarily add nodes. For more information, see *HP Performance Manager Administrator Guide.*

The Performance Manager administrator can add and delete nodes permanently through the Manage Nodes screen. In case you want to add and delete nodes permanently, contact your Performance Manager administrator.

Nodes added temporarily are not alphabetically sorted. Nodes added temporarily in the Standard View page will not be displayed in the Diagnostic View, also any node added temporarily in the Diagnostic View page will not be displayed in the Standard view.

You cannot upload or manage a flat file from the Performance Manager user interface. A flat file is essentially an ASCII text file with one record per line. Every field in the line is separated by a tab, or a comma. A header line at the top of the file defines the contents of the file including the date, time and metric names. A flat file or business unit file will be treated as a node and has to be uploaded by the Performance Manager administrator to the Performance Manager server. For more information, refer to the *HP Performance Manager Administrator Guide.*

A flat file has to be uploaded by the Performance Manager administrator to the Performance Manager server. After the flat file is uploaded, it appears on the node list tree under the node group called "file".

Import Nodes

This option allows you to import nodes from HP Operations Manager for Windows, HP Reporter, and Agentless Data source to Performance Manager.

From HP Operations Manager

Performance Manager imports the list of nodes configured in HP Operations Manager for Windows when Performance Manager starts. The following option can be used to import the node list anytime after startup:

- Click **Nodes -> Reload HPOM**. Performance Manager retrieves the nodelist from Operations Manager and reloads the nodelist tree in the **Select Nodes** window. Any new node added to

Operations Manager is also listed on reload.

> **Note:** This option is enabled only if Performance Manager is configured to import the nodelist from HP Operations Manager (HPOM). If you do not want to import nodes from HPOM, contact your HP Performance Manager administrator to disable this option.

From HP Reporter

Performance Manager imports the list of nodes configured in HP Reporter when Performance Manager starts. The following option can be used to import the node list anytime after startup:

- Click **Nodes -> Reload Reporter**. Performance Manager retrieves the nodelist from Reporter and reloads the nodelist tree in the **Select Nodes** window. Any new node added to Reporter is also listed on reload.

> **Note:** This option is enabled only if Performance Manager is configured to import nodelist from Reporter. If you do not want to import nodes from Reporter, contact your HP Performance Manager administrator to disable this option. However, you will still be able to use REPORTER and REPSYS data sources to design and draw graphs.

From Agentless Datasource

Performance Manager imports the list of nodes configured in HP SiteScope Server when Performance Manager starts. The following option can be used to import the node list anytime after startup:

- Click **Nodes -> Reload Agentless**. Performance Manager retrieves the nodelist from the SiteScope Server and reloads the nodelist tree in the **Select Nodes** window. Any new node added to SiteScope Server is also listed on reload.

This option is enabled only when Performance Manager is configured to import nodelist from SiteScope Server. If you do not want to import nodes from Agentless Server, contact your HP Performance Manager administrator to disable this option.

You can import both host based nodes and non-host based nodes from Sitescope Server. Host based nodes are directly listed under the nodegroup specified in the OVPMconfig.ini file. Examples of Host based nodes are those that are monitored by monitors like CPU monitor, File monitor, Memory monitor, and so on. These have HOSTNAME as a key metric in Sitescope Server.

Sitescope Server also has non-host based nodes like Web Service monitor, URL monitor, LDAP monitor, and JMX monitor, and so on. The nodes monitored by these monitors are also imported by Performance Manager and they get grouped under the corresponding CLASSNAMES. For example if you have configured Performance Manager to import nodes from Sitescope Server abc.xyz.com into the nodegroup 'DataCenter1', and if this Sitescope Server has a URL monitor which is monitoring 'url1' and 'url2', then the imported nodegroup will be displayed.

The nodegroup names for non-host based monitors are not configurable and are automatically set based on the classname in which they get logged. These classes do not have HOSTNAME as a key metric.

Configure Instance Selection option for multi-instance class of metrics

When you are using multi-instance class of metrics to draw or design a graph, you can enable or disable the 'Instance Selection' option. The Performance Manager administrator can configure the default value.

If you want to select instances:

- Click **Graph** → **Instance Selection - Turn On**. When you draw a graph with multi-instance class of metrics, a prompt to select instances appears.

If you want to disable the instance selection option, do the following:

- Click **Graph** → **Instance Selection - Turn Off**. When you draw a graph with multi-instance class of metrics, all instances of the metric appears in one graph.

However the option you select is effective only for the current session and will be reset to the default value the next time you logon.

Reload Graphlist

Use this option to view the most recent changes made to the graph list. You can view the changes made by another user with the same login credentials in a different session. To reload graph list click **Graphs** -> **Reload Graphlist**.

View Graphs

From the menu bar, click **View -> Drawn Graphs**. Any graphs which are drawn previously appear.

Multiple graphs appear as tabs in the same window.

Change Date Defaults

HP Performance Manager uses the date settings specified in the template by default. For more information, see Changing Default Settings.

When you are drawing more than one graph, any changes to the default values which you have specified will be retained while drawing another graph. The values specified will not be reset.

View System Information

To view system information for a node, perform the following tasks:

- Select the system for which you want to view system information from the node tree. Click .

- The system information of the selected node appears in a new page. The system information includes details such as: System ID, the Data source, Data communication protocol, Number of disks and CPUs available, Operating system name, Operating system version, list of key metrics and available metric classes and number of instances available for each metric class.

Change Password

You can change your password once you log on to Performance Manager. To change the password, perform the following tasks:

1. From the menu bar, click **Admin** -> **Change Password**. The Change Password window appears.

2. Enter the new password in the **New password** text box.

3. Re-enter the new password in the **Confirm Password** text box again.

4. Click **OK**. A confirmation message which states that your password has been changed successfully appears.

If you are a Performance Manager administrator, you can perform the following tasks from the Standard-view:

> **Note:**
>
> - The maximum length for a password is 15 characters. The password can be a combination of alphabets, numbers, and the special characters: **!**, **@**, **#**, **$**, **^**, *****, **_**.
>
> - You need to enter the same password string in both the places to ensure that your password change is successful.
>
> - The Change Password option is not available when you log on to Performance Manager which is configured with the Microsoft Active Directory server.

Administrator tasks

If you are a Performance Manager administrator, you can perform the following tasks from the Standard-view:

- "Manage Nodes" on page 62

- "Manage Users" on page 64

Drawing Graphs

You can draw graphs using a set of predefined templates or your own graph templates

- Select a node or a flat file for which you want to draw a graph from the node tree on the left pane. You can also select multiple nodes to draw a graph. Flat files are categorized under the family name "File".

> **Note:**

- Graphs are drawn in one or more tabs based on the type of graph.

- Performance Manager supports the use of flat files or a business unit files to upload data for analysis. A flat file or business unit file is treated as a node and has to be uploaded to the Performance Manager server. A flat file can be uploaded only by a Performance Manager Administrator.

- Select a graph from the graph list in the right pane. You can also create your own graphs using the Design wizard. Performance Manager maintains a graph Family tree, which consists of Family, Category and Graph Name. Graph Family refers to the group that organizes graphs and Graph category refers to the various categories of graphs within the family. The Graph Name uniquely identifies a graph definition.

  Note:

  - You can also modify default settings for date, time, and summarization. If you want to modify the default settings, see Change Date Defaults.

  - When you are drawing more than one graph, any changes to the default values which you have specified will be retained when you draw more graphs until you modify these values.

  - A graph template designed for a flat file, by default will include the details of the flat file for which the graph template is designed. In case you want to select a different flat file, make sure the metrics in the graph template is same as the metrics available in the new flat file.

  - There are SiteScope metrics that are aligned with Performance Agent (PA) metrics. Hence, if you are drawing an out-of -the-box graph against an Agentless node that contains one or more of the aligned metrics, the graph will be drawn only for those metrics.

- Click **Draw** to get a graph with default properties. The graph appears in a new tab in the same browser window.

  Note:

  - If you select a node without selecting a graph and click **Draw**, the **Graph Selection** pop-up appears. Select a graph and click Draw. Click **Cancel** to close the pop-up.

  - If you click **Draw** without selecting a graph and a node, the pop-up for **Node Selection** appears. After you select a node, a pop-up for **Graph Selection** appears.

  - If you select a Graph without selecting a node and click **Draw**, the **Node Selection** pop-up appears. Select a node and click Draw. Click **Cancel** to close the pop-up.

> ■ If you are drawing a user-defined graph and if you have not selected a node while drawing the graph, by default the node selected during design time is used in the graph. If you select another node when you draw the graph, this selection will override the node selected during design time.

- Click **Back to Home** at the bottom of the page or **Home** from the menu bar, to go to the home page. To view the drawn graphs from home page, click **View → Drawn Graphs**.

- To view the data in tabular form, you can use drill down option. You can also use this option to draw a different graph (image or table).

- To print a graph, click on **Graphs → Print**. The graph appears with information in the print view.

- You can zoom-in to view a smaller set of data points and zoom-out to reset and view the original graph.

- You can also export the graph to formats such as TSV, CSV, XLS, XML. Click **Graphs → Export**. The **Export from a Graph** window appears. From the **Export type** drop-down select the required format. Click **OK**, the graph in the selected format appears in a new window.

- You can also modify a drawn graph. You can preview the modified graph and save it as a different graph. Click **Graphs → Edit**. The Metric Selection page in the Design Wizard appears. You can edit the graph attributes. To go back to the graph, click **View → Drawn Graphs**.

- You can draw any number of graphs and each graph would be displayed in a different tab in the same page. The first graph appears in a new window and the subsequent graphs appear in tabs on the same window. You can also create a list of favorite graphs.

> **Note:** If you have too many graphs open on the screen, it might be difficult scroll and view all graphs. To close all graphs, click **Graphs → Close All Graphs**.

Graph types

Select the graph style from the drop-down selection box:

Line - Draws each metric as a line. Line Styles and Markers are only valid for this graph type.

Area - Also known as a filled line graph. This shows each metric as a line with data below the line filled in the same color. Multiple metrics must have the same units.

Bar - Vertical bars for each metric.

Mixed - Each metric can be individually set as a line or area.

Horiz bar - Horizontal bars for each metric.

Pie - Circular pie chart.

Gauge - Displays a single automotive type dial gauge for each metric

Table - Tabular display of the data with columns for each metric and each record displayed in its own row.

Horiz table - Horizontal table with columns for each record and each metric displayed in its own row.

Baseline - Shows the average values for a single metric for a "typical week." A baseline graph is useful to identify patterns in system activities. All the available data from the data source is used to generate this baseline and so it may take a few moments to produce. To calculate the baseline for a typical day, Performance Manager requires more than 7 days of data for the selected system.

When you draw a baseline graph, 8 graphs are drawn. The first graph in the series is a "typical week" graph which displays the average values of a system, organized by day of the week, and by hour of the day. Following this graph are 7 graphs displaying the expected high and low values for the metric versus the actual metric value. The subsequent graphs display values for all the days of the week. In the subsequent graphs, the blue line displays the range of the values that is "Expected" at a particular hour of the day of the week. The expected values are determined by examining all past data for the system and calculating statistics for every hour of every day of the week. The blue lines typically display the range where 80 percent of the data points are expected to fall. The red line displays the actual data for each hour of the day.

> **Note:** Baseline graphs do not support the following features, which are supported by other graph types:
>
> - **Mouse Hover** - You cannot see the date and other information by hovering the mouse on the graph.
>
> - **Export** - You cannot export the performance data to any format.
>
> - **Drill Down** - You cannot drill-down graph to view the historic data for a selected period.
>
> - **Zoom in/ Zoom out** - You cannot adjust the summarization levels in the graph for a selected time-frame.
>
> - **Previous/ Next** - You cannot view the data for adjacent time-frames.

XML - Returns the data in XML format.

Excel - Returns the data as an Excel spreadsheet. The client should have Microsoft Excel™ installed in order to properly view this graph type.

TSV - Returns the data as Tab Separated Values. This format is similar to CSV except that it separates each item with the tab character instead of a comma. This format may be easier to display since the tabs tend to visually align each column.

> **Note:** If you are selecting a Microsoft excel or a TSV graph, you need to configure the browser settings to display Microsoft Excel and TSV files. For instructions, see Configuring browser settings to display Microsoft Excel and TSV files.

CSV - Returns the data as Comma Separated Values (The values are separated by commas) This is a generic way of representing data that is importable into a variety of other products.

Drawn Graphs

From the home page, click **View → Drawn Graphs**, the graph appears in one or more tabs.

- On this page, Performance Manager provides the following navigation options:
  - Performance Manager provides **Prev** and **Next** buttons based on the value specified for "points every" while drawing a graph.

  - Performance Manager provides **Append** and **Prepend** buttons based on the value specified for "points every" while drawing a graph.

- To view the data in tabular form, you can use Drill down option. You can also use this option to draw different graph (image or table).

- You can add the graph as a favorite graph .

- To view the most recent changes, select the checkbox Automatically Refresh. The most recent data from data sources is displayed.

- To print a graph, click on **Graphs → Print**. The graph appears with information in the print view.

- You can zoom-in to get a narrow down the view to a smaller set of data points and zoom-out to reset and view the original graph to narrow down to one set of data.

- You can also view the exact value of the data when you hover the mouse over the points on the graph a pop-up displaying the actual value of the data point and time stamp appears. If the graph type is line, the pop-up also displays the line color of the selected data point and metric name. However you can turn-on or turn-off the mouse hover option as required. To turn off this option, click **Graphs → Mouse Hover-Turn Off**. But this setting is effective only in the current session and is reset to the default option in the next session. To turn on this option, click **Graphs → Mouse Hover-Turn On**. The Performance Manager administrator can configure the default.

- You can also Hide or Show metrics after the graph is drawn to view only the required set of metrics without editing the graph.

- You can use the Y-axis scroll bar available beside the Y-axis to adjust the scale range.

- You can also export the graph to formats such as TSV, CSV, XLS, and XML. Click **Graphs → Export**. The **Export from a Graph** window appears. From the **Export type** drop-down select the required format. Click **OK.** The graph in the selected format will appear in a new page. For the *details* graphs that present data in the tabular format across multiple pages, you can select the All Data checkbox to export records from all pages.

- You can also modify a graph. Click **Graphs → Edit**. The Metric Selection page in the Design Wizard appears. You can edit the graph attributes. To go back to the graph, click **View -> Drawn Graphs**.

If Performance Agent, version 5.00 is installed on the node, older versions of user-defined graph templates containing Virtualization metrics or metrics from the 'Logical system' class created using older version of Performance Manager, will work if you manually update the graph templates by replacing the label `BYLS_LS_ID` and `BYLS_LS_NAME` with `BYLS_DISPLAY_NAME`.

If you are launching a VIRTUALIZATIONGRAPH using a graph template
"VIRTUALIZATIONGRAPH " containing logical system class of metrics for an instance Guest1,
which is configured with Resourcepool1 and installed on Host1, then the format of the path will be
as below:

```
http://<servername>:8081/OVPM?SYSTEMNAME=ConfiguredVIMANODE&GRAPHTEMP
LATE=VIRTUALIZATIONGRAPH&GRAPH=VIRTUALIZATIONGRAPH
&INSTANCE=Host1/Resourcepool1/Guest1
```

DrillDown

You can use the **DrillDown** option to view the data displayed on a graph in tabular form. You can
also use this option to draw different graph (image or table) with more granularity:

a. Click **DrillDown** option on the **Graphs** menu. The **DrillDown** pop-up appears.

By default, the start Date and end Date of the table graph after drill down is same as the
start date and end date of the original graph. To view more granular data, perform the
following steps:

i. Under **Start Date**, drag the indicator to specify a start date and time.

ii. Under **End Date**, drag the indicator to specify an end date and time.

iii. Select one of the following options from the **Drill To** radio buttons.

i. **Graph** - Select this option if you want to drill down to a specific time-interval and more
granular data in the graph format.

ii. **Table** - Select this option if you want to view records in tabular format. The graph type
will be changed to table format. You can also filter or highlight the data in tabular form.

iii. **Process Table** - Select this option if you want to view the process details on the
selected node.

iv. **Draw a Different Graph -** Select this option if you want to draw a different graph to
compare with the current graph. The graph list appears. Select a graph. This option is
disabled if you select drill down to **Process Table**.

v. Click **Draw**. The data you requested appears in the format you specified while drilling down.

