

# HP Business Availability Center

for the Windows and Solaris operating systems

Software Version: 7.0

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## Reference Information

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To register for an HP Passport ID, go to:

**<http://h20229.www2.hp.com/passport-registration.html>**

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# Welcome to This Guide

This guide provides general reference information for HP Business Availability Center.

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## How This Guide Is Organized

The guide contains the following chapters:

### **Part I User Interface**

Provides additional reference material regarding the user interface, explains the main concepts, tasks, and references of Topology Query Language (TQL) and View Explorer, explains how to work with reports, how to use the toolbars and right-click menu options in IT Universe, and how to work with dates, data samples, and log files.

### **Part II Data**

Describes the data samples and their fields that are available in various contexts in HP Business Availability Center (including Custom Reports, Measurement Filters, and Custom Query Builder).

### **Part III Dates and Times**

Describes date and time reference information for HP Business Availability Center.

### **Part IV Troubleshooting**

Describes the problems that arise while working with or administering HP Business Availability Center.

## **Who Should Read This Guide**

This guide is intended for the following users of HP Business Availability Center:

- ▶ HP Business Availability Center administrators
- ▶ HP Business Availability Center platform administrators
- ▶ HP Business Availability Center application administrators
- ▶ HP Business Availability Center data collector administrators

Readers of this guide should be knowledgeable about enterprise system administration and HP Business Availability Center.

## **Getting More Information**

For a complete list of all online documentation included with HP Business Availability Center, additional online resources, information on acquiring documentation updates, and typographical conventions used in this guide, see the *HP Business Availability Center Deployment Guide* PDF.

# Part I

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## User Interface



# 1

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## Working in Reports

Reports consist of charts and tables that help you track and analyze the health of your monitored environment. You view and generate reports, and drill down and/or apply various filtering criteria to examine performance trends and pinpoint the cause of availability and performance issues.

This chapter describes:	On page:
About Working in Reports	15
Understanding Common Report Elements	16
Choosing the Time Range and Granularity	19
Animating Report Charts with Macromedia Flash Player	22

### About Working in Reports

Reports enable you to examine and analyze the data that HP Business Availability Center collects. When generating reports, you can specify various report settings, including time range and resolution, profile, grouping, and filters.

You can also customize reports by adding a header and a footer, by selecting to automatically or manually generate the report, or by customizing other display elements. For details, see Chapter 2, “Sharing and Storing Reports.”

For details on the navigation functions in HP Business Availability Center, see “Navigating HP Business Availability Center” in the *HP Business Availability Center Deployment Guide* PDF.


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**Note:** HP Business Availability Center presents certain reports within the context of transaction thresholds. For details on configuring transaction thresholds, see “Transaction Threshold Settings” in *Using End User Management*.

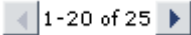








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## Understanding Common Report Elements

The items listed in the table below are common to most report pages. You may see only a few of the items described below in your report. Report elements specific to a certain application are described within that application’s documentation:

Item	Description
	<p>After you have specified the report criteria, click <b>Generate</b> to generate the report (in certain applications, reports are generated automatically when the page is loaded).</p> <p>Certain reports are initially generated automatically, whereas for others you must specify report criteria and generate the report manually. For details on setting reports to be automatically generated, see “Configuring Report Generation Settings” in <i>Platform Administration</i>.</p>
<p><b>Time Range and Granularity Bar</b></p>	<p>Located at the top of the report area. Displays the currently selected report date and time frame and granularity.</p> <p>For details, see “Choosing the Time Range and Granularity” on page 19.</p>



Item	Description
	<p>Divides a table of data or a list of reports into pages. You move from page to page by clicking the relevant button:</p> <ul style="list-style-type: none"> <li>▶ To view more reports, click the <b>Next page</b> or <b>Last page</b> buttons.</li> <li>▶ To view previous reports in the list, click the <b>Previous page</b> or <b>First page</b> buttons.</li> </ul>
	<p>Click the <b>back</b> button to view the previous page in the list of reports.</p>
	<p>Click the <b>forward</b> button to view the following page in the list of reports.</p>
	<p>Click to view the first page of reports.</p>
	<p>Click to view the last page of reports.</p>
	<p>Click the <b>Sort Up</b> button to display an alphabetical list in the column you chose.</p>
	<p>Click the <b>Sort Down</b> button to display a reverse alphabetical list in the column you chose.</p>
	<p>Click to reset the table columns' width to its default setting. You can adjust the width of the table's columns by dragging the borders of the column to the right or the left.</p>
	<p>Click the <b>Select Columns</b> button to open the Select Columns dialog box and select the columns you want to be displayed on the table.</p> <p>For details on the Select Columns dialog box, see “Select Columns Dialog Box” on page 45.</p>

Item	Description
	<p>Click the <b>Print</b> button to drill down for the following options:</p> <ul style="list-style-type: none"> <li>▶  produce a .pdf format file. For details, see “Producing a Printer-Friendly Report in .pdf Format” on page 27.</li> <li>▶  send a report to a printer. For details, see “Printing a Report” on page 27.</li> </ul>
	<p>Click the <b>Format</b> button to drill down for the following options:</p> <ul style="list-style-type: none"> <li>▶  produce a .csv format file. For details, see “Saving a Report in .csv Format” on page 28.</li> <li>▶  produce an Excel format file. For details, see “Saving a Report in Microsoft Excel Format” on page 29.</li> <li>▶  produce an .xml format file. For details, see “Saving a Report in .xml Format” on page 30.</li> </ul>
	<p>Click the <b>Export</b> button to drill down for the following options:</p> <ul style="list-style-type: none"> <li>▶  send a report by e-mail. For details, see “Sending a Report by E-Mail” on page 31.</li> <li>▶  publish a report with updated data. For details, see “Publishing a Report” on page 33.</li> <li>▶  save a report to the report repository. For details, see “Saving a Report to the Report Repository” on page 36.</li> </ul>
<animated reports>	<p>Certain reports are animated with Macromedia Flash Player. For details, see “Animating Report Charts with Macromedia Flash Player” on page 22.</p>
<breadcrumbs>	<p>The list of pages appearing horizontally across the top of the page that you have navigated through to get to the current page.</p> <p><b>Note:</b> Each page in the list of breadcrumbs is a link which you can click to trace your path of navigation.</p>

Item	Description
<color coding>	<p>HP Business Availability Center uses color coding in reports to organize data in a meaningful way, and make reports more readable.</p> <p>Use the legend that appears in a report to get a basic description of the color coding used in the report. For detailed information about a specific report and how to interpret the color coding used, refer to that report's documentation.</p>
View as Graph tab	<p>Located just above the report.</p> <p>Click to display a graphical representation of the data. This is generally the default view.</p>
View as Table tab	<p>Located just above the report.</p> <p>Click to display a tabular representation of the data.</p>

## Choosing the Time Range and Granularity

When generating a report, you choose the time range and granularity in which the report is displayed.

For additional information on choosing the time range and granularity in Service Level Management, see “Tracking Range and Granularity in Service Level Management” in *Using Service Level Management*.

**To choose a time range and granularity:**



- 1 From the time range list (labeled **View**), select a time range. You can display reports by:
  - custom range
  - hour, day, week, month, quarter, year
  - past hour, past day, past week, past month, past quarter, past year

- week to date, month to date, quarter to date, year to date
- previous week, previous month, previous quarter, previous year
- last <definable time period>

---

**Note:** Not all reports include all the above time ranges.

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**2** Select:

- **Hour, Day, Week, Month, Quarter, or Year** to generate the report in that time range. Then choose either the start date and time or the end date and time. HP Business Availability Center updates the other accordingly. Continue to the next step.
- **Custom** to generate the report for a time range whose start and end date you want to manually select. Then choose both a start and end date and time. Continue to the next step.
- **Last** to generate the report for the last hour, day, week, month, quarter, or year.
- Any of the other options to view the time range relative to the current date and time. (If you select one of these options, and then make changes to the start and end dates, the View box updates the time range.) To continue, skip to step 7 on page 21.

**3** To specify a starting date and time, click the start date link (labeled **From**).

To specify an ending date and time, click the end date link (labeled **To**) to open the calendar window.



**4** Use the calendar to select the start or end date and time for the report. Choose a month, year, and time from the lists, and click a date in the calendar table.

Use the forward and back arrows on either side of the selected month to move the time period forward or back by a month.

**5** Click **OK** to accept the date you chose.

Click **Reset** to reset the calendar to the default day, month, year, and time.

Click **Cancel** to close the calendar without changing the starting time.

  **6** Use the forward or back arrows as required to move the selected time period forward or back by the period of time specified in the time range list. If a custom time range is selected, HP Business Availability Center moves the time period forward or back by the current custom time range.

**7** For reports that are divided by time units, you can select report granularity. From the granularity value and granularity unit lists (labeled **Every**), select the granularity for the report. The available granularity units (minute, hour, day, week, month, year) differ depending on the selected time range and the specific report, and the granularity values differ per granularity unit.

The granularity determines how many measurement samples are displayed in the report per time interval. By default, reports are limited to a maximum of 32 samples (trend reports have a maximum of 50 samples). Thus, for example, if you select the “Day” time range and the “minutes” granularity, since there are 1,440 minutes in a day and a maximum of 32 samples on a chart, the granularity ranges from “every 45 minutes” ( $1440/32=45$ ) to “every 59 minutes” (above 59 minutes, you use the “hour” granularity unit).

Additional examples:

- ▶ If you select the Day time range and a granularity of every 1 hour, the report is displayed using 24 samples (1 hour x 24 = 1 day).
- ▶ If you select the Month time range and a granularity of every 1 week, the report is displayed using 4 samples (1 week x 4 = 1 month).

You can modify the allowed number of samples in reports in the Infrastructure Settings Manager. To do so, select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, click **Foundations**, select **End User/System Availability Management**, and locate the **Max Data Points in Report** parameter entry in the **Data** table. Modify the value to the required amount.

For details on using the Infrastructure Settings Manager, see “Infrastructure Settings” in *Platform Administration*.

**Note:**

- ▶ In certain reports, the selected time range is displayed along the x-axis. HP Business Availability Center breaks down the time range according to segments that differ depending on the selected time range. For details, see “Report Times” on page 320.
  - ▶ Depending on the time range you select, HP Business Availability Center generates reports using either raw data or aggregated data. A note is displayed in the report when aggregated data is used. For details, see “How Reports Use Aggregated Data” on page 311.
- 

## Animating Report Charts with Macromedia Flash Player

You can choose to use Macromedia Flash Player to render report charts, to control the flow of information and add interest to your reports.

Your users must have Flash Player installed on their machines. If they do not, the browser displays a message containing instructions on downloading Flash Player.

The reports that support the use of Flash Player are those that include charts. Scatter charts are not supported.

Pie charts in Flash reports have the following functionality, available from the context menu (opened by right-clicking on the chart):

- ▶ **Enable Rotation.** When this option is selected, you can click and drag to rotate the pie. Toggles with **Enable Slicing Movement**.
- ▶ **Enable Slicing Movement.** When this option is selected, you can click on a pie slice to slide it out from the main pie. Toggles with **Enable Rotation**.
- ▶ **View 2D/View 3D.** Toggle between these options as required.

By default, the KPIs Distribution Over Time, KPIs Summary, and KPIs Trend reports (available in Dashboard and My BAC Business Dashboard) use Flash with a built-in one second delay for rendering the reports. If required, you can remove the delay (so that the reports are immediately displayed fully rendered). To remove the delay, select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, choose **Applications**, select **Dashboard Application**, and locate the **Reports Delay Time** entry in the Business Reports Properties table. Modify the value to **False**.

For details on customizing Flash Player charts, contact Customer Support.





# 2

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## Sharing and Storing Reports

You can share and store reports using various methods, including printing, exporting to other formats, and storing in a repository for future access.












<b>This chapter describes:</b>	<b>On page:</b>
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### About Sharing and Storing Reports

HP Business Availability Center provides the following functionality for sharing and storing reports that you generate:

- ▶ sending a report to a printer or saving a report in .pdf format
- ▶ formatting a report in .csv, Excel, or .xml format
- ▶ exporting a report, by sending it by e-mail, publishing it, or saving it to the report repository

Depending on the type of report you are viewing, some or all of the following buttons are available:

Category	Click to...
	 produce a .pdf format file. For details, see “Producing a Printer-Friendly Report in .pdf Format” on page 27.
	 send a report to a printer. For details, see “Printing a Report” on page 27.
	 produce a .csv format file. For details, see “Saving a Report in .csv Format” on page 28.
	 produce an Excel format file. For details, see “Saving a Report in Microsoft Excel Format” on page 29.
	 produce an .xml format file. For details, see “Saving a Report in .xml Format” on page 30.
	 send a report by e-mail. For details, see “Sending a Report by E-Mail” on page 31.
	 publish a report with updated data. For details, see “Publishing a Report” on page 33.
	 save a report to the report repository. For details, see “Saving a Report to the Report Repository” on page 36.

## Printing Reports

You can send a report directly to a printer or produce a printer-friendly report in .pdf format.

This section includes the following topics:

- ▶ “Printing a Report” on page 27
- ▶ “Producing a Printer-Friendly Report in .pdf Format” on page 27

## Printing a Report

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**Tip:** Before printing, ensure that printer settings are set to print the selected frame, and not to print frames as laid out on screen.

To obtain optimal print results if you are using Microsoft Internet Explorer, enable the **Print background color and images** option (**Tools > Internet Options > Advanced tab > Printing**).

---

### To print a report:



- 1** Click the **Printer-Friendly Report** button to open a window displaying the printer-friendly report.
- 2** To print the report, click the browser's Print button, or right-click on the page and select **Print**.

### Producing a Printer-Friendly Report in .pdf Format

The following procedure explains how to produce a printer-friendly report in .pdf format.

#### To produce a report in .pdf format:



- 1** In any report, click the **Open in PDF Format** button to display the report in .pdf format in a new browser window.
- 2** Follow the Adobe Acrobat instructions to print or save the file in your local file system.

**Note:** When producing a hierarchal UCMDB report, the size of the .pdf is limited to the default number of data units defined for your environment. The default value is 400. A data unit is the information displayed under a CI in a report. In a table, each row is counted as one data unit. If this value does not suit your needs and must be modified, contact Customer Support.

If the file you are producing contains more than the allotted number of data units, the .pdf file is truncated.

The affected UCMDB reports are:

- System Report
  - Asset Report
  - Related CI's Report
  - Correlation Report
  - Export Package to Report
- 

## Formatting Reports

You can format a report in .csv, Excel, or .xml format.

This section includes the following topics:

- “Saving a Report in .csv Format” on page 28
- “Saving a Report in Microsoft Excel Format” on page 29
- “Saving a Report in .xml Format” on page 30

### **Saving a Report in .csv Format**

The following procedure explains how to save a report in .csv format. Only those reports that support this functionality include the CSV button.

**To save a report in .csv format:**

- 1 In a report, click the **CSV** button to open the report in a new browser window.

If your browser does not display the .csv file in a new window (for example, if you do not have Microsoft Excel installed on the machine), follow your browser's instructions to view the file or save it to disk.

- 2 Select **File > Save As**, choose a path, file name, and file format type (Microsoft Excel, .csv, and so on), and click **Save**.

---

**Note:** For the CSV formatted report to display correctly, the comma (,) must be defined as the list separator. In Windows, to verify or modify the list separator value, open Regional Options from the Control Panel, and on the Numbers tab ensure that the comma is defined as the List Separator value. In Solaris, you can specify the list separator in the application that opens the CSV file.

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**Saving a Report in Microsoft Excel Format**

The following procedure explains how to save a report in Microsoft Excel format. Only those reports that support this functionality include the Excel button.

---

**Note:** Microsoft Office Excel 2002 or later must be installed on the client machine from which you are generating the report.

---

**To format a report in Excel format:**

- 1 In a report, click the **Excel** button .
- 2 Choose whether you want to display the report or save it. To save the file, click **Save**, and in the browser that opens, choose a path and file name and click **Save**.

Any tooltips in the report are converted to comments in Microsoft Excel. To view all the text of a large tooltip, edit the comment by right-clicking the cell and choosing **Edit Comment**. Enlarge the box by dragging a corner:

	A	B	C	D	E
1	<b>Data</b>				
2	<b>Time Period</b>	<b>SLA 1</b>			
3	6/6 3:00 AM	90			
4	6/6 4:00 AM	90			
5	6/6 5:00 AM	90			
6	6/6 6:00 AM	90			
7	6/6 7:00 AM				
8	6/6 8:00 AM				
9	6/6 9:00 AM				
10	6/6 10:00 AM				
11	6/6 11:00 AM				
12	6/6 12:00 PM				

Availability: 90,000 %  
 Status: Failed  
 Business Rule: Group Average Value  
 Exceeded: > 98,000 %

	A	B	C	D	E
1	<b>Data</b>				
2	<b>Time Period</b>	<b>SLA 1</b>			
3	6/6 3:00 AM				
4	6/6 4:00 AM				
5	6/6 5:00 AM				
6	6/6 6:00 AM				
7	6/6 7:00 AM				
8	6/6 8:00 AM				
9	6/6 9:00 AM				
10	6/6 10:00 AM				
11	6/6 11:00 AM				
12	6/6 12:00 PM				

Availability: 90,000 %  
 Status: Failed  
 Business Rule: Group Average Value  
 Exceeded: > 98,000 %  
 Met: > 95,000 %  
 Minor Breached: > 90,000 %  
 CI: SLA\_1  
 Date: 6/6 3:00 AM

## Saving a Report in .xml Format

You can save a report in .xml format to send to users, or to insert into other reports. The data in the XML file is not updated. Only those reports that support this functionality include the XML button.

**To open a report in .xml format:**

- 1 In any of the reports that support this functionality, click the **Open in XML Format** button to open the report in a new browser window.
- 2 Select **File > Save As**, choose a path, file name, and .xml file format type and click **Save**. This step is optional.



---

**Tip:** To extract HTML code from the report, save the file as HTML, open the file in an HTML editor, and copy the relevant table into the target file.

---

## Exporting Reports

You can send a report by e-mail, publish a report with updated data, or save a report to the report repository.

This section includes the following topics:

- ▶ “Sending a Report by E-Mail” on page 31
- ▶ “Publishing a Report” on page 33
- ▶ “Saving a Report to the Report Repository” on page 36

### Sending a Report by E-Mail

The following procedure explains how to send a report by e-mail.

**To send a report by e-mail:**



- 1** Click the **E-mail this Report** button to open the Mail Details window.
- 2** Change the default subject, if required.
- 3** Specify one or more e-mail addresses in the **To** box. Separate multiple addresses using a semi-colon.
- 4** Specify an e-mail address for receiving replies in the **Reply-to** box.

If required, an e-mail address can be configured to appear in the **Reply-to** field by default. This is done in the Infrastructure Settings Manager. Select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, click **Foundations**, select **Business Availability Center**, and locate the **Default Reply-To Address** entry in the **Business Availability Center Interface - Display** table. Update the value as required.

For details on using the Infrastructure Settings Manager, see “Infrastructure Settings” in *Platform Administration*.

- 5 If required, type a comment in the **Comments** box.
- 6 Specify whether you want to send the report as:
  - a **HTML mail.** The report is displayed in the e-mail client (the e-mail client must support, and be configured to display, HTML).
    - Select **Include Images** to include all report resources (for example, graphics) in the e-mail.
    - Clear **Include Images** so the images are not included in the e-mail. In that case, all report resources (for example, graphics) are located on HP Business Availability Center servers. A network connection to HP Business Availability Center is required to view the images in the report.
  - b **HTML attachment.** The report is displayed in a browser (the browser must support the MHT format—Microsoft Internet Explorer supports MHT format, for example).
    - Select **Send as Internet Explorer Archived HTML.** The report is displayed in a browser (the browser must support the MHT format—Microsoft Internet Explorer supports MHT format, for example). All report resources (for example, graphics) are included in the e-mail.
    - Select **Zipped attachment** to send the attachment in zipped format.
  - c **PDF.** The report is displayed in .pdf format in a new browser window.
    - Select **Zipped attachment** to send the attachment in zipped format.

---

**Note:** If you choose to use a mail option that displays the report content in the e-mail client, check that the e-mail client does not employ security restrictions which prevent the running of scripts contained in HTML mail. E-mail clients that do employ such restrictions may be unable to properly display all report content.

---

- 7 Click **OK** to e-mail the report.



## Publishing a Report

You can generate up-to-date reports that can be viewed by users who do not usually work with HP Business Availability Center, and, therefore, do not know how to create reports. However, these users must have a network connection to HP Business Availability Center to view the report. You publish the reports in .csv format, Excel format, .xml format, or printer-friendly format, and send the report (generally, by e-mail) to the user.

The report contains data that is updated when the report is accessed. For example, say you prepare a report for the past month (24 Oct 2005 8:00 AM – 21 Nov 2005 8:00 AM), publish the report, and send the URL or an HTML file of the report to a user. The user accesses the report a week later (on 28 Nov 2005), at which time the report shows the updated past month (31 Oct 2005 8:00 AM – 28 Nov 2005 8:00 AM).

You would probably publish reports that use a relative tracking period (for example, past month, month to date), as it may not be useful to publish reports that use an absolute tracking period (for example, hour, day, month).

You can choose between two methods for publishing reports: URL and HTML. Use URL to submit the form with a **GET** method (recommended), and HTML to submit the form with a **POST** method.

For a list of reports that you can publish, see the list of customizable reports in “Defining a Default Header and Footer” in *Custom Reporting and Alerting*. You can also view a list of these reports in the **Report Types** window accessed from the Report Repository page. For details, see “Searching for a Report in the Report Repository” on page 126.

**To publish a report in .csv, Excel, .xml, or printer-friendly format:**

- 1 Set up the report that you want to publish. Where relevant, choose the Graph or Table format.

---

**Tip:** Choose only from tracking periods that show data when the user accesses the report. For example, say you set up the Triage report to show data for the past hour, then send the report to a user. If the monitor being tracked by the profile is going down shortly, the user's past hour does not include data.

---



- 2 Click the **Publish Report** button to open the Publish Report window.
- 3 Choose the format in which you want to publish the report: **CSV**, **Excel**, **XML**, or **Printer-Friendly**.
  - **CSV.** The report is formatted as a comma-separated values (CSV) text file that can be displayed in a spreadsheet.
  - **Excel.** The report is formatted as an .xls (Excel) file that can be displayed in a spreadsheet.
  - **XML.** The report is formatted as an XML file that can be opened in a text or XML editor.
  - **Printer-Friendly.** The report is saved in HTML format for printing purposes.
- 4 Enter a login name and password which enable the user to log in to HP Business Availability Center, view the report, and log out.

---

**Note:**

- ▶ The default login name and password are those with which you logged in to HP Business Availability Center in the current session.
  - ▶ Do not publish the report with administrator permissions. We recommend that you create a login name and password for the user with less permissions than for an administrator. For details, see “User Management Overview” in *Platform Administration*.
  - ▶ If you include your own user name and password in the URL or the HTML file, when the user closes the report, you are simultaneously logged out of HP Business Availability Center.
  - ▶ The user name and password are encrypted in the URL or the HTML file.
  - ▶ The log in and log out steps are transparent to the user.
- 

**5** Choose whether to send the URL of the report (recommended) or to send the report as an HTML file. Click **Generate URL** or **Generate HTML**:

- ▶ **Generate URL.** HP Business Availability Center generates the URL and displays it in the window. Click **Copy** to select the URL, then paste the URL into an e-mail to send to the user. It is recommended that the URL does not exceed a maximum length of 2,000 characters (~2K), to ensure that the URL can be read by all systems.

**Note:** Do not modify the URL string. If necessary, make changes to the report itself, then publish the report again.

- ▶ **Generate HTML.** The File Download window opens and you can choose to open or save the file. Click **Open** to open the report in a browser in the selected format. Click **Save**, and, in the **Save As** dialog box that opens, locate the directory where you want to save the file, and click **Save**.

**Tip:** To extract HTML code from the published report, choose the XML format and click **Generate URL** or **Generate HTML**. Continue with the relevant procedure to publish the report. Click **Open** to display the report in HTML markup in a browser. Save the file as HTML, open the file in an HTML editor, and copy the relevant table into the target file.

---

## Saving a Report to the Report Repository

You can save the data of certain reports to a report repository, for viewing on other occasions, or for sending to other users. The report is saved with data valid at the time the report is saved. This is the case even if data subsequently changes, or more data accrues to the report. You access the report through Dashboard, Service Level Management, or End User Management (Triage report only).

For a list of reports that you can save to the repository, see the list of customizable reports in “Defining a Default Header and Footer” in *Custom Reporting and Alerting*. You can also view a list of these reports in the **Report Types** window accessed from the Report Repository page. For details, see “Searching for a Report in the Report Repository” on page 126.

---

**Note:** The Report Repository icon is enabled only on the pages of reports that can be saved to the repository.

---

### To save a report to the repository:



- 1** Click the **Save to Repository** button to open a window displaying the report in PDF format.
- 2** Enter a name for the report.
- 3** Choose whether the report should be available to all users (**Public**), or only to yourself and the administrators (**Private**).

**Public:** any user can view, edit, or delete the report from the repository.

**Private:** only the user or administrator can view, edit, or delete the report from the repository. (For HP Managed Software Solutions customers: **Private:** only the user, superuser, operator, customer superuser, and customer administrator can view, edit, or delete the report from the repository.)

- 4** Enter a description for the report.
- 5** Click **OK**, or click **Cancel** to close the window without saving the report.

The report is displayed in the application page.



# 3

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## Topology Map Printing Options

This chapter describes how to print the contents of the topology map and save a topology map to file.

This chapter describes:	On page:
Printing the Contents of the Topology Map	39
Defining the Print Settings for a Map	40
Previewing the Topology Map Before Printing	41
Saving a Topology Map to File	41

### Printing the Contents of the Topology Map

You can print the contents of the topology map. The result is similar to a screen capture. It is therefore recommended to define your print settings and arrange the contents of the topology map according to your requirements before printing.

**To print the contents of the topology map:**

- 1** Select and display the contents of the topology map to be printed.
- 2** Define your print settings. For details, see “Defining the Print Settings for a Map” on page 40.
- 3** Arrange the contents of the topology map for print. You can use the **Layout** option and **Layout Properties**. For details about the layout options, see “Toolbar Options” on page 49. For details about layout properties, see “Layout Properties User Interface” on page 57.
- 4** From the toolbar, select **Print Map > Print Map** to open the Print dialog box.

- 5 In the **Copies** area, enter the number of copies you want to print.
- 6 Click **Properties** to open the Document Properties dialog box.
- 7 Define document properties as required and click **OK** to save your changes.
- 8 Click **OK** in the Print dialog box to print the contents of the topology map.

## Defining the Print Settings for a Map

This section describes how to define the print settings for a map.

To define the print settings for a map:

- 1 Select **Print Map > Map Printing Settings** to open the Map Printing Settings dialog box.
- 2 Select **Print Entire Drawing** to print the complete view.
- 3 Select **Print Current Window** to print the part of the view that appears in the window.
- 4 Select **Print Current Selection** to print the selected notes and their relationships.
- 5 In the **Scale By** area:
  - Select **Pages** and enter the number of columns and rows in the **Page Columns** and **Page Rows** boxes.
  - Select **Actual Size** to print the view as it really is.
  - Select **Zoom Level** to print the view at the current zoom level.
- 6 In the **Caption** area:
  - Select **Print Caption**, enter the caption in the text area and click **Font** to select the required custom font.
  - Select the position of the caption in the **Position** list.
- 7 In the **Multipage Printing** area:
  - Select **Print Page Numbers** to print the page numbers.
  - Select **Print Crop Marks** to print the crop marks.



- 8** In the **Other** area:
  - ▶ Select **Print Border** if you want the printed view to have a border and click **Color** to select the required border color.
  - ▶ Select **Print Background** to print the background behind the view.
  - ▶ Select **Print Grid** if you want to print a grid behind the printed view.
- 9** Click **Page Setup** to set the printer settings.
- 10** Click **OK**. These definitions are applied to your printouts.

## Previewing the Topology Map Before Printing

You can preview the content of the topology map before printing.

**To preview the content of the topology map before printing:**

- 1** Select **Print Map > Print Preview** to open the Print Preview window.
- 2** To define the print settings for the map, click **Print Setup**. For details, see “Defining the Print Settings for a Map” on page 40.
- 3** Use the **Zoom** options to focus on specific details of the map. For details, see “Toolbar Options” on page 49.
- 4** To fit the complete view in the window, click **Fit in Window**.
- 5** To print the map, click **Print**. For details, see “Printing the Contents of the Topology Map” on page 39.
- 6** Click **Close** to close the Print Preview window.

## Saving a Topology Map to File

You can save a topology map to a file.

**To save a topology map to a file:**

- 1** Select and display the topology map you want to save to file.
- 2** Select **Print Map > Export Graph** to open the Export Graph dialog box.
- 3** From the **Type** list, select the required file format.

- 4** In the **File Name** box, specify the required file name and location (or click **Browse** to search for the file and location).
- 5** In the **Image Content** area:
  - a** Select **Visible Window Only** to save only the part of the graph that appears in the window.
  - b** Select **Draw Grid** to draw a grid in the graph.
  - c** Select **Selected Objects Only** to save only the nodes/CIs that you selected and their relationships.
- 6** In the **Image Characteristics** area, enter a value in the **Image Quality (0-100)** window or move the indicator left or right to set the required quality of the printed map on the scale. 100 means that the quality is excellent.
- 7** In the **Size** area, do the following:
  - a** Select **Current Zoom Level** to save the view as you see it on the topology map. For example, if you have used the **Interactive Zoom** mode to decrease the view magnification, the nodes also appear smaller in the saved view. For details, see “Interactive Zoom” on page 53.
  - b** Select **Actual Size** to save the view so that the node sizes are at maximum.
  - c** Select **Fit in Canvas** to expand or shrink the view so it fits in the window.
  - d** Select **Custom** to specify the size of the view you want to save in the **Width** and **Height** boxes.
- 8** Click **OK**.

# 4


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## Working with Tables






This chapter describes how to customize tables.

This chapter describes:	On page:
Columns Dialog Box	43
Customizing Columns	44
Select Columns Dialog Box	45
Set Page Number Dialog Box	46
Set Rows Per Page Dialog Box	46

### Columns Dialog Box

<b>Description</b>	Enables you to choose the information you are interested in displaying. You can change the display order of the columns, hide a column, or display a hidden column. <b>To access:</b> Right-click a column header and select <b>Customize</b> or click  <b>Customize Columns</b> .
--------------------	--


The Columns dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Displays a hidden column. Moves the selected column from the <b>Hidden Columns</b> pane to the <b>Visible Columns</b> pane.
	Hides a selected column. Moves the selected column from the <b>Visible Columns</b> pane to the <b>Hidden Columns</b> pane. <b>Note:</b> Alternatively, you can right-click the required column in the table itself and select <b>Hide Column</b> .
	Displays all hidden columns. Moves all the columns from the <b>Hidden Columns</b> pane to the <b>Visible Columns</b> pane (whether or not the columns are selected). <b>Note:</b> Alternatively, you can right-click the required column in the table itself and select <b>Show All Columns</b> . This option only appears if at least one column has already been hidden.
	Hides all selected columns. Moves all the columns from the <b>Visible Columns</b> pane to the <b>Hidden Columns</b> pane.
	Moves one selected column up or down to determine the position of the column in the Statistics pane.
<b>Hidden Columns</b>	The columns in this pane do not appear in the table.
<b>Visible Columns</b>	The columns in this pane are visible in the table.


## Customizing Columns

<b>Description</b>	Enables you to customize tables by changing column width, changing the display order of the columns, or displaying only specific columns.
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The following options are available by right-clicking or clicking a table header (listed alphabetically):

GUI Element	Description
	Click a column header to sort its contents. An upward arrow indicates ascending order and a downwards arrow indicates descending order.
<b>Auto-resize Column</b>	Right-click the column header to change the column width to fit the contents.
<b>Customize</b>	Right-click the column header to change the display order of the columns. Opens the Columns dialog box.
<b>Hide Column</b>	Right-click the column header of the column to hide the column.
<b>Show All Columns</b>	Right-click the column header to display all hidden columns. Displayed when a column is hidden.

## Select Columns Dialog Box

<b>Description</b>	Enables you to select the columns to be displayed. <b>To access:</b> Click the <b>Select Columns</b>  button in the Asset, Host Dependency, Change, and System reports.
--------------------	---

The Select Column dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Displays a column. Moves the selected column from the <b>Available Columns</b> pane to the <b>Visible Columns</b> pane.
	Hides a selected column. Moves the selected column from the <b>Visible Columns</b> pane to the <b>Available Columns</b> pane.
	Displays all hidden columns. Moves all the columns from the <b>Available Columns</b> pane to the <b>Visible Columns</b> pane.

GUI Element	Description
Available Columns	The columns in this pane do not appear in the table. Select the columns to be included in the report.
Default	Restores the report columns to their original status.
Visible Columns	The columns in this pane are visible in the table.


## Set Page Number Dialog Box

Description	<p>Enables you to go directly to a required page.</p> <p>A table can contain more than one page depending on how many rows can appear in each page of the table (for details, see the Set Rows Per Page dialog box).</p> <p>The numbers between the left and right arrows of a table indicate which page is currently being displayed. For example, <b>1/7</b> means that the 1st of 7 pages is displayed.</p> <p><b>To access:</b> Click the <b>Go to page 1 / 7</b> button in a table.</p>
Useful Links	“Set Rows Per Page Dialog Box” on page 46

The Set Page Number dialog box includes the following elements:

GUI Element	Description
Page	Enter the required page number to go to a different page.

## Set Rows Per Page Dialog Box

Description	<p>Enables you to determine the number of node/CI instances that appear on a page. Enter the required number in the <b>Set rows per page</b> field.</p> <p><b>To access:</b> Click <b>Set Rows Per Page</b>  in a table.</p>
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The Set Rows Per Page dialog box includes the following elements:

GUI Element	Description
Set rows per page	Enter the required number.





# 5

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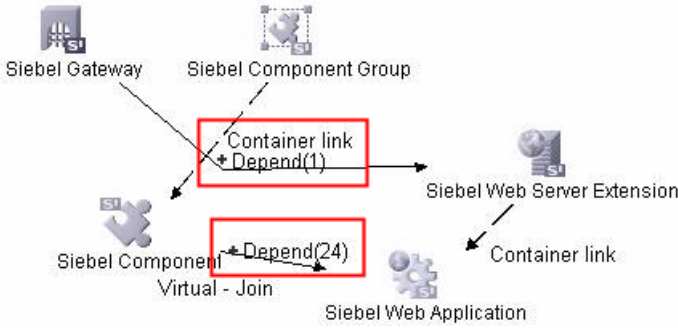


## Toolbar Options







The following table contains a description of each toolbar option, organized alphabetically.





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







**Note:** These toolbar options are relevant for Universal CMDB applications.








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Button	Option Name	Use This Option to...
	<b>Add Background Image</b>	<p>Add a background image to a view. For details, see “Add Background Image Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>To access:</b> Open the drop-down menu under <b>Hierarchical Layout</b>.</p> <p><b>Note:</b> This option is only active in IT Universe Manager and the Topology View application.</p>
	<b>Additions Count</b>	<p>Calculate the number of instances that are created as a result of an Enrichment Rule. The number of TQL node instances and relationships that are created appear next to the Enrichment nodes/relationships, as seen in the figure below.</p>  <p><b>Note:</b> This option appears in the toolbar in Enrichment Manager only.</p>
	<b>Candidates for Deletion</b>	<p>Identify the CIs in the current view which are candidates for deletion.</p> <p><b>Note:</b> This option appears in the toolbar in the Topology map in the Topology View application only.</p>
	<b>Change labels size</b>	<p>Enter the maximum number of characters that the labels should contain.</p> <p><b>To access:</b> Open the drop-down menu under <b>Drag Map</b>.</p>



Button	Option Name	Use This Option to...
	<b>Clear Correlation</b>	<p>Clear the Topology View of the statuses of the trigger and affected CIs for the state Change. CI statuses only appear after using the Run Correlation dialog box to run an Impact Analysis report for the selected CIs on a set of the existing Correlation rules. For details, see “Run Correlation Dialog Box” in <i>IT World Model Management</i>. For details on Correlation rules, see “Correlation Manager User Interface” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> This option appears in the toolbar in the Topology map in the Topology View application only.</p>
	<b>Create Relationship</b>	<p>Create a relationship between two existing TQL nodes. For details, see “Adding Nodes and Relationships to a TQL Query” on page 189.</p> <p>Create a relationship between existing CIs. For details, see “Attaching Existing CIs” in <i>IT World Model Management</i>.</p>
	<b>Delete</b>	<p>Delete a CI from IT Universe Manager, a node from View Manager, a TQL node from Query Manager, Correlation Manager, Report Manager, or Enrichment Manager, or a CIT from CI Type Manager.</p> <p><b>Note:</b> When you delete a CIT from the CI Type Manager, the CIT no longer appears in the CI Type Model, the View Manager, the Enrichment Manager, and the Query Manager. To restore it, you must redeploy the package that contains the deleted CIT. For details, see “Package Manager User Interface” in <i>IT World Model Management</i>.</p>
	<b>Drag map</b>	<p>Drag the view.</p>
	<b>Export Graph</b>	<p>Save the topology map to a file. For details, see “Saving a Topology Map to File” on page 41.</p> <p><b>To access:</b> Open the drop-down menu under Print Map.</p>
	<b>Fit to Window</b>	<p>Fit the complete map in the window.</p>

Button	Option Name	Use This Option to...
	<b>Get Related CIs report</b>	<p>Display the Get Related CIs Report for the selected CI. For details, see “Get Related CIs Report” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> This option appears in the toolbar in the Related CIs tab of IT Universe Manager and the Topology View application.</p>
	<b>Go up one layer</b>	<p>Move up one level in the topology map. This option is enabled only if there is an additional CI, CIT, or TQL node layer above it, created by a parent or child organization rule defined in the View Manager. For information on how to set up organization rules, see “Adding Folding Rules to Relationships” in <i>IT World Model Management</i>.</p>
	<b>Hide All Inheritance_f From Map</b>	<p>Toggle between showing and hiding Inheritance_f relationships and their connecting node.</p> <p><b>To access:</b> Open the drop-down menu under <b>Select All</b>.</p> <p><b>Note:</b> This option appears in the topology map toolbar in CI Type Manager only.</p>
	<b>Hide All Node Labels</b>	<p>Toggle between showing or hiding the CI/CIT/node/pattern labels.</p> <p><b>To access:</b> Open the drop-down menu under <b>Select All</b>.</p> <p><b>Note:</b> The icon appears only in Dashboard.</p>
	<b>Hide All Relationship Labels</b>	<p>Toggle between showing or hiding the relationship labels.</p> <p><b>To access:</b> Open the drop-down menu under <b>Select All</b>.</p> <p><b>Note:</b> The icon appears only in Dashboard.</p>
	<b>Hide All Relationships</b>	<p>Toggle between showing and hiding the relationships in the displayed map.</p> <p><b>To access:</b> Open the drop-down menu under <b>Select All</b>.</p>

Button	Option Name	Use This Option to...
	<b>Hierarchical Layout</b>	<p>Select the layout display from the list. The options are:</p> <ul style="list-style-type: none"> <li>▶  <b>Hierarchical.</b> Enables you to display the precedence relations in the topology map.</li> <li>▶  <b>Symmetric.</b> Enables you to display clear representations of complex networks.</li> <li>▶  <b>Circular.</b> Groups a graph's nodes into groups or clusters.</li> <li>▶  <b>Orthogonal.</b> Enables you to display views of outstanding clarity that are achieved by employing only horizontal and vertical edge routing.</li> <li>▶  <b>Manual.</b> Enables you to display the changes you have made manually to the topology map.</li> </ul> <p><b>Note:</b> Click <b>Save Layout</b> to save the selected layout.</p> <p>For further details about each of the options, see “Layout Properties User Interface” on page 57.</p>
	<b>Import</b>	<p>Import XML files containing CI types into the CI Type Manager.</p> <p><b>Note:</b> This option appears in the topology map toolbar in CI Type Manager only.</p>
	<b>Insert CI/Insert Related CI</b>	<p>Create a new CI. For details, see “Working with CIs” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> This option appears in the toolbar in IT Universe Manager only.</p>
	<b>Interactive Zoom</b>	<ul style="list-style-type: none"> <li>▶ Decrease the view magnification by clicking and pushing the pointer upwards.</li> <li>▶ Magnify the view by clicking and pulling the pointer downwards.</li> </ul> <p><b>To access:</b> Open the drop-down menu under <b>Drag Map</b>.</p>
	<b>Layout Properties</b>	<p>Define the view's layer layout, by assigning positions for the nodes and relationships of the view. For details, see “Layout Properties User Interface” on page 57.</p> <p><b>To access:</b> Open the drop-down menu under <b>Hierarchical Layout</b>.</p>
	<b>Layout</b>	<p>Select the layout display from the list as described in <b>Hierarchical Layout</b>. For further details about each of the options, see “Layout Properties User Interface” on page 57.</p>

Button	Option Name	Use This Option to...
	<b>Map overview</b>	Open a small window with a copy of the topology map. This is useful in large views when zooming in. <b>To access:</b> Open the drop-down menu under <b>Drag Map</b> .
	<b>Map Printing Settings</b>	Define print settings for printing the topology map. For details, see “Topology Map Printing Options” on page 39. <b>To access:</b> Open the drop-down menu under <b>Print Map</b> .
	<b>Navigation</b>	Take the pointer to the next connected CI/CIT/TQL node in a clockwise direction. <ul style="list-style-type: none"> <li>➤ Left-click to move in a clockwise direction.</li> <li>➤ Right-click to point to the next CI/CIT/node/pattern in a clockwise direction.</li> </ul> <b>To access:</b> Open the drop-down menu under <b>Drag Map</b> . <b>Note:</b> You can use this option only on CI/CIT/nodes/patterns that are connected by relationships.
	<b>Place in Center</b>	Places the selected CI/node/CIT/pattern in the center of the map. <b>To access:</b> Open the drop-down menu under <b>Drag Map</b> .
	<b>Print Map</b>	Print the contents of the topology map. For details, see “Topology Map Printing Options” on page 39.
	<b>Print Preview</b>	Preview the contents of the map before printing. <b>To access:</b> Open the drop-down menu under <b>Print Map</b> .
	<b>Rediscover View</b>	Rediscover all the CIs in a selected view by manually starting the Discovery jobs that originally discovered them.
	<b>Remove Enrichment Results</b>	Remove the instances created from an Enrichment rule from the CMDB. <b>Note:</b> This option appears in the toolbar in Enrichment Manager only.
	<b>Reorganize Layer</b>	Reorganize the CIs/CITs/ TQL nodes according to the selected layer. This is used when CIs/CITs/TQL nodes have been moved around.

