OPTIMIZE

MERCURY APPLICATION MAPPING™

User's Guide

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BUSINESS TECHNOLOGY OPTIMIZATION

Mercury Application Mapping

User's Guide

Version 6.5

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Mercury Interactive Corporation
379 North Whisman Road
Mountain View, CA 94043
Tel: (650) 603-5200
Fax: (650) 603-5300
http://www.mercury.com

If you have any comments or suggestions regarding this document, please send them by e-mail to documentation@mercury.com.

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PART III: PATTERN VIEWS AND FOLDING RULES

Welcome to Mercury Application Mapping User's Guide

This guide provides detailed instructions on how to use Mercury Application Mapping.

How This Guide is Organized

The guide contains the following parts:

Part I Introduction

Introduces Mercury Application Mapping technology, its architecture, its workflow, and provides a quick tour of the application.

Part II Topology Query Language Builder

Describes how to define and save different types of TQL queries as well as TQL validation restrictions.

Part III Pattern Views and Folding Rules

Describes how to define managed views, which are a series of rules and definitions for displaying query results, and how to notify specific users, group members, or unregistered interested parties of changes that occur in views and nodes.

Part IV Viewing Queries with Topology View

Describes how to view multi-level maps that display the results of the query based on a selected view; how to manage the events occurring in the system, at the CI level and at higher, top-view levels, enabling you to locate problems occurring in different areas of your IT infrastructure; and how to monitor the changes occurring in the managed world and provide information about those changes using the Event System.

Part V Generating Reports

Describes how to generate Asset, Dependency, Event, and Change reports.

Part VI Correlation Rules

Describes how to use the Correlation Manager to create topology correlations, and define correlation rules.

Part VII Enrichment Nodes and Rules

Describes how to use the Enrichment Manager to create Enrichment nodes and rules, and create sample views.

Part VIII System Reports

Describes how to use the Report Manager to create system reports and how to create a sample system report.

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Describes how to use the CI Type Manager to view the CI Type Model of your managed world, to create and add new CITs to the CI Type Model, and to create a predefined list whose values define an attribute type.

Part X Applications

Describes how to use one of the Mercury Application Mapping applications to take a snapshot of a specific view, save it and then compare it, using Mercury Application Mapping's comparison capabilities, to snapshots taken of that view at different times; how to use another application that enables you to view the content of configuration files and compare the differences between them; and how to assess the impact of infrastructure events.

Part XI Appendixes

Provides information about the permitted relationships between CIs, key attributes of CITs, relationship definitions, and a glossary.

Getting More Information

For information on using and updating the Mercury Application Mapping Documentation Set, reference information on additional documentation resources, typographical conventions used in the Documentation Set, and quick reference information on deploying, administering, and using Mercury Application Mapping, refer to *Getting Started with Mercury Application Mapping*.

Part I

Introduction

1

Introduction

This chapter provides a general introduction to Mercury Application Mapping.

About Mercury Application Mapping

Mercury Application Mapping is an application that uses Mercury's Topology Information System (TIS) technology to manage all the configuration items (CIs) contained in a managed world. A managed world refers to any self-contained environment that can be described using a topology model. For example, the IT infrastructure of a large business represents a managed world, where the topology is comprised of multiple layers such as networks, protocols, databases, operating systems, and so forth.

Mercury Application Mapping addresses the following operational and functional needs:

- **IT resources and application alignment**. Automatic discovery of IT resources and their interdependencies from a business service perspective.
- **Problem isolation and problem resolution.** Understanding the causal relations between CIs to locate and address the root cause of infrastructure problems and reduce troubleshooting time.
- **Business impact analysis.** Evaluating the impact of infrastructure events on business services to assess their implications and prioritize the responses to them.
- **Asset and change management control**. Automatic detection of infrastructure changes, to enable automatic updating of all the relevant subsystems.
- **Customized state management, such as performance and change**. Ability to define a CIs management state.
- **Performance management and capacity planning**
- **Architecture and infrastructure planning**

Mercury Application Mapping offers a configurable and flexible approach to business service management. It uses TQL query language, which enables you to focus on the information relevant to your needs. For details, see "Mercury Application Mapping Topology Query System" on page 5. Mercury Application Mapping enables you to manage views so that you view the information in exactly the format you require. For details about managed views, see "Working with Pattern Views" on page 97.

Additionally, the information contained in the results of each query is updated automatically with the latest data entering the configuration management database (CMDB). As a result, once a query and managed view have been defined, they continue to provide updated information about the current state of your managed world. Managed views are displayed in multi-level maps that enable you to identify key CIs and events, as required. The Report Manager enables you to create reports (in HTML, Excel or Table format) about information collected by the system.

Mercury Application Mapping Discovery Process

The Mercury Application Mapping discovery process is the mechanism that enables you to collect data about your system by discovering the IT infrastructure resources and their interdependencies. It can discover such resources as applications, databases, network devices, different types of servers, and so forth. Each discovered IT resource is then delivered and stored in the configuration management database (CMDB) where it is represented as a managed configuration item (CI). For more information about the CMDB, see "Configuration Management Database (CMDB)" on page 7.

The Mercury Application Mapping discovery process is run by activating discovery patterns. For more information about the Mercury Application Mapping discovery process, see *Discovery Manager Administration*.

Mercury Application Mapping Topology Query System

The Topology Query System includes Topology Query Language (TQL), a language and tool for discovering, organizing, and managing IT infrastructure data (for details, see "Topology Query Language (TQL)" on page 6).

TQL is used to build a business service model that guides the discovery and identification of the business services and structures the way they are organized and managed in the CMDB. TQL is used to create queries that retrieve business service data from the CMDB, and display that data. TQL queries constantly search the CMDB for changes that occur in the state of managed resources, and inform and update the relevant subsystems (for details, see "The Roles of TQL" on page 7).

The CMDB is the core information repository of Mercury Application Mapping. 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 details, see "Configuration Management Database (CMDB)" on page 7). For details on the CI Type model, see Part IX, "The CI Type Manager".

The Topology Query System is the underlying mechanism of all Mercury Application Mapping core modules. It enables the user to create a TQL query (for details, see "Mercury Application Mapping Core Modules" on page 9).

This section includes the following topics:

- Topology Query Language (TQL)
- The Roles of TQL
- Configuration Management Database (CMDB)
- What is a Configuration Item (CI)?
- What is a Node?
- Mercury Application Mapping Core Modules

Topology Query Language (TQL)

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

- TQL enables Mercury Application Mapping 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 has 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 is not in itself a stand-alone product. It is an integral part of Mercury Application Mapping and plays several roles:

- Builds a business service model that defines and delineates the interconnection between IT assets that function in concert 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. Once the resources that comprise the business services are discovered, the business service model structures the way they are organized and managed in the configuration management database (CMDB). For details, see "Configuration Management Database (CMDB)" on page 7.
- Creates queries that retrieve business service data from the CMDB, and displays it 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.

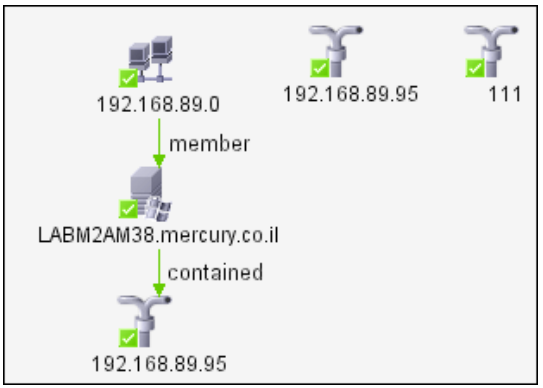
Configuration Management Database (CMDB)

The CMDB is the central repository for the configuration information gathered from Mercury Application Mapping and the various third-party applications and tools.

The CMDB contains all of the (CIs) and relationships created in Mercury Application Mapping, whether created automatically from the discovery process or inserted manually. The CIs and relationships together represent a model of all the components of the IT world in which your business functions. The CMDB stores and handles the infrastructure data collected and updated by the discovery process.

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

You use the service views (the factory service views supplied with Mercury Application Mapping), or instance views and pattern views defined in the Topology Map to display and manage the CIs and relationships in the CMDB. The views enable you to focus on specific IT areas and are available in Topology View, as shown in the figure below:



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 XML definitions used to define the CIs and relationships. For information on TQL queries, see “Topology Query Language (TQL)” on page 6 and “The Roles of TQL” on page 7.

What is a Configuration Item (CI)?

A configuration item (CI) is a component of the CMDB that represents a physical or logical entity in the system, for example, representing hardware, software, services, business processes, customers, and so forth. The CIs are part of the IT 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 Mercury Application Mapping are called relationships.

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

You view and manage the CIs in the CMDB using service views. CIs are the components that constitute service views in Topology View. Each service view provides a mirror for part of the IT model, so that the changes you make in the view are actually changes to the IT model.

What is a Node?

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

Mercury Application Mapping Core Modules

The Topology Query System is the underlying mechanism of all Mercury Application Mapping core modules. It enables you to create a TQL query, a graphic scenario of CIs and their interdependencies, which addresses the corresponding structure of a business service or any other formation of IT data in the managed world.

After a TQL query is defined, it scans the CMDB for the requested information on a regular basis. When matching results are found, they are stored in one of the database subsets. They can then be displayed and analyzed through the other Topology modules.

Since the TQL queries are self-maintaining and dynamic, they are constantly polling the CMDB for changes in CIs or their interdependencies. When changes are discovered, the query results are automatically updated and all relevant subsystems are informed and alerted.

There are five types of TQL queries: Discovery, Viewing, Correlation, Reporting, and Enrichment.

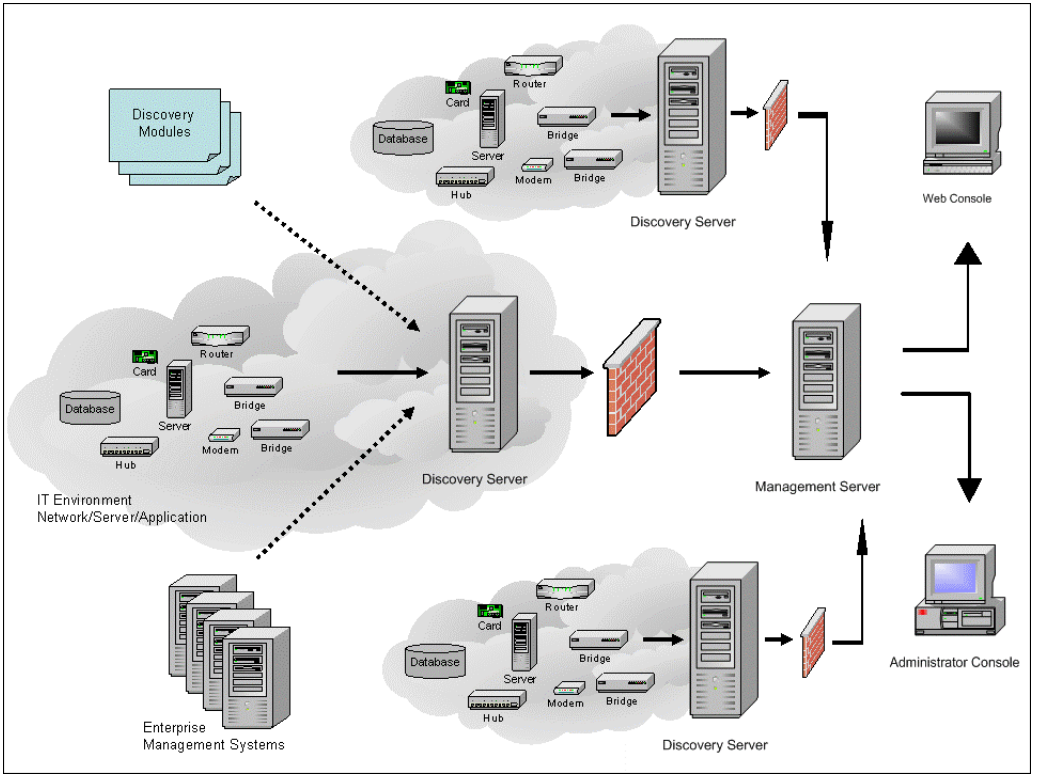
- **Viewing System (Mapping System)**. Generates specific managed views (maps) that display the query results and enable their monitoring and management. The Viewing System provides the user with following rules for achieving the kind of display that best serves his/her needs:
  - **Folding Rules**. For arranging the results data in a structured display. The folding rules arrange the result data in multi-layer views, and define the position of CIs in each layer. This way, all query results can fit into one window, and the user can focus on a specific area of interest by navigating between a view's layers, either by individually selecting the required layers or by drilling down from higher layers to lower ones. For details, see "Adding Folding Rules to Relationships" on page 142.
  - **Personalization Rules**. For customizing the built-in display rules of the Viewing System. These built-in rules are designed to create visual indications that assist in the management of the displayed data. By customizing them, the user can adapt the display rules to management requirements. For example, a Viewing System rule states that when an event with a severity higher than Normal occurs in relation to a CI in a Normal state, the CI starts blinking and this blinking passes on to the layers above the CI. The user can control this blink, and decide whether the blinking propagates and to which view layers. For details, see "Understanding the Event System" on page 214.
- **Correlation System**. Defines causal relationships between CIs, to enable you to locate and identify, in case of system's alerts, the CI that is the root cause of a problem and the one(s) affected by it.

  The Correlation Module uses topology knowledge that is gathered through TQL queries, to automatically outline the interdependencies that exist between service components in a specific IT infrastructure. By using this information to predefine correlation rules and scenarios, correlation events are generated when a change in one CI's state affects the state of others. These automatically-generated correlation events contain information that enable Mercury Application Mapping to quickly identify the true origin of a change, to assess the implications and consequences of infrastructure changes, and to appropriate prioritization in handling alerts. For details, see "Using the Correlation Manager" on page 263.

- **Reporting System**. Defines templates for displaying and analyzing the data that is gathered by TQL queries. These templates are defined by the user, and determine the content, structure, and layout of the final reports. The wide variety of options enables the generation of focused summaries and statistics about specific aspects or general conditions of the managed world. For details, see "Creating System Report Templates" on page 339.
- **Enrichment System**. Enlarges the CMDB by adding CIs and relationships that are currently not included in it. This system allows you to integrate prior knowledge or knowledge you deduced from accumulated information, with data that is found through the discovery process. For details, see "Defining Enrichment Nodes and Rules" on page 293.

Mercury Application Mapping Deployment

The following diagram provides a graphical overview of a typical deployment of the Mercury Application Mapping system.



Launching Mercury Application Mapping

For details on logging in to Mercury Application Mapping, see *Getting Started with Mercury Application Mapping*.

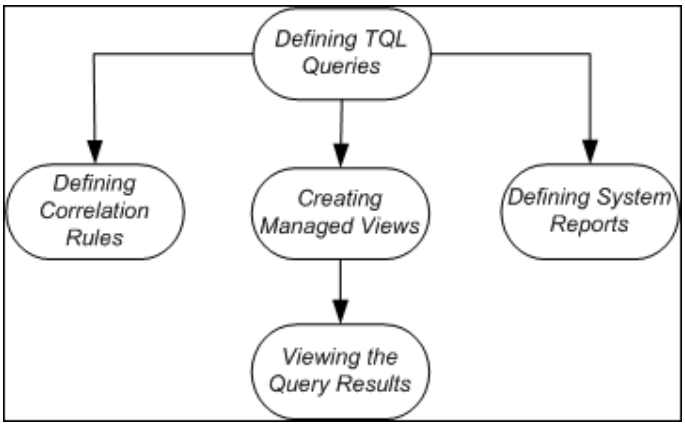
2

Mercury Application Mapping Quick Tour

This chapter introduces the basic concepts of the Mercury Application Mapping application and familiarizes you with its components and functionality.

Mercury Application Mapping Workflow

The following workflow contains the main tasks that are performed when creating a TQL query in Mercury Application Mapping.



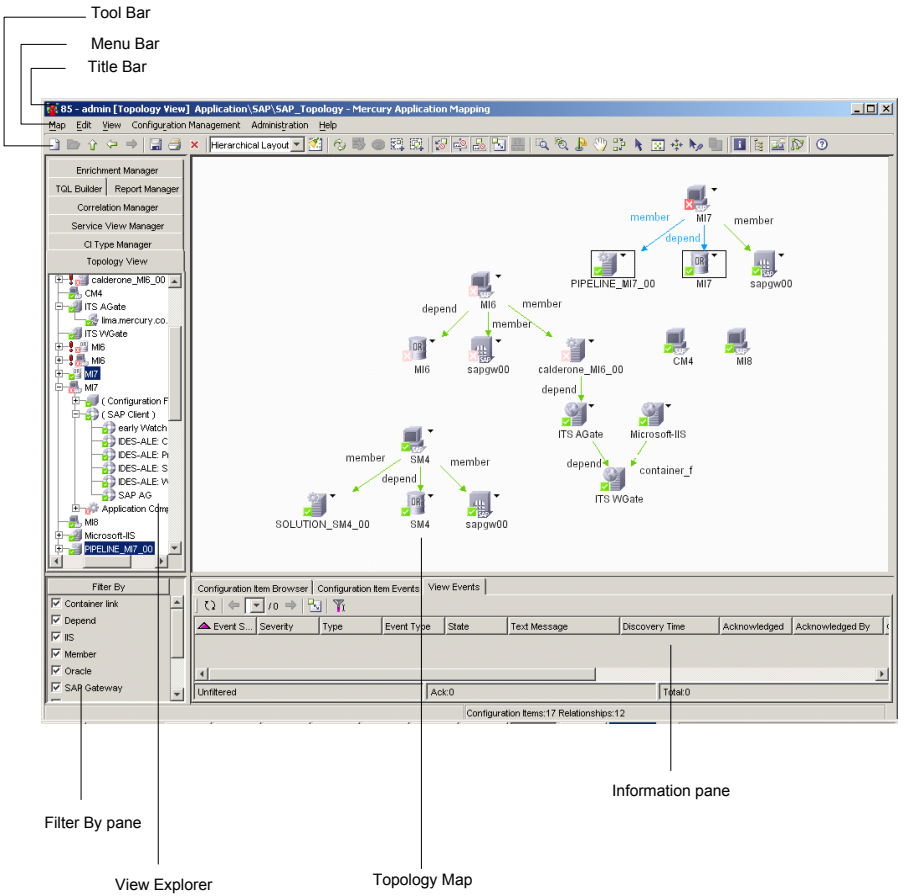
Each step in the workflow summarizes the main tasks performed, as described below:

- **Define a new query**. You define a new query using the Topology Query Language Builder, by selecting TQL nodes and defining the specific attributes and conditions of the nodes and relationships that define the connection between the nodes. Depending on the type of TQL query created, you then create managed views, define correlations rules, or produce reports. For details, see Part II, "Topology Query Language Builder."
- **Create a new view**. You create a new view, attach it to a specific View TQL query and define how the query results are displayed in the topology map. This includes adding organizational rules and notifications to define the organization structure of the CIs in the topology map. For details, see Part III, "Pattern Views and Folding Rules."
- **View multi-level maps that display the results of queries based on selected views**. You can also search for CIs and display and monitor the changes that occur in your managed data using the Event system. This includes managing the events related to specific nodes in your query and locating problems occurring in your network. For details, see Part IV, "Viewing Queries with Topology View."

- **Define the causal relationships between CIs and the implications of these interdependencies**. This consists of creating a Correlation TQL, defining root cause CI and CIs that are affected by it, deciding which users and/or groups are to receive events from the root cause CI, setting the event message format, and determining the event severity. For details, see Part VI, "Correlation Rules."
- **Create and define enrichment rules**. These rules can be used for several purposes: creating new enrichment nodes and relationships for adding data to the CMDB, and allowing additional representation options of existing data; updating the value of CI attributes in the database; and deleting CIs from the database. For details, see "Defining Enrichment Nodes and Rules" on page 293
- **Create and define system reports based on the Report TQL**. This consists of defining the basic report parameters, the report layout, and the data display order. You can then view the selected report or save it to a local directory. For details, see Part VIII, "System Reports."
- **Create and Edit CITs**. For details, see Part IX, "The CI Type Manager."
- **Manage business services, view event information and perform Mercury Application Mapping actions**. Use Mercury Application Mapping WebView—a Web-based management console—to use business service management. For details, see the *Mercury Application Mapping WebView User's Guide*.

Mercury Application Mapping Main Window

The Mercury Application Mapping main window enables you to work with the Mercury Application Mapping layers, menus, toolbar functions, and windows.



➤ **Title bar.** Displays the following information:

- ➤ The name of the active server
- ➤ The name of the currently logged-in user
- ➤ The displayed Manager

- The name of the selected view/TQL/rule

- **View Explorer**. Contains hierarchical tree structures of the CI Type model, TQL Queries, managed views or map CIs, depending on the tab selected (for details, see "View Explorer" on page 18).
- **Filtered By pane**. Contains CI groups that can be displayed or hidden in the topology map.
- **Topology map**. Displays multi-layered views of CIs and relationships, including the connections between them, using various relationship types. Each CIT has a unique icon; its neighbors (as indicated by its connection to the CIT in the View Explorer) all share the same shape surrounding the icon. (Shapes are predefined according to logical CIT groupings.)

  In addition, the topology map includes the following components:

  - When the TQL Builder tab is selected, the Configuration Item Types pane is displayed.
  - When the Topology View tab is selected, the Information pane is displayed.
- **Information pane**. Displays different tabs (Information Browsers) depending on the Information Browser selected **View** menu. To hide/display the Information Browsers, select **View** > **Information Browsers** and click the Information Browser you want to hide/display. For more information on Information Browsers, see "View Menu" on page 22.
- **Menu bar**. For details, see "Menu Bar" on page 19.
- **Toolbar**. For details, see Chapter 3, "Toolbar Options".

This section contains the following topics:

View Explorer

The View Explorer contains hierarchical tree structures of the CI Type model, TQL Queries, managed views or map CIs, depending on the tab selected. The tabs are:

- **Correlation Manager**. Enables you to define correlation rules, which specify a causal relationship between two or more nodes and physical relationships. Each correlation rule you define is attached to a specific Correlation TQL query. This type of TQL query is created especially for correlation rules, and provides them with the required dependency information for their execution. For details, see "Using the Correlation Manager" on page 263.
- **Service View Manager**. Enables you to define managed views that are a series of rules and definitions for displaying query results. For details, see "Introduction to the Service View Manager" on page 89.
- **Topology View**. Enables you to view the results of your TQL queries based on the view defined with the Service View Manager. The maps displayed in the topology map may be displayed in multiple layers, depending on whether organization rules are defined in the view. You can drill down from one layer to the next to see more CIs. The topology map also enables you to view events associated with the CIs displayed in each map. For details, see "Introduction to the Topology View" on page 155.
- **CI Type Manager**. Enables you to view the information in the CI Type model, which consists of all the defined CITs in the system and the relationships that define the connection between them. The CI Type model represents the structure of the managed world on which Mercury Application Mapping is used. For details, see "Introduction to the CI Type Manager" on page 373.
- **Enrichment Manager**. Enables you to integrate prior knowledge of the infrastructure with data that is found and gathered through the Mercury Application Mapping Discovery system and provides you with greater flexibility in managing queries and designing views. For details, see "Introduction to Enrichment Nodes and Relationships" on page 283.

- **TQL Builder**. Enables you to define and save different types of TQL queries. These queries, which use a structured language similar to SQL, perform various functions in the system, such as extracting the information from the CMDB that is relevant to the user, or creating a report containing specific information. For details, see "Introducing the Topology Query Language (TQL) Builder" on page 67.
- **Report Manager**. Enables you to define system reports about selected nodes in the managed world. Each report is based on a specific Report TQL query, which is created especially for it. (If required, you can define multiple reports for each query.) The Report Manager enables you to define exactly what information appears in each report, including the order in which nodes are listed and their placement relative to other nodes, how the information within each node is sorted and the maximum number of rows of information to include for each node. System reports can be displayed in three formats (HTML, Table and Excel), and can either be viewed immediately or saved for later use. For details, see "Introduction to the Report Manager" on page 333.

Menu Bar

This section describes the menu options available from the Mercury Application Mapping menu bar.

Map Menu

The **Map** menu contains the following options:

- **New**. Enables you to define new items in all Mercury Application Mapping Managers (except the topology map):
  - New queries in the TQL Builder. For details, see "Creating a TQL Query" on page 77.
  - New views in the Service View Manager. For details, see "Creating a Pattern View" on page 100.
  - New correlations rules in the Correlation Manager. For details, see "Creating a Correlation Rule" on page 270.
  - New enrichment nodes and relationships in the Enrichment Manager. For details, see "Creating Enrichment Nodes and Relationships" on page 301.