Note: The DrillDown option is available only for image graphs. This option is not available for
non-image graphs such as table, XML, excel.

Table Highlights

If you have chosen to view the data in the tabular format, you can highlight a cell based on its
content and set conditions to highlight the contents based on the metric value, so that the records
can be accessed easily.

To highlight a cell in the drill-down table,

a. On the **Graphs** menu, click **Add Highlights**. The **Table Highlights** pop-up appears.

b. The **Table Highlights** window displays the following options:

  ○ The metrics list displays all the metrics of the metric class. By default, the first metric of the drill-down table is displayed.

  ○ The comparison symbol list displays the comparison symbols to set the condition to the filter. By default, = sign is displayed.

  ○ The text box allows you to type a value to compare against the metric.

  ○ Click **Add** to list the given condition below.

  ○ If you want to edit the condition you have just added, make changes and click **Update**.

  ○ **Selected color** displays the cell color you chose.

  ○ Click **Color** to pick any color of your choice which will be used to highlight the table cells of matching conditions.

  ○ If you want to remove a condition from the list, select the condition and click **Remove**.

  ○ Click **Remove All** to remove all the conditions appearing in the list.

  ○ Click **OK** to filter the data based on the conditions specified in the list.

  ○ Click **Cancel** to close the Table Highlights window.

  ○ Click **Help** to display the context-sensitive help topics.

c. Select the metric which you want to highlight based on a condition.

d. Select a comparison symbol. Enter a value to compare against the metric.

e. Click **Color**, to add a color to the cell. The color picker pop-up appears. Select a color, from the color palette and click **OK**.

f. Click **OK**.

Auto Refresh

When you select the **Automatically Refresh** check box, the graph is redrawn approximately every five minutes with the latest data available from the data source. Use this feature to refresh the graph with recent changes from the data source.

The updates in the graph are obvious unless the Points Every value is set to small intervals, such as every five minutes. The last point on the graph is re-calculated and re-averaged with the new data. Any new point will not be plotted until it has reached the next interval. For example, if the Points Every is set to 1 hour, a new point will not be plotted until it is 1 hour past the last point on the graph.

> **Note:** The Automatically Refresh option is not available for forecast graphs.

Print View

To print a graph, do the following:

a. Click **Graphs** -> **Print**. The graph appears in a new window. This window displays the graph with a complete description of graph data. In addition, the **Print** dialog box appears with the default options pre-selected.

b. Click **Print** to print the graph with the graph information.

Zoom-in and Zoom-out

After you draw a graph you can zoom-in to view a smaller set of data points and zoom-out to reset and view the original graph:

a. To zoom-in data, click and drag the mouse to a rectangular area on the graph from left to right. The selected area is expanded. The zoom-in time frame appears below the graph image.

b. To zoom-out data, click and drag a rectangular area on the graph from right to left. When you zoom-out a graph, the graph is reset to its previous state.

You can zoom-in data up to multiple levels. Every zoom-out will take the graph to its previous state.

> **Note:** This option is available only for image graphs. However this option is not available for image graphs such as pie, gauge, and forecast.

Hide or Show metrics

After you draw a graph, you can hide metrics and view only a required set of metrics without editing the graph. To hide or show metrics, perform the following tasks:

a. After you draw, click **Hide/Show Metrics**. The **Hide or Show Metrics** pop-up window appears. The pop-up displays a list of metrics available in the graph with a check-box against each metric. By default all the metrics available in the graph are pre-selected.

b. To modify the metrics appearing on the graph, select only those metrics which you want to appear on the graph and unselect those metrics which you do not want in the graph. Use **Select All** checkbox if you want to select all the metrics. If you want to clear the selection, use the **Clear All** checkbox.

c. If you want to view the graph with selected metrics without closing the **Hide or Show Metrics** pop-up, Click **Apply**. The graph is now redrawn with only those metrics which you have selected. However the window remains open till you click **OK**. You can continue to modify the metric selection.

d. Click **OK** after you have selected the metrics which you want to appear in the graph. The graph is redrawn with the metrics which you have selected and the **Hide or Show Metrics** pop-up is closed.

e. Click **Cancel** to close the **Hide or Show Metrics** pop-up without making any changes.

> **Note:** The option to hide or show metrics is not available for graph types: table, pie, bar, gauge, horizontal bar graph, htable, xml, csv, tsv, excel, baseline and forecast.

Y-axis scrolling

Use the Y-axis scroll bar available beside the Y-axis to adjust the scale range. For example, if you want to view CPU utilization between 0 to 50% range, you can set the scroll bar to display the data within that range.

To view data for a specific range, set the vertical scale on Y-axis by moving the slider up to increase the maximum value on the scale and by moving it down to decrease the upper limit. The minimum value that you can set on Y-axis is 1 and you can scale the slider up to 1 billion. When the upper limit is set to 1000 or 10000 or 1 million, Performance Manager redraws the graph to display the required data.

The graphs with the right Y-axis also provide you with the option to set the vertical scale. Use the slider on the right Y-axis scroll bar to increase or reduce the upper limit.

Delete Graphs

You can delete only user-defined graphs. Follow these steps:

1. From the menu, select **Graphs → Delete a Graph**. The **Graph Selection** window appears. This window displays a list of user defined graphs.

2. Select the graph which you want to delete and Click **Delete**. A message asking you to confirm deletion appears.

3. Click **OK**. A message confirming the deletion appears.

4. Click **OK**.

> **Note:**
>
> - You cannot delete out-of-the-box graphs.
>
> - You can delete graphs which you created or which are created using your credentials.

Using the Design Wizard

Using the design wizard you can do the following:

- "Designing Graphs" below

- "Editing Graphs" on page 51

If you are designing a new graph, the design wizard displays "Design Wizard - New Graph" in the title of the design wizard pages.

Designing Graphs

You can design a graph and save this as a template.

1. From the menu, click **View** → **Design wizard** or click **Graphs** → **Design a Graph**. The **Design Wizard** window appears.

2. Select **Design a New Graph** and click **Next**. The following options appear in the **Design Wizard - New Graph** page:

   - Designing a Normal Graph: Select this option to draw a normal graph. A normal graph consists of metrics from only one data source. The metrics can belong to multiple classes.

   - Designing a System Comparison Graph: Select this option to draw a system comparison graph. A system comparison graph can be used to compare data from multiple nodes. You can select one or more nodes but you can select only one metric. While designing a system comparison graph, you can select only those metrics which do not have multiple instances. You can compare one metric across multiple systems. At the time of design you can select only one node. When you preview graphs, you can select more nodes.

   - Designing a Instance Comparison Graph: Select this option to draw an instance comparison graph. An instance comparison graph can be used to compare two or more instances of a metric from a single data source from a node. You can select at least two instances for comparison. You can select only one metric. You can compare multiple instances of a metric on the same node. When you preview a graph while designing, from the design wizard or draw from the display page, you can select one or more instances.

   - Designing a Multi-source Graph: Select this option to draw a multi-source graph. A Multi-source graph can be used to compare multiple nodes with multiple metrics. The metrics can belong to multiple classes. You can select multiple data sources. After you select a node, you can select metrics from multiple data sources available on the selected node. In case you have selected multi-instance metrics, you can also specify the instance.

   - Designing a Forecast Graph: Select this option to draw a forecast graph. A forecast graph can be used for Capacity Planning. Performance Manager allows you to design forecast graphs. Performance Manager uses time-series based statistical forecasting techniques to predict the service demands of users.

3. Select the type of the graph you want to design and click **Next**. Based on the type of graph you select, the design wizard takes you through the steps to design a graph.

Capacity Planning

The objective of computer capacity planning is to provide an acceptable, cost-effective level of IT services to users while responding to workload demands generated by business requirements. Capacity planning is an important part of managing an adaptive enterprise. Capacity planning begins with collecting performance data.

The key to effective capacity planning is to understand the relationship between business requirements, systems, network workload, IT infrastructure capacity, and the level of service required by users. Changes in the business environment often result in changes in systems and network workload. Planning for capacity changes can help you anticipate problems and suggest capacity adjustments with greater confidence.

Node Selection

A window displaying a list of Nodes and flat files appears. If the Performance Manager administrator makes any changes to the node group, the node group appears collapsed in other pages like home page, design wizard etc. Expand the node group to view any new changes to the list of nodes or node-groups.

If you want to design a graph using a flat file as a data source, you must make sure that the file is uploaded to the Performance Manager server. A flat file can be uploaded only by a Performance Manager administrator. For more information, see *HP Performance Manager Administrator Guide*. Select the node or flat file for which you want to design the graph. Flat files are categorized under the family name "**File**".

While designing a **Normal Graph**, if you do not select any node and if Reporter is configured on your system, by default **Reporter** will be selected. For more information, refer to the *HP Performance Manager Administrator's Guide*.

If you want to design a graph using Agentless data source, you must make sure that the Agentless Server is configured on your system. An Agentless Server can be configured only by a Performance Manager administrator. For more information, see *HP Performance Manager Administrator Guide*.

To design graphs you need to select metrics from the data sources found on the nodes. The node you select will be saved in the graph template.

If you are editing a pre-defined graph, the nodes selected while designing that graph will be pre-selected. You can modify this and select nodes for which you want to draw the graph. The name of the graph which you are currently editing appears in the title of the design wizard page. The node will remain pre-selected only if the node is still available under the same node group path. If the node has been moved to a different node group, then the node will not appear pre-selected.

When you preview the graph, by default the data from the node you selected during design time will be used.

- You can search for a node using the Search feature. Enter the name of the node in the text box and click on the icon .

- You can view the system information of a node by clicking .

- To clear your selection click ⬚.

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

- You can also add a node temporarily. Click 🖥, the **Add a Node** window appears. Enter the name of the node which you want to add. Click **OK**. However you cannot upload or manage a flat file from the Performance Manager user interface. A flat file or business unit file will be treated as a node and has to be uploaded to the Performance Manager server. A flat file can be uploaded only by a Performance Manager Administrator.

> **Note:** For all graph types other than Multi-source graphs, you can select only *one* node while designing.

Data Source Selection

When you select a node in the previous step, Performance Manager fetches the list of data sources available on the node. Data sources are the agents which collect performance data. If you have selected a flat file in the previous steps, by default the option FILE appears pre-selected.

If you are editing a graph, the name of the graph which you are currently editing appears in the title of the design wizard page.

- If you have selected a node in the previous step, Performance Manager displays a list of data sources available on the node.

- Select a data source from the list of data sources. Each data source collects a set of metrics to capture performance data, based on which you can draw graphs for analysis. You need to specify metrics to draw or design graphs.

- A node can have one or more data sources. For example, HP Performance Agent (PA), Embedded Performance Component (EPC), Repsys (nodes from HP Reporter), Business unit file (flat file), and Agentless (SiteScope).

  > **Note:**
  >
  > - The Agentless option appear only if the selected node monitored by SiteScope Server is configured in Performance Manager.
  >
  > - To view the list of metrics and the definitions for Performance Agent and EPC, refer to the HP Performance Agent's "Dictionary of Performance Metrics".

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

To configure a particular data source, contact your Performance Manager administrator. Data sources on the node/nodes you selected, are discovered at runtime by Performance Manager. So, you do not have to know beforehand the data sources available on a particular node.

 If you are designing a system comparison graph, you can select only one node on this page.

You can configure the time period after which Performance Manager connection times out when connection to agents through http(s) is not successful in the Server. Modify this parameter to an optimal value to enable quicker time outs when the agent is not reachable.

You can configure the rate at which Performance Manager refreshes metadata from the data sources. You can modify it to an optimal value, to improve the time taken to generate graphs.

Graph Attributes

If you are editing a graph, the fields specified below are populated with the values specified in the graph template. However you can modify these values. The name of the graph which you are currently editing appears in the title of the design wizard page.

- **Title**: Enter a title for the graph. This graph title is displayed on the top of the graph. You can use any of the substitution variables for graph title; however, the actual values replace the variables after a graph is designed or drawn.

- **Subtitle**: Enter a subtitle for the graph. This subtitle is displayed below the title. You can use any of the substitution variables for Graph Subtitle; however, the actual values replace these variables after a graph is designed or drawn.

Example: If you are designing a graph titled "Global History" for a node 'mysys.xyz.com', for a duration of 7 days ending on 4/11/2007, 11.00 AM for Points Every one hour, the following details are displayed:

- **Graph Title** - Global History for mysys.xyz.com

- **Subtitle** - 1 week, at points every hour

- **Time displayed beneath the graph** - From 4/4/07 11.00 AM to 4/11/2007 11.00 AM

- **Graph Type**: Select the type of graph you want to design from the drop-down list. For a forecast graph, by default the graph type is line graph. Hence this option is disabled while designing a forecast graph.

- **Limit Number of Points**: Enter the number of records (table graph) or data points (for image graph) which you want to view on the graph at a time. The default value is 100. If the graph contains more data points, the **Prev** and **Next** buttons are enabled, so that you can navigate to view all the data points. The number of points also depends on the graph type which you have selected.
  - For a table graph, the default value for number of rows can be configured by the Performance Manager administrator. For more information, see the *HP Performance Manager Administrator Guide*. However the value specified while designing a graph template overrides the default value and the value is saved in the graph template.
    - The recommended value for maximum number of points is 1000 for a graph. If you select a value greater than this for table graphs, the processing time is very

high.

- If you are designing a pie graph or a gauge graph, by default, the Limit Number of Points is set to 1. You cannot change this value.

- If you are designing a baseline graph, you cannot change the value for Limit Number of Points.

- **Description**: Enter a general description of what the graph represents. The description entered here appears as tooltip when the mouse is hovered over the graph name in the graph list tree. The graph list tree is displayed when Performance Manager prompts you to select a graph or when you are viewing the home page.

- **Automatically Refresh**: When you select the Automatically Refresh check box, the graph is redrawn every five minutes with the latest data available from the data source. The refresh rate is configurable. Contact your Performance Manager administrator to configure the time interval for refreshing data. For more information, refer to the *HP Performance Manager Administrator Guide*.

- **Sum From Raw**: Select this option if you want to specify that Performance Manager should gather unsummarized data from the data sources and then summarize the retrieved data. Select this option when you do not want the data to be summarized by data source. Using this feature can cause large volumes of data to be transferred from the node and can slow down the resulting graph. When you select this option, you can specify the summarization level for individual metrics.

- **Force Points Every**: Select this field to force control on the granularity (number of points) on the graph. Selecting this value overrides any **Points Every** value that the specified while drawing a graph.

- **Date Range:** The default date range is 7 days ending 'Now' and Points Every value is auto summarization. You can also modify default settings for date and time. If you want to modify the default settings refer to the section, Changing Default Date Settings.

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

Note:

- The date selection specified here is saved in the graph template. These settings are used you preview and draw graphs.

- If you are drawing a forecast graph, you can specify the forecasting date range in this screen or on the planner screen of the design wizard too.

- You cannot specify Graph type, Limit number of points and Automatically refresh options if you are designing a forecast graph.

Changing Default Settings

You can override the default date range and shifts for a graph.

Change Date Defaults

HP Performance Manager uses the date settings specified in the template by default. If date settings are not specified in the graph template, then Performance Manager uses the default date range is: 7 days ending 'Now' and Points Every value: auto summarization.

> **Note:** If you are using planner to draw forecast graphs, when you specify the forecasting date range or planner, the forecast range would be same as the period selected for forecasting. For example: if you select 1 month, 1 month's data would be used and the forecast is done for the next 1 month.

To specify date range for a graph:

1. Clear **Use Defaults** checkbox.

2. Specify the time duration for which you want to draw the graph in the **Duration** text box.

3. Enter the number and specify the unit of time. You can specify time duration in minutes, hours, days, and weeks.
   If you select "all", all the data gathered by the data source and logged in the agent log files is included in the graph and the text entered in the **Duration** text box is not considered.

4. Specify the end date for the graph. The default value is '**Now**'. Select from one of the following options:

   - **Now** - the current date and time on the HP Performance Manager Server.

   - **Last** - the date and time when data was last collected by the data source.

   - **Date/Time** - When you select this option, the calendar icon is enabled. Click the calendar icon to select the date. Select the time from the **Time** drop-down list.

     Example: If you select "4 weeks" of data ending Now, the graph displays data for the last 4 weeks. If you select "3 days" of data ending at January 12, 2007 at 13:00 hours, you can view the data from 'January 9, 2007 at 13.00 hours' to January 12, 2007 at 13.00 hours'.