Button	Option Name	Use This Option to...
	<b>Save</b>	<p>Save new and changed definitions in each of the following managers:</p> <ul style="list-style-type: none"> <li>▶ TQL queries in Query Manager.</li> <li>▶ Views in View Manager.</li> <li>▶ Correlation rules in Correlation Manager.</li> <li>▶ Enrichment rules in Enrichment Manager.</li> <li>▶ System Reports in the Report Manager.</li> </ul>
	<b>Save Layout</b>	<p>Save changes to the layout. To retrieve the layout you have saved, select <b>Manual Layout</b>. For details, see “Hierarchical Layout” on page 53.</p> <p><b>To access:</b> Open the drop-down menu under <b>Hierarchical Layout</b>.</p> <p><b>Note:</b> This option appears in the toolbar in IT Universe Manager and Topology View application only.</p>
	<b>Show Schedule Info</b>	<p>Display the scheduling information for the selected job. For details, see “Discovery Scheduler Dialog Box” in <i>Discovery</i>.</p> <p><b>Note:</b> This option appears in the toolbar in the Dependency Map tab of Discovery. For details, see “Dependency Map Tab” in <i>Discovery</i>.</p>
	<b>Select All</b>	<p>Select all the CIs and relationships in a selected layer.</p>
	<b>Select All Nodes</b>	<p>Select all the nodes in a selected layer.</p> <p><b>To access:</b> Open the drop-down menu under <b>Select All</b>.</p>
	<b>Select Mode</b>	<p>Select a CI/CIT/TQL node or multiple CIs/CITs/TQL nodes.</p>
	<b>System Type Manager</b>	<p>Create a predefined list whose values define an attribute type. For details, see “System Type Manager User Interface” in <i>CI Attribute Customization</i>.</p> <p><b>Note:</b> This option is specific to the toolbar in CI Type Manager.</p>

Button	Option Name	Use This Option to...
	<b>TQL result count</b>	Calculate the number of instances found for each TQL node/relationship.
	<b>Zoom</b>	Zoom in on a specific section of the topology map by clicking and drawing a selection rectangle around the part to magnify. The area you select is displayed at the highest percentage that fits in the topology map.  <b>To access:</b> Open the drop-down menu under <b>Drag Map</b> .



# 6

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## Layout Properties User Interface

This chapter includes the pages and dialog boxes that are part of the Layout Properties user interface.

This chapter describes:	On page:
Circular Tab	57
Disconnected Tab	61
General Tab	64
Hierarchical Tab	65
Layout Properties Dialog Box	76
Orthogonal Tab	77
Routing Tab	79
Symmetric Tab	83

### Circular Tab

<b>Description</b>	Enables you to group a graph's nodes into groups or clusters based on the grouping options you select. It is particularly suited for visualizing ring and star network topologies, and for link analysis.  <b>To access:</b> Click the <b>Circular</b> tab in the Layout Properties dialog box.
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This tab consists of the following areas:

- “Clustering Area” on page 58
- “Cluster Layout Style Area” on page 58
- “Layout Quality Area” on page 59
- “Spacing Area” on page 60

### Clustering Area

<b>Description</b>	Specifies the ratio between the average cluster size and the number of clusters as well as the minimum and maximum number of clusters in a layer.
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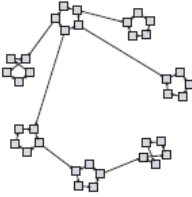

The Clustering area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Cluster Size Multiplier</b>	Specifies the ratio between the average cluster size and the number of clusters. The size of a cluster is defined as the sum of the weights of all nodes in the cluster. You can assign a weight value to each node.
<b>Max Number of Clusters</b>	The maximum number of clusters in a layer.
<b>Min Number Of Clusters</b>	The minimum number of clusters in a layer.

### Cluster Layout Style Area

<b>Description</b>	Displays clusters either in a symmetric or circular layout style.
--------------------	---

The Cluster Layout Style area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Circular</b>	Displays clusters in a circular layout style. 
<b>Symmetric</b>	Displays clusters in a symmetric layout style. 

### Layout Quality Area

<b>Description</b>	Adjusts the quality of the layout produced to fit your application's needs. The quality reflects the number of steps or the method used to produce the layout. For example, high quality is sharper but takes more time to set the layout.
--------------------	--





The Layout Quality area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Draft</b>	Sets the layout to draft quality.
<b>Default</b>	Sets the layout to default quality.
<b>Proof</b>	Sets the layout to proof quality.

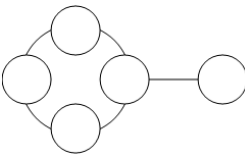
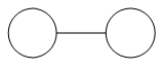
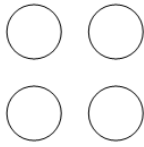
## Spacing Area

<b>Description</b>	Sets the spacing around each node within the same cluster and between clusters.
--------------------	---

The Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Cluster Spacing</b>	<p>Sets the spacing between clusters.</p> <p><b>Default value: 50</b></p> <p>This illustration shows smaller cluster spacing.</p>  <p>This illustration shows larger cluster spacing.</p> 
<b>Node Spacing</b>	<p>Sets the spacing around each node within the same cluster. The larger the spacing, the more nodes there are on the cluster boundary.</p> <p><b>Default value: 10</b></p> <p>This illustration shows smaller node spacing.</p>  <p>This illustration shows larger node spacing.</p> 

## Disconnected Tab

<p><b>Description</b></p>	<p>Enables you to define general layout parameters for disconnected nodes and connected components.</p> <ul style="list-style-type: none"> <li>➤ A disconnected node is a node that is not connected to any other node.</li> <li>➤ A disconnected component is a component that is not connected to any other component. It contains a set of nodes that can be connected to each other.</li> </ul> <p>The following example illustrates a connected component with five nodes:</p>  <p>The following example illustrates a connected component with two nodes:</p>  <p>The following example illustrates four disconnected components, each made up of a single, disconnected node:</p>  <p><b>To access:</b> Click the <b>Disconnected</b> tab in the Layout Properties dialog box.</p>
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This tab consists of the following areas:

- “Aspect Ratio Area” on page 62
- “Components Area” on page 62
- “Disconnected Nodes” on page 63

## Aspect Ratio Area

<b>Description</b>	Sets the layout's proportions. This setting affects the placement of components with respect to each other only, and not the layout of each individual component. The setting has no effect if the graph is connected.
--------------------	--

The Aspect Ratio area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Automatic</b>	The layout is performed automatically.
<b>Custom</b>	Sets a specific aspect ratio. <b>Default value:</b> 1.0

## Components Area

<b>Description</b>	The spacing between the components in a disconnected graph consists of both a constant value and a proportional value based on the sizes of the components.
--------------------	---

The Components area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Constant Spacing</b>	Set constant spacing (horizontal and vertical) around each disconnected component. <b>Default value:</b> 20

GUI Element	Description
<b>Detect Components</b>	Select this option to view the disconnected components. You can specify that all components be laid out together or individually, regardless of the other components. If the grouping for components is selected, each component is laid out, and the resulting components are packed together.
<b>Proportional Spacing</b>	Set spacing (horizontal and vertical) that is proportional to the size of the component around each disconnected component. <b>Default value:</b> 0.05

### Disconnected Nodes

<b>Description</b>	The spacing between the nodes in a disconnected graph consists of both a constant value and a proportional value based on the sizes of the nodes.
--------------------	---

The Disconnected Nodes area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Constant Spacing</b>	Sets constant spacing (horizontal and vertical) around each disconnected node. <b>Default value:</b> 20
<b>Detect Disconnected Nodes</b>	Select this option to view the disconnected nodes. You can specify that disconnected nodes be grouped into one component or laid out individually.
<b>Proportional Spacing</b>	Set spacing (horizontal and vertical) that is proportional to the size of the component, around each disconnected node. <b>Default value:</b> 0.05

## General Tab

<b>Description</b>	<p>Enables you to define a general layout for all layout types. The <b>General</b> tab settings are available with all layout styles. If the layout contains more than one graph, each graph is laid out separately, and the intergraph edges (the relationships between the graphs) are routed.</p> <p><b>To access:</b> Click the <b>General</b> tab in the Layout Properties dialog box.</p>
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The tab consists of the following areas:

- ▶ “Margin Spacing Area” on page 64
- ▶ “Nested View Spacing” on page 65

### Margin Spacing Area

<b>Description</b>	<p>The layout’s proportions. This only affects the placement of components with respect to each other, not the layout of each individual component. It has no effect if the graph is connected.</p>
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The Margin Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Bottom</b>	<p>The size of the space under the display. <b>Default value:</b> 20</p>
<b>Left</b>	<p>The size of the space to the left of the display. <b>Default value:</b> 20</p>
<b>Right</b>	<p>The size of the space to the right of the display. <b>Default value:</b> 20</p>
<b>Top</b>	<p>The size of the space above the display. <b>Default value:</b> 20</p>



## Nested View Spacing

<b>Description</b>	Enables you to enclose a child graph inside a parent node, thereby creating a nesting hierarchy. When expanded, the parent node is resized to fit the child graph and, no matter what its shape, is represented as a rectangle large enough to accommodate the geometry of the nested graph. Nested View Spacing is the thickness of the expanded node's border.
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The Nested View Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Bottom</b>	The thickness of the expanded node's bottom border. <b>Default value:</b> 10
<b>Left</b>	The thickness of the expanded node's left border. <b>Default value:</b> 10
<b>Right</b>	The thickness of the expanded node's right border. <b>Default value:</b> 10
<b>Top</b>	The thickness of the expanded node's top border. <b>Default value:</b> 10

## Hierarchical Tab

<b>Description</b>	The hierarchical layout shows the precedence relationships that can represent organizational or information management system dependencies, as well as process models, software call graphs, and work flows. The hierarchical layout emphasizes dependencies by placing the nodes at different levels.  <b>To access:</b> Click the <b>Hierarchical</b> tab in the Layout Properties dialog box.
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The Hierarchical tab includes the following elements (listed alphabetically):

GUI Element	Description
<b>Variable Level Spacing</b>	<p>Variable level spacing adjusts the spacing between pairs of neighboring levels according to the density of edges between the levels.</p> <p>If the drawing's edges are orthogonally routed, this ensures the desired vertical spacing between horizontal edges (in a top-to-bottom or bottom-to-top layout) routed between levels.</p> <p>If the routing is polyline, variable level spacing makes it easier to distinguish among edges in very dense drawings.</p>
<b>Undirected Layout</b>	<p>Edge direction is not used to build the levels of the hierarchical drawing.</p>

The tab consists of the following areas:

- “Horizontal Spacing Area” on page 67
- “Layout Quality Area” on page 70
- “Level Alignment Area” on page 70
- “Orientation Routing Area” on page 71
- “Polyline Routing Area” on page 73
- “Routing Area” on page 74
- “Vertical Spacing Area” on page 76

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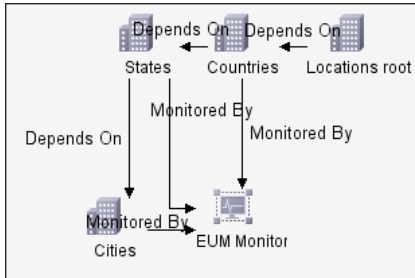
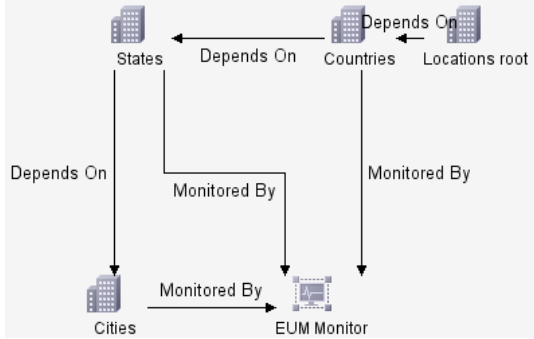
**Note:** Orthogonal Routing is currently not supported.

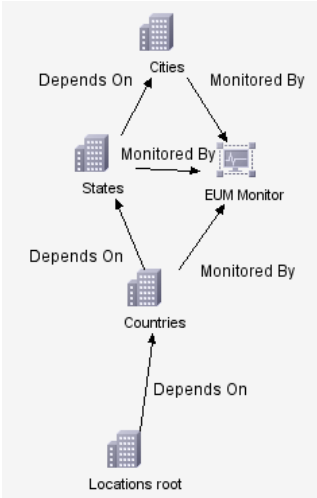
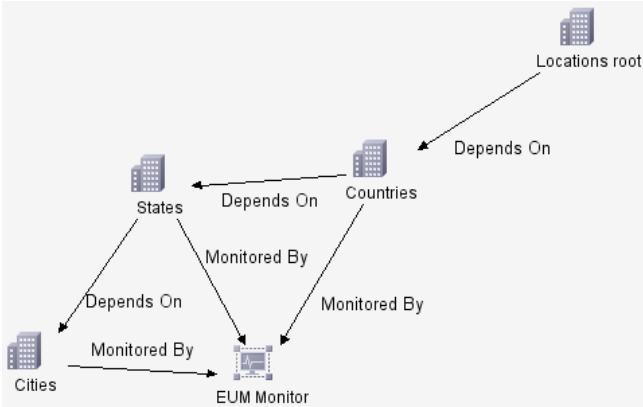
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### **Horizontal Spacing Area**

<b>Description</b>	Enables you to set the minimum horizontal distance between two neighboring nodes at each level.
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The Horizontal Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<p><b>Spacing Between Edges</b></p>	<p>This setting is available only when you select <b>Routing &gt; Orthogonal</b>. It sets a horizontal space between edges in the graph.</p> <p><b>Default value: 12</b></p> <p>This illustration shows smaller edge spacing.</p>  <p>This illustration shows larger edge spacing.</p> 

GUI Element	Description
<p><b>Spacing Between Nodes</b></p>	<p>Sets a space around each node horizontally in the layer.  <b>Default value: 20</b></p> <p>This illustration shows smaller node spacing.</p>  <p>This illustration shows larger node spacing.</p> 

## Layout Quality Area

<b>Description</b>	Enables you to adjust the quality of the layout produced to fit your application's needs. The quality reflects the number of steps or the method used to produce the layout. For example, high quality is sharper but takes more time to set the layout.
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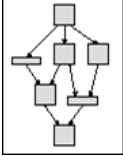
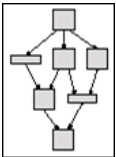
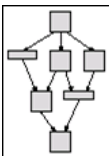
The Layout Quality area includes the following elements (listed alphabetically):

<b>GUI Element</b>	<b>Description</b>
<b>Default</b>	Sets the layout to default quality.
<b>Draft</b>	Sets the layout to draft quality.
<b>Proof</b>	Sets the layout to proof quality.

## Level Alignment Area

<b>Description</b>	Enables you to set the way nodes are vertically aligned.
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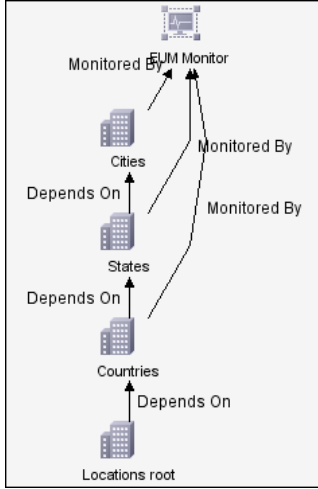
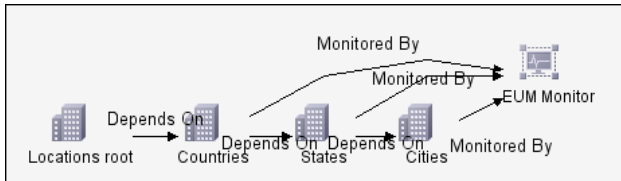
The Level Alignment area includes the following elements (listed alphabetically):

GUI Element	Description
<p><b>Bottom</b></p>	<p>This illustration shows that the bottom of the nodes at the same level of the hierarchy are aligned.</p> 
<p><b>Center</b></p>	<p>This illustration shows that the center of the nodes at the same level of the hierarchy are aligned.</p> 
<p><b>Top</b></p>	<p>This illustration shows that the top of the nodes at the same level of the hierarchy are aligned.</p> 

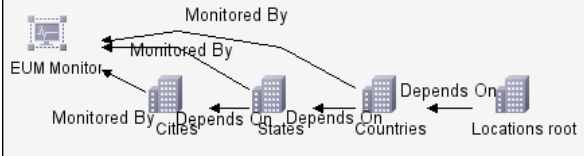
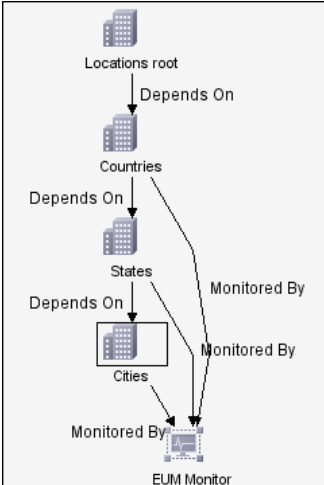
### Orientation Routing Area

Description	Enables you to set the orientation of the hierarchy
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The Orientation area includes the following elements (listed alphabetically):

GUI Element	Description
<p><b>Bottom To Top</b></p>	<p>The children are located below the parent (in the example, Alignment = Center).</p>  <pre> graph BT     LR[Locations root] -- Depends On --&gt; C[Countries]     C -- Depends On --&gt; S[States]     S -- Depends On --&gt; CH[Cities]     CH -- Depends On --&gt; EM[EUM Monitor]     EM -- Monitored By --&gt; LR     EM -- Monitored By --&gt; C     EM -- Monitored By --&gt; S     EM -- Monitored By --&gt; CH     </pre>
<p><b>Left To Right</b></p>	<p>The children are located to the left of the parent (in the example, Alignment = Center).</p>  <pre> graph LR     LR[Locations root] -- Depends On --&gt; C[Countries]     C -- Depends On --&gt; S[States]     S -- Depends On --&gt; CH[Cities]     EM[EUM Monitor] -- Monitored By --&gt; LR     EM -- Monitored By --&gt; C     EM -- Monitored By --&gt; S     EM -- Monitored By --&gt; CH     </pre>

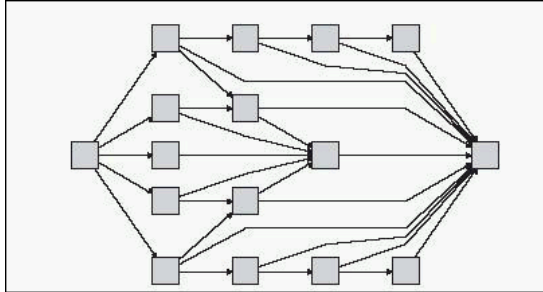


GUI Element	Description
<p><b>Right To Left</b></p>	<p>The children are located to the right of the parent (in the example, Alignment = Center).</p> 
<p><b>Top To Bottom</b></p>	<p>The children are located above the parent (in the example, Alignment = Center).</p> 

**Polyline Routing Area**

<p><b>Description</b></p>	<p>Routes edges as one or more straight line segments with arbitrary angles. Polyline routed edges are prevented from overlapping by adding extra segments.</p>
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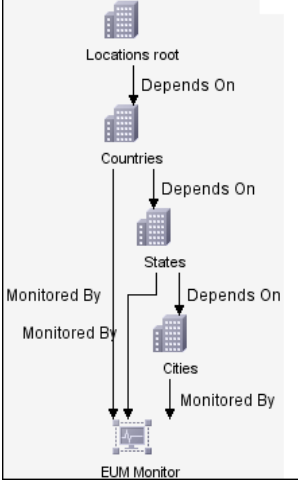
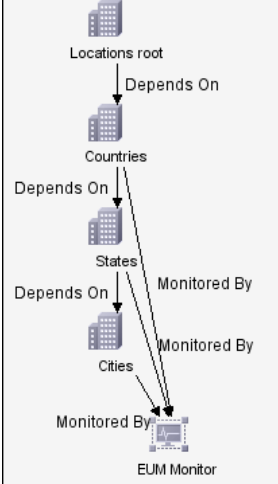
The Polyline Routing area includes the following elements:

GUI Element	Description
<p><b>Spacing Between Ends (connecting lines)</b></p>	<p>This setting is available only when you select <b>Routing &gt; Polyline</b>. Polyline routing routes edges (connecting lines) as one or more straight line segments with arbitrary angles. Path nodes are added automatically to prevent the edges (connecting lines) from overlapping.</p> <p><b>Default Value: 12</b></p> 

### Routing Area

<p><b>Description</b></p>	<p>Enables you to set the type of relationship between CIs. This option is useful when layers have nodes with a very large number of connecting relationships.</p>
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The Routing area includes the following elements (listed alphabetically):

GUI Element	Description
<p><b>Orthogonal</b></p>	<p>For orthogonal lines between nodes/CIs.</p>  <pre> graph TD     LR[Locations root] -- Depends On --&gt; C[Countries]     C -- Depends On --&gt; S[States]     S -- Depends On --&gt; CI[Cities]     LR -- Monitored By --&gt; EUM[EUM Monitor]     C -- Monitored By --&gt; EUM     S -- Monitored By --&gt; EUM     CI -- Monitored By --&gt; EUM     </pre>
<p><b>Polyline</b></p>	<p>For straight lines between nodes/CIs.</p>  <pre> graph TD     LR[Locations root] -- Depends On --&gt; C[Countries]     C -- Depends On --&gt; S[States]     S -- Depends On --&gt; CI[Cities]     LR -- Monitored By --&gt; EUM[EUM Monitor]     C -- Monitored By --&gt; EUM     S -- Monitored By --&gt; EUM     CI -- Monitored By --&gt; EUM     </pre>

## Vertical Spacing Area

<b>Description</b>	Enables you to set the minimum vertical distance between two neighboring nodes on different levels.
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The Vertical Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Spacing Between Edges</b>	This setting is available only when you select <b>Routing &gt; Orthogonal</b> . It sets a vertical space between edges in the graph. <b>Default value:</b> 12
<b>Spacing Between Nodes</b>	Sets a vertical space around each node in the level. <b>Default value:</b> 28

## Layout Properties Dialog Box

<b>Description</b>	<p>Enables you to customize the layout of a specific layer in a view, to achieve the clearest presentation possible and to better understand and monitor the managed data.</p> <p>You define the layout of a view's layers by assigning logical positions for the nodes and relationships that appear in a layer. You customize the layer layouts by modifying the default values.</p> <p><b>Note:</b> You set layout definitions for a specific layer only. The definitions cannot be saved for a different layer or a different view.</p> <p><b>To access:</b> From the toolbar of the Editing pane, select <b>Layout &gt; Layout Properties</b>.</p>
<b>Important Information</b>	Parameter values are in pixels.

## Orthogonal Tab

<b>Description</b>	<p>Enables you to set orthogonal layout route relationships horizontally and vertically. This results in relationships bending at 90-degree angles only.</p> <p><b>Note:</b> The <b>Fix Node Sizes</b> option is currently not supported.</p>
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This tab consists of the following areas:

- “Aspect Ratio Area” on page 62
- “Horizontal Spacing Area” on page 78
- “Layout Quality Area” on page 78
- “Vertical Spacing Area” on page 78

### Aspect Ratio Area

<b>Description</b>	<p>Enables you to set the layout’s proportions. This only affects the placement of components with respect to each other, not the layout of each individual component. The layout’s proportions have no effect if the graph is connected.</p>
--------------------	---

The Aspect Ratio area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Automatic</b>	The layout is performed automatically.
<b>Custom</b>	Specify the aspect ratio. <b>Default value:</b> 1.0
<b>Disabled</b>	Disables the aspect ratio.

## Horizontal Spacing Area

<b>Description</b>	Enables you to set the minimum horizontal distance between nodes.
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The Horizontal Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Spacing Between Nodes</b>	Set a space around each node in the layer. <b>Default value: 20</b>
<b>Spacing Between Edges</b>	Set a space between elements in the layer. <b>Default value: 12</b>

## Layout Quality Area

<b>Description</b>	Enables you to adjust the quality of the layout produced to fit your application's needs. The quality reflects the number of steps or the method used to produce the layout. For example, high quality is sharper but takes more time to set the layout.
--------------------	--

The Layout Quality area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Default</b>	Set the layout to default quality.
<b>Draft</b>	Set the layout to draft quality.
<b>Proof</b>	Set the layout to proof quality.

## Vertical Spacing Area

<b>Description</b>	Enables you to set the minimum vertical distance between nodes.
--------------------	---

The Vertical Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Spacing Between Nodes</b>	Sets a space around each node in the layer. <b>Default value: 20</b>
<b>Spacing Between Edges</b>	Set a space between elements in the layer. <b>Default value: 12</b>

## Routing Tab

<p><b>Description</b></p>	<p>Enables you to produce drawings that leave nodes essentially where they are, and reroute the lines orthogonally.</p> <div style="border: 1px solid black; padding: 10px; text-align: center;"> <p style="display: flex; justify-content: space-around; width: 100%;"> <span>Before</span> <span>After</span> </p> </div> <p><b>To access:</b> Click the <b>Routing</b> tab in the Layout Properties dialog box.</p>
---------------------------	--

The Routing tab includes the following elements (listed alphabetically):

GUI Element	Description
<b>Fix Node Positions</b>	Maintain the position of all the nodes in the display. Clear this option for the layout to move the nodes if it is necessary to improve the layout. The movement is minimal, avoids overlaps, and minimizes bend points.
<b>Fix Node Sizes</b>	Maintain the size of a node. Clear this option if you want the layout to increase the size of a node if it is necessary to maintain the specified relationship spacing when more than one relationship is attached to the same node side.

This tab consists of the following areas:

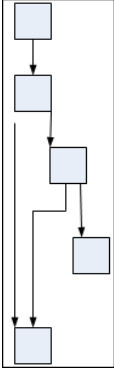
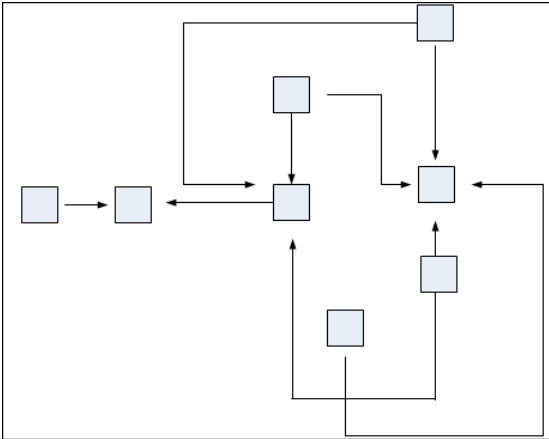
- “Horizontal Spacing Area” on page 80
- “Vertical Spacing” on page 82

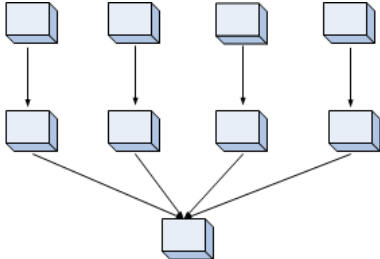
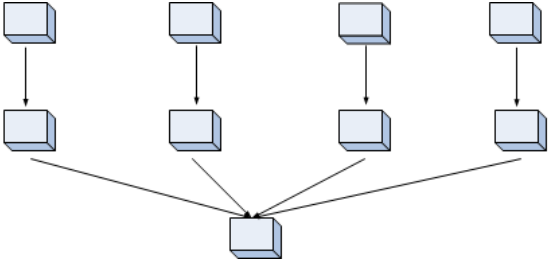
### **Horizontal Spacing Area**

<b>Description</b>	Enables you to set the horizontal space around each node.
--------------------	---

The Horizontal Spacing area includes the following elements (listed alphabetically):



GUI Element	Description
<b>Spacing Between Edges</b>	<p>Sets the horizontal space between any two neighboring parallel lines. Line spacing can also affect the size of a node to which many lines are attached, unless the node is set to remain fixed at its current size. The settings for line spacing are constant values.</p> <p><b>Default value:</b> 12</p> <p>The following illustrates smaller line spacing:</p>  <p>The following illustrates larger line spacing:</p>  <p>The first diagram shows a vertical flow of five square nodes connected by arrows. The spacing between the nodes and the edges is relatively tight. The second diagram shows a more complex network of eight square nodes connected by arrows. The spacing between the nodes and the edges is significantly larger, making the layout more spread out.</p>

GUI Element	Description
<p><b>Spacing Between Nodes</b></p>	<p>Sets the horizontal space around each node in the layer.  <b>Default value: 20</b></p> <p>The following illustrates smaller node spacing:</p>  <p>The following illustrates larger node spacing:</p> 

**Vertical Spacing**

Description	Enables you to set the vertical space around each node.
-------------	---

The Vertical Spacing area includes the following elements (listed alphabetically):

GUI Element	Description
<b>Spacing Between Edges</b>	Set the vertical space between any two neighboring parallel lines. Spacing between lines can also affect the size of a node to which many edges are attached, unless the node is set to remain fixed at its current size. The settings for edge spacing are constant values. <b>Default value:</b> 12
<b>Spacing Between Nodes</b>	Set the vertical space around each node in the layer. <b>Default value:</b> 20

## Symmetric Tab

<b>Description</b>	Displays a clear representation of complex networks. The symmetric layout emphasizes the symmetries that may occur in a graph. <b>To access:</b> Click the <b>Symmetric</b> tab in the Layout Properties dialog box.
--------------------	---

This tab consists of the following areas:

- “Layout Quality Area” on page 83
- “Spacing Options Area” on page 84

### Layout Quality Area

<b>Description</b>	Adjusts the quality of the layout produced to fit your application’s needs. The quality reflects the number of steps or the method used to produce the layout. For example, high quality is sharper but takes more time to set the layout.
--------------------	--

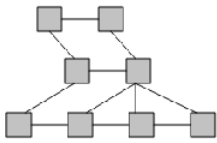
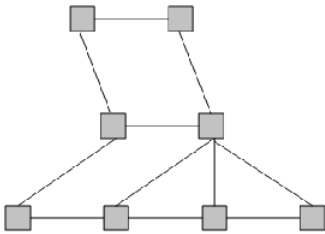
The Layout Quality area includes the following elements (listed alphabetically):

GUI Element	Description
Default	Set the layout to default quality.
Draft	Set the layout to draft quality.
Proof	Set the layout to proof quality.

### Spacing Options Area

<b>Description</b>	Enables you to adjust the spacing around each node in the layer.
--------------------	--

The Spacing Options area includes the following elements:

GUI Element	Description
<b>Node Spacing</b>	<p>Allows you to set constant horizontal and vertical spacing around each node in the layer. The value you specify is a guideline for the layout, so that it is possible that the spacing for a particular pair of nodes might be different from the one you specified. The larger the node spacing, the farther apart the nodes are spaced in the final layout.</p> <p><b>Default value:</b> 10</p> <p>The following figure illustrates smaller and larger spacing.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  <p>node spacing=75</p> </div> <div style="text-align: center;">  <p>node spacing=150</p> </div> </div>

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---

## Regular Expression Examples

- Enter a regular expression to define an IP address (aa.yy.zz.mm):

To:	In the First Field Enter:	In the Second Field Enter:
Create label by aa	(.*)(([.]*[.]*[.]*))	1
Create label by yy	(.*[.])((.*[.]*[.]*))	2
Create label by zz	(.*[.]*[.])((.*[.]*[.]*))	2
Create label by mm	(.*[.]*[.]*[.])((.*[.]*[.]*[.]*))	2

- Enter a regular expression to create the label by the first or last letters of the selected attribute:

To:	In the First Field Enter:	In the Second Field Enter:
Create label by the first letter	(.)(.*)	1
Create label by the last letter	(.*)()	2
Create label by the first two letters	(..)(.*)	1
Create label by the last two letters	(.*)()	2



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---

## Naming Conventions

This chapter describes the conventions that should be followed when naming entities in HP Business Availability Center.

This chapter describes:	On page:
General Guidelines	87
Allowed Characters	88

### General Guidelines

Keep in mind the following general guidelines when naming entities:

- ▶ Due to certain Web browser limitations, the names of server machines running the HP Business Availability Center servers should only consist of alpha-numeric characters (a-z, A-Z, 0-9), hyphens (-), and periods (.). For example, if the names of the machines running the servers contain underscores, it may not be possible to log into the HP Business Availability Center Web site when using Microsoft Internet Explorer 6.0 or later. (To access the web site in this case, use the machine's IP address instead of the machine name containing the underscore.)
- ▶ The HP Business Availability Center program directory, named HPBAC by default, cannot contain non-English characters.
- ▶ Names must begin with a letter.
- ▶ Name length should not exceed 50 characters (except for transaction names, which can be up to 1024 characters), for both the User name and Login name fields.

- ▶ Entity names in HP Business Availability Center for CMDB-based applications follow the conventions described below:
  - ▶ **CIT attributes values.** All primitive types are supported: long, double, float, string, and so on.
  - ▶ **CIT attributes values-type string.** All special characters are supported. The maximum length is 4000 characters.
  - ▶ **CIT names and attributes names.** The following are permitted: a-z, A-Z, and underscore (\_). The length is limited to 200 characters. The CIT name must be in English.
  - ▶ **CIT attribute length.** The total length of all the attributes in one CIT cannot exceed 8K due to a SQL Server limitation.

## Allowed Characters

Allowed characters are a-z, A-Z, 0-9, and the special characters described in the following table:

Entity	Special Characters Allowed
<b>CMDB-Based Components</b>	
IT Universe	All
View Manager	All
Discovery	All; For IP addresses only digits and *
Source Manager	All
CI Type Manager	All characters except: " \ / [ ] :   < > + = ; , ? *
Dashboard	All
Service Level Management	All
CMDB alerts	All
<b>Platform Administration</b>	
Management database name	_ @ \$ #



Entity	Special Characters Allowed
Management user schema (Oracle)	None
Management user schema password (Oracle)	None
User name	All characters except: " \ / [ ] :   < > + = ; , ? *
User login	All characters except: " \ / [ ] :   < > + = ; , ? *
User password	All characters
User group name	All characters except: " \ / [ ] :   < > + = ; , ? *
Alert name	` ~ ! @ # \$ % ^ & * ( ) - + = [ ] { } \   / ? . , " ' : ; < >
Recipient name	` ~ ! @ # \$ % ^ & * ( ) - + = [ ] { } \   / ? . , " ' : ; < >
Message sender name in alerts	` ~ ! # \$ % ^ * _ - + = { } \   / ? . ' <space>
SMTP server name in alerts	_ . -
Scheduled report name	` ~ ! @ # \$ % ^ & * ( ) _ - + = [ ] { } \   / ? . , " ' : ; < > <space>
Downtime/Event Schedule name	All characters except: " < >
<b>System Availability Management and End User Management Administration</b>	
Transaction name	` ~ ! @ # \$ % ^ & * ( ) _ - + { } ; <space>
Script name	! _ <space>
Profile name	~ ! @ # \$ % ^ & * ( ) _ - { } .
Views	` ~ ! @ # \$ % ^ & * ( ) _ - + { } ; <space>
Categories	` ~ ! @ # \$ % ^ & * ( ) _ - + { } ; <space>
<b>Data Collectors</b>	

Entity	Special Characters Allowed
Business Process Monitor host name	`~!@#\$%^&*()_ - + = [ ] { } \   / ? . , " ' ; < > <space>
Business Process Monitor host location	`~!@#\$%^&*()_ - + = [ ] { }   / ? . : ; <space>
SiteScope group name	_ . -
Real User Monitor entities, including Engine	`~!@#\$%^&*()_ - + { } ; <space>
<b>Custom Reporting</b>	
Custom report title	_ - + =   [ ] { } , . : ; <space>
Custom report menu name	_ - + =   [ ] { } , . : ; <space>
Custom report component title	_ - + =   [ ] { } , . : ; <space>
Trend report title	_ - + =   [ ] { } , . : ; <space>
Trend report menu name	_ - + =   [ ] { } , . : ; <space>

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---

## Using the JMX Console

This chapter describes how to deploy, undeploy, or display currently displayed packages using the JMX console.

This chapter describes:	On page:
JMX Console Overview	91
Deploying a Package	92
Undeploying a Package	93
Displaying Currently Deployed Packages	94

### JMX Console Overview

You can use the JMX console to deploy, undeploy, or display currently displayed packages. For more information on packages, see “Package Manager” in *IT World Model Management*.

- ▶ A deployed package is a package whose resources are imported into the system and available for use.
- ▶ An undeployed package is a package whose resources are not in the system, but can be imported by deployment.

---

**Note:** It is recommended that you use the Package Manager to perform these tasks instead of the JMX console. For details, see “Package Manager User Interface” in *IT World Model Management*.

---

## Deploying a Package

This section explains how to deploy a package using the JMX console.

**To deploy a package:**

- 1** Launch your Web browser and enter the following address:  
**http://<server\_name>:8080/jmx-console**, where **<server\_name>** is the name of the machine on which HP Business Availability Center is installed.
- 2** Under **MAM**, click **service=Package manager** to open the JMX MBEAN View page.
- 3** Locate **java.lang.String deployPackages** and enter the following information:
  - a** In the **ParamValue** box for the parameter **customerId**, enter 1.
  - b** In the **ParamValue** box for the parameter **dir**, enter the name of the folder that contains the package's zip file.

Include the full path to the folder.

---

**Note:** To deploy the package from the default package directory, leave this box empty. The default package directory is located in **<HP Business Availability Center root directory>\mam\_lib\packages**.

---

- c** In the **ParamValue** box for the parameter **packagesNames**, enter the name of the package.

The rules for entering a package name are as follows:

- ▶ The package name can contain a wildcard character (\*).
- ▶ The package name is case sensitive.
- ▶ The package name must have a **.zip** extension.

---

**Note:** You cannot deploy a package whose time stamp is older than a package with the same name that already exists in the CMDB.

---

- d** In the **ParamValue** box for the parameter **ignoreTimestamp**, select one of the following:
  - **True**. Ignore the time stamp and deploy the package.
  - **False**. Do not deploy the package if the date of the package is older than an existing package with the same name in the CMDB.
- 4** Click **Invoke** to deploy the package.

## Undeploying a Package

This section describes how to undeploy a package using the JMX console.

**To undeploy a package:**

- 1** Launch the Web browser and navigate to: **http://<server\_name>:8080/jmx-console**, where **<server\_name>** is the name of the machine on which HP Business Availability Center is installed.
- 2** Under **MAM**, click **service=Package manager** to open the JMX MBEAN View page.
- 3** Locate **java.lang.String undeployPackages** and enter the following information:
  - In the **ParamValue** box for the parameter **customerId**, enter 1.
  - In the **ParamValue** box for the parameter **packagesNames**, enter the name of the package you want to remove.

The rules for entering a package name are as follows:

  - Wildcard characters (\*) are not supported.
  - The package name is case sensitive.
- 4** Click **Invoke** to undeploy the package.

## Displaying Currently Deployed Packages

This section describes how to display currently deployed packages using the JMX console.

**To display currently deployed packages:**

- 1** Launch the Web browser and navigate to: **http://<server\_name>:8080/jmx-console**, where **<server\_name>** is the name of the machine on which HP Business Availability Center is installed.
- 2** Under **MAM**, click **service=Package manager** to open the JMX MBEAN View page.
- 3** Locate **java.lang.String displayDeployedPackages** and enter the following information:  
In the **ParamValue** box for the parameter **customerId**, enter 1.
- 4** Click **Invoke** to display the packages that are currently deployed.

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---

## Relationship Definitions

This chapter defines relationships used throughout HP Business Availability Center documentation.

### **backbone**

A physical connection between two switches. The relationship is discovered by the Discovery layer 2 service.

### **bcastdomain**

The relationship between an elan (emulated LAN) and a switch.

### **bridgebackbone**

A physical connection between two switches connecting a switch port to a switch bridge. The relationship is discovered by the Discovery base service.

### **brother**

The relationship among elements which share the same parent.

### **chassiselanmap**

The relationship between a chassis and an elan (emulated LAN).

### **chassisvlanmap**

The relationship between a chassis and a vlan (virtual LAN).

**clientserver**

A row of data from the `tcpConnLocalAddress` table in the Management Information Base (MIB) tree. This data contains information about the TCP connection between the ports of two hosts when a differentiation can be made between the server port and the client port. The `tcpConnLocalAddress` table lies in the MIB address **1.3.6.1.2.1.6.13.1.2**. The `clientserver` relationship is discovered by the Discovery TCP connection collector.

**contained**

The relationship between two CIs whereby a second CI is included in the first CI. This relationship exists only between an IP and host.

**container\_f**

The functional relationship between a parent and a child. The child does not inherit any properties.