- New System Reports in the Report Manager. For details, see "Creating a Report" on page 341.
- New CITs in the CI Type Manager. For details, see "Creating CITs" on page 383.

- **Open**. Enables you to open a selected parent CI and drill down to its lower map layers in the topology map. For details, see Chapter 12, "Using the Topology Map."
- **Save**. Enables you to save new and changed items in all Mercury Application Mapping Managers (except the CI Type Manager):
  - TQL queries in the TQL Builder. For details, see "Saving a Query" on page 82.
  - Managed views in the Service View Manager. For details, see "Saving the Pattern View" on page 151.
  - Correlations rules in the Correlation Manager. For details, see "Saving the Correlation Rule" on page 279.
  - Any changes to the manual layout in the topology map. For details, see "Improving Views" on page 174.
  - System Reports in the Report Manager. For details, see "Displaying the Generated Report" on page 351.
- **Import**. Enables you to import into your system TQLs of different types, as follows:
  - TQL queries in the TQL Builder. For details, see "Saving a Query" on page 82.
  - Managed views in the Service View Manager. For details, see "Importing a Managed View" on page 151.
  - Correlations rules in the Correlation Manager. For details, see "Saving the Correlation Rule" on page 279.
  - Report templates. For details, see "Introduction to the Report Manager" on page 333).

➤ Enrichment rules. For details, see "Introduction to Enrichment Nodes and Relationships" on page 283).

You can import numerous items simultaneously, by using the CTRL and SHIFT keys.

- **Layout Properties**. Enables you to accurately define the view's layer layout, by assigning positions for the nodes and relationships of the view, to achieve the clearest presentation possible. For details, see Chapter 5, "Defining a View's Layout".
- **Export Graph**. Enables you to save a topology map to file. For details, see "Saving a Topology Map" on page 193.
- **Change Password**. Enables you to change your login password.
- **Page Setup**. Enables you to define the page setup for printing the contents of the topology map.
- **Print information pane**. Enables you to print the contents of the Information pane in the topology map. For details, see "Printing Options" on page 41.
- **Map printing settings**. Enables you to set printing options. For details, see "Printing Options" on page 41.
- **Print Map**. Enables you to print the contents of the topology map. For details, see "Printing Options" on page 41.
- **Print Preview**. Enables you to preview the topology map before printing. For details, see "Printing Options" on page 41.
- **Exit**. Closes the application.

Edit Menu

The **Edit** menu contains the following options:

- **Insert Configuration Item**. Displays the Insert Configuration Item dialog box, enabling the administrator to manually add CIs to the CMDB. For details, see "Adding CIs to the CMDB" on page 196.
- **Add Background Image**. Enables you to add a background map for display and navigational purposes in the topology map. This is used with the Manual Layout option. For details, see "Adding a Background Image to a Topology Map" on page 174.

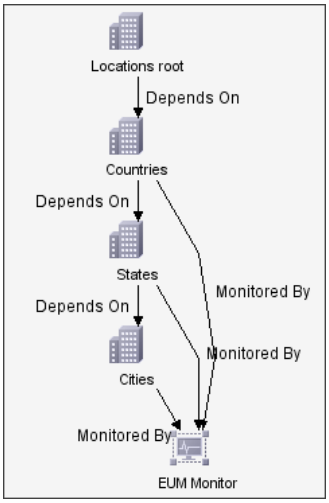
➤ **Find**. Enables you to search for CIs in the topology map, either in specific views and layers, or in the entire CMDB. The Find option also provides you with different search criteria, through which you can search for CIs according to their CIT, label, and/or attributes. For details, see "Searching for CIs" on page 202.

View Menu

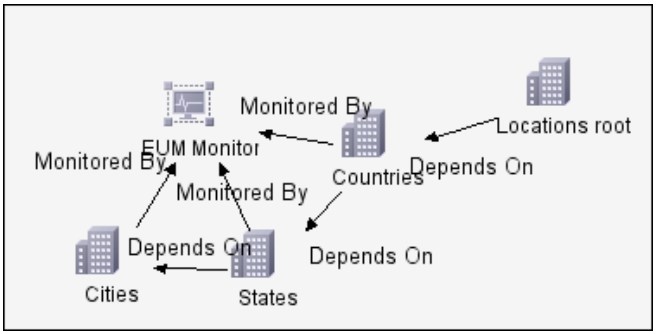
The **View** menu contains the following options.

➤ **Layout**. Contains the following options for displaying the contents of the topology map:

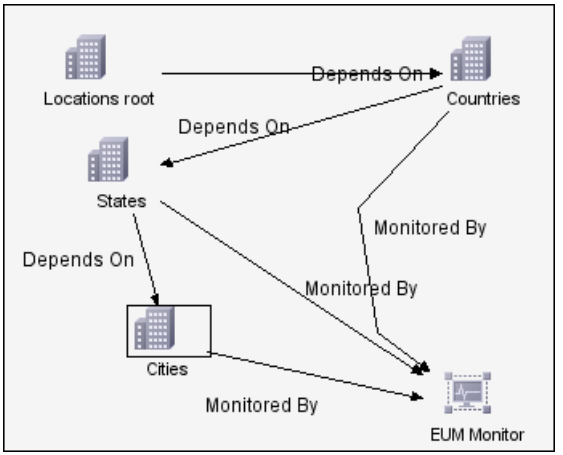
➤ **Hierarchical Layout**. Displays the precedence relations in the topology.



➤ **Symmetric Layout**. Displays clear representations of complex networks.



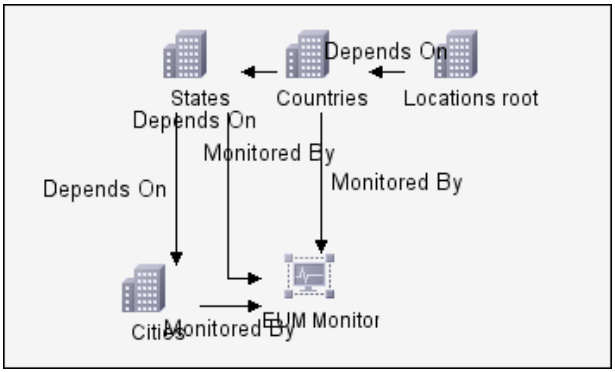
➤ **Manual Layout**. Enables you to manually change the topology map display, by dragging the displayed nodes and relationships to your required location.



Note: To save the manual changes and reuse the layout you created, click the **Save** button on the toolbar.

You can save only one manual layout. If another manual layout is already saved, you are asked whether you want to replace the saved layout. Click **Yes** to save the new layout. Click **No** to keep the old layout.

- **Orthogonal Layout**. Displays views of enhanced clarity by employing only horizontal and vertical edge routing.



- **Zoom**. Zooms in on a specific section of the topology map by clicking and drawing a selection rectangle around the part you want to magnify. When you select this option, the pointer becomes a zoom.

- **Interactive Zoom**. When you select this option, the pointer becomes an interactive zoom. You decrease the view magnification by clicking and pushing the pointer away from you and magnify the view by clicking and pulling the pointer towards you.

- **Fit to Window**. Fits the complete view area in the window.

Note: The **Zoom**, **Interactive Zoom**, **Fit to Window**, and **Layout** options are also displayed by right-clicking inside any empty area of the topology map.

- **Information Browsers**. Enables you to open or close the following Information tabs, which are displayed in the Information pane in the topology view:
  - "Configuration Item Browser" on page 159
  - "Configuration Item Events" on page 219
  - "View Events" on page 219
- **Show Hidden Symbols**. Displays hidden CIs.

- **Details**. Displays the attributes of all CIs that are located in the same view layer in one table. Data is organized by the CIT of the CI. For details, see "Viewing Layers with a Large Number of CIs" on page 179.

Configuration Management Menu

The **Configuration Management** menu contains the following options:

- **Compare Compound**. Compares two compound objects, enabling you to see the difference between the hierarchies of the two objects. For details, see Chapter 30, "Gold Master Comparison".
- **System Reports**. Displays the System Reports dialog box, enabling you to select the report you want to view. For details, see "Displaying the Generated Report" on page 351.
- **Gold Master Reports**. Enables you to generate a report that compares the configuration of a GoldMaster CI to other CIs of the same CIT (for details, see "Understanding Gold Master Comparison" on page 424.
- **Impact Analysis**. Displays the Ticket Manager, enabling you to simulate how the changes you want to make will impact your system. For details on impact analysis, see "Impact Analysis" on page 453.

Administration Menu

The **Administration** menu contains the following options:

- **Discovery Manager**. Enables you to design, edit, and activate discovery patterns. For details, see "Running the Discovery Process" in *Discovery Manager Administration*.
- **User Management**
  - **User Profile**. Enables you to display in the topology map selected views and the events related to those views, use existing Event Filters to filter the displayed events, and define your display definitions. For details, see the *Mercury Application Mapping Administration Guide*.
  - **User Manager**. Enabling administrators to create and manage the system's users.
  - **Role Manager**. Enables you to create and manage roles. For details on users and roles, see "Introduction to User and Role Administration" in the *Mercury Application Mapping Administration Guide*.

- **Security Manager**. Enables you to define specific user or role permissions for different Mercury Application Mapping resources. For details, refer to "Introduction to User and Role Administration" in the *Mercury Application Mapping Administration Guide*.
- **Show Concurrent Users**. Enables you to see which users are currently logged in.

- **State Manager**. Enables you to define a CI's management state. For details, refer to "Defining Attribute States" in the *Mercury Application Mapping Administration Guide*.
- **System Type Manager**. Enables you to define an attribute whose value has been predefined. For details on creating Enumeration definitions, see "Enumerations and Lists" in the *Mercury Application Mapping Administration Guide*.
- **Event Configuration**. Enables administrators to configure the event system, which consists of defining rule and time actions, as well as the message catalog and priorities.

Note: User management and event configuration can be performed only by system administrators.

- **Scheduler**. Enables you to schedule the system to automatically activate actions on a periodic basis. For example, you can define a schedule for an automatic backup of the database, and determine how many backups are to be saved. For details on scheduled actions, see "Task Scheduling" in the *Mercury Application Mapping Administration Guide*.

Help Menu

The **Help** menu contains the following option:

- **Help**. Opens the Documentation Index.
- **About Mercury Application Mapping**. Displays software version information.

Toolbar

For a description of Mercury Application Mapping's toolbar options, see "Toolbar Options" on page 33.

The Main Window's Level Structure

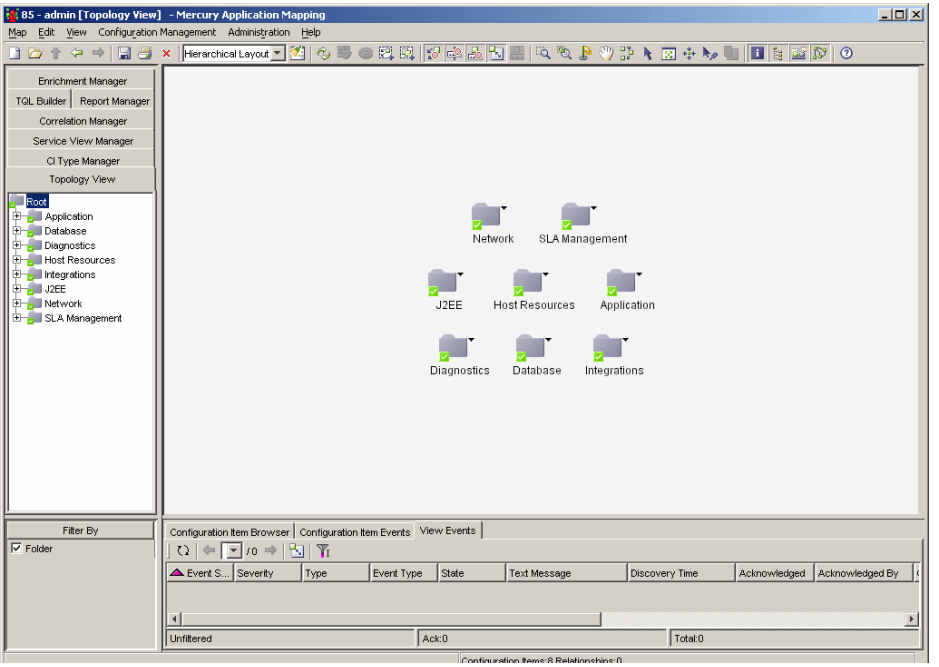
The Mercury Application Mapping main window includes the Folder, View, and CI levels. They can include additional sublevels or layers.

To drill down from a higher level to a lower one, double-click the symbol on the topology map. For more navigation options, see "Navigating in Maps" on page 172.

This section includes the following topics:

Folder Level

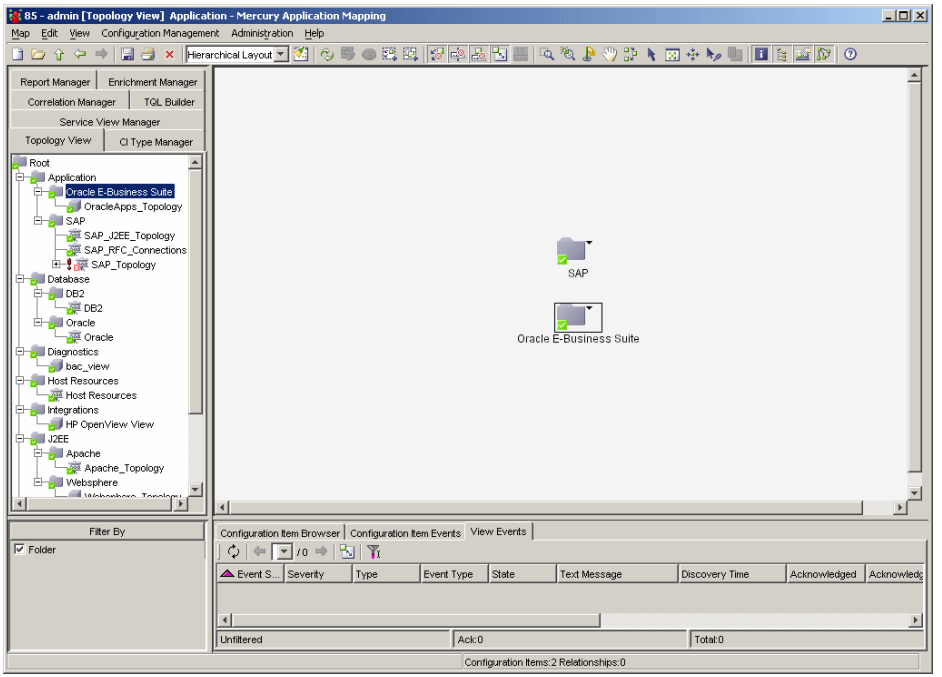
If you choose to connect to only one server in the Login stage, or if you double-clicked one of the displayed servers, you can view either the Folder level or the View level (see next section), depending on whether views are organized in folders in your system.



A folder can contain subfolders and several views. You use the Service View Manager to organize the views in a folder. For details, see “View Shortcut Menu” on page 93.

View Level

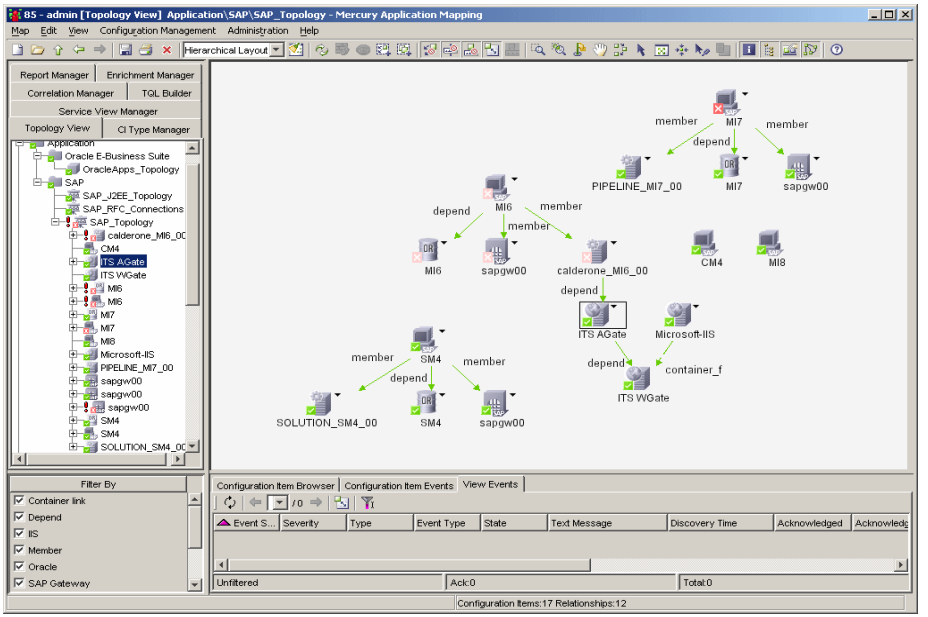
The View level displays the views that are set in the Service View Manager to be displayed on the topology map, and the views that are part of your user profile. For details, see “Defining a View’s Layout” on page 45.



Note: A view’s icon can be customized in the Service View Manager. For details, see “Navigating in Maps” on page 172.

CI Level

The CI level displays the view results, that is, the CIs and relationships that fulfill a View TQL query. These CIs and relationships are displayed according to the display and folding rules assigned to them in the Service View Manager.



The icon that represents each CI and relationship is determined by the CI/relationship CIT. CI icons are comprised of the following components:

- An icon.
- The severity, for example, critical or major, appears in the lower left-hand corner.

If an icon appears with a downward arrow, as shown in the example above, it means that there is an additional CI layer beneath it, which was created by a parent or child folding rule defined in the View Manager. For information on how to set up folding rules, see “Adding Folding Rules to Relationships” on page 142. For information on how to navigate between layers, see “Navigating in Maps” on page 172. Double-click to drill down to the lower level(s).

Working with Mercury Application Mapping

Several features of Mercury Application Mapping work the same way across the different components:

- "Selecting Multiple CIs" on page 31
- "Working with Shortcut Menus" on page 31
- "Tooltips" on page 31
- "Drilling Down" on page 31

Selecting Multiple CIs

You can select more than one CI in the topology map.

To select multiple CIs:

Hold down CTRL and click the CIs or drag the mouse diagonally around the CIs you want to select.

Working with Shortcut Menus

Right-clicking a CI in the topology map opens a shortcut menu. The shortcut menu depends on the selected CI. The shortcut menus are detailed in each relevant part of this guide.

Tooltips

When you move the pointer over a CI in the topology map, a tooltip displays information that is relevant to the CI. For details, see "Understanding Topology View Concepts" on page 158.

Drilling Down

If a CI icon appears with a downward arrow, double-click it to display the layer beneath it.

3

Toolbar Options

This chapter contains a description of the toolbar options available in Mercury Application Mapping.

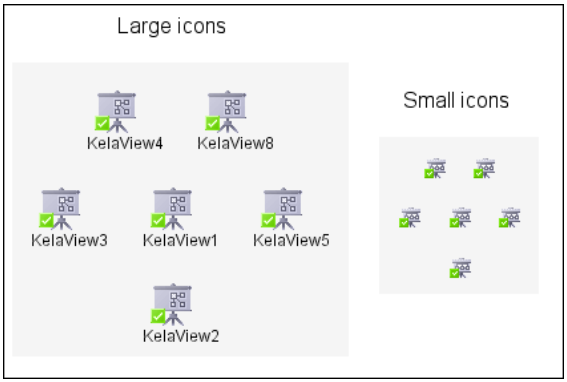
Understanding Toolbar Options

The toolbar buttons provide quick access to the most commonly used functions in the Mercury Application Mapping and Mercury Application Mapping WebView main windows. The following table contains a brief description of each toolbar option.

Option Name	Button	Use This Option to...
New		Define the following: ➤ New instance view in the Topology View. For details, see "Defining Instance Views" on page 205. ➤ New queries in the TQL Builder. For details, see "Creating a TQL Query" on page 77. ➤ New views in the Service View Manager. For details, see "Creating a Pattern View" on page 100. ➤ New correlations rules in the Correlation Manager. For details, see "Creating a Correlation Rule" on page 270. ➤ New enrichment nodes and relationships in the Enrichment Manager. For details, see "Creating Enrichment Nodes and Relationships" on page 301. ➤ New System Reports in the Report Manager. For details, see "Creating a Report" on page 341. ➤ New CITs in the CI Type Manager. For details, see "Creating CITs" on page 383.
Open		Open a selected parent CI and drill down to its lower map layers in the topology map. For details, see "Navigating in Maps" on page 172.
Go up one layer		Move up one level in the topology map. This option is enabled only if there is an additional CI layer above it, created by a parent or child folding rule defined in the View Manager. For information on how to set up organization (folding) rules, see "Adding Folding Rules to Relationships" on page 142.
Back		Return to the last view you displayed.

Option Name	Button	Use This Option to...
Forward		Display a view you displayed before clicking the **Back** button.
Save		Save new and changed items in all Mercury Application Mapping Managers (except the CI Type Manager): ➤ TQL queries in the TQL Builder. For details, see "Saving a Query" on page 82. ➤ Managed views in the Service View Manager. For details, see "Saving the Pattern View" on page 151. ➤ Correlations rules in the Correlation Manager. For details, see "Saving the Correlation Rule" on page 279. ➤ Any changes to the manual layout in the topology map. For details, see "Improving Views" on page 174. ➤ System Reports in the Report Manager. For details, see "Saving the System Report Template" on page 350.
Print		Print the contents of the Information pane. For details on printing the topology map, see Chapter 4, "Printing Options".
Delete		Delete a selected item such as a view from the Service View Manager, a TQL from the TQL Builder, or a CIT from the CI Type Manager. **Note:** When you delete a CIT from the CI Type Manager, the CIT no longer appears in the CI Type Model, the Service View Manager, the Enrichment Manager, or the TQL Builder. To restore it, you must redeploy the package that contains the deleted CIT. For details, see "Package Administration" in the *Mercury Application Mapping Administration Guide*.
Layout		Select the layout display from the list. For further details about each of the options, see "Defining a View's Layout" on page 45.
Reorganize Layer		Reorganize the CIs/CITs/nodes according to the selected layer. This is used when CIs/CITs/nodes have been moved around.

Option Name	Button	Use This Option to...
Refresh		Reorganize the CIs according to the selected layer. This is used when CIs have been moved around or when hidden CIs exist (used mainly for the topology map).
Rebuild		Rebuild the view in the Topology View manager (used when the view name is selected in the View Explorer).
Show Hidden Symbols		Display previously hidden CIs.
Select All		Select all the CIs and relationships in a selected layer.
Select All Nodes		Select all the nodes in a selected layer.
Hide All Relationships		Toggle between showing and hiding the relationships in the displayed view.
Hide All Relationship Labels		Toggle between showing and hiding the relationship labels in the displayed view.
Hide All Node Labels		Toggle between showing and hiding the pattern/node/CIT.

Option Name	Button	Use This Option to...
Set Nodes Image Size		Toggle between displaying a map with large icons with labels and displaying a map with small icons without labels. (The labels are hidden because they become too small to read.) Useful for displaying large maps. 
Hide All Inheritance_f From Map		Toggle between showing and hiding Inheritance_f relationships and their connecting node.
Zoom		Zoom in on a specific section of the topology map by clicking and drawing a selection rectangle around the part you want to magnify. The area you have selected is displayed at the highest percentage that fits in the topology map.
Interactive Zoom		➤ Decrease the view magnification by clicking and pushing the pointer away from you. ➤ Magnify the view by clicking and pulling the pointer towards you.
Map overview		Open a separate window with only the topology map.
Drag map.		Drag the view.

Option Name	Button	Use This Option to...
Navigation		Take the pointer to the next connected node/pattern in a clockwise direction. ➤ Left-click to go from node/pattern to node/pattern in a clockwise direction. ➤ Right-click to point to the next node/pattern in a clockwise direction. **Note:** You can use this option only on nodes/CITs/patterns that are connected by relationships.
Select Mode		Select one or more CIs.
Fit to Window		Fit the complete view in the window.
Place in Center		Places the selected CI/node/CIT/pattern in the center of the map.
Create Relationship		Create a relationship between two existing CIs. For details, see“Adding Nodes and Relationships to a TQL Query” on page 106.
TQL result count		Calculate the number of instances found for each CI/TQL node/relationship.
Information Pane		Display or hide the Information pane (containing the **Configuration Item Browser**, **Configuration Item Events**, and **View Events** tabs in the topology map).
Explorer Pane		Display or hide the View Explorer in the selected tab.
Filters Pane		Display or hide the Filter by pane in the Topology View tab.
Map Pane		Display or hide the topology map in the selected tab.