5. Use the **Points Every** setting to control how much data is to be summarized in each point on the graph. You can use the Points Every option to determine the granularity (number of data points) on the graph. The default value is **Auto**. You can select from the following options:

> **Note:** If you are using flat file or a business unit file as a data source to design a normal graph, make sure you specify the points every value based on the data available in the flat file or business unit file.

Auto	Selecting this option automatically selects the value to display the data points within the configured limit. If you select "auto", Performance Manager will automatically summarize the data based on the date range that you have specified to a level that would make the graph easy to read. If the combination of Date Range and Points Every settings results in too many points, the Points Every value is automatically adjusted to display all of the requested data in one page.
	In addition, Performance Manager also provides **Append** and **Prepend** options to increase the data points which you can view on a single page.
	▪ Click **Append >>** button to view data for the next set of data points, in addition to the data you are currently viewing.
	▪ Click **Prepend <<** button to view data for the previous set of data points, in addition to the data you are currently viewing.
	If you click **Append** or **Prepend** button**,** Performance Manager adds additional data. The number of points displayed is same as the data points which appear in the initial graph. The duration is doubled. For example, if you were currently viewing data for the previous 1 month, and you click **prepend**, you can view data for the previous 2 months.
	All the data points are displayed in the same page. The points every setting is reset by Performance Manager to make the data readable. When all the data available is displayed, the **Append** and **Prepend** buttons are disabled.
	Example 1: When the combination of the date range and **Points Every** settings is one week of data from 1/1/2007 to 8/1/2007 with points every one hour, if you Click **Append**/**Prepend** additional one week of data is displayed in the same page. You can see two weeks of data with points every three hours.
	Example 2: For example, if you have specified the **Duration** as 12 hours, the graph displays this data for 12 hours and the summarization is automatically set by Performance Manager to accommodate this data within one page.

	Note: Based on the value set for **limit number of points**, for image graphs, summarization interval is decided by Performance Manager when 'points every' is selected as auto. The behavior of the **Next/Prev** button is different if 'points every' is selected as "auto", unlike the behavior when points every is specified as any other value other that 'auto' from the drop down. When auto is selected, user gets data for the duration specified, in the same graph, with summarization interval specified by Performance Manager. The **Next/Prev** options displays the graph from the next and previous duration with the same points every (summarization) value.
5 minutes	Selecting this option displays one data point for every five minutes of the specified duration.
15 minutes	Selecting this option displays one data point for every fifteen minutes of the specified duration.
30 minutes	Selecting this option displays one data point for every thirty minutes of the specified duration.
hour	Selecting this option displays one data point for every one hour of the specified duration.
3 hours	Selecting this option displays one data point for every three hours of the specified duration.
6 hours	Selecting this option displays one data point for every six hours of the specified duration.
12 hours	Selecting this option displays one data point for every twelve hours of the specified duration.
day	Selecting this option displays one data point for every day of the specified duration.
unsummarized	If you select "unsummarized", Performance Manager does not summarize the data. The raw data collected by the data source for the specified duration is displayed. Any values set in Performance Manager does not affect the summarization.

If the points every value is anything other than "auto", and if the data in the chosen time range cannot be fit into a single graph/table, the graph/table appears in more than one page and **Prev** and **Next** buttons are enabled. Click **Prev** to move to the previous page and **Next** to go to the next page to view all the data. The **Append/Prepend** options are disabled when you set **Points Every** to anything other than auto.

6. Enter the number of records (table graph) or data points (for image graph) which you want to view on the graph at a time in **Limit number of Points**. The default value is 100. If the graph contains more data points, the **Prev** and **Next** buttons are enabled, so that you can navigate to view all the data points. The number of points also depends on the graph type which you have selected.

   ▪ For a table graph, the default value for number of rows can be configured by the Performance Manager administrator. For more information, see the *HP Performance Manager Administrator Guide*. However the value specified while designing a graph template overrides the default value and the value is saved in the graph template.

      ○ The recommended value for maximum number of points is 1000 for a graph. If you select a value greater than this for table graphs, the processing time is very high.

   ▪ If you are designing a pie graph or a gauge graph, by default, the Limit number of Points is set to 1. You cannot change this value.

   ▪ If you are designing a baseline graph, you cannot change the value for Limit number of Points.

When you are drawing more than one graph, any changes to the default values which you have specified will be retained while drawing another graph. The values specified will not be reset

You can use any of the substitution variables for Graph Title or Subtitle; however, actual values will replace these variables after a graph is designed or drawn.

@@[SYSTEM]	Refers to the name of the system being graphed.
@@DATERANGE	Refers to the duration for which the graph is designed, (for example, 7 Days.)
@@POINTSEVERY	Refers to the amount of time summarized into each data point, (for example, points every 15 minutes).
@@STARTTIME	Refers to the beginning time on the graph (for example 3/30/07 3:00 PM).
@@STOPTIME	Refers to end time being displayed on the graph (for example, 4/10/07 3:00 PM).
@@metric	The value of the metric. For example: If you use @@APP_NAME, the title or sub-title will include the value of the metric, that is name of the application. **Note:** It is recommended that you use this parameter only when single instance of a metric is drawn in a graph. If there are multiple instances in a single graph, then all the instance names will be appended to the title or sub-title.

Add Metrics

1. Click **Add Metrics**. The **Metric Selection** window appears.

2. If you are designing a multi-source graph, the **Metric Selection** window displays a list of data sources available on the node or nodes you selected. From the **Data Sources** drop-down, select the node and data source combination which you want.

3. Expand the metric class name. If it is a flat file, the metric class name is FILEDATA. The list of metrics appears.

4. Select one or more metrics for which you want to draw graph and click **Add**.

5. Depending on the type of graph you are designing, follow these steps:

   - If you are designing a system comparison graph or an Instance comparison graph, you can add only one metric. To change the metric you selected, Click **Change Metric.**

   - If you are editing a graph, the metrics saved in the graph template is preselected. You can remove a metric in case you want to modify this list.

   - If you are drawing a forecast graph, refer to the section Suggested Forecast Metrics, for a list of valid metrics for forecasting.

   - If you are drawing a multi-source graph, you can select metrics from multiple data sources. Repeat steps a and b, after you follow step [1] to select different nodes and data source combinations.

6. Click **Close** after you complete the selection. The list of metrics which you selected now appears in a tabular form.

7. Remove a metric

   a. From the list of metrics, select the metric which you want to remove by clicking on the row corresponding to the metric.
   Tip: Press and hold CTRL key to select and then remove multiple metrics.

   b. Click **Remove**. The selected metrics are removed from the list.

8. Remove all metrics

   a. Click **Remove All**. All the metrics will be removed from the list.

9. Specify the order of metrics

   a. From the list of metrics, select the metric which you want to move up or move down by clicking on the row corresponding to the metric.

   b. Click **Move Up** to move the metric to the top of the list or **Move Down** to move the metric to the bottom of the list from its current position in the list.

> **Note:** This option will be enabled only when there are two or more metrics in the list of metrics. This option is not available for instance comparison and system comparison graphs.

Suggested Forecast Metrics

The selection of metrics to forecast must reflect the specific needs of the environment. For example, forecasting values for CPU Utilization, Response Time, and I/O Rate can often be useful to maintaining an acceptable level of performance. The performance of particular applications may also be important to maintain. If you are just getting started in forecasting, here are some suggested metrics from HP Performance Agent, HP Reporter and HP Operation Manager which you can use in designing a forecast:

Class	Metric	Description
GLOBAL	GBL_CPU_ TOTAL_UTIL	The amount of the CPU resource that is being consumed on the system. When CPU utilization nears 100%, processing slows down and responsiveness might degrade.
	GBL_DISK_ PHYS_IO_ RATE	The number of transfers made to and from all disk drives.
	GBL_DISK_ UTIL_PEAK	The percent busy of the busiest disk drive. (Which disk drive may change).
	GBL_DISK_ VM_IO_RATE	The number of transfers to and from disk in support of memory management (swapping).
	GBL_FS_ SPACE_UTIL_ PEAK	The perfect full of the most full file system.
	GBL_NET_ PACKET_ RATE	The number of packets of information sent and received from network links.
	GBL_NUM_ USER	The number of users logged in to the system. (This might make a useful business metric).
APPLICATION	APP_CPU_ TOTAL_UTIL	The amount of CPU consumed by this application.
	APP_IO_ BYTE_RATE	The amount of data transferred to and from disk devices.
	APP_ACTIVE_ PROC	The average number of processes in the application that were running during the interval.

	APP_ COMPLETED_ PROC	The number of processes that were run and terminated during the interval.
TRANSACTION	TT_TRAN_1_ HR_RATE	The number of transactions that completed each hour.
	TT_WALL_ TIME_PER_ TRAN	The average time it took for each transaction to complete.
	TT_SLO_ PERCENT	The percent of the completed transactions that exceeded their pre-defined Service Level Objectives.

Note: The Application and Transaction class of metrics listed here are multi-instance classes.

Metric Properties

You can configure the way a particular metric appears in the graph. To change the properties of a metric, perform the following tasks:

- **Label**: The label can be a literal string, or it can contain references to special substitution variables.

@@[LABEL]	The metric label. For example, CPU%. It refers to the metric label specified by the data source. If the data source does not provide a label for the metric instance, the metric name is used.
@@[METRIC]	The metric name. For example, GBL_CPU_ TOTAL_UTIL. By default the metric name is displayed on the graph or table.
@@[CLASS]	The metric class name. For example, GLOBAL.
@@[SYSTEM]	The node name supplying the metric. For example, mysys.net.com

@@[DATASOURCE]	The datasource of the metric, for example, CODA, PA, EPC, REPSYS, and AGENTLESS.
	The metric label specified by the datasource. For example, (CPU %), if the data source does not provide a label, then the metric name is used.
@@metric	The value of the metric from the same data source and class.
	For example: @@BYDSK_DEVNAME will label the metric with the value of the BYDSK_DEVNAME metric. If the BYDSK_DEVNAME metric value were "0", Disk @@BYDSK_DEVNAME would produce a label of Disk 0.

For example, @@[SYSTEM]:@@[CLASS]:@@[METRIC] might produce a label like "mysys.net.com:GLOBAL:GBL_CPU_TOTAL_UTIL".

- **Type**: Displays the type of graph which you selected while specifying graph attributes. If you have selected mixed graph, you can specify the graph type for the metric which you selected. The options available are line or area.

- **Y Axis**: Specify whether you want the Y-Axis of the graph to appear on the left hand side or right hand side from the drop-down list.

  Note: This option is available only for graph types 'line', 'area' and 'mixed'. For all other graph types, the option 'right' does not appear in the drop-down.

- **Color**: To specify a color for the metric, click Color. The color picker pop-up appears.

- **Graph specific properties**: Based on the type of the graph you select, you can specify properties.

- **Summarization**: If you have selected the Sum from Raw check box on the Graph Attributes page, the Summarization box appears, The default value is Average. Summarization of data is

done when multiple records from a datasource are combined to view the required amount of time per data point.

- Click **OK** to save your settings or **Cancel** to exit from the window.

- **Filter**: A metric filter consists of a metric name, a comparison symbol and a value to compare. You can add, update and remove filters.

Filter will be applied before summarization if Performance Manager is summarizing the data. If the data source is summarizing the data, the filter will be applied after summarization.

Performance Manager does not support the "=@" filter. The "=@" filter in the OVPM 6.x is used in case of textual metrics. The "=@" filter gathers all values from the data source, but separates each distinct value into a separate metric. In Performance Manager 8.x, specifying the @@[Metric Name] within the label gathers all the values from the data source and identifies each distinct value as a separate metric.

For multi-instance metrics, Performance Manager attaches a prefix @@[instance metric] to the metric label automatically while designing a graph using design wizard.

While specifying strings or expressions for filters, use regular expressions. (Example: .*C.* instead of *C*).

To see the differences between filter options in OVPM 6.x and Performance Manager 8.x, see the HP Performance Manager Administrator Guide.

For metric properties for area graphs or bar graphs, select the fill style from the drop-down list.

Line Style

1. Style - Select the line style for the lines in the graph from the drop-down list

2. Marker - Select a marker from the drop-down list

> **Note:** If you specify a marker, you can differentiate if the data points displays missing data or actual data. If data is missing for a particular interval, Performance Manager connects both the previous and the next data point with a straight line and the marker for that point does not appear.

3. Width - Specify the width for the lines

Missing Data

When no data is captured by the data sources during an interval, it is referred to as missing data. Select an option to represent missing data. Select from the following options:

- **Hidden** - Select this option to represent missing data as gaps in the graph.

- **Zero** - Select this option to represent missing data with the same value as that of the

previous point.

- ○ **Previous** - Select this option to represent the value of Missing data points as 'zero'.

> **Warning:** When you set the Missing data value to 'Hidden', the single data points that do not have a data point preceding or following them will not be visible. (It takes at least two points to draw a line). To solve this problem, select markers for each metric. Markers will make the data points visible even if a line cannot be drawn.

Data source might not capture data in scenarios such as the following:

- No data found in a particular interval

- Data source is configured not to fetch data frequently.

Summarization

Summarization of data is done when multiple records from a data source are combined to view the required amount of time per data point. The Summarization type option is available on the Metric Selection screen of design wizard, only if you have the "Sum From Raw" check box selected on the Graph Attributes screen. The various types of summarization options are as follows:

1. **Auto** - When you design graph with auto summarized data, Performance Manager summarizes data based on the summation type provided by the data sources, if the **Sum from Raw** check box on the Graph Attributes screen is not selected. If the summarization type is not provided by the agents or if the **Sum from Raw** check box on the Graph Attributes screen is selected and if you specify the summarization type as '**auto**', Performance Manager uses the '**average**' value to summarize data. Currently, data sources such as Performance Agent and EPC provide summarization types for the respective metrics.

2. **Average** - If the summarization type is not provided by the data sources and if the **Sum from Raw** check box is selected, by default Performance Manager used the option 'average'. The 'average' refers to the mean value obtained by dividing the sum of values by the number of samples.

3. **Sum** - On selecting this option, Performance Manager adds metric values to arrive at a sum.

4. **Minimum** - On selecting this, Performance Manager uses the lowest numeric value.

5. **Maximum** - On selecting this, Performance Manager uses the highest numeric value.

6. **Last** - On selecting this, Performance Manager uses the last value read from the data source.

7. **Count** - On selecting this, Performance Manager uses the number of records from the data source that are combined into each point.

Add a Filter

Follow these steps:

1. In the first drop-down list, select the metric for which you want to apply the filter.

2. From the second drop-down list, select one of the comparison operators.

3. Enter the value against which the comparison is done in the text box.

4. Click **Add**.

5. Click **OK**. The Metric Selection screen of the design wizard appears.

Example: The filter **APP_NAME~.*Application.***filters data where the application name contains the text "Application".

Specify Multiple Filters

Follow these steps:

1. In the first drop-down list, select the metric for which you will apply the filter.

2. From the second drop-down list, select one of the comparison operators.

3. Enter the value against which the comparison is done in the text box. Select the appropriate **AND** or **OR** operators. By default, "AND" is selected.

> **Note:** You can select either "AND" or "OR" option. You cannot specify a combination of these two options.

4. Click **Add**. Click **OK**. The **Metric Selection** screen of the design wizard appears.

The following table lists the logical operators:

Logical Operators

Symbol	Description
&&	Both filter conditions must match
||	One of the two filter conditions must match
@	Capture all values from the data source

Update a Filter

Follow these steps:

1. Click on the filter which you want to update from the list of filters in the **Metric Properties** window. The selected filter will now be displayed on the drop-down list.

2. Click **Update**. Update the filter.

3. Click **OK**. The **Metric Selection** screen of the design wizard appears.

Remove Filters

You can remove one or all filters which you specified:

To remove a filters, follow these steps:

1. Click on the filter which you want to remove from the list of filters in the **Metric Properties** window.

2. Click **Remove**.

3. Click **OK**. The **Metric Selection** screen of the design wizard appears.

To remove all filters, follow these steps:

- Click **Remove All**. All the filters specified for this metric is removed.

Metric Selection

This page allows you to do the following:

1. Add Metrics

2. Define Metric Properties

If you are editing a graph, the fields specified below are populated with the values specified in the graph template. However you can modify these values. The name of the graph which you are currently editing appears in the title of the design wizard page.

The metrics you select and the metric properties which you have specified while designing a graph will be saved in the graph template.