**contains**

The relationship between two CIs whereby a second CI is included in the first CI.

**dbclient**

The relationship between a process and a database.

**dblink**

The relationship between a database and a database link object.

**depend**

The relationship wherein one CI needs the functionality of another CI.

**dependency**

The relationship wherein one CI needs the functionality of another CI.

**deployed**

The relationship wherein one CI is put into action by another CI.



**elanvlanmap**

The relationship between elan (emulated LAN) and vlan (virtual LAN) network components.

**execute**

The relationship between an agent and the job it deploys.

**j2eesocket**

The relationship between a server and a remote client.

**layertwo**

The physical connection between a switch and a host. The layertwo relationship is discovered by the Discovery layer 2 service.

**member**

The relationship between two CIs whereby one CI is included in another CI.

**mqalias**

The relationship between an alias queue and a local queue.

**mqchannelof**

The relationship between a channel and its transmission queue.

**mqmqilink**

The relationship between client and server channels for Message Queue Interface (MQI) calls.

**mqmsglink**

The relationship between two channels for message transfer.

**mqrepository**

The relationship between a message queue cluster and a message queue manager.

**mqresolve**

The relationship between a remote queue and the local queue to which it is mapped.

**nfs**

Network file server.

**owner**

The user of a resource.

**parent**

The relationship between elements where one element is parent of the other. For example, ip is the parent of interface.

**pnniconnection**

The relationship between two ATM ports.

**resource**

The relationship between elements where one element is the resource of the other. For example, dbsnapshot is the resource of dblinkobject.

**route**

A row of data from the routing table in the Management Information Base (MIB) tree, containing the data of the next\_hop IP address and the destination network address. The routing table lies in the MIB address **1.3.6.1.2.1.4.21.1.7**. The relationship is discovered by the Discovery route collector.

**sap\_rfc\_connection**

The relationship between a SAP system and a host. The host may be another SAP system or a non-SAP system.

**share**

The relationship between two drives.

**talk**

The relationship between two hosts.

**tcp**

A row of data from the tcpConnLocalAddress table in the Management Information Base (MIB) tree. This data contains information about the TCP connection between the ports of two hosts when a differentiation can be made between the server port and the client port. The tcpConnLocalAddress table lies in the MIB address **1.3.6.1.2.1.6.13.1.2**. The relationship is discovered by the Discovery TCP connection collector.

**traffic**

Represents all network flow, regardless of protocol, between two IPs.

**uniconnection**

The relationship between an ATM port and an IP.

**unnumbered**

A row of data from the routing table in the Management Information Base (MIB) tree. This data contains information about the `next_hop` IP address and the destination network address. The routing table lies in the MIB address `1.3.6.1.2.1.4.21.1.7`. Unnumbered relationships are discovered by the base collector.

**usb**

The relationship between two interfaces.

**use**

The relationship between elements whereby one element uses the other. For example, `process` uses `file`.

**virtual**

The relationship between a router and its virtual IP.

**vlanmembership**

The relationship between a vlan (virtual LAN) and a physical port.

**vlantobridge**

The relationship between a vlan (virtual LAN) and a bridge.



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## View Explorer

This chapter includes the main concepts, tasks, and reference information for View Explorer.

<b>This chapter describes:</b>	<b>On page:</b>
<b>Concepts</b>	
View Explorer Overview	102
Displaying a View	103
Using the Search Tool	104
View Explorer Configuration	106
<b>Tasks</b>	
Search for Configuration Items	106

## View Explorer Overview

View Explorer presents the elements of the IT universe model in HP Business Availability Center through the medium of views. HP Business Availability Center displays View Explorer in the left pane of applications and pages, for example, Dashboard, Service Level Management, and IT Universe Manager.

When you select a view in View Explorer, the configuration items (CIs) contained in the view are displayed in a hierarchical tree format according to the relationships defined between the CIs. A view may be empty if no CIs have been added to it (for an instance view), or if no CIs were found matching the TQL query (for a pattern view). For details on pattern and instance views, see “View Manager Overview” in *IT World Model Management*.

You can use View Explorer to select views and to locate CIs. You can select a view and browse through the list of CIs, or you can search for a CI if you do not know in which view the CI is included.

The interaction between the View Explorer pane and the information presented in the right pane varies, according to the context. For example, in IT Universe Manager, information is presented for the CI selected in View Explorer; in Dashboard, information is presented for the view selected in View Explorer; in Service Level Management, and in other dialog boxes, CIs can be selected in View Explorer and added to the right pane.

The functionality available for searching and browsing in View Explorer, and the menu options available for the CIs, also vary with the context.

For information on the components of View Explorer, see “View Explorer User Interface” on page 109.

## Displaying a View

When View Explorer is set to **Browse** mode, you can display the contents of a selected view. The name of the selected view is shown in the **View** box, and repeated again in the lower part of the View Explorer pane with the CI tree beneath it. When you move to other applications in HP Business Availability Center, the selected view remains the same.

### Unavailable Views and CIs

The View list in View Explorer may not display all views in the CMDB, or it may not display the contents of a view, for any of the following reasons:

- ▶ The View list includes only the views for which you have the necessary permissions set in **Admin > Platform > Users and Permissions > Permissions**. For more information, see “Granting and Removing Permissions” in *Platform Administration*.
- ▶ When using View Explorer in IT Universe Manager, Dashboard, or Service Level Management, the View list includes only those views that are assigned to that application.
- ▶ Views that are currently inactive appear in red in the View list, but they cannot be selected.
- ▶ Out-of-the-box views for which you do not have a license may appear in the View list, but these views do not contain CIs. For information on the out-of-the-box views, see “Predefined Folders and Views” in *IT World Model Management*.

---

**Note:** After deleting one or more nodes from a TQL, it can take time for changes to be updated to the view; meanwhile, the removed CIs appear in the view. If you select one of these CIs before it is updated, an error message is displayed. Use the Refresh button to update the view.

---

## Using the Search Tool

The View Explorer search tool enables you to find the CI you need, so that you can shift the focus, in the application in which you are working, on to that CI. Searches can be set up based on any number and combination of the following filter criteria.

This section includes the following topics:

- ▶ “Searching by CI Name” on page 104
- ▶ “Searching in Views or the CMDB” on page 104
- ▶ “Searching by Related Configuration Item” on page 105
- ▶ “Searching by Configuration Item Type” on page 105

### Searching by CI Name

When searching for CIs by name in View Explorer Search mode, you enter a string in the **Search for** box, representing the name of the CI, or part of the name. The search returns all CIs that contain the entered string somewhere in the name (within the boundaries of the other search criteria that you define).

When using this search option, note the following:

- ▶ The search by CI name option is not case sensitive.
- ▶ You can use the wildcard character asterisk (\*) in the string to represent zero or more characters.

### Searching in Views or the CMDB

All searches in View Explorer must specify the locations in which to search:

- ▶ **The current view only.** This option includes the view currently selected in Browse mode.
- ▶ **All views.** This option searches in the most recently accessed views. It does not include any views that are unavailable in the current application. For information on unavailable views, see “Unavailable Views and CIs” on page 103.



- **The entire CMDB.** This option enables you to find CIs that are not included in any view, or that are part of a view that is unavailable in IT Universe Manager. This option is only available if you are working in IT Universe Manager, Change Report, or in the Instance View Editor in View Manager.

## Searching by Related Configuration Item

You can search for CIs using the **Related to** box. This search returns CIs that have defined relationships to the CI specified in the **Related to** box. You can perform the same search by selecting the **Show Related CIs** option from the context menu when working in Browse mode. For details, see the context menu options under “Browse Mode” on page 110.

You cannot manually enter a CI in the **Related to** box – you define the required CI by selecting it in a view.

---

**Note:** The results list does not include relationships that exist in the CMDB, but are not included in any view.

---

After defining a CI in the **Related to** box, HP Business Availability Center remembers your selection until you move to a different application, or until you define a different value. The selection is shown inactive – you activate it again for a search by selecting the check box.

## Searching by Configuration Item Type

You can search for CIs using the **CI type** box. This search returns CIs that are of the type specified in the **CI type** box.

You cannot manually enter a CIT in the **CI type** box – you define the required CIT by selecting it from a list.

After defining a CI in the **CI type** box, HP Business Availability Center remembers your selection until you move to a different application, or until you define a different value. The selection is shown inactive – you activate it again for a search by selecting the check box.

## View Explorer Configuration

You can modify display options for View Explorer. These options are configured in the Infrastructure Settings Manager.

---

**Important:** Many of the settings in the Infrastructure Settings Manager should not be modified without first consulting Customer Support or your HP Professional Services representative. Modifying certain settings can adversely affect the performance of HP Business Availability Center.

---

To access the Infrastructure Settings Manager, select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**. Select the **Foundations** context and choose **View Explorer** from the list.

The following settings can be modified:

- ▶ **Immediate Children Count.** Number of children immediately displayed when expanding their parent's node in View Explorer.
- ▶ **Maximal Children Count.** Maximum number of children displayed under their parent's node in View Explorer.
- ▶ **Maximal search results size.** Maximum number of CMDB instances that can be returned in one search operation.
- ▶ **Recently Used Views List size.** Maximal number of recently used views to store per user.

## Search for Configuration Items

Follow these steps to search for configuration items:

### Define the Search

In the View Explorer pane, go to **Search** mode and define the criteria for your search. For details, see “View Explorer” on page 110.

## Run the Search and Sort the Results

Run the search. The results are listed in the lower part of the View Explorer pane, showing the CI name and the name of the view that the CI appears in, for each entry. You can sort the search results by clicking the appropriate heading.

When you select the required CI from the results list, the right pane displays details for the CI you selected, in the context in which you are working. To see a CI in the context of its view, right-click the CI and select **Locate CI in View**. View Explorer reverts to Browse mode and displays the view that contains the CI, with the CI selected in the view tree.



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## View Explorer User Interface

This chapter includes a description of the pages and dialog boxes that are part of the View Explorer user interface.



This chapter describes:	On page:
View Explorer	109





## View Explorer

<b>Description</b>	<p>Enables you to select views and to locate CIs.</p> <p><b>To access:</b> Appears in the left pane of the window, for example, the left pane of the IT Universe Manager window, the left pane of Dashboard, and the left pane of Service Level Management.</p>
<b>Important Information</b>	<p>The interaction between the View Explorer pane and the information presented in the right pane varies, according to the context. For example, in IT Universe Manager, information is presented for the CI selected in View Explorer; in Dashboard, information is presented for the view selected in View Explorer; in Service Level Management, and in other dialog boxes, CIs can be selected in View Explorer and added to the right pane.</p> <p>View Explorer consists of two functional formats: Browse mode and Search mode.</p> <ul style="list-style-type: none"> <li>▶ In Browse mode you can search for and display a view, and browse through the view to locate a particular CI. You can also perform operations for the CI from a context menu.</li> <li>▶ In Search mode you can search for one or more CIs in the views or the CMDB, search for all occurrences of a CI, or filter the list of CIs that is displayed.</li> </ul>

### Browse Mode



The View Explorer window includes the following elements in Browse mode (listed alphabetically):

GUI Element	Description
	<p>Click the <b>Refresh</b> button to refresh the list of CIs (if new CIs have been added to a view) or to refresh the <b>View</b> list (if views have been newly defined).</p>
	<p>The <b>Related CIs tree structure/CI type tree structure</b> enables you to change the way the CIs in a view are displayed.</p>

GUI Element	Description
	Click the <b>Menu option</b> button to display a context-sensitive menu containing the options you can perform on a selected CI. You can also display the menu by right-clicking a CI.
	Click the <b>Help</b> button to display the help for View Explorer.
	Click the <b>Close/Open</b> button to hide or display the View Explorer pane.
	Click the <b>Select view from the folder tree</b> button to the right of the <b>View</b> box, to open the Select View dialog box. You can browse through the folder tree to locate the view you want to display.
<CIs>	The CIs contained in the currently selected view.
<Tooltip>	Hold the cursor over a CI to display a tooltip with the relevant CI type.
<b>View</b>	<p>The <b>View</b> box displays the currently selected view. To select a view to display, click the down arrow on the right side of the View box; this displays an abridged list of views, containing the most recently accessed views. Click the arrow at the bottom of the list to scroll through the entire list.</p> <p>Alternatively, place the cursor in the list and begin typing the view name. HP Business Availability Center completes the view name, if the first few letters that you type match an existing entry. If the names of several views begin with those letters, all matching views are displayed in the list.</p>

## Search Mode

The View Explorer window includes the following elements in Search mode (listed alphabetically):

GUI Element	Description
	Click the <b>Help</b> button to display the help for View Explorer.
	In the <b>Related to</b> window, click to open the Select Configuration Item dialog box, where you select the required CI.  In the <b>CI type</b> window, click to open the Select Configuration Item Type dialog box, where you select the required CIT to search for.
<Search results>	After you run the search, the results are listed in the lower part of the View Explorer pane. The results are shown in two columns: <ul style="list-style-type: none"> <li>▶ <b>Name.</b> Contains the name of the CI.</li> <li>▶ <b>View.</b> Contains the name of the view in which the CI appears.</li> </ul> If the CI or view name is abbreviated, hold the pointer over the entry to see the full name. You can sort the search results by clicking the appropriate heading.
<b>CI type</b>	To search for CIs related to a specified CI type, select the <b>CI Type</b> check box and click the ellipsis button to select a CI from the Select Configuration Item dialog box.
<b>Name filter box</b>	Enter a CI name or part of a name in the filter box under the Name column of the results and press <b>Enter</b> to filter the results by name.
<b>Related to</b>	To search for CIs of a specified CI, select the <b>Related to</b> check box and click the ellipsis button to select a CI from the Select Configuration Item dialog box.
<b>Search</b>	Click to run the search. The results are listed in the lower part of the View Explorer pane, showing the CI name and the name of the view that the CI appears in, for each entry.



GUI Element	Description
<b>Search for</b>	In the <b>Search for</b> box, enter the name of the CI (or part of the name). For more information, see “Searching in Views or the CMDB” on page 104.
<b>Search in</b>	Specify the scope of your search. You can limit your search to the current view or search in the most recently accessed views (by selecting <b>All views</b> ). In IT Universe Manager, Change Report, and the Instance View Editor in View Manager, you also have an option to search the entire CMDB. The default option is <b>Current view</b> . Select the required option.  For more information, see “Searching in Views or the CMDB” on page 104.
<b>View filter box</b>	Enter a view name or part of a name in the filter box under the View column of the results and press <b>Enter</b> to filter the results by view.

## Context Menu Options

GUI Element	Description
<b>&lt;Context sensitive menu options&gt;</b>	The View Explorer context menu contains different options in each of the windows in which it appears. For example, in Dashboard you can open reports for the CI, and in IT Universe Manager you can attach new CIs to the CI.  For details on the context menu options specific to a particular application, see the User Interface Help for that application.
<b>Locate CI in View</b>	When this is selected for a CI, View Explorer reverts to Browse mode and displays the view that contains the CI, with the CI selected in the view tree.  <b>Note:</b> This option is only available in <b>Search</b> mode.

GUI Element	Description
<b>Properties</b>	Opens the Properties page for the selected CI. For details, see “Properties Tab” on page 279.
<b>Show Related CIs</b>	When this option is selected, View Explorer changes to Search mode and displays a list of the CIs that have a relationship to the original CI. This is the same as defining the original CI in the <b>Related to</b> box when performing a search in all views.  <b>Note:</b> This option is not available in IT Universe Manager.

# 13

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## Topology Query Language

This chapter includes the main concepts, tasks, and references of Topology Query Language (TQL).

This chapter describes:	On page:
Topology Query System Overview	115
TQL Query Validation Restrictions	117

### Topology Query System Overview

Topology Query System includes Topology Query Language (TQL). TQL is a language and tool for discovering, organizing, and managing IT infrastructure data. It is used to create queries that retrieve specific data from the configuration management database (CMDB) and display that data. For details on CMDB, see “Configuration Management Database (CMDB) Concepts” on page 193.

TQL queries constantly search the CMDB for changes that occur in the state of managed resources, and inform and update the relevant subsystems.

The CMDB is the core information repository. It contains the CI Type model and the custom tailored business service model, and stores and handles the infrastructure data collected and updated by the Discovery process. For more information on the Discovery process, see “Discovery Overview” in *Discovery*. For details on the CI Type model, see *CI Attribute Customization*.

The Topology Query System enables you to create a TQL query. For details, see “Query Manager User Interface” in *IT World Model Management*.

## Topology Query Language

TQL extends the standard SQL language by adding two important capabilities:

- ▶ TQL enables you to draw conceptual relationships between configuration items (CIs), which represent their actual interdependencies. Using predefined operators, the different types of interconnections that exist between CIs can be established, and consequently the infrastructure design and performance are more accurately represented. This representation serves as a basis and a model for the discovery, arrangement, query, and management of complex infrastructures.
- ▶ TQL contains a graphical aspect, consisting of visual symbols and syntax that represent the resources and their interconnections. This visualization of an IT infrastructure simplifies the understanding, monitoring, and managing of the IT business operations.

## The Roles of TQL

TQL plays several roles:

- ▶ Builds a business service model that defines and delineates the interconnection between IT assets that function together as business services. The business service model guides the discovery and identification of these business services, from the ever-increasing number and complexity of infrastructure resources. After the resources that comprise the business services are discovered, the business service model structures the way they are organized and managed in the CMDB.
- ▶ Creates queries that retrieve business service data from the CMDB, and displays the data in a visual representation that facilitates data monitoring and managing.
- ▶ Constantly searches the CMDB for changes that occur in the state of managed resources. When such changes are detected, the relevant subsystems are informed and updated.

## TQL Query Validation Restrictions

For TQL queries to be valid, they must comply with certain restrictions.

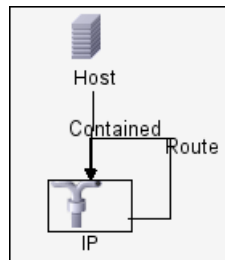
This section includes the following topics:

- “Understanding Validation Restrictions” on page 117
- “Correlation TQL Validation” on page 119
- “Enrichment TQL Validation” on page 120

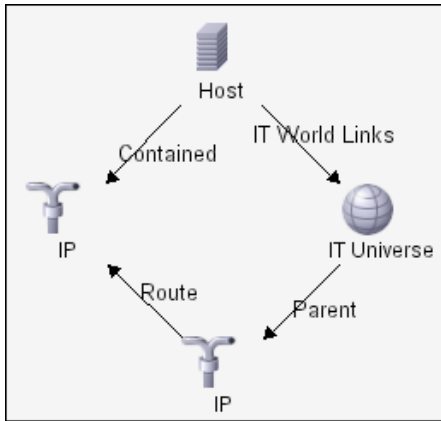
### Understanding Validation Restrictions

For Correlation, Enrichment, and Discovery TQL types to be valid, they must comply with the following restrictions:

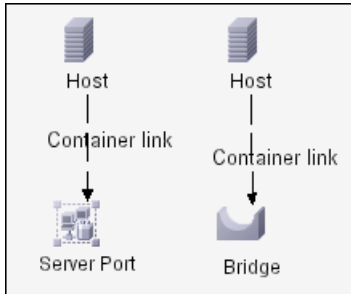
- **Self Relationships.** A TQL must not contain self relationships, that is, a relationship must not lead from a node to itself, as the following example illustrates:



- **Cyclic Graph.** The TQL structure cannot be a closed circle, as shown in the following example:



- **Separate Nodes and Groups.** All the TQL nodes must be linked to one another, that is, the TQL cannot contain separate nodes or groups, as the following example illustrates:



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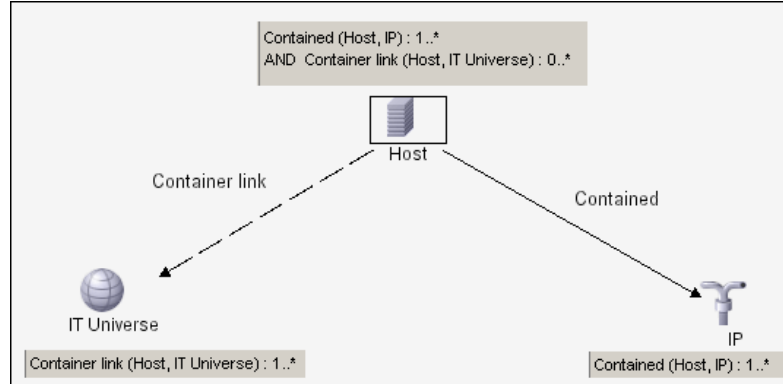
**Note:** This restriction also applies to Report TQLs.

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## Correlation TQL Validation

A Correlation TQL must also comply with the following restrictions:

- **Number of nodes.** A Correlation TQL must consist of at least two nodes.
- **Trigger and affected nodes must be connected.** There must be a path of relationships from the triggered node to the affected nodes.
- **Selecting nodes to function as Correlation triggers.** When selecting nodes to function as Correlation triggers, the nodes must comply with the following restrictions:
  - You can select more than one node as a trigger. However, you cannot define a node as affected and as a trigger.
  - If a node has a relationship whose minimum limit is 0 (meaning that one of its ends does not necessarily have a node linked to it), the node that is linked to its other end cannot be a root cause node (because it may or may not exist in the TQL). For details about minimum limits, see “Cardinality Tab” on page 159. For example, **IT Universe** cannot be either a root cause or affected node because it is connected to the host with a **Min** limit of 0.




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**Note:** A node that is not visible cannot be a root cause or an affected node.

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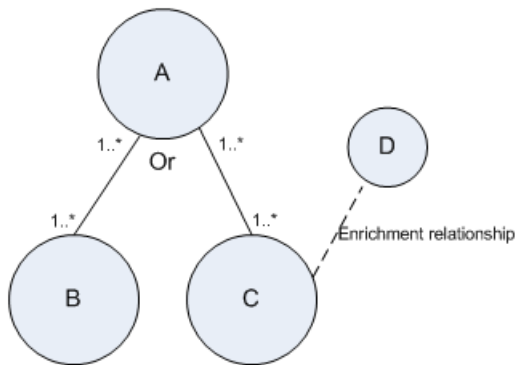
- **The connection between trigger and affected nodes.** The trigger node and affected nodes you define must be connected by a path of relationships from the triggered node to the affected nodes.

## Enrichment TQL Validation

Enrichment TQL queries must comply with the following restriction:

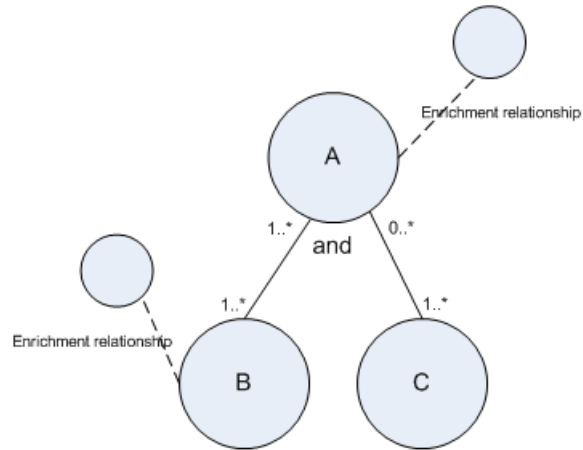
- **Required elements.** You cannot perform Enrichment on a non-required node, that is, a node that does not necessarily appear in the TQL results.

**Example 1.** In this example, the TQL results can be either **A** and **B** or **A** and **C**. Therefore, you cannot add an Enrichment node to nodes **B** or **C** because they are not required elements. You can add an Enrichment node to node **A** because it always appears in the TQL results. For details on how to add Enrichment nodes and relationships, see “Adding Enrichment Nodes and Relationships to an Enrichment TQL Query” on page 190.





**Example 2.** In this example, both **A** and **B** are required elements that always appear in the TQL results. Only **C** is not a required element because it has a cardinality of 0. Therefore, you cannot add an Enrichment node to it.





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## Topology Query Language User Interface

This chapter includes the pages and dialog boxes that are part of the Topology Query Language user interface in Correlation Manager, Enrichment Manager, Query Manager, Report Manager, View Manager, and Trigger TQL Editor in Discovery.

<b>This chapter describes:</b>	<b>On page:</b>
Add Compound Relationship Dependency Dialog Box	124
Add Dependency Dialog Box	126
Add Relationship Dialog Box	128
Attribute Condition Dialog Box	140
Change CI Type Dialog Box	142
Element Instances Dialog Box	143
Filter CI Instances Dialog Box	146
Join Relationship Condition Dialog Box	147
Layout Settings Dialog Box	148
Node/Relationship Condition Dialog Box	150
Relationship Cardinality Dialog Box	161
Subgraph Dialog Box	164
Subgraph Condition Definition Dialog Box	168
TQL Node Wizard	171

## Add Compound Relationship Dependency Dialog Box

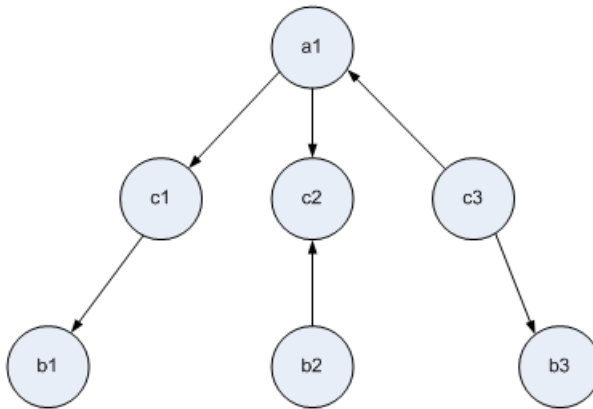
<b>Description</b>	<p>Enables you to create a compound relationship definition. The compound definition appears in the Compound Definition area in the Add Relationship dialog box.</p> <p><b>To access:</b> In the Add Relationship dialog box, click the <b>Advanced</b> link, choose <b>Function Relationship</b>, select <b>Virtual - Compound relationship</b>, and then click the <b>Add</b>  button in the Compound Definition area.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>▶ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>▶ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>▶ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>▶ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>▶ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Add Compound Relationship Dependency dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Relationship</b>	Select an available relationship connecting the two nodes. The list of available relationships appears only after defining both nodes.
<b>Relationship Direction</b>	<p>Select the required direction. Setting different relationship directions can achieve different query results. For an example, see “Setting Different Relationship Directions for Compound Definitions” below.</p> <p><b>Note:</b> The Relationship list remains empty until you have selected a Source and Target.</p>
<b>Source</b>	Select the required source node.
<b>Target</b>	Select the required target node.

## Setting Different Relationship Directions for Compound Definitions

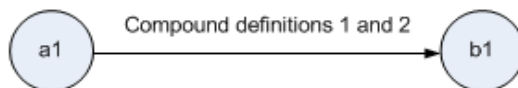
You can achieve different TQL results by setting different relationship directions. For example, in your business world, as illustrated below, you want to create a compound relationship that connects between a node of the CIT **a** and a node of the CIT **b**. Depth is defined at 5 (for details, see “Depth” on page 165).



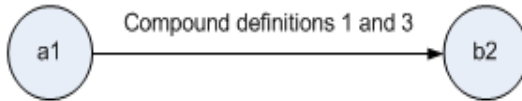
In the Add Compound Relationship Dependency dialog box, you can create compound definitions to link nodes **a** and **b** using different relationship directions.

Compound Definition	Source	Target	Relationship	Relationship Direction
#1	node <b>a</b>	node <b>c</b>	<relationship>	source --> target
#2	node <b>c</b>	node <b>b</b>	<relationship>	source --> target
#3	node <b>c</b>	node <b>b</b>	<relationship>	source <-- target

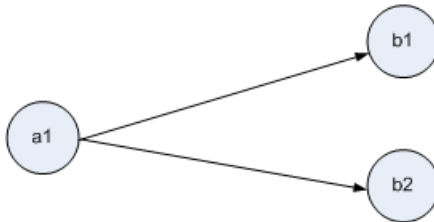
- Compound definitions 1 and 2 result in the following query:




- Compound definitions 1 and 3 result in the following query:




- Compound definitions 1, 2, and 3 result in the following query:





## Add Dependency Dialog Box

<p><b>Description</b></p>	<p>Enables you to create a dependency graph definition. Select the nodes and relationships to be included in the dependency graph.</p> <p><b>To access:</b> In the Subgraph dialog box, click  <b>Add..</b></p>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Add Dependency dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Define attribute conditions for the source and target nodes you selected. Opens the Subgraph Condition Definition dialog box.  <b>Note:</b> The <b>Condition</b> button is enabled only after you select a node from the <b>Source</b> or <b>Target</b> lists.
<b>Relationship</b>	Select an available relationship connecting the source and target nodes. The list of available relationships appears only after defining both the required source and target nodes.
<b>Source</b>	Select the desired source node.
<b>Target</b>	Select the required target node.


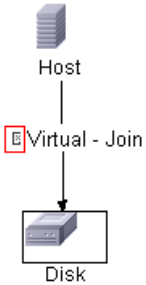
## Add Relationship Dialog Box

<p><b>Description</b></p>	<p>Enables you to define the connection between two nodes in a query.</p> <p><b>To access in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, and View Manager:</b></p> <ul style="list-style-type: none"> <li>➤ Right-click the required nodes in the Editing pane in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, View Manager and select <b>Add Relationship</b>.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>➤ Click the <b>Create Relationship</b>  icon and draw a line between the required nodes.</li> </ul> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane to display the <b>Add Relationship</b> option.</p> <p><b>To access in Resource Configuration in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 Click the  button to the right of the <b>Input TQL</b> box, located in the <b>Pattern Signature</b> tab, to open the Input TQL Editor.</li> <li>2 Right-click the required node and select <b>Add Relationship</b>.</li> </ol>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>



The Add Relationship dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Advanced</b>	<p>Click <b>Advanced</b> to select one of the following:</p> <ul style="list-style-type: none"> <li>▶ Select <b>Relationship</b> to define the connection between two nodes using a child of the relationship in the <b>Relationship Type</b> box.</li> <li>▶ Select <b>Function Relationship</b> to define the connection between two CIs using either a join or compound relationship. <ul style="list-style-type: none"> <li>▶ For details on defining join relationships, see “Join Definition Area” on page 131.</li> <li>▶ For details on defining Compound relationships, see “Compound Definition Area” on page 135.</li> </ul> </li> </ul>
<b>Allow relationships</b>	<p>Define how to handle relationships between identical nodes or self relationships in the query results. A self relationship is a relationship that leads from a node to itself.</p> <p><b>Note:</b> This list appears only when you select one node or two identical nodes.</p> <p>Click the <b>Advanced</b> link and select one of the following options:</p> <ul style="list-style-type: none"> <li>▶ <b>Allow all relationships.</b> All relationships appear in the query results.</li> <li>▶ <b>Allow self-relationships only.</b> Only self relationships (a relationship that leads to itself) appear in the query results.</li> <li>▶ <b>Discard self-relationships.</b> Self-relationships do not appear in the query results.</li> </ul>
<b>Direction</b>	The direction of the relationship that indicates which node is dependent on the other.
<b>Node Label</b>	The label of the selected nodes.
<b>Relationship Type</b>	A valid relationship that defines the connection between the selected nodes.

GUI Element	Description
<p><b>Visible</b></p>	<p>Select <b>Visible</b> to include query results relating to a join or compound relationship. By default, <b>Visible</b> is selected. When <b>Visible</b> is cleared, an invisible box  appears to the left of the of the relationship's name in the Editing pane. Any query results pertaining to the relationship are not displayed in the topology map.</p> 

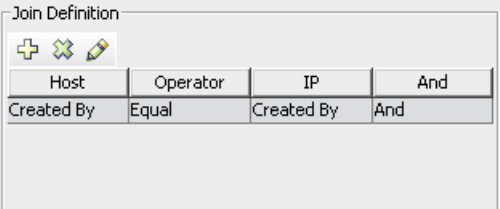
### Relationship Area

<p><b>Description</b></p>	<p>Enables you to define a valid relationship that defines the connection between the selected nodes.</p> <p><b>To access:</b> Click <b>Advanced</b> and select <b>Relationship</b> from the <b>Relationship</b> list on the left.</p>
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The Relationship area includes the following elements:




GUI Element	Description
<p>&lt;List of relationships from which to choose&gt;</p>	<p>Select the relationship that defines the connection between two nodes using a child of the relationship in the <b>Relationship Type</b> box.</p>

## Join Definition Area

<p><b>Description</b></p>	<p>Enables you to define join relationships. A join relationship is a logical connection, which appears only in the topology view containing the TQL query results, and represents the relationship between two CIs. It does not exist in the CMDB. A join relationship is created by defining an attribute for each node, whose values are used for comparison.</p> <p>The TQL results retrieve all CIs whose attribute values meet the conditions defined in the join definition.</p> <p>For example, you can create a join definition that links all <b>Host</b> CIs connected to <b>IP</b> CIs whose <b>Created by</b> attribute values are equal (see the example below).</p>  <p>Each row in the Join Definition area represents one condition defined for the join relationship.</p> <p><b>Note:</b> You can define multiple conditions.</p> <p>For an example of a compound definition, see “Sample Join Relationship” on page 132.</p> <p><b>To access the Join Definition area:</b></p> <ol style="list-style-type: none"> <li>1 In the Add Relationship dialog box, click <b>Advanced</b>.</li> <li>2 Select <b>Function Relationship</b> from the <b>Relationship</b> list on the left.</li> <li>3 Select <b>Virtual - Join Relationship</b>.</li> </ol>
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<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>
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The Join Definition area includes the following elements (listed alphabetically):

GUI Element	Description
	Define a join definition. Opens the Join Relationship Condition dialog box.
	Delete the selected row in the Join Definition area.
	Edit the selected row in the Join Definition area. Opens the Join Relationship Condition dialog box.
<p>&lt;Selected node1&gt;</p>	A selected node. The first attribute applies to <end_1>.
<p>&lt;Selected node2&gt;</p>	A selected node. The second attribute applies to <end_2>.
<p><b>And</b></p>	All join definitions are linked by the <b>And</b> operator.
<p><b>Operator</b></p>	The operator selected in the Join Relationship Condition dialog box. For details about operator definitions, see “Attribute Operator Definitions” on page 185.

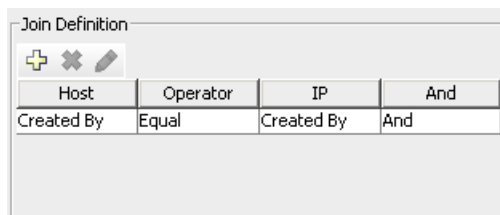
### Sample Join Relationship

This section explains how to define a join relationship that links **Host** CIs that are linked to **IP** CIs whose **Created by** attribute values are equal.

To define a join relationship that links all IP and Host CIs whose Created by attribute values are equal:

- 1 Create a TQL query and drag the following nodes from the CI Types pane onto the Editing pane:
  - Host
  - IP
- 2 Select the **Host** and **IP** nodes and right-click to open the Add Relationship dialog box.
- 3 Click **Advanced**.
- 4 From the list under **Advanced**, select **Function Relationship**.
- 5 Select **Virtual - Join Relationship**.
- 6  Click the **Add** button to open the Join Relationship Condition dialog box and do the following:
  - In the **Host Attribute** box, select **Created by**.
  - In the **Operator** box, select **Equal**.
  - In the **IP Attribute** box, select **Created by**.
- 7 Click **OK** to save your changes.

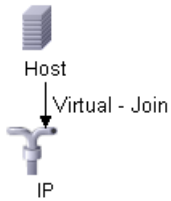
The Join Definition area now looks like this.



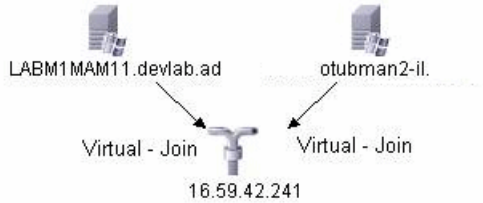
Host	Operator	IP	And
Created By	Equal	Created By	And

- 8 Click **OK** to save your changes in the Add Relationship dialog box.

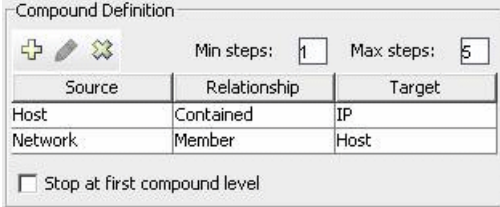
The TQL query in the Editing pane now looks like this:






Go to the required view in IT Universe to view the results. Double-click the **Virtual - Join** relationship in IT Universe to open the Link Map (as seen below), which displays all the **Host** CIs that are connected to an **IP** CI whose **Created by** attribute values are equal.



## Compound Definition Area

<p><b>Description</b></p>	<p>Enables you to define the connection between two nodes using a compound relationship. A compound relationship represents a path in the topological graph. You use a compound relationship to define the allowed steps in the path between the source and the target CIs.</p> <p>Each row in the Compound Definition area represents one of the allowed steps in the path leading from the source CI to the target CI in the topology map.</p>  <p><b>Note:</b> For an example of a compound definition, see “Sample Compound Relationship” on page 137.</p> <p><b>To access the Compound Definition area:</b></p> <ol style="list-style-type: none"> <li>1 In the Add Relationship dialog box, click <b>Advanced</b>.</li> <li>2 Select <b>Function Relationship</b> from the <b>Relationship</b> list on the left.</li> <li>3 Select <b>Virtual - Compound Relationship</b>.</li> </ol>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>
<p><b>Important Information</b></p>	<p>You can create as many compound definitions as necessary.</p>

The Compound Definition area includes the following elements (listed alphabetically):

GUI Element	Description
	Add a Compound definition. Opens the Add Compound Dependency dialog box.
	Delete the selected Compound definition.
	Edit the selected Compound definition. Opens the Change CI Type dialog box.
<b>Max steps</b>	Enter a number that represents the longest path allowed between the two CIs in the CMDB to be included in the Discovery process. <b>Default is: 5</b>
<b>Min steps</b>	Enter a number that represents the shortest path allowed between the two CIs in the CMDB to be included in the Discovery process. <b>Default is: 1</b>
<b>Relationship</b>	The relationship connecting the two nodes.
<b>Source</b>	The required source node.



GUI Element	Description
<p><b>Stop at first compound level</b></p>	<p>Select this option if you want the system to stop looking for TQL results once it reaches the first target in the path.</p> <p>In the following sample compound link definition, <b>Depth</b> is defined as 10 and <b>Stop at first compound level</b> is selected.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> </div> <p>The TQL results include the <b>Target 1</b>, <b>Target 3</b>, and <b>Target 4</b> because they are all at level 1 (the first CI found in the path). <b>Target 2</b> is not included in the TQL results because it is at level 2 (the second CI found in the path).</p>
<p><b>Target</b></p>	<p>The required target node.</p>

### Sample Compound Relationship

This section describes how to define the allowed steps that form a Compound relationship between a **Network** and an **IP** CI.

**To define a compound relationship between a Network CI and a IP CI:**

- 1 Create a TQL query and drag the following nodes from the CI Types pane onto the Editing pane:
  - Network
  - IP
- 2 Right-click the **Network** and **IP** nodes and select **Add Relationship** to open the Add Relationship dialog box.
- 3 Click **Advanced**.
- 4 From the list under **Advanced**, select **Function Relationship**.

**5 Select Virtual - Compound Relationship.**



**6** Click the **Add** button to open the Add Compound Relationship Dependency dialog box and do the following:

- From the **Source** list, select **Host**.
- From the **Target** list, select **IP**.
- From the **Relationship** list, select **Contained**.
- Select the required **Relationship** direction.

**7** Click **OK** to save your changes.

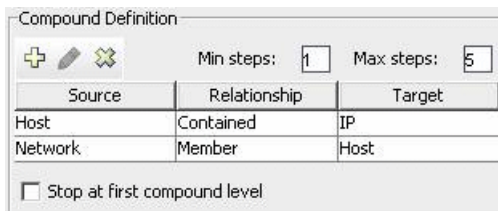


**8** Click the **Add** button to open the Add Compound Relationship Dependency dialog box and do the following.

- From the **Source** list, select **Network**.
- From the **Target** list, select **Host**.
- From the **Relationship** list, select **Member**.
- Select the required **Relationship** direction.

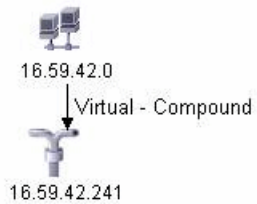
**9** Click **OK** to save your changes.

The Compound Definition area now looks like this.

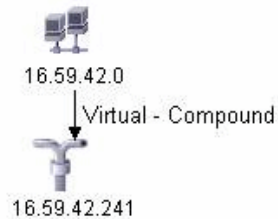


**10** Click **OK** to save your changes in the Add Relationship dialog box.

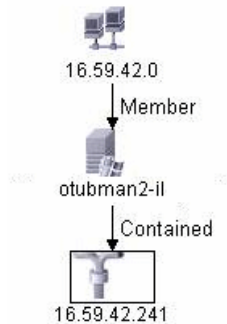
The TQL query in the Editing pane now looks like this:



Go to the required view in IT Universe to view the results.




You can double-click the **Virtual - Compound** relationship in IT Universe to open the Link Map, which displays the CIs and relationships that comprise the allowed steps used to link the **Network** and **IP** CIs.



In this example, the **16.59.42.0** (Network) CI is linked to the **16.59.42.241** (IP) CI through the **Otubman2-il** (Host) CI.

## Attribute Condition Dialog Box

<b>Description</b>	<p>Enables you to choose the attribute name, operator, and value required for the attribute definition.</p> <p><b>To access:</b> Click the <b>Add an attribute condition</b>  button in the Node/Relationship Condition dialog box.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>▶ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>▶ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>▶ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>▶ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>▶ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Attribute Condition dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Attribute name</b>	Choose an attribute from the list.