Option Name	Button	Use This Option to...
Edit properties		Open the Pattern Editor to edit the pattern as required. For details about the Pattern Editor, see, "Understanding the Pattern Editor" in *Discovery Manager Administration*. You can edit a pattern only when it is in a deactivated state. You can also double-click the discovery pattern to open the Pattern Editor. **Note:** This option is specific to the toolbar in the Map View tab of the Discovery Manager.
Scheduler		Display the scheduling information for the selected pattern. For details, see "Scheduling a Discovery Pattern to Run on a Periodic Basis" in *Discovery Manager Administration*. **Note:** This option is specific to the toolbar in the Map View tab of the Discovery Manager.
Help		Display the table of contents for the online Help.

4

Printing Options

This chapter describes how to print the contents of both the topology map and the Information pane.

Printing the Contents of the Topology Map

You can print the contents of the topology map pane. 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 that you want to print.
2. To define your print settings, see "Defining the Print Settings for a Map" on page 42.
3. To arrange the contents of the topology map for print, you can use the **Layer Setup** and **Layout** options.

   For details about the **Layer Setup** and **Layout** options, see "Defining a View's Layout" on page 45.

4 Click **Print Map** button 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 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 **Map** > **Map print settings** to open the Map print settings dialog box.

2 Select **Print Entire Graph** 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.

Printing the Contents of the Information Pane

You can print the contents of the Configuration Item Browser, Configuration Item Events, and View Events tabs.

To print the contents of the Information pane:

1. (Optional) Use the **Hide Column** and **Customize** options to arrange the contents of the Information pane for print. For details, see "Sorting, Hiding, and Displaying Columns" on page 195.
2. Select **Map** > **Print information panel** to open the Print dialog box.
3. In the **Copies** area, enter the number of copies you want to print.
4. Click **Properties** to open the Document Properties dialog box.
5. Define document properties as required and click **OK** to save your changes.
6. Click **OK** to print the contents of the Information pane.

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 **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 42.

3 Use the **Zoom In** option to focus on specific details of the map or **Zoom Out** see more of the page, or click the down arrow next to the **Zoom** box and select the required zoom setting.

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 41.

6 Click **Close** to close the Print preview window.

5

Defining a View's Layout

This chapter describes how to customize the layout of a specific layer in a view, to achieve the clearest presentation possible and to better understand and monitor your managed data.

Defining Layer Layout

You define the layout of a view's layers by assigning logical positions for the nodes and relationships that appear in a layer.

Note: You set layout definitions for a specific layer only. The definitions cannot be saved for a different layer or a different view.

You customize the layer layouts by modifying the default values.

To define a layer layout:

1. On the **Map** menu, select **Layout properties** to open the Layout Properties dialog box with the following tabs:
   - **General**. Defines general layout for all layout types. For details, see "General Layout" on page 48.
   - **Disconnected**. Defines general layout parameters for disconnected nodes and connected components. For details, see "Disconnected Layout" on page 49.
   - **Hierarchical**. Shows the precedence relationships of the nodes in the selected layer. For details, see "Hierarchical Layout" on page 50.
   - **Orthogonal**. Routes relationships only horizontally and vertically. For details, see "Orthogonal Layout" on page 58.
   - **Symmetric**. Displays a clear representation of complex networks. For details, see "Symmetric Layout" on page 59.
   - **Routing**. Leaves nodes where they are in the graphic representation and reroutes the edges orthogonally. For details, see "Routing Layout" on page 61.
2. Enter new values for the layout type you want to change.
   - Click **Defaults** to restore the original default values.
   - Click **Apply** to apply the changes you made and keep the dialog box open.
   - Click **OK** to save the changes you made to the database and close the dialog box.

Defining a Manual Layout

You can manually change the topology map display by dragging the displayed CIs and relationships to the desired location. You save these changes by clicking the **Save** button on the toolbar.

Note: You can save one manual layout only. If another manual layout is already saved, after you click **Save**, a message is displayed. Click **Yes** to save the new layout or **No** to cancel the layout.

Modifying Layer Layout

This section explains how to modify the layer layout. Parameter values are in pixels.

To modify layer layout values:

On the **Map** menu, select **Layout properties** to open the Layout Properties dialog box:

This section includes the following topics:

General Layout

The General Layout settings are available with all layout styles. If your layout contains more than one graph, each graph is laid out separately, and the intergraph edges (the relationships between the graphs) are routed.

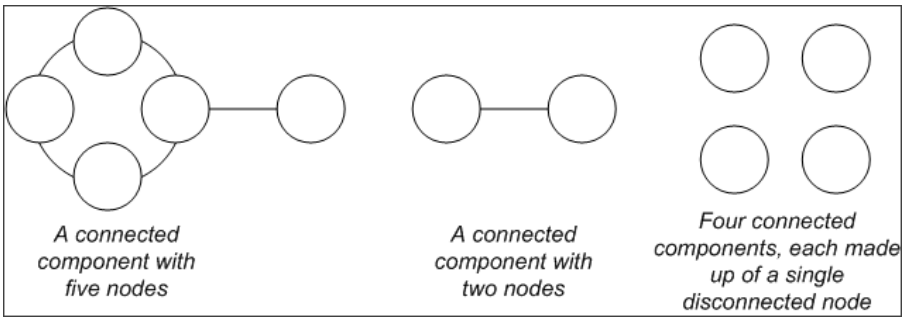
- **Margin Spacing**. Sets the borders around each node in the layer.
  - **Constant Spacing**. Sets a constant vertical and horizontal space around the displayed layer. This space remains the same even if the size of the layer changes.
    - **Left**. The size of the space to the left of the display. The default value is 20.
    - **Top**. The size of the space above the display. The default value is 20.
    - **Right**. The size of the space to the right of the display. The default value is 20.
    - **Bottom**. The size of the space under the display. The default value is 20.
  - **Proportional Spacing**. Sets a space around the displayed layer; the space is proportional to the display's size. This space changes when the size of the display changes.
    - **Left**. The size of the space to the left of the display. The default value is 0.
    - **Top**. The size of the space above the display. The default value is 0.
    - **Right**. The size of the space to the right of the display. The default value is 0.
    - **Bottom**. The size of the space under the display. The default value is 0.
- **Nested View Spacing**. For future use.
- **Intergraph Edge Spacing**. If intergraph edges are routed orthogonally, you can specify horizontal and vertical spacing for the edges.
  - **Horizontal Spacing**. Sets the horizontal distance between edges.
  - **Vertical Spacing**. Sets the vertical distance between edges.

Disconnected Layout

In this tab, you define general layout parameters for disconnected nodes and connected components:

- A disconnected node is a node that is not connected to any other node.
- 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.

  The following example illustrates connected components:



- **Components**. 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.
  - **Detect Components**. 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 then the resulting components are packed together.
  - **Constant Spacing**. Sets constant spacing (horizontal and vertical) around each disconnected component. The default value is 20.
  - **Proportional Spacing**. Sets spacing (horizontal and vertical) that is proportional to the size of the component around each disconnected component. The default value is 0.05.

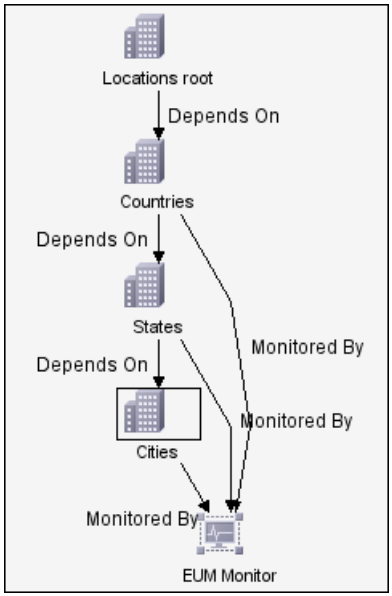
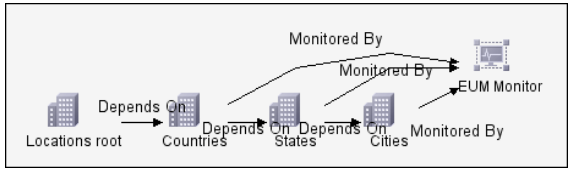
- **Disconnected Nodes**. The spacing between the nodes in a disconnected graph consists of both a constant value and a proportional value based on the sizes of the nodes.
  - **Detect Disconnected Nodes**. Select this option to view the disconnected nodes. You can specify that disconnected nodes be grouped into one component or laid out individually.
  - **Constant Spacing**. Sets constant spacing (horizontal and vertical) around each disconnected node. The default value is 20.
  - **Proportional Spacing**. Sets spacing (horizontal and vertical) that is proportional to the size of the component, around each disconnected node. The default value is 0.05.
- **Aspect Ratio**. 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.
  - **Automatic**. The layout is performed automatically.
  - **Custom**. You can specify the aspect ratio. The default value is 1.0.

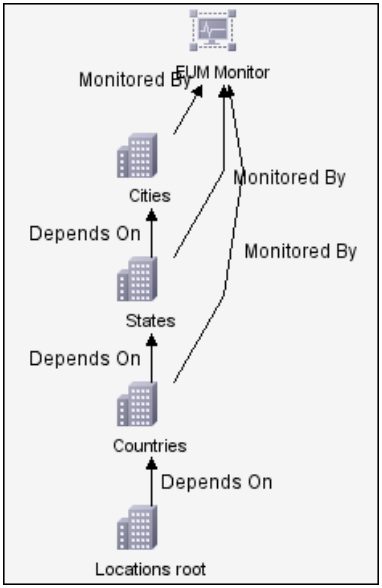
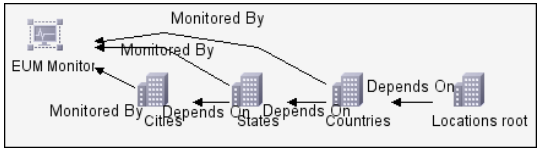
Hierarchical Layout

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.

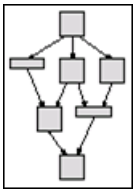
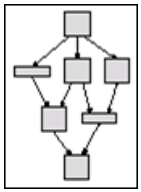
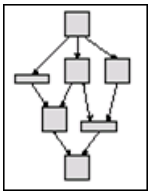
You can apply the following layout options to a hierarchical layout:

➤ **Orientation.** This option enables you to control the orientation of the hierarchy.

Top to Bottom. The children are located above the parent (in the example, Alignment = Center).	
Left to Right. The children are located to the left of the parent (in the example, Alignment = Center).	

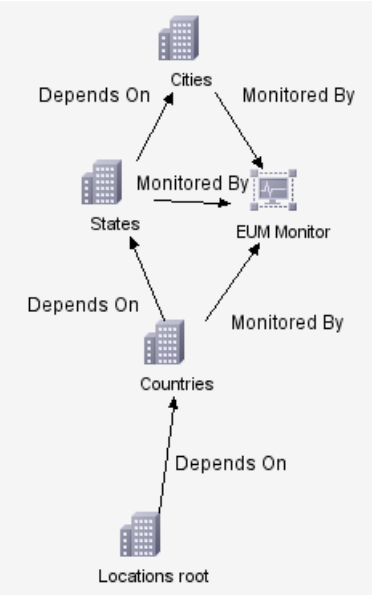
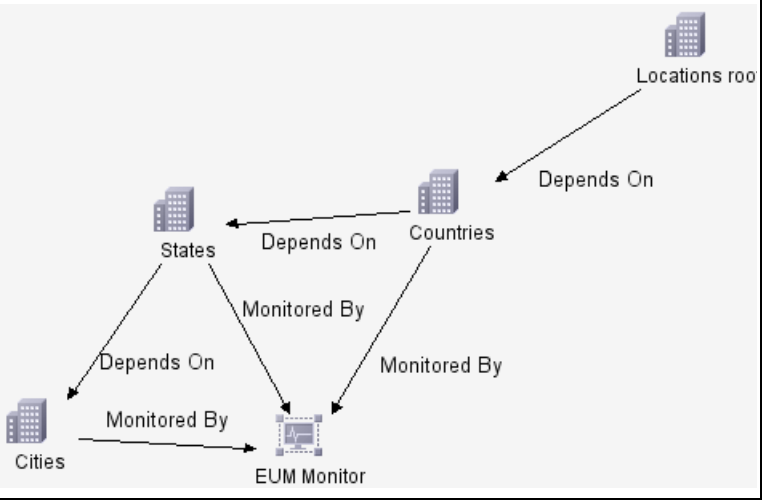
Bottom to Top. The children are located below the parent (in the example, Alignment = Center).	
Right to Left. The children are located to the right of the parent (in the example, Alignment = Center).	

➤ **Level Alignment.** This option enables you to control the way nodes are vertically aligned.

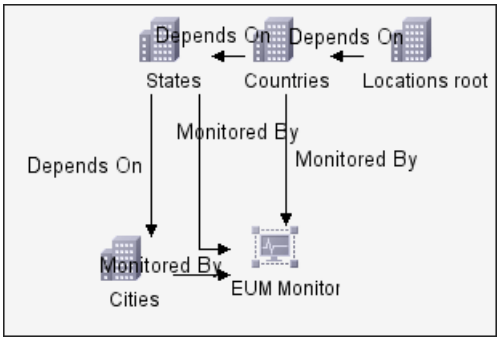
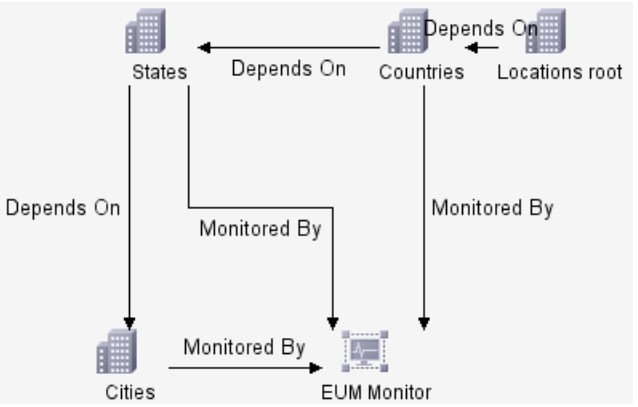
Top. The top of the nodes at the same level of the hierarchy are aligned.	**Center.** The center of the nodes at the same level of the hierarchy are aligned.	**Bottom.** The bottom of the nodes at the same level of the hierarchy are aligned.
		

- **Layout Quality.** You can 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 lay out):
  - **Draft**
  - **Default**
  - **Proof**
- **Horizontal Spacing.** Sets the minimum horizontal distance between two neighboring nodes on each level.

➤ **Spacing Between Nodes.** Sets a space around each node horizontally in the layer. The default value is 20.

Spacing Between Nodes = 20	
Spacing Between Nodes = 75	

➤ **Spacing Between Edges.** This setting is available only when you select **Routing** > **Orthogonal**. It sets a horizontal space between edges in the graph.

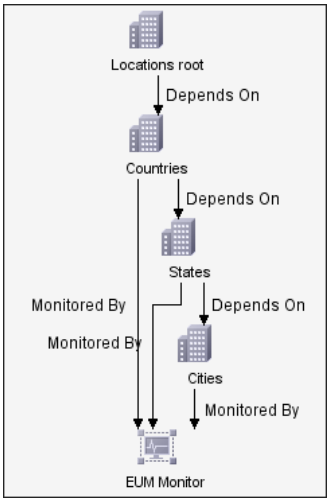
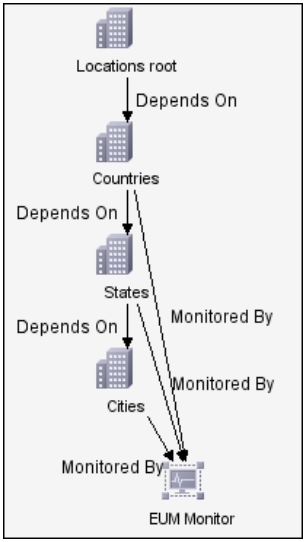
Spacing Between Edges = 12	
Spacing Between Edges = 90	

➤ **Vertical Spacing.** Sets the minimum vertical distance between two neighboring nodes on different levels.

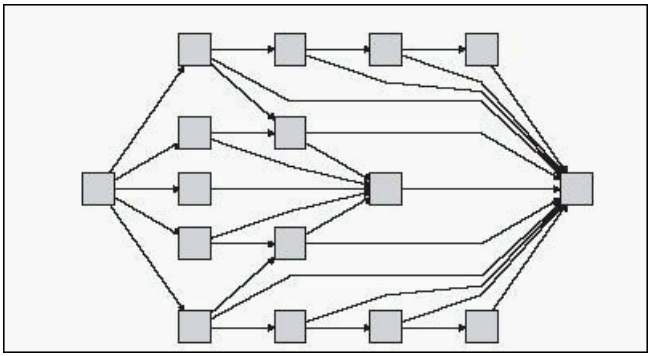
➤ **Spacing Between Node.** Sets a vertical space around each node in the layer. The default value is 20.

➤ **Spacing Between Edges.** This setting is available only when you select **Routing** > **Orthogonal**. It sets a vertical space between edges in the graph.

➤ **Routing.** Sets the type of relationship between CIs. This option is useful when layers have nodes with a very large number of connecting relationships.

Orthogonal. For orthogonal relationships between CIs.	
Polyline. For straight lines between CIs.	

- **Orthogonal Routing.** Routes edges horizontally and vertically.
  - **Fix Node Sizes.** For future use.
- **Polyline Routing.** Routes edges as one or more straight line segments with arbitrary angles. Polyline routed edges are prevented from overlapping by adding extra segments.
  - **Spacing Between Bends.** This setting is available only when you select **Routing** > **Polyline**. Polyline routing routes edges as one or more straight line segments with arbitrary angles. Path nodes are added automatically to prevent the edges from overlapping.



- **Variable Level Spacing.** Adjusts the spacing between pairs of neighboring levels according to the density of edges between the levels.

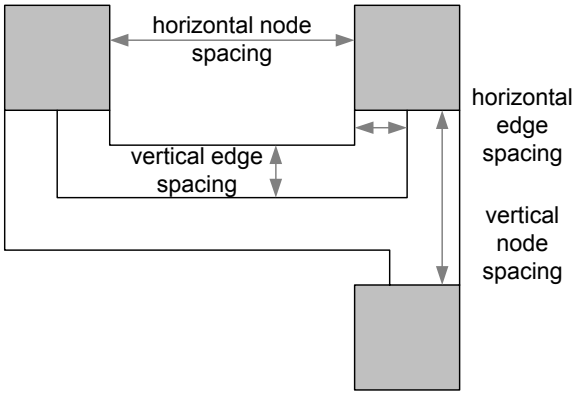
  Orthogonal routing of the drawing's edges ensures the required vertical spacing between horizontal edges (in a top-to-bottom or bottom-to-top layout) routed between levels.

  If the routing is polyline, variable level spacing makes it easier to distinguish between edges in very dense drawings.
- **Indirect Layout.** Edge direction is not used to build the levels of the hierarchical drawing.

Orthogonal Layout

The orthogonal layout routes relationships horizontally and vertically. This results in relationships bending at 90-degree angles only.

- **Horizontal Spacing.** Sets the minimum horizontal distance between CIs.

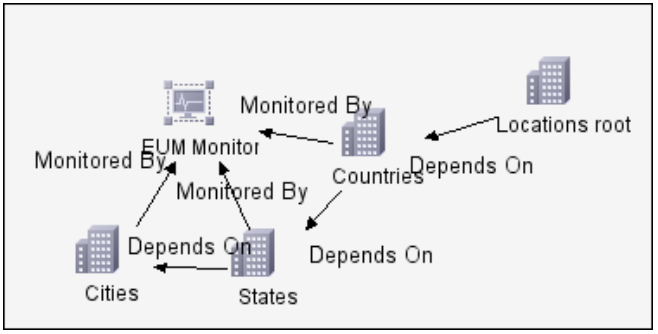


  - **Spacing Between Nodes.** Sets a space around each node in the layer. The default value is 20.
  - **Spacing Between Edges.** Sets a space between elements in the layer.
- **Vertical Spacing.** Sets the minimum vertical distance between CIs.
  - **Spacing Between Nodes.** Sets a space around each node in the layer. The default value is 20.
  - **Spacing Between Edges.** Sets a space between elements in the layer.
- **Layout Quality.** You can 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 lay out).
  - **Draft**
  - **Default**
  - **Proof**

- **Aspect Ratio.** 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.
  - **Automatic.** The layout is performed automatically.
  - **Custom.** Specify the aspect ratio. The default is 1.0.
  - **Disabled.** Disables the aspect ratio.
- **Fix Node Size.** For future use.

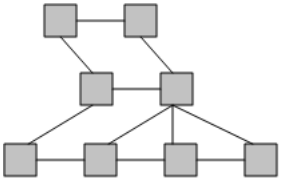
Symmetric Layout

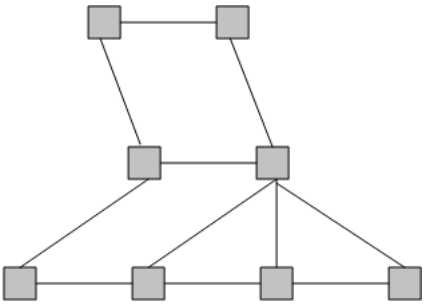
The symmetric layout emphasizes the symmetries that may occur in a graph.



This section describes the available symmetric layout options:

- **Spacing Options.** The symmetric layout allows you to adjust the spacing of nodes.
  - **Node Spacing.** 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 will be in the final layout. The default is 10.

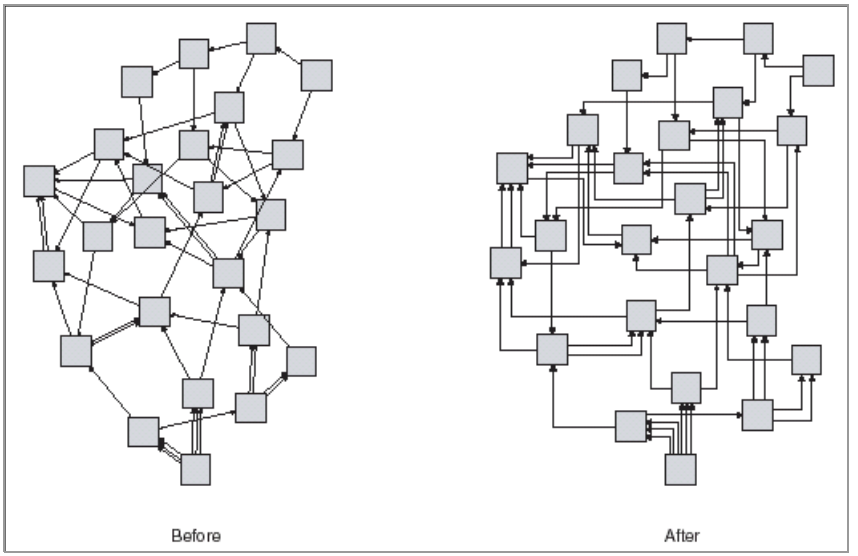




- **Layout Quality.** You can adjust the quality of the layout produced to fit your application's needs. The quality reflects the number of steps or the method used to produce the layout (for example: high quality is sharper but takes more time to lay out).
  - **Draft**
  - **Default**
  - **Proof**

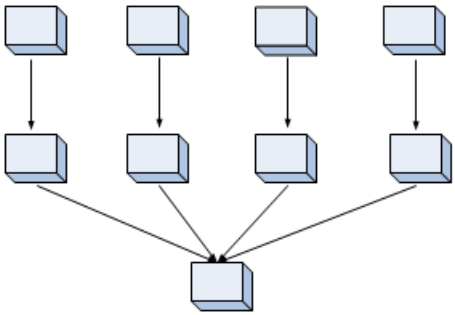
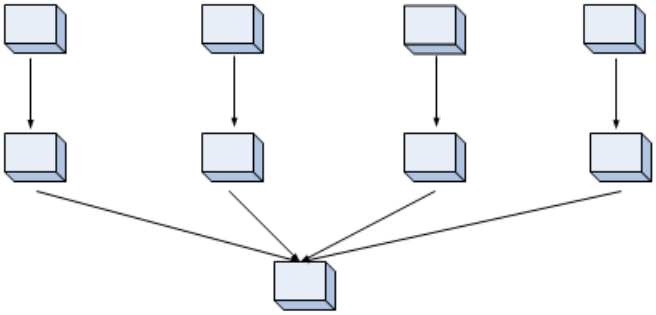
Routing Layout

Routing produces drawings that leave nodes essentially where they are, and reroutes the edges orthogonally.