1. Click **Next** to go to the next page or **Prev** to go to the previous page.

2. Click **Save** or **Save As** to save the graph. The **Save** window appears. You must enter the following:

   a. **Family** - Enter the name of the graph family

   b. **Category** - Enter the name of the graph category

   c. **Name** - Enter a name for the graph

   If the family name and category already exists, Performance Manager automatically populates the **Family, Category** and Name fields text boxes with the names when you type the first few alphabets.

3. Click **Preview** to preview the graph. To go back to design wizard from the preview page, click **Back to Design**. Based on the type of the graph you are designing, the design wizard takes you to the next step:

   a. If you are designing a normal graph and if you have selected multi-instance metrics, the **Select Instances** pop-up appears. Select the instances you want to compare and click **OK**.

b. If you are designing instance comparison graphs, the **Select Instances** pop-up appears. Select the instances for which you want data and then click **OK**. You must select at least two instances to compare. However, you can also select one instance.
Tip: To view the list of the available instances, drag the bottom-right end of the Instance selection window, in the direction of the arrow displayed.

c. For system comparison graphs, the **Select a Node** pop-up appears. Select a system to compare with and click **Draw**.

d. If you are designing a Forecast graph, specify planner options.

4. Click **Cancel** to exit the design wizard.

Planner

Planner is based on time-series based statistical forecasting techniques. You can design and draw forecasting graphs using planner. Perform the following tasks:

1. Select the **Trending Method** required. By default, 'Smoothing' is selected. Click here for more information about different types of forecast graphs. Select from the options available:

- Smoothing

- Linear

- Exponential

- S-curve: If you have selected S-curve option as the trending method:

  ○ **S-Curve Min**: Enter the minimum values for the S-curve. The default value is 0. The value you specify here determines the minimum value that a metric forecast is allowed to have.

  ○ **S-Curve Max**: Enter the maximum values for the S-curve. The default value is 100. The value you specify here determines the maximum value that a metric forecast is allowed to have.

- Business Units: If you have selected Business Units as a trending method: A business unit is a measure of business activity that can be correlated to the activity of a critical system resource. If there is a strong correlation, business units can be used for accurate projections of performance metrics.

- **Example**: A business unit for an order processing system can be the number of orders processed, number of mail messages processed, number of customers or users.

  - **Business Metric**: The business unit file which contains the business metric must be available on the Performance Manager server. The business unit file can be uploaded only by the Performance Manager administrator. For more information on business unit file, refer

to the *HP Performance Manager Administrator Guide*.

To use a business unit:

1. Click **Source**. The **Business Units: Select Node** dialog box appears.

2. Select the business unit file which contains the business metric.

3. Click **OK**. The **Business Units: Data Source Selection** dialog box appears with **FILE(FILE)** as a preselected option.

4. Click **OK**. The **Business Units: Metric Selection** dialog box appears.

5. Select the metric which you want to use for forecasting. You can select only one metric. Click **OK**.

To modify the metric or the business file:

1. Click **Edit**.

   ○ If you have already selected a business file and a business metric, the **Business Units: Metric Selection** dialog box appears. Go to step 3.

   ○ If you click **Edit** before selecting a business file, The **Business Units: Select Node** dialog box appears. Follow steps 2 to 5 of the section To use a Business Unit to select a business metric.

2. Select the business metric which you want to use for forecast.

Date Range: The default date range is: 7 days ending 'Now' and Points Every value is auto summarization. You can also modify default settings for date and time by forecasting date range. If you have specified this value in the Graph Attributes screen, the same value appears here.

Note:

- When you specify the points every value, make sure you specify a value which is in synchronization with the data available in the business unit file. For example: If you have a business metric of number of orders on a hourly basis, make sure that you specify points every value as "hour".

- It is important that the business unit file contains historical and future predicted values of data until the forecasting end date.

Confidence Lines

You must specify the interval type and confidence level.

Interval Type - Select the interval type for the forecast graph. The default option is 'none'.

An interval is a statistical range in which the forecast falls. This range is shown on your forecast as lines defining the upper and lower limits. Planner supports two types of intervals: Confidence Interval and Prediction Interval.

The confidence interval is much narrower then the prediction interval. The confidence interval defines a range in which the average of the predicted values (the trend line) fall in the given percentage of the time. The prediction interval defines a range in which the predicted values (all points) fall in the given percentage of the time. The range must be wider for the prediction interval because there is more variability in the forecasted values then there is in the mean of the forecasted values. Confidence lines are disabled for a smoothing forecast graph.

Confidence Level - Specify the Confidence Level percentage for the specified interval type. The options available are: 70%, 80% and 90%. The Confidence Level is set to 70% by default.

A higher value for confidence level, for example 90%, sets a wider range, since it indicates that the upper and lower limit curves should encompass a larger percentage of the values. If you select the Interval type as "None", this option is disabled.

Show validation data - Selecting this option allows you to check the validity of a forecast. When you select this option, the forecast graph displays any data found after the Ending Date and before the Forecast Ending date. This data is displayed, but is not used in forecasting. This data can be used to compare the forecast with the actually data during that duration.

Seasonality: Seasonality refers to a pattern of variation in data that is related to specific time intervals (seasons). Metric data can vary in a pattern based on the hour of the day or day of the week. These patterns of usage can dilute the accuracy of a forecast if they are not

Seasonality	Pattern varies for	Only valid when
Hour of the Day	each hour of a 24 hour day	Points Every <= 1 hour
Day of the Week	each day of a 7 day week Points Every <= 1 week	Points Every <= 1 week Duration > 1 week
Week of the Month	each week in the month, based on calendar months	Points Every <= 1 day Duration > 30 days
Month of the Year	each calendar month of the year	Duration > 3 months

Example: If your company is on a 5-day work week, you can see day-of-the-week seasonality because your systems do little work, if any, on the weekends. Firms that process orders often experience week-of-the-month seasonality as the month-end approaches and sales quotas must be met.

Note:

- Seasonality and Confidence Lines are not available for smoothing.

- Seasonality is not applicable for business units.

- Even if you specify one or more of the available options for seasonality, the options are applied only if they improve the forecast.

Special Attributes

1. You can define attributes specific to the graph type you selected:

   a. Line, Area, Bar graph

   b. Table

   c. Forecast Graphs

Note: This option is not available for XML, CSV, Baseline and TSV graph types.

If you are editing a graph, all the attributes specified are saved in the graph template and appear preselected. The name of the graph which you are currently editing appears in the title of the design wizard page.

2. Click **Next** to go to the next page or **Prev** to go to the previous page.

3. Click **Save** or **Save As** to save the graph. The Save window appears. You must enter the following:

   - **Family** - Enter the name of the graph family

   - **Category** - Enter the name of the graph category

   - **Name** - Enter a name for the graph

If the family name and category already exists, Performance Manager automatically populates the **Family**, **Category**, and **Name** fields text boxes with the names when you type the first few alphabet.

4. Click **Preview** to preview the graph. To go back to design wizard from the preview page, click **Back to Design**.

Note: For normal and instance comparison graphs, The **Select Instances** pop-up appears. Select the instances you want to compare and click **OK**. For system comparison graphs, The **Select a Node** pop-up appears. Select a system to compare with and click Draw.

5. Click **Cancel** to exit the design wizard.

> **Note:** If the graph is a table graph you can specify the highlight data and filter.

Other Attributes

1. In this page you can specify the following options:

   > **Note:** If you are editing a graph, all the 'Other Attributes' specified will be saved in the graph template and will appear preselected. The name of the graph which you are currently editing appears in the title of the design wizard page.

   - **Graph Header -** Specify a description for the graph. The description appears at the top of the page. The description appears only in the print view.

   - **Graph Trailer -** Specify a description for the graph. This description appears at the bottom of the page. The description appears only in the print view.

   - **Pixels -** Specify the pixels for the graph

     ○ **Width**: The width of the graph image file in pixels (default=700).

     ○ **Height**: The height of the graph image file in pixels (default=500).

       > **Note:** If the width and height specified for the graph are more than the window size, horizontal or vertical scroll bars are displayed. You can view the graph using using the scroll bars. The window size depends on the browser window size.

2. Click **Next** to go to the next page or **Prev** to go to the previous page.

3. Click **Preview** to preview the graph. To go back to design wizard from the preview page, click **Back to Design**.

   > **Note:** For normal and instance comparison graphs, The **Select Instances** pop-up appears. Select the instances you want to compare and click **OK**. For system comparison graphs, The **Select a Node** pop-up appears. Select a system to compare with and click Draw.

4. Click **Cancel** to exit the design wizard.

Finish

After you save the graph, the design wizard displays the following message:

You have successfully designed a graph with the Design Wizard!

- Click **Design Another Graph** if you want to design another graph.

(or)

- Click **Home** if you want to go to the home page. The graph you designed is listed in the **Select a Graph** pane on the home page.

Line, Area, Bar Graph

You can specify the you want the look and feel of the graph to appear. Select from one of the following options:

- **Background color**: Click **Color**, to select a background color.

- **Legend Font color**: Click **Color**. The color picker pop-up appears. Select a color.

- **Left Y Axis**

  - **Label** - Specify a label for Y Axis appearing on the left side.

  - **Minimum** - Specify minimum value for points on the left side Y-Axis. If left blank, the initial scale of the axis will automatically be adjusted to accommodate the values in the graph.

  - **Maximum** - Specify maximum value for points on the left side Y-Axis. If left blank, the initial scale of the axis will automatically be adjusted to accommodate the values in the graph.

- **Right Y Axis**

  - **Label -** Specify a label for Y Axis appearing on the right side. This allows you to specify a label for the right side of the graph to identify the right hand Y-Axis. This field does not appear unless at least one metric has the "Right Y-Axis" selected from **Metric properties** window.

  - **Minimum -** Specify minimum value for points on the right side Y-Axis. If left blank, the initial scale of the axis is automatically be adjusted to accommodate the values in the graph.

  - **Maximum -** Specify maximum value for points on the right side Y-Axis. If left blank, the initial scale of the axis is automatically adjusted to accommodate the values in the graph.

> **Note:** This option is available only for graph types 'line', 'area', and 'mixed'. For all other graph types, this option does not appear on the screen.

- **Metrics per graph** - Specify the number of metrics you want to see in a graph. The default value is 8.

  - **Single graph** - Select Single Graph checkbox, to limit the number of graphs to one graph when number of metrics or instances exceed the value specified for "Metrics per Graph".

  - **Multiple graphs** - Select Multiple Graphs checkbox, to display multiple graphs when number of metrics or instances exceed the value specified for "Metrics per Graph". The number of metrics or instances in each graph will be less than or equal to the value specified for "Metrics per Graph".

- **Metric Display order** - Specify the order in which you want the metrics to be displayed. The default value for instance comparison graphs and system comparison graphs is 'Sort by average'. The default value for other types of graphs is 'User defined'. You can select from the following options:

  - **User defined** - The metrics appear in the order in which you select while adding metrics. You can also specify the order of metrics.

  - **Average** - The metrics appear in the descending order of the average value.

  - **Reverse Average** - The metrics appear in the ascending order of the average value.

Note:

- Valid scenarios for **Average** and **Reverse Average** display order options are comparison graphs such as instance comparison, system comparison or top N graphs.

- This option is available for line, area and bar graphs. This option is not available for table, baseline, forecast graphs.

- You can configure maximum number of graphs using the configuration parameter SORTBY_MAX_GRAPH_COUNT in the file OVPMConfig.ini. For more information, refer to the *HP Performance Manager Administrator Guide*.
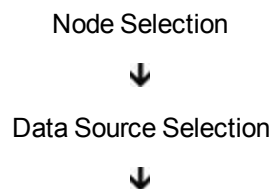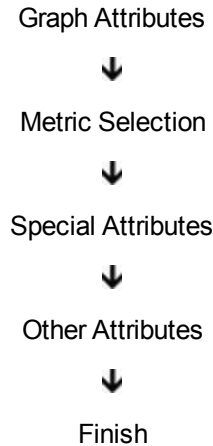

Color Selection

To select a color from the color palette, perform the following tasks:

1. From the color palette, click on the vertical bar to select the color you want.

2. The left pane displays the available hues or shades of a particular color. Click on a required hue to select the same.
   (or)
   You can also enter the values for Red, Green, and, Blue to select a particular color. The selected color is displayed on the **Selected Color** box.

3. Click **OK** to select or **Cancel** to go back to design wizard.

Designing a Normal Graph

Once you select Normal Graph, the design wizard takes you through the steps to design a Normal graph:

<div align="center">

Node Selection

⬇

Data Source Selection

⬇

</div>

Graph Attributes

⬇

Metric Selection

⬇

Special Attributes
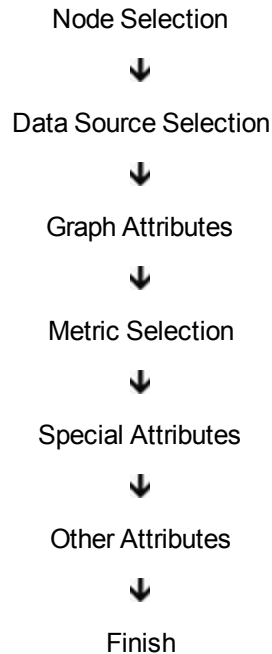
⬇

Other Attributes

⬇

Finish

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.
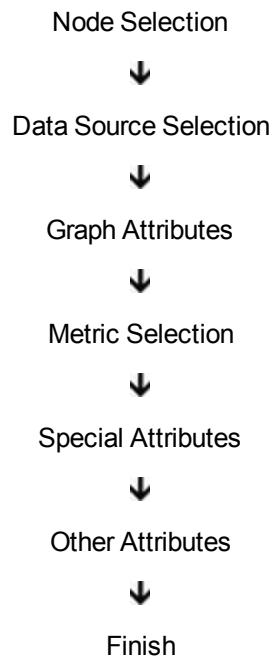
Designing a System Comparison Graph

Once you select System Comparison Graph, the design wizard takes you through the steps to design a System Comparison graph:

Node Selection

⬇

Data Source Selection

⬇

Graph Attributes

⬇

Metric Selection

⬇

Special Attributes

⬇

Other Attributes

⬇

Finish

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

Designing a Instance Comparison Graph

Once you select Instance Comparison Graph, the design wizard takes you through the steps to design a Instance Comparison graph:

<div align="center">

Node Selection

↓

Data Source Selection

↓

Graph Attributes

↓

Metric Selection

↓

Special Attributes

↓

Other Attributes

↓

Finish

</div>

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

Designing a Multi-source Graph

Once you select Multi-source graph, the design wizard takes you through the steps to design a Multi-source graph:
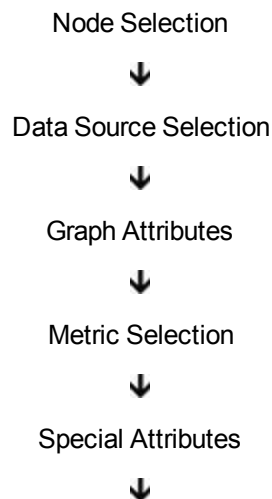
<div align="center">

Node Selection

↓

Data Source Selection

↓

Graph Attributes

↓

Metric Selection

↓

Special Attributes

↓

</div>

<div align="center">

Other Attributes

⬇

Finish

</div>

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

Designing a Forecast Graph

Once you select Forecast Graph, the design wizard takes you through the steps to design a Forecast graph. Click here for some information about statistical forecasting:

<div align="center">

Node Selection

⬇

Data Source Selection

⬇

Graph Attributes

⬇

Metric Selection

⬇

Planner

⬇

Special Attributes

⬇

Other Attributes

⬇

Finish

</div>

- Click **Next** to go to the next page or **Prev** to go to the previous page.

- Click **Cancel** to exit the design wizard.

You can specify the following special attributes for a forecast graph:

- **Background color**: To select the background color, Click Background Color.

- **Legend Font Color**: Click Color. The color picker pop-up appears. Click here for instructions to select a color.

- **Left Y Axis**:

- **Label** - Specify a label for Y Axis appearing on the left side.

- **Minimum** - Specify minimum value for points on the left side Y-Axis. If left blank, the initial scale of the axis is automatically adjusted to accommodate the values in the graph.

- **Maximum** - Specify maximum value for points on the left side Y-Axis. If left blank, the initial scale of the axis is automatically adjusted to accommodate the values in the graph.