GUI Element	Description
<b>Operator</b>	Select the required operator. For details, see “Attribute Operator Definitions” on page 185.
<b>Value</b>	<p>Enter or select the value of the attribute. The <b>Value</b> options vary according to the attribute type you select.</p> <p>Select one of the following options:</p> <p><b>Fixed value.</b> You cannot change the value of the parameter.</p> <p><b>Parameterized value.</b> Enables you to change the value of the parameter.</p> <ul style="list-style-type: none"> <li>▶ When a parameterized value is selected in View Manager, an option called Set View Element Parameters is included in the right-click menu. For details on how to change the value when using the TQL, see “Set View Parameters/Set View Element Parameters Dialog Box” on page 308.</li> </ul> <p><b>Note:</b> If you select this option, you can enter a value here that is saved in the view. If you do not enter a value here, you are forced to enter one before saving the view.</p> <ul style="list-style-type: none"> <li>▶ When a parameterized value is selected in Report Manager, a <b>Set parameters values</b> option is displayed at the top right of a generated System report, enabling you to edit the predefined parameters of node conditions in a System report. For details, see “System Report User Interface” in <i>IT World Model Management</i>.</li> </ul>


## Change CI Type Dialog Box

<b>Description</b>	<p>Enables you to change the CI type of the TQL node after you have created a TQL query.</p> <p><b>To access:</b> Right-click the required node and select <b>Change Type</b>.</p> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane to display the <b>Change Type</b> option.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>
<b>Important Information</b>	<p>You can change the CI type to a type from one of the CIT’s sub-CITs, if one exists. If one does not exist, this option does not appear.</p>

The Change CI Type dialog box includes the following elements:






GUI Element	Description
<b>List of CI types from which to choose</b>	Select the required CI type.

## Element Instances Dialog Box





<p><b>Description</b></p>	<p>Display all of the CI instances found for the selected TQL node in a table.</p> <p><b>To access in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, and View Manager:</b> In the Editing pane, right-click the required node and select <b>Show Element's Instances</b>.</p> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane to display the <b>Show Element's Instances</b> option.</p> <p><b>To access in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 In Resource Configuration, click the  button to the right of the <b>Input TQL</b> box, located in the <b>Pattern Signature</b> tab, to open the <b>Input TQL Editor</b>.</li> <li>2 Right-click the required node and select <b>Show Element's Instances</b>.</li> </ol>
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<p><b>Important Information</b></p>	<p>The columns displayed in the report vary according to the CI type selected.</p> <p>By default, only columns corresponding to attributes that have been defined with the <b>Asset Data</b>, <b>Change Monitored</b>, and <b>Comparable</b> attribute qualifiers in the CIT Manager are displayed as columns in the dialog box. For details, see “Attributes Page” in <i>CI Attribute Customization</i>.</p> <p>If required, you can click the <b>Display Hidden Columns</b> button to display the attributes that are defined as Visible but not Static. For details on Static attributes, see “Attributes Page” in <i>CI Attribute Customization</i>.</p>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>


The Element Instances dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	<p>Filter the CI instances you want to display for the selected node. Opens the Filter CI Instances dialog box.</p>
	<p>Clear the filter definitions you created in the Filter CI Instances dialog box.</p>
	<p>Hide or display specific columns. Opens the Columns dialog box.</p>
	<p>Update the table.</p>
	<p>Determine the number of CI instances that appear on a page. Opens the Set Rows Per Page dialog box.</p>



GUI Element	Description
	Go to first page
	Go to previous page.
2 / 7	<p>The list of CIs are divided into pages. The number indicates which page is currently being displayed. For example, 2/7 means that it is the second out of seven pages. Click this button to go to a different page. The Set Page Number dialog box opens.</p> <p><b>Note:</b> For details on how to determine the number of CI instances that appear on a page, see “Set Rows Per Page Dialog Box” on page 46.</p>
	Go to next page.
	Go to last page.
<div style="border: 1px dashed gray; padding: 2px; display: inline-block;">Show Filtered Columns</div> <div style="border: 1px dashed gray; padding: 2px; display: inline-block;">Display hidden columns</div>	Toggle between hiding and displaying columns.
<CI type attributes>	The attributes of the CIT of the selected CI.
<Click a column header>	For details, see “Working with Tables” on page 43.
<Right-click a column header>	For details, see “Working with Tables” on page 43.
CI Type	The CIT of the selected CI.
Display Label	The name of the CI instance as it appears in the topology map.


## Filter CI Instances Dialog Box

<b>Description</b>	<p>Enables you to reduce the number of CI instances to be displayed in a list by selecting a condition and a value for a specific CI.</p> <p><b>To access:</b></p> <ul style="list-style-type: none"> <li>➤ Click the <b>Filter</b>  button in the Element Instances dialog box.</li> <li>➤ In Discovery, click the <b>Filter</b> button in the CIs Discovered by [Module Name] dialog box.</li> </ul>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Filter CI instances dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Condition</b>	Select the required operator. For details, see “Attribute Operator Definitions” on page 185.
<b>Display Name</b>	The display name of the Configuration Item type to which the CI belongs.
<b>Value</b>	Select or enter the required value.

## Join Relationship Condition Dialog Box

<b>Description</b>	<p>Enables you to define the connection between two nodes using a join relationship. The join definition appears in the Join Definition area.</p> <p><b>To access:</b> Click the <b>Add a Join definition</b>  button in the <b>Join Definition</b> area in the Add Relationship dialog box.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Join Relationship Condition dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<Selected node1>	A selected node. The first attribute applies to <end_1>.

GUI Element	Description
<Selected node2>	A selected node. The second attribute applies to <end_2>.
<b>Operator</b>	<p>Select one of the following operators:</p> <ul style="list-style-type: none"> <li>▶ <b>Equal.</b> The system checks whether two selected attributes are equal.</li> <li>▶ <b>Not equal.</b> The system checks whether two selected attributes are not equal.</li> <li>▶ <b>Sub string.</b> The system checks whether the value of the first attribute is a substring of the value of the second attribute.</li> <li>▶ <b>Sub string ignore case.</b> The system checks whether the value of the first attribute is a substring of the value of the second attribute regardless of the string's case.</li> </ul> <p><b>Important:</b> When using the operator <b>Not equal</b>, ensure that both sides of the join relationship have a limited result size. It is recommended to define more specific conditions so as not to overload the system with large results.</p>

## Layout Settings Dialog Box



<b>Description</b>	<p>Enables you to determine which attributes are used in the calculation of the TQL query when using the UCMDB API. For details, see “Working with the HP Universal CMDB API” in <i>Solutions and Integrations</i>.</p> <p><b>To access:</b> Click the <b>Advanced layout settings</b> link in the Node/Relationship condition dialog box.</p>
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<b>Important Information</b>	<ul style="list-style-type: none"> <li>▶ Since this option is only relevant when querying the CMDB API, the query results in the user interface is not impacted by the attributes you select in this dialog box.</li> <li>▶ Once you have selected the required attributes and clicked <b>OK</b>, you cannot clear the selections you have made.</li> </ul>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>▶ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>▶ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>▶ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>▶ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>▶ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Layout Settings dialog box includes the following elements (listed alphabetically):


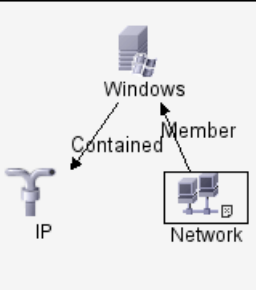
<b>GUI Element</b>	<b>Description</b>
<b>Attribute name</b>	The name of the attribute.
<b>Calculate</b>	Select this check box to include the attribute in the query’s calculation.

## Node/Relationship Condition Dialog Box

<p><b>Description</b></p>	<p>Enables you to define the attribute conditions for the selected TQL node/relationship.</p> <p><b>To access in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, and View Manager:</b></p> <ul style="list-style-type: none"> <li>➤ In the Editing pane, right-click the required node and select <b>Node/Relationship Condition</b>.</li> <li>or</li> <li>➤ Click the <b>Edit Definition</b>  button in the Information pane.</li> </ul> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane to display the <b>Node Condition</b> option.</p> <p><b>To access in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 In Resource Configuration in Discovery, click the  button to the right of the <b>Input TQL</b> box, located in the <b>Pattern Signature</b> tab, to open the <b>Input TQL Editor</b>.</li> <li>2 Right-click the required node and select <b>Node/Relationship Condition</b>.</li> </ol>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Node/Relationship dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Advanced layout settings</b>	<p>Enables you to determine which attributes are used in the calculation of the TQL query when querying the CMDB using third-party or custom tools.</p> <p>Opens the Layout Settings dialog box. For details, see “Layout Settings Dialog Box” on page 148.</p>
<b>Element name</b>	<p>(Optional) The <b>Element name</b> box contains the name of the selected node/relationship. By default, the CIT type is assigned as the element’s name. You can rename a TQL node in the <b>Element name</b> box giving it a unique label. This can be helpful when there is more than one node of the same CIT type in the TQL query.</p>

GUI Element	Description
<p><b>Include subtypes</b></p>	<p>Display both the selected CI and its descendents in the topology map.</p>
<p><b>Visible</b></p>	<p>Select <b>Visible</b> to display the selected TQL node in the Editing pane. When <b>Visible</b> is cleared, an invisible box  appears to the right of the selected TQL node in the Editing pane.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;">  </div> <p>Any query results pertaining to that TQL node are not displayed in the topology map. This can be useful when certain relationships or TQL nodes are required to build the query but are not needed in the results. For example, Windows are connected to the network by defining specific IPs, but in any query results you may want to view the IP elements only and not the Windows elements.</p>

This dialog box contains the following tabs:







- “Attribute Tab” on page 153
- “Qualifier Tab” on page 155
- “Element ID Tab” on page 157
- “Cardinality Tab” on page 159.



## Attribute Tab

<b>Description</b>	<ul style="list-style-type: none"> <li>▶ Add an attribute condition to a node or relationship.</li> <li>▶ Filter the query results. For details, see “Attribute Area” on page 154.</li> </ul> <p><b>To access:</b> Click the <b>Attribute</b> tab in the Node/Relationship Condition dialog box.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>▶ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>▶ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>▶ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>▶ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>▶ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>


The Attribute tab includes the following elements:

GUI Element	Description
	Add an attribute definition. Opens the Attribute Condition dialog box.  <b>Note:</b> The attribute condition you define appears in the Attribute area. For details, see “Attribute Area” on page 154.
	Delete an attribute condition.
	Edit an attribute condition. Opens the Element Instances Dialog Box.
	Insert an attribute condition before a selected row.
	Move a selected row up.
	Move a selected row down.

### Attribute Area

<p><b>Description</b></p>	<p>Enables you to create an expression defining conditions that restrict the number of nodes that appear in the query.</p> <p><b>To access:</b></p> <ul style="list-style-type: none"> <li>▶ Click the <b>Attribute</b> tab in the Node/Relationship Condition dialog box.</li> <li>or</li> <li>▶ Click <b>Next</b> in the New TQL Relationship Page wizard page.</li> </ul>
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The Attribute area includes the following elements (listed alphabetically):

GUI Element	Description
<p><b>And/Or</b></p>	<p>Click inside the <b>And/Or</b> field and select either <b>And</b> or <b>Or</b> to link multiple conditions.</p>
 <p><b>Brackets</b></p>	<p>Click inside the <b>Brackets</b> box to display a list of brackets you can use to build more complex, logical statements.</p>
<p><b>Criteria</b></p>	<p>Contains the attribute condition definition as defined in the Element Instances Dialog Box.</p>
<p><b>Not</b></p>	<p>Select <b>NOT</b> if you want the condition statement to do the opposite of what is defined.</p> <p><b>Note:</b> If you select <b>NOT</b>, query results do not include data from the CI instances that were not assigned a value. For example, your system contains three hosts: Host1 is assigned the value A, Host2 is assigned the value B and Host3 is not assigned a value. You create a query to retrieve all hosts that are equal to A and select <b>NOT</b>; the results of your query only include Host2 because Host3 is not assigned a value.</p>

## Qualifier Tab

<b>Description</b>	<p>Enables you to define qualifier conditions for the selected node or relationship. For example, you can use a qualifier to define a CIT as abstract, meaning you cannot create instances from it.</p> <p><b>To access:</b> Click the <b>Qualifier</b> tab in the Node/Relationship Condition dialog box.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>





The Qualifier tab includes the following element:







GUI Element	Description
<Qualifiers>	<p>Following are the qualifier definitions:</p> <ul style="list-style-type: none"> <li>➤ <b>ABSTRACT_CLASS.</b> You cannot create instances of this CIT.</li> <li>➤ <b>BLE_LINK_CLASS.</b> A relationship that has been assigned this qualifier is loaded by an online BLE engine TQL and becomes part of the Dashboard status calculations.</li> <li>➤ <b>CONTAINER.</b> This qualifier is assigned to relationships that signify a containment relationship, such as Member, Container link, Contains, or Contained.</li> <li>➤ <b>HIDDEN_CLASS.</b> Instances of this CIT do not appear anywhere in the application.</li> <li>➤ <b>ITU_HIDDEN_CLASS.</b> Instances of this CIT do not appear in the topology map application.</li> <li>➤ <b>MAJOR_APP.</b> CITs which are assigned this qualifier appear in the Major Application Type Breakdown overview report for details, see “Major Application Type Breakdown” in <i>IT World Model Management</i>).</li> <li>➤ <b>NETWORK_DEVICES.</b> A qualifier common to all the CITs that represent a network device. It can be used for TQL queries related to network devices and serves as a replacement for CITs in a query.</li> <li>➤ <b>ProtocolDialog.</b> For internal use only.</li> <li>➤ <b>READ_ONLY_CLASS.</b> This CIT cannot be edited.</li> <li>➤ <b>TRACK_LINK_CHANGES.</b> Changes that occur on the specified relationship appear in Change reports. For details, see “Change Report User Interface” in <i>IT World Model Management</i>.</li> </ul> <p><b>Important:</b> Multiple selection links the conditions with the Or operator.</p>

## Element ID Tab

<p><b>Description</b></p>	<p>Enables you to filter the TQL results according to the element ID of the instances found for the selected TQL node.</p> <p>Move the required element from the TQL node instances pane on the left to the to the Filtered TQL results pane on the right to define what you want included in the TQL results using the double right arrows.</p> <p>The Element ID dialog box has the following panes:</p> <ul style="list-style-type: none"> <li>▶ TQL Node Instances Pane</li> <li>▶ Filtered TQL Results Pane</li> </ul> <p><b>To access:</b> Click the <b>Element ID</b> tab in the Node Condition dialog box.</p>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>▶ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>▶ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>▶ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>▶ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>▶ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Element ID tab includes the following elements :

GUI Element	Description
	<p>Filter the CI instances you want to display for the selected node. Opens the Filter CI Instances dialog box.</p>
	<p>Clear the filter definitions you created in the Filter CI Instances dialog box.</p>
	<p>Hide or display specific columns. Opens the Columns dialog box.</p>
	<p>Update the table.</p>

GUI Element	Description
	Determine the number of CI instances that appear on a page. Opens the Set Rows Per Page dialog box.
	Go to first page
	Go to previous page.
	The list of CIs are divided into pages. The number indicates which page is currently being displayed. For example, 2/7 means that it is the second out of seven pages. Click this button to go to a different page. The Set Page Number dialog box opens.  <b>Note:</b> For details on how to determine the number of CI instances that appear on a page, see “Set Rows Per Page Dialog Box” on page 46.
	Go to next page.
	Go to last page

### TQL Node Instances Pane

<b>Description</b>	Displays all the instances found for the selected TQL node in a table.  <b>To access:</b> Click the <b>Element</b> tab in the Node Condition dialog box.
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The TQL node instances pane includes the following elements (listed alphabetically):

GUI Element	Description
<b>CI Type</b>	The CI type
<b>Display label</b>	The label that is displayed for the node’s instance.
<b>ID</b>	The unique ID for the node’s instance.

**Filtered TQL Results Pane**

<b>Description</b>	Displays the elements that are used to define what should be included in the TQL results. <b>To access:</b> Click the <b>Element</b> tab in the Node/Relationship dialog box.
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The Filtered TQL Results pane includes the following elements (listed alphabetically):

GUI Element	Description
CI Type	The CI type
Display label	The label that is displayed for the node's instance.
ID	The unique ID for the node's instance.

**Cardinality Tab**

<b>Description</b>	Enables you to define how many CI instances you expect to have at the end of a relationship in your query result. <b>To access:</b> Click the <b>Cardinality</b> tab in the Node/Relationship dialog box.
<b>Important Information</b>	This tab appears only when a node is selected.
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>


The Cardinality tab includes the following elements:

GUI Element	Description
	Add a cardinality definition. Opens the Relationship Cardinality dialog box. <b>Note:</b> The relationship cardinality you define appears in the Cardinality area.
	Delete a cardinality definition from the Cardinality area.
	Edit a cardinality definition. Opens the Relationship Cardinality dialog box.
	Insert a cardinality definition before a selected row.
	Move a selected row up.
	Move a selected row down.

### Cardinality Area

<b>Description</b>	Enables you to define relationship conditions that enable the relationship's connecting node to be included in the TQL query results. In the <b>Cardinality</b> area, you can create an expression defining that condition. For an example, see "Example of a Relationship Condition" on page 162.
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The Cardinality area includes the following elements (listed alphabetically):

GUI Element	Description
<b>And/Or</b>	Click inside the <b>And/Or</b> field and select either <b>And</b> or <b>Or</b> to link multiple conditions.
<b>Brackets</b> 	Click inside the <b>Brackets</b> box to display a list of brackets you can use to build more complex logical statements.



GUI Element	Description
<b>Criteria</b>	Contains the cardinality definition as defined in the Relationship Cardinality dialog box.
<b>Not</b>	<p>Select <b>NOT</b> if you want the cardinality definition to do the opposite of what is defined.</p> <p><b>Note:</b> If you select <b>NOT</b>, query results do not include data from the CI instances that are not assigned a value. For example, let us assume that your system contains three hosts. Host1 is assigned the value A, Host2 is assigned the value B and Host3 is not assigned a value. If you create a query in which you want to retrieve all hosts that are equal to A and you select <b>NOT</b>, the results of your query only include Host2 because Host3 is not assigned a value.</p>

## Relationship Cardinality Dialog Box

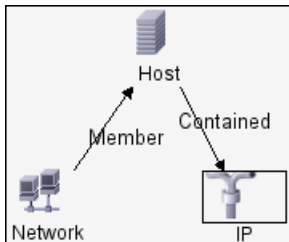
<b>Description</b>	<p>Enables you to define a relationship cardinality. Select the required relationship to which the selected node is attached. Then define the lower and upper limits for including the node at the other end of the relationship in the query results.</p> <p><b>To access:</b> Click the <b>Add a cardinality definition</b>  button in the Cardinality tab in the Node/Relationship Condition dialog box.</p>
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Relationship Cardinality dialog box includes the following elements (listed alphabetically):

GUI Element	Description
<b>Max</b>	Enter the value that defines the upper limits for including the node at the other end of the relationship in the query results.  <b>Note:</b> You can use an asterisk (*) in the <b>Max</b> box to represent an infinite value.
<b>Min</b>	Enter the value that defines the lower limits for including the node at the other end of the relationship in the query results.  For example, if <end_1> is <b>IP</b> and <end_2> is <b>Windows</b> , entering <b>1</b> in the <b>Min</b> box and asterisk (*) in the <b>Max</b> box instructs the system to retrieve only those IPs that are connected to at least one Windows operating system. (The asterisk indicates an infinite value.) Entering <b>3</b> in the <b>Min</b> box and asterisk (*) in the <b>Max</b> box instructs the system to retrieve only those Windows operating systems that are connected to at least three IPs.
<b>Node</b>	Select the required relationship to which the selected node is attached. The list contains all the relationships that are linked to the selected node.

### Example of a Relationship Condition

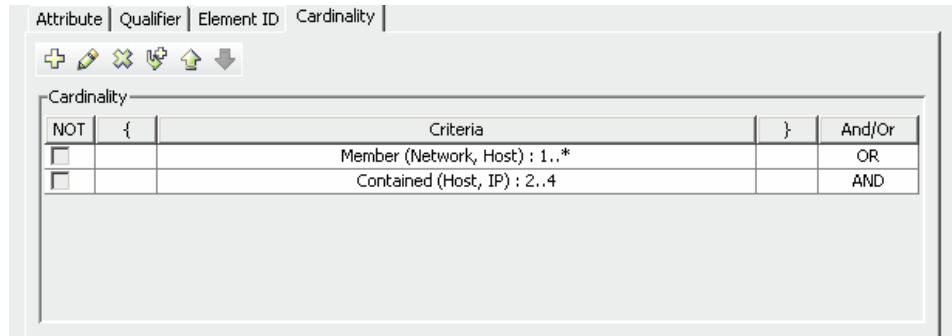
The example of relationship conditions is based on the following TQL query:



In the Relationship Cardinality dialog box, the following relationship conditions are defined for the TQL:



- Member – **Min: 1, Max: \***
- Contained – **Min: 2, Max: 4**

The definitions appear in the **Cardinality** section, as follows:






- [member (Network, Host)] OR [contained (Host, IP)] means that the host must either have between two and four IPs OR be a member of the network.
- [member (Network, Host)] AND [contained (Host, IP)] means that the host must have between two and four IPs AND ALSO be a member of the network.

## Subgraph Dialog Box

<p><b>Description</b></p>	<p>Enables you to create a graph that represents additional TQL query data related to a specific CI. The Discovery job searches for the results from both the TQL query and the dependency graph definitions. The query recursively retrieves all the related CIs by a defined depth.</p> <p>In the graph, you can define the relationship that is connected to a specific node. For example, if one of the nodes is a host, you can specify different relationships for Windows, router, and IP. You can also define attribute conditions for nodes. For details, see “Subgraph Condition Definition Dialog Box” on page 168.</p> <p>The Discovery job retrieves data that meets the criteria that is defined in the dependency graph.</p> <p>For an example, see “Sample Subgraph Definition” on page 165.</p> <p><b>To access in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, and View Manager:</b></p> <p>In the Editing pane, right-click the required node and select <b>Add Subgraph</b>.</p> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane to display the <b>Show Subgraph</b> option.</p> <p><b>To access in Resource Configuration in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 Click the  button to the right of the <b>Input TQL</b> box, located in the <b>Pattern Signature</b> tab, to open the <b>Input TQL Editor</b>.</li> <li>2 Right-click the required node and select <b>Add Subgraph</b>.</li> </ol>
<p><b>Important Information</b></p>	<p>The following icon is displayed next to the icon for which you define a subgraph:</p> <div style="text-align: center;">  </div>

<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>
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The Subgraph dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Add a dependency definition to the <b>Dependencies</b> area. Opens the Add Dependency dialog box.
	Delete a dependency definition from the Dependencies area.
	Edit a dependency definition. Opens the Add Dependency dialog box.
<b>Depth</b>	A number that represents the longest path (that is, the most connecting nodes) allowed between two CIs in the CMDB that should be included in the Discovery process. <b>Default: 5.</b>
<b>Node1</b>	The required node selected in the Add Dependency dialog box.
<b>Node2</b>	The required node selected in the Add Dependency dialog box.
<b>Relationship</b>	The relationship selected in the Add Dependency dialog box connecting <node1> to <node2>.

### Sample Subgraph Definition

This section describes how to create a subgraph definition. In this example, the TQL query results retrieve all CIs that are connected to a host whose host's display label is <host display label> by either a **Container link** or a **Contained** relationship.

**To create this sample subgraph definition:**

- 1** Create a TQL query and drag a **Host** node from the CI Types pane onto the Editing pane.
- 2** Right-click the **Host** node and select **Add Subgraph** to open the Subgraph dialog box.
- 3** Select the default subgraph definition that appears and delete it.



- 4** Click the **Add** button to open the Add Dependency dialog box and do the following:
  - From the **Source** list, select **IT Universe**.
  - From the **Target** list, select **IT Universe**.
  - From the **Relationship** list, select **Contained**.

- 5** Click **OK** to save your changes.



- 6** Click the **Add** button to open the Add Dependency dialog box and do the following:
  - From the **Source** list, select **IT Universe**.
  - From the **Target** list, select **IT Universe**.
  - From the **Relationship** list, select **Container link**.

- 7** Click **OK** to save your changes.




- 8** Click the **Add** button to open the Add Dependency dialog box and do the following:
  - From the **Source** list, select **IT Universe**.
  - From the **Target** list, select **IT Universe**.
  - From the **Relationship** list, select **Contains**.







- 9** Click **OK** to save your changes.

The Add Dependency dialog box now looks like this.

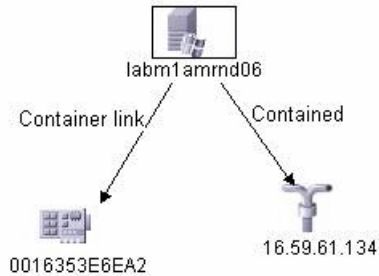
Dependencies		
Node 1	Relationship	Node 2
IT Universe	Contained	IT Universe
IT Universe	Container link	IT Universe
IT Universe	Contains	IT Universe

- 10** Click **OK** in the Subgraph dialog box.
- 11** Right-click the **Host** node and select **Node Condition** to open the Node Condition dialog box.
- 12** Click the **Attribute** tab.
-  **13** Click the **Add an attribute condition** button to open the Attribute Condition dialog box.
- 14** From the **Attribute Name** list, select **Display Label**.
- 15** From the **Operator** list, select **Equal**.
- 16** Select **Fixed Value**.
- 17** In the box under **Value cannot be changed**, enter <host display label>.
- 18** Click **OK** to save your changes.

The Attribute tab now looks like this.


Attribute   Qualifier   Element ID   Cardinality				
     				
Attribute				
NOT	{	Criteria	}	And/Or
<input type="checkbox"/>		Display Label Equal "labm1amrnd08"		

Go to the required view in IT Universe to view the results.









The results show that the **labm1amrnd06** (Host) CI is linked to the **16.59.61.134** (IP) CI by the **Contained** relationship and to the **0016353E6EA2** (Interface) CI by the **Container link** relationship.

## Subgraph Condition Definition Dialog Box


<p><b>Description</b></p>	<p>Enables you to:</p> <ul style="list-style-type: none"> <li>➤ Define attribute conditions for nodes and relationships.</li> <li>➤ Filter the query results. For details, see “Attribute Area” on page 169.</li> </ul> <p><b>To access:</b> Click <b>Condition</b>  in the Add Dependency dialog box.</p>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>




The Subgraph Condition Definition dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Define the attribute condition name, the operator and the value necessary to create the condition. Opens the Element Instances Dialog Box. <b>Note:</b> The condition definition appears in the Attribute area. For details, see “Attribute Area” on page 169.
	Edit an existing attribute condition. Opens the Element Instances Dialog Box.
	Delete an attribute condition.
	Insert an attribute condition before a selected row.
	Move a selected row up.
	Move a selected row down.
CIT	Contains the CIT selected from the <b>Source</b> and <b>Target</b> lists.


### Attribute Area

<b>Description</b>	Displays an expression defining conditions that restrict the number of nodes that appear in the query. <b>To access:</b> Click <b>Condition</b>  in the Add Dependency dialog box.
<b>Included in Tasks</b>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

The Attribute Area includes the following elements (listed alphabetically):

GUI Element	Description
<b>And/Or</b>	Click inside the <b>And/Or</b> field and select either <b>And</b> or <b>Or</b> to link multiple conditions.
 <b>Brackets</b>	Click inside the <b>Brackets</b> box to display a list of brackets you can use to build more complex, logical statements.
<b>Criteria</b>	Contains the attribute condition definition as defined in the Element Instances Dialog Box.
<b>Not</b>	<p>Select <b>NOT</b> if you want the condition statement to do the opposite of what is defined.</p> <p><b>Note:</b> If you select <b>NOT</b>, query results do not include data from the CI instances that were not assigned a value. For example, let us assume that your system contains three hosts. Host1 is assigned the value A, Host2 is assigned the value B and Host3 is not assigned a value. If you create a query in which you want to retrieve all hosts that are equal to A and you select <b>NOT</b>, the results of your query only include Host2 because Host3 is not assigned a value.</p>

## TQL Node Wizard

<p><b>Description</b></p>	<p>Enables you to build a TQL query.</p> <p><b>To access in Report Manager, Enrichment Manager, Correlation Manager, Query Manager, and View Manager:</b> In the Editing pane, right-click the required node and select <b>TQL Node Wizard</b>.</p> <p><b>Note:</b> If you are using Enrichment Manager, select <b>TQL</b> mode at the top of the Editing pane.</p> <p><b>To access in Job Configuration in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 Select a job in the Discovery Modules pane. Select a Trigger TQL in the Properties pane. Click the Open the TQL Editor button to open the <b>Trigger TQL Editor</b>.</li> <li>2 Right-click the required node and select <b>TQL Node Wizard</b>.</li> </ol> <p><b>To access in Resource Configuration in Discovery:</b></p> <ol style="list-style-type: none"> <li>1 Select a pattern in the Discovery Resources pane. In the <b>Pattern Signature</b> tab, click the Edit  button to the right of the <b>Input TQL</b> box to open the <b>Input TQL Editor</b>.</li> <li>2 Right-click the required node and select <b>TQL Node Wizard</b>.</li> </ol>
<p><b>Important Information</b></p>	<p>If the TQL query is empty, drag the required TQL nodes on to the Editing pane from the tree displayed in the CI Types pane.</p>
<p><b>Included in Tasks</b></p>	<ul style="list-style-type: none"> <li>➤ “Define a Report Rule” in <i>IT World Model Management</i></li> <li>➤ “Create a Correlation Rule” in <i>IT World Model Management</i></li> <li>➤ “Define an Enrichment Rule” in <i>IT World Model Management</i></li> <li>➤ “Define a TQL Query” in <i>IT World Model Management</i></li> <li>➤ “Pattern View Workflow” in <i>IT World Model Management</i></li> </ul>

<b>Useful Links</b>	“Topology Query Language” on page 115
<b>Wizard Map</b>	The TQL Node Wizard contains: New TQL Node Page > New TQL Relationship Page > TQL Node Condition Page > Element Instances Page

## New TQL Node Page

<b>Description</b>	Enables you to add a node to the TQL query.
<b>Important Information</b>	If the TQL query is empty, drag the required TQL node on to the Editing pane from the tree displayed in the Configuration Item Types pane.  For general information on the TQL Node Wizard, see “TQL Node Wizard” on page 171.
<b>Useful Links</b>	“Topology Query System Overview” on page 115
<b>Wizard Map</b>	The TQL Node Wizard contains: <b>New TQL Node Page</b> > New TQL Relationship Page > TQL Node Condition Page > Element Instances Page

The New TQL Node wizard page includes the following elements (listed alphabetically):

GUI Element	Description
<b>&lt;node&gt; is required</b>	Define the relationship cardinality. For details, see “Relationship Cardinality Dialog Box” on page 161. <ul style="list-style-type: none"> <li>▶ Select the <b>&lt;node&gt; is required</b> check box for each node to include a minimum of one instance of the node at the other end of the relationship in the query results. Selecting the check box gives the relationship a cardinality value of 1*.</li> <li>▶ Clear the <b>&lt;node&gt; is required</b> check box to give the relationship a cardinality value of 0*.</li> </ul>
<b>Element name</b>	(Optional) Contains the name of the selected node. By default, the CIT type is assigned as the element’s name You can rename a TQL node in the <b>Element name</b> box giving it a unique label. This can be helpful when there is more than one node of the same CIT type in the TQL query.
<b>Show only CITs with instances</b>	Select this check box to display only the CITs of which there are instances in the CMDB. <b>Note:</b> The <b>Show only CITs with instances</b> check box is selected by default.
<b>TQL Node hierarchy tree</b>	Select the required node. The node you select appears in the <b>Element name</b> box. This list only includes the nodes of the CIT type that have valid relationships to the selected (source) node. To the right of each node, the number of CI instances that exist in the CMDB for that CIT type is displayed. The number of instances is only updated after you close the TQL Node Wizard and open it again. <b>Note:</b> The first node in the hierarchy tree is selected by default.

## New TQL Relationship Page

<b>Description</b>	Enables you to add a relationship to a TQL query.
<b>Wizard Map</b>	The TQL Node Wizard contains: New TQL Node Page > <b>New TQL Relationship Page</b> > TQL Node Condition Page > Element Instances Page.







The New TQL Relationship wizard page includes the following elements (listed alphabetically):


<b>GUI Element</b>	<b>Description</b>
<b>Direction</b>	Select the required relationship direction. The direction indicates which node is dependent on the other.
<b>Node Label</b>	The label of the node you selected in the New TQL Node page. <b>Note:</b> This field appears in the Node Label box on the right hand side of the page.
<b>Relationship Type</b>	A valid relationship that defines the connection between the selected nodes. The box displays the relationship you selected in the relationship hierarchy tree.
<b>Show only relationships with instances</b>	Display only the relationships of which there are instances in the CMDB.
<b>TQL Relationship hierarchy tree</b>	Select the required relationship. The node you select appears in the <b>Relationship Type</b> box.

## TQL Node Condition Page

<b>Description</b>	Enables you to define the attribute conditions for the selected TQL node.
<b>Useful Links</b>	“Topology Query System Overview” on page 115.
<b>Wizard Map</b>	The TQL Node Wizard contains: New TQL Node Page > New TQL Relationship Page > <b>TQL Node Condition Page</b> > Element Instances Page

The TQL Node Condition wizard page includes the following elements (listed alphabetically):

GUI Element	Description
	Add an attribute definition. Opens the Attribute Condition dialog box. <b>Note:</b> The attribute condition you define appears in the Attribute Area. For details, see “Attribute Area” on page 154.
	Delete an attribute condition.
	Edit an attribute condition. Opens the Element Instances Dialog Box.
	Insert an attribute condition before a selected row.
	Move a selected row up.
	Move a selected row down.







GUI Element	Description
<p><b>Include subtypes</b></p>	<p>Display both the selected CI and its descendents in the topology map.</p>
<p><b>Visible</b></p>	<p>Select <b>Visible</b> to display the selected TQL node in the editing pane. When <b>Visible</b> is cleared, an invisible box  appears to the right of the selected TQL node in the Editing pane.</p> <div> <pre> graph TD     IP[IP] -- Contained --&gt; Windows[Windows]     Network[Network] -- Member --&gt; Windows     </pre> </div> <p>Any query results pertaining to that TQL node are not displayed in the topology map. This can be useful when certain relationships or TQL nodes are required to build the query but are not needed in the results. For example, Windows are connected to the network by defining specific IPs, but in any query results you may want to view the IP elements only and not the Windows elements.</p>

### Element Instances Page

<p><b>Description</b></p>	<p>Displays all the instances found for the selected TQL node in a table.</p>
<p><b>Wizard Map</b></p>	<p>The TQL Node Wizard contains:                      New TQL Node Page &gt; New TQL Relationship Page &gt; TQL Node Condition Page &gt; <b>Element Instances Page</b>.</p>



The Element's instances dialog box includes the following elements (listed alphabetically):

GUI Element	Description
	Update the table.
	Determine the number of CI instances that appear on a page. Opens the Set Rows Per Page dialog box.
	Go to first page
	Go to previous page.
2 / 7	The list of CIs are divided into pages. The number indicates which page is currently being displayed. For example, 2/7 means that it is the second out of seven pages. Click this button to go to a different page. The Set Page Number dialog box opens.  <b>Note:</b> For details on how to determine the number of CI instances that appear on a page, see “Set Rows Per Page Dialog Box” on page 46.
	Go to next page.
	Go to last page
<CI type attributes>	The attributes of the CIT of the selected CI.
<Click a column header>	For details, see “Working with Tables” on page 43.
<Right-click a column header>	For details, see “Working with Tables” on page 43.
CI Type	The CIT of the selected CI.
Display Label	The name of the CI instance as it appears in the topology map.



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## Topology Query Language Context Menu Options

This chapter includes a list of TQL context menu options (listed alphabetically):


GUI Element	Description
<b>Add Relationship</b>	<ul style="list-style-type: none"><li>▶ Displays the Add Relationship dialog box, enabling you to create a relationship for your nodes by selecting it from a predefined list.</li><li>▶ In Enrichment Manager, this option adds an Enrichment relationship to the rule when working in <b>Enrichment</b> mode. Applicable for regular and Enrichment nodes. For details, see “Enrichment Manager User Interface” in <i>IT World Model Management</i></li></ul> <p><b>Note:</b> Added relationships are displayed by an added + indicator.</p> <p>For details, see “Add Relationship Dialog Box” on page 128.</p>

GUI Element	Description
<b>Add Rule</b>	<p>Enables you to add folding rules to a relationship. Right-click the relationship for which you want to define a folding rule. Select one of the following options to define the organizational structure between the two CI types connected by the selected relationship:</p> <ul style="list-style-type: none"> <li>▶ <b>Parent.</b> Select this option to display <b>Node1</b> as the parent of <b>Node2</b>. That is, double-clicking the <b>Node1</b> element on one map level displays a new map level with <b>Node2</b> elements.</li> <li>▶ <b>Right Sibling.</b> Select this option to display <b>Node1</b> elements wherever <b>Node2</b> elements are displayed. That is, both CIs are displayed on the same map level.</li> <li>▶ <b>Left Sibling.</b> Select this option to display <b>Node2</b> elements wherever <b>Node1</b> elements are displayed. That is, both CIs are displayed on the same map level.</li> <li>▶ <b>Child.</b> Select this option to display <b>Node1</b> as the child of <b>Node2</b>. That is, double-clicking a <b>Node2</b> element on one map level displays a new map level with <b>Node1</b> elements.</li> <li>▶ <b>None.</b> Do not define any folding rules for this relationship.</li> </ul> <p><b>Note:</b> Only relevant for View Manager.</p>
<b>Add Subgraph</b>	<p>Displays the Subgraph dialog box, where you can create a graph that represents additional TQL query data related to a specific node. For details, see “Subgraph Dialog Box” on page 164.</p>
<b>Add to Applications</b>	<p>Click to create an application CI and link it to all CIs of the type selected. For details, see “Link Nodes to Application CI” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for View Manager.</p>
<b>Change Type</b>	<p>Displays the Change CI Type dialog box. Enables you to change the CI type of the node after you have created it. For details, see “Change CI Type Dialog Box” on page 142.</p> <p><b>Note:</b> This option appears only when the selected CI type has descendants.</p>

GUI Element	Description
<b>Clear</b>	<p>Available by right-clicking a node or relationship when working in <b>Enrichment</b> mode in the Enrichment Manager. Clears the node/relationship's Enrichment rule definition. For details, see "Enrichment Manager User Interface" in <i>IT World Model Management</i>.</p> <p>Appears only if you have updated or deleted a node/relationship using an Enrichment rule.</p> <p><b>Note:</b> Only relevant for Enrichment Manager.</p>
<b>Clear Node Definition</b>	<p>Deletes the report definition for the selected Report node. For details, see "Report Manager User Interface" in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for Report Manager.</p>
<b>Copy/Paste</b>	<p>Copy/paste an existing TQL node/relationship in the same query or into another TQL query.</p> <p>The copied TQL node/relationship includes all TQL definitions.</p> <p>You can copy and paste relationships provided that the TQL nodes to which the relationships are connected are also selected. A relationship on its own cannot be copied without its connecting TQL nodes.</p> <p>You can select multiple TQL nodes/relationships as well.</p> <p><b>Note:</b> This option is available only after using the <b>Copy</b> option to copy an existing TQL node/relationship.</p>
<b>Define Affected</b>	<p>Define which node in the TQL query is the trigger Correlation node and which nodes are affected by the changes that occur in the system. For details, see "Affected Nodes Dialog Box" on page 317.</p> <p><b>Note:</b> Only relevant for Correlation Manager.</p>
<b>Delete</b>	<p>Deletes the selected node/relationship/CI.</p>

GUI Element	Description
<p><b>Delete Relationship/Node</b></p>	<p>Available by right-clicking a node or relationship when working in <b>Enrichment</b> mode.</p> <p>Creates a specific Enrichment rule that is designed to delete CIs/relationships from the CMDB. Applicable to regular nodes and relationships only. You can use this option, for example, for removing unnecessary data from the CMDB. For details, see “Enrichment Manager User Interface” in <i>IT World Model Management</i>.</p> <p>Deleted nodes are displayed by a removed  indicator.</p> <p><b>Note:</b> Only relevant for Enrichment Manager.</p>
<p><b>Edit Relationship Type</b></p>	<p>Displays the Edit Relationship Type dialog box. For details, see “Add Relationship Dialog Box” on page 128.</p> <p><b>Note:</b> This option appears only when the selected relationship has descendants.</p>
<p><b>Node Order</b></p>	<p>Displays the Set Node Order dialog box, enabling you to determine the order in which Report node information is displayed in the report, that is, the order of the report’s columns. For details, see “Set Node Order Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for Report Manager.</p>
<p><b>Node/Relationship Condition</b></p>	<p>Displays the Node/Relationship Condition dialog box, enabling you to define the attribute conditions for the selected TQL node/relationship. For details, see “Node/Relationship Condition Dialog Box” on page 150.</p>
<p><b>Remove from Applications</b></p>	<p>Click to remove a business service item from a business service view. For details, see “Link Nodes to Application CI” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for View Manager.</p>
<p><b>Remove Subgraph</b></p>	<p>Only appears if you have defined a dependency graph. For details, see “Subgraph Dialog Box” on page 164.</p>

GUI Element	Description
<b>Report Node Definition</b>	<p>Displays the Report Node Definition dialog box, enabling you to determine the content of the report. For details, see “Report Node Definition Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for Report Manager.</p>
<b>Reset Affected</b>	<p>Removes the Define Affected definition applied to that node. For details on the Define Affected definition, see “Affected Nodes Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for Correlation Manager.</p>
<b>Reset Inner Relationship</b>	<p>Redraws a self-referential relationship in the Topology map as a square for ease of viewing.</p> <p><b>Note:</b> Only relevant for self-referential relationships which are not square.</p>
<b>Set View Element Parameters</b>	<p>Appears only when a parameterized condition is defined for the selected CI.</p> <p>Displays the Set View Element Parameters dialog box where you can edit the parameter of each condition. For details, see “Set View Parameters/Set View Element Parameters Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for View Manager and for views in IT Universe Manager and Change Report.</p>
<b>Show Element’s instances</b>	<p>Displays the Element Instances dialog box which displays all the instances found for each node in a table. For details, see “Element Instances Dialog Box” on page 143.</p>
<b>Straighten</b>	<p>Straightens the relationship between two nodes. This option is only available for relationships that have angles.</p>
<b>TQL Node Wizard</b>	<p>Displays the TQL Node Wizard dialog box which enables you to build a TQL query. For details, see “TQL Node Wizard” on page 171.</p>

GUI Element	Description
<p><b>Update Relationship/Node</b></p>	<p>Use an Enrichment rule to update the value of CI attributes in the CMDB, or to add data to attributes that currently do not have values. Opens the Node Definition - Attributes dialog box. For details, see “Node Definition – Attributes Dialog Box” in <i>IT World Model Management</i>. This is applicable for both regular and Enrichment nodes. Updated nodes are displayed by an updated  indicator.</p> <p><b>Note:</b> Only relevant for Enrichment Manager.</p>
<p><b>View Node/Relationship Definition</b></p>	<p>Displays the Condition dialog box which enables you to group CIs in the topology map. For details, see “Condition Dialog Box” in <i>IT World Model Management</i>.</p> <p><b>Note:</b> Only relevant for View Manager.</p>



# 16

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## Attribute Operator Definitions

This chapter contains a list of operators that define attribute conditions.