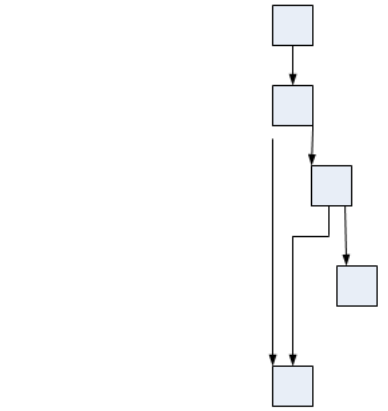
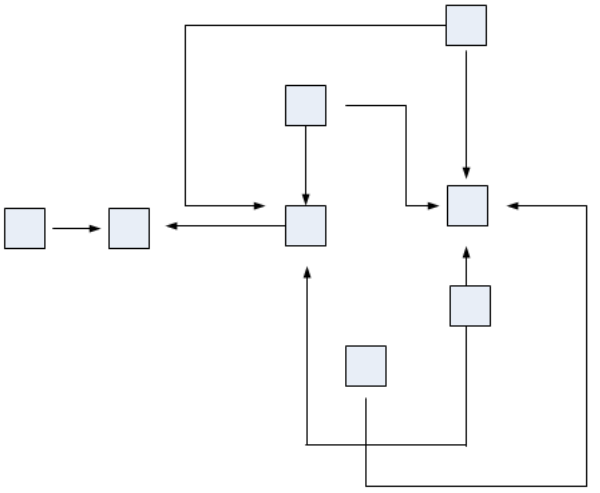


This section describes the available routing layout options:

- **Horizontal Spacing.** Sets the horizontal space around each node or each CI.
  - **Spacing Between Nodes.** Sets the horizontal space around each node in the layer. The default value is 20.

Spacing Between Nodes = 20	
Spacing Between Nodes = 75	

➤ **Spacing Between Edges.** Sets the horizontal space between any two neighboring parallel edges. Edge spacing 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. For example:

Spacing Between Edges = 20	
Spacing Between Edges = 50	

- **Vertical Spacing.** Sets the vertical space around each CI.
  - **Spacing Between Nodes.** Sets the vertical space around each node in the layer. The default value is 20.
  - **Spacing Between Edges.** Sets the vertical space between any two neighboring parallel edges. Edge spacing 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.
- **Fix Node Sizes.** Select **Fix Node Sizes** to 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.
- **Fix Node Positions.** Select **Fix Node Positions** to 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.

Part II

Topology Query Language Builder

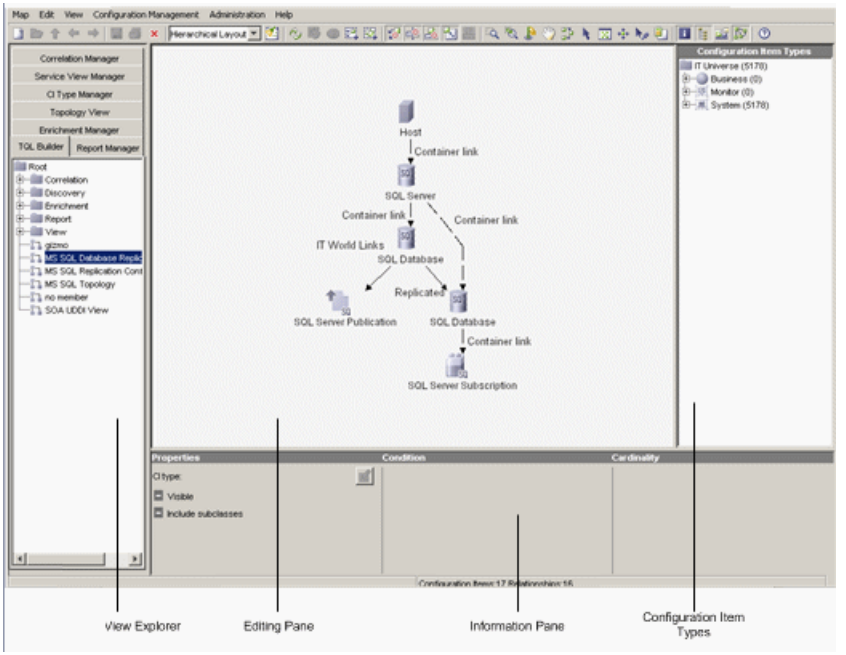
6

Introducing the Topology Query Language (TQL) Builder

This chapter introduces the Topology Query Language (TQL) Builder, which enables you to query the CMDB by defining TQL queries.

About the Topology Query Language (TQL) Builder

The TQL Builder enables you to define and save different types of TQL queries. These queries, which use a structured language similar to SQL, perform various functions in the system, such as extracting relevant information from the CMDB, or creating a report containing specific information. After you create a TQL query, it resides in the system memory and generates updated results automatically. For details, see "Mercury Application Mapping Topology Query System" on page 5.



When the TQL Builder tab is selected, the Mercury Application Mapping main window is divided as follows:

- **View Explorer**. Displays a hierarchical tree structure of the queries that you defined. You can copy, export, and save TQL queries as XML scripts to be used for backup purposes.

Note: Each TQL definition type is represented by a unique icon.

- **Editing pane**. Displays the currently selected TQL query, which consists of TQL nodes and the relationships between them.
- **Configuration Item Type**. Represents the CI Type Model and contains icons for each CIT, as defined by the administrator (for details, see "Assigning an Icon to a CIT" on page 389). By clicking and dragging nodes to the editing pane and then defining the relationship between them, you can define a query and save it to the database. For example, you can drag the Windows and IP nodes to the editing pane and then define the connection between them by adding relationships.
- **Information Pane**. Displays the attribute conditions you defined for the selected node and relationship. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.

Working With the TQL Builder

Use the TQL Builder to perform the following functions:

- Create, duplicate, and delete various types of TQL queries.
- Delete selected TQL nodes and relationships in the editing pane.
- Define the relationship between TQL nodes by adding relationships, either one by one or by selecting multiple relationships to speed up the process.
- Define the specific attribute conditions of TQL nodes and relationships in the query.
- Define the attributes whose information should automatically be updated in the topology map whenever the attribute is changed.
- Define whether to display the result of the query in the topology map, including the CIs derived from the selected TQL nodes.
- Export and import selected queries to and from XML script format files, for example, to relocate TQL queries from one workstation to another.

- Zoom in and out of the editing pane to view the selected TQL at different zoom levels.
- Display the queries in different layout views.

TQL Builder Shortcut Menus and Toolbar Options

The TQL Builder contains different right-click shortcut menus, depending on your selection, as follows:

- "TQL Toolbar Options" on page 70
- "TQL Folder Shortcut Menu" on page 70
- "TQL Query Menu" on page 71
- "Multiple TQL Node Menu" on page 72
- "Single TQL Node Shortcut Menu" on page 72
- "Relationship Shortcut Menu" on page 73

TQL Toolbar Options

For a description of each toolbar option in the TQL Builder, see "Toolbar" on page 27.

TQL Folder Shortcut Menu

The following options are available by right-clicking a TQL folder in the View Explorer:

Option	Description
New	Defines a new TQL Query.
New Folder	Creates a new folder.
Delete	Deletes a selected TQL folder.

TQL Query Menu

The following options are available by right-clicking a TQL query in the View Explorer:

Option	Description
New	Defines a new TQL Query. For details, see "Creating a TQL Query" on page 77.
New Folder	Creates a new TQL folder.
Save	(Enabled only when a new TQL is created or when changes are made to an existing TQL.) Saves the selected query to the database, as described in "Saving a Query" on page 82.
Save As	Displays the Save As dialog box, enabling you to define a new name and description for a query. This option can be used for copying queries, as described on "Creating a Query by Copying an Existing Query" on page 79.
Delete	Deletes a selected TQL query.
Export	Displays a standard Save As dialog box, enabling you to save the TQL query in XML script format. This option can be used to move TQL queries from one workstation to another.
Properties	Enables you to change the description and priority of the selected TQL query, but not the name of the query or its type.

Tip: Hold the pointer over a TQL node or relationship to view its tooltip. The tooltips for the TQL nodes and relationships contain the definitions of the selected TQL nodes, for example, the attribute conditions, as described in "Adding Nodes and Relationships to a TQL Query" on page 106.

Multiple TQL Node Menu

The following options are available by selecting two or more TQL nodes in the editing pane. For a description of how to select multiple TQL nodes, see "Selecting Multiple CIs" on page 31.

Option	Description
Add Relationship	(For two selected TQL nodes only.) Displays the Add Relationship dialog box, enabling you to add a predefined relationship between two TQL nodes in a query, as described in "Adding TQL Nodes and Relationships to a Query" on page 79. (Only relevant relationships are displayed in the **Add Relationship** list.)
Delete	Deletes the selected TQL nodes.
Copy	Copies the selected TQL nodes.

Single TQL Node Shortcut Menu

The following options are available by right-clicking a single TQL node in the editing pane:

Option	Description
TQL Node Wizard	Builds a TQL query. For details, see "Using the TQL Node Wizard" on page 80.
Add Relationship	Displays the Add Relationship dialog box, enabling you to create a relationship for your TQL nodes by selecting it from a predefined list. For details, see "Adding TQL Nodes and Relationships to a Query" on page 79.
TQL Node Definition	Displays the TQL Node Definition dialog box, enabling you to define the attribute conditions for the selected TQL node. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.
Delete	Deletes the selected TQL node(s).
Add SubGraph	Creates a graph that represents additional TQL query data related to a specific node. For details, see "Creating a Dependency Graph" on page 80.

Option	Description
Show Element's Instances	Displays all of the instances found for each TQL node in a table. For details, see "Showing TQL Node Instances" on page 81.
Copy	Copies the selected TQL nodes.

Relationship Shortcut Menu

The following options are available by right-clicking a relationship in the editing pane:

Option	Description
TQL Relationship Definition	Displays the TQL Relationship Definition dialog box, enabling you to define the attribute conditions for the selected relationship. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.
Delete	Deletes the selected relationship.
Straighten	Straightens the relationship between two nodes. This option is only available for relationships that have angles. For details, see "Straightening a Relationship With an Angle" on page 80.
Copy	Copies the selected TQL node(s).

7

Defining Topology Query Language (TQL) Queries

This chapter explains how to define TQL queries.

About Defining TQL Queries

When defining a new query with the TQL Builder, you first select the type of query to create, and then select the TQL nodes that are to be part of the query. You then define specific attribute conditions for each node, including the attributes that define the relationships between nodes.

You can define the TQL either by manually dragging and dropping the TQL nodes from the Configuration Item Types pane or by using the TQL Node Wizard (for details, see "Using the TQL Node Wizard" on page 80).

Note: A TQL query is subject to certain validation restrictions. For details, see "Validation Restrictions" on page 83.

TQL Query Workflow

You create TQL queries according to the following workflow:

- Create a new TQL query.

  For details, see "Creating a TQL Query" on page 77.

- Add nodes and relationships to the query.

  For details, see "Adding TQL Nodes and Relationships to a Query" on page 79.

- Define node and relationship attribute conditions.

  For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.

- Create a dependency graph.

  For details, see "Creating a Dependency Graph" on page 80.

- Save the new query.

  For details, see "Saving a Query" on page 82.

Creating a TQL Query

You can create a new query or you can use an existing TQL from any query type as a basis for your new TQL. In either case, you must give a unique name to the query.

This section includes the following topics:

Creating a New Query

You can create a new query.

To create a new query:

1 Click the **Map** > **New** button on the toolbar or right-click the folder in which you want to create the new query, and select **New** to open the Create New TQL dialog box.

Note: You can, at a later stage, change the query's location by dragging and dropping the folder into another folder.

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2 In the **TQL Name** box, type a unique name for the TQL query.

3 From the **Type** list, choose the type of TQL query you want to create, as follows:

- **View**. Creates queries whose results are displayed in the Topology View manager. For details, see Part IV, "Viewing Queries with Topology View."
- **Correlation**. Creates queries regarding correlation nodes that influence other correlation nodes in the system, as defined using the Correlation Manager. For details, see Part VI, "Correlation Rules."
- **Enrichment**. Creates queries regarding enrichment nodes and relationships, whose existence can be deduced from prior or accumulated knowledge about your system. For details, see Chapter 22, "Defining Enrichment Nodes and Rules."

- **Report**. Creates queries whose results are compiled into reports using the Report Manager. For details, see Chapter 24, "Introduction to the Report Manager."
- **Discovery**. Creates queries for use by the discovery system. For details, see, "Running the Discovery Process" in *Discovery Manager Administration*.
- **API Query**. Creates queries that allow you to query the CMDB through the CMDB API. For details, see "Working with the CMDB API" in *Integrating with Third-Party Applications*.

Note:

- Discovery TQLs should be created only by users who are thoroughly familiar with the discovery patterns used by the discovery system. For details, contact Mercury Customer Support.
- For the Correlation, Enrichment, and Report TQLs to be valid, they must comply with the restrictions described in "Validation Restrictions" on page 83. If the TQL is not valid, you cannot save it.

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4. From the **Priority** list, select a priority level for the new TQL query (**Low, Medium**, **High,** or **Express**). This setting determines how often the query should be rerun automatically by the system to include updated information from the database.
5. If necessary, in the **Description** box, enter a description of the TQL query.
6. If necessary, select **Persistent** to define whether the selected TQL should always remain in the system memory. Use this option only for frequently used TQLs.
7. Click **OK** to open the new TQL query in the View Explorer.

Creating a Query by Copying an Existing Query

You can create a query by copying an existing query and modifying it.

To create a query by copying an existing one:

1. On the View Explorer, right-click the query you want to use as a basis for the new query. Click **Save As** to display the Save TQL as dialog box.
2. In the **TQL Name** box, enter a unique name for the new TQL query.
3. From the **Type** list, select the type of the new TQL query. For details, see step 3 in "Creating a New Query" on page 77.
4. Follow steps 4 to 7 in "Creating a New Query" on page 77.

TQL Builder Tooltips

Hold the pointer over a node or relationship to view its tooltip. The tooltips contain the definitions of the selected nodes and relationships. For details, see for example, the attribute conditions, as described in "Setting TQL Node and Relationship Definitions" on page 116.

Adding TQL Nodes and Relationships to a Query

After you have created the TQL query, the next step is to add the TQL nodes and relationships that define the query. The TQL nodes represent the CITs, as defined in the CI Type Manager, and the relationships represent the connection between them. Relationships are defined one at a time for each pair of TQL nodes in the query. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.

Setting TQL Node and Relationship Definitions

After you have added the TQL nodes and relationships required for your query, you can define their specific attribute conditions. For details, see "Setting TQL Node and Relationship Definitions" on page 116.

Using the TQL Node Wizard

You can use the TQL Node Wizard to build a TQL query. The TQL Node Wizard allows you to:

- Add a node to a TQL query
- Add a relationship to a TQL query
- Define node conditions
- View all of the instances found for the TQL node in a table

For details, see "Using the TQL Node Wizard" on page 128.

Straightening a Relationship With an Angle

Mercury Application Mapping allows you to straighten a relationship that has angles.

To straighten a relationship that has angles:

Right-click the relationship that has an angle and select **Straighten**.

Creating a Dependency Graph

You can create a graph that represents additional TQL query data related to a specific CI. The discovery pattern 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.

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 "Defining Attribute Conditions for Nodes and Relationships" on page 119.

The discovery pattern retrieves data that meets the criteria defined in the dependency graph. For details, see, "Creating a Dependency Graph" on page 145.

Showing TQL Node Instances

You can display all of the instances found for each TQL node in a table. For details, see "Showing TQL Node Instances" on page 147.

Editing a TQL query

This section describes how to edit a TQL query.

To edit a TQL query:

1. In the View Explorer, right-click the TQL query you want to edit, and select **Properties** to open the TQL Properties window.
2. Make the required changes. For details, see "Creating a TQL Query" on page 77.
3. Click **OK** to save the changes you have made.

Copying/Pasting TQL Nodes in the TQL Builder

You can copy and paste existing TQL nodes in the TQL Builder. The copied TQL nodes include all TQL node information. You can also 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.

To copy and paste an existing TQL node in the TQL Builder:

1. Select the TQL node you would like to copy. You can select multiple TQL nodes as well.
2. Right-click and select **Copy**.
3. Right-click again and select **Paste**. The TQL node(s) are added to the TQL.

Saving a Query

After you have defined the specific attribute conditions of the nodes and relationships in the query, save the query to the CMDB. If you exit the TQL Builder without saving, a confirmation dialog box is displayed, requesting that you save your query.

To save the query:

Display the query to be saved in the editing pane, and click **Save** on the toolbar or select a different query or tab in the View Explorer. A message is displayed asking if you want to save the current query.

The query you created is saved to the CMDB.

Importing a TQL Query

You can import XML files that contain saved TQL queries to the TQL Builder. Use this option if you want to relocate TQL queries from one workstation to another.

To import a TQL query:

1. From the TQL Builder, open the **Map** menu and click **Import** to display the Import dialog box.
2. Locate the TQL query you want to import, select it, and click **Import**. The imported TQL query is added to the query list in the View Explorer.

8

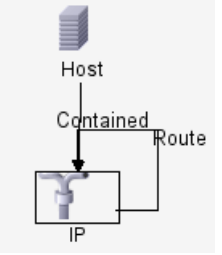
Validation Restrictions

This chapter explains TQL validation restrictions.

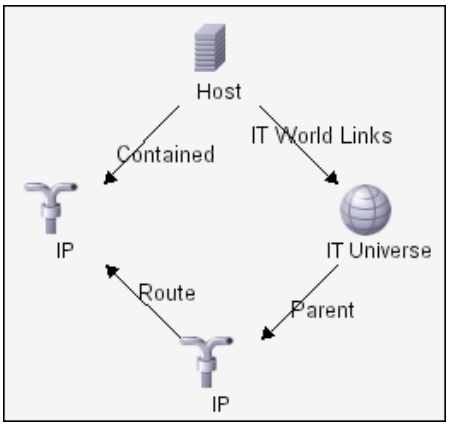
Understanding Validation Restrictions

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

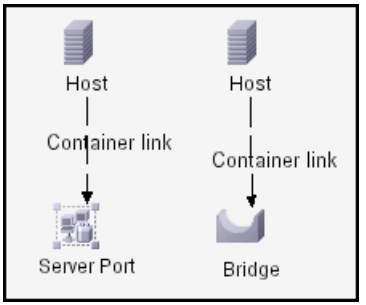
- **Self Relationships**. A TQL must not contain self relationships, that is, a relationship must not lead from a node to itself, as the following example illustrates:



➤ **Circular Structure**. 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:



Note: This restriction applies to Report TQLs as well.

Correlation TQL Validation

In addition to the above restrictions, a Correlation TQL should also comply with the following restriction:

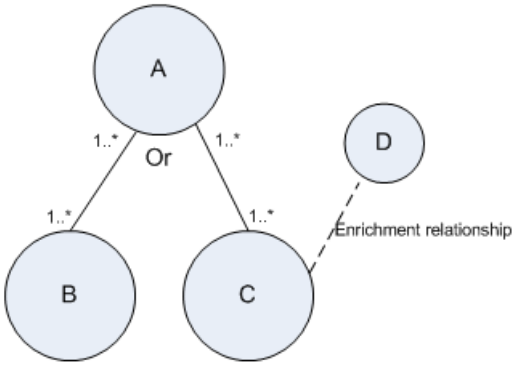
➤ **Number of Nodes**. A Correlation TQL must consist of at least two nodes.

Enrichment TQL Validation

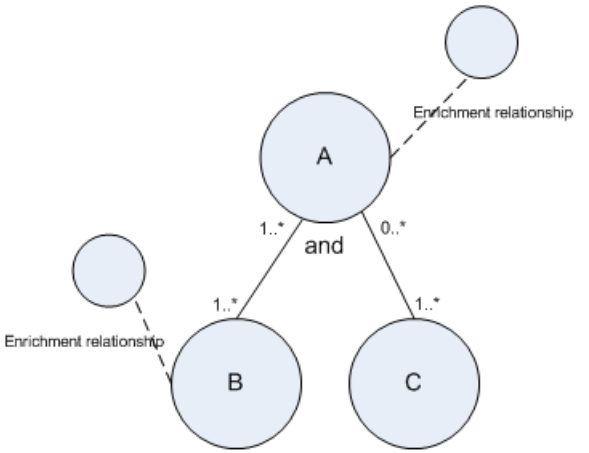
Enrichment TQLs must comply with the following restriction:

➤ **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 Define a TQL Query" on page 302.



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.



Part III

Pattern Views and Folding Rules

9

Introduction to the Service View Manager

This chapter introduces the Service View Manager, which enables you to define service views for viewing the results of TQL queries.

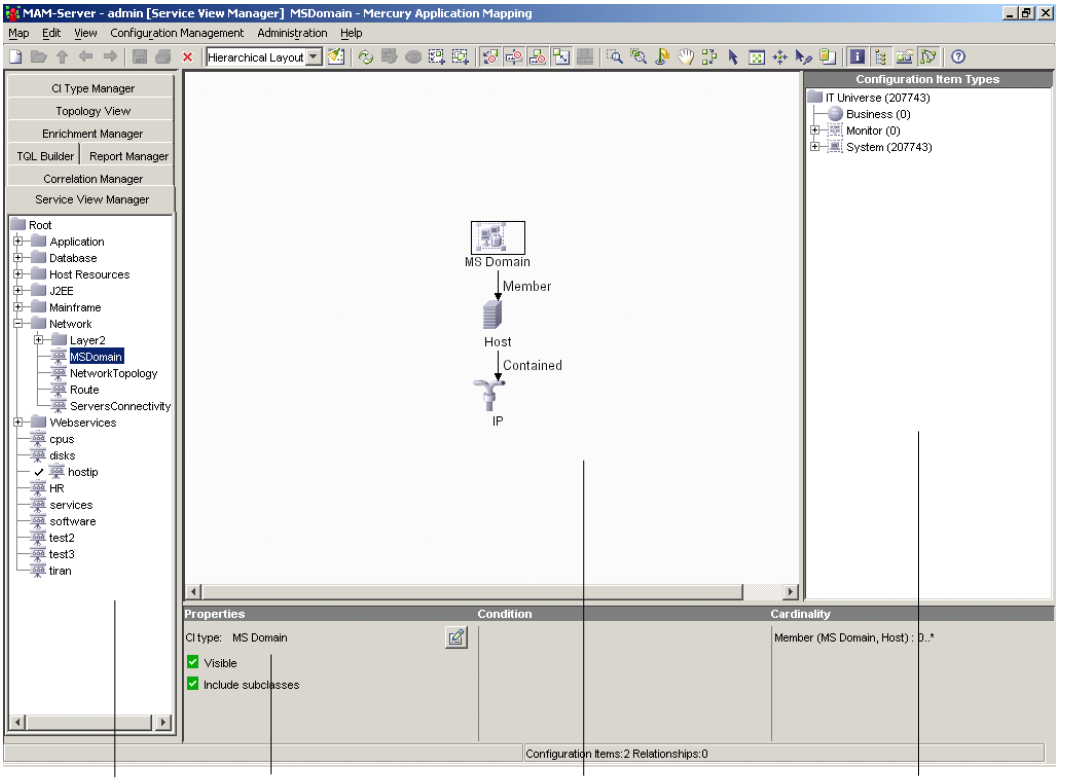
About Creating Service Views

Mercury Application Mapping allows you to create a subset of your overall business environment, a service view, to define a view that displays only the information that is relevant to your organization's business needs.

The Service View Manager enables you to define pattern views, by which to populate your view. Pattern views are built from a TQL (Topology Query Language) query, which are a series of rules and definitions for displaying query results. By creating service views, you can define how the query results are displayed in the topology map, including nodes, groups and the number of map levels to be displayed.

The view only displays those CIs and relationships that satisfy the query definition. Each view is attached to a specific TQL query (if required, you can define multiple views for each query).

When the view is opened up or refreshed, the Service View Manager queries the CMDB for all elements that fit the query, and automatically updates the view with those elements. For more information on pattern views, see “Working with Pattern Views” on page 97. In addition, by creating view folders, you can determine how the views are arranged in the editing pane.



When the Service View Manager tab is selected, the Mercury Application Mapping main window is divided as follows:

- **View Explorer**. Displays a hierarchical tree structure of the views you have defined. Multiple views can be defined for each query, each of which can be used only with the query to which it is attached. The color of the view icon indicates the view status. For details, see "Creating a Pattern View" on page 100.
- **Editing Pane**. Displays the currently selected view, which consists of TQL nodes that are defined in the TQL query and the relationships between them.
- **Configuration Item Types**. Displays the Configuration Item Types and the icons for each CIT, as defined by the administrator (for details, see "Assigning an Icon to a CIT" on page 389). By clicking and dragging CITs to the topology map and then defining the relationship between them, you can define a query and save it to the database. For example, you can drag the **Windows** and **IP** CIs to the topology map and then define the relationship between them by adding relationships.
- **Information Pane**. Displays the attribute conditions you defined for the selected node and relationship. For details, see, "Setting TQL Node and Relationship Definitions" on page 116.