Designing a Graph for Reporter

You need to configure Reporter as a data source. For more information, refer to *Performance Manager Administrator Guide*.

1. Select **Normal Graph**.

2. Click **Next**. The **Node Selection** page appears.

3. Click **Next** without selecting any node. By default **Reporter** is selected.

4. Click **Next** the design wizard takes you through the steps to design a Normal graph:

<div align="center">

Data Source Selection

↓

Graph Attributes

↓

Metric Selection

↓

Special Attributes

↓

Expert Options

</div>

Editing Graphs

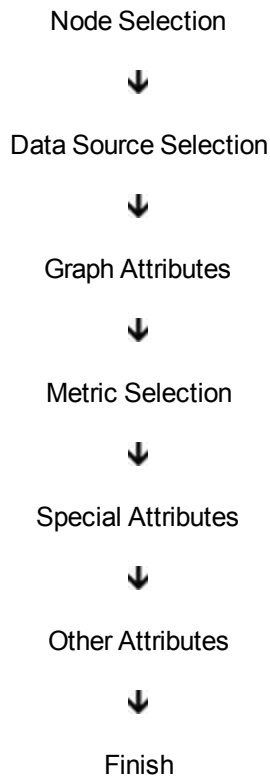You can edit a graph definition and save your changes.

> **Note:**
>
> - You can edit out-of-the-box graph definitions, but you can only save it with a different name. Out-of-the-box graphs are read-only.
>
> - User-defined graphs can either be saved with changes or you can save it as a new graph.

- While editing a Business unit forecast graph, the flat file selected while designing will appear pre-selected as long as the flat file used for designing is available in the appropriate location on the Performance Manager server. You can modify this selection from the Planner screen of the design wizard while editing a graph.

To edit a graph definition, follow these steps:

1. Click **View** → **Design wizard**. The Design Wizard window appears.

2. Select **Edit an Existing Graph** and click **Next**. The **Graph Selection** window appears. You can reload the graphlist to view the most recent changes made. To reload graph list click **Graphs** → **Reload Graphlist**. You can only view the changes made by another user with the same login credentials in a different session.

3. Select the graph which you want to edit. Click **Next**. The design wizard displays the name of the graph in the title of the design wizard page. The design wizard takes you through the series of steps to edit the graph:

Node Selection

⬇

Data Source Selection

⬇

Graph Attributes

⬇

Metric Selection

⬇

Special Attributes

⬇

Other Attributes

⬇

Finish

Managing Favorite Graphs

You can create a list of favorite graphs, which you need to view frequently. The maximum number of graphs you can save as favorites is 10. You can perform the following tasks:

Add a graph as favorite

After you draw a graph, you can add the graph as your favorite. To add a graph as your favorite, perform the following tasks:

1. From the menu, click **Graphs → Add to Favorites**. The **Save** dialog box appears.

2. Enter a name for the favorite graph. By default the graph **Family** name is *Favorites*.

> **Note:**
>
> ■ If you want to add a favorite graph as a home page, from the **Save** dialog box, select the checkbox **Set this graph as a Home page**. When you log in to Performance Manager, this favorite graph is displayed as the home page.
>
> ■ To disable the graph from appearing as the home page, delete the Favorite graph that is set as the home page. If you want to retain the graph template, save the graph with a different name before deleting.

3. Click **OK** to save or **Cancel** to cancel and exit. When you click **OK**, the following message appears:

   The <*name of the graph*> graph has been saved successfully.

4. Click **OK**. This graph is saved as a favorite and appears in the list of favorite graphs in the **My Favorites** pane.

View Favorite Graphs

You can view favorite graphs in the following ways:

1. From the menu bar, click **View → My Favorites**. The **My Favorites** pane displays a list of all favorite graphs.

2. From the home page, you can also view the list of favorite graphs in the Graph tree on the right pane.

Draw Favorite Graphs

From the home page:

1. Select the favorite graph from the graph tree on the right pane. Click **Draw**. The graph is displayed on the same page.

2. In case you select a node from the node tree, this selection overrides the node saved in the graph template.

From the menu bar:

1. Click **View → My Favorites**. The **My Favorites** pane displays a list of all favorite graphs.

2. Select the favorite graph which you want to draw.

3. Click **Draw**. The graph is displayed on the same page.

Delete a Favorite Graph

1. From the list of favorite graphs on the **My Favorites** pane, select the graph that you want to delete. The **Delete** button appears on the bottom of the left pane.

2. Click **Delete** to delete the favorite graph. A message asking you to confirm deletion appears.

3. Click **OK** and the following message appears:

   The <*name of the graph graph*> has been deleted successfully.

4. Click **OK**.

Close My Favorites Pane

To close the **My Favorites** pane:

- Click ☒ icon on the top right corner of the **My Favorites** pane.

- Click on the arrow available on border of the pane, which separates the graph and **My Favorites** Pane.

> **Note:**
>
> - You can draw a favorite graph without specifying the node and the date range. When a favorite graph is drawn, it uses the node and date range that was previously used to save a drawn graph as favorite.
>
> - If you delete a favorite graph, it is deleted from the Performance Manager.

Overview of Planner

HP Performance Manager provides a feature called Planner to forecast system resource consumption. You can use planner to design and draw forecast graphs which can be used for capacity planning.

Capacity planning is a process designed to ensure that sufficient system resources are available to maintain acceptable performance levels. Capacity planning is different from day-to-day performance management, troubleshooting or tuning because the focus is on planning future resources to meet changing business demands. Hence capacity planning is an important part of managing an adaptive enterprise. This is an on-going process which requires continuous

monitoring. This process enables you to ensure that system users receive the required level of performance to work effectively.

Capacity planning begins with collection of performance data. For Performance Manager data is collected through data sources. Examples of data sources: HP Performance Agent (PA), Embedded Performance Component (EPC), Repsys (nodes from HP Reporter), and Agentless (nodes from HP SiteScope). Based on the performance data gathered by the data sources, you can use planner for capacity planning and predict the future service demands of system resources.

Planner is based on time-series based statistical forecasting techniques.

Statistical Forecasting

Statistical Forecasting is a technique useful in planning for capacity changes. Planner is based on time-series based statistical forecasting techniques. Statistical Forecasting uses historical trends to predict future trends, can be used to examine subtle variations in data, types of trends, seasonality, and significance and provide indication of confidence in results. Statistical forecasting is not useful in predicting performance for your workload on alternate configurations or doing extensive "what if" analysis.

In statistics, a trend is a change, tendency, or pattern in a series of data over a period of time after other components have been accounted for.

You can use Planner to make more reliable decisions on when to acquire additional resources or adjust system load to meet changing demands. Use the planner feature to forecast system resource utilization and capacity planning.

Planner also provides you options to enhance your forecasts by adding interval bounds. An interval is a statistical range within which the forecast falls. This range is shown on your forecast as lines defining the upper and lower limits. Planner supports two types of intervals namely Confidence Interval and Prediction Intervals.

To do statistical forecasting you must do the following:

1. Measure the workload by collecting performance data. Performance data is collected from data sources: HP Performance Agent (PA), Embedded Performance Component (EPC), Repsys (nodes from HP Reporter), and Agentless (nodes from HP SiteScope).

2. Characterize the typical workload.

3. Use the performance data gathered to visualize the future capacity trend and generate a forecast.

You can design and draw forecasting graphs using planner.

Types of Forecasting Graphs

You can design and draw forecasting graphs using planner. Listed below are the various types of forecasting performed by Performance Manager. The choice of trending method may be based on knowledge of the metric behavior:

Smoothing

A smoothing method is used to make it easier to determine a trend in the data. The smoothed graph does not extend beyond the existing data to predict or forecast future data values; it just shows the trend in the existing data. Smoothing techniques are used to reduce irregularities (random fluctuations) in time series data. Select this option to determine a trend in the data. On a smoothed graph, mean values replace the actual data values, to produce a smooth curve. A Smoothed curve makes it easier to see any trend over time. On a smoothed graph, you'll see the actual data collected and a smooth curve based on mean values replacing data values. A smoothed curve removes some of the variability in the data and makes it easier to see any trend over time. You can use the smoothing curve to detect potential disruptions to the metric values that you may want to accommodate in your date range selections.

Linear

The forecast equation for Linear Trending is as follows:

$Y = slope\ X + intercept$

Where,

- "Y" represents the metric value plotted against the Y-Axis in the graph

- "X" represents the X-Axis value. By default this is usually the time, expressed as a "point number". The first displayed value is point 0, the next is point 1, and so on.

This is the most commonly used trending method.

Exponential Trending

The choice of trending method may be based on knowledge of the metric behavior. Exponential trending is useful when you know that the metric values tend to behave in a non-linear fashion. An example of a good use of the Exponential trending method is when forecasting response time values. For Exponential forecasts, the equation is as follows:

$Y = exp(slope\ X + intercept)$

Where,

- "Y" represents the metric value plotted against the Y-Axis in the graph

- "X" represents the X-Axis value. By default this is usually the time, expressed as a "point number". The first displayed value is point 0, the next is point 1, and so on.

The "exp" function returns the exponential number e (i.e., 2.718...) raised to the power of its argument.

S-curve Trending

An S-Curve trending method fits an "S" shaped curved line to the data. The curve assumes that there are minimum and maximum values that it can approach but never actually achieve. The S-Curve method is often useful for forecasting bounded metrics such as CPU Utilization. CPU Utilization can never be less than zero or more than 100. When using the S-Curve trending method, you must ensure that the S-Curve Min and S-Curve Max values in the Planner tab are set properly to the minimum and maximum value that the S-Curve can achieve. For S-Curve forecasts, the

equation is as follows:

Y = YMax / (exp(slope X + intercept)+1)

Where,

- "Y" represents the metric value plotted against the Y-Axis in the graph

- "X" represents the X-Axis value. This is usually the time, expressed as a "point number". The first displayed value is point 0, the next is point 1, and so on.

"YMax" is the maximum value for the metric as selected in the Performance Manager user interface.

Business Units

While designing a forecast graph, use the Business Unit trending method to forecast the impact of changes in a business unit on your system. You need to create a Business unit file (a flat file in ASCII format) to upload the business data to Performance Manager for analysis and forecasts. To create a business unit file:

1. Identify the business unit.

2. Gather historic data on the business unit.

3. Gather expected future values for the business unit.

4. Consolidate the data into a business unit file. This is typically an ASCII file. For more information on the format supported by Performance Manager, see the *HP Performance Manager Administrator Guide*.

5. Correlate the business unit to a metric.

Example: The number of orders can be a business unit for an order processing system. This can be a business metric which can be used to forecast CPU utilization (GBL_CPU_TOTAL_UTIL) of the order processing system.

The business unit file can be uploaded only by a Performance Manager Administrator. For more information on the format and location of flat files, refer to the *HP Performance Manager Administrator Guide*.

Validating Forecasts

After you have produced a forecast, you must validate it to confirm that it reasonably represents the system that it is designed to represent. The following tools are used to validate a forecasting model:

- Performance Experience

- Show Validation Data

- Confidence Interval and Prediction Interval

- Statistical Measures

Validating a forecasting model means testing the model to see if it seems likely that the forecast generated is accurate enough to be useful. You can use any or all of the listed tools to validate the forecasting model. It is not necessary to use all of them. In many cases, you can determine forecast validity by using just a few of the validity tools listed here.

If the forecast is not valid, you may repeat the process of designing a forecast graph by modifying options that may allow generation of a valid forecast. Planner allows you to perform forecast on a trial and error basis because it allows you to easily change the options (such as Points Every, Date range) preview the graph and switch to design wizard to make more changes. To improve the forecast you can modify some values such as: the date range, enable or disable seasonality, a different forecasting method, or looking at a subset of application data.

It may be helpful if, after obtaining a successful forecast, you repeat the forecast with minor changes. For example, if the forecast is dependent on the exact date range that you have specified. If you get a forecast that predicts an increase in value, but a slightly different date range gives you a decreasing trend then the forecast might not be valid.

Performance Experience

The experienced system performance manager understands the variables that affect system performance and knows what behavior is reasonable. Using the reasonability test helps one avoid ludicrous results in a forecast.

Show Validation Data

The Show Validation Data option in Planner lets you use a portion of the actual recorded set of performance data to validate the forecast. Any data found after the "Date Range: Ending" date is not used for the forecasting calculation but then is included after the forecast is generated. You can then compare the predicted data to the corresponding portion of actual data to evaluate the accuracy of the trending method.

If the forecasted data and the actual data are close, this increases your confidence in the trending method and lends credibility to the forecast values past the validation data. If, however, the forecasted values and actual data differ a great deal, it is strong evidence against the validity of the trending method or other forecast settings.

Confidence Interval and Prediction Intervals

Confidence and Predictions are a visual way to indicate the quality of a forecast. You can specify the interval type while designing a forecast graph. When you specify these intervals, two extra lines appear in the graph to indicate the Upper and Lower limits. This defines a range of values around the forecast curve.

- **Confidence Interval:** It is an interval (range of values) which defines the range (the upper and lower limit) within which there is a specific probability that the average of the predicted values fall in the given percentage of the time.

For example, a 95% confidence interval is an interval such that the chance of the predicted values lying within that interval is 95%.

- **Prediction Interval:** it is an interval which defines the range within which there is a specific probability that all the predicted values fall within the given percentage of the time.

A Prediction interval is always wider than a Confidence interval for the same forecast. A confidence interval encloses the mean values while a prediction interval has to enclose all the points. The range is wider for the prediction interval because there is more variability in the forecasted values than there is in the mean of the forecasted values. A narrow interval (small spread between the upper and lower bounds) tends to indicate a valid or credible forecast. Conversely, a broad interval indicates a less credible forecast.

Statistical Measures

After you draw a forecast graph, from the main menu, click **Graphs -> Print**. The print view of the forecast graphs displays information such as the forecast equation and Correlation co-efficient. You can use the following information to interpret the accuracy of the forecast:

Statistics	Range of Values	Interpretation
Correlation Coefficient	-1 to 0	Indicates that the forecast is decreasing, A value closer to -1 is accurate
Correlation Coefficient	0 to 1	Indicates that the forecast is increasing, Closer to 1 is accurate
Estimated Standard Error	0 to metric value	Lower is accurate (same units as the forecast metric)
Variance as a function of …	0 to 100%	Higher is accurate

The print view of the graph displays the forecast equation.

In this equation,

- "Y" represents the metric value plotted against the Y-Axis in the graph

- "X" represents the X-Axis value. This is normally the time, expressed as a "point number".

The first displayed value is point 0, the next is point 1, and so on. The rest of the equation depends on the type of trending method selected.

For Linear forecasts, the equation is as follows:

Y = slope X + intercept

Where slope and intercept are numbers and X is usually the number of time periods since the start of the forecast. A negative slope means that the forecast is decreasing as time increases.

For Exponential forecasts, the equation is as follows:

Y = exp (slope X + intercept)

The argument in the parentheses is the same as the linear equation. You need to know the intercept, slope, and the number of time periods from the beginning of the forecast. Calculate the value of the equation within the parenthesis and then you calculate exp or the exponential number e (i.e., 2.718...) raised to the power of that argument.

For S-Curve forecasts, the equation is as follows:

Y = YMax / (exp(slope X + intercept)+1)

YMax is the maximum value for the metric as selected in for forecasting.

If you want to be able to calculate the forecast value in other tools (such as spread sheets) then you should be able to transfer these equations, providing you follow the rules for providing X values.

Interpret Statistical Numbers

You can refer to the descriptions of the statistical measures to interpret the forecast. You can use one, several, or all of these validity checks to analyze your forecast. Typically you will use common sense, confidence intervals, and the statistical measures to validate your forecasts. If the forecast fails any of the validity checks, it is not valid. You can then either repeat the forecasting process again to try to develop a valid forecast, or you can decide that a valid forecast is not feasible. It is possible that the chosen forecast metric has behaved in an unpredictable manner during the measurement period that you selected. The statistical measures are described below.

Correlation Coefficient

The Correlation Coefficient is often referred to as "r" or "R" in many statistics books. It has also been called the "product-moment coefficient correlation" or "Pearson's correlation". The correlation coefficient measures the tightness of fit of the forecast line to the actual metric values.

The correlation coefficient ranges from -1 to 1. Negative R values indicate that the slope of the line is negative (that is, the line goes down and to the right). Positive R values indicate that the slope of the line is positive (that is, the line goes up and to the right).