Operator	Description
<b>Changed during</b>	(Displayed only when you select the <b>Create Time</b> attribute.) Displays only the instances that changed during the period specified in the <b>Value comparison</b> box.
<b>Equal</b>	Checks whether the attribute value is equal to the value specified in the <b>Value Comparison</b> box.
<b>Equal ignore case</b>	Checks whether the attribute value is equal to the value specified in the value box regardless of the case.
<b>Great than or equal</b>	Checks whether the attribute value is greater than or equal to the value specified in the <b>Value comparison</b> box.
<b>Greater</b>	Checks whether the attribute value is greater than the value specified in the <b>Value comparison</b> box.
<b>In</b>	Displays only the instances where this attribute value equals one of the selected values. For example, for CIs that have a Change state that equals Plan and New, select the operator <b>In</b> from the <b>Operator</b> list and select both Plan and New from the <b>Value</b> box.
<b>In list</b>	Equals one of the elements that appears in the list, for example: 320,4445,3483.
<b>Is null</b>	Checks whether the attribute value is null.

Operator	Description
<b>Less</b>	Checks whether the attribute value is less than the value specified in the <b>Value comparison</b> box.
<b>Less than or equal</b>	Checks whether the attribute value is less than or equal to the value specified in the <b>Value comparison</b> box.
<b>Like</b>	Uses a wildcard (%). Use <b>Like</b> when you are not sure of the complete name for which you are searching.
<b>Like ignore case</b>	Uses a wildcard (%). Use Like ignore case when you are not sure of the complete name for which you are searching. The case of the string is ignored.
<b>Not equal</b>	Checks whether the attribute value is not equal to the value specified in the <b>Value Comparison</b> box.
<b>Unchanged during</b>	(Displayed when you select a date type attribute.) Displays only the instances that did not change during the period specified in the <b>Value comparison</b> box.

**Note:**

- ▶ For **Not equal** or **Not like** operators, query results do not include data from the CI instances that are not assigned a value. For example, a system contains three hosts: Host1 is assigned the value A, Host2 is assigned the value B, and Host3 is not assigned a value. If you create a query to retrieve all hosts that are **Not equal** to A, the results of your query include Host2 only, because Host3 is not assigned a value.
  - ▶ HP Business Availability Center supports both Microsoft SQL Server and Oracle Server servers. Microsoft SQL Server is not case sensitive by default (unlike Oracle Server which is case sensitive). Consequently, if you are using Microsoft SQL Server, the **Equal** operator retrieves the same query results as the **Equal ignore case** operator. For example, if you select the attribute **City**, the operator **Equal**, and type **NEW YORK** in the **Value comparison** box, case differences are ignored and query results include **NEW YORK**, **New York** and **new york**.
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# 17

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## Adding Nodes and Relationships to a TQL Query

This chapter explains how to add nodes and relationships to a TQL query. It is relevant for View Manager, Query Manager, Correlation Manager, Enrichment Manager, and Report Manager.

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Adding Enrichment Nodes and Relationships to an Enrichment TQL Query	190

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**Note:** For TQL queries to be valid, they must comply with certain restrictions. For details, see “TQL Query Validation Restrictions” on page 117.

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### Adding Nodes and Relationships to a TQL Query

This section describes how to add nodes and relationships to a TQL query in Query Manager, Correlation Manager, Report Manager, and View Manager.

**To add nodes and relationships to a TQL query:**

- 1 From the tree in the left pane, select the required query or create a new one. For details, see “Create New TQL/TQL Properties Dialog Box” in *IT World Model Management*.

- 2 From the tree displayed in the CI Types pane, click and drag one or more required TQL nodes on to the Editing pane. These are the TQL nodes that are included in the query.
  - 3 To add a relationship between two nodes:
    - ▶ Select the required TQL node(s) by holding down CTRL and clicking the TQL nodes, right-click and select **Add Relationship**.
    - or
    - ▶ Click the **Create Relationship** icon and draw a line between the required nodes.
- The Add Relationship dialog box opens. For details, see “Add Relationship Dialog Box” on page 128.
- 4 Click **OK**. The selected nodes are linked by the relationship you have selected.

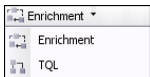


## Adding Enrichment Nodes and Relationships to an Enrichment TQL Query

This section describes how to add Enrichment nodes and relationships to an Enrichment TQL query in the Enrichment Manager. For more information on Enrichment Manager, see “Enrichment Manager User Interface” on page 361.

**To add Enrichment nodes and relationships to a TQL query:**

- 1 From the tree in the Enrichment Rules pane, select the Enrichment rule to which you want to add Enrichment nodes and relationships or create a new one. For details, see “Create New Enrichment Rule/Properties Dialog Box” in *IT World Model Management*.



- 2 From the **TQL/Enrichment** list at the top of the Enrichment Manager window, select **Enrichment** mode.
- 3 From the tree displayed in the CI Types pane, click and drag the nodes you want to function as an Enrichment node on to the Editing pane. These are the TQL nodes that are included in the query. Added Enrichment nodes are displayed by an added indicator.



**Note:** You can add more than one Enrichment node to a rule.

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- 4 The next step is to link the Enrichment node to an existing TQL node or nodes, to provide the Enrichment node with the needed context for its operation.

Following are the Enrichment rule validations:

- ▶ You must link the new Enrichment node to at least one of the existing TQL nodes in the rule.
- ▶ Enrichment nodes can only be linked to one another with an Enrichment relationship.
- ▶ If the new Enrichment node must be contained (according to its CIT definition) in another node, you must use the **Container link** relationship to connect this Enrichment node to an existing TQL node.
- ▶ You cannot link an Enrichment node to a TQL node that is not visible.

- 5 To add a relationship between two nodes:

- ▶ Select the required node(s) by holding down CTRL and clicking the TQL nodes, right-click and select **Add Relationship**.

or



- ▶ Click the **Create Relationship** icon and draw a line between the required nodes.



Added Enrichment relationships are displayed by an added indicator.

The Add Relationship dialog box opens. For details, see “Add Relationship Dialog Box” on page 128.

- 6 Click **OK**. The selected nodes are linked by the relationship you have selected.





# 18

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## Configuration Management Database (CMDB) Concepts

This chapter describes the main CMDB concepts.

This chapter describes:	On page:
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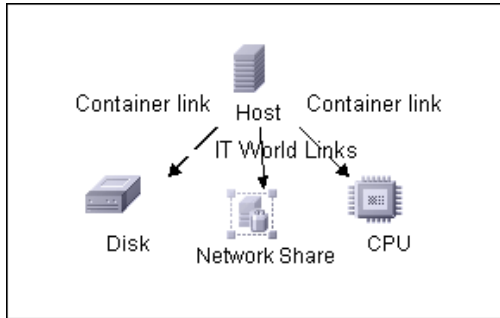
### Understanding the CMDB

The CMDB is the central repository for the configuration information that is gathered from the Discovery process and the various third-party applications and tools.

The CMDB contains all the configuration items (CIs) and relationships created in HP Business Availability Center, whether created automatically from the Discovery process or source adapters, or manually using IT Universe Manager. The CIs and relationships together represent a model of all the components of the IT Universe in which your business functions. The CMDB stores and handles the infrastructure data collected and updated by the Discovery process. For more information about the Discovery process, see *Discovery*.

The IT Universe model can be very large, containing millions of CIs. To facilitate their management, you work with the CIs in a view that provides a subset of the overall components in the IT Universe world.

You use factory views or views defined in View Manager to display and manage the CIs and relationships in the CMDB. The views enable you to focus on specific IT areas and are available via View Explorer in different HP Business Availability Center applications, such as Dashboard and Service Level Management. An example of a view is shown in the following figure:



The CMDB also contains the TQL query definitions that are used to query and retrieve data from the CMDB, for presentation in the pattern views (views based on TQLs); and the configuration item type (CIT) model, a repository for the CI types used to define the CIs and relationships. For information on TQL queries, see “Topology Query Language” on page 115.

In addition, the CMDB contains the object repositories for the various additional data added to CIs in Dashboard and Service Level Management, such as KPIs, context menus, and tooltips. For more information on these repositories, see “Overview of the Repositories” in *CI Attribute Customization*.

## Configuration Items (CI)

A configuration item (CI) is a component of the CMDB that represents a physical or logical entity in the system, for example, hardware, software, services, business processes, customers, and so on. The CIs are part of the IT Universe model in the CMDB, where they are organized into a hierarchical format based on the interdependencies in your organization’s IT environment. The interdependencies in HP Business Availability Center are called relationships.

Each CI belongs to a configuration item type (CIT). The CIT defines a category of CIs used in HP Business Availability Center. The CITs provide templates for creating the CIs and associated properties in each category.

You view and manage the CIs in the CMDB using views. Each view shines a spotlight on part of the IT Universe model. Furthermore, changes that you make in the view are actually changes to the IT Universe model.

### **Nodes and Relationships**

Nodes are the components from which TQL queries are built in the Enrichment Manager, View Manager, Correlation Manager, Report Manager, and Query Manager.

Relationships are connections defined between CIs. Relationships are defined one at a time for each pair of nodes in a TQL query.

### **CMDB Log Files**

CMDB log files enable you to perform basic troubleshooting of common CMDB runtime problems. Additionally, tracking CMDB behavior in the log files enables you to examine the effects of changes made in the system. For details, see Chapter 27, “CMDB Logs.”



# 19

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## CMDB Configuration Parameters

This chapter describes configuration parameters used in the CMDB.

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## CMDB Configuration Parameters Overview

This chapter describes the parameters needed for configuring the CMDB. By changing the values of CMDB parameters, the administrator can change the runtime behavior of CMDB.

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**Note:** Changed parameters may impact the entire system and not just the CMDB. In this chapter, parameters that can be changed by users are marked **Y** in the **Change Value? (Y/N)** column of each table. All other parameters should be changed by Customer Support only.

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To modify a parameter, select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, choose **Foundations**, select **cmdb** and locate the parameter in the appropriate table. Click the **Edit** button and modify the parameter with the required value.

CMDB configuration parameters are located in the following contexts in the Infrastructure Settings Manager:

- Applications:
  - MAMWeb
  - UCMDB GUI
- Foundations:
  - CMDB
  - MAMServer
  - UCMDB common

## Aging Parameters

This section describes the aging parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
model.aging.is.aging.enabled	Defines whether the aging mechanism is enabled.	boolean	<ul style="list-style-type: none"> <li>▶ <b>true.</b> Aging is enabled. The scheduler runs and marks candidates (objects/links) for deletion.</li> <li>▶ <b>false.</b> Aging is disabled. The scheduler does not run but the dates when candidates must be deleted and the actual deletion are set. This is the default.</li> </ul>	Y
model.aging.scheduler.hour.of.first.run	The time when the aging parameter runs after startup.	integer	Default: 2:00 AM	N
model.aging.scheduler.interval.in.hours	The interval in hours between aging parameter runs.	integer	Default: 24 hours	N
model.aging.time.unit=days				
model.max.removed.cis=50000				

## Configuration Item Type Parameters

This section describes the CIT parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.classmodel.dao.type	Defines the storage type of the CI Type Model.	string	<ul style="list-style-type: none"> <li>► <b>jdbc</b>. Storage in the database.</li> <li>► <b>xml</b>. Storage in an XML file.</li> </ul>	N
dal.classmodel.filesystem.file.name	Defines the relative directory path where a CI Type is saved when the storage type is <b>xml</b> .	string	The path is relative to the HP Business Availability Center home directory.	N
dal.classmodel.deployment.dao.type	Defines the storage type of a CI Type definition for initial deployment.	string	<b>xml</b> . CMDB reads from the XML files and deploys the CI Type in CMDB.	N
dal.classmodel.deployment.file.name	Defines the relative directory path to the CI Type XML files. These files are needed for CI Type deployment.	string	All XML files must have the suffix <code>_deployment.xml</code> .	N
dal.classmodel.db.name	Defines the name of the schema for CMDB management. CMDB management includes two tables: ID gen and CMDB versions.	string	Relevant for MS SQL only.	Y



Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.classmodel.host.name	The IP address of the CMDB management database host.	string		Y
dal.classmodel.userName	User name to log into the CMDB management database.	string	In Oracle, it is also the schema name.	Y
dal.classmodel.password	Password to log into the CMDB management database.	string		Y
dal.classmodel.server	The same as dal.classmodel.host.name.	string	Defined for DB context only. DB context is the name of a parameter in the connection pool.	Y
dal.classmodel.sid	The <b>sid</b> of a CI Type Model.	string	Relevant for Oracle database.	Y
dal.classmodel.port	Defines a TCP port of database host.	integer		Y
dal.classmodel.db.type	The type of CMDB.	string	<ul style="list-style-type: none"> <li>➤ ORACLE Server</li> <li>➤ SQL Server</li> </ul>	Y

## Configuration Item Type Setting Parameters

This section describes the CI Type settings parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
classmodel.persistency.file=/cmdb/classmodel/persistency/classmodel.xml				

## Data Model Parameters

This section describes the data model parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.datamodel.dao.type	Defines the type of continuous storage of a data model.	string	<ul style="list-style-type: none"> <li>▶ <b>jdbc.</b> Continuous storage in the database.</li> <li>▶ <b>mock.</b></li> </ul>	N
dal.datamodel.db.name	Defines the name of the schema.	string	Relevant for MS SQL Server only.	Y
dal.datamodel.host.name	The IP address of the CMDB database host.  <b>Note:</b> CMDB database includes CI Type Model and data model database.	string		Y
dal.datamodel.user.name	User name to log into the CMDB database.	string	In Oracle, it also denotes the schema name.	Y

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.datamodel.password	Password to log into the CMDB database.	string		Y
dal.datamodel.server	The same as dal.datamodel.host.name.	string	Defined for DB context only. DB context is the name of a parameter in the connection pool.	Y
dal.datamodel.sid	If the CMDB database is Oracle, this parameter defines the <b>sid</b> of the CI Type Model.	string		Y
dal.datamodel.port	The TCP port of the database host.	integer		Y
dal.datamodel.db.type	The type of CMDB database.	string	<ul style="list-style-type: none"> <li>▶ ORACLE Server</li> <li>▶ SQL Server</li> </ul>	Y

## General Server Parameters

This section describes the general server parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
server.sync.session.timeout	The default time-out for executing synchronous CMDB operations.  Does not affect asynchronous operations.	integer	<ul style="list-style-type: none"> <li>▶ Value is in seconds.</li> <li>▶ If the CMDB operation runs longer than the defined value, a request time-out exception is sent to the client.</li> </ul>	N
upgrade.enabled	Defines whether CMDB should perform an upgrade on startup.	boolean	<ul style="list-style-type: none"> <li>▶ <b>true</b>. Perform an upgrade.</li> <li>▶ <b>false</b>. Do not perform an upgrade.</li> </ul>	N
upgrade.file=/cmdb/upgrade.dat	The file containing the date of the last upgrade for each customer.		/cmdb/upgrade.dat	
task.threads.pool.size.process	For internal HP use only.	integer	20	
task.threads.pool.size.modeltopology	The number of threads dedicated to the CMDB model topology.	integer	10	
task.threads.pool.size.tqlcalculator	The number of threads dedicated to the TQL calculator.	integer	15	
task.threads.pool.size.tqlresultrepository	The number of threads dedicated to the TQL result repository.	integer	8	
task.threads.pool.size.modelquery	The number of threads dedicated to the CMDB model query.	integer	20	

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
task.threads.pool.size.tqlnotification	The number of threads dedicated to TQL notification.	integer	8	
task.threads.pool.size.tqlresultsutilities	The number of threads dedicated to TQL results utilities.	integer	20	
task.threads.pool.size.tqlpatternscache	The number of threads dedicated to the TQL query cache.	integer	6	
task.threads.pool.size.tqlpatternsmanager	The number of threads dedicated to the TQL query manager.	integer	2	
task.threads.pool.size.plugins	The number of threads dedicated to plug-ins	integer	1	
task.threads.pool.size.raw.event	The number of threads dedicated to raw events.	integer	1	
task.threads.pool.size.enrichmentadmin	The number of threads dedicated to enrichment administration.	integer	1	
task.threads.pool.size.enrichmentdefinition	The number of threads dedicated to enrichment definitions.	integer	4	
task.threads.pool.size.enrichmentcalculation	The number of threads dedicated to the enrichment calculation.	integer	4	
task.threads.pool.size.classmodel	The number of threads dedicated to the CIT model.	integer	1	
task.threads.pool.size.deployment	The number of threads dedicated to deployment.	integer	1	

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
task.threads.pool.size.modelupdate	The number of threads dedicated to updating the CMDB model.	integer	1	
task.threads.pool.size.tqlresultrepositorycache	The number of threads dedicated to the TQL results repository cache.	integer	1	
task.threads.pool.size.tqlscheduler	The number of threads dedicated to the TQL scheduler.	integer	1	

## History Database Parameters

This section describes the History database parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.history.db.name	Defines the name of the History schema.	string	Relevant for MS SQL only.	Y
dal.history.host.name	The IP address of the database host.	string		Y
dal.history.user.name	User name to log into History database.	string	In Oracle, it also denotes the schema name.	Y
dal.history.password	Password to log into the data model database.	string		Y

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.history.server	Defined for DB context only. DB context is the name of a parameter in the connection pool.	string	The value must be the same as dal.history.host.name.	Y
dal.history.sid	If the CI Type database is Oracle, this parameter defines the SID of the CI Type.	string		Y
dal.history.port	The TCP port of the database host.	integer		Y
dal.history.db.type	The type of History database.	string	<ul style="list-style-type: none"> <li>▶ ORACLE Server</li> <li>▶ SQL Server</li> </ul>	Y
dal.history.data.tablespace.name	This parameter is relevant for the Oracle database only. The DBA can define the tablespace for the History data.		cmdbhistorydata	
dal.history.index.tablespace.name	This parameter is relevant for the Oracle database only. The DBA can define the tablespace for indexes.		cmdbhistoryindex	

## History Database Purging Parameters

This section describes the History database purging parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
history.purging.days.to.save.backup	The minimum number of days to keep update and last create changes in the CMDB before purging those changes from the History database.  Note: The last change of an attribute is not purged until a newer one overrides it.	integer	For example, if the value is <b>90</b> , changes that occur today remain in the History database for at least 90 days.	Y
history.purging.scheduler.interval.in.hours	The interval of time between purges of the History database.	integer	Value is in hours.  For example, if the value is <b>24</b> , the History database is purged every 24 hours.	Y
history.purging.scheduler.hour.of.first.run	The hour of the day, using a 24 hour format, to begin purging. Purging is generally performed during the night hours.	integer	For example, if the value is <b>01</b> , purging begins at 01:00 every day.	Y



## Monitoring Parameters

This section describes the monitoring parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
monitor.scheduler.lo ad.customer.number	Defines the number of customers to be monitored.  Relevant only for the Self-Alert Monitor of HP Business Availability Center with one customer installation.	integer	If the value is -1, no customer is monitored.  Values other than -1 define the number of monitored customers.	N
monitor.performance .warning	The minimum threshold to define CMDB performance as Warning.  The maximum threshold to define CMDB performance as Good.	long	Value is in milliseconds.	N
monitor.performance .error	The minimum threshold to define CMDB performance as Error.  The maximum threshold to define CMDB performance as Warning.	long	Value is in milliseconds.	N
monitor.scheduler.ti mer.time	The interval of time to run a performance check.	long	Value is in milliseconds.	N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
monitor.scheduler.delay.time	The delay between system startup and the first performance check run.	long	Value is in milliseconds.	N
task.threads.pool.size.monitorQuery	The number of threads dedicated to the pool size monitor query.		1	
task.threads.pool.size.monitorCollector	The number of threads dedicated to the pool size monitor collector.		1	
task.threads.pool.size.customer.load			1	

## Notification Parameters

This section describes the notification parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
notification.number.of.publish.tasks	Number of single-threaded tasks that publish CMDB changes to internal listeners.	integer		N
notification.jms.connection.factory	The JMS connection used for receiving notification.	N/A	N/A	N
notification.topic.jndi.name	The JNDI name of the topic selected for notification.	N/A	N/A	N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
notification.sessions.applications=DASHBOARD=3;MAM_Viewing_system=3;MAM_=10;CmdbExt=3;AdaptersFramework=3;MAM_AutoDiscovery=3;sap=2;siebel=2;MAM_Correlation_system=3	Defines a number of topic sessions for JMS subscribers per caller application.	string	Definitions are separated by a semicolon (;).	N
notification.queue.size.max	Maximum number of messages that can accumulate in the internal queue when the JMS server is down.	integer		N
notification.queue.flush.interval	Interval of time to send any JMS messages accumulated in the queue.	integer	Value is in seconds.	N

## Other Parameters

This section describes other data parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.datamodel.data.tablespace.name	The tablespace name for the data model.	string	Relevant for Oracle database only.	Y
dal.datamodel.index.tablespace.name	The tablespace name for indexes.	string	Relevant for Oracle database only.	Y

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.in.clause.threshold	The maximum number of values in a SQL IN clause.	integer		N
dal.num.of.in.chunks	The maximum number of chunks to be performed by a SQL IN clause.	integer	For example: a SQL WHERE clause generates n number of values. If (dal.in.clause.threshold * dal.num.of.in.chunks) > n, a temporary table is used. If, however, n is larger, several SQL statements are executed with the SQL IN clause.	N
dal.use.dirty.read	Defines whether the database queries use dirty read.	boolean	Relevant only for certain queries. <ul style="list-style-type: none"> <li>▶ <b>true.</b> Queries use dirty read.</li> <li>▶ <b>false.</b> Queries do not use dirty read.</li> </ul>	N
dal.update.class.model.enabled	Defines whether CI Type Model updates are permitted. This parameter is currently used for consolidated tables in HP Managed Software Solutions.	boolean	<ul style="list-style-type: none"> <li>▶ <b>false.</b> Tables are consolidated and an update of CI Type Model is not allowed.</li> <li>▶ <b>true.</b> Tables are not consolidated and an update of CI Type Model is allowed.</li> </ul>	N
dal.use.memory.instead.temp.table.low.threshold=				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
dal.use.memory.instead.temp.table.high.threshold=				
dal.datamodel.max.name.length.allow	Maximum length of table and column names in database.	integer		N
dal.classmodel.use.idgen	Defines whether to use the HP sequence ID generator for the database.	boolean	<ul style="list-style-type: none"> <li>▶ <b>true.</b> Use ID generator.</li> <li>▶ <b>false.</b> Do not use ID generator.</li> </ul>	N
dal.datamodel.create.time.attribute.name	Name of the attribute with the creation time of the CI or relationship.	string		N
dal.datamodel.update.time.attribute.name	Name of the attribute with the last update time of the CI or relationship.	string		N
dal.handle.statistics.on.startup=true				
dal.statistics.startup.percentage.threshold=5				
dal.statistics.startup.aging.threshold.hours=36				

## Plug-in Parameters

This section describes the plug-in parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
plugins.raw.event.qualifiers	The list of attribute qualifiers relevant for raw events. If an attribute has one of the qualifiers in the list, this qualifier is sent as a raw event to the HP Universal CMDB server, to the event system.	string	Names of attribute qualifiers must be separated by a semicolon (;).	N

## Quota Parameters

This section describes the quota parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
quota.name.customer.model.objects	The maximum number of CIs in a CIT. Every customer in MMS mode has a maximum number.	integer	For example, if the value is <b>100</b> and the CIT already includes 100 CIs, no additional CIs can be added.	N
quota.name.customer.tql.active	The maximum number of active TQLs that can be run concurrently.	integer	When the quota limit is reached, no further TQLs can be added.	N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
quota.name.server.model.objects	The maximum number of CIs that the CMDB server can hold in a CIT for all customers combined.	integer	<ul style="list-style-type: none"> <li>▶ In HP Business Availability Center, the value must be the same as quota.name.customer.model.objects.</li> <li>▶ In HP Managed Software Solutions, the value must be greater than quota.name.customer.model.objects.</li> </ul>	N
quota.name.server.tql.active	The maximum number of active TQLs that can run in the entire CMDB Server.	integer	<ul style="list-style-type: none"> <li>▶ In HP Business Availability Center, the value must be the same as quota.name.customer.tql.active.</li> <li>▶ In HP Managed Software Solutions, the value must be greater than quota.name.customer.tql.active.</li> </ul>	N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
quota.scheduler.interval.sec	The frequency in which the actual customer and server counts are checked against their defined quota value.	integer	Value is in seconds.	N
quota.statistics.enabled	Defines if quota counts should be returned to the Self-Alert Monitor. This is relevant for HP Business Availability Center.	boolean	<ul style="list-style-type: none"> <li>▶ <b>false.</b> Do not return the quota count. This value is relevant for HP Universal CMDB.</li> <li>▶ <b>true.</b> Return the quota count to the Self-Alert Monitor. This value is relevant for HP Business Availability Center.</li> </ul>	N
quota.check.enabled	Defines whether to enforce quota checking.	boolean	<ul style="list-style-type: none"> <li>▶ <b>true.</b> Perform quota checking.</li> <li>▶ <b>false.</b> Do not perform quota checking.</li> </ul>	N
quota.loader.name	Defines where to load quota values.	string	<b>settings.</b> Read from the HP Business Availability Center configuration file.	N



## TQL Parameters

This section describes the TQL parameters:

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
tql.threads.pool.size	Defines the number of threads to limit concurrent calculation of TQLs. This is done to prevent high CPU consumption.	integer		N
tql.scheduler.timer.time	Defines the interval of time to wait between wake up calls to the TQL State Machine manager.	long	Value is in milliseconds.	N
tql.scheduler.statistics.logupdate.interval.time.millsec	The interval between updates of <code>cmdb.pattern.statistics.log</code> .	long	Value is in milliseconds.	N
tql.resultrepository.timer.time	The length of time the ad hoc TQL results reside in memory before the results are purged from memory.	long	Value is in milliseconds.	N
tql.resultutils.pattern takeover.timeout			10000	
tql.resultutils.adhoc.validate	Defines whether to perform pattern validation of ad hoc TQLs.	boolean	<ul style="list-style-type: none"> <li>▶ <b>true.</b> Perform pattern validation.</li> <li>▶ <b>false.</b> Do not perform pattern validation.</li> </ul>	N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
tql.resultutils.chunk.maxresultsize	The maximum number of CIs and relationships in a TQL result that can be retrieved together without dividing them into chunks for separate retrievals.	integer	100000	N
tql.resultutils.chunk.maxnotificationsize	The maximum number of CIs and relationships in a TQL result that can be sent to external clients, the applications that get notification service from CMDB. If this number is exceeded, a message is sent.	integer	50000	N
tql.resultutils.chunk.keepingperiod.seconds	The length of time that a chunk of TQL results is resident in memory until the next chunk is received in memory.	integer	Value is in seconds.	N
tql.conditionstatistics.refresh.seconds	The time interval in which the total number of objects of each type in the CMDB is updated.	integer	Value is in seconds.	N
tql.statemachine.fail.retries	Number of times to recalculate a TQL before the status is set to <b>Fail</b> .	integer		N

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
tql.statemachine.fail.recover.time	Time interval to wait between a pattern calculation failure and the next attempt to recalculate.	integer	Value is in seconds.	N
tql.scheduler.statistics.maxcalculation	The maximum number of a TQL's recent calculations stored in the Scheduler statistics.	integer		N
tql.group.all.active.count	Maximum number of active TQLs permitted per customer in the appropriate group: all, collectors, view, topology, report, server data, path manager, and internal enrichment.  The name of the group is found in the name of the parameter after <b>tql.group</b> .	integer		N
tql.group.collectors.active.count				
tql.group.view.active.count				
tql.group.topology.active.count				
tql.group.report.active.count				
tql.group.serverdata.active.count				
tql.group.pathmanager.active.count				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
tql.group.all.result.size	The maximum number of CIs held in a TQL result before the TQL is deactivated.	integer	Values are assigned according to TQL group: all, collectors, view, topology, report, server data, path manager, and internal enrichment.	N
tql.group.collectors.result.size				
tql.group.view.result.size				
tql.group.topology.result.size				
tql.group.report.result.size				
tql.group.serverdata.result.size				
tql.group.pathmanager.result.size				
EXPRESS_PRIORITY.Min.CalculationTimeInterval	Minimum length of time to wait until a full calculation is performed for some TQL query.  The results are updated after calculation.	long	<ul style="list-style-type: none"> <li>▶ Value is in milliseconds.</li> <li>▶ Value is defined for each TQL priority.</li> </ul>	N
HIGH_PRIORITY.Min.CalculationTimeInterval				
MED_PRIORITY.Min.CalculationTimeInterval				
LOW_PRIORITY.Min.CalculationTimeInterval				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
EXPRESS_PRIORITY.Max.CalculationTimeInterval	Maximum length of time to wait until a full calculation is performed for a TQL query. The results are updated after calculation.	long	<ul style="list-style-type: none"> <li>➤ Value is in milliseconds.</li> <li>➤ Value is defined for each TQL priority.</li> </ul>	N
HIGH_PRIORITY.Max.CalculationTimeInterval				
MED_PRIORITY.Max.CalculationTimeInterval				
LOW_PRIORITY.Max.CalculationTimeInterval				
EXPRESS_PRIORITY.Min.EventArrivalTimeInterval	The minimum length of time to wait after the last event arrives before starting a full calculation. A full calculation is not started if the elapsed time from the last event is less than this value.	long	<ul style="list-style-type: none"> <li>➤ Value is in milliseconds.</li> <li>➤ Value is defined for each TQL priority.</li> </ul>	N
HIGH_PRIORITY.Min.EventArrivalTimeInterval				
MED_PRIORITY.Min.EventArrivalTimeInterval				
LOW_PRIORITY.Min.EventArrivalTimeInterval				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
EXPRESS_PRIORITY.Max.EventArrivalTimeInterval	The maximum length of time to wait after the last event arrives before starting a full calculation. A full calculation is started if this value is reached.	long	<ul style="list-style-type: none"> <li>▶ Value is in milliseconds.</li> <li>▶ Value is defined for each TQL priority.</li> </ul>	N
HIGH_PRIORITY.Max.EventArrivalTimeInterval				
MED_PRIORITY.Max.EventArrivalTimeInterval				
LOW_PRIORITY.Max.EventArrivalTimeInterval				
EXPRESS_PRIORITY.Max.EventArrivalTimeIntervalForImmediate	The maximum length of time to wait after the last event arrives before starting an immediate calculation. An immediate calculation is started no later than this value.	long	<ul style="list-style-type: none"> <li>▶ Value is in milliseconds.</li> <li>▶ Value is defined for each TQL priority.</li> </ul>	N
HIGH_PRIORITY.Max.EventArrivalTimeIntervalForImmediate				
MED_PRIORITY.Max.EventArrivalTimeIntervalForImmediate				
LOW_PRIORITY.Max.EventArrivalTimeIntervalForImmediate				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
EXPRESS_PRIORITY.Min.PendingEventsAmount	Minimum number of events to accumulate to start a full calculation. A full calculation is not started if the number of pending events for some TQL is less than this value.	integer	Value is defined for each TQL priority.	N
HIGH_PRIORITY.Min.PendingEventsAmount				
MED_PRIORITY.Min.PendingEventsAmount				
LOW_PRIORITY.Min.PendingEventsAmount				
EXPRESS_PRIORITY.Max.PendingEventsAmount	Maximum number of events to accumulate to start a full calculation. A full calculation starts when the number of pending events for a TQL equals, or is greater than, the value defined in this parameter.	integer	Value is defined for each TQL priority.	N
HIGH_PRIORITY.Max.PendingEventsAmount				
MED_PRIORITY.Max.PendingEventsAmount				
LOW_PRIORITY.Max.PendingEventsAmount				

Parameter Name	Parameter Description	Type	Value Description	Change Value? (Y/N)
EXPRESS_PRIORITY.Max.PendingEventsAmountForImmediate	Maximum number of events to accumulate to start an immediate calculation.	integer	Value is defined for each TQL priority.	N
HIGH_PRIORITY.Max.PendingEventsAmountForImmediate	An immediate calculation starts when the number of pending events for a TQL equals, or is greater than, the value defined in this parameter.			
MED_PRIORITY.Max.PendingEventsAmountForImmediate				
LOW_PRIORITY.Max.PendingEventsAmountForImmediate				



# 20

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## Creating an Impact Analysis Report Using a URL

This chapter describes how to create an Impact Analysis report using a URL.

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### Impact Analysis Report Creation Overview

HP Business Availability Center enables you to simulate how infrastructure changes can impact your system. For details, see “Correlation Manager Overview” in *IT World Model Management*.

You can generate an Impact Analysis report that displays the trigger and the impacted CIs. For more details about what the report displays, see the Generate Report field in “Run Correlation Dialog Box” in *IT World Model Management*.

You can generate an Impact Analysis report in Topology View Application, or by building a URL that opens an Impact Analysis report directly in your browser, without being located in the HP Business Availability Center context. For details on creating a report, see “Topology View Application” in *IT World Model Management*.

## Generating an Impact Analysis Report Using a URL

This section explains the URL syntax for generating an Impact Analysis report directly in your browser.

Build the URL using the following syntax:

```
http://<serverName>/topaz/TopazSiteServlet?createSession=true&requestType=login&directLogin=true&directLoginEncrypted=true&userlogin=<userName>&userpassword=<userPassword>&forward_url=/rfw/newReport.do?reportID=impact&populateAnyway=true&autoGenerate=true&filter.objectIds=[xxx,yyy,zzz]&filter.impactCategory=<impactCategory>&filter.impactSeverity=<impactSeverity>
```

---

**Note:** The `forward_url` must go through URL encoding.

---

The parameters whose values must be provided are described below:

- ▶ `<serverName>`. The name of the HP Business Availability Center server.
- ▶ `<impactCategory>`. The name of the category to be analyzed.
- ▶ `<impactSeverity>`. The severity level of the category.
- ▶ `<[xxx,yyy,zzz]>`. The object ID of the CIs in the CMDB. The object IDs are separated by a comma (,).
- ▶ `<userName>`. Valid user login name.
- ▶ `<userPassword>`. Password for specified login name.

---

**Note:** Parameters are separated from the rest of the URL by a question mark (?).

Configured URLs must use the ampersand character (&) as the parameter delimiter.

---

For example:

```
http://bac/topaz/TopazSiteServlet?createSession=true&requestType=login&directLogin=true&directLoginEncrypted=true&userlogin=admin&userpassword=admin&forward_url=/rfw/newReport.do?reportID=impact&populateAnyway=true&autoGenerate=true&filter.objectIds=[700737a29899f4f66c70a67c6b9cb386,9a6faadff8b547a2c62fc454dfd3661b,e5659759ed3b41cf01dfbb47191892fa]&filter.impactCategory=change>&filter.impactSeverity=2
```



# Part II

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**Data**



# 21

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## Data Samples

This chapter describes the data samples, and their fields, that are available in various contexts in HP Business Availability Center (including Custom Reports, Measurement Filters, and Custom Query Builder). These samples can also be used to create queries to extract data from the HP Business Availability Center profile database using the HP Business Availability Center API.

<b>This chapter describes:</b>	<b>On page:</b>
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## Special Fields

This section describes the special fields that are available in various HP Business Availability Center contexts.

### IP Addresses

In some samples, IP addresses are returned as 32 bits representing an array of four bytes. Each byte represents a segment of the IP address. To get the standard text representation of an IP address, convert the returned value to binary and pad left with zeros to a length of 32. Convert each eight bits separately into decimal representation and concatenate the text representation of the resulting numbers together with decimal points between the numbers.

For example,

The query returns: 167772247

The binary representation is: 101000000000000000001010111

Pad to length of 32: 0000101000000000000000001010111

Split into bytes: 00001010.00000000.00000000.01010111

Convert each byte to decimal and present with the standard IP format: 10.0.0.87

### Time Stamps

Time in queries and return data is a double data type representing seconds since January 1, 1970. For details on understanding date-time values returned by queries, see “Date-Time Values” in *Solutions and Integrations*.



## Data Samples for Dashboard

This section describes the samples and sample fields for Dashboard data (that is, data processed by the Business Logic Engine). These samples use the Universal Data Exchange (UDX) framework, and are thus available for filtering in the Measurement Filters page (for details, see “Working with Measurement Filters” in *Platform Administration*).

---

**Limitation:** There is currently no configuration item name field, and it is not possible to map CI names to their CMDB IDs (entity\_id field). As such the value of these samples is limited.

---

### Sample: KPI Statuses (bl\_kpi\_ot\_ke)

The KPI Statuses sample (bl\_kpi\_ot\_ke) contains data used when generating the KPIs Over Time report.

Field	Display Name	Data Type	Units	Description
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client).
entity_id	CMDB Entity id	BINARY		Configuration ID of CI.
heartbeat	Heartbeat	INT	0 or 1	If 0, data sample representing status change has been sent from the source.  If 1, no status change has been sent from the source in the last 24 hours.
kpi_id	Kpi instance cmdb id	BINARY		Configuration ID of KPI instance.

Field	Display Name	Data Type	Units	Description
kpi_type	Kpi type	INT		The ID of the KPI, as displayed in the Repositories page ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs</b> ).
sampletype		STRING		The name of the sample.
status	Status	INT		The ID as defined in the <b>From</b> field in the Parameter Details window ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs &gt; clone/override KPI &gt; click the Edit Entity button &gt; Item Details &gt; click the parameter to display the Parameter Details window</b> )
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
TUID		STRING		Internal ID

### Sample: KPI Values (bl\_kpi\_ot\_kt)

The KPI Values sample (bl\_kpi\_ot\_kt) contains data used when generating the KPI Over Time report.

Field	Display Name	Data Type	Units	Description
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client).
entity_id	CMDB Entity id	BINARY		Configuration ID of CI.
kpi_id	Kpi instance cmdb id	BINARY		Configuration ID of KPI instance.
kpi_type	Kpi type	INT		The ID of the KPI, as displayed in the Repositories page ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs</b> ).

Field	Display Name	Data Type	Units	Description
sampletype		STRING		The name of the sample.
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970.
TUID		STRING		Internal ID
Value	Value	DOUBLE	Depends on related rule	The result of the business rule calculation.

## Data Samples for SiteScope

This section describes the samples and sample fields for SiteScope data:

- “Sample: SiteScope Monitor (ss\_monitor\_t)” on page 235
- “Sample: SiteScope Heartbeat (ss\_heartbeat)” on page 238
- “Sample: Event (event)” on page 239
- “Event Sample Examples” on page 241
- “Sample: SiteScope Measurement (ss\_t)” on page 242
- “Sample: SiteScope Measurement Aggregation (ss\_hr\_t)” on page 244

### Sample: SiteScope Monitor (ss\_monitor\_t)

The SiteScope Monitor sample (ss\_monitor\_t) includes the monitor data measured by SiteScope.