Working With Service View Manager

Use the Service View Manager to perform the following functions:

- Create new views, as well as duplicate and delete existing views.
- Determine how the nodes and relationships, which are defined in the query, are displayed in the topology map.
- Show or hide and delete selected nodes and relationships in the editing pane.
- Define the node's status factor (that is, its system-level significance which affects the status of the CI in the topology map).
- Define a grouping option for the nodes displayed in the topology map.

- Define the attributes to display in the label of the selected node in the topology map.
- Add and delete organization rules that define the map levels to be displayed in the topology map.
- Save a view as an XML script. This can be used to relocate views from one workstation to another. (This can be performed providing the attached TQL query is also relocated.)
- Zoom in and out of the editing pane area to view the selected layer at different levels of magnification.

Service View Manager Shortcut Menus

The Service View Manager contains right-click shortcut menus, depending on your selection, as follows:

- "View Folder Shortcut Menu" on page 92
- "View Shortcut Menu" on page 93
- "Node Shortcut Menu" on page 94
- "Relationship Shortcut Menu" on page 95

View Folder Shortcut Menu

This is the same as the TQL Folder shortcut menu. For details, see "TQL Folder Shortcut Menu" on page 70.

View Shortcut Menu

The following table contains a brief description of each option in the menu displayed by right-clicking a selected view in the View Explorer:

Option	Description
New	Enables you to create a new view.
New Folder	Enables you to create a new view folder. These folders are displayed in the topology map and can assist you in organizing views according to criteria that are significant to your management needs, such as specific technologies, corporate procedures, internal workflows, company sites and so forth.
Add/Remove to Topology View	Enables you to add/remove views to the list in the topology map. When adding a view, a check mark is displayed beside the selected view in the View Explorer. This option is especially useful for removing views from the topology map that are created by other users and may not be of interest.
Save As	Enables you to define a new name and description for a view. You can use this option to create a new view based on an existing one.
Delete	Enables you to delete a selected view from the database.
Export	Enable you to save a view as an XML script. This option can be used to move views from one workstation to another, provided the attached TQL query is also relocated.
Properties	Displays the View Properties dialog box (which is the same as the Create New View dialog box). This option enables you to change the properties of the selected view (apart from the name of the view and the attached TQL). **Note:** You can also change the view's properties at a later stage from the topology map.
Relationship Rules	Displays the Relationship Rules dialog box, enabling you to define multiple relationship rules.

Node Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a node in the Topology pane:

Option	Description
TQL Node Wizard	Build a TQL query. For details, see "Using the TQL Node Wizard" on page 128.
Add Relationship	Define the connection between two nodes. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.
TQL Node Definition	Define attribute conditions for nodes. For details, see "Setting TQL Node and Relationship Definitions" on page 116.
Delete	Delete a node.
Add SubGraph	Create a graph that represents additional TQL query data related to a specific node. For details, see "Creating a Dependency Graph" on page 145.
Show element's instances	Display all of the instances found for each TQL node in a table. For details, see "Showing TQL Node Instances" on page 147.
View Node Definition	Display the View Node Definition dialog box, enabling you to determine how the nodes defined in the query are displayed in the topology map.
Copy	Copy and paste a TQL node and its definitions into a view.
Add to Business Service	Define the creation of a business service item by view name and link it to different CIs. For details, see "Business Service Enrichment" on page 148.

Relationship Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a relationship in the Topology pane:

Option	Description
TQL Relationship Definition	Define attribute conditions for relationships. For details, see "Setting TQL Node and Relationship Definitions" on page 116.
Delete	Delete a relationship.
Straighten	(Enabled only for relationships with angles on the Topology pane.) Straighten relationships with angles.
Add Rule	Define the organizational structure of nodes displayed in the topology map.
View Relationship Definition	Display the View Relationship Definition dialog box, enabling you to determine how the relationships defined in the query are displayed in the topology map.
Copy	Copy and paste a relationship and its definitions into the same view or into another view definition.
Edit Relationship Type	Edit an existing relationship. This option only appears if at least one of the following is true: ➤ You can change the direction the relationship. ➤ You can select a descendent of the existing relationship. ➤ The selected relationship is function relationship (Compound or Join).

Tip: Right-clicking an empty area in the topology map displays a shortcut menu with the same zoom and layout options available in the **View** menu. For details, see "Mercury Application Mapping Quick Tour" on page 13.

Service View Manager Tooltips

When the pointer is moved over a node in the topology map, a tooltip is displayed.

The tooltip contains the following information:

Option	Description
Element Name	The name of the node.
CI Type	The CIT of the node.
Visible	Whether the selected node is visible in the topology map.
Cardinality	Relevant for relationships. Cardinality defines how many nodes you expect to have at the other end of the relationship. For example, in a relationship between host and IP if the cardinality is 1:3, the TQL will retrieve only the hosts that are connected to 1 to 3 IPs.
Label Format	The format of the label displayed underneath the node.
Status Factor	The relative weight of the selected node, used for determining the status of the node.
Group node By	The type of group (CIT, TQL, node, or attribute) the node belongs to, if any.
Minimum in Group	The minimum number of matching nodes required to create the group to which the node belongs.
Group Label	The label of the group to which the node belongs.

10

Working with Pattern Views

This chapter describes how you create a pattern view. Pattern views enable you to query the CMDB by defining Topology Query Language (TQL) queries. The pattern view you create displays the results of the TQL queries.

About Pattern Views

A pattern view enables you to define TQL queries that extract information from the CMDB that is relevant to your needs (for details, see "Mercury Application Mapping Topology Query System" on page 5).

You define a pattern view and then create or attach a TQL query, which is a series of rules for defining how the query results are displayed in the editing pane, including which nodes and relationships are to be displayed. Once a TQL query has been created, it persists in the system memory and continuously generates updated results.

About Defining Pattern Views

When you create a pattern view, you must first name the managed view and then define how you want the query results displayed, including organization (folding) rules that determine the number of map levels to be generated, attribute conditions for each node and relationship and how many CI instances you expect to have at the end of a relationship in your query result.

You can define the pattern view either by dragging the TQL nodes from the Configuration Item Types pane or by using the TQL Node Wizard (for details, see "Using the TQL Node Wizard" on page 128).

Once you have finished defining how you want the TQL results displayed, you activate the TQL query to retrieve the requested data from the CMDB.

Pattern View Workflow

You create pattern views according to the following workflow:

- Define a new view.

  For details, see "Creating a Pattern View" on page 100.

- Add nodes and relationships to the query.

  For details, see "Adding Nodes and Relationships to a TQL Query" on page 106.

- Define node and relationship attribute conditions.

  For details, see "Setting TQL Node and Relationship Definitions" on page 116.

- Add organization (folding) rules to relationships.

  For details, see "Adding Folding Rules to Relationships" on page 142.

- Define multiple relationship rules.

  For details, see "Defining Multiple Relationship Rules" on page 143.

- Create a dependency graph.

  For details, see "Creating a Dependency Graph" on page 145.

➤ Save the TQL query.

For details, see "Saving the Pattern View" on page 151.

Creating a Pattern View

The first step in creating a pattern view is to set the name and properties of the managed view in which you want to define the TQL query.

Note: TQL queries should only be created by administrators with an advanced knowledge of how the TQL system works.

This section includes the following topics:

Creating a View With the Service View Manager

You can create a view and attach it to a specify TQL query.

To create a pattern view:

1 Click the **Service View Manager** tab.

2 Click **New** on the toolbar or open the **Map** menu and click **New** to open the **View Properties** tab in the Create New View dialog box.

3 In the **View Name** box, enter a unique name for the new view.

4 (Optional) In the **Organization Name** box, enter the name of the organization related to the query.

5 (Optional) In the **Service Name** box, enter the name of the service related to the query.

6 (Optional) From the **ViewIcon** list, select a special icon for this view. The view is represented by this icon in the topology map.

7 In the **Integration Vendor** box, choose the integration application to which you want to connect Mercury Application Mapping.

8 (Optional) In the **Description** box, enter a description for the new view.

9 Select **Is Persistent** to define whether you want the selected view to always remain in the system memory. You should only use this option for views that are used frequently.

Note: Views that are not persistent are recalculated by the system only when they are selected for display. This may take some time, depending on the size of the view.

---

10 Select **Merge Identical Instances** to automatically display identical instances that appear on the same layer in this view merged into one symbol in the editing pane (for details, see "Merging Identical Instances" on page 105). This helps you remove redundant information and sharpen the view's focus.

11 In the **Send Notification on changes** area:

- Select **Added CIs** if you want to be notified when CIs are added.
- Select **Removed CIs** if you want to be notified when CIs are removed.

12 Click the **TQL Properties** tab to either create a new TQL or attach an existing one.

13 To create a new TQL, select **Create New TQL**.

14 In the **TQL Details** section, type a unique name for the TQL in the **Name** box.

15 From the **Priority** list, select a priority level for the new TQL query (Low, Medium, High, Express). This setting determines how often the query should be rerun automatically by the system to include updated information from the CMDB.

16 (Optional) In the **Description** box, enter a description of the TQL query.

17 If required, select **Is Persistent** to define whether you want the TQL to always remain in the system's memory. Use this option for TQLs that are used frequently rather than occasionally.

18 To attach a new TQL, select **Attach to existing TQL**.

19 In the **TQL Details** section, choose the TQL you want to attach from the **Name** list.

20 Repeat steps 15, 16, and 17.

21 Click the **View States** tab to define topology map states. For details, see "Defining Topology Map States" on page 103.

About Defining Topology Map States

To define the states that are displayed on every map, you create a list of states in the **View States** tab of the View Properties dialog box. By default, only the **change** state is predefined. To enable a specific map to receive and display additional states, you add the states to the **State Priority** list.

The **State Priority** list also determines the CI color according to the following rules:

- Mercury Application Mapping scans the CI state for each state that is on the list starting from the lowest number to the highest. The lowest number on the list has the highest priority.

  For example, for the numbers 1, 2, 3, 4, the state that has the Priority value of 1 has the highest priority, the state that has the Priority value of 2 has the next highest priority, and so forth.

- If the CI state in the first state (the highest priority value) is not equal to **Normal**, the CI color is determined according to the state color that is defined in the System Type Manager dialog box. For details, see "Enumerations and Lists" in the *Mercury Application Mapping Administration Guide*.

- If the CI state in the first state (the highest priority value) is equal to Normal, then Mercury Application Mapping checks the next highest state on the **Priorities** list (the state that has the next highest number) for a state that is not equal to Normal.

In the following example, the CI takes the color according to the Performance state because it is the first in the list of priorities whose severity is other than Normal. Security is a custom state.

Priority	State	Severity
1	Operation	0
2	Performance	5
3	Security	8

➤ In cases where there are two states of equal importance, you can assign them the same priority value providing they are defined based on the same Enumeration. In this case, the most critical value determines the CI color.

In the following example, the states Operation and Test have the same priority level and same Enumeration definition. The CI takes the color that represents the seventh severity in the Enumeration definition.

Priority	State	Severity
1	Operation	5
1	Test	7
2	Performance	8
3	Security	10

Defining Topology Map States

This section describes how to define states in the topology map.

To define topology map states:

1 Right-click the required view to open the View Properties dialog box.

2 Click the **View States** tab.

3 Click the **Add State Priority** button to create a new row and add a new priority level.

Note: To remove a state priority, select it and click the **Remove State Priority** button.

4 Click inside the **State** column and choose the state. The states that appear in the list are the states defined in the State Manager dialog box. For details, see "Defining Attribute States", in the *Mercury Application Mapping Administration Guide*.

5 Click inside the **Priority** column and enter a priority value.

Note: You can give the same priority value to two or more states only if they have the same enumeration definition. For details, see "Enumerations and Lists" in the *Mercury Application Mapping Administration Guide*.

6 Repeat steps 3 to 5 to add another state to the list.

7 Click **OK** to save the list.

Creating a View by Copying an Existing View

You can create a new view by copying an existing view and modifying it.

To create a view by copying an existing view:

1 On the View Explorer, right-click the view you want to use as a basis for the new view. Click **Save As** to display the Save As dialog box.

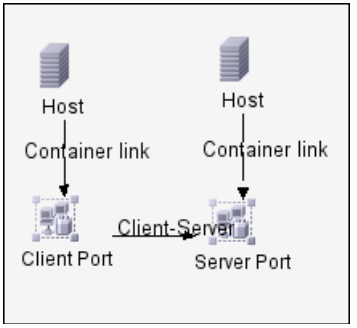
2 Edit the view's definitions as required, as described in "Creating a Pattern View" on page 100.

3 Click **OK**.

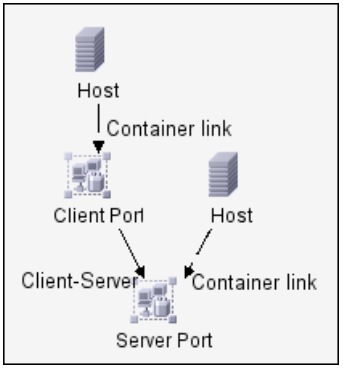
Merging Identical Instances

You can decide to have identical instances that appear on the same layer in this view automatically merged into one symbol on the editing pane. This helps you remove redundant information and sharpen the view's focus.

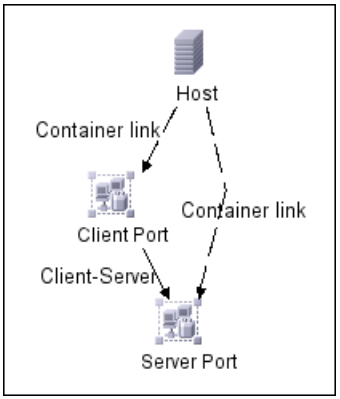
For example, suppose you want to discover and display hosts that are connected to other hosts in a server-client relationship, you can create the following TQL:



However, if both the server and the client are installed on the same host, one host appears twice.



To overcome the redundant host display, you define that identical instances should be merged by selecting **Merge Identical Instances**:



View Manager Tooltips

Hold the pointer over a node or relationship to view its tooltip. The tooltips contain the definitions of the selected nodes and relationships, for example, the attribute conditions, as described in "Setting TQL Node and Relationship Definitions" on page 116.

Adding Nodes and Relationships to a TQL Query

Once you have created the pattern view, the next step is to add the nodes and relationships that define the query in the Create View page. The nodes represent the CITs, as defined in the CI Type Model. A relationship is a set of rules that defines the connection between two CIs. Relationships are defined one at a time for each pair of nodes in the query.

For a list of the relationships you can use to link two nodes and their definitions, see "Relationship Definitions" on page 505.

This section contains the following topics:

Adding Nodes and Relationships to Define a TQL Query

This section describes how to add nodes and relationships to a TQL query.

To add nodes and relationships to a TQL query:

1. From the tree in the View Explorer, select the required TQL query.
2. From the tree displayed in the Configuration Item Type 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

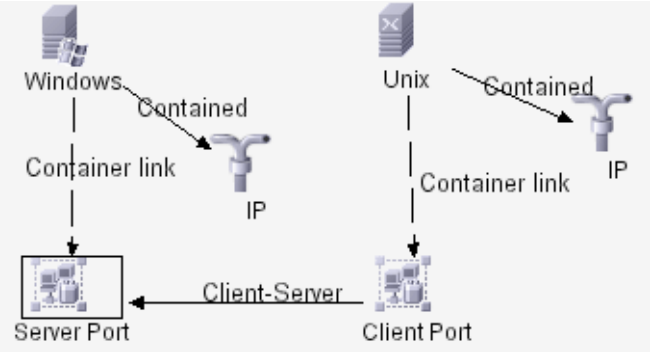
   - Click the **Create Relationship** icon and draw a line between the required nodes.

The Add Relationship dialog box opens. It contains the following fields:

Field	Description
Node Label	The label of the selected node.
Relationship Direction	The direction of the relationship that indicates which node is dependent on the other.
Relationship Type	A valid relationship that defines the connection between the selected nodes.
Advanced	➤ In the list under **Advanced** to the left, select one of the following: ➤ Select **Relationship** to define the connection between two nodes using a child of the relationship in the **Relationship Type** box. ➤ Select **Function Relationship** to define the connection between two CIs using either a Join or Compound relationship. For details, see "Defining Join and Compound Relationships" on page 109. ➤ In the list under **Advanced** to the right, define how you want to handle relationships between identical nodes or internal relationships. For details, see "Handling Self Relationships" on page 115.

4. Select the required direction of the relationship.
5. If required, click **Advanced** to use the Advanced options as described above.
6. Click **OK**. The selected nodes are linked by the relationship you have selected.

The direction of the relationship indicates which node is dependent on the other. The following example displays two hosts, a Server Port, and a Client Port that are linked to one another via a client/server connection. The TQL results must comply with the direction of the arrows.



Defining Join and Compound Relationships

This section describes how to define the following function relationship types:

- **Join link**. A logical connection that appears only in the topology view containing the TQL query results. It does not exist in the CMDB and represents the relationship between two CIs.

  When you create a Join link relationship, you must define an attribute for each node, whose value is used for comparison.

- **Compound link**. Represents a path in the topological graph. You use a Compound link to define the allowed steps in the path between two CIs.

To define Join and Compound relationships:

1. In the Editing pane, select the nodes you want to connect with a Join or Compound relationship For details on how to add nodes to a TQL query, see "Adding Nodes and Relationships to Define a TQL Query" on page 107.
2. Right-click and select **Add Relationship** to open the Add Relationship dialog box.
3. Click **Advanced**.

4 To define the connection between two nodes using a **Join link**, select **Function Relationship** from the **Relationship** list to the left and do the following.

- Select **Virtual - Join link**.

- In the **Join Definition** area, click the **Add an attribute definition** button to open the Conditions dialog box.
- From the **Attribute** lists, choose the two required attributes. The first attribute applies to <end_1> and the second attribute applies to <end_2>.
- From the **Operation** list, select one of the following operations:
  - Select **Equal** if you want the system to check whether the two selected attributes are equal.
  - Select **Not equal** if you want the system to check whether the two selected attributes are not equal.
  - Select **Sub string** if you want the system to check whether the value of the first attribute is a substring of the value of the second attribute.
  - Select **Sub string ignore case** if you want the system to check whether the value of the first attribute is a substring of the value of the second attribute regardless of the string's case.
- Click **OK** to save your definition. The definition appears in the **Join Definition** area.
- To delete a definition, select the required definition in the **Join Definition** area and click the **Delete selected row** button.

- To edit a definition, select the required definition in the **Join Definition** area and click the **Edit selected row** button to open the Conditions dialog box. Edit the definition as described in step 4.

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

5 To define the connection between two nodes using a **Compound link**, select **Function Relationship** from the **Relationship** list and do the following:

a Select **Virtual - Compound link.**

b In the **Compound Definition** area, click the **Add** button to open the Add dependency dialog box.

c From the **Source** list, select the source node.

d From the **Target** list, select the target node.

e From the **Relationship** list, select an available relationship connecting the two nodes. The list of available relationships appears only after defining both nodes.

f From the **Relationship Direction** list, select the required direction.

Note: You can create as many virtual compound definitions as necessary.

---

g Click **OK** to save the compound definition. The compound definition appears in the Compound definition dialog box.

Note: Each row represents a set of allowed steps in the path leading from one CI to the other.

h To delete a definition, select the required definition in the **Compound Definition** area and click the **Delete** button.

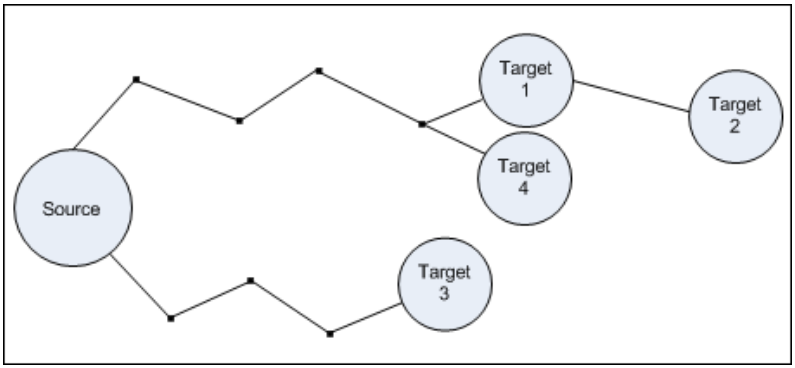
i To edit a definition, select the required definition in the **Compound Definition** area and click the **Edit** button to open the Add dependency dialog box.

j In the **Depth** box, select or enter a number that represents the longest path allowed between the two CIs in the CMDB you want included in the discovery process. The default is 5.

k Select **Stop at first compound level** if you want the system to stop looking for TQL results once it reaches the first target in the path.

Example:

For the following sample compound link definition, **Depth** is defined as 10 and **Stop at first compound level** is selected.



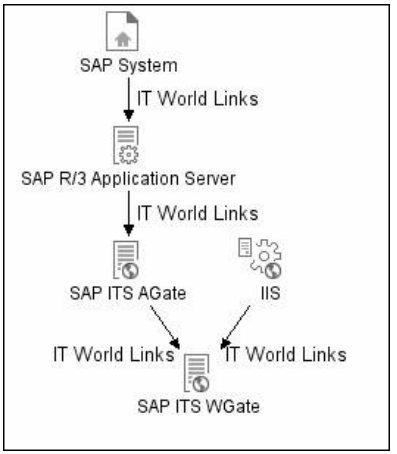
The TQL results include the **Target 1**, **Target 3**, and **Target 4** because they are all at level 1 (the first CI found in the path). **Target 2** is not included in the TQL results because it is at level 2 (the second CI found in the path).

6 Click **OK** to save your definitions.

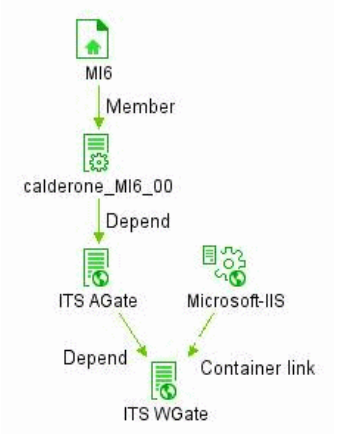
Sample Compound Relationship

This section contains a sample compound relationship comprising several nodes and their connections, displayed in two different views:

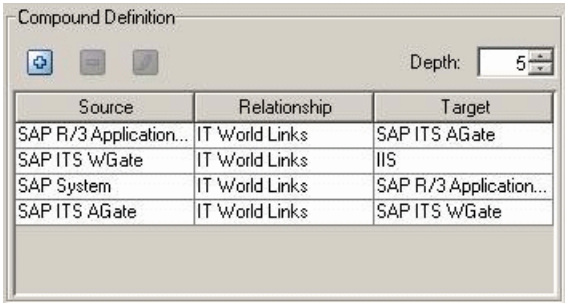
➤ A normal view in which each node in the compound relationship was dragged and dropped from the Configuration Item Types pane. (For details, see "Adding Nodes and Relationships to Define a TQL Query" on page 107.)



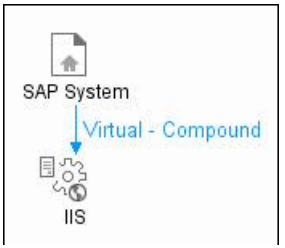
The normal view result is displayed below:



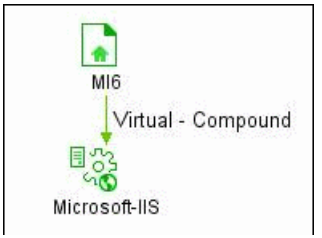
➤ A compound view in which the compound relationship was defined by using the **Compound Definition** area of the Add Relationship dialog box, as illustrated below. (For details, see "Defining Join and Compound Relationships" on page 109.)



The following compound view is created:



The compound view result is as follows:



Handling Self Relationships

A self relationship is a relationship that leads from a node to itself. In this section, you define how to handle relationships between identical CIs or self relationships in the query results.

Note: This list appears either when you select one node or two identical nodes.

To define how to handle self relationships:

1. From the tree in the View Explorer, select the required TQL query.
2. Select either identical TQL nodes or a single node.
3. Select **Add Relationship** to open the Add Relationship dialog box.
4. Click **Advanced**.
5. In the list underneath **Advanced** to the right, select one of the following options:
   - **Allow all relationship.** All relationships appear in the query results.
   - **Allow self relationship only**. Only self relationships appear in the query results.
   - **Discard self relationships.** Self relationships do not appear in the query results.
   - Click **OK** to save your changes.