A correlation coefficient with an absolute value of 1 represents a perfect fit (either +1 or -1) and a correlation coefficient of 0 represents a bad fit. The closer your forecast's correlation coefficient is to 1, the better the forecast line fits the data. A correlation coefficient of 0 indicates that the forecast is not very accurate.

Estimated Standard Error

The Estimated Standard Error, often called simply "Standard Error" is a measure of how well the forecast line fits the data points. It is calculated by taking the distance between the forecast line and the actual data value at each point. To make the calculations work we actually sum the square of this difference and when we are done, take the square root of this value divided by the number of points. A value for Standard Error close to 0 is optimal.

The units of the Standard Error are the same as the units of the forecast metric. Thus, if you are forecasting Response Time in seconds and get a Standard Error of 2.5 then you can assume that "typically" the forecast is 2.5 seconds away from the actual data. The Estimated Standard Error value is not dependent on how well the X value predicts the forecast metric. Instead it shows how

close the forecast line lays to the actual data points. For this reason, a small Estimated Standard Error value can indicate a good forecast even when the forecast metric does not vary much.

Squared correlation or R-squared

R-squared or the squared correlation is the proportion of the variation in the metric that is explained by time. The value for R-Squared is expressed as a percent and is shown in the PM forecast graph statistics report in the line:

Approximately <value> percent of the variance in the metric can be explained as a function of time. Where value is the R-Squared value times 100%.

R-Squared is the square of the correlation coefficient R (described above). R-Squared is always a positive value between 0 and 1, with values closer to 1 indicating better forecasts. R-Squared is also called the Coefficient of Determination.

> **Note:** Both the Correlation Coefficient and R-Squared values indicate how well the forecast metric can be predicted by the X value (time). If the metric value is not changing relative to the X value then these numbers are almost close to zero, indicating a bad fit. This doesn't mean that the forecast line cannot be trusted. It merely means that the X values chosen are not effective at predicting changes in the forecast metric.

Example: If your forecast metric always has the same value (say 5.0) then as time changes the forecast metric value stays the same. The forecast displays a slope of zero, indicating no change, and the R and R-squared values is equal zero. On the other hand, if the forecast metric is equal 5.0 then it is likely to remain at this value so the forecast line, predicting 5.0 into the future, may well be accurate. See the Estimated Standard Error measure for a different approach to measuring forecast validity.

Related Documentation

Listed below are the documentation available for Performance Manager:

Performance Manager Documentation

Title	Location	Description
HP Performance Manager Tutorials	From the Performance Manager home page, Click **Help** -> **Tutorials**	Refer to the tutorial for instructions to use HP Performance Manager.
HP Performance Manager Administrator Guide	`<Install_dir>\paperdocs\PM\C`	If you are an administrator, refer to this guide.

Performance Manager Documentation, continued

Title	Location	Description
HP Performance Manager Installation, Migration, and Upgrade Guide	Included on the product's DVD media as: `\paperdocs\PMInstallGuide.pdf` (or) Click **Installation Guide** on the Installation home page	This guide provides instructions to install the product. This guide also includes information about the system requirements, configuration tasks and pre-requisites to install Performance Manager.

Administrator Tasks

If you are a Performance Manager administrator, you can perform the following tasks from the Standard-view:

- "Manage Nodes" below

- "Manage Users" on page 64

Manage Nodes

The Performance Manager Admin User Interface allows you to manage multi-level node-groups. You can add or delete only Performance Manager specific nodes and node groups. Non Performance Manager nodes and node groups that does not belong to Performance Manager, for example, HP Reporter, HP Operations Manager, and HP SiteScope cannot be deleted from the Admin page.

You can view the system information of a node. From the menu bar, click **Admin -> Manage Nodes**. The **Manage Nodes** screen appears. You can perform the following tasks:

Add a Node Group

A node group can be added at different levels in a node tree. You can add a sub group to a node group. If you have not selected any node groups, a new group will be added to the top level.

To add top level node groups, perform the following tasks:

1. Click . Enter the name of the node group in the **Add a Node Group** pop up window.

2. Click **Add**, to add a new node group.

To add sub level node groups to the existing top level node-group, perform the following tasks:

1. Expand and select the node group to which you want to add the new sub node group. To select a node group, click on the check box adjacent to the node group.

2. Click ![icon]. Enter the name of the node group in the **Add a Node Group** pop up window.

3. Click **Add**, to add the new sub group under the selected node group.

> **Note:** If you add a sub node group under a non Performance Manager node group, all the nodes and the node groups under the sub node group are converted to a Performance Manager node group.

Add a Node

You can select a node group either at the top level or at any level in the node tree to add a node. To add a node, perform the following tasks:

1. Select a node group or node sub group to which you want to add a node by clicking on the checkbox next to the node group.

2. Click ![icon] and enter the name of the node group in the **Name text box** below the node tree. The node is added to the group selected.

Nodes can be added only to a group or sub group. If the Performance Manager administrator makes any changes to a node group, the node group appears collapsed in other pages such as Home Page and Design Wizard. Expand the node group to view any new changes to the list of nodes or node groups.

If you add a node under a non Performance Manager node group, the node group is converted to a Performance Manager node.

Delete a Node Group

You can only delete Performance Manager node groups and the respective sub groups from the Admin User Interface. To delete a node group, perform the following tasks:

1. Select the Performance Manager node group or sub group you want to delete by selecting the check box adjacent to the node group. Click the **Delete** icon ![icon]. A message asking you to confirm if the node group is to be deleted appears.

2. Click **OK**. All the sub level node groups and all the nodes which belong to the top level node-group are deleted or click **Cancel** to exit from this window.

If you select to delete the sub group, only the sub group and the nodes belonging to that sub group are deleted.

In the **Manage Nodes** option of the **Admin** menu you cannot delete non Performance Manager node groups. Only Performance Manager specific node groups can be deleted.

Delete a Node

To delete a node, perform the following tasks:

1. Select the node which you want to delete by clicking on the check box adjacent to the node.

   Click the **Delete** icon. A confirmation message asking if you want to delete the node appears. In addition, the confirmation message includes a checkbox, **Delete the node(s) from all groups**. Select this option if you want to delete the node(s) from all the groups to which it belongs.

2. Click **OK** to delete the node with required option or **Cancel** to exit from this window.

In the **Manage Nodes** option of the **Admin** menu you cannot delete non Performance Manager nodes. Only the respective node groups are visible. However, you can delete for Performance Manager nodes and node groups.

Search for a Node or Node Group

To search for a node or a node-group, perform the following tasks:

1. Enter the name of the node or node group which you want to search in the text box below the node tree. Click the **Search** icon.

2. If the node or node group is present in the node tree, the node or node group will be highlighted.

3. If the node or node group is not present in the node tree, then a message stating that the node or node group is not found appears.

In the Manage Nodes option of the Admin menu, you cannot search for HP Operations Manager, HP Reporter, and HP SiteScope Server nodes. Only the respective node groups are visible. However, you can search for Performance Manager nodes and node groups.

If a node group belongs to a Performance Manager and a non Performance Manager, only the nodes under Performance Manager will be displayed and can be searched.

When you search for a node, Performance Manager highlights only the first 10 nodes matching the search string. To narrow down your search, you need to specify appropriate search strings. Also, the search operation cannot highlight a node where SiteScope is installed.

View System Information

To view the system information for a node, Select the node and click the **System Information** icon.

The system information of the selected node appears in a new page. The system information includes details such as: System ID, the Data source, Data communication protocol, Number of disks and CPUs available, Operating system name, Operating system version, list of key metrics and available metric classes and list of instances and number of instances available for each metric class.

Manage Users

The Performance Manager Admin User Interface allows you to manage customers and users. You can also attach node groups to customers. From the menu bar, click **Admin -> Manage Users**.

The **Manage Users** window appears. This page displays a list of customers and users configured to use Performance Manager. From this page you can do the following:

> **Note:** After upgrading from Performance Manager 8.10 to 9.00, the node permissions will not be carried forward. You need to manually recreate the node groups permissions from the *OVPMusers.xml.bkp*.

Add customer

To add a customer, perform the following tasks:

1. Click **Add Customer**, the **Add Customer** window appears.

2. Enter **Customer Name** and **Password**. You must enter the password again in the **Confirm Password** text box.

3. Click **OK** to add or **Cancel** to exit from this window.

Add User

To add a user, perform the following tasks:

1. Select a customer for which you want to add a user.

2. Click **Add User**. The **Add User** window appears.

3. Enter the **User Name** and **Password** for the user. You must enter the password again in the **Confirm Password** text box.

4. Specify the user privileges. The options available are:

    ▪ **Normal** - A user with 'Normal' privileges can draw out-of-the-box graphs. The user can also design, edit, delete and save graph definitions. The changes are visible only to the user who logs in to Performance Manager with the same credentials.

    ▪ **Read only** - A user with "read only" privileges can draw out-of-the-box graphs. The user can design, and edit graph definitions. The user cannot save any new or modified graph definitions.

    ▪ **Display only** - A user with "display only" privileges can draw only out-of-the-graph definitions. The user cannot create, edit, delete or save any of the existing graphs.

Click **OK** to add or **Cancel** to exit from this window.

If the Performance Manager is configured with the Microsoft Active Directory server, you need to add users to the Performance Manager. These users must be assigned permission to access the Performance Manager configured with the Microsoft Active Directory server using their valid credentials.

View or Modify Customer or User Profile

To view a user's profile, perform the following tasks:

- Select the user whose profile you want to view. Click **Profile**. The **User Profile** window appears. This window displays the following:

    - User Name

    - User Privileges

- You can modify the User Name, change the password and modify the user privileges.

To view a customer's profile, perform the following tasks:

1. Select the customer whose profile you want to view. Click **Profile**. The **Customer Profile** window appears. This window displays the Customer Name.

2. You can modify the Customer name and the password.

Delete User or Customer

To delete a User or a Customer, perform the following tasks:

1. Select the user or customer which you want to delete. Click **Delete Customer/User**. A message asking you to confirm deletion appears. If you delete a customer then all the users associated with that customer are deleted.

2. Click **OK** to delete or cancel to exit from this window.

Attach Node Groups

You can attach one or more node groups for a customer. When you attach a node group to a customer all the sub-groups belonging to the group are automatically attached to the customer. To attach node groups, perform the following tasks:

1. Select the customer for which you want to attach node groups, Click **Attach Node Groups**. The **Select Groups** window appears.

2. Click **OK** to attach the selected node groups or **Cancel** to exit from this window. If you have selected the top-level group, all sub-groups belonging to the top-level group will automatically be attached to the customer. When you attach a node group(s) to a customer, the node group (s) will be attached to all the user(s) attached to the customer. The node groups which you attached appears in the **List of Node Groups configured for this customer**. If you have selected one or more sub-groups, the complete path will be listed.

You cannot select 'All' customers to attach groups. Select one or more groups or sub-groups which you want to attach.

If you select a top-level group, and then select the sub-group belonging to the top-level group, the top-level will be unselected. This is because when you select the top-level group all sub-groups are automatically selected. If you want only a particular sub-group to be attached, you need to select only the sub-group.

If you select a sub-level group, and then select the top-level group to which the sub-level group belongs, the sub-group will be unselected. This is because once the top-level group is selected, all sub-groups under that are automatically considered for attachment. The **Select Groups** window displays only the top-level group(s).

Example 1: If customer1 is attached to a group "windows", which contains sub-groups "win2k", "win2k3" and "win2k8", when customer1 is attached to "windows", all the sub-groups will be automatically attached. When you select 'customer1', the **List of Node Groups configured for this customer** displays only */windows/* and the sub-groups attached to the group "windows" are automatically considered to be attached to customer1.

Example 2: If customer1 is attached to win2k, which belongs to group "windows". When you select 'customer1', the List of Node Groups configured for this customer will display the complete path */windows/win2k/*

View the List of Attached Groups to a Customer

You can view the list of groups or sub-groups attached to a customer. To see the list of groups or sub-groups, click on the name of the customer. The **List of Node Groups configured for this customer** displays the list of groups or sub-groups attached to the customer.

If the customer is attached to a group which has many sub-groups, all the sub-groups will be automatically attached to the customer. However the list displays only the name of the top-level group and sub-groups are not displayed.

Example 1: If a customer is attached to a group windows, which has 3 sub-groups, win2k, win2k3 and win2k8, the **List of Node Groups configured for this customer** displays only */windows/*. If a customer is attached to a sub-group, the list will display the complete path of the sub-group.

Example 2: */Windows/win2k3/* - indicates that the customer is attached only to the sub-group "win2k3" belonging to the group "windows".

Detach Node Groups

You can detach one or more node groups attached to a customer. To detach node groups, perform the following tasks:

1. Select the customer from the list of customers. All the node groups attached to the customer appear in the **List of Nodes configured for this customer**.

2. Select node group(s) which you want to detach. Click **Detach Nodes**. A message asking you to confirm the deletion appears.

3. Click **OK** to detach or **Cancel** to exit from this window.

The node group(s) you detach does not appear in the **List of Nodes configured for this customer**. When you detach one or more node group(s) for a customer, all the user(s) attached to the customer will automatically be detached from the node group(s).

Diagnostic View

Diagnostic View of Performance Manager enables you to monitor and analyze real- time and near real-time performance data from the nodes collected by various data sources. It enables you to draw and design graphs for data available from different data sources. It helps you visualize the historical and real time data at the same time within the Graphs Panel through separate graphs for each type of data.

You can also select the time range, for which you want to monitor the data, and drill down to have a granular view of the available data.

The Diagnostic View consists of two panels:

- **Selection Panel** - Using the Selection Panel you can connect to data sources, select the metrics and metric sub-classes, instances and perform the drill down on any metric class.

- **Graphs Panel** - You can view the drawn graphs in the Graphs Panel. It helps you perform advanced diagnostic functions such as monitoring, and comparing performance data for the selected time period. It also helps you save the customized layout of graphs for future use.

The following menus are available on the Diagnostic View page:

- **DataSources** menu: It gives you options such as **Add**, **Draw**, **Remove** and **Remove All** .You can use the options under this menu to add a data source, remove a data source or remove all connected data sources. You can also redraw a pre-defined graph using the **Draw** option.

- **Graphs** menu: It gives you options such as **Tooltips**, **Navigation Panel**, **Date Range Panel**, **Close All Graphs**, **Save State**, **Load State**, and **Delete State**.

- **Help** menu: It displays the online help and tutorials.

Selection Panel

The Selection Panel contains the following:

- **Data Sources** pane: Displays the nodes you selected from the Connect Data Sources window. You can right-click in the data sources pane and select **Add** to add one or more data sources. The node name appears with the data source in the `<systemname::data source>` format.

- **Metric Classes** pane: When you select a data source, the **Metrics Classes** pane lists the metric classes available from the data source on the node.

- **Instances** pane: When you select a multi-instance metric, the **Instances** pane lists all the instances of the selected metric class. This pane will not be displayed if a non-multi-instance metric class is selected.

- **Metrics** pane: When you select a of metric class, the metrics pane lists the metrics available in each category.

The ![refresh icon] icon is used to refresh a data source. To refresh, select a data source and then click the refresh icon. When you refresh a data source, all the available metric classes, instances (if any), and the metrics are refreshed. You can also refresh an RTM data source manually, using this refresh icon.

Optionally, you can also refresh a data source using the following methods:

- Select a data source, click DataSources menu and then select **Refresh** option.

- Right-click a data source, and then select the **Refresh** option.

> **Note:** All the available options under the DataSources menu and the right-click options on the Data Sources pane in the Selection Panel are unavailable until the selected data source is completely refreshed.

If a communication error occurs while refreshing the selected data source, an error message is displayed. Click OK to continue. The selected data source is then removed from the list of available data sources. The graphs drawn for the metrics of the data source are also removed from the Graphs Panel.

> **Note:** You can show and hide the Selection Panel by clicking on the expand/collapse button available in the Graphs Panel. You can also adjust the width of the Selection Panel.

Graphs Panel

The Graphs Panel shows default graph containing important system metrics after you connect to the data source. You can also draw your own graphs using the data available from different data sources for any selected node.

Connect to Data Sources

You can connect to RTM (Real-Time Measurement) and near real-time data sources to graph and analyze real-time and near real-time performance data from nodes.

To connect to a data source:

1. Click **DataSources** -> **Add**. Alternatively, you can also click ⊕ on the Selection Panel. The **Connect Data Sources** dialog box opens.