Field	Display Name	Data Type/Units	Description
cfg_frequency	Configuration Frequency	DOUBLE	The configuration frequency of the monitor
class_logical_name		STRING	The monitor class display name (for example, <b>CPU</b> for CPU monitor)

Field	Display Name	Data Type/Units	Description
class_real_name		STRING	The monitor class name
class_type_id		U_INT	The ID that corresponds to the monitor class name
strCustomerName	Customer Name	STRING	Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dTime		DOUBLE/milli-seconds	Time stamp of when the measurement was taken
frequency	Frequency	DOUBLE	The average frequency that the monitor was run
monitor_description		STRING	The description of the monitor (sent only in configuration sample)
monitor_full_id		STRING	The ID of the monitor, including the profile name and the full monitor ID (sent only in configuration sample)
monitor_full_path		STRING	The path of the monitor, including the groups in which the monitor is defined (sent only in configuration sample)
monitor_logical_name	Monitor Name	STRING	The display name of the monitor
profile_name	Profile Name	STRING	Profile name
strCustomerName	Customer Name	STRING	Same as customer_name
szConnectionName		STRING	Name of the instance of the monitor that monitors the measurement
szMonitorName	Monitor Type	STRING	Type of monitor that retrieved that measurement
szSessionName		STRING	HP Business Availability Center session name to which the sample belongs

Field	Display Name	Data Type/Units	Description
szStatusMessage	Status Message	STRING	In <b>Normal</b> status, field is empty; in <b>No data</b> status, field returns reason for No Data status (for example, monitor disabled or monitor suspended)
szTargetName	Target Name	STRING	Name of the host that the monitor monitors
time_stamp		DOUBLE/seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
u_iConnectionId		U_INT	ID of the instance of the monitor that monitors the measurement
u_iMonitorId		U_INT	HP Business Availability Center ID of the monitor that retrieved the measurement
u_iQuality	Quality	U_INT	Quality of the measurement from 0 to 3 (3 is bad)
u_iSessionId		U_INT	Profile ID as stored in the SESSIONS table in the management database
u_iStatus	Status ID	U_INT	Status of the value. Value is valid = 0; error and the value is not valid = 1
u_iTargetId		U_INT	ID of the host that the monitor monitors

**Sample: SiteScope Heartbeat (ss\_heartbeat)**

The SiteScope Heartbeat sample (ss\_heartbeat) indicates that SiteScope is functioning properly and that its integration with HP Business Availability Center is healthy. The sample is only sent if SiteScope is in data reduction mode (in which case the sample is sent every minute).

Field	Display Name Display Name	Data Type/Units	Description
customer_name	Customer Name	STRING	Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
profile_name	Profile Name	STRING	Profile name
time_stamp	Time Stamp	DOUBLE/seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
sampletype		STRING	The name of the sample.
status		INT	The Worst Child status of the SiteScope health monitors
status_description		STRING	The status value displayed in Dashboard (for example two out of 5 monitors are in Error)
TUID		STRING	Internal ID
u_iSessionId		U_INT	Profile ID as stored in the SESSIONS table in the management database

## Sample: Event (event)

The Event sample (event) includes data from integration monitors (external EMS data), SiteScope alerts, and SiteScope status changes. You can use these fields when configuring integration monitor field mappings. For details, see “Integration Monitor Field Mapping” in *Using System Availability Management*. This sample uses the Universal Data Exchange (UDX) framework, and is thus available for filtering in the Measurement Filters page. For details, see “Working with Measurement Filters” in *Platform Administration*.

Field	Display Name	Description
acknowledged_by	Acknowledged By	Name of user that acknowledged this event
attr1		Extra data slot
attr2		Extra data slot
attr3		Extra data slot
attr4		Extra data slot
attr5		Extra data slot for long strings
ci_type	CI Type	The type of configuration item that is monitored by the EMS monitor that captures the event
collector_host_ip	Collector Host IP	IP address of the machine running SiteScope
collector_host_name	Collector Host Name	Host name of the machine running SiteScope
customer_name	Customer Name	Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
data_source	Data Source	System that generated the event
description	Description	Textual description of event
event_id	Event ID	Unique identifier of this event
instance	Instance	Instance of subject that generated the event (e.g D:\ ). Lowest level of hierarchy describing the event source

Field	Display Name	Description
logical_group	Logical Group	Logical grouping of this event
monitor_group	Monitor Group	Monitor group that reported this event
object	Object	Optional level in the hierarchy describing the event source
orig_severity_name	Original Severity Name	Severity in external EMS terminology
owner	Owner	Name of user who owns this event
severity	Severity	One of the following severities: SEVERITY_UNKNOWN SEVERITY_INFORMATIONAL SEVERITY_WARNING SEVERITY_MINOR SEVERITY_MAJOR SEVERITY_CRITICAL
severity_name	Severity Name	Severity name
status	Status	Status of event in external EMS terminology
subject	Subject	Subject of event (e.g. CPU , SAP application, Hard Disk ), middle/high level hierarchy describing the event source. The hierarchy describing an event is in the following format:  monitor_group (optional) --> target_name --> object (optional) --> subject --> instance.  More levels can be added above monitor_group by using logical_group, and attr1 - 5.
target_ip	Target IP	IP of host or device that generated the event
target_name	Target Name	Name of device or host that generated the event
time_stamp	Time Stamp	Time stamp in seconds since Jan 1 1970
value	Value	Use to transfer numerical values from the event



## Event Sample Examples

Infrastructure status change events (popular in EMS):

Timestamp	IP	Severity	Alert name
11/5/2004 10:20 AM	192.168.82.74	Critical	Server Unionville_1 is down

Ticketing system events:

Ticket ID	Severity	Region	Product	Open Date	Close Date
2321	1	Europe	HP Business Availability Center	11/5/2004 11:38 AM	13/5/2004 11:38 AM

Call center logs:

Call ID	Customer ID	Time Stamp	Queue number	Response Time	Call Answered	Call Duration
43443	4344322	15/5/04 8:23 AM	4	32 Sec.	Yes	284 Sec.

Miscellaneous events (server backup log):

Time stamp	IP	Backup Start Time	Backup Duration	Errors
15/5/04 8:23 AM	192.168.82.74	15/5/04 8:23 AM	15/5/04 14:23 AM	0

**Sample: SiteScope Measurement (ss\_t)**

The SiteScope Measurement sample (ss\_t) is sent from the SiteScope server to HP Business Availability Center for each metric that is measured. For example, if a CPU monitor measures utilization, for each run of the monitor, a sample is sent returning the value for this metric. If a monitor is configured to measure more than one metric, each run of the monitor sends a separate sample for each measured value.

Field	Display Name	Data Type/Units	Description
cfg_frequency	Configuration Frequency	DOUBLE	The configuration frequency of the monitor
customer_name		STRING	Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dTime		DOUBLE/milliseconds	Time stamp of when the measurement was taken
dValue	Measurement Value	DOUBLE	Value of the measurement taken
frequency	Frequency	DOUBLE	The average frequency that the monitor was run
instance_id		INT	A unique id per instance that is set by the dispatcher
measurement_description	Measurement Description	STRING	The description of the measurement
monitor_curr_quality		INT	The average frequency that the measurement was run
profile_name	Profile Name	STRING	Profile name
start_time		DOUBLE	The start time of the bulk report
szCategoryName	Category Name	STRING	Monitor type name
szConnectionName	Connection Name	STRING	Name of the instance of the monitor that monitors the measurement

Field	Display Name	Data Type/Units	Description
szErr	Error Message	STRING	Error message if the sample has an error
szMeasurementName	Measurement Name	STRING	HP Business Availability Center measurement name
szMonitorName	Monitor Name	STRING	Type of monitor that retrieved that measurement
szMonitorTitle	Monitor Title	STRING	Name given to the monitor upon creation
szSessionName		STRING	HP Business Availability Center session name to which the sample belongs
szTargetName	Target Name	STRING	Name of the host that the monitor monitors
time_stamp	Time Stamp	DOUBLE/seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
u_iCategoryId		U_INT	monitor type ID
u_iConnectionId		U_INT	ID of the instance of the monitor that monitors the measurement
u_iMeasurementId		U_INT	HP Business Availability Center measurement ID
u_iMonitorId		U_INT	HP Business Availability Center ID of the monitor that retrieved the measurement
u_iMsmtQuality	Measurement Quality	U_INT	The measurement quality, indicating whether the value of the measurement represent a real value or an error value (helps to differentiate between 0 value that represents a real sample and 0 value that represents a error)
u_iQuality	Quality	U_INT	Quality of the measurement from 0 to 3 (3 is bad)

Field	Display Name	Data Type/Units	Description
u_iSessionId		U_INT	Profile ID as stored in the SESSIONS table in the management database
u_iStatus	Status ID	U_INT	Status of the value. Value is valid = 0; error and the value is not valid = 1
u_iTargetId		U_INT	ID of the host that the monitor monitors

### Sample: SiteScope Measurement Aggregation (ss\_hr\_t)

The SiteScope Measurement Aggregation sample (ss\_hr\_t) contains the hourly aggregated data of the data in the SiteScope Measurement sample.

Field	Display Name	Data Type/Units	Description
customer_name	Customer Name	STRING	Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dValue_max		DOUBLE	The maximum value of the measurements taken in the hour
dValue_min		DOUBLE	The minimum value of the measurements taken in the hour
dValue_sum		DOUBLE	Sum of the value of the measurements taken for the hour
dValue_sumsqr		DOUBLE	The sum of the squares of the value of the measurements taken for the hour. Can be used to calculate standard deviations
instance_id		INT	A unique id per instance that is set by the dispatcher
profile_name	Profile Name	STRING	Profile name as stored in the SESSIONS table in the management database
szCategoryName	Category Name	STRING	The category of the measurement (what the measurement measures)

Field	Display Name	Data Type/Units	Description
szConnectionName	Connection Name	STRING	Name of the instance of the monitor that monitors the measurement
szMeasurementName	Measurement Name	STRING	HP Business Availability Center measurement name
szMonitorName	Monitor Name	STRING	Monitor type as known by HP Business Availability Center
szMonitorTitle	Monitor Title	STRING	Name given to the monitor upon creation
szTargetName	Target Name	STRING	Name of the host that the monitor monitors
time_stamp	Time Stamp	DOUBLE/seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
u_iCategoryId		U_INT	ID of the category
u_iConnectionId		U_INT	ID of the instance of the monitor that monitors the measurement
u_iMeasurementId		U_INT	HP Business Availability Center measurement ID
u_iMonitorId		U_INT	Index of the monitor type
u_iQuality_good_sum		U_INT	Number of samples in the hour with a good status
u_iQuality_poor_sum		U_INT	Number of samples in the hour with a poor status
u_iQuality_warn_sum		U_INT	Number of samples in the hour with a warning status
u_iSessionId		U_INT	Profile ID as stored in the SESSIONS table in the management database
u_iStatus_abnormal_count		U_INT	Number of samples with an abnormal value that passed in the hour.
u_iStatus_fail_count		U_INT	Number of samples with a non-valid value that passed in the hour.

Field	Display Name	Data Type/Units	Description
u_iStatus_pass_count		U_INT	Number of samples with a valid value that passed successfully in the hour.
u_iTargetId		U_INT	ID of the host that the monitor monitors

## Data Samples for Business Process Monitor

This section describes the samples and sample fields for Business Process Monitor data:

- “Sample: Transactions (trans\_t)” on page 246
- “Sample: Transactions Aggregation (trans\_hr\_t)” on page 251
- “Sample: Webtrace (trc\_path\_t)” on page 258

### Sample: Transactions (trans\_t)

The Transactions sample (trans\_t) is used by Business Process Monitor to report transaction data for transactions in script monitors. It includes data on the transaction itself, as well as on the results of the specific run (duration, status, and so on).

Field	Display Name	Data Type	Units	Description
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dEndTime	End Time	DOUBLE	milliseconds from 1970	Timestamp for the current management database time
dGreenThreshold	Green Threshold	DOUBLE	milliseconds	Defined OK threshold value
dRedThreshold	Red Threshold	DOUBLE	milliseconds	Defined Critical threshold value

Field	Display Name	Data Type	Units	Description
dResponseTime	Response Time	DOUBLE	milliseconds	Response time (duration)
iComponentError Count	Component Error Count	INT		Number of component errors
instance_id	Instance Id	STRING		A unique id per instance that is set by the dispatcher
trans_instance_id	Instance ID	STRING		A unique id per transaction instance that is set by the dispatcher
profile_name	Profile Name	STRING		Profile name
szHostName	Host Name	STRING		Data collector host name
szLegacyTimeString	Legacy Time String	STRING		The time at which the transaction ended, in the format <b>%d/%m/%Y %H:%M:%S</b>
szLocationName	Location Name	STRING		Data collector location name
szOrganizationName	Organization Name	STRING		Group name for the data collector in the profile
szScriptName	Script Name	STRING		Script name
szStatusName	Status Name	STRING		Status of the transaction (passed/failed/timed out)
szTransactionDesc	Transaction Description	STRING		Transaction description
szTransactionName	Transaction Name	STRING		Transaction name
szUniqueIdentifier	Unique Id	STRING		A unique identifier for this transaction run from the specific data collector
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970

Field	Display Name	Data Type	Units	Description
trans_instance_id	Instance ID	INT		A unique ID per transaction in an instance set by the dispatcher
u_iHostId		U_INT		Data collector host ID
u_iLocationId		U_INT		Location ID
u_iOrganizationId		U_INT		Group ID for the data collector in the profile
u_iScriptId		U_INT		Script ID
u_iSessionId		U_INT		Profile ID as stored in the SESSIONS table in the management database
u_iSize	Download data size	U_INT	kilobytes	Total download size
u_iStatus		U_INT		Status ID of the transaction (passed/failed/timed out)
u_iSumConnectionTime	Summary Connection Time	U_INT	milliseconds	Sum of component connection times in the transaction breakdown. This data is not presented in the reports.
u_iSumDnsTime	Summary DNS Time	U_INT	milliseconds	Sum of component DNS times in the transaction breakdown. This data is not presented in the reports.
u_iSumDownloadTime	Summary Download Time	U_INT	milliseconds	Sum of component download times in the transaction breakdown. This data is not presented in the reports.
u_iSumFirstBufTime	Summary Network First Buffer Time	U_INT	milliseconds	Sum of component 'time to first buffer' times in the transaction breakdown. This data is not presented in the reports.



Field	Display Name	Data Type	Units	Description
u_iSumNetTime	Summary Network Time	U_INT	milliseconds	Sum of component network times in the transaction breakdown. This data is not presented in the reports.
u_iSumRetryTime	Summary Retry Time	U_INT	milliseconds	Sum of component retry times in the transaction breakdown. This data is not presented in the reports.
u_iSumServerTime	Summary Server Time	U_INT	milliseconds	Sum of component server times in the transaction breakdown. This data is not presented in the reports.
u_iSumSSLTime	Summary SSL Time	U_INT	milliseconds	Sum of component SSL times in the transaction breakdown. This data is not presented in the reports.
u_iTransactionId		U_INT		Transaction ID
u_iWConnectionTime	Weighted Connection Time	U_INT	milliseconds	Connection time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWDnsTime	Weighted DNS Time	U_INT	milliseconds	DNS time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWDownloadTime	Weighted Download Time	U_INT	milliseconds	Download time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.

Field	Display Name	Data Type	Units	Description
u_iWFirstBufTime	Weighted Network First Buffer Time	U_INT	milliseconds	Time to first buffer in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWNetTime	Weighted Network Time	U_INT	milliseconds	Network time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWRetryTime	Weighted Retry Time	U_INT	milliseconds	Retry time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWServerTime	Weighted Server Time	U_INT	milliseconds	Server time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.
u_iWSSLTime	Weighted SSL Time	U_INT	milliseconds	SSL time in the transaction breakdown, using a weighed aggregation algorithm. This is the data presented in the reports.

### Sample: Transactions Aggregation (trans\_hr\_t)

The Transactions Aggregation sample (trans\_hr\_t) contains the hourly aggregated data of the data in the Transactions sample. Although these calculations are done for only successful Transactions samples, this sample also includes count data on failed and timed out transactions.

Field	Display Name	Data Type	Unit	Description
dGreenThreshold	Green Threshold	DOUBLE	milliseconds	Defined OK threshold value
dRedThreshold	Red Threshold	DOUBLE	milliseconds	Defined Critical threshold value
dResponseTime_max		DOUBLE	milliseconds	The maximum response time for the sample during the hour
dResponseTime_min		DOUBLE	milliseconds	The minimum response time for the sample during the hour
dResponseTime_nbd_sum		DOUBLE	milliseconds	
dResponseTime_nbd_sumsqr		DOUBLE	milliseconds	
dResponseTime_obd_sum		DOUBLE	milliseconds	
dResponseTime_obd_sumsqr		DOUBLE	milliseconds	
dResponseTime_sum	Response Time	DOUBLE	milliseconds	The sum of the response times (duration) for the hour
dResponseTime_sumsqr		DOUBLE	milliseconds	The sum of the squares of the response times for the hour. Can be used to calculate standard deviations.
faile_count_cnt		Integer		Number of samples that failed during the hour
iComponentError Count_sum	Component Error Count	Integer		Number of component errors

Field	Display Name	Data Type	Unit	Description
page_cbd_count_sum		Integer		
pass_count_cnt		Integer		Number of samples that passed successfully in the hour
pass_count_ndb_cnt		Integer		
pass_count_obd_cnt		Integer		Number of samples that passed successfully in the hour with a connection time that was not null
profile_name	Profile Name	STRING		Profile name
szLocationName	Location Name	STRING		Data collector location name
szOrganizationName	Organization Name	STRING		Group name for the data collector in the profile
szScriptName	Script Name	STRING		Script name
szTransactionDesc	Transaction Description	STRING		Transaction description
szTransactionName	Transaction Name	STRING		Transaction Name
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
timed_out_cnt		Integer		Number of samples that timed out during the hour
transaction_instance_id	Instance ID	INT		A unique id per transaction in an instance set by the dispatcher.
u_iLocationId		U_INT		Location ID
u_iOrganizationId		U_INT		Group ID for the data collector in the profile

Field	Display Name	Data Type	Unit	Description
u_iScriptId		U_INT		Script ID
u_iSessionId		U_INT		Profile ID as stored in the SESSIONS table in the management database
u_iSize_nbd_sum		U_INT	kilobytes	
u_iSize_obd_sum		U_INT	kilobytes	
u_iSize_sum	Download data size	U_INT	kilobytes	The sum of the total download size
u_iSize_sumsqr		U_INT	kilobytes	The sum of the squares of the total download size. Can be used to calculate standard deviations.
u_iSumConnectionTime_sum	Summary Connection Time	U_INT	milliseconds	The hourly sum of component connection times in the transaction breakdown.
u_iSumConnectionTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component connection times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumDnsTime_sum	Summary DNS Time	U_INT	milliseconds	The hourly sum of component DNS times in the transaction breakdown.
u_iSumDnsTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component DNS times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumDownloadTime_sum	Summary Download Time	U_INT	milliseconds	The hourly sum of component download times in the transaction breakdown.

Field	Display Name	Data Type	Unit	Description
u_iSumDownloadTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component download times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumFirstBufTime_sum	Summary Network First Buffer Time	U_INT	milliseconds	The hourly sum of component 'time to first buffer' times in the transaction breakdown.
u_iSumFirstBufTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component 'time to first buffer' times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumNetTime_sum	Summary Network Time	U_INT	milliseconds	The hourly sum of component network times in the transaction breakdown.
u_iSumNetTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component network times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumRetryTime_sum	Summary Retry Time	U_INT	milliseconds	The hourly sum of component retry times in the transaction breakdown.
u_iSumRetryTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component retry times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumServerTime_sum	Summary Server Time	U_INT	milliseconds	The hourly sum of component server times in the transaction breakdown.

Field	Display Name	Data Type	Unit	Description
u_iSumServerTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component server times in the transaction breakdown. Can be used to calculate standard deviations.
u_iSumSSLTime_sum	Summary SSL Time	U_INT	milliseconds	The hourly sum of component SSL times in the transaction breakdown.
u_iSumSSLTime_sumsqr		U_INT	milliseconds	The sum of the squares of the hourly sum of component SSL times in the transaction breakdown. Can be used to calculate standard deviations.
u_iTransactionId		U_INT		Transaction ID
u_iWConnectionTime_sum	Weighted Connection Time	U_INT	milliseconds	The sum of the connection times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWConnectionTime_sumsqr		U_INT	milliseconds	The sum of the squares of the connection times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.
u_iWDnsTime_sum	Weighted DNS Time	U_INT	milliseconds	The sum of the DNS times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWDnsTime_sumsqr		U_INT	milliseconds	The sum of the squares of the DNS times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.

Field	Display Name	Data Type	Unit	Description
u_iWDownloadTime_sum	Weighted Download Time	U_INT	milliseconds	The sum of the download times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWDownloadTime_sumsqr		U_INT	milliseconds	The sum of the squares of the download times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.
u_iWFirstBufTime_sum	Weighted Network First Buffer Time	U_INT	milliseconds	The sum of the times to first buffer in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWFirstBufTime_sumsqr		U_INT	milliseconds	The sum of the squares of the times to first buffer in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.
u_iWNetTime_sum	Weighted Network Time	U_INT	milliseconds	The sum of the network times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWNetTime_sumsqr		U_INT	milliseconds	The sum of the squares of the network times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.



Field	Display Name	Data Type	Unit	Description
u_iWRetryTime_sum	Weighted Retry Time	U_INT	milliseconds	The sum of the retry times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWRetryTime_sumsqr		U_INT	milliseconds	The sum of the squares of the retry times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.
u_iWServerTime_sum	Weighted Server Time	U_INT	milliseconds	The sum of the server times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWServerTime_sumsqr		U_INT	milliseconds	The sum of the squares of the server times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.
u_iWSSLTime_sum	Weighted SSL Time	U_INT	milliseconds	The sum of the SSL times in the transaction breakdown for the hour, using a weighed aggregation algorithm.
u_iWSSLTime_sumsqr		U_INT	milliseconds	The sum of the squares of the SSL times in the transaction breakdown for the hour, using a weighed aggregation algorithm. Can be used to calculate standard deviations.

**Sample: Webtrace (trc\_path\_t)**

The Webtrace sample (trc\_path\_t) is used by Business Process Monitor to report WebTrace data.

Field	Display Name	Data Type	Units	Description
iDnsTime	DNS Time	INT		Not in use
iHostId		INT		ID of host machine from which WebTrace runs
iIsReachable	Is Reachable	INT	True/False	Indication of whether destination is reachable
iLocationId		INT		ID of location of host machine from which WebTrace runs
iRetries	Retries	INT		The number of times a data packet tries, but fails, to reach its destination due to timeout, network difficulty, and so on
iRoundTrip	Round Trip	INT	milliseconds	The average time it takes for a packet of data to be sent from the host machine to the destination Web site
iSessionId		INT		ID of profile in which WebTrace is defined
profile_name	Profile Name	STRING		Name of profile in which WebTrace is defined
szDstIp	Destination IP	STRING		Destination server IP defined in the profile (in the profile you declare an IP or a destination name; WebTrace resolves the other by itself)
szDstName	Destination Name	STRING		Destination server name defined in the profile (in the profile you declare an IP or a destination name; WebTrace resolves the other by itself)

Field	Display Name	Data Type	Units	Description
szHostName	Host Name	STRING		Name of host machine from which WebTrace runs
szLegacyTimeString	Legacy Time String	STRING		The time at which the transaction ended, in the format %d/%m/%Y %H:%M:%S
szLocationName	Location Name	STRING		Location name of host machine from which WebTrace runs
szLocationName	Location Name	STRING		Location name of host machine from which WebTrace runs
szSrcIp	Source IP	STRING		IP of host machine from which WebTrace runs
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
trc_instance_id		INT		Internal ID

## Data Samples for Real User Monitor

This section describes the samples and sample fields for Real User Monitor data. These samples use the Universal Data Exchange (UDX) framework, and are thus available for filtering in the Measurement Filters page (for details, see “Working with Measurement Filters” in *Platform Administration*).

This section describes the following samples and sample fields for Real User Monitor:

- “Sample: RUM Active End Users (rum\_active\_eu\_t)” on page 260
- “Sample: RUM Broken Links (rum\_bro\_links\_t)” on page 262
- “Sample: RUM End Users (rum\_eu\_t)” on page 263
- “Sample: RUM Events (rum\_event\_t)” on page 267
- “Sample: RUM Pages (rum\_page\_t)” on page 270
- “Sample: RUM Most Error Pages (rum\_most\_error\_page\_t)” on page 277

- “Sample: RUM Popular Pages (rum\_pop\_page\_t)” on page 279
- “Sample: RUM Servers (rum\_server\_t)” on page 280
- “Sample: RUM Sessions (rum\_session\_t)” on page 282
- “Sample: RUM Session Statistics (rum\_session\_stats\_t)” on page 285
- “Sample: RUM Slowest Components (rum\_slow\_comp\_t)” on page 287
- “Sample: RUM Slowest End Users (rum\_slow\_eu\_t)” on page 288
- “Sample: RUM Transactions (rum\_trans\_t)” on page 291

**Sample: RUM Active End Users (rum\_active\_eu\_t)**

The RUM Active End Users sample (rum\_active\_eu\_t) contains data about the end-users that were detected as having performed the most hits in the last interval. This interval is defined in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id	Application Id	INT		HP Business Availability Center internal application ID number
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_id		INT		HP Business Availability Center internal end-user ID number

Field	Display Name	Data Type	Units	Description
eu_loc	End User Location	STRING		End-user location as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration
new_tot_page_hits	New Total Page Hits	INT	number of hits	Total number of pages hit by end-user
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_conn_hits	Total Connection Hits	INT		Currently not used
tot_http_bytes	Total http bytes	DOUBLE	bytes	Total number of bytes sent and received by the end-user for http
tot_https_bytes	Total https bytes	DOUBLE	bytes	Total number of bytes sent and received by the end-user for https
tot_latency	Latency	DOUBLE	milliseconds	total latency of all packets sent by end-user

Field	Display Name	Data Type	Units	Description
tot_page_hits	Total Page Hits	INT	number of hits	Total number of pages hit by the end-user
TUID		STRING		Internal ID from the profile database

### Sample: RUM Broken Links (rum\_bro\_links\_t)

The RUM Broken Links sample (rum\_bro\_links\_t) contains data about a component that was missing. Only components that were accessed from within a site defined in End User Management Administration are reported.

Field	Display Name	Data Type	Units	Description
application_id	Application Id	INT		HP Business Availability Center internal application ID number
availability	Availability	INT	0 or 1	Always 0 (not available)
comp_url	Component URL	STRING		URL of component on page
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name

Field	Display Name	Data Type	Units	Description
ref_url	Referer URL	STRING		URL of page that requested component
sampletype		STRING		Currently not used
server_ip		INT		IP address of component server
server_name	Server name	STRING		Name of component server
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_comp_hits	Total Component Hits	INT	number of hits	Total number of components hit
TUID		STRING		Internal ID from the profile database

### Sample: RUM End Users (rum\_eu\_t)

The RUM End Users sample (rum\_eu\_t) contains data describing a specific end-user.

Field	Display Name	Data Type	Units	Description
active_session_count	Active Sessions Counter	DOUBLE		Number of sessions that were active during the time frame to which the sample refers
application_id		INT		Monitored application internal ID number
closed_session_count	Closed Sessions Counter	DOUBLE		Number of sessions closed during the time frame to which the sample refers
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)

Field	Display Name	Data Type	Units	Description
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
eu_domain_name	End User Domain Name	STRING		End-user group name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_id		INT		HP Business Availability Center internal end-user ID number
eu_loc	End User Location	STRING		End-user location as configured in End User Management Administration
eu_loc_city	End User Location City	STRING		End-user city as configured in End User Management Administration
eu_loc_country	End User Location Country	STRING		End-user country as configured in End User Management Administration
eu_loc_state	End User Location State	STRING		End-user state as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration



Field	Display Name	Data Type	Units	Description
new_tot_page_hits	New Total Page Hits	INT	number of hits	Total number of pages hit by end-user
op_se_with_err_count	Active Sessions With Errors Counter	DOUBLE		Number of active sessions in which an error event occurred during the time frame to which the sample refers
op_se_with_perf_count	Active Sessions With Performance Event Counter	DOUBLE		Number of active sessions in which a performance event occurred during the time frame to which the sample refers
open_session_count	Opened Sessions Counter	DOUBLE		Number of sessions opened during the time frame to which the sample refers
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
reporter		INT		Currently not used
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_available_page_hits	Total available page hits	DOUBLE		Total number of available pages hit by the end-user
tot_conn_b_lth	Connections Below Latency Warning Threshold	INT		Currently not used

Field	Display Name	Data Type	Units	Description
tot_conn_o_lth	Total Connections over latency threshold	INT		Currently not used
tot_http_bin	Total http bytes in	DOUBLE	bytes	Total size of all end-user http requests
tot_http_bout	Total http bytes out	DOUBLE	bytes	Total size of all end-user http replies
tot_https_bin	Total https bytes in	DOUBLE	bytes	Total size of all end-user https requests
tot_https_bout	Total https bytes out	DOUBLE	bytes	Total size of all end-user https replies
tot_latency	Latency	DOUBLE	milliseconds	Total latency of all packets sent by end-user
tot_latency_b_lth	Latency Below Latency Warning Threshold	DOUBLE	milliseconds	Total latency time that was less than the threshold configured in End User Management Administration
tot_latency_color		DOUBLE	number representing color	Color of end-user status in Dashboard
tot_latency_o_lth	Latency Over Latency Threshold	DOUBLE	milliseconds	Total latency time that was more than the threshold configured in End User Management Administration
tot_page_b_lth	Number Of Pages Hits Below Latency Threshold	INT	number of hits	Number of pages hit that had a latency less than the threshold configured in End User Management Administration
tot_page_hits	Total Page Hits	INT	number of hits	Total number of pages hit by the end-user

Field	Display Name	Data Type	Units	Description
tot_page_o_lth	Number Of Page Hits Over Latency Threshold	INT	number of hits	Number of pages hit that had a latency more than the threshold configured in End User Management Administration
tot_pages_with_err	Pages with availability problems	DOUBLE		Number of pages that had availability problems
tot_pages_with_perf	Pages with perf problems	DOUBLE		Number of pages that had performance problems
tot_unavailable_page_hits	Total unavailable page hits	DOUBLE		Total number of unavailable pages hit by the end-user
total_conn	Total Connection Hits	INT		Currently not used
TUID		STRING		Internal ID from the profile database

### Sample: RUM Events (rum\_event\_t)

The RUM Events sample (rum\_event\_t) contains data about a defined event that was detected. The different event types are configured in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id	Application Id	INT		HP Business Availability Center internal application ID number
bb_guid	BB GUID	STRING		An internal, unique session ID from the Real User Monitor probe
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)

Field	Display Name	Data Type	Units	Description
engine_id	Engine Id	INT		HP Business Availability Center internal Real User Monitor engine ID number
eu_domain_name	End User Domain Name	STRING		End-user group name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_host_name	End User Host Name	STRING		Host machine name of the end-user
eu_id	End User Id	INT		HP Business Availability Center internal end-user ID number
eu_ip	End User IP	INT		IP address of end-user
eu_loc		STRING		End-user location as configured in End User Management Administration
eu_loc_city	End User Location City	STRING		End-user city as configured in End User Management Administration
eu_loc_country	End User Location Country	STRING		End-user country as configured in End User Management Administration
eu_loc_state	End User Location State	STRING		End-user state as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration

Field	Display Name	Data Type	Units	Description
eu_subnet_name	End User Subnet Name	STRING		Currently not used
eu_user_name	End User Login Name	STRING		Login name of end-user
event_category	Event Category	INT		Category of event configured in End User Management Administration (for example, informational, error, http, performance)
event_data	Event Extra Data	STRING	alpha-numeric	Actual values returned from event
event_id	Event Id	INT		HP Business Availability Center internal event ID number
event_name	Event Name	STRING		Name of event as configured in End User Management Administration
event_type	Event Type	INT	number (of event type)	Event type as configured in End User Management Administration
page_id	Page Id	INT		HP Business Availability Center internal page id of the page configured in End User Management Administration, on which the event occurred (-1 used for pages that have not been configured)
page_name	Page Name	STRING		Name of page as configured in End User Management Administration
page_url	Page URL	STRING		URL of the page configured in End User Management Administration, on which the event occurred

Field	Display Name	Data Type	Units	Description
profile_id	Profile Id	INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
server_ip	Server IP	INT		IP address of component server
server_name	Server Name	STRING		Name of server
session_comp_seq	Component Sequence Number in Session	INT	number	Last component sequence number on the page on which the event occurred
time_stamp	End Time	DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
TUID		STRING		Internal ID from the profile database

### Sample: RUM Pages (rum\_page\_t)

The RUM Pages sample (rum\_page\_t) contains data about a monitored page. The sample contains performance, availability, and general measurements regarding the page. Only pages that match one of the page definitions in End User Management Administration are reported to HP Business Availability Center.

Field	Display Name	Data Type	Units	Description
application_id		INT		HP Business Availability Center internal application ID number
availability	Availability	INT	number of pages	number of available pages (of the monitored page) during the time frame

Field	Display Name	Data Type	Units	Description
bb_guid	BB GUID	STRING		An internal, unique session ID from the Real User Monitor probe
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_id		INT		HP Business Availability Center internal end-user ID number
eu_ip	End User IP	INT		IP address of end-user
eu_loc	End User Location	STRING		End-user location as configured in End User Management Administration
eu_loc_city	End User Location City	STRING		End-user city as configured in End User Management Administration
eu_loc_country	End User Location Country	STRING		End-user country as configured in End User Management Administration
eu_loc_state	End User Location State	STRING		End-user state as configured in End User Management Administration

Field	Display Name	Data Type	Units	Description
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration
eu_subnet_name	End User Domain And Subnet Range	STRING		Currently not used
http_err_bad_c	HTTP Error Bad Request Category	INT		Currently not used
http_err_nfound_c	HTTP Error Request Not Found Category	INT		Currently not used
http_err_ref_c	HTTP Error Request Refused Category	INT		Currently not used
http_err_serr_c	HTTP Error Server Errors Category	INT		Currently not used
main_http_err	HTTP Response Code	INT	number	http response code for the requested page
max_client_time	Maximum Client Time	Double		
max_dl_time	Maximum Download Time	Double		
max_net_time	Maximum Network Time	Double		



Field	Display Name	Data Type	Units	Description
max_server_time	Maximum Server Time	Double		
min_client_time	Minimum Client Time	Double		
min_dl_time	Minimum Download Time	Double		
min_net_time	Minimum Network Time	Double		
min_server_time	Minimum Server Time	Double		
page_id		INT		HP Business Availability Center internal page id of the page configured in End User Management Administration
page_name	Page Name	STRING		Name of page as configured in End User Management Administration
page_url	Page URL	STRING		URL of the page configured in End User Management Administration
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
reporter		INT		Currently not used
squares_sum_client_time	Squares Sum Client Time	DOUBLE		
squares_sum_download_time	Squares Sum Download Time	DOUBLE		

Field	Display Name	Data Type	Units	Description
squares_sum_net_time	Squares Sum Network Time	DOUBLE		
squares_sum_server_time	Squares Sum Server Time	DOUBLE		
sampletype		STRING		Currently not used
server_ip	Server IP	INT		IP address of server
server_name	Server Name	STRING		Name of server
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_avail_color		DOUBLE	number representing color	Color representing status of page in Dashboard
tot_client_time	Client Time	DOUBLE	milliseconds	Amount of time of total processing time between components
tot_components	Number of Page Components	INT	number	Total number of components on the page
tot_dl_b_dth	Download Time Below Download Warning Threshold	DOUBLE	milliseconds	Amount of download time less than the download warning threshold configured in End User Management Administration
tot_dl_o_dth	Download Time Over Download Threshold	DOUBLE	milliseconds	Amount of download time more than the download warning threshold configured in End User Management Administration
tot_dl_time	Download Time	DOUBLE	milliseconds	Total download time of page

Field	Display Name	Data Type	Units	Description
tot_event_app_error	Application Errors Events	INT	number of error events	Total number of application error events on page
tot_event_http_error	HTTP Errors Events	INT	number of http errors	Total number of http errors on page
tot_event_info	Non Error Events	INT	number of info events	Total number of informational event on page
tot_frstbfr_b_fbth	Total time of time to first buffer below the threshold	Double		
tot_frstbfr_o_fbth	Total time of time to first buffer over the threshold	Double		
tot_frstbfr_time	Sum of total time to first buffer	Double		
tot_hits_b_dth	Hits Below Download Warning Threshold	INT	number of hits	Total number of hits with a download time less than the threshold configured in End User Management Administration
tot_hits_b_fbth	Total hits below the time to first buffer threshold	Double	number of hits	
tot_hits_b_sth	Hits Below Server Warning Threshold	INT	number of hits	Total number of hits with server time less than the threshold configured in End User Management Administration

Field	Display Name	Data Type	Units	Description
tot_hits_o_dth	Hits Over Download Threshold	INT	number of hits	Total number of hits with a download time more than the threshold configured in End User Management Administration
tot_hits_o_fbth	Total hits over the time to first buffer threshold	Double	number of hits	
tot_hits_o_sth	Hits Over Server Threshold	INT	number of hits	Total number of hits with server time more than the threshold configured in End User Management Administration
tot_net_time	Network Time	DOUBLE	milliseconds	Total network time
tot_page_color		DOUBLE	number representing color	Color representing status of page in Dashboard
tot_page_size	Page Size	DOUBLE	bytes	Total page size
tot_server_b_sth	Server Time Below Server Warning Threshold	DOUBLE	milliseconds	Amount of server time less than the threshold configured in End User Management Administration
tot_server_color		DOUBLE	number representing color	Color representing status of server in Dashboard
tot_server_o_sth	Server Time Over Server Threshold	DOUBLE	milliseconds	Amount of server time more than the threshold configured in End User Management Administration
tot_server_time	Server Time	DOUBLE	milliseconds	Total server time
tot_stopped	Number Of Stopped Pages	INT	number of pages	Total number of pages stopped before their download was completed

Field	Display Name	Data Type	Units	Description
total_hits	Hits	INT	number of hits	Total number of hits on page
TUID		STRING		Internal ID from the profile database

### Sample: RUM Most Error Pages (`rum_most_error_page_t`)

The RUM Most Error Pages sample (`rum_most_error_page_t`) contains data about the pages that were detected as having the most HTTP and application errors occur on them in the last interval. The pages detected do not have to be defined in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id	Application ID	INT		HP Business Availability Center internal application ID number for the page
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
page_id		INT		HP Business Availability Center internal page id of the page configured in End User Management Administration
page_hits		INT	number of hits	Total number of hits of the page
page_name	Page Name	STRING		The meaningful name assigned to the page, if configured.

Field	Display Name	Data Type	Units	Description
page_url	Page URL	STRING		URL of the page on which most errors occurred
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_app_errors	Application Errors	INT	number of application errors	Total number of application errors that occurred on the page
tot_errors	Total Errors	INT	total number of application and HTTP errors	Total number of application and HTTP errors that occurred on the page
tot_http_errors	HTTP Errors	INT	number of http errors	Total number of http errors that occurred on the page
TUID		STRING		Internal ID from the profile database

### Sample: RUM Popular Pages (rum\_pop\_page\_t)

The RUM Popular Pages sample (rum\_pop\_page\_t) contains data about the pages that were detected as having the highest number of hits in the last interval. The interval is defined in End User Management Administration. The pages detected do not have to be defined in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id	Application ID	INT		HP Business Availability Center internal application ID number
availability	Availability	INT		Currently not used
comp_url	Page URL	STRING		URL of component on page
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
page_id		INT		HP Business Availability Center internal page id of the page configured in End User Management Administration
page_name	Page Name	STRING		Name of page as configured in End User Management Administration
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)

Field	Display Name	Data Type	Units	Description
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_page_hits		INT	number of hits	Total number of hits of the page
TUID		STRING		Internal ID from the profile database

**Sample: RUM Servers (rum\_server\_t)**

The RUM Servers sample (rum\_server\_t) contains data about a server whose traffic the Real User Monitor is listening to.

Field	Display Name	Data Type	Units	Description
application_id	Application ID	INT		HP Business Availability Center internal application ID number
availability	Availability	INT	# of requests	Number of requests successfully handled by server, or with HTTP denial codes not in the range of 500-599
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration



Field	Display Name	Data Type	Units	Description
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
reporter		INT		Currently not used
sampletype		STRING		Currently not used
server_ip	Server IP	INT		IP address of component server
server_name	Server Name	STRING		Name of server
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_avail_color		DOUBLE	number representing color	Color representing status of page in Dashboard
tot_comp_hits	Total Component Hits	INT	number of hits	Total number of components hits
tot_conn_hits	Total Connection Hits	INT		Currently not used
tot_http_bin	Total Http Bytes In	DOUBLE	bytes	Total size of all end-user http requests
tot_http_bout	Total Http Bytes Out	DOUBLE	bytes	Total size of all end-user http replies
tot_https_bin	Total Https Bytes In	DOUBLE	bytes	Total size of all end-user https requests
tot_https_bout	Total Https Bytes Out	DOUBLE	bytes	Total size of all end-user https replies

Field	Display Name	Data Type	Units	Description
tot_ok_comp_hits	Total OK Component Hits	INT	number of hits	Total number of hits on components that were successfully downloaded
tot_page_hits	Total Page Hits	INT	number of hits	Total number of pages hit on the server
total_hits	Total Component Hits	INT	number of hits	Total number of all component hits
TUID		STRING		Internal ID from the profile database

### Sample: RUM Sessions (rum\_session\_t)

The RUM Sessions sample (rum\_session\_t) contains information about a user session. This sample is sent only after the session has ended. The rum\_session\_t is always sent with the rum\_session\_id\_t sample.