Deleting a Node or Relationship

This section describes how to delete a node or relationship.

To delete a node or relationship:

In the Editing pane, right-click the TQL node or relationship you want to delete and select **Delete**.

Editing a Relationship Type

This section describes how to edit an existing relationship. This option only appears if at least one of the following is true:

- You can change the direction of the relationship.
- You can select a descendent of the existing relationship.
- The selected relationship is function relationship (Compound or Join).

To edit a relationship type:

1. Right-click the required relationship and select **Edit Relationship Type**. The Edit Relationship Type dialog box opens.
2. Make the required changes. For details, see "Adding Nodes and Relationships to Define a TQL Query" on page 107 and "Defining Join and Compound Relationships" on page 109.
3. Click **OK** to save your changes.

Setting TQL Node and Relationship Definitions

After you have added the TQL nodes and relationships required for your query, you can define their specific attribute conditions.

This section includes the following topics:

Defining TQL Nodes and Relationships

This section describes how to define TQL nodes and relationships.

To define TQL nodes and relationships:

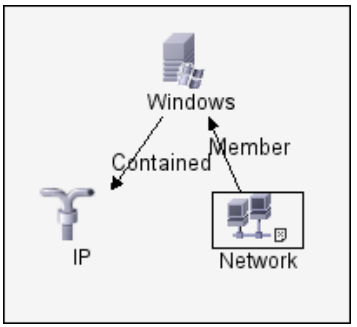
1 In the Editing pane, right-click the TQL node or relationship whose attribute conditions you wish to define, and select **TQL Node Definition** or **TQL Relationship Definition** to open the TQL Node/Relationship Definition dialog box.

Note: Alternatively, you can select the required node/relationship, and click the **Go to Edit Dialog** button in the Information pane to open the TQL Node/Relationship Definition dialog box.

---

2 (Optional) The **Element name** box contains the name of the selected node/relationship. By default, Mercury Application Mapping assigns the CIT type as the element's name. You can rename a TQL node in the **Element name** 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.

3 To display the selected TQL node in the editing pane, select **Visible**. When **Visible** is cleared, an invisible box appears to the right of the selected TQL node in the editing pane:



Any query results pertaining to that TQL node are not displayed in the topology view. 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.

4 To display both the selected CI and its descendents in the topology map, select **Include Sub Types**.

Changing the CI Type of the TQL Node

You can change the CI type of the TQL node after you have created a TQL.

To change the CI type of a TQL node after creating a TQL query:

1 In the Editing pane, right-click the TQL node whose CI type you want to change. and select **TQL Node Definition** to open the TQL Node Definition dialog box.

2 Click the **Change CI type** button to open the Change CI type dialog box.

3 Select the required CI type and click **OK**.

Note: You can only change the CI type to a type from one of the CIT's subclasses, if one exists.

Defining Attribute Conditions for Nodes and Relationships

This section describes how to define attribute conditions for nodes and relationships.

To define attribute conditions:

1 In the Editing pane, right-click the TQL node or relationship whose attribute conditions you wish to define, and select **TQL Node Definition** or **TQL Relationship Definition** to open the TQL Node/Relationship Definition dialog box.

2 In the TQL Node/Relationship Definition dialog box, click the **Attribute Conditions** tab.

3 Click the **Add an attribute condition** button to open the Condition dialog box.

4 From the **Attribute Name** list, choose the required attribute.

5 From the **Operation** list, select the required operation.

The operations in the **Operation** list are:

Operation	Description
Equal	Checks whether the attribute value is equal to the value specified in the **Value Comparison** box.
Not equal	Checks whether the attribute value is not equal to the value specified in the **Value Comparison** box.
Is null	Checks whether the attribute value is null.
Like	Uses a wildcard (%). Use **Like** when you are not sure of the complete name of what you are looking for.
Like ignore case	Uses a wildcard (%). Use Like ignore case when you are not sure of the complete name of what you are looking for. The case of the string is ignored.

Operation	Description
In	Displays only the instances where this attribute value equals one of the selected values. For example, for CIs that have an operational state that equals Warning(2) and Warning(3), select the operation **In**, and select both Warning(2) and Warning(3) from the **Value comparison** list.
Equal ignore case	Checks whether the attribute value is equal to the value specified in the value box regardless of the case.
Greater	Checks whether the attribute value is greater than the value specified in the **Value comparison** box.
Great than or equal	Checks whether the attribute value is greater than or equal to the value specified in the **Value comparison** box.
Less	Checks whether the attribute value is less than the value specified in the **Value comparison** box.
Less than or equal	Checks whether the attribute value is less than or equal to the value specified in the **Value comparison** box.
Changed during	(Displayed only when you select the **Create Time** attribute.) Displays only the instances that changed during the period specified in the **Value comparison** box.
Unchanged during	(Displayed only when you select the **Create Time** attribute.) Displays only the instances that did not change during the period specified in the **Value comparison** box.
In list	Equals one of the elements that appears in the list. For example: 320,4445,3483.

Note:

- When using the **Not equal** or **Not like** operations, 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 was assigned the value A, Host2 was assigned the value B, and Host3 was not assigned a value. If you created a query in which you want to retrieve all hosts that are **Not equal** to A, the results of your query only include Host2 because Host3 was not assigned a value.
- Mercury Application Mapping supports both MS SQL and Oracle database servers. MS SQL Servers used by Mercury Business Availability Center are not case sensitive by default, unlike Oracle servers which are case sensitive. Consequently, if you are using MS SQL Server, the **Equal** operation retrieves the same query results as the **Equal ignore case** operation. For example, if you select the attribute **City**, the operation **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**.

---

6 If you want to make a value comparison, do the following:

a Select **Value**.

b In the **Value Comparison** box, enter or select the value of the attribute.

Note: If you use a string in the **Value** box, it must appear in single quotes, as follows: 'YOKO', 'JASON'.

---

7 If you want to create a condition in which you compare two attributes, do the following:

a Select **Attribute**.

b In the **Attribute Comparison** box, select the required attribute from the **Attribute Comparison** list.

8 To filter the query results, see "Filtering Query Results in the Attribute Condition Tab" below.

9 Click **OK** to save the changes you have made and close the Condition dialog box.

Filtering Query Results in the Attribute Condition Tab

In the **Attribute Condition** tab, you can create an expression defining conditions that restrict the number of nodes that appear in the query.

To filter your query results:

1 In the editing pane, right-click the TQL node or relationship whose attribute conditions you wish to define, and select **TQL Node Definition** to open the TQL Node Definition dialog box.

2 Click the **Attribute Condition** tab.

3 In the **Condition** area, create an expression using the following:

Field	Description
NOT	Select **NOT** if you want the condition statement to do the opposite of what is defined. **Note**: If you select **NOT**, 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 was assigned the value A, Host2 was assigned the value B and Host3 was not assigned a value. If you created a query in which you want to retrieve all hosts that are equal to A and selected **NOT**, the results of your query only include Host2 because Host3 was not assigned a value.
Brackets 	Click inside the **Brackets** box to display a list of brackets you can use to build more complex logical statements.

Field	Description
Criteria	Contains the attribute condition definition as defined in the Condition dialog box (for details, see step 3 in "Defining Attribute Conditions for Nodes and Relationships" on page 119).
And/Or	Click inside the **And/Or** field and select either **And** or **Or** to link multiple conditions.

4 To delete an attribute condition, select the attribute condition you want to delete and click the **Delete selected row** button.

5 To insert an attribute condition before a selected row, select the required row, and click the **Insert an attribute condition before a selected row** button to open the Condition dialog box.

6 To edit an attribute condition, select the attribute condition you want to edit and click the **Edit selected row** button to open the Condition dialog box. For details on how to define an attribute condition, see "Defining Attribute Conditions for Nodes and Relationships" on page 119.

7 To move a row up, select the row you want to move and click the **Move selected row up** button.

8 To move a row down, select the row you want to move and click the **Move selected row down** button.

9 Click **OK** to save the changes you have made.

Defining Qualifier Conditions

This section describes how to define qualifier conditions for the selected node/relationship. For example, you can use a qualifier to define a CIT as abstract, meaning you cannot create instances from it.

To define qualifier conditions:

1 In the editing pane, right-click the TQL node or relationship whose qualifier conditions you wish to define, and select **TQL Node Definition** or **TQL Relationship Definition** to open the TQL Node/Relationship Definition dialog box.

2 Click the **Qualifier condition** tab.

3 Select the required qualifier(s) according to the following:

- **NOTIFY_CHANGES**. For internal use only.
- **BLE_LINK_CLASS**. For internal use only.
- **ABSTRACT_CLASS**. You cannot create instances of this CIT.
- **ITU_HIDDEN_CLASS**. For internal use only.
- **CONTAINER**. Relevant for relationships only. Represents containment between two CIs.
- **HIDDEN_CLASS**. Does not appear anywhere in the application.
- **READ_ONLY_CLASS**. For internal use only.
- **PM_SUSPECT**. Defines the CIT as an element that is a possible root cause for infrastructure problems that affected the selected CI. For details, see "Problem Isolation" on page 190.

Note: You can hold the CTRL key down to make multiple selections.

---

4 Click **OK** to save your definitions.

Defining Relationship Cardinality

In this section, you define how many CI instances you expect to have at the end of a relationship in your query result.

To define relationship cardinality:

1 In the editing pane, right-click the TQL node whose conditions you wish to define, and select **TQL Node Definition** to open the TQL Node Definition dialog box.

2 Click the **Cardinality** tab.

Note: This tab only appears when a node is selected.

3 Click the **Add an attribute condition** button to open the Relationship Cardinality dialog box.

4 In the **Node** box, select the required relationship to which the selected node is attached. The list contains all the relationships that are linked to the selected node.

In the following steps, you define the lower and upper limits for including the node at the other end of the relationship in the query results.

5 In the **Min** box, enter the value that defines the lower limits for including the node at the other end of the relationship in the query results.

6 In the **Max** box, enter the value that defines the upper limits for including the node at the other end of the relationship in the query results. You can use an asterisk (*) in the **Max** box to represent an infinite value.

For example, if <end_1> is IP and <end_2> is Windows, entering 1 in the **Min** box and asterisk (*) in the **Max** box instructs the system to retrieve only those IPs that are connected to at least one Windows. (The asterisk indicates an infinite value.) Entering 3 in the **Min** box and asterisk (*) in the **Max** box instructs the system to retrieve only those Windows that are connected to at least three IPs.

7 To filter the query results, see "Filtering Query Results in the Cardinality Tab" on page 125.

8 Click **OK** to save the changes you have made.

Filtering Query Results in the Cardinality Tab

You can define relationship conditions that allow the relationship's connecting node to be included in the TQL query results. In the **Cardinality** tab, you can create an expression defining that condition. For an example, see "Sample Relationship Conditions" on page 127.

To filter your query results:

1 In the editing pane, right-click the TQL node or relationship whose qualifier conditions you wish to define, and select **TQL Node Definition** to open the TQL Node Definition dialog box.

2 Click the **Cardinality** tab.

3 In the **Cardinality** area, create an expression using the following:

Field	Description
Brackets { }	Click inside the **Brackets** box to display a list of brackets you can use to build more complex logical statements.
Criteria	Contains the attribute condition definition as defined in the Condition dialog box (for details, see step 3 in "Defining Attribute Conditions for Nodes and Relationships" on page 119).
And/Or	Click inside the **And/Or** field and select either **And** or **Or** to link multiple conditions.

4 To delete an attribute condition, select the attribute condition you want to delete and click the **Delete selected row** button.

5 To insert an attribute condition before a selected row, select the required row, and click the **Insert an attribute condition before a selected row** button to open the Condition dialog box.

6 To edit an attribute condition, select the attribute condition you want to edit and click the **Edit selected row** button to open the Condition dialog box. For details on how to define an attribute condition, see "Defining Attribute Conditions for Nodes and Relationships" on page 119.

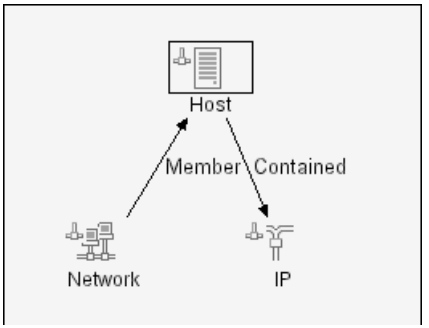
7 To move a row up, select the row you want to move and click the **Move selected row up** button.

8 To move a row down, select the row you want to move and click the **Move selected row down** button.

9 Click **OK** to save the changes you have made.

Sample Relationship Conditions

This section contains an example of relationship conditions based on the sample TQL query shown below.

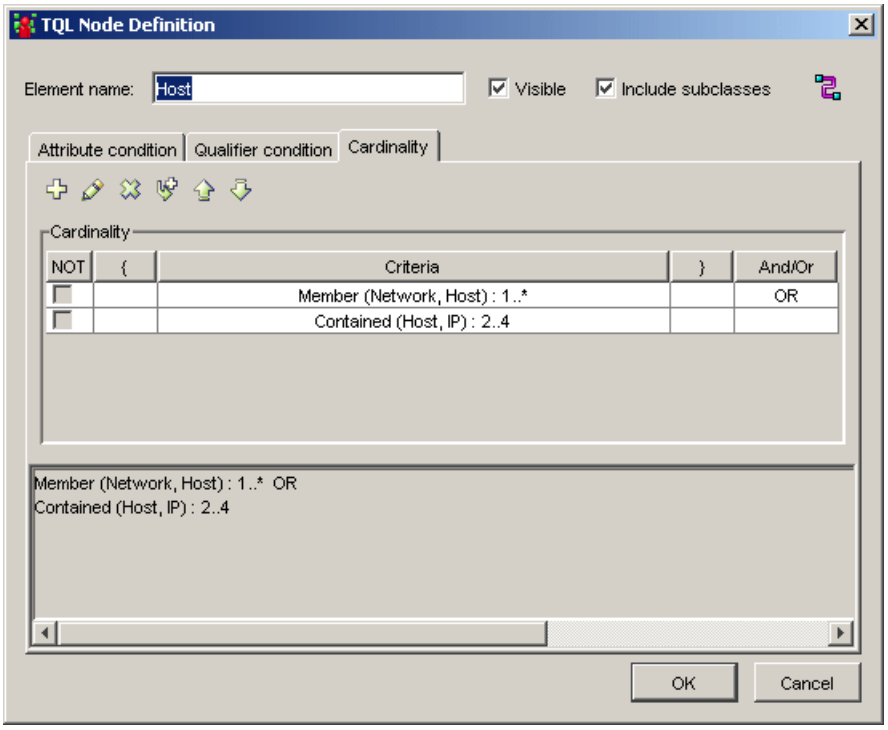


The following relationship conditions were defined for the TQL:

In the Relationship Cardinality dialog box, the following was defined (see "Defining Relationship Cardinality" on page 124):

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

The definitions appear in the **Cardinality** section, as displayed below.



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

Using the TQL Node Wizard

You can use the TQL Node Wizard to build a TQL query. The TQL Node Wizard allows you to:

- Add a node to a TQL query
- Add a relationship to a TQL query
- Define node conditions

- View all of the instances found for the TQL node in a table

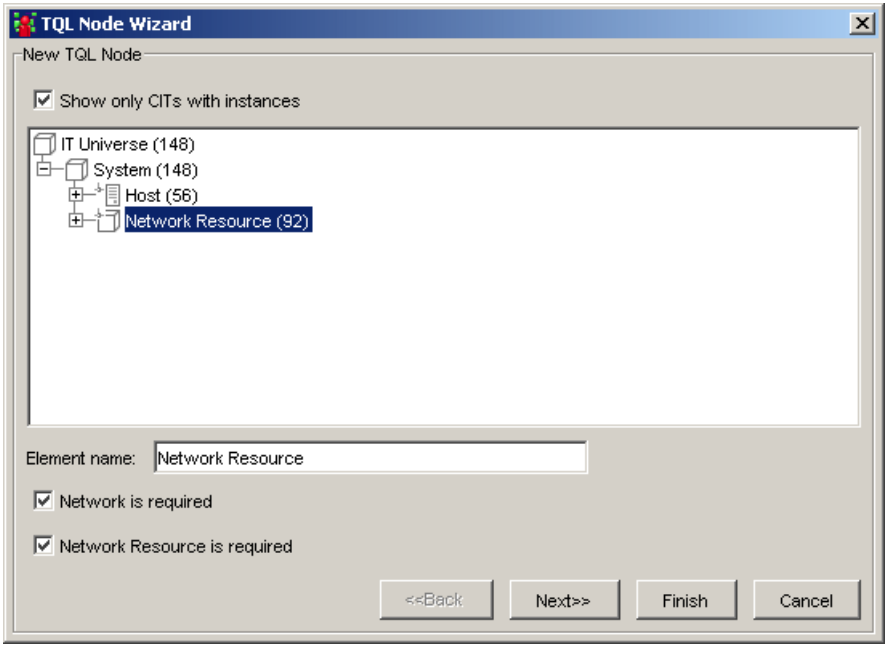
This section includes the following topics:

Adding a Node to the TQL Query

This section describes how to add a node to the TQL query.

To add a node to the TQL query:

1. In the required view, if the view is empty, drag a TQL node onto the editing pane from the tree displayed in the Configuration Item Type pane.
2. Right-click the required TQL node and select **TQL Node Wizard**. The New TQL Node page opens, allowing you to add a new TQL node to the query.



This page displays only the list of TQL 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.

Note: The first node in the hierarchy tree is selected by default.

---

3 Select the **Show only CITs with instances** check box to display only the CITs of which there are instances in the CMDB.

Note: The **Show only CITs with instances** check box is selected by default.

---

4 (Optional) The **Element name** box contains the name of the selected node. By default, Mercury Application Mapping assigns the CIT type as the element's name. You can rename a TQL node in the **Element name** 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.

5 The **<node> is required** check box defines the relationship cardinality (for details, see "Defining Relationship Cardinality" on page 124).

- Select the **<node> is required** 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*.
- Clear the **<node> is required** check box to give the relationship a cardinality value of 0*.

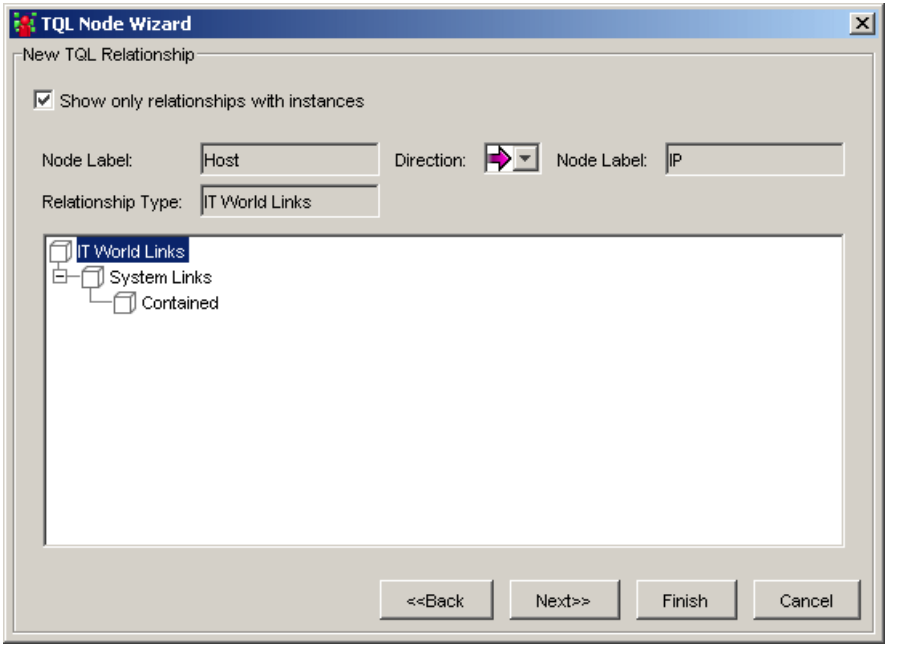
6 Click **Finish** to create the TQL query with the node you have added. To add a relationship, see "Adding a Relationship to a TQL Query" on page 131.

Adding a Relationship to a TQL Query

This section describes how to add a relationship to the TQL query.

To add a relationship to the TQL query:

1 In the New TQL Node page (for details, see "Adding a Node to the TQL Query" on page 129), select **Next** to open the New TQL Relationship page.



The Add Relationship dialog box contains the following fields:

Field	Description
Show only relationships with instances	Display only the relationships of which there are instances in the CMDB.
Node Label	The label of the source node. The default value is the CI Type display name. For details, see "Creating CITs" on page 383. **Note:** This field appears on the right hand side of the page.

Field	Description
Direction	The direction of the relationship that indicates which node is dependent on the other.
Node Label	The label of the node you selected in the New TQL Node page. **Note:** This field appears on the right hand side of the page.
Relationship Type	A valid relationship that defines the connection between the selected nodes. The field displays the relationship you selected in the node hierarchy tree.

2 Select the required direction of the relationship.

3 If required, select another valid relationship type to define the connection between the selected nodes.

Note: The relationship type that is selected by default is the highest in the hierarchy of the available, valid relationships.

---

4 Click **Finish** to create the TQL relationship you added to the query. The selected nodes are linked by the relationship you have selected. The direction of the relationship indicates which node is dependent on the other. To set node definitions, see "Setting TQL Node Definitions" on page 132.

Setting TQL Node Definitions

This section describes how to define TQL node definitions.

To define TQL node definitions:

1 In the New TQL Relationship page (for details, see "Adding a Relationship to a TQL Query" on page 131), select **Next** to open the New TQL Node Condition page.

2 To define attribute conditions for the node you added, see "Defining Attribute Conditions for Nodes and Relationships" on page 119.

3 To filter query results in the **Attribute condition** area, see "Filtering Query Results in the Attribute Condition Tab" on page 122.

4 Click **Finish** to save the node conditions you have defined. To display the TQL instances that were found, see "Showing TQL Node Instances" on page 133.

Showing TQL Node Instances

You can display all of the instances found for each TQL node in a table.

To display all of the instances found for each TQL node in a table:

1 In the TQL Node Condition page (for details, see "Setting TQL Node Definitions" on page 132), select **Next** to open the Element Instances page. For details, see "Showing TQL Node Instances" on page 147.

2 Click **Finish** to save your TQL query definitions.

Specifying the CI Status Factor

The status factor of a CI is a value (in percent) that defines the significance of the CI status. This is useful for reducing the significance of CIs whose status can fluctuate on a regular basis, such as processes, which continuously change. By reducing the significance of such CIs in the system, events are prevented from generating an overflow of critical messages. For example, if the state of an event is 5 and the status weight of the process is defined at 40%, then the CI status is 2 (5*40/100).

To specify the status factor of a CI:

1 In the editing pane, right-click the node for which you want to define the factor status and select **View Node Definition**. The View Node Definition dialog box opens.

2 Click the **Status Factor** tab.

3 In the **Status Factor** area:

a In the **Status Weight** box, enter a value (in percentage) to define the significance of the CI's status. This is useful for reducing the significance of CIs whose status can fluctuate on a regular basis, such as processes and CPU. By reducing the significance of such CIs in the system, you can prevent events from generating an overflow of critical messages.

b For example, if the state of an event is **5** and the status weight of the process is defined at **40%**, then the CI status is **2 (5*40/100)**. For details on status, see "Introduction to the Topology View" on page 155.

c In the **Compound Status Weight** box, enter a value (in percentages) to define the significance of the CI's compound status (for details, see compound status on 512).

4 In the **Propagation** area:

a (Optional) Select **Propagate Node Status** to determine whether the status of the node is inherited by its upper view's layers.

b (Optional) Select **Propagate Node Blink** to determine whether the blinking attribute of the node (indication for its unacknowledged state) is inherited by its upper view's layers.

c (Optional) If you selected the **Propagate Node Status** option above, select whether the propagation should be the maximum (**Max**) or average status of the CI (**Average**) in the **Propagate Function** list.

5 Click **OK** to save the settings you have defined.

Grouping CIs

Mercury Application Mapping enables you to group the CIs in a pattern view according to defined criteria, for example, by CIT or by a particular attribute. You can apply the grouping option you defined to the layer of your view to organize the way the view is presented throughout Mercury Application Mapping. This section includes the following topics:

Grouping CIs in the Topology Map

This section describes how to group CIs in the topology map.

To group CIs in the topology map:

1 In the editing pane, right-click the node for which you want to create groups according to selected criteria and select **View Node Definition**. The View Node Definition dialog box appears.