2. From the node tree on the **Select Nodes** pane, you can do the following:
   - **Select Node or Nodes**: Expand the node tree to view the list of nodes. Select the node for which you want to draw the real-time graph by selecting the check-box adjacent to the node.

Click to cancel the selection of node. You can also clear the check-box adjacent to the node to cancel the selection of node

- Search for Nodes

- View System Information

- Add Nodes temporarily

- **Refresh nodelist**: Click to view the most recent changes to the node groups and nodes.

3. After you select one or more nodes, click **List Data Sources**. Performance Manager lists all the available data sources on the selected nodes. Performance Manager displays a message "No data source found on the selected node(s) if a data source is not available on the node you selected.

4. If you want to remove a node from the list, click .

5. Click **Connect** to connect to all data sources in the list.

6. Click **Cancel** to exit from this window without selecting any data source.

After you connect to the data sources, default graphs appear in the **Graphs Panel**. To stop automatic drawing of default graphs, clear the **Draw Default Graphs** checkbox before you click **Connect**.

Remove Data Sources

You can remove a data source that was added previously. To remove a data source, you can do one of the following:

- Removing from Menu option
  a. From the list of Data Sources on the Selection Panel, select the data source that you want to remove

  b. Click **DataSources** > **Remove**.

  > **Note:** Click **Remove All** if you want to remove all the added data sources.

- Removing from Selection Panel
  a. Right-click the data source you want to remove and select **Remove**. Select **Remove All** to remove all the added data sources.

  A confirmation message asking you to confirm removal of data source appears.

b. Click **OK** if you want to remove the data source. The data source is removed from the list and all the metrics associated with that data source are deleted from the graphs in **Graphs Panel**.

c. Click **Cancel** if you do not want to delete the data source.

> **Note:**
>
> - The **Remove** and **Remove All** options are disabled if no data sources are added or if the data sources pane does not contain any data source.
>
> - When you remove a data source, the graph windows and drill down windows associated with the metric class of the data source is removed. The window is removed from the Control bar menu options.

Launch a Default Graph

You can draw a default graph with pre-defined metrics for a selected data source.

To launch a default graph for a selected data source, you can do one of the following:

- Drawing a default graph from the Menu option:
  a. Select the data source for which you want to launch a default graph.

  b. Click **DataSources** > **Draw**. The default graph is displayed in the Graphs Panel.

- Drawing a default graph from the Selection Panel:

  Right-click the data source for which you want to launch a default graph, and then select **Draw**.

  Alternatively, drag and drop the data source from the **Data Sources** list on the Selection Panel to the blank space on the Graphs Panel.

  The default graph is displayed in the Graphs Panel.

Drawing Real Time and Near Real Time Graphs

You can launch graphs based on real time and near real time data in the Graphs Panel.

To draw a real time and near real time graph:

- Connect to data sources available on nodes. For instructions, see Connecting to Data Sources. A default graph with pre-defined metrics is launched in the Graphs Panel.

> **Note:** The pre-defined system metrics shown in the default graph window are configurable. For more information, see *HP Performance Manager Administrator Guide.*

- Drag and drop a metric from the metrics list on Selection Panel to the blank space on the Graphs Panel. The graph is drawn in the Graphs Panel for the selected metrics. You can drag and drop any number of metrics. You can also add one or more metrics to an existing graph in the Graphs Panel.
  - After you draw a graph, you can see the following:
    - Legends for the metrics appear on the graph.

    - Name of the node from which the data source is collecting data appears in the title bar of the graph window.

    - The metric name, metric value, and the timestamp of the metric.

> **Note:** However, you cannot drag and drop metrics from a real-time graph to a historical graph, and from a historical graph to a real-time graph. The graphs for the metrics will appears in a new window.

To perform real-time analysis Diagnostic View provides the following options:

Compare metrics from different nodes

To compare metrics from different nodes:

1. Select a metric class from a node where a data source is available.

2. Drag and drop a metric of the selected metric class from the **Metrics pane** to the graph panel. The metric appears in a new graph.

3. Select another node from the **Data Sources** pane on the **Selection Panel**. The selected node is highlighted

4. Select the same metric class and drag and drop the same metric to the previously drawn graph on the **Graphs Panel**.

5. You can now compare the same metric of different nodes on the drawn graph window.

Compare metrics of different metric classes belonging to the same node

To compare metrics of different metric classes belonging to the same node:

1. Select a metric class from a node where a data source is available.

2. Drag and drop a metric of the selected metric class from the Metrics pane to the graph panel. The metric appears in a new graph.

3. Select another metric class belonging to the same node.

4. Drag and drop another metric of the selected metric class to the previously drawn graph on the **Graphs Panel**.

5. You can now compare metrics of different metric classes belonging to the same node on the drawn graph window.

> **Note:**
>
> - The timestamp displays the time of your browser and not the time at which the data is collected on the node. There could be a delay of few seconds in displaying the data depending on your Internet connectivity.
>
> - You cannot drag and drop metrics from a real-time graph to a historical graph, and from a historical graph to a real-time graph. The graphs for the metrics will appears in a new window.

Multiple instances from same data source

To compare multiple instances of the same metric in case of multi-instance metrics:

1. Select a multi-instance metric class from one node where a data source is available.

2. The **Instances** pane displays all the instances of the metric class.

3. Select any one instance, by default the first instance in the list is selected.

4. Select the metric which you want to compare and drag it to the **Graphs Panel**. The metric appears in a new graph.

5. Select the other instance which you want to compare with the previously selected instance.

6. Select the same metric from the Metrics Pane and drag it to the drawn graph on the Graphs Panel.

Remove metric

Right-click the metric name from the legend and select remove. The metric is removed from the graph and will no longer appear in the legend.

Add metric

Drag and drop a metric into an existing graph. The new metric is displayed in the graph and will be listed in the legend.

Copy metrics from one graph to another

You can drag a metric from one graph and add it to another. The target graph will display the metric.

> **Note:** However, you cannot drag and drop metrics between real-time and historical graph windows. Also, if you drag and drop different metrics between two different graph windows, no

title appears in the target graph window.

Pull out metric from a graph

You can drag a metric from one graph and drop it into the empty space in graph panel area. A new graph is drawn with the metric which you selected.

View or Hide Metrics

Click on a metric legend in the graph window. The metric is disabled and does not appear in the drawn graph. To view a hidden metric, click on the disabled metric legend.

Change the Metric Label

After a graph is drawn you can change the metric label within a graph. To change the name, right-click on the label and type the name.

Note: The timestamp displays the time of your browser and not the time at which the data is collected on the node. There could be a delay of few seconds in displaying the data depending on your Internet connectivity.

Working With Drawn Graphs

After you draw a graph using real time or near real time data, the Graph Panel displays graph for each data source as a separate window.

You can perform the following actions on real-time and near real-time graph windows:

Export Performance Data

You can export the data in one of the following formats:

- CSV

- TSV

- XLS

- XML

- PDF

To export performance data:

1. Select **Export** from the **Options** menu available on the graph window. The **Export from a Graph** window opens.

2. Select the format in which you want to export the data from the list available in the **Type** menu of the **Export from a Graph** window.

3. Click **OK**.

> **Note:**
>
> - You need to modify your browser settings to display data in the XLS and TSV format. See "Configure Browser Settings to Display Microsoft Excel and TSV Files" on page 7.
>
> - When you export data from real-time graphs, only the data that is displayed in the graph or drill-down table is exported.

Clone

The clone option enables you to generate a new graph with the same set of metrics (and instances) of a different data source.

To clone an existing graph:

1. Select **Clone** from the **Options** menu in the graph window, The **Select Datasources** window opens.

2. Select the data source for which you want to clone the graph.

3. Click **OK**.

By default, the name of the data source appears on the title bar of a graph window.

To change the graph title:

1. Select **Change Title** from the **Options** menu available on the graph window. The **Change Title** window opens.

2. Type a title in the **New Title** text box.

3. Click **OK**.

Save as image

To save a graph as an image:

1. Select **Save As Image** from the **Options** menu available on the graph window. The **Save in** window opens.

2. Browse to the location where you want to save and type the file name with which you want to save the image.

   > **Note:** You must save the file in the JPG format.

Resize Graph Windows

To resize the graph windows on the Graphs Panel:

1. Place the cursor at the bottom-right of the graph window and wait till the cursor changes to the re-size icon ⚒ .

2. Click and drag the mouse to increase or decrease the size of the graph window.

3. Release the mouse once the specified graph window size is attained. All other graph windows in the graphs panel are automatically resized to same size.

> **Note:** If you want to resize a graph window other than the first one, the shadow of the resized window appears while you drag the bottom right corner of the window. After you finish resizing the window, all other graph windows are sized similarly.

Rearrange Graph Windows

To rearrange graph windows:

1. Select a graph window you want to rearrange.

2. Drag the selected graph window by the title bar and drop on the graph window of the target graph window location

3. The selected graph window replaces the target graph window.

Highlight Graph Windows

To highlight graph windows:

1. Click the node from the list in the data source pane. The default graph is highlighted with a thick blue border.

2. To highlight all graph windows belonging to a particular node, you need to click on the node from the list in the data source pane. One graph window is highlighted at a time in a round robin fashion.

View or Hide Metrics

- To disable a metric from appearing on a graph, click the metric legend in the graph window.

- To enable the disabled metric, click the metric legend in the graph window. The legend is enabled and the metric appears on the graph

> **Note:** When you disable a metric, the value of the metric does not appear in the graph. However, for real-time graphs, RTM continues to collect the real time performance data in the background.

Maximize or Restore Graph Windows

- To maximize a reduced graph window click ▣. The graph window is maximized to the size of the graphs panel.

- To restore a graph which is maximized, click ▣. The graph is reduced to its initial default size.

Close Graph Windows

To close any graph, click ☒. To close all open graphs windows, select **Close All Graphs** from the **Graphs** menu.

Drill Down

To drill down to view historical data for a selected period:

- Select **Drill down** from the **Options** menu in the near real-time graph window. The Drill Down Options dialog box opens.

- Select the start date and end date from the Drill Down Options dialog box and click **Draw** to view data for the selected period.

> **Note:** You can drill down and view data as a line graph or table graph. By default, the graph displays the data for the metrics appearing in the historical graph window. However, you can also drill down to view data for a single metric class.

Launch Real-Time or Near Real-Time Graphs

To launch a real-time graph from a near real-time graph window:

Select **Launch Real Time** from the **Options** menu in the near real-time graph window.

> **Note:** This option will be available only for nodes that have near real-time data. Also, to launch a real- time graph from a near real-time graph window the same node must have a real-time data source connected to it.

To launch a near real-time graph from a real-time graph window:

Select **Launch Near Real Time** from the **Options** menu in the real-time graph window.

> **Note:** This option will be available only for nodes that have real-time data. Also, to launch a near real- time graph from a real-time graph window the same node must have a near real-time data source connected to it.

Navigate

To select the time period for which you want to view the graph:

- Select **Navigate** from the **Options** menu in the near real-time graph window. The Time Settings dialog box opens.

- You can select the start date and end date and view the near real-time graph for the selected period.

> **Note:** This option is available only for near real-time graph windows. The Start Date and the End Date Time Settings displays the time range dialog box

Navigation Panel

To enable the navigation options in a historical graph window:

Select Navigation Panel from the Graphs menu. The navigation options are enabled in the near real-time graph windows.

The following options are available in the Navigation Panel:

- **Auto Refresh On/Off** - You can click on [icon] to enable or disable the Auto Refresh option. If you enable this option, the graph is redrawn with the latest data available from the data source. You can use this option to refresh the data in the graph with the recent changes from the data source. You can configure the data refresh time interval.

- **Previous/Next** - This option enables you to view the data for the adjacent time intervals, based on the values specified for the 'points every' while drawing the graph.

- **Prepend/Append** - This option enables you to view the data for the previous or next set of data points, in addition to the data you are currently viewing.

Zoom-in and Zoom-out

The Zoom-in and Zoom-out option enables you to adjust the summarization levels in the near real-time graphs. For more information, see Zoom.

Save the Layout of the Diagnostic View

You can draw multiple graphs in the Graphs Panel with the data available from different data sources from different nodes.

You can draw composite graphs that are made of different metrics from different data sources and customize the layout of the graphs. When you log out or close the browser, all the information related to the layout of drawn graphs, connected data sources, and the selected metrics is lost. You are then required to reconnect to the data sources to get data and recreate graphs again from the beginning. To avoid this, you can save the customized layout of the Diagnostic View for future use. You can, at a later time, retrieve the saved view.

You can also launch the saved layout of the customized Diagnostic View by passing the relevant parameters in the URL. A URL is generated and displayed in the confirmation dialog box, when you

save a layout for the Diagnostic View. You can copy this link and launch the saved layout, by pasting this URL in a browser window.

> **Note:** The URL for launching the saved layout will be shown only for those Performance Manager users, who do not have any password set for their accounts. Also, this option will not be available if AD authentication is enabled.

You can save the following in the layout of the Diagnostic View:

- Connected data sources

- Selected metric classes and metric sub-classes

- Graph windows with a set width and height

- Layout view with the **Tooltips** option enabled or disabled

You cannot save the following in the layout of the Diagnostic View:

- Drill-down table

- Graph windows with specific legends disabled.

To save the layout of the Diagnostic View:

1. Click **Graphs > Save State**. The Save State dialog box appears.

2. Type a name in the **Enter State Name** box.

3. *Optional.* Select the **Save the Date range** check box to save the state for a particular time range.

   > **Note:** You have to select the date range on the graph before you proceed to save the layout.

4. *Optional.* Add a description in the **Description** text box.

5. Click **Save**. The layout is saved by the specified name.

6. A confirmation dialog box opens.

   If you logged on to the Performance Manager console as an administrator or user without a password, the confirmation dialog box shows a URL that you can use to launch the saved layout. The **Copy Link to Clipboard** button helps you copy the URL to clipboard.

7. Click **OK** to continue.

When saving a layout, note the following:

- You can save multiple layouts in the Diagnostic View by assigning unique names to each layout.

- You can use alphanumeric characters. The only special character you can use is underscore. The text you type in the text box is not case-sensitive.

- If you assign an already existing name while saving a layout, a message appears asking if you want to replace the existing layout.

To load the layout of the Diagnostic View:

1. Click **Graphs > Load State**. The Load State dialog box appears if you have saved more than one layout.

2. Select a layout from the list.

3. Click **Load**. The selected layout is displayed.

However, if you are user who does not have any password set for the account you will see an additional feature to launch a selected layout as following:

1. Select a layout from the list.

2. Click **Copy Link to Clipboard** button to copy the link.

3. Launch your browser and paste the URL in the address bar.

4. The saved layout is displayed in your browser window. It displays the customized Diagnostic View for the selected layout.

> **Note:** If you select time range for a graph at the time of saving the state, the layout displayed will be for that time range only.

To delete the saved layout of the Diagnostic View:

1. Click **Graphs > Delete State**. The Delete State dialog box appears if you have saved more than one layout.

2. Select a layout from the list.

3. Click **Delete**. The selected layout is deleted.

> **Note:**
>
> - The **Load State** and **Delete State** options are disabled if no states are saved.
>
> - You can also launch the saved layout using an URL reference. For more information, see *HP Performance Manager Administrator Guide*

Date Range Panel

The Diagnostic View enables you to draw and design real-time and near real-time graphs. The graphs so drawn, displays the available data from the connected nodes depending on values specified for 'points every', and the default date range of seven days ending 'Now'.

Using the **Date Range Panel** option, you can perform a detailed diagnosis of the data displayed in the near-real time graphs. It enables you to customize the graphs to display granular data for the selected unit of time. You can also drag and drop any metric, and draw a reference graph for the selected time range. You can use these reference graphs to identify the problem areas and perform a root cause analysis.

To enable the date range options, click **Graphs** >**Date Range Panel**. The Date Range Panel appears in the Graphs Panel above the graph windows.

The Date Range Panel enables you to do the following:

- Select a unit of time - You can select a unit of time using the drop-down list. You can then view data for the last hour, day, week or month.

- Select a time frame - To select a time frame, click 📅 . The **Time Settings** dialog box opens. You can then select the start date and the end date to view the graph for that period. The start date and the end date values range between the earliest and the latest time stamps available in the data source.

- Select a time range - You can select the time range from the list. You can then view data for the specified range such as days in a week, weeks in a month, and months in a year. You can also adjust the time frame for the selected unit of time. You can also use the navigation buttons to view data for the selected time frame such as Previous/Next day, week, month and so on.