Field	Display Name	Data Type	Units	Description
application_id	Application ID	INT		HP Business Availability Center internal application ID number
availability	Availability	INT	number of pages	number of all available pages in the session
bb_guid	BB GUID	STRING		An internal, unique session ID from the Real User Monitor probe
browser	Browser	STRING		Type of browser used for the session
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
download_time	Download Time	DOUBLE	milliseconds	Total download time of all pages in the session

Field	Display Name	Data Type	Units	Description
dwel_time	Dwell Time	DOUBLE		Currently not used
engine_id	Engine ID	INT		HP Business Availability Center internal Real User Monitor engine ID number
eu_domain_name	End User Domain Name	STRING		End-user group name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_host_name	End User Host Name	STRING		Host machine name of the end-user
eu_id	End User Id	INT		HP Business Availability Center internal end-user ID number
eu_ip	End User IP	INT		IP address of end-user
eu_loc		STRING		End-user location as configured in End User Management Administration
eu_loc_city	End User Location City	STRING		End-user city as configured in End User Management Administration
eu_loc_country	End User Location Country	STRING		End-user country as configured in End User Management Administration
eu_loc_state	End User Location State	STRING		End-user state as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration

Field	Display Name	Data Type	Units	Description
eu_subnet_name	End User Subnet Name	STRING		Currently not used
eu_user_name	End User Login Name	STRING		Login name of end-user
http_version	Http Version	STRING		http version used for session
os	Operating System	STRING		Operating system used for session
profile_id	Profile ID	INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
server_ip	Server IP	INT		IP address of component server
session_size	Session Size	DOUBLE	bytes	Total size of all pages included in the session
start_time	Session Start Time	DOUBLE	seconds since Jan 1 1970	Time that the session started
time_stamp	Session End Time	DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_event_app_error	Application Errors	INT	number of events	Total number of application events that occurred in the session
tot_event_http_error	HTTP Errors	INT	number of events	Total number of http error events that occurred in the session
tot_event_info	Informational Events	INT	number of events	Total number of information events that occurred in the session

Field	Display Name	Data Type	Units	Description
tot_event_perfor mance	Performance Events	INT	number of events	Total number of performance events that occurred in the session
tot_latency	Latency	DOUBLE	milliseconds	total latency of all packets sent by end-user in session
tot_pages	Pages Hits	INT	number of pages	Total number of pages in the session
TUID		STRING		Internal ID from the profile database

### Sample: RUM Session Statistics (rum\_session\_stats\_t)

The RUM Session Statistics sample (rum\_session\_stats\_t) contains aggregated data about open sessions over a five minute period for a specific application on a specific Real User Monitor engine.

Field	Display Name	Data Type	Units	Description
active_session_co unt	Active Sessions Counter	DOUBLE		Number of sessions that were active during the time frame to which the sample refers
application_id		INT		Monitored application internal ID number
application_name		STRING		Monitored application name
closed_session_co unt	Closed Sessions Counter	DOUBLE		Number of sessions closed during the time frame to which the sample refers
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number

Field	Display Name	Data Type	Units	Description
engine_name		STRING		Real User Monitor engine name as configured in End User Management Administration
op_se_with_err_count	Active Sessions With Errors Counter	DOUBLE		Number of active sessions in which an error event occurred during the time frame to which the sample refers
op_se_with_perf_count	Active Sessions With Performance Event Counter	DOUBLE		Number of active sessions in which a performance event occurred during the time frame to which the sample refers
open_session_count	Opened Sessions Counter	DOUBLE		Number of sessions opened during the time frame to which the sample refers
probe_ip		INT		The IP of the probe machine
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name		STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
TUID		STRING		Internal ID from the profile database

### Sample: RUM Slowest Components (rum\_slow\_comp\_t)

The RUM Slowest Components sample (rum\_slow\_comp\_t) contains data about the pages that were detected as having the longest download time in the last interval. The interval is defined in End User Management Administration. The pages do not have to be defined in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id		INT		Monitored application internal ID number
availability	Availability	INT	numeric value between 0 and 1	Availability of page in requested time frame
comp_url	Page URL	STRING		URL of component on page
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
page_id		INT		HP Business Availability Center internal page id of the page configured in End User Management Administration
page_name	Page Name	STRING		Name of page as configured in End User Management Administration

Field	Display Name	Data Type	Units	Description
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_comp_hits	Page Hits	INT	number of hits	Total number of components hit
tot_dl	Page Download Time	DOUBLE	milliseconds	Total page download time
tot_server_time	Page Server Time	DOUBLE	milliseconds	Total server time
TUID		STRING		Internal ID from the profile database

### Sample: RUM Slowest End Users (rum\_slow\_eu\_t)

The RUM Slowest End Users sample (rum\_slow\_eu\_t) contains data about the slowest end-users that were detected in the last interval. The interval is defined in End User Management Administration. The slowest end-users are those that experienced the highest average network latency for the defined interval.

Field	Display Name	Data Type	Units	Description
application_id		INT		Monitored application internal ID number
availability	Availability	INT		Currently not used



Field	Display Name	Data Type	Units	Description
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_id		INT		HP Business Availability Center internal end-user ID number
eu_loc	End User Location	STRING		End-user location as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration
new_tot_page_hits	New Total Page Hits	INT	number of hits	Total number of pages hit by end-user
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
sampletype		STRING		Currently not used

Field	Display Name	Data Type	Units	Description
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_conn_hits	Total Connection Hits	INT		Currently not used
tot_http_bytes	Total http bytes	DOUBLE	bytes	Total number of bytes sent and received by the end-user for http
tot_https_bytes	Total https bytes	DOUBLE	bytes	Total number of bytes sent and received by the end-user for https
tot_latency	Latency	DOUBLE	milliseconds	total latency of all packets sent by end-user
tot_latency_color		DOUBLE	number representing color	Color of end-user status in Dashboard
tot_page_hits	Total Page Hits	INT	number of hits	Total number of pages hit by the end-user
TUID		STRING		Internal ID from the profile database

### Sample: RUM Transactions (rum\_trans\_t)

The RUM Transactions sample (rum\_trans\_t) contains data performance and availability measurements of end-user transactions that match one of the transaction definitions in End User Management Administration.

Field	Display Name	Data Type	Units	Description
application_id	Application ID	INT		HP Business Availability Center internal application ID number
availability	Availability	INT	value between 0 and 1	availability of pages included in the transaction
bb_guid	BB GUID	STRING		An internal, unique session ID from the Real User Monitor probe
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
engine_id		INT		HP Business Availability Center internal Real User Monitor engine ID number
engine_name	Engine Name	STRING		Real User Monitor engine name as configured in End User Management Administration
eu_end_ip	End User End IP	INT		End IP address for end-user range as configured in Monitor Administration
eu_id		INT		HP Business Availability Center internal end-user ID number
eu_ip	End User IP	INT		IP address of end-user
eu_loc	End User Location	STRING		End-user location as configured in End User Management Administration

Field	Display Name	Data Type	Units	Description
eu_loc_city	End User Location City	STRING		End-user city as configured in End User Management Administration
eu_loc_country	End User Location Country	STRING		End-user country as configured in End User Management Administration
eu_loc_state	End User Location State	STRING		End-user state as configured in End User Management Administration
eu_name	End User Domain And Subnet Range	STRING		End-user name as configured in End User Management Administration
eu_start_ip	End User Start IP	INT		Start IP address for end-user range as configured in Monitor Administration
last_http_error	Last HTTP Error	INT	http error code number	Error code number of last http error in transaction
last_trans_page	Last Transaction Page	STRING	page url	URL of last page in transaction
last_trans_pid	Last Transaction Page ID	INT		HP Business Availability Center internal page ID number of the last page in transaction
max_client_time	Maximum Client Time	Double		
max_dl_time	Maximum Download Time	Double		
max_net_time	Maximum Network Time	Double		

Field	Display Name	Data Type	Units	Description
max_server_time	Maximum Server Time	Double		
min_client_time	Minimum Client Time	Double		
min_dl_time	Minimum Download Time	Double		
min_net_time	Minimum Network Time	Double		
min_server_time	Minimum Server Time	Double		
profile_id		INT		HP Business Availability Center internal profile ID number (default 1)
profile_name	Profile Name	STRING		HP Business Availability Center internal profile name
reporter		INT		Currently not used
sampletype		STRING		Currently not used
server_ip	Server IP	INT		IP address of component server
server_name	First Page Server Name	STRING		Name of server of first page in transaction
squares_sum_client_time	Squares Sum Client Time	DOUBLE		
squares_sum_dl_time	Squares Sum Download Time	DOUBLE		
squares_sum_net_time	Squares Sum Network Time	DOUBLE		

Field	Display Name	Data Type	Units	Description
squares_sum_server_time	Squares Sum Server Time	DOUBLE		
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
tot_avail_color		DOUBLE	number representing color	Color representing status of page in Dashboard
tot_client_time	Client Time	DOUBLE	milliseconds	Amount of time of total processing time between components
tot_completed	Number of Completed Transactions	INT	number of transactions	Always 1
tot_components	Number of Page Components	INT	number	Total number of components on transaction pages
tot_event_app_error	Application Errors Events	INT	number of error events	Total number of application error events in transaction
tot_event_http_error	HTTP Errors Events	INT	number of error events	Total number of http error events in transaction
tot_event_info	Non Error Events	INT	number of error events	Total number of information events in transaction
tot_event_performance	Performance Events	INT	number of error events	Total number of performance events in transaction
tot_frstbfr_b_fbt_h	Total time of time to first buffer below the threshold	Double		
tot_frstbfr_o_fbt_h	Total time of time to first buffer over the threshold	Double		

Field	Display Name	Data Type	Units	Description
tot_frstbfr_time	Sum of total time to first buffer	Double		
tot_gdl_b_gth	Gross Download Time Below Gross Warning Threshold	DOUBLE	milliseconds	Total download time of transaction less than the threshold configured in End User Management Administration
tot_gdl_o_gth	Gross Download Time Over Gross Threshold	DOUBLE	milliseconds	Total download time of transaction more than the threshold configured in End User Management Administration
tot_gdl_time	Gross Download Time	DOUBLE	milliseconds	Total download time of transaction
tot_gross_color		DOUBLEe	number representing color	Color representing status of transaction in Dashboard
tot_hits_b_fbth	Total hits below the time to first buffer threshold	Double	number of hits	
tot_hits_b_gth	Hits Below Gross Warning Threshold	INT	number of hits	Number of hits whose time was less than the gross threshold configured in End User Management Administration. Always 0 or 1
tot_hits_b_nth	Hits Below Net Warning Threshold	INT	number of hits	Number of hits whose time was less than the net threshold configured in End User Management Administration. Always 0 or 1

Field	Display Name	Data Type	Units	Description
tot_hits_b_sth	Hits Below Server Warning Threshold	INT	number of hits	Number of hits whose time was less than the server threshold configured in End User Management Administration
tot_hits_o_fbth	Total hits over the time to first buffer threshold	Double	number of hits	
tot_hits_o_gth	Hits Over Gross Threshold	INT	number of hits	Number of hits whose time was more than the gross threshold configured in End User Management Administration. Always 0 or 1
tot_hits_o_nth	Hits Over Net Threshold	INT	number of hits	Number of hits whose time was more than the net threshold configured in End User Management Administration. Always 0 or 1
tot_hits_o_sth	Hits Over Server Threshold	INT	number of hits	Number of hits whose time was more than the server threshold configured in End User Management Administration
tot_ndl_b_nth	Net Download Time Below Net Warning Threshold	DOUBLE	milliseconds	Total time of pages in the transaction whose time was less than the net threshold configured in End User Management Administration
tot_ndl_o_nth	Net Download Time Over Net Threshold	DOUBLE	milliseconds	Total time of pages in the transaction whose time was more than the net threshold configured in End User Management Administration
tot_ndl_time	Net Download Time	DOUBLE	milliseconds	Total net download time



Field	Display Name	Data Type	Units	Description
tot_net_color		DOUBLE	number representing color	Color representing status of transaction in Dashboard
tot_net_time	Network Time	DOUBLE	milliseconds	Total network time
tot_server_b_sth	Server Time Below Server Warning Threshold	DOUBLE	number of hits	Total number of hits whose time was below the threshold configured in End User Management Administration
tot_server_color		DOUBLE	number representing color	Color representing status of server in Dashboard
tot_server_o_sth	Server Time Over Server Threshold	DOUBLE	milliseconds	Total server time more than the threshold configured in End User Management Administration
tot_server_time	Server Time	DOUBLE	milliseconds	Total server time
tot_trans_size	Transaction Size	DOUBLE	bytes	Total size of transaction
total_hits	Transaction Hits	INT	number of hits	Total number of hits in transaction
trans_id		INT		HP Business Availability Center internal transaction ID
trans_name	Transaction Name	STRING	alpha-numeric	Transaction name as configured in End User Management Administration
trans_pages_seq_ids		STRING	sequence numbers	String of the sequence numbers of the pages that comprise the transaction
TUID		STRING		Internal ID from the profile database

## Data Samples for Alerts

This section describes the samples and sample fields for alerts generated by the new alert engine (CI Status Alerts) and the legacy alert engine (Business Process Monitor and Real User Monitor alerts).

### Sample: Alert Log (alert\_log)

The Alert Log sample (alert\_log) contains data generated by CI Status Alerts used when generating the Configuration Item Status Alerts report.

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**Limitation:** There is currently no configuration item name field, and it is not possible to map CI names to their CMDB IDs (entity\_id field). As such, the value of this sample is limited.

---

This sample uses the Universal Data Exchange (UDX) framework, and is thus available for filtering in the Measurement Filters page (for details, see “Working with Measurement Filters” in *Platform Administration*).

Field	Display Name	Data Type	Units	Description
action	Action	STRING		The actions performed by the alert
alert_id	alert_id	INT		Alert instance ID
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
entity_id	CMDB Entity id	BINARY		Configuration ID of CI
kpi_name	KPI name	STRING		The name of the KPI
name	Alert Name	STRING		The name of the alert

Field	Display Name	Data Type	Units	Description
next_severity	Next Severity	INT		The severity status of the KPI after the change that caused the alert to be sent, expresses as the ID defined in the <b>From</b> field in the Parameter Details window ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs &gt; clone/override KPI &gt; click the Edit Entity button &gt; Item Details &gt; click the parameter to display the Parameter Details window</b> )
obj_name	Objective name	STRING		For future use
prev_severity	Previous Severity	INT		The severity status of the KPI before the change that caused the alert to be sent, expresses as the ID defined in the <b>From</b> field in the Parameter Details window ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs &gt; clone/override KPI &gt; click the Edit Entity button &gt; Item Details &gt; click the parameter to display the Parameter Details window</b> )
sampletype		STRING		The name of the sample.
send_time	Send time	DOUBLE	seconds since Jan 1 1970	The date and time that the alert was sent, expressed in seconds since Jan 1 1970
time_stamp	Time Stamp	DOUBLE	seconds since Jan 1 1970	The date and time of the event that caused the status change, expressed in seconds since Jan 1 1970
TUID		STRING		Internal ID

**Sample: Alerts (alarm\_t)**

The Alerts sample (alarm\_t) contains data generated by Business Process Monitor and Real User Monitor alerts.

Field	Display Name	Data Type	Units	Description
alarm_id	alarm Id	INT		ID of the alert (definition)
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dEventTimeStam p	triggered time	DOUBLE	seconds	Time of the event that triggered the alert
iIsLoggedOnly	Is logged Only	INT		Determines whether the alert is logged only (1 is true or 0 is false)
iIsPositive	Is Positive	INT		Determines whether the alert is a follow-up (1 is true or 0 is false)
iNmmtEventType Id	Nmmt Event Type Id	INT		Obsolete
iNmmtId	NMMT Id	INT		Obsolete
iSessionId	Profile ID	INT		Profile ID as stored in the SESSIONS table in the management database
iSeverityId	Severity ID	INT		Severity of the alert
profile_name	Profile Name	STRING		Profile name
szActionDesc	Action Description	STRING		Action that is taken as a result of the alert
szAlarmDesc	Alarm Description	STRING		Description of the alert
szAlarmName	Alarm Name	STRING		Alert name
szNmmtEventTyp e	Nmmt Event Type	STRING		Obsolete

Field	Display Name	Data Type	Units	Description
szNmmtName	NMMT Name	STRING		Obsolete
time_stamp	Time Stamp	DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970

## Data Sample for Real Transaction Monitor

The Real Transaction Monitor sample (bristol\_t3) contains data integrated into HP Business Availability Center from HP TransactionVision monitoring software. This sample uses the Universal Data Exchange (UDX) framework, and is thus available for filtering in the Measurement Filters page. For details, see “Working with Measurement Filters” in *Platform Administration*.

Field	Display Name	Data Type	Units	Description
bpmTransactionField	Transaction Field	STRING		The transaction name as it appears in the Business Process Monitor script
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
EndTime	End Time	STRING		The transaction end time
IsBPMScripted	BPM Generated Transaction	INT	0 or 1	If true (1), transaction initiated from a Business Process Monitor; if false (0), transaction originated from a real user.
IsBPMScriptedRealEquivalent	Is Real Correlated BPM Transaction	INT	0 or 1	If true (1), the sample is for real transactions, and the Business Process Monitor is also generating the same type of transaction synthetically.
profile_id	BPM Profile ID	INT		The correlated Business Process Monitor profile ID

Field	Display Name	Data Type	Units	Description
profile_name	Profile Name	STRING		Business Process Monitor profile name
ReportingInterval	Reporting Interval	INT	seconds	The interval between samples originating from Bristol software (all transaction hits are aggregated and one aggregated data sample is sent in each interval)
sampletype		STRING		The name of the sample.
StartTime	Start Time	STRING		The transaction start time
time_stamp	Time Stamp	DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970
TUID		STRING		Internal ID
TxAvgResponseTime	Transaction Avg ResponseTime	DOUBLE	milli-seconds	The average response time of transactions in the Reporting Interval
TxClass	Transaction Class	STRING		The transaction name as it is called in Bristol software (should be the same name as Business Process Monitor transaction name)
TxCount	Transaction Count	INT		Total number of transactions in the Reporting Interval
TxFailedCount	Transaction Failed Count	INT		Number of failed transactions
TxFailedValue	Transaction Failed Value	DOUBLE		Total value of the failed transaction
TxId	BPM Transaction ID	INT		The correlated Business Process Monitor transaction ID
TxLateCount	Transaction Late Count	INT		Number of transactions that are above some response threshold (defined in Bristol software)

Field	Display Name	Data Type	Units	Description
TxLateValue	Transaction Late Value	DOUBLE		Total value of transaction that are late
TxMaxResponse Time	Transaction Max ResponseTime	DOUBLE	milli-seconds	The maximum response time of transactions in the Reporting Interval
TxMinResponse Time	Transaction Min ResponseTime	DOUBLE	milli-seconds	The minimum response time of transactions in the Reporting Interval
TxResponse Threshold	Transaction Response Threshold	DOUBLE	milli-seconds	The response time threshold
TxValue	Transaction Value	DOUBLE		Total value of the specific fields read from the data (Bristol software can read real transaction values, for example, the number of dollars transferred in a transaction)

## Data Samples for SOA

This section describes the samples and sample fields for SOA data (that is, data used in the Business Availability Center for SOA application). These samples use the Universal Data Exchange (UDX) framework, and are thus available for filtering in the Measurement Filters page (for details, see “Working with Measurement Filters” in *Platform Administration*).

### Sample: SOA Event (`ws_event_aggr_t`)

The SOA Event sample (`ws_event_aggr_t`) contains data used in SOA event reports. Data collectors can collect data for the following types of events:

- ▶ **HTTP errors.** Can be used to detect client and server side errors, such as: Not found 404 and Internal Error 500.
- ▶ **SOAP errors.** There are several standard SOAP faults that can indicate on the reason for a problem. For example: "version mismatch". In addition there can be customized SOAP faults per WS implementation.

Field	Display Name	Data Type	Units	Description
consumer	Consumer IP	INT		The IP address of the consumer of the service
customer_name		STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client)
dc_source	DC Source	STRING		Specifies the data collector source—Diagnostics or SiteScope
end_point	End Point	STRING		The name of the monitored end point (it appears in the WSDL as the port name)
event_count	Event Count	INT		The number of occurrences of the event in the time period of the aggregation
event_name	Event Name	STRING		The name of the event



Field	Display Name	Data Type	Units	Description
is_synthetic	Is Synthetic	STRING		Specify 0 for real user monitoring and 1 for synthetic monitoring
name	Name	STRING		The name of the Web service. It appears in the WSDL as the service name. There might be more than one in a WSDL
namespace	Namespace	STRING		The URI of the definition resource of the Web service (it appears in the WSDL as the targetNamespace)
operation	Operation Name	STRING		The operation name of the Web service
sampletype		STRING		The name of the sample
server	Server IP	INT		The IP address of the monitored server
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970 (this sample has aggregated values of 5 minutes)
TUID		STRING		Internal ID

**Sample: WS Performance (ws\_perf\_aggr\_t)**

The WS Performance sample (ws\_perf\_aggr\_t) contains data used in SOA performance reports. Data collectors can collect data for end to end performance of Web service operation, including availability and response time.

Field	Display Name	Data Type	Units	Description
calls_count	Calls Count	INT		The number of calls in the last 5 minutes
consumer	Consumer	INT		The IP address of the consumer of the service
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client).
dc_source	DC Source	STRING		Specifies the data collector source—Diagnostics or SiteScope
end_point	End Point	STRING		The name of the monitored end point (it appears in the WSDL as the port name)
error_count	Error Count	INT		The numbers of errors in the last 5 minutes
is_synthetic	Is Synthetic	STRING		Specify 0 for real user monitor data source and 1 for synthetic monitor data source
max_st	Max Server Time	INT	milli-seconds	The maximum server response time
max_rtt	Max Total Response Time	INT	milli-seconds	The maximum round trip response time
min_st	Min Server Time	INT	milli-seconds	The minimum server response time

Field	Display Name	Data Type	Units	Description
min_rtt	Min Total Response Time	INT	milli-seconds	The minimum round trip response time
name	Name	STRING		The name of the Web service. It appears in the WSDL as the service name. There might be more than one in a WSDL
namespace	Namespace	STRING		The URI of the definition resource of the Web service (it appears in the WSDL as the targetNamespace)
operation	Operation	STRING		The operation name of the Web service
over_threshold_rtt	Over Threshold Client Time	INT		The number of instances of round trip response time being over threshold
over_threshold_st	Over Threshold Server Time	INT		The number of instances of server time being over threshold
sampletype		STRING		The name of the sample
server	Server IP	INT		The IP address of the monitored server
sum_st	Sum Server Time	INT	milli-seconds	The sum of server response time
sum_rtt	Sum Total Response Time	INT	milli-seconds	The sum of round trip response time
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970 (this sample has aggregated values of 5 minutes)
TUID		STRING		Internal ID

## Data Samples for Business Process Insight (BPI)

The BPI sample (bpi\_t) contains data from the HP Business Process Insight application.

Field	Display Name	Data Type	Units	Description
bac_kpi_type	BAC KPI ID for reporting data	INT		The ID of the Business Availability Center KPI, as displayed in the Repositories page ( <b>Admin &gt; Dashboard &gt; Repositories &gt; KPIs</b> ).
customer_name	Customer Name	STRING		Customer name to which the sample belongs (for HP Managed Software Solutions, otherwise Default client).
metric_id	BPI Metric ID	STRING		The ID of the Business Process Insight Metric.
sampletype		STRING		The name of the sample
status	BPI Calculated Status for BAC Dashboard	INT		The Business Process Insight calculated status displayed in Business Availability Center Dashboard.
time_stamp		DOUBLE	seconds since Jan 1 1970	Time stamp in seconds since Jan 1 1970 (this sample has aggregated values of 5 minutes)
TUID		STRING		Internal ID
unit_desc	Unit description of value field	STRING		The units of the value field.
value	Calculated value	DOUBLE		The calculated value of the bac_kpi_type field. It can corresponds to the Backlog, Throughput, or Duration KPIs.

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## Data Aggregation

This chapter describes the how HP Business Availability Center uses data aggregation to improve data management.

<b>This chapter describes:</b>	<b>On page:</b>
Introducing Data Aggregation	309
How Data Is Aggregated	310
How Reports Use Aggregated Data	311
Effect of Outlier Setting on Data Aggregation	314
Data Aggregation Limitations	314

### Introducing Data Aggregation

HP Business Availability Center uses data aggregation to make data handling and management more efficient and to improve the speed and performance of report generation. HP Business Availability Center data aggregation tasks are performed on the Data Processing Server.

HP Business Availability Center aggregates various types of data that it collects for reports (for example, response time data collected by Business Process Monitor, infrastructure machine performance data collected by SiteScope, and user traffic data collected by Real User Monitor). Data aggregation involves combining individual measurements into manageable chunks. The result is improved speed and performance of report generation.

HP Business Availability Center groups data into the following categories:

- **raw data.** The actual metrics collected by data collectors.
- **fine aggregation granularity.** Data grouped into hourly chunks.
- **coarse aggregation granularity.** Data grouped into daily chunks.

## How Data Is Aggregated

HP Business Availability Center aggregates data collected by Business Process Monitor and SiteScope data collectors (not including SiteScope Integration Monitors using the event data template). Data is aggregated as follows:

### Hourly

Hourly aggregation is performed every hour. The default schedule is as follows:

Hourly aggregation for Business Process Monitor and SiteScope data is done every hour for the time period that began 2 hours earlier (for example, at 12:00 PM HP Business Availability Center aggregates the data collected between 10:00 AM and 11:00 AM).

### Daily

Daily aggregation is performed once a day after the hourly aggregation. The default schedule is that aggregation begins at 1:00 AM for the previous day (for example, at 1:00 AM HP Business Availability Center aggregates the data collected between 12 am, 25 hours ago and 12 am, 1 hour ago). When configuring profile properties, you can specify the time zone that HP Business Availability Center uses to determine when to perform daily aggregation in **GMT Offset**. For more details, see “GMT Time Zones” on page 323.

You can define a different delay for when the aggregation begins in the Offline Aggregator context of the Infrastructure Settings page (**Admin > Platform > Setup and Maintenance > Infrastructure Settings > Foundation > Offline Aggregator**). You can specify a separate delay for Business Process Monitor, custom, and SiteScope data. The delay you specify is for both the hourly and daily aggregations. It is recommended that only advanced users change the defaults set in Infrastructure Settings and after first consulting Customer Support or your HP Services representative. For details on using the Infrastructure Settings Manager page, see “Infrastructure Settings” in *Platform Administration*.

## How Reports Use Aggregated Data

Whether HP Business Availability Center displays a report using raw data, daily aggregated data, or hourly aggregated data depends on several factors:

- ▶ If the requested data in the report is for the past 30 hours, HP Business Availability Center uses raw data for Business Process Monitor data.
- ▶ For reports that use custom data—trend reports, Real User Monitor reports, Service Level Management reports containing custom data, and Diagnostics reports (if installed)—for the requested time range and granularity, Business Availability Center chooses the optimal combination of data categories so that the least amount of rows must be retrieved from the database.

For example, for a time range Jan. 1 10:40 AM - Jan. 3 10:40 AM and granularity of 1 day, Business Availability Center chooses data categories as follows:

- ▶ for Jan. 1 10:40 AM - Jan. 1 11:00 AM – raw data is used
- ▶ for Jan. 1 11:00 AM - Jan. 1 11:59 PM – hourly aggregated data is used
- ▶ for Jan. 2 12:00 AM - Jan. 2 11:59 PM – daily aggregated data is used
- ▶ for Jan. 3 12:00 AM - Jan. 3 10:00 AM – hourly aggregated data is used
- ▶ for Jan. 3 10:00 AM - Jan. 3 10:40 AM – raw data is used

- ▶ If the requested data in the report does not use custom data and the report range is not 30 hours, HP Business Availability Center uses an aggregation threshold—by default, 93% of the maximum—to determine whether to use daily aggregated data, hourly aggregated data, or raw data. When a report is generated for a specific time range, HP Business Availability Center calculates the amount of each type of data that exists over that time range and considers only the data types that are above the aggregation threshold.

For example, HP Business Availability Center might determine that, for the requested time range “Past Week,” raw data exists for 100% of the time range, hourly aggregated data exists for 96% of the time range, and daily aggregated data exists for 86% of the time range. In this case, HP Business Availability Center only considers raw data and hourly aggregated data as possible options since both exceed the aggregation threshold of 93%.

When more than one option exists, HP Business Availability Center gives priority to the data with the highest granularity (that is, daily is chosen over hourly or raw, hourly is chosen over raw). Thus, in the above example, HP Business Availability Center would display the report using hourly aggregated data.

- ▶ If the time granularity for the report (or report time range in reports that are not over time) is set to less than a day, regardless of the chosen time range, HP Business Availability Center never uses daily aggregated data.
- ▶ If the time granularity for the report (or report time range in reports that are not over time) is set to less than an hour, regardless of the chosen time range, HP Business Availability Center always uses raw data.



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**Note:** (not relevant for HP Managed Software Solutions customers) If you select a report time range that includes the past day (for example Past Month), and for which HP Business Availability Center chooses daily aggregated data, the data for the past day may be missing, as it may not yet have been aggregated into its one day chunk. In such cases, you can “force” HP Business Availability Center to use one hour chunks, instead of one day chunks, by increasing the aggregation threshold from its default setting of 93% to 98%. To do so, open the file <Gateway Server root directory>\AppServer\DataEngine\conf\ TAS\_consts.properties in a text editor, and search for the line **defConf.aggrReasonableDiff=7**. Modify the value from 7 to 2, save the file, and restart HP Business Availability Center on the Gateway Server machine. (If you have multiple Gateway Servers, repeat this procedure on all the servers.) Keep in mind that, once you make this change, it will apply for all generated reports.

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The **Aggregation Policy** setting defines the aggregated data usage policy for reports that use custom data. By default, reports use all available data, raw and aggregated. In certain circumstances, however, it may be necessary to modify this setting. For example, if the aggregation engine is not working (aggregator process on the Data Processing Server is down), you can modify the setting so that only raw data is used.

The setting can be configured in the Infrastructure Settings Manager, **Foundations > Generic Data Engine** context, **Generic Data Engine - Aggregation** table to modify the way aggregated data is used in reports.

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**Note:** In general, **Aggregation Policy** setting should not be modified without first consulting Customer Support. It is not relevant for HP Managed Software Solutions customers.

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## Effect of Outlier Setting on Data Aggregation

When aggregating data, if the **Ignore outlier data in reports** setting is cleared in a profile's properties, in the Transaction Threshold Settings section in End User Management Administration, HP Business Availability Center excludes transaction instances whose response time exceeds the outlier value, also set in the Transaction Threshold Settings section. If the **Ignore outlier data in reports** setting is selected, HP Business Availability Center ignores outlier transactions, and therefore the data is not considered. Note that the default outlier value for all transactions is 45 seconds. For details on configuring outlier values, see "Setting Transaction Thresholds" in *Using End User Management*.

## Data Aggregation Limitations

The following limitations apply, as a result of data aggregation:

- ▶ When viewing aggregated data, you may not always be able to see results when drilling down to individual transaction instances.
- ▶ When viewing aggregated data for non-rounded time periods, there might be inaccuracies for the time period close to the starting and ending times of the report. For example, if you generate a report on a Thursday based on data collected between 9:45 AM the previous Monday and 9:45 AM the previous Tuesday, the time period between 9:45 AM and 10:00 AM Monday will not contain any data, even if data was originally collected.
- ▶ HP Business Availability Center is unable to display both aggregated and raw data simultaneously in the Multi-Profile report.
- ▶ When viewing SiteScope data that is aggregated hourly, keep in mind that if the aggregator did not finish aggregating the necessary data, the latest hour may not include all the data. This may happen on rare occasions when there is a large amount of data needing hourly aggregation.
- ▶ Service Level Management aggregates some data differently. For details, see "Aggregated Data" in *Using Service Level Management*.

# **Part III**

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## **Dates and Times**



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## Date and Time Reference Information

This chapter describes date and time reference information for HP Business Availability Center.

This chapter describes:	On page:
Times and Time Zones Used in HP Business Availability Center	317
Date Formats on Client Machines	320
Report Times	320
GMT Time Zones	323

### Times and Time Zones Used in HP Business Availability Center

HP Business Availability Center deals with times and time zones differently, depending on the context.

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**Note:** All HP Business Availability Center servers, as well as the database servers, must be installed in the same time zone, with the same daylight savings time configuration, and be set to the same time.

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This section includes the following topics:

- “Data Collection” on page 318
- “Business Process Monitor Scheduling” on page 318

- “Data Aggregation” on page 318
- “Alerts and Alert Recipients” on page 319
- “Scheduled Reports” on page 319
- “Service Level Agreements” on page 320

## Data Collection

HP Business Availability Center data collectors collect performance data and transmit it to the Gateway Server, which submits the data to profile databases using the loader mechanism. Data is inserted into the database along with a timestamp. HP Business Availability Center components synchronize their time clocks with that of the database server machine hosting the HP Business Availability Center management database. Thus, the timestamp attached to each measurement inserted into the database is that of the database server clock at the time the measurement was collected.

## Business Process Monitor Scheduling

When running profiles and WebTrace, the Business Process Monitors use the schedule you set when specifying profile settings. When configuring schedule properties, the Business Process Monitor can base its scheduling on:

- **the data collector machine’s time clock.** HP Business Availability Center uses the host machine’s time zone (displayed in parentheses), which is registered in the management database when the Business Process Monitor is installed on the host machine.
- **a specific time zone relative to GMT.** HP Business Availability Center uses the time zone you specify. Choosing Offset from GMT enables you to synchronize transaction run times among hosts in different time zones. Note that this setting is not available for all-day scheduling schemes.

## Data Aggregation

The aggregators on the Gateway Server aggregate the raw data in the profile databases on an hourly and daily basis.

For the standard data aggregator, you set the time zone, relative to GMT, for daily data aggregation when defining a profile's properties. For the custom data aggregator, you set the time zone for data aggregation when configuring the default profile database. For more information on the different aggregators used by HP Business Availability Center, see "Data Aggregation" on page 318.

For example, for HP Business Availability Center to perform daily aggregation on data collected by a particular profile based on Pacific Time, enter **-8**, since Pacific Time is GMT-8. Note that this setting cannot be edited once it is saved.

## **Alerts and Alert Recipients**

HP Business Availability Center sends alerts from the Gateway Server. The Gateway Server synchronizes its time clock with that of the database server machine hosting the management database. Thus, the time associated with an alert or subalert is that of the database server clock at the time the alert or subalert occurred.

HP Business Availability Center sends alerts to recipients based on the time range and GMT offset factor that you set when configuring recipient properties in the Platform Administration. For example, if you configure a recipient to receive pager alerts from 9:00 AM - 9:00 PM, and choose a GMT offset of -5 hours, the recipient receives alerts via pager only from 9:00 AM - 9:00 PM Eastern Time.

## **Scheduled Reports**

HP Business Availability Center sends scheduled reports from the Gateway Server machine. HP Business Availability Center sends scheduled reports based on the report generation time and GMT offset factor that you set when configuring scheduled reports in the Platform Administration.

For example, if you configure a scheduled report to be sent at 9:00 AM, and choose to offset report generation time from GMT by -8 hours, HP Business Availability Center sends the report at 9:00 AM Pacific Time.

## Service Level Agreements

Service Level Management enables you to specify the time zone of each SLA. Service Level Management calculates reports according to this time zone, so that data is linked to the appropriate time interval. However, Service Level Management displays dates and times according to the time zone settings of the machine on which it is installed.

## Date Formats on Client Machines

HP Business Availability Center displays dates according to the machine's locale (HP Business Availability Center supports 17 locale definitions).

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**Note:** HP Business Availability Center does not retrieve the date formats from the machine's date definitions.

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## Report Times

In some HP Business Availability Center reports (for example, Average Response Times over Time and Transaction Breakdown over Time), the selected time range is displayed along the x-axis. HP Business Availability Center breaks down the time range according to segments, which differ depending on the time range. For example, for the **Day** time range, HP Business Availability Center uses one-hour segments.

HP Business Availability Center calculates each time segment differently, depending on the selected time range. Each time segment is exactly the same amount of time with the exception of the first and last time segment of the time range, which are rounded to the start and end time of the report.



The table below describes the time segments that appear along the x-axis for each available time range. For illustration purposes, the information in the table is based on the starting date and time 13/9/01 12:03 PM, where the date format is **month/day/year** and the time format is **hours:minutes:seconds**.

Time Range	Segment	First Time Segment	Example of Middle Time Segment	Last Time Segment
Hour	5 minutes	9/13/01 12:03:00 PM to 9/13/01 12:04:59 PM	9/13/01 12:05:00 PM to 9/13/01 12:09:59 PM	9/13/01 1:00:00 PM to 9/13/01 1:02:59 PM
Day	1 hour	9/13/01 12:03:00 PM to 9/13/01 12:59:59 PM	9/13/01 1:00:00 PM to 9/13/01 1:59:59 PM	9/14/01 12:00:00 PM to 9/14/01 12:02:59 PM
Week	1 day	9/13/01 12:03:00 PM to 9/13/01 11:59:59 PM	9/14/01 12:00:00 AM to 9/14/01 11:59:59 PM	9/20/01 12:00:00 AM to 9/20/01 12:02:59 PM
Month	1 day	9/13/01 12:03:00 PM to 9/13/01 11:59:59 PM	9/14/01 12:00:00 AM to 9/14/01 11:59:59 PM	10/13/01 12:00:00 AM to 10/13/01 12:02:59 PM

Time Range	Segment	First Time Segment	Example of Middle Time Segment	Last Time Segment
Quarter*	1 week	9/13/01 12:03:00 PM to 9/16/01 11:59:59 PM	9/17/01 12:00:00 AM to 9/23/01 11:59:59 PM	12/10/01 12:00:00 AM to 12/13/01 12:02:59 PM
Year	1 month	9/13/01 12:03:00 PM to 9/30/01 11:59:59 PM	10/1/01 12:00:00 AM to 10/31/01 11:59:59 PM	9/1/02 12:00:00 AM to 9/13/02 12:02:59 PM

\* For the **Quarter** time range, the week starts on Monday, and the first step is from the start time until the beginning of the following week.

## GMT Time Zones

The following list describes GMT time zones for locations throughout the world.