2 Click the **Group By** tab to group the node's instances according to selected criteria.

3 To define a group of nodes for this view, click **Add** to display the Group Configuration Items dialog box.

4 Define a group of nodes for this view by selecting one of the following options:

- **Configuration Item Type**. Group CIs in the topology map by their CIT.
- **TQL Node**. Groups all CIs of the same CIT that fulfill the node definition criteria. By default, these CIs appear in the topology map under a folder, containing the name of the selected TQL node and an automatically added identification number.
- **Attribute**. Groups CIs from multiple CITs in the topology map, according to the attribute selected from the list. A CI can be a member of multiple groups. The **Attribute** option enables you to group CIs from different CITs. The **Configuration Type Item** and **TQL Node** options are used to group CIs from the same CIT. For details, see "Grouping By Attribute Properties" on page 138.

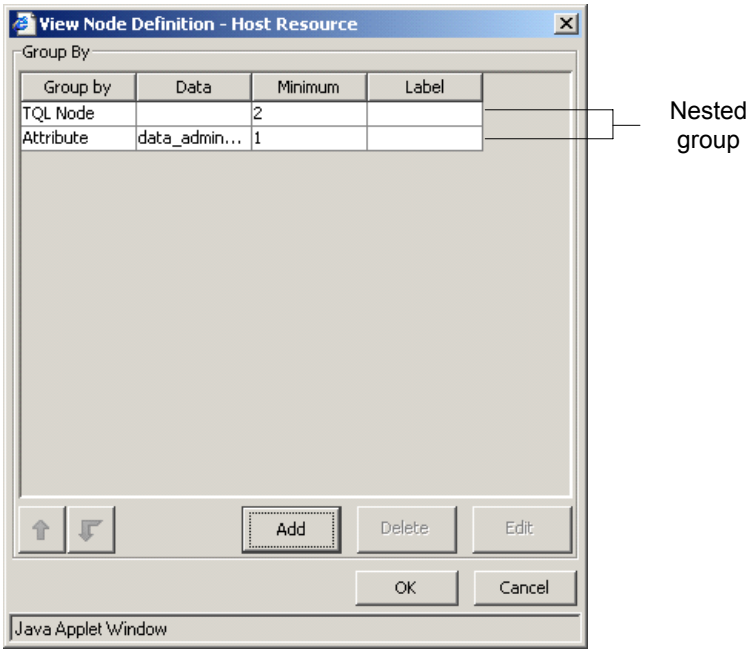
5 (Optional) In the **Minimum in group** box, enter the minimum number of matching CIs required to create the group. By default, there must be at least one CI in the group.

Note: If you use the Minimum in group option, click the **Rebuild** button in the toolbar to view updated results.

6 (Optional) In the **Group label** box, enter the label of the group.

7 You can create nested groups (using the **operation state** attribute), that is, a CI group inside another CI group. This option provides you with additional fine-tuning of the TQL results that are displayed in the topology map (for more details, see "Nested Groups" on page 139).

8 To nest a group, create one group and return to the **Group By** dialog box (for more details, see "Nested Groups" on page 139). Click the **Add** button again and create another group. When you finish creating the second group, the **Group By** tab should look similar to the following figure:



You can repeat this procedure to create as many groups as needed.

9 To change their nesting order by using the arrow buttons at the bottom of the View Node Definition dialog box.

10 To delete a group, select the required group and click **Delete**.

11 To edit a group:

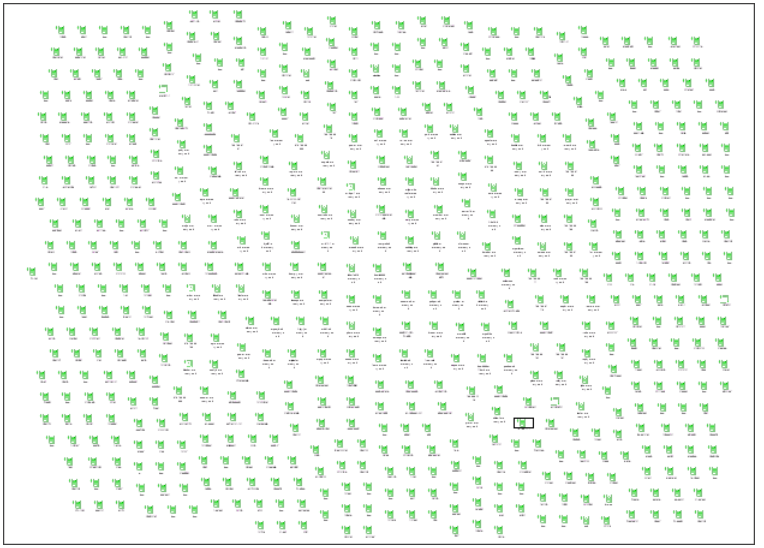
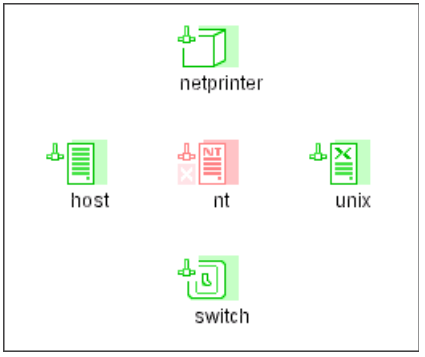
a Select the required group and click **Edit**.

b Repeat steps 3 to 5 in "Grouping CIs in the Topology Map" on page 135.

12 Click **OK** to save the node's definitions.

13 Click **OK** to save the definitions of the selected node.

The following figures show how the host grouping affects the display in the topology map:

<table>
<tr><td>  </td><td>Non-grouped hosts</td></tr>
<tr><td> 
</td><td>Grouped hosts</td></tr>
</table>

Grouping By Attribute Properties

You can group nodes from multiple CITs in the topology map by using a regular expression.

To group nodes by using regular expressions:

1. In the editing pane, right-click the node for which you want to create groups according to selected criteria and select **View Node Definition**. The View Node Definition dialog box appears.
2. Click the **Group By** tab to group the node's instances according to selected criteria.
3. To define a group of nodes for this view, click **Add** to display the Group Configuration Items dialog box.
4. In the **Attribute Name** box, choose the required Attribute Name.
5. In the **Mask to group by** box, enter a regular expression, as follows:
   a. In the first field, enter the regular expression pattern. This is the structure of the selected attribute.
   b. In the second field, enter the group number. This is the part of the regular expression pattern to focus on when creating the group.

   For example, enter a regular expression to define the IP address (aa.yy.zz.mm), as follows:

To:	In the first field enter:	In the second field enter:
Group by zz	(.*[.].*[.])(.*)([.].*)	2
Group by yy	(.*[.])(.*)([.].*[.].*)	2
Group by aa	(.*)([.].*[.].*[.].*)	1
Group by mm	(.*[.].*[.].*[.])(.*)	2

You can also group by the first or last letter of any attribute:

For example, enter a regular expression to group the nodes by the first or last letter(s) of the selected attribute as follows:

To:	In the first field enter:	In the second field enter:
Group by the first letter	(.)(.*)	1
Group by the last letter	(.*)(.)	2
Group by the first two letters	(..)(.*)	1
Group by the last two letters	(.*)(..)	2

c **Group List**. Define the specific groups of the selected attribute to be created. For example, to display two groups of IP addresses that end between 0 and 100, enter `0-50, 51-100`. Any IPs that fall outside this group are placed automatically into the **Others** group.

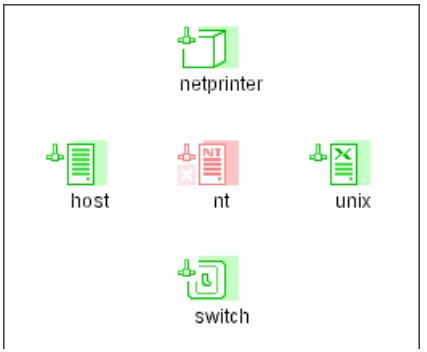
Nested Groups

You can create nested groups (a node group inside another node group) to help fine-tune the TQL results that are displayed in the topology map.

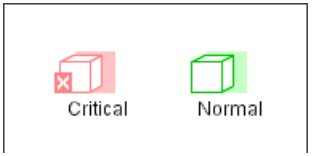
For example, after grouping host nodes by their CIT, you can use their **operation state** attribute to create more focused groups.

In the topology map, nested grouping is displayed as follows:

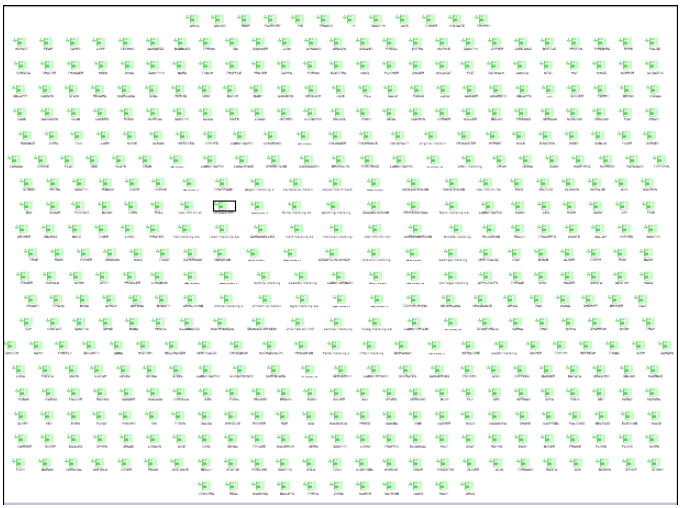
➤ The first layer shows host nodes grouped by their CIT:



➤ Drill down to the next layer to display host nodes grouped by **Oper State**:



➤ Drill down to the next layer to display host nodes belonging to a certain host CIT and with the same **Oper State**:



Straightening a Relationship With an Angle

Mercury Application Mapping allows you to straighten a relationship that has angles.

To straighten a relationship with angles:

Right-click the relationship that has an angle and select **Straighten**.

Adding Folding Rules to Relationships

After setting the node and relationship definitions of the view, you can add folding rules to selected relationships. This enables you to define the organizational structure of CIs in the topology map by displaying selected CIs at different levels. When no folding rules are defined, the topology view displays all CIs included in the query results on one level by default. For example, if the query results include hosts and networks, both CIs are displayed on the same level in the topology map.

If an icon appears with a downward arrow in the topology map, it means that there is an additional CI layer beneath it, created by a parent or child folding rule.

To add folding rules:

1. In the editing pane, right-click the relationship for which you want to define a folding rule.
2. Select **Add Rule**.
3. Select one of the following options to define the organizational structure between the two CI types connected by the selected relationship:
   - **Parent**. Select this option to display Node1 as the parent of Node2. That is, double-clicking the Node1 element on one map level displays a new map level with Node2 elements.
   - **Right Sibling**. Select this option to display Node1 elements wherever Node2 elements are displayed. That is, both CIs are displayed on the same map level.
   - **Left Sibling**. Select this option to display Node2 elements wherever Node1 elements are displayed. That is, both CIs are displayed on the same map level.
   - **Child**. Select this option to display Node1 as the child of Node2. That is, double-clicking a Node2 element on one map level displays a new map level with Node1 elements.
   - **None**. Do not define any folding rules for this relationship.

Defining Multiple Relationship Rules

As an alternative to adding folding rules (for details, see "Adding Folding Rules to Relationships" on page 142), you can choose to define multiple relationship rules.

Whereas you define folding rules to define the structure of two nodes connected to a specific relationship, you define relationship rules to define the structure between CITs in a view.

For example, if one of the view's nodes is a host, you can specify different relationships for Windows, UNIX, router, and so forth. By assigning different folding rules to different CITs, views can encompass and represent additional query data.

Note: If both folding and relationship rules have been defined, the definitions for the folding rules override the definitions for relationship rules.

This section includes the following topics:

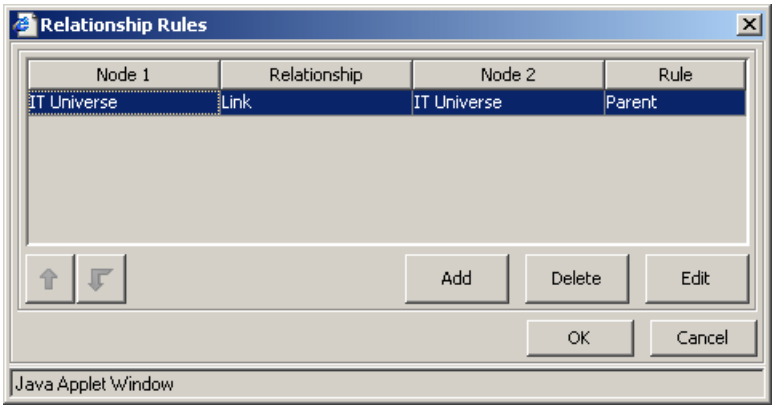
Defining Multiple Relationship Rules

This section describes how to define multiple relationships.

Note: You can define sibling and child rules for the same relationship between two CITs. However, you cannot define parent and child rules for the same relationship, or left sibling and right sibling rules.

To define multiple relationship rules:

1 In the View Explorer, right-click the required view for which you want to define relationship rules and select **Relationship folding rules** to open the Relationship Rules dialog box.



2 Click **Add** to display the Add Rule dialog box.

3 Select the required Node1 node in the **Node1** list.

4 Select the required Node2 node in the **Node2** list.

5 From the **Relationship** list, select an available relationship connecting the Node1 node to the Node2 node. (Enabled only after you defined both CITs.)

6 From the **Rule** list, select a folding rule: **Parent**, **Right Sibling**, **Left Sibling**, or **Child**. For details, see “Adding Folding Rules to Relationships” on page 142.

7 Click **OK** to save the settings you have defined. The new rule is added to the Relationship Rules dialog box.

8 Repeat steps 2 to 7 to add another rule.

9 Click **OK**.

Editing Relationship Rules

This section describes how to edit an existing relationship rule.

To edit a relationship rule:

1 In the Relationship Rules dialog box, select the rule you want to edit and click **Edit** to display the Add Rule dialog box.

2 Make the required changes.

3 Click **OK** to save the changes.

Deleting Relationship Rules

This section describes how to delete an existing relationship rule.

To delete a relationship rule:

In the Relationship Rules dialog box, select the rule you want to delete and click **Delete**.

Creating a Dependency Graph

You can create a graph that represents additional TQL query data related to a specific CI. The discovery pattern searches for the results from TQL query as well as the dependency graph definitions. The query recursively retrieves all the related CIs by a defined depth.

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 "Defining Attribute Conditions for Nodes and Relationships" on page 119.

The discovery pattern retrieves data that meets the criteria that is defined in the dependency graph.

This section contains the following topics:

Defining a Dependency Graph

This section describes how to define a dependency graph.

To define a dependency graph:

1. Right-click the required node and select **Add SubGraph** to open the Dependency List dialog box.

2. Click the **Add** button to open the Add Dependency dialog box.
3. From the **Node 1** list, select the desired node.
4. From the **Node 2** list, select the desired node.

5. To define attribute conditions for the node you selected, click the **Condition** button to the right of the node. For information on how to define attribute conditions, see "Defining Attribute Conditions for Nodes and Relationships" on page 119.

Note: The **Condition** button is enabled only after you selected a node from the node list.

---

6. From the **Relationship** list, select an available relationship connecting Node 1 to Node 2. The list of available relationships appears only after defining both nodes.
7. Click **OK** to save the dependency map definition. The dependency map definition appears in the Dependency List dialog box.
8. In the **Depth** box, select a number that determines how many steps (that is, how many connecting nodes) in the TQL pattern you want included in the discovery process. The default is 5.
9. Click **OK** to save the changes you have made.

Deleting a Dependency Definition

This section defines how to delete a dependency definition.

To delete a dependency definition:

1 From the Dependency List dialog box, select the row you want to delete.

2 Click the **Delete** button.

Editing a Dependency Definition

This section defines how to edit a dependency definition.

To edit a dependency definition:

1 From the Dependency List dialog box, select the row you want to edit.

2 Click the **Edit** button to open the Add Dependency dialog box.

3 Edit the nodes and relationships as desired. For details, see "Defining a Dependency Graph" on page 146.

4 To define attribute conditions for a node, click the **Condition** button to the right of the node.

For details, see "Defining Attribute Conditions for Nodes and Relationships" on page 119.

5 Click **OK** to save the changes you have made.

Showing TQL Node Instances

You can display all of the instances found for each TQL node in a table.

To display all of the instances found for each TQL node in a table:

1 In the Editing pane, right-click the required TQL and select **Show element's instances** to open the Element instances dialog box.

The list of nodes are divided into pages. The number at the bottom of the screen indicates which page is currently being displayed. For example, 2/4 means that it is the second out of four pages.

2 To view other pages, use the left and right arrows.

3 To determine the number of node instances that appear on a page, do the following:

- ➤ Click the **Set bulk size** button to open the Set bulk size dialog box.
- ➤ Use the up and down arrows or type the number of node instances you want to appear on a page and click **OK**.

4 To update the table, click the **Refresh** button.

5 Click **OK** to save the settings you have defined.

Copying and Pasting TQL Nodes and Relationships

You can copy and paste TQL nodes and relationships and their definitions into the same view or another view definition.

To copy and paste TQL nodes and relationships:

1 Select the node(s)/relationship(s) you want to copy into the same view or another view. To select more that one item, hold down CTRL and click the required TQL nodes/relationships.

2 Right-click the selected items and click **Copy**.

3 In the view where you want to paste the selected item(s), right-click and select **Paste**.

Business Service Enrichment

Mercury Application Mapping allows you to define the creation of a business service item by view name and link it to different CIs. You can use this feature to show which hosts are serving a specific business service or create correlation rules that reflect problems at the business level.

You first create the required view, define the business view item in that view and then create the TQL query to see the results.

The TQL results in the topology map of the Topology View manager display the business service item and all the CIs linked to it. The name of the business service item gets its name of the view from which you defined the business service item. The business service item and the linked CIs are connected by **Application Links**.

By default, you can only apply this option to hosts. You can change the default by adding other CITs to the **appilogConfig.properties** file, located in **\<Mercury Application Mapping root directory>\root\lib\server**.

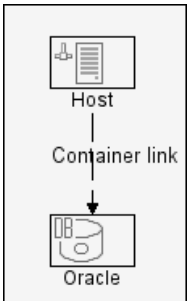
This section contains the following topics:

Creating a Business Service View

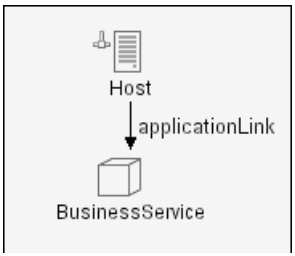
This section describes how to create a business service view.

To create a business service view:

1 Create the required view and define the Business Service item. For example, in the following view called **Oracle**, right-click **Host** and select **Add to Business View**.

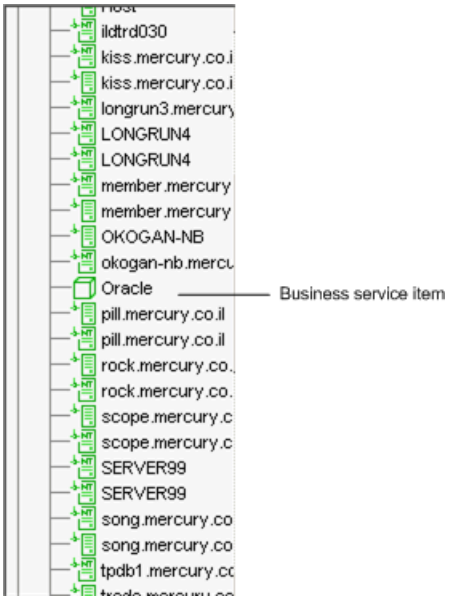


2 To see the results of the view, create the required TQL. For example, you can create a TQL using the **BusinessService** node and the **Application Link** as shown in the following example. For details about how to create TQL queries, see "Using the TQL Node Wizard" on page 128.



3 In this example, if you defined Host in your view as a business service item, a new business service item named **Oracle** is created and all the Hosts queried in this TQL are linked to an **Oracle** business service item by an Application Link.

The following example shows the business service view, which contains the **Oracle** business service item and the different CIs that are linked to it.



Removing a Business Service Item from a Business Service View

This section describes how to remove a business service item from a business service view.

To remove a business service item from a business service view:

Right-click the CI you defined as the business service item and select **Remove from Business Service**. The business service item is removed from the business service view.

Saving the Pattern View

Once you have defined your pattern view, the last step is to save the TQL query to the CMDB so it can retrieve the data based on the definitions you have set. If you exit the Service View Manager without saving, a confirmation message is displayed, requesting that you save your changes.

To save the pattern view:

Click the **Save** button on the toolbar.

Importing a Managed View

You can import XML files that contain saved views to the Service View Manager. Use this option if you want to relocate managed views from one workstation to another.

Note: Before you import a managed view, you must verify that its attached TQL query appears in the **Attached TQL** list in the New dialog box. If the attached query does not exist in your query list, importing fails.

To import a managed view:

1. From the Service View Manager, select the **Map** menu and click **Import** to open the Import dialog box.
2. Locate the managed view you want to import, select it and click **Import**. The imported managed view is added to the view list in the View Explorer.

Using the Toolbar Options

For a description of each toolbar option in the Service View Manager, see "Toolbar Options" on page 33.

Printing the Contents of the Topology Map

For a description of how to print the contents of the topology map, see "Printing Options" on page 41.

Defining a View's Layout

For a description of how to customize the layout of a specific layer in a view, see, "Defining a View's Layout" on page 45.

Understanding Layout Options

For a description of how you can display the contents of the topology map using different layout options, see "Defining a View's Layout" on page 45.

Part IV

Viewing Queries with Topology View

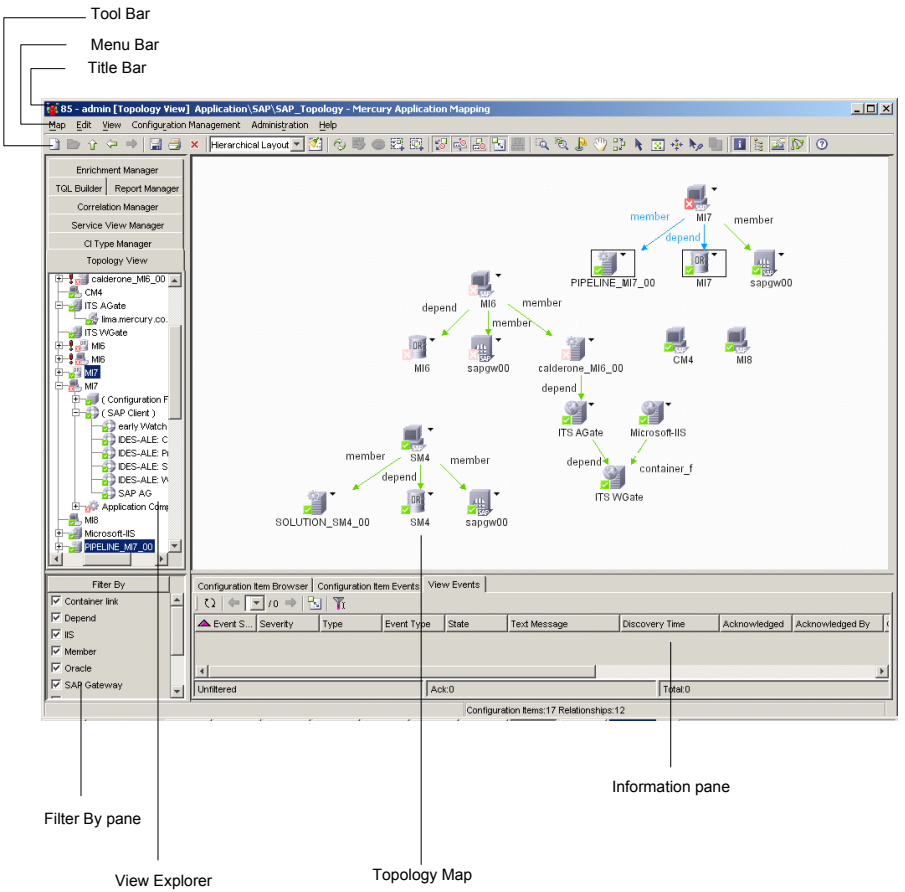
11

Introduction to the Topology View

This chapter introduces the Topology View, which enables you to view multi-level maps displaying the results of the query based on a selected view. In addition, you can manage the events occurring in the system, at the CI level and at higher, top-view levels, enabling you to locate problems occurring in different areas of your IT infrastructure.

About the Topology View

The topology view is displayed by selecting the Topology View tab in the View Explorer, and enables you to view the results of your TQL queries based on the view defined with the View Manager. The maps displayed in the topology map may be displayed in multiple layers, depending on whether organization rules are defined in the view, as described in Part III, “Pattern Views and Folding Rules.” The topology map also enables you to view events associated with the CIs displayed in each map.