- Draw a reference graph - You can drag and drop a metric from the metrics list or any of the historical graph windows to draw a reference graph. You can use this reference graph to perform root cause analysis.

  For example, you can analyze the performance of a web server over a period of time, using the data collected by SiteScope for the URL response time related metric. You can use this metric as a symptom metric to identify the various underlying cause metrics. You can look at any of the system or infrastructure metrics related to web server collected by the Operations Agent and SPIs. You can use the URL response time metric as a reference metric, and draw graphs for various system and SPI metrics to analyze the root cause of the problem.

- Apply changes to all the graphs - You can select the **All** option to apply the changes made in the Date Range Panel to all the historical graphs. If **All** option is not selected, changes apply to the selected graph only.

- Auto apply changes to all the graphs - If you select the **Auto** option, changes made in the Date Range Panel is applied to all the historical graphs. Alternatively, if the Auto option is not selected, click **Apply** to update the graphs with the changes made in the Date Range Panel.

Metric Drill Down

You can use the Drill down option to analyze, compare metric data and view granular data based on the selected metric class. It enables you to drill down to multiple levels of the selected metric class to identify the bottlenecks. For example, you can drill down on the metric class Application. Further, you can drill down on the Application's sub-metric class, Process. You can continue to drill down on by region and pfile instances of Process.

Sub-classes vary based on the platform agent is running on. For example, on HP-UX, Application's metric sub-class, Process has Thread as one of the sub-class; however, on Solaris some metric sub-classes are not available. For the list of available metric sub-classes, see *HP Performance Agent's Dictionary of Performance Metrics for Sun Solaris*. However, you can view the metrics data for the metric class PROCESS, using the Drill-down option only.

To drill down on a metric class

- *For the RTM data source.* Right-click the metric class you want to drill down to and select **Drill down** You can also select the metric class you want to drill down and click on the Selection Panel. The Drill Down window opens. It displays the metric data in a tabular form. The data displayed is refreshed at a predefined interval as specified in the RTM data source. See "Drill Down Window" below

- *For the PA data source.* In the graph window, click **Options > Drill down**. The Drill Down Options window opens. In this window, select the time range and metric class, and then click **Draw**. The Drill Down Window opens.

- You can resize the Drill Down window by dragging the bottom-right corner of the window. The mouse pointer changes to an arrow which indicates the direction in which you can resize the window

- To minimize the Drill Down window, click the . The window appears as a menu option in the control bar. To restore the window, click on the menu options in the control bar and select the option to show only the minimized window or all Drill Down windows which you minimized as required.

- To maximize the window, click the . The drill down window is maximized to the size of browser window. To restore to original size, click .

- To close the window, click .

Drill Down Window

The Drill Down Window displays the following items:

- Title of the Drill Down window displays the selected node name and metric class.

- **Drill down**: Displays the sub classes of the metric class selected and enables you to further drill down to the metric sub classes.

- **New Window**: Enables you to open a new Drill Down window which displays the metric sub classes.

- **Lock Column**: Enables you to lock columns so that they are visible even if you horizontally scroll to the right side of the window to view the columns on the right hand side. You can also unlock columns.

- **Table Highlights**: Enables you to highlight cells based on the metric value specified. For more information see "Using Table Highlights" on page 85

- **Table Filters**: Enables you to filter the drill-down table based on the metric value specified. For more information see "Using Table Filters" on page 86.

- **Metrics Table Options**: Enables you to add or remove metrics for which you want the data in the drill-down table.

- **Metric Class**: Displays the metric class and sub metric classes as breadcrumbs. It also allows you to navigate to the upper level metric class and examine different instances and metric classes.

- **Save**: Enables you to save the data in the drill-down table.

- **Update interval**: Displays the time interval in which the data is collected by the RTM data source.

- **Last update**: Displays the timestamp of the data last collected by the RTM data source.

- **Pause**: When clicked, stops the data from being refreshed for analysis. The data is not refreshed after you click **Pause** until you click **Resume**.

  > **Note:** Any metric related data is not cached during the pause time. You can use the Standard View of Performance Manager to retrieve the historical data.

- **Resume**: The Resume button is enabled only if you click **Pause**. When you click **Resume**, the latest data fetched from RTM is displayed and the corresponding time stamp shows up against Last Update.

- **Help**: Displays the help topics.

You can also perform the following tasks from the Drill Down window:

Sorting Data

You can sort the data based on any metric appearing in the column. To sort the contents of the

column, follow these steps:

- Click the column header area of any metric.

- Click on the arrow which appears at multiple column sort area by the side of the metric.

- If you want to sort in ascending order, the arrow should point upwards. By default, when you select a metric column for sorting, the data is sorted in ascending order.

- The data in the table is sorted based on the selected column and displays the value one at multiple column sort area of the metric.

- To sort the data in descending order, click on the arrow again. The arrow changes to downward direction and the data is sorted in descending order.

- You can also select another metric to perform multi-level sorting. When you select the second metric and click on the arrow which appears at multiple column sort area of the metric, the selected metric column displays a value two at multiple column sort area of the metric.

- To arrange data in ascending or descending order, click the arrow in the metric column to modify the direction.

- At any point, you can restart the sorting order by clicking any column. However you need to click the area of the column other than multiple column sort area of the metric header.

Rearranging Columns

You can rearrange a column in the table as required:

Select the column header of the metric which you want to rearrange and drag it and place it at the required position.

Filtering Drill Down Table Data

You can filter the drill-down table contents based on some criteria to analyze the performance data.

To specify filter criteria, click ▽ .The **Table Filter** window appears. For instructions to specify filter, see Table Filters.

Highlighting Drill Down Table Cells

You can highlight required cells of the drill down table based on certain criteria for easy analysis of performance data.

To specify highlight criteria, click ▦ . The **Table Highlight** window appears. For instructions to specify highlight, see "Using Table Highlights" on the next page.

Exporting Performance Data

You can export performance data in CSV, TSV, XLS, and XML from the drill-down table.

To export the data, click [icon]. The **Export from a graph** window appears. Select from the format in which you want to export the data from the **Type** menu and then click **OK**.

> **Note:** You need to modify your browser settings to display data in the XLS and TSV format.

Using Metrics Table Options

You can show and hide metric columns of the drill-down window.

You can select the metric columns for which you want to view the data and deselect the metric columns for which you want to hide the data by using the Metrics Table Options. For instructions to add and remove metric columns, click Metrics Table Options.

Lock Columns

You can lock one or more columns so that they are always visible when you navigate across columns using the horizontal scroll bar on the drill-down window. You can unlock columns which are locked.

To lock columns, follow these steps:

- Select the check box **Lock Columns**. The first column is now locked. You can now navigate across columns using the horizontal scroll bar in the drill down window and the first column is always visible. The column border after first column appears as a thick line.

- You can add one or more columns to the locked column section. To add another column, drag and drop any column adjacent to the first column before the thick column border. The column border indicates the range of columns which are locked.

To unlock columns, follow these steps:

- Deselect the check box **Lock Columns**.

- To unlock one or more columns, drag and drop the required columns to the area of the table outside of the thick line. At least one column will still remain locked.

Save Drill Down Table

You can save all the changes made to the drill-down table using the **Save** option.

To save the changes made to the drill-down table, click [icon]. A message appears, stating that the drill down options have been saved successfully. Click **OK** to save the table.

Using Table Highlights

You can highlight cells by specifying conditions based on the metric value.

1. Click Table Highlights icon on the drill-down window. The Table Highlights window appears.

2. The Table Highlights window displays the following options:
   ▪ The metrics list displays all the metrics of the metric class. By default, the first metric of the drill-down table is displayed.

   ▪ The comparison symbol list displays the comparison symbols to set the condition to the filter. By default, = sign is displayed.

   ▪ The text box allows you to type a value to compare against the metric.

   ▪ Click **Add** to list the given condition below.

   ▪ If you want to edit the condition you have just added, make changes and click **Update**.

   ▪ **Selected color** displays the cell color you chose.

   ▪ Click **Color** to pick any color of your choice which will be used to highlight the table cells of matching conditions.

   ▪ If you want to remove a condition from the list, select the condition and click **Remove**.

   ▪ Click **Remove All** to remove all the conditions appearing in the list.

   ▪ Click **OK** to filter the data based on the conditions specified in the list.

   ▪ Click **Cancel** to close the Table Highlights window.

   ▪ Click **Help** to display the context-sensitive help topics.

3. Select the metric which you want to highlight based on a condition.

4. Select a comparison symbol. Enter a value to compare against the metric.

5. Click **Color**, to add a color to the cell. The color picker pop-up appears. Select a color, from the color palette and click **OK**.

6. Click **OK**.

Using Table Filters

To specify the conditions to filter contents based on metric value:

1. Click the **Table Filters** icon 🔽 on the drill-down table. The **Table Filters** window appears.

2. The **Table Filters** window displays the following options:
   ▪ The metrics list displays the metrics displayed in the drill-down table. By default, the first metric of the drill-down table is displayed.

- The comparison symbol list displays the comparison symbols to set the condition to the filter.

- The text field allows you to type a value to compare against the metric.

- Click **Add** to add to the list of filter conditions.

- If you want to edit the condition you have just added, make changes and click **Update**.

- Select **AND** or **OR** to specify multiple conditions in conjunction.

- If you want to remove a condition from the list, select the condition and click **Remove**.

- Click **Remove All** to remove all the conditions appearing in the list.

- Click **OK** to filter the data based on the conditions specified in the list.

- Click **Cancel** to close the Table Filters window.

- Click **Help** to display the context-sensitive help topics.

3. Select the metric for which you want to filter data.

4. Select a comparison symbol and enter a value to compare against the metric.

5. Click **Add** to list the condition in the **Table Filters** window.

6. Click **Update** to make changes to the condition added.

7. Select either **AND** or **OR** to apply multiple conditions.
   - **AND** - filters the rows that satisfy the first condition you set and the row that satisfies the following condition as well.

   - **OR** - filters the rows that satisfy either the preceding or the following condition.

8. Click **OK**.

> **Note:** While specifying strings or expressions for filters, use regular expressions. (Example: .*C.* instead of *C*)

Comparison Symbols

Symbol	Description
=	Equal
>	Greater
<	Less

Comparison Symbols, continued

Symbol	Description
>=	Greater or Equal
<=	Less or Equal
!=	Not Equal
!>	Not Greater (Same as <=)
!>=	Not Greater or Equal (Same as <)
!<	Not Less (same as >=)
!<=	Not Less or Equal (Same as >)
~	Like (text with leading or trailing ".*" expressions)
!~	Not Like (text with leading or trailing ".*" expressions)

Metrics Table Options

You can show and hide metric columns of the Drill Down window. You can select the metric columns for which you want to view the data and deselect the metric columns for which you want to hide the data by using the **Metrics** option.

To show and hide the metric columns of the Drill Down window, click the **Metrics** option on the Drill Down window.

The Metric Table Options window appears and displays the following:

- **Available Metrics**: Displays the list of all the metrics available under the metric class you selected except the metrics displayed in the Metrics to Display pane.

  Note: Available Metrics pane does not display the metrics shown in Metrics to Display pane.

- **Metrics to Display**: Displays the list of metrics you want to display in the Drill Down window. By default, it displays a set of pre-defined metrics available in the drill-down table. You can select metrics from the Available Metrics pane into the Metrics to Display pane. You can also move metrics from Metrics to Display pane to Available Metrics pane.

- **Navigation buttons** : Enables you to move a metric between Available Metrics pane and Metrics to Display pane.

- **Lock the first column**: Enables you to lock the first column in the Drill Down table from the Metrics Table Options window after you update and change the order of metrics in the Metrics to Display pane. When you select the Lock the first column box in the metrics table options

window, the Lock Column box in the Drill Down window is automatically selected. The first column in the drill-down table is locked from scrolling horizontally for easy analysis.

- **Control buttons** : Allows you to rearrange the order of metrics appearing in the Metrics to Display pane.

  > **Note:** This option will be enabled only when there are two or more metrics in the Metrics to Display pane.

- **OK**: If you click **OK** the changes you made in the Metrics Table Options window will be displayed in the Drill Down window. The **OK** option is disabled if the Metrics to Display list is empty.

- **Cancel**: If you click **Cancel** all the changes you made in the Metrics Table Options window will not be reflected in the Drill Down window.

Adding Metric Columns

To add a metric to the drill-down table, follow these steps:

1. From the Available Metrics pane, select the metrics you want to display in the drill-down table.

2. Click ⏭ to add the selected metrics to the Metrics to Display pane. The selected metrics does not appear in the Available Metrics pane.

3. Click **OK** after you complete the selection. The selected metrics now appears in the drill-down table as a column.

4. To cancel the selection, click **Cancel**.

Locking the First Metric Column

To lock the first metric column in the drill-down table:

- Select ☐ **Lock the first column** box in the Metrics Table Options window. The first metric name appearing in the **Metrics to Display** pane will be locked in the Drill Down table.

  > **Note:** When you select the ☐ **Lock the first column** box in the Metrics Table Options window, the ☐ **Lock Columns** box in the Drill Down window is automatically selected.

- You can add more than one column to the locked column section. To add another column, drag and drop an unlocked column before the thick column border that separates locked and unlocked columns. The column border indicates the range of columns which are locked.

To unlock the first metric column in the drill-down table:

- Deselect the ☐**Lock the first column** box. The thick line after the first column does not appear.

- To unlock one or more columns and not all columns, drag and drop the required columns to the area of the table outside of the thick line. The columns within the thick line still remain locked.

Remove Metric Columns

To remove a metric from the drill-down table:

1. From the Metrics to Display pane, select the metrics you want to remove from the drill-down table.

2. Click ❮❮ to remove the selected metrics from the Metrics to Display pane. The metric is moved to the Available Metrics pane from the Metrics to Display pane.

3. Click **OK** after you complete the selection. The metric you removed now does not appear in the drill-down table.

4. To cancel the selection, click **Cancel**.

Specifying the Order of Metric Columns

1. Select a metric from the Metrics to Display pane which you want to move up or move down.

2. Click ▲ to move the metric up or click ▼ to move the metrics down from its current position in the list.

   > **Note:** This option will be enabled only when there are two or more metrics in the Metrics to display pane.

3. Click OK after you specify the order of metrics. The metric columns in the drill-down table appear in the specified order.

4. To cancel the selection, click Cancel.

Analyzing Metric Class Data

You can drill down metric classes to analyze and view granular data based on the selected metric class.

Drill down on a metric class and analyze data

Follow these steps:

1. Right-click the metric class which you want to drill down, for example, Application, and select Drill down. The Drill Down window appears and displays the default metrics for the selected metric class in a tabular form.

   Note: You can launch more than one Drill Down window at the same time. You can add more than one metrics of the metric class for which you want to view the data by using the Metrics Table Options available in the Drill Down window.

2. Select an instance from the drill down table showing an abnormal value to further drill down and identify the bottleneck. For example, other_user_root.

   Note: At anytime during the procedure you can select another instance of the metric class from the window for drill down.

Navigating across Drill Down Windows

You can navigate across different Drill Down windows associated with different nodes by using the following:

Control Bar

The control bar appears on the bottom of the Graphs panel as menu when at least one Drill Down window is open. Name of the node is displayed as a menu, for example, laurel.

To open any of the minimized drill down windows, click the menu in the control bar. The following menu options appear:

- **Metric class** - Name of the metric class for which the drill-down window is currently open.

- **Show All** - Shows all the minimized drill-down windows for a selected node.

- **Hide All** - Hides all the opened drill-down windows for a selected node.

- **Close All** - Closes all the drill-down windows for a selected node. After you select this option, all drill-down windows corresponding to the data source is closed, the menu options from the control bar is removed.

   Note: If you have selected multiple metric classes of different nodes to drill down data, menu options corresponding to every node name appears in the control bar.

Breadcrumbs

In a Drill Down window, breadcrumbs appear next to the Metric Class as hyperlinks. You can easily navigate to the parent metric class drill-down windows by clicking the hyperlinks.

If you click the metric or sub metric hyperlink, the drill-down window is updated to show the parent metric class information so that you can select a different instance of the parent metric class or drill

down into another sub class. For example, if you click PROCESS (APP NUM:4) on the thread (PROC_PROC_ID:10) window the PROCESS (APP NUM:4) data will be updated on the same drill-down window.

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