(GMT -11) Pacific/Niue	(GMT -11) Pacific/Apia
(GMT -11) MIT	(GMT -11) Pacific/Pago_Pago
(GMT -10) Pacific/Tahiti	(GMT -10) Pacific/Fakaofu
(GMT -10) Pacific/Honolulu	(GMT -10) HST
(GMT -10) America/Adak	(GMT -10) Pacific/Rarotonga
(GMT -9) Pacific/Marquesas	(GMT -9) Pacific/Gambier
(GMT -9) America/Anchorage	(GMT -9) AST
(GMT -8) Pacific/Pitcairn	(GMT -8) America/Vancouver
(GMT -8) America/Tijuana	(GMT -8) America/Los_Angeles
(GMT -8) PST	(GMT -7) America/Dawson_Creek
(GMT -7) America/Phoenix	(GMT -7) PNT
(GMT -7) America/Edmonton	(GMT -7) America/Mazatlan
(GMT -7) America/Denver	(GMT -7) MST
(GMT -6) America/Belize	(GMT -6) America/Regina
(GMT -6) Pacific/Galapagos	(GMT -6) America/Guatemala
(GMT -6) America/Tegucigalpa	(GMT -6) America/El_Salvador
(GMT -6) America/Costa_Rica	(GMT -6) America/Winnipeg
(GMT -6) Pacific/Easter	(GMT -6) America/Mexico_City
(GMT -6) America/Chicago	(GMT -6) CST
(GMT -5) America/Porto_Acre	(GMT -5) America/Bogota
(GMT -5) America/Guayaquil	(GMT -5) America/Jamaica
(GMT -5) America/Cayman	(GMT -5) America/Managua
(GMT -5) America/Panama	(GMT -5) America/Lima
(GMT -5) America/Indianapolis	(GMT -5) IET
(GMT -5) America/Nassau	(GMT -5) America/Montreal
(GMT -5) America/Havana	(GMT -5) America/Port-au-Prince
(GMT -5) America/Grand_Turk	(GMT -5) America/New_York
(GMT -5) EST	(GMT -4) America/Antigua
(GMT -4) America/Anguilla	(GMT -4) America/Curacao
(GMT -4) America/Aruba	(GMT -4) America/Barbados
(GMT -4) America/La_Paz	(GMT -4) America/Manaus
(GMT -4) America/Dominica	(GMT -4) America/Santo_Domingo

(GMT -4) America/Grenada	(GMT -4) America/Guadeloupe
(GMT -4) America/Guyana	(GMT -4) America/St_Kitts
(GMT -4) America/St_Lucia	(GMT -4) America/Martinique
(GMT -4) America/Montserrat	(GMT -4) America/Puerto_Rico
(GMT -4) PRT	(GMT -4) America/Port_of_Spain
(GMT -4) America/St_Vincent	(GMT -4) America/Tortola
(GMT -4) America/St_Thomas	(GMT -4) America/Caracas
(GMT -4) Antarctica/Palmer	(GMT -4) Atlantic/Bermuda
(GMT -4) America/Cuiaba	(GMT -4) America/Halifax
(GMT -4) Atlantic/Stanley	(GMT -4) America/Thule
(GMT -4) America/Asuncion	(GMT -4) America/Santiago
(GMT -3) America/St_Johns	(GMT -3) CNT
(GMT -3) America/Fortaleza	(GMT -3) America/Cayenne
(GMT -3) America/Paramaribo	(GMT -3) America/Montevideo
(GMT -3) America/Buenos_Aires	(GMT -3) AGT
(GMT -3) America/Godthab	(GMT -3) America/Miquelon
(GMT -3) America/Sao_Paulo	(GMT -3) BET
(GMT -2) America/Noronha	(GMT -2) Atlantic/South_Georgia
(GMT -1) Atlantic/Jan_Mayen	(GMT -1) Atlantic/Cape_Verde
(GMT -1) America/Scoresbysund	(GMT -1) Atlantic/Azores
(GMT +0) Africa/Ouagadougou	(GMT +0) Africa/Abidjan
(GMT +0) Africa/Accra	(GMT +0) Africa/Banjul
(GMT +0) Africa/Conakry	(GMT +0) Africa/Bissau
(GMT +0) Atlantic/Reykjavik	(GMT +0) Africa/Monrovia
(GMT +0) Africa/Casablanca	(GMT +0) Africa/Timbuktu
(GMT +0) Africa/Nouakchott	(GMT +0) Atlantic/St_Helena
(GMT +0) Africa/Freetown	(GMT +0) Africa/Dakar
(GMT +0) Africa/Sao_Tome	(GMT +0) Africa/Lome
(GMT +0) GMT	(GMT +0) UTC
(GMT +0) Atlantic/Faeroe	(GMT +0) Atlantic/Canary
(GMT +0) Europe/Dublin	(GMT +0) Europe/Lisbon
(GMT +0) Europe/London	(GMT +1) Africa/Luanda
(GMT +1) Africa/Porto-Novo	(GMT +1) Africa/Bangui
(GMT +1) Africa/Kinshasa	(GMT +1) Africa/Douala
(GMT +1) Africa/Libreville	(GMT +1) Africa/Malabo
(GMT +1) Africa/Niamey	(GMT +1) Africa/Lagos

(GMT +1) Africa/Ndjamena	(GMT +1) Africa/Tunis
(GMT +1) Africa/Algiers	(GMT +1) Europe/Andorra
(GMT +1) Europe/Tirane	(GMT +1) Europe/Vienna
(GMT +1) Europe/Brussels	(GMT +1) Europe/Zurich
(GMT +1) Europe/Prague	(GMT +1) Europe/Berlin
(GMT +1) Europe/Copenhagen	(GMT +1) Europe/Madrid
(GMT +1) Europe/Gibraltar	(GMT +1) Europe/Budapest
(GMT +1) Europe/Rome	(GMT +1) Europe/Vaduz
(GMT +1) Europe/Luxembourg	(GMT +2) Africa/Tripoli
(GMT +1) Europe/Monaco	(GMT +1) Europe/Malta
(GMT +1) Africa/Windhoek	(GMT +1) Europe/Amsterdam
(GMT +1) Europe/Oslo	(GMT +1) Europe/Warsaw
(GMT +1) Europe/Stockholm	(GMT +1) Europe/Belgrade
(GMT +1) Europe/Paris	(GMT +1) ECT
(GMT +2) Africa/Bujumbura	(GMT +2) Africa/Gaborone
(GMT +2) Africa/Lubumbashi	(GMT +2) Africa/Maseru
(GMT +2) Africa/Blantyre	(GMT +2) Africa/Maputo
(GMT +2) Africa/Kigali	(GMT +2) Africa/Khartoum
(GMT +2) Africa/Mbabane	(GMT +2) Africa/Lusaka
(GMT +2) Africa/Harare	(GMT +2) CAT
(GMT +2) Africa/Johannesburg	(GMT +2) Europe/Sofia
(GMT +2) Europe/Minsk	(GMT +2) Asia/Nicosia
(GMT +2) Europe/Tallinn	(GMT +2) Africa/Cairo
(GMT +2) ART	(GMT +2) Europe/Helsinki
(GMT +2) Europe/Athens	(GMT +2) Asia/Jerusalem
(GMT +2) Asia/Amman	(GMT +2) Asia/Beirut
(GMT +1) Europe/Vilnius	(GMT +2) Europe/Riga
(GMT +2) Europe/Chisinau	(GMT +2) Europe/Bucharest
(GMT +2) Europe/Kaliningrad	(GMT +2) Asia/Damascus
(GMT +2) Europe/Kiev	(GMT +2) Europe/Istanbul
(GMT +2) EET	(GMT +3) Asia/Bahrain
(GMT +3) Africa/Djibouti	(GMT +3) Africa/Asmera
(GMT +3) Africa/Addis_Ababa	(GMT +3) EAT
(GMT +3) Africa/Nairobi	(GMT +3) Indian/Comoro
(GMT +3) Asia/Kuwait	(GMT +3) Indian/Antananarivo
(GMT +3) Asia/Qatar	(GMT +3) Africa/Mogadishu

(GMT +3) Africa/Dar_es_Salaam	(GMT +3) Africa/Kampala
(GMT +3) Asia/Aden	(GMT +3) Indian/Mayotte
(GMT +3) Asia/Riyadh	(GMT +3) Asia/Baghdad
(GMT +2) Europe/Simferopol	(GMT +3) Europe/Moscow
(GMT +3) Asia/Tehran	(GMT +3) MET
(GMT +4) Asia/Dubai	(GMT +4) Indian/Mauritius
(GMT +4) Asia/Muscat	(GMT +4) Indian/Reunion
(GMT +4) Indian/Mahe	(GMT +4) Asia/Yerevan
(GMT +4) NET	(GMT +4) Asia/Baku
(GMT +4) Asia/Aqtau	(GMT +4) Europe/Samara
(GMT +4) Asia/Kabul	(GMT +5) Indian/Kerguelen
(GMT +4) Asia/Tbilisi	(GMT +5) Indian/Chagos
(GMT +5) Indian/Maldives	(GMT +5) Asia/Dushanbe
(GMT +5) Asia/Ashkhabad	(GMT +5) Asia/Tashkent
(GMT +5) Asia/Karachi	(GMT +5) PLT
(GMT +5) Asia/Bishkek	(GMT +5) Asia/Aqtobe
(GMT +5) Asia/Yekaterinburg	(GMT +5) Asia/Calcutta
(GMT +5) IST	(GMT +5) Asia/Katmandu
(GMT +6) Antarctica/Mawson	(GMT +6) Asia/Thimbu
(GMT +6) Asia/Colombo	(GMT +6) Asia/Dacca
(GMT +6) BST	(GMT +6) Asia/Almaty
(GMT +6) Asia/Novosibirsk	(GMT +6) Indian/Cocos
(GMT +6) Asia/Rangoon	(GMT +7) Indian/Christmas
(GMT +7) Asia/Jakarta	(GMT +7) Asia/Phnom_Penh
(GMT +7) Asia/Vientiane	(GMT +7) Asia/Saigon
(GMT +7) VST	(GMT +7) Asia/Bangkok
(GMT +7) Asia/Krasnoyarsk	(GMT +8) Antarctica/Casey
(GMT +8) Australia/Perth	(GMT +8) Asia/Brunei
(GMT +8) Asia/Hong_Kong	(GMT +8) Asia/Ujung_Pandang
(GMT +8) Asia/Macao	(GMT +8) Asia/Kuala_Lumpur
(GMT +8) Asia/Manila	(GMT +8) Asia/Singapore
(GMT +8) Asia/Taipei	(GMT +8) Asia/Shanghai
(GMT +8) CTT	(GMT +8) Asia/Ulan_Bator
(GMT +8) Asia/Irkutsk	(GMT +9) Asia/Jayapura
(GMT +9) Asia/Pyongyang	(GMT +9) Asia/Seoul
(GMT +9) Pacific/Palau	(GMT +9) Asia/Tokyo

(GMT +9) JST	(GMT +9) Asia/Yakutsk
(GMT +9) Australia/Darwin	(GMT +9) ACT
(GMT +9) Australia/Adelaide	(GMT +9) Australia/Broken_Hill
(GMT +10) Australia/Hobart	(GMT +10) Antarctica/ DumontDURville
(GMT +10) Pacific/Truk	(GMT +10) Pacific/Guam
(GMT +10) Pacific/Saipan	(GMT +10) Pacific/Port_Moresby
(GMT +10) Australia/Brisbane	(GMT +10) Asia/Vladivostok
(GMT +10) Australia/Sydney	(GMT +10) AET
(GMT +10) Australia/Lord_Howe	(GMT +11) Pacific/Ponape
(GMT +11) Pacific/Efate	(GMT +11) Pacific/Guadalcanal
(GMT +11) SST	(GMT +11) Pacific/Noumea
(GMT +11) Asia/Magadan	(GMT +11) Pacific/Norfolk
(GMT +12) Pacific/Kosrae	(GMT +12) Pacific/Tarawa
(GMT +12) Pacific/Majuro	(GMT +12) Pacific/Nauru
(GMT +12) Pacific/Funafuti	(GMT +12) Pacific/Wake
(GMT +12) Pacific/Wallis	(GMT +12) Pacific/Fiji
(GMT +12) Antarctica/McMurdo	(GMT +12) Asia/Kamchatka
(GMT +12) Pacific/Auckland	(GMT +12) NST
(GMT +12) Pacific/Chatham	(GMT +13) Pacific/Enderbury
(GMT +13) Pacific/Tongatapu	(GMT +13) Asia/Anadyr
(GMT +14) Pacific/Kiritimati	





# Part IV

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## Troubleshooting



# 24

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## Troubleshooting Resources

The following resources are available to aid in troubleshooting problems that arise while working with or administering HP Business Availability Center:

- ▶ **Installation troubleshooting.** Use to troubleshoot common problems that you may encounter when installing HP Business Availability Center, and the solutions to those problems. For details, see “Installation and Connectivity Troubleshooting” in the *HP Business Availability Center Deployment Guide* PDF.
- ▶ **Login troubleshooting.** Use to troubleshoot possible causes of failure to log in to HP Business Availability Center. For details, see “Troubleshooting HP Business Availability Center Login” in *Platform Administration*.
- ▶ **Customer Knowledge Base.** Use to search for specific troubleshooting information on a wide variety of topics. Located on the Customer Support Web site (<http://support.mercury.com>), the Knowledge Base can be accessed by selecting **Troubleshooting & Knowledge Base** from the HP Business Availability Center Help menu.

Note that only registered customers can access the resources on the Customer Support Web site. Customers who have not yet registered can do so from the site.

- ▶ **HP Business Availability Center tools.** Use to assist in troubleshooting the HP Business Availability Center environment. You access the tools from the **<HP Business Availability Center server root directory>\tools** directory. Most of the tools should only be used in coordination with HP personnel. The Database Schema Verification utility (dbverify) and Data Marking utility should be used according to their documented instructions.



# 25

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## Working in Non-English Locales

This chapter lists considerations and limitations when working in a non-English locale.

<b>This chapter describes:</b>	<b>On page:</b>
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Administration Issues	335
Dashboard Issues	335
Service Level Management Issues	336
HP Business Availability Center for Siebel Applications Issues	336
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## Installation and Deployment Issues

- ▶ Installing HP Business Availability Center in an I18N environment is only supported for HP Business Availability Center installed on a Windows platform. For details on installing HP Business Availability Center on a Windows platform, see “Installing HP Business Availability Center Servers on a Windows Platform” in the *HP Business Availability Center Deployment Guide* PDF.
- ▶ The installation path for all HP Business Availability Center components must not contain non-English language characters.
- ▶ Business Process Monitors and the Gateway Server must be installed on an operating system that has the same locale as the data.
- ▶ During Business Process Monitor installation, use English names only for the host name and location. If necessary, you can change the names to non-English names after installation, in Business Process Monitor Admin.

## Database Environment Issues

- ▶ To work in a non-English language HP Business Availability Center environment, you can use either Oracle Server database or MS SQL Server database. The encoding of the database should be the same as the encoding of the specific language. When using Oracle Server database, the encoding of the database can also be UTF-8, which supports both non-English languages as well as multiple languages.
- ▶ When you create a new Oracle instance in an Oracle database, you must specify the character set for the instance. All character data, including data in the data dictionary, is stored in the instance’s character set. For details on working with Oracle databases, see “Deploying and Maintaining the Oracle Server Database” in the *HP Business Availability Center Database Guide* PDF.
- ▶ The Database Query Monitor can connect to an Oracle database but the Oracle user names and passwords must contain only English characters.

## Administration Issues

- ▶ E-mail alerts sent with ISO-2022-JP encoding are supported only by an SMTP server running on a Windows NT platform. Use of this encoding affects all HP Business Availability Center servers.
- ▶ When using the default authentication strategy to authenticate users logging in to HP Business Availability Center, all user names and passwords must be in English.

## Dashboard Issues

- ▶ To display non-Latin languages in Dashboard Top View:
  - a Verify that you have followed the instructions on installing the JRE on a non-Western Windows system. The instructions are found at <http://java.sun.com/j2se/1.5.0/jre/install-windows.html>.
  - b Make sure that you:
    - ▶ have administrative permissions to install the J2SE Runtime Environment on Microsoft Windows 2000 and XP.
    - ▶ (For users installing the JRE on non-Western 32-bit machines) choose a **Custom Setup Type**. In Custom Setup under feature 2 (**Support for Additional Languages**), select **This feature is installed on local hard drive**.
  - c Select **Admin > Platform > Setup and Maintenance > Infrastructure Settings**, click **Applications**, select **Dashboard Application**, and locate the **Top View Font Name** entry in the **Dashboard Application – Top View Properties** table. Change the value to **Arial Unicode MS**.

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**Important:** If the value of the **Top View Font Name** entry is **default**, you do not need to perform this step, as the Top View Font Name property automatically assumes the Arial Unicode MS value in that case.

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- d Close all instances of the Web browser.
- e Log in to HP Business Availability Center and access Dashboard Top View. Verify that the Chinese or Japanese characters now appear correctly.

## Service Level Management Issues

Service Level Management does not support service names that contain more than 50 multibyte characters.

## HP Business Availability Center for Siebel Applications Issues

- ▶ Non-English characters may not appear or may be corrupted in the Topology View. If you encounter this problem, install the Arial Unicode Microsoft font from the Microsoft Web site.
- ▶ HP Business Availability Center by default only supports English language Siebel. Do not deliver data from a non-English version of Siebel to HP Business Availability Center. You should use special translation adapters to enable HP Business Availability Center to work with a non-English version of the Siebel application. For details, contact Customer Support.

## Report Issues

- ▶ HP Business Availability Center does not support Custom Report names that contain more than 50 multibyte characters.
- ▶ The Page Component Breakdown report does not support URLs that contain multibyte characters. When specifying a URL and a location from which to run the breakdown, you must enter English characters in the URL box.
- ▶ Excel reports must have English file names when uploading to HP Business Availability Center running on a Chinese Simplified operating system. To view Excel reports, select **Applications > End User Management**. Choose the User Reports tab and click **Excel Reports**.



- Reports downloaded from HP Business Availability Center to Excel cannot be displayed properly on an operating system whose language differs from the data language.

To download Excel files with multibyte data when HP Business Availability Center is installed on an English-language machine, set the **user.encoding** entry in the <**Business Availability Center root directory**>\AppServer\resources\strings.properties file to the correct encoding.

- By default, Excel does not open UTF8 encoded CSV documents correctly. After saving a report as a .csv file, you can import it into Excel by doing the following in Excel:
  - On the **Data** menu, select **Import External Data**, and click **Import Data**.
  - In the Files of type box, click **Text Files**.
  - In the **Look in** box, locate and double-click the text file you want to import as an external data range.

To specify how you want to divide the text into columns, follow the instructions in the Text Import Wizard, and then click **Finish**.

## Business Process Monitor Issues

- If the Business Process Monitor log files contain non-English data, you must open them in a viewer that supports UTF-8 format parsing, for example, Notepad, rather than from the View BPM Files window in the Business Process Monitor Admin.

Log files that are saved in the default encoding of the server on which the Business Process Monitor Admin is installed are shown correctly in the View BPM Files window.

- HP Business Availability Center does not support Business Process Monitor host names that contain more than 25 multibyte characters.

## SiteScope Issues

- ▶ In SiteScopes running in I18N mode, the **Return to Group** link displayed during monitor set creation shows the indexed-based group name (for example, **group0**) instead of the user-defined group name.
- ▶ The Database Query Monitor can connect to an Oracle database only if the Oracle user names and passwords contain English-only characters.
- ▶ SiteScope does not support non-English characters in the username/password.
- ▶ Beginning with SiteScope version 8.5, the user interface can be displayed in several languages. For details, see “Working in an Internationalization Environment” in *Using System Availability Management*.
- ▶ For a list of monitors that are tested for internationalization, see “Monitors Tested for Internationalization” in *Using System Availability Management*.

## Real User Monitor Issues

- ▶ Real User Monitor supports non-English characters in UTF-8 format. For details on configuring the HP Real User Monitor probe to support non-Unicode encodings, see “Configuring the HP Real User Monitor Probe for I18N” in the *Real User Monitor Administration* PDF.
- ▶ To support non-English character from Real User Monitor, the encoding for HP Business Availability Center databases must be defined as UTF-8, or set to the specific language. For further details, see “Database Environment Issues” on page 334.

## End User Management Administration Issues

Global replace does not support non-English languages.

## System Availability Management Issues

- ▶ Global replace does not support non-English languages.

## Problem Isolation Issues

Problem Isolation does not support I18N and is not translated into non-English languages.

## Multiple-language Issues

- ▶ The SNMP notification method does not support multiple-language text, and can only send a notification in the character set of the Gateway Server machine. This is because HP Business Availability Center uses SNMP version 1.0, which does not support multilingual data.
- ▶ Error messages in the Failed Transactions report do not display correctly when HP Business Availability Center runs on an English operating system, and the Business Process Monitor runs on a Japanese operating system. To access the Failed Transactions report, select **Applications > End User Management > Business Processes > Error Summary**. Locate the General Errors table, and click a link to open the Failed Transactions window.
- ▶ In UNIX, there is no support for I18N. Make sure that transactions and scripts contain English characters only.
- ▶ HP Business Availability Center can store multiple-language data. However, a regular executable cannot usually accept multiple-language data on the command line.

The following table describes the procedures that you must perform to add multiple-language data to the command line when running an executable file upon alert:

Platform	Procedure
Windows	To prevent multiple-language data from being lost, write the application with a <b>wmain</b> function instead of a <b>main</b> function. You can also use another <b>main</b> -type function that can take command line parameters of type <b>wchar</b> instead of type <b>char</b> .  <b>Note:</b> When you use the SubAlerts command line option, the created XML file does not include an encoding attribute, and the encoding is different from the default UTF-8 encoding.
Solaris	Inform the writer of the application that the parameters passed to the application must be encoded in UTF-8.

For details on using a custom command line when running an executable file upon alert, refer to “Run Executable File Dialog Box” in *Platform Administration*.

- An executable file that was created for a previous version of HP Business Availability Center is compatible with a multiple-language version.

## Multi-Lingual User (MLU) Interface Support

The HP Business Availability Center user interface can be viewed in the following languages in your Web browser:

Language	Language Preference in Web Browser
English	English
French	French (France) [fr]
Japanese	Japanese [ja]

Language	Language Preference in Web Browser
Korean	Korean [ko]
Simplified Chinese	Chinese (China) [zh-cn]

---

**Note:** There is no support for I18N on a UNIX machine.

---

Use the language preference option in your browser to select how to view HP Business Availability Center. The language preference chosen affects only your local machine (the client machine) and not the HP Business Availability Center machine or any other user accessing the same HP Business Availability Center machine.

**To set up and view HP Business Availability Center in a specific language:**

- 1** Install the appropriate language's fonts on your local machine if they are not yet installed. If you choose a language in your Web browser whose fonts have not been installed, HP Business Availability Center displays the characters as squares.
- 2** If you are logged in to HP Business Availability Center, you must log out. Click **LOGOUT** at the top of the HP Business Availability Center window.  
Close every open browser window or alternatively clear the cache (if HP Business Availability Center is running on Internet Explorer).
- 3** If HP Business Availability Center is running on Internet Explorer, configure the Web browser on your local machine to select the language in which you want to view HP Business Availability Center (**Tools > Internet Options**).
  - a** Click the **Languages** button and in the Language Preference dialog box, highlight the language in which you want to view HP Business Availability Center.
  - b** If the language you want is not listed in the dialog box, click **Add** to display the list of languages. Select the language you want to add and click **OK**.
  - c** Click **Move Up** to move the selected language to the first row.

- d** Click **OK** to save the settings.
- e** Display the HP Business Availability Center login window.
- f** From the Internet Explorer menu, select **View > Refresh**. HP Business Availability Center immediately refreshes and the user interface is displayed in the selected language.

---

**Note:** For details on viewing Web pages in Internet Explorer that are written in a different language, see <http://support.microsoft.com/kb/306872/en-us>.

---

If HP Business Availability Center is being viewed on FireFox, configure the Web browser on your local machine as follows:

- a** Select **Tools > Options > Advanced**. Click **Edit Languages**. The Language dialog box opens.
- b** Highlight the language in which you want to view HP Business Availability Center.  
  
If the language you want is not listed in the dialog box, expand the **Select language to add...** list, select the language, and click **Add**.
- c** Click **Move Up** to move the selected language to the first row.
- d** Click **OK** to save the settings. Click **OK** to close the Language dialog box.

### **Notes and Limitations**

- ▶ There is no language pack installation. All translated languages are integrated into the HP Business Availability Center Multi-lingual User Interface (MLU).
- ▶ Data remains in the language it is entered in, even if the language of the Web browser changes. Changing the language of the Web browser on your local machine does not change the language of the data input definitions and configurations.
- ▶ Some of the links in the Help menu are displayed in the user interface language you select.

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## HP Business Availability Center Logs

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**Note to HP Managed Software Solutions customers:** This chapter is not relevant for HP Managed Software Solutions customers.

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This chapter provides an overview of HP Business Availability Center log files.

<b>This chapter describes:</b>	<b>On page:</b>
About HP Business Availability Center Logs	344
Log File Locations	344
Log Severity Levels	345
Log File Size and Automatic Archiving	346
JBoss and Tomcat Logs	347
Real User Monitor Logs	348

## About HP Business Availability Center Logs

HP Business Availability Center records the procedures and actions performed by the various components in log files. The log files are usually designed to serve Customer Support when HP Business Availability Center does not perform as expected.

The default severity threshold level for log files is differs per log, but is generally set to either **Info** or **Error**. For a definition of log levels, see “Log Severity Levels” on page 345.

You can view log files with any text editor.

## Log File Locations

Most log files are located in the **<HP Business Availability Center root directory>\log** directory and in subdirectories organized by component.

Log file properties are defined in files in the following directory and its subdirectories: **<HP Business Availability Center root directory>\conf\core\Tools\log4j**.

### Log File Locations in a Distributed Deployment

In typical or compact installations, all HP Business Availability Center servers and their logs reside on the same machine. In the case of a distributed deployment of the servers among several machines, logs for a particular server are usually saved on the computer on which the server is installed. However, if it is necessary for you to inspect logs, you should do so on all machines.

When comparing logs on client machines to those on the HP Business Availability Center server machines, keep in mind that the date and time recorded in a log are taken from the machine on which the log was produced. It follows that if there is a time difference between the server and client machines, the same event is recorded by each with a different time stamp.



## Log Severity Levels

Each log is set so that the information it records corresponds to a certain severity threshold. Because the various logs are used to keep track of different information, each is pre-set to an appropriate default level. For details on changing the log level, see “Changing Log Levels” below.

Typical log levels are listed below from narrowest to widest scope:

- ▶ **Error.** The log records only events that adversely affect the immediate functioning of HP Business Availability Center. When a malfunction occurs, you can check if Error messages were logged and inspect their content to trace the source of the failure.
- ▶ **Warning.** The log’s scope includes, in addition to Error-level events, problems for which HP Business Availability Center is currently able to compensate and incidents that should be noted to prevent possible future malfunctions.
- ▶ **Info.** The log records all activity. Most of the information is normally routine and of little use and the log file quickly fills up.
- ▶ **Debug.** This level is used by Customer Support when troubleshooting problems.

---

**Note:** The names of the different log levels may vary slightly on different servers and for different procedures. For example, **Info** may be referred to as **Always logged** or **Flow**.

---

## Changing Log Levels

If requested by Customer Support, you may have to change the severity threshold level in a log, for example, to a debug level.

**To change the severity threshold level:**

- 1** Open the log properties file in a text editor. Log file properties are defined in files in the following directory: <HP Business Availability Center root directory>\conf\core\Tools\log4j.

- 2 Locate the **loglevel** parameter. For example,

```
loglevel=ERROR
```

- 3 Change the level to the required level. For example,

```
loglevel=DEBUG
```

For a description of the log levels, see “Log Severity Levels” on page 345.

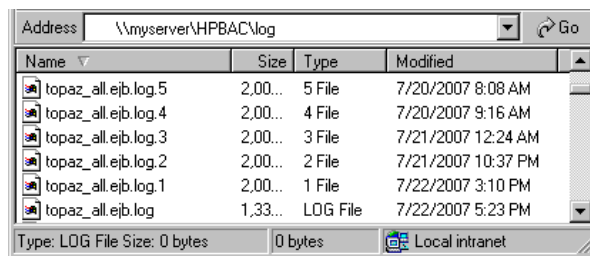
- 4 Save the file.

## Log File Size and Automatic Archiving

A size limit is set for each type of log file. When a file reaches this limit, it is renamed and becomes an archived log. A new active log file is then created.

For many logs, the number of archived log files saved can be configured. When a file reaches its size limit, it is renamed with the numbered extension **1**. If there is currently an archived log with the extension **1**, it is renamed with the extension **2**, **log.2** becomes **log.3**, and so on, until the oldest archived log file (with the number corresponding to the maximum number of files to be saved) is permanently deleted.

The following image shows an example of a log file, **topaz\_all.ejb.log**, and its archived copies.



The maximum file size and the number of archived log files are defined in the log properties files located in <HP Business Availability Center root directory>\conf\core\Tools\log4j. An example is:

```
def.file.max.size=2000KB
def.files.backup.count=10
```

## JBoss and Tomcat Logs

The following <HP Business Availability Center root directory>\log directory holds JBoss- and Tomcat-related log files:

- **jboss\_boot.log.** Logs startup activities including running the JBoss process, deployment, and startup status, as well as the number of busy ports. If HP Business Availability Center fails to start, any problems are written to this log.
- **jboss\_server.log.** Logs all JBoss activities including JBoss messages, deployment and startup status.
- **jboss\_tomcat.log.** Logs the Tomcat messages.

---

**Note:** You can view the JBoss Management Console at <http://<HP Business Availability Center server>:8080/jmx-console>.

---

## Real User Monitor Logs

Real User Monitor logs store messages from Real User Monitor modules and are used to troubleshoot problems, and to provide information about the system's operations. There are three types of logs: engine logs, JBoss logs, and core logs. The log files are located in the **<Real User Monitor Engine root>\log** directory.

You change log levels, and the default log size and archiving parameters, in the same way as in HP Business Availability Center. For details, see “Changing Log Levels” on page 345, and “Log File Size and Automatic Archiving” on page 346.

This section contains the following topics:

- Engine Logs
- JBoss and Tomcat Logs
- Core Logs

### Engine Logs

Engine logs contain log messages from the different processes. There are two types of engine log files:

- **rumengine log files.** Log files for modules within the Real User Monitor engine.
- **repository log files.** Log files for modules connecting the Real User Monitor engine and its MySQL database.

There is a log for each module and the Real User Monitor engine saves up to 20 files for each log by default. When a file reaches a maximum, default size of 3 MB, a new log file is created automatically. Each time the Real User Monitor engine is restarted, it creates a new set of logs. The name of the log file consists of the log type (rumengine or repository), the module name, log and the log file number.

For example, a rumengine type module called **clustermanager** would produce the following log files:

```
rumengine.clustermanager.log
rumengine.clustermanager.log.1
rumengine.clustermanager.log.2
```

and so on.

The structure of a message in the log file is as follows: <timestamp> <invoking thread> <java class name and line number> <message log level> <message content>. For example:

```
2005-08-03 14:20:32,953 [main] (NodesVerifierManager.java:185) INFO - Found
primary installation on current machine
2005-08-03 14:20:33,125 [main] (NodeVerifierServer.java:103) INFO - Got host
name=paddington from repository. Hostname ID=1
```

You can change the default log file size and archiving cycle. For details, see “Log File Size and Automatic Archiving” on page 346.

You can change the error level that is reported to the log file for each module. The following error levels can be set for Real User Monitor log files:

- **Fatal.** The log only records severe events that could cause the Real User Monitor to abort.
- **Error.** The log records severe events that adversely affect the immediate functioning of Real User Monitor, that might still allow the application to continue running.
- **Warn.** The log’s scope is widened to include events that include potentially harmful situations.
- **Info.** The log includes informational messages about the regular running of the system.
- **Debug.** This level is used by Customer Support when troubleshooting problems.

For details on changing the error level, see “Changing Log Levels” on page 345.

---

**Note:** Each severity level includes all the levels above it. For example, if the log is set to **Warn** level, it includes **Warn**, **Error** and **Fatal** events.

---

## **JBoss and Tomcat Logs**

JBoss and Tomcat log messages are written to the following files in the <Real User Monitor Engine root>\log directory:

- **jboss\_boot.log.** Logs startup activities including running the JBoss process, deployment, and startup status. If the Real User Monitor fails to start, any problems are written to this log.
- **jboss\_server.log.** Logs all JBoss activities including JBoss messages, deployment and startup status.
- **jboss\_tomcat.log.** Logs the Tomcat messages.

## **Core Logs**

Core log messages are written to log files in the <Real User Monitor Engine root>\log\core directory.

The core log files contain messages about the general status of the application server on which the HP Real User Monitor engine is installed, and its services.

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## CMDB Logs

This chapter describes various log files and explains how to perform basic troubleshooting.

<b>This chapter describes:</b>	<b>On page:</b>
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CMDB Enrichment Log	362
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## CMDB Log File Overview

This chapter describes configuration management database (CMDB) log files.

CMDB log files enable you to perform basic troubleshooting of common CMDB runtime problems. Additionally, by tracking CMDB behavior in the log files, you can examine the effects of changes made in the system. CMDB is composed of subsystems and each subsystem records to several log files.

---

**Note:** Log files are located in the <HP Business Availability Center root directory>\log folders.

---

## CMDB Server Parameters

This section contains definitions for CMDB server parameter log files.

This section includes the following topics:

- “Lifecycle Log” on page 353
- “General CMDB Log” on page 353
- “Quota Log” on page 354



## Lifecycle Log

The log name is **cmdb.info.log**.

Log File	Description
Purpose	CMDB server lifecycle: <ul style="list-style-type: none"> <li>▶ all server tasks</li> <li>▶ customer loading and unloading</li> <li>▶ startup and shutdown of Task manager</li> </ul> Contains information about any application that does not start up correctly.
Information Level	All lifecycle details.
Error Level	Startup errors of CMDB subsystems, primarily in the data access layer.
Debug Level	Not applicable
Basic Troubleshooting	<ul style="list-style-type: none"> <li>▶ If the CMDB client receives an exception that the customer does not exist, check that the customer is properly loaded.</li> <li>▶ If the CMDB client receives an exception that it cannot find CMDB in a JNDI lookup, check that the CMDB server is bound in the JNDI tree.</li> <li>▶ If the HA Controller does not load the CMDB customers, check that the CMDB server is registered in the HA controller.</li> </ul>

## General CMDB Log

The log name is **cmdb.log**.

Log File	Description
Purpose	Errors of all CMDB subsystems and CMDB CITs that do not have their own log file.
Information Level	Information from the CMDB server not directed to any specific log.
Error Level	All errors in the CMDB server.

Log File	Description
Debug Level	Debug information in the CMDB server that is not directed to a specific log.
Basic Troubleshooting	CMDB server errors during CMDB deployment.

## Quota Log

The log name is **cmdb.quota.log**.

Log File	Description
Purpose	Quota names, quota values, and current quota levels.
Information Level	Quota names and values set in the server and customer levels during a customer load.
Error Level	CMDB operations that fail because they exceed quota limits.
Debug Level	A count collector runs every <b>n</b> minutes and gathers current counts for all quotas. Collected counts are logged.
Basic Troubleshooting	If operations fail because of quota limits, check the count growth and quota values.

## CI Type Model Log

The log name is **cmdb.classmodel.log**.

Log File	Description
Purpose	CI Type Model errors and debug messages.
Information Level	When a CI Type Model is loaded, incorrect definitions are logged as informational messages. An example of an incorrect definition is duplicate attributes.
Error Level	Not available.

Log File	Description
Debug Level	<p>Every CI Type update includes the following:</p> <ul style="list-style-type: none"> <li>▶ original CIT in XML format</li> <li>▶ new CIT in XML format</li> <li>▶ differences between the CITs</li> </ul> <p>If the CI Type Model update is rejected, the reason is logged.</p>
Basic Troubleshooting	<p>Compares the differences that the server finds between the original CIT and the new CIT. This is useful to understand the following scenarios:</p> <ul style="list-style-type: none"> <li>▶ a CIT in a package failed</li> <li>▶ an action in the CIT browser applet failed</li> <li>▶ an action in the CIT browser applet succeeded when it should have failed</li> </ul>

## CMDB Notification Log

The log name is **cmdb.notification.log**.

Log File	Description
Purpose	<p>Notification messages from the time of the component's creation in CMDB until the client's listener receives a message. Most components receive configuration changes from CMDB in push mode, by the notification mechanism, rather than in pull mode.</p>
Information Level	<ul style="list-style-type: none"> <li>▶ startup and shutdown of publishers</li> <li>▶ register and unregister remote and internal listeners</li> </ul>
Error Level	<ul style="list-style-type: none"> <li>▶ errors when messages are published</li> <li>▶ errors when messages are received</li> </ul>
Debug Level	<ul style="list-style-type: none"> <li>▶ unique message ID</li> <li>▶ number of changes that a message includes as well as more details according to the type of the message (for example, the TQL result version)</li> <li>▶ JMS header properties</li> </ul>

Log File	Description
Basic Troubleshooting	<p>If an application does not receive a notification, check the following:</p> <ul style="list-style-type: none"> <li>▶ a listener is registered with the appropriate notification filter</li> <li>▶ a message is published with data that matches this filter</li> <li>▶ a message is received by the listener (use the unique message ID to verify)</li> </ul>

## CMDB Model Audit Short Log

The log name is `cmdb.model.audit.short.log`.

Log File	Description
Purpose	<p>Information about a CI Type operation: type of operation, data received as input, and what happened to the data in each CIT.</p> <p>Also contains information about the caller application, execution times, and persistency time.</p>
Information Level	Operation details
Error Level	Not available.
Debug Level	Not available.
Basic Troubleshooting	<p>If there are no changes when there should be, check the following:</p> <ul style="list-style-type: none"> <li>▶ the operation exists</li> <li>▶ the input is correct</li> <li>▶ what happened to the data. There may have been a false update.</li> </ul> <p>This is especially useful when running Discovery to trace the input.</p>

## TQL Logs

This section contains definitions for TQL parameter log files.

This section includes the following topics:

- “Pattern Log” on page 357
- “Pattern Statistics Log” on page 358
- “Audit Short/Detailed Log (TQL Perspective)” on page 359
- “Incremental Statistics Log” on page 359
- “Incremental Splitter Log” on page 360
- “Incremental Detailed Log” on page 361

### Pattern Log

The log name is **cmdb.pattern.log**.

Log File	Description
Purpose	Information about the lifecycle of a TQL query that is handled and calculated in the CMDB. Only TQLs stored in the CMDB are included. Information about ad hoc TQLs is not included.
Information Level	Not available.
Error Level	Not available.
Debug Level	Possible actions performed on each TQL query include: <ul style="list-style-type: none"> <li>➤ status changes</li> <li>➤ model changes</li> <li>➤ query changes</li> <li>➤ completed calculations</li> </ul>

Log File	Description
Basic Troubleshooting	<p>Check if a TQL query has the same status for a long time:</p> <ul style="list-style-type: none"> <li>▶ <b>new</b> – the query is in lazy loading</li> <li>▶ <b>inactive</b></li> <li>▶ <b>calculation</b> – the calculation may have failed but the scheduler was not informed</li> </ul> <p>You can also see the number of notifications that a TQL received.</p>

### Pattern Statistics Log

The log name is `cmdb.pattern.statistics.log`.

Log File	Description
Purpose	General calculation data for each TQL, updated at predefined intervals.
Information Level	<p>The following information is given for each TQL:</p> <ul style="list-style-type: none"> <li>▶ name</li> <li>▶ average, minimum, and maximum calculation times</li> <li>▶ number of calculations</li> <li>▶ last calculation time</li> <li>▶ result size</li> </ul>
Error Level	Not available.
Debug Level	Not available.
Basic Troubleshooting	<ul style="list-style-type: none"> <li>▶ Verify that a specific TQL was updated.</li> <li>▶ Evaluate a TQL's calculation time.</li> <li>▶ Evaluate a TQL's result size.</li> </ul>

## Audit Short/Detailed Log (TQL Perspective)

The log name is `cmdb.audit.short.log`.

Log File	Description
Purpose	CMDB state changes, CI Type changes, and TQL results. You can use this log to follow the results of TQL queries.
Information Level	Not available.
Error Level	Not available.
Debug Level	<ul style="list-style-type: none"> <li>▶ Final calculation for TQLs is logged.</li> <li>▶ If the final TQL calculation is unchanged from the previous calculation, this is noted.</li> <li>▶ If the final TQL calculation is changed from the previous calculation, results of the CIs and relationships are recorded in the detailed log. The number of CIs and relationships are recorded in the short log.</li> </ul>
Basic Troubleshooting	<ul style="list-style-type: none"> <li>▶ Use this log to verify which notifications are published by the TQL subsystem.</li> <li>▶ Check the section at the end of each result. This section includes added, removed, and updated CIs and relationships.</li> <li>▶ Track the CIT changes and see if the query results also change. You can thus correlate the CIT changes to the results of the query calculations.</li> </ul>

## Incremental Statistics Log

The log name is `cmdb.incremental.statistics.log`.

Log File	Description
Purpose	Traces the calculation procedure, full or incremental, of every query.
Information Level	Not available.

Log File	Description
Error Level	Not available.
Debug Level	<ul style="list-style-type: none"> <li>▶ Gives the date, time, query name, and whether an incremental statistic calculation was performed (yes/no).</li> <li>▶ If an incremental statistic calculation was not performed, states the reason, the number of subcalculations (relevant for incremental calculations only), and the complete calculation time.</li> </ul>
Basic Troubleshooting	<p>Monitors the calculation process.</p> <p>If a specific query calculation takes a long time, check if it is a full or incremental calculation:</p> <ul style="list-style-type: none"> <li>▶ If full, check whether a full calculation is necessary.</li> <li>▶ If incremental, check how many subcalculations have been performed.</li> </ul>

## Incremental Splitter Log

The log name is `cmdb.incremental.splitter.log`.

Log File	Description
Purpose	Monitors the incremental splitter result made during an incremental calculation.
Information Level	Not available.
Error Level	Not available.
Debug Level	Gives the set of node numbers of each query graph created by the incremental splitter.
Basic Troubleshooting	If the TQL result calculated by the incremental calculator is wrong, verify that the splitter result is correct.



## Incremental Detailed Log

The log name is `cmdb.incremental.detailed.log`.

Log File	Description
Purpose	Monitors the incremental calculation process.
Information Level	Not available.
Error Level	Not available.
Debug Level	Each incremental subcalculation entry includes the following: <ul style="list-style-type: none"> <li>▶ the trigger node</li> <li>▶ the number of elements classified to the trigger node</li> <li>▶ whether the subcalculation step is driven by new elements added to the model or by existing elements</li> <li>▶ the calculated query graph</li> </ul>
Basic Troubleshooting	Follows the basic steps of an incremental calculation.

## History Database Log

The log name is `cmdb.history.log`.

Log File	Description
Purpose	<ul style="list-style-type: none"> <li>▶ Records which CITs are found by the History database when the database is initialized from an existing topology.</li> <li>▶ Records what is to be saved in the History database.</li> <li>▶ Tracks events saved in the History database.</li> <li>▶ Records when the History database was purged.</li> </ul>
Information Level	<ul style="list-style-type: none"> <li>▶ When the last purge was carried out.</li> <li>▶ Information about initialization of the History database.</li> </ul>

Log File	Description
Error Level	Lists errors that occur when event information is inserted in the History database.
Debug Level	<ul style="list-style-type: none"> <li>▶ Details about CITs inserted during initialization of the History database.</li> <li>▶ Details about changes in the TQL results saved in the History database.</li> </ul>

## CMDB Enrichment Log

The log name is `cmdb.enrichment.log`.

Log File	Description
Purpose	<p>Enrichment definitions: adding, updating, removing, and calculating.</p> <p>Calculation results such as how many CIs were added, how many relationships were removed, and so forth.</p> <p>Supplies the reason for a calculation failure. Failure in a model update, however, is not included since it is an asynchronous execution.</p>
Information Level	<ul style="list-style-type: none"> <li>▶ Add, update, and remove enrichment definitions.</li> <li>▶ Add, update, and remove CIs or relationships to or from a model.</li> </ul>
Error Level	Calculation failure.
Debug Level	Traces the enrichment calculation process.
Basic Troubleshooting	<ul style="list-style-type: none"> <li>▶ If no calculation was carried out, check the definition of <b>add enrichment</b>.</li> <li>▶ If there are no results, check the <b>finish calculate</b> entry.</li> </ul>

## CMDB Plug-in Log

The log name is **cmdb.plugins.log**.

Log File	Description
Purpose	Plug-in input and output notification.
Information Level	Lifecycle of publisher.
Error Level	<ul style="list-style-type: none"> <li>▶ no customer name exists in the customer ID</li> <li>▶ publisher failure</li> </ul>
Debug Level	Receive or send a change.
Basic Troubleshooting	If notification did not reach the destination, check that the plug-in received the input.

## CMDB Dal Log

The log name is **cmdb.dal.log**.

Log File	Description
Purpose	Information about activity that occurred in the data access layer, the layer that works with CMDB.
Information Level	Not available.
Error Level	<ul style="list-style-type: none"> <li>▶ connection pool errors</li> <li>▶ database errors</li> <li>▶ command execution errors</li> </ul>

Log File	Description
Debug Level	<ul style="list-style-type: none"> <li>▶ all DAL commands executed</li> <li>▶ all SQL commands executed</li> </ul>
Basic Troubleshooting	<p>If you suspect that CMDB actions are taking too long, check the time spent on queries and updates in the dal logs and operation logs.</p> <p>Exception details and ID are entered into the log. The exception ID appears in the exception itself.</p>

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