When the Topology View tab is selected, the Mercury Application Mapping main window is divided, as follows:

- **View Explorer.** Displays a hierarchical tree structure of the map CIs based on a selected view. You can navigate between map layers by either selecting layers from the View Explorer or by drilling down. For example, by selecting the view of a network in the View Explorer, you can drill down to view the CIs belonging to the selected network at the host level. Selecting a CI in the View Explorer simultaneously selects it in both the Map and Information panes. The color of the selected view's icon is determined by its severity level.
- **Filter By pane.** Contains CI groups that can be displayed or hidden in the topology map.
- **Topology Map pane.** Displays the results of the view currently selected in the View Explorer, and consists of CIs that are defined in the TQL query and the relationships between them. You can change the way the maps are displayed by selecting one of the view layouts (Hierarchical, Symmetric, Manual, Orthogonal). For details, see "Improving Views" on page 174.
- **Information pane.** Displays events that are related to the CIs in the selected view. This pane includes the following tabs: **Configuration Item Browser**, **Configuration Item Events**, and **View Events**. For details, see "The Event Tabs in the Information Pane" on page 218.

Working with Topology View

Use the topology map to perform the following functions:

- Display the views created with the View Manager.
- Show or hide selected CIs, relationships or views.
- Edit labels of selected CIs in the Topology Map pane.
- Display the neighbors of a selected CI, which are connected to the CI using the various relationship types.
- Display and edit the CI's attributes, according to your access rights.
- Acknowledge events relating to the selected CIs and to the CIs displayed in the levels below the selected CIs (the compound CIs).

- Show or hide the Filter by pane, which represents logical groupings of the CIs and relationships that are defined in the query.
- Display the selected CI's events and compound events.
- Zoom in and out of the Topology Map pane to view the selected layer at different levels of magnification.
- Display the view in one of a number of different layouts. If required, you can create your own manual layout view and save it to the database.
- Add a background map for navigational purposes, when using the manual layout display.

Understanding Topology View Concepts

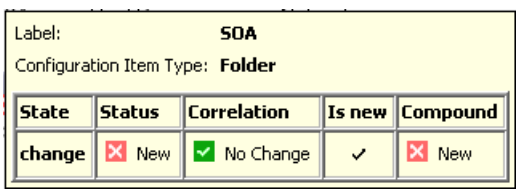
The CIs and relationships that are represented in the topology map pane have unique topology data in addition to their basic attributes. This topology data is based on, and produced according to, the way these CIs and relationships are located and defined in Mercury Application Mapping views. You can view this data through the tooltip and browser, as described in the following sections.

This section includes the following topics:

- "Topology View Tooltip" on page 158
- "Configuration Item Browser" on page 159

Topology View Tooltip

When you point to a CI in the Topology Map pane, a tooltip is displayed that contains the CI statuses in the selected categories of the view:



The tooltip contains the following information:

- **Label.** The label of the selected CI.
- **Configuration Item Type.** The CIT of the selected CI as defined in the Configuration Item Type Model.
- **State.** The state name.
- **Status.** The severity level of the category.
- **Correlation.** Indicates the severity of the CI that is affected by a correlation rule (in the corresponding category).
- **Is new.** Indicates that the CI has a new event that is neither acknowledged nor suppressed.
- **Compound.** The severity level of the category of the children that exist at all map levels below the selected level.

Configuration Item Browser

The **Configuration Item Browser** tab lists all the CIs of the selected view that are currently displayed in the Topology Map pane. (To display the **Configuration Item Browser** tab, select **View > Information Browsers > Configuration Item Browser**.) In addition to the information displayed in the tooltip, the **Configuration Item Browser** tab contains the following information:

- **Symbol.** The icon defined for the CIT of the selected CI.
- **No. of Children.** The number of children and relationships that exist at all map levels below the selected level. Double-click the selected value to view the map level below the current level.

Selecting a CI in the Configuration Item Browser also selects it in both the Topology View pane and the View Explorer pane.

Note: You can sort the displayed CIs by setting which columns to show and in what order. For details, see “Sorting, Hiding, and Displaying Columns” on page 213.

Topology View Shortcut Menus

The topology view contains different shortcut menus, depending on your selection in the Topology Map pane.

This section includes the following topics:

View Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a selected view in the View Explorer, Topology map or Information panes:

Option	Description
Hide	Enables you to hide the selected view.
Properties	Displays the View Properties dialog box. This option enables you to see and edit the properties of the selected view (apart from the view name and the attached TQL).
Rebuild	Refreshes the CIs and relationships displayed in the selected view.
Snapshot	Enables you to view and to save snapshots.

Option	Description
Reports	Select one of the following options: **Asset Report**. Lists all the CIs in a selected view and their attribute values. For details, see "Asset Reports" on page 233. **Dependency Report**. Lists all the relationships of the type dependency that connect between servers in the selected view or between the servers in the CMDB and the servers within the selected view. For details, see "Dependency Reports" on page 237. **Event Report**. Displays the events for the CIs in the selected view. For details, see "Event Management" on page 213.
Acknowledge (Compound)	Acknowledge the events relating to all the CIs in the view.
Events	(These options are enabled for parent CIs only.) Select one of the following options: ➤ **Compound Event Browser**. Displays the Event Browser dialog box that enables you to view active events related to CIs in lower maps that are connected to the selected view. Through this dialog box you can perform other actions. ➤ **Compound Event Log**. Displays the Event Log dialog box that enables you to view all the raw events related to CIs in lower maps that are connected to the selected view.
Deactivate/Activate View	Toggles between showing and hiding the view's CIs. The CIs are not deleted.

CI Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a selected CI in the Topology Map, View Explorer, or Information panes.

Option	Description
Hide	Enables you to hide the selected CI. By hiding one or more CIs, you can focus on the CIs that are of interest to you. This option is useful for display purposes and can assist you in creating reports and diagrams, which are based on the current display of the topology map.
Show CI Attributes F9	Displays the CI Attributes dialog box, enabling you to view and edit CI attributes, according to your access rights.
Note	Enables you to create personal notes that include comments, and attach them to CIs or events in the topology map.
Delete	Enables you to delete the selected CI from the view and from the CMDB. **Note:** When you delete a parent CI, the selected CI and its children are removed from the view, but only the selected CI is removed from the database.
Get Related CIs	Enables you to display the interdependencies of a selected CI (that is, its neighbors) in different contexts: a specific layer, a specific view or the entire CMDB. For details on the Get Related CIs options, see "Displaying Interdependent CIs" on page 181.
Insert CI	Displays the Insert Configuration Item dialog box, enabling you to manually add new CIs to the database and to the view. For details, see "Adding CIs to the CMDB" on page 196.
Reports	Enables you to choose reports for events, changes, and related CIs. Displays the appropriate dialog box, enabling you to create and display reports. For details, see Chapter 12, "Generating Map Reports."

Option	Description
Analysis	Select one of the following options: ➤ **Show Impact**. Displays the Impact Correlation Rules dialog box, enabling you to select a correlation rule, and then display in a new window all the CIs that are affected by the selected CI. If only one correlation rule is defined for this CI, the Impact window is directly displayed. ➤ **Problem Isolation**. Displays the Root cause Correlation Rules dialog box, enabling you to select a correlation rule, and then display in a new window the root cause CI(s) that affected the selected CI. If only one correlation rule is defined for this CI, the Correlation window is directly displayed.
Events	Select one of the following options: ➤ **Event Browser**. Displays the Event Browser dialog box, enabling you to view the events related to the selected CI. ➤ **Event Log**. Displays the raw event history of the selected CI.

Option	Description
Actions	Select one of the following options: ➤ **Set Admin State**. Enables you to manually change the Admin State of a CI, so that it is no longer a managed CI in the system. For example, by setting the Admin State of a router to **Testing**, the router has no influence on other CIs in the system, and the other CIs have no influence on it. The default Admin State is **Managed**. Other options include: **Disabled, Restricted, Unknown,** and **Unmanaged**. ➤ **Send Event**. Displays the Send Event dialog box, to enable you to define the event category that affects the CI, according to your access rights. For details on defining the event category, see "Sending an Event" on page 229. ➤ **Clear All Events**. Enables you to clear the CI's state and return it to **Normal**. For details on clearing the CI's state, see "Clearing All Events" on page 229. ➤ **Add Discovery Pattern**. Displays the Add Discovery Pattern dialog box, enabling you to manually invoke a Discovery Pattern for the selected CI. You can use this option to discover additional information about the CI through one of the available Discovery Patterns. The Add Discovery Pattern dialog box also allows you to edit the parameters of the Discovery Patterns and to customize them to your needs. ➤ **Remove Discovery Pattern**. Displays the Remove Discovery Pattern dialog box, enabling you to manually remove a Discovery Pattern from the selected CI.
Ping	(This option is enabled for host and IP CIs only.) Enables you to ping the selected CI.

Multiple CIs Shortcut Menu

The table below contains a brief description of each option in the shortcut menu, displayed by selecting several CIs and right-clicking them in the Topology Map pane (for details, see "Selecting Multiple CIs" on page 31).

Note:

- Use Windows conventions—SHIFT+ARROW key, CTRL+ARROW key—to select adjacent (for the View Explorer only) or nonadjacent CIs.
- You cannot select multiple CIs from different view layers.

Option	Description
Hide	Enables you to hide the selected CI. By hiding several CIs, you can focus on the CI(s) that are of interest to you. This option is useful for display purposes and can assist you in creating reports and diagrams, which are based on the current display of the Topology Map pane.
Delete	Enables you to delete the selected CIs.

Option	Description
Actions	Select one of the following options: ➤ **Add CI to Discovery Pattern**. Displays the Add Discovery Pattern dialog box, enabling you to manually invoke a Discovery Pattern for the selected CI. You can use this option to discover additional information about the CI through one of the available Discovery Patterns. The Add Discovery Pattern dialog box also allows you to edit the parameters of the Discovery Patterns and to customize them to your needs. ➤ **Remove CI from Discovery Pattern**. Displays the Remove CI from Discovery Pattern dialog box.
Insert Relationship	(Enabled for two selected CIs only) Display the Insert Relationship dialog box, enabling administrators to manually add relationships between CIs that are saved to the database. Adding a relationship to the database triggers the Discovery Methods to begin collecting the required information regarding the new relationship.

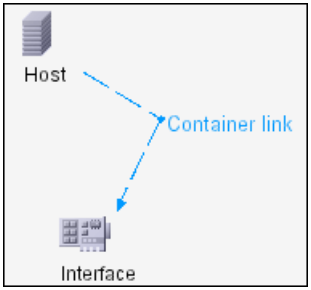
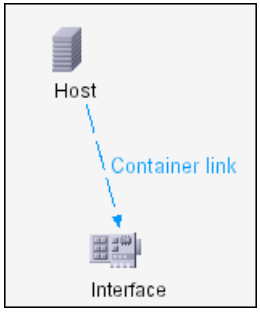
Relationship Shortcut Menu

This section contains a brief description of each option in the shortcut menu displayed by right-clicking a relationship in the topology map pane:

Option	Description
Hide	Enables you to hide the selected relationship.
Show CI Attributes	Displays the Attributes dialog box, enabling you to view and edit relationship attributes, according to your access rights. For details, see "Viewing and Editing CI Attributes" on page 177.
Delete	Enables you to delete the selected relationship from the view and from the CMDB.

Option	Description
Analysis	Select one of the following options: ➤ **Show Impact**. Displays the Impact Correlation Rules dialog box, enabling you to select a correlation rule, and then display in a new window all the CIs that are affected by the selected relationship. If only one correlation rule is defined for this relationship, the Impact window is directly displayed. For further details, see "Showing a Correlation Impact" on page 188. ➤ **Problem Isolation**. Displays the Root Cause Correlation Rules dialog box, enabling you to select a correlation rule, and then display in a new window the root cause CI(s) that affected the selected relationship. If only one correlation rule is defined for this CI, the Correlation window is directly displayed.
Events	**Event Browser**. Displays the Event Browser dialog box, enabling you to view the events related to the selected relationship. For details, see "Event Browser" on page 225.

Option	Description
Actions	Select one of the following options: ➤ **Set Admin State**. Enables you to manually change the Admin State of a relationship, so that it is no longer a managed CI in the system. For example, by setting the Admin State of a router to Testing, the router has no influence on other CIs in the system, and the other CIs have no influence on it. The default Admin State is Managed. Other options include: Disabled, Restricted, Unknown, and Unmanaged. ➤ **Send Event**. Displays the Set State dialog box, enabling you to determine the relationship's state, according to your access rights. ➤ **Clear Events**. Enables you to clear the relationship's Operational State and return it to Normal.

Option	Description
Straighten	(Enabled only for relationships with angles on the Topology Map pane.) Enables you to straighten relationships with angles, such as the one that appears in the following example:  To straighten the relationship, right-click the blue square in the middle of the angle and select **Straight**. The relationship is straightened, as seen below: 

12

Using the Topology Map

This chapter explains how to use the Topology View manager.

About Using the Topology Map

The Topology Map pane enables you to navigate between different map levels (from the top level down to the CI level) to focus on specific areas of the network, according to your requirements. In addition, the Topology Map pane enables you to view the attributes of any displayed CI and add a background graphic to the map.

Navigating in Maps

When a view is selected in the View Explorer, the map for that view is displayed in the topology map pane. The icon displayed for each CI represented in the map is determined by its CIT, as defined in the CI Type Model, and includes the label defined for that CIT in the Service View Manager.

If the CI appears with a downwards arrow, you can double-click the CI to drill down to a lower map level, created by a child organizational rule set up in the Service View Manager.

For example, if the IP CI is defined as a child of the host CI in the Service View Manager, you can double-click any host icon in the topology map pane to display a map of IPs connected with that host.

To drill down from a selected parent CI, you can also use the Open option on the **Map** menu, or the **Open** button on the toolbar.

Right-click a CI and select from the shortcut menu one of the **Get Related CIs** options, to display a map containing the interdependencies of the selected CI in different contexts: a specific layer, a specific view or the entire CMDB. Selecting the **Get Related CIs** > **Layer** option is useful when working with maps that display a great number of CIs, as it enables you to focus on a particular portion of the map while removing unneeded details. The other options enable you to locate and manage the interdependencies that exit between the selected CI and other CIs in your system, as described in “Displaying Interdependent CIs” on page 181.

Understanding Layer Layouts

The **Layer Setup** option enables you to accurately define the layout of view's layers in a way that helps you achieve the clearest presentation possible. For details, see Chapter 5, "Defining a View's Layout".

Deactivating and Activating Views

You can deactivate a view if you do not currently need it in Mercury Application Mapping. For example, you can deactivate a view if the view was created for test reasons and it is not being accessed by any user. When a view is deactivated, the view is not built in the CMDB and as a result, the load on the system is reduced.

Views are automatically deactivated if the view contains more than the maximum number of CIs allowed by CMDB thresholds. Views are also deactivated if there are more than 200 active views, the default number of views. In the latter case, you can reactivate the current view if you delete or deactivate other unwanted views to reduce the number of active views to less than 200.

To deactivate or activate a view:

1. In the Topology Map or Information pane, right-click the selected view and select **Deactivate** to deactivate an active view. Select **Activate** to activate an inactive view.
2. When a view is deactivated, all CIs associated with the view disappear. When a view is activated, all CIs associated with the view appear. There may be a slight delay until the pane updates the views.

Improving Views

You can improve a view.

- Modifying the default layer setup to achieve the clearest presentation possible
- Adding an image file (of .gif type) as a background image to be used as a navigational aid

This section includes the following topics:

- "Defining a Layer Layout" on page 174
- "Adding a Background Image to a Topology Map" on page 174

Defining a Layer Layout

You can customize the layer layouts by modifying the values of the default layer layouts. For details, see Chapter 5, "Defining a View's Layout".

Adding a Background Image to a Topology Map

You can add an image file (of .gif type) as the background image of a view. This can be used as a navigational aid, for example, for global networks containing different networks in different countries.

To add a background image:

1. In the View Explorer pane, select the required view and then select **Manual Layout** from the list in the toolbar or click **View** > **Layout** > **Manual** to display the manual layout view option.
2. From the **Edit** menu, select **Add Background Image** to open the Add Background Image dialog box.
3. From the **File Name** area, select the image that you want to display in the background of the selected view.
4. Click **OK**. The selected background image is displayed in the topology map.

To remove a background image:

Display the Add Background Image dialog box, and select **(none)** from the **File Name** area.

To add background images to the existing list:

Insert images (of .gif type) in the following location:
Mercury Application Mapping root directory\root\lib\gui\images\backgrounds

Adding Notes

You can create personal notes that include comments, and attach them to CIs in the topology map. You can use these notes as reminders to yourself or to provide feedback to other users. You can edit and delete existing notes.

This section includes the following topics:

Adding a Note

You can add a note to a CI.

To add a note to a CI:

1. From the Explorer, Map, or Information pane, right-click the CI to which you want to add a note and select **Note** > **Add Note** to open the Note dialog box.
2. Type the note text in the dialog box.
3. Click outside the Note dialog box or click **OK**.

Displaying and Editing a Note

CIs with notes have an indicator in their bottom right corners. The CI then looks like this.

To display and edit a note:

1. Double-click the indicator in the bottom right corner of the CI or right-click the CI and select **Note** > **Add Note** to open the Note dialog box.
2. To edit the note's text, type your changes in the dialog box and click **OK**.

Deleting a Note

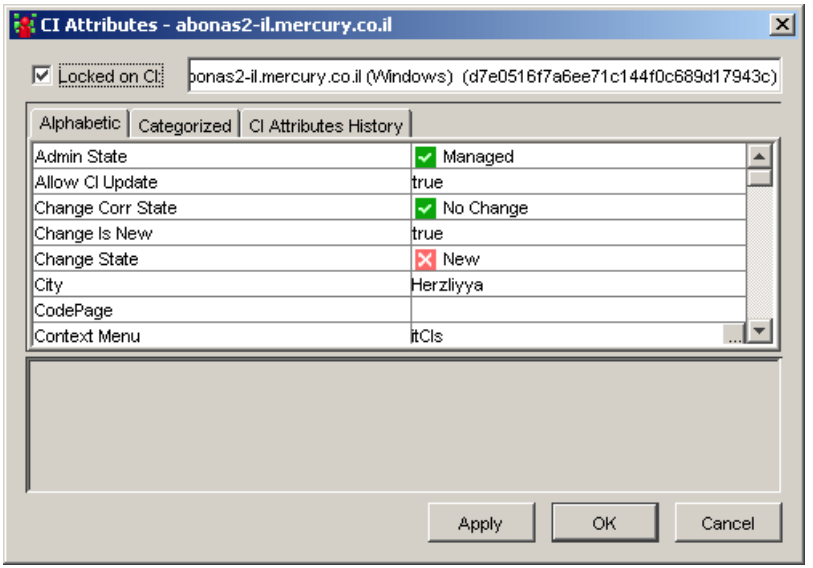
This section describes how to delete a note from a CI.

To delete a note from a CI:

Right-click the CI and select **Note** > **Delete Note**.

Viewing and Editing CI Attributes

The Attributes dialog box enables you to view and edit specific CI attributes, depending on your user access rights to the system (for details, see "Introduction to User and Role Administration" in the *Mercury Application Mapping Administration Guide*).



The CI Attributes dialog box enables you to view and edit the attributes defined for the selected CI. The name of the selected CI appears at the top. When the **Locked on CI** check box is checked, Mercury Application Mapping displays only the attributes of the CI in the box at the top. Clear the **Locked on CI** check box to display the attributes of any CI you select.

Note: Only the attributes that were marked as **Editable** and **Visible** in the CI Type Manager appear in the CI Attributes dialog box. For details, see "Creating CITs" on page 383.

The CI Attributes dialog box has the following tabs:

- **Alphabetic**. Displays the CI's attributes in alphabetical order.
- **Categorized**. Displays the CI's attributes according to the CIT to which it belongs. Click the **Expand** button to display the CI attributes for that CIT.
- **CI Attributes History**. Displays a list of attributes in which changes have occurred.

Note: The CI Attributes History tab only displays the attributes whose values have been defined as **Change Monitored** in the Add Attributes dialog box in the CI Type Manager. For details, see "Creating CITs" on page 383.

The CI Attributes History tab has the following fields:

Field	Description
Attribute	The name of the attribute.
Change Date	The date when the change occurred.
Changer	Indicates the cause of the change. For example, the field can contain the name of a user or a discovery pattern.
New Value	The new value of the attribute.

Note: You can reduce the number of attributes that appear in the CIs Attributes History tab by selecting an attribute from the **Filter by** list.

To edit the attributes:

1 Edit the attributes as required in either the **Alphabetic** or **Categorized** tabs. You can only edit the attribute if a pencil icon appears at the bottom next to the attribute name. To edit the value of an attribute, click the value cell and then click the square button on the right.

2 Make the required changes in the dialog box that opens and click **OK**. The changes appear immediately.

3 Click **Apply** in the CI Attributes dialog box to save your changes or click **OK** to save your changes and close the CI Attributes dialog box.

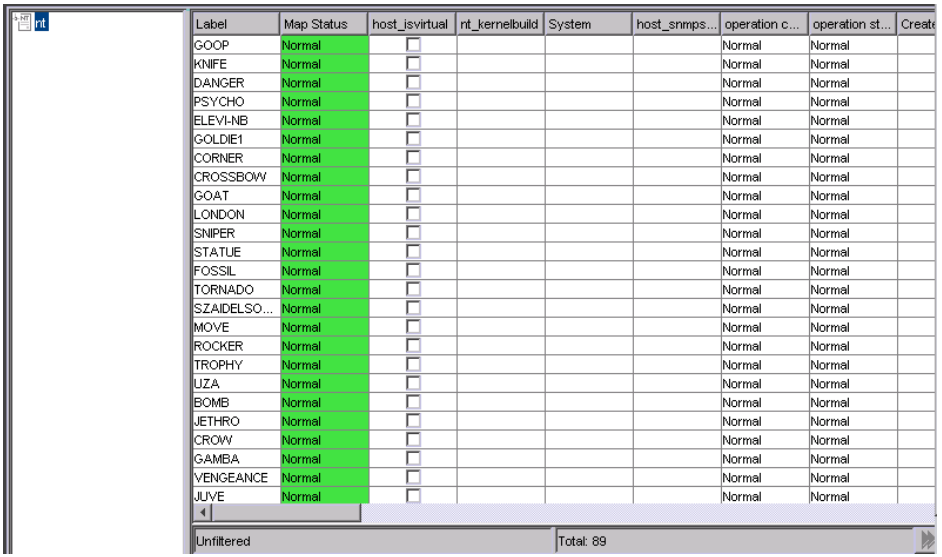
Viewing Layers with a Large Number of CIs

A layer cannot display more than 1000 CIs in one topology map. You can, however, display layers that contain more than 1000 CIs and less than 3001 in a table format. When using this option, the layer's CIs are displayed in a Details window, and can be viewed in successive segments.

If the layer contains more than 3001 CIs, it cannot be opened. If you try to open it, a message is displayed. Click **OK** to confirm the message. In this case, it is recommended to use folding rules to spread the CIs among several layers. For using folding rules, see "Adding Folding Rules to Relationships" on page 142.

To display a layer that has more than 1000 CIs:

1. Double-click the layer you want to open. A message is displayed that the layer cannot be displayed as a map. Click **OK** to display the layer in the Details window.
2. Click **OK.** The Details window is opened, displaying the first 1000 CIs of the layer:



Label	Map Status	host_isvirtual	nt_kernelbuild	System	host_snmps...	operation c...	operation st...	Create
GOOP	Normal					Normal	Normal	
KNIFE	Normal					Normal	Normal	
DANGER	Normal					Normal	Normal	
PSYCHO	Normal					Normal	Normal	
ELEVI-NB	Normal					Normal	Normal	
GOLDIE1	Normal					Normal	Normal	
CORNER	Normal					Normal	Normal	
CROSSBOW	Normal					Normal	Normal	
GOAT	Normal					Normal	Normal	
LONDON	Normal					Normal	Normal	
SNIPER	Normal					Normal	Normal	
STATUE	Normal					Normal	Normal	
FOSSIL	Normal					Normal	Normal	
TORNADO	Normal					Normal	Normal	
SZAIDELSO...	Normal					Normal	Normal	
MOVE	Normal					Normal	Normal	
ROCKER	Normal					Normal	Normal	
TROPHY	Normal					Normal	Normal	
UZA	Normal					Normal	Normal	
BOMB	Normal					Normal	Normal	
JETHRO	Normal					Normal	Normal	
CROW	Normal					Normal	Normal	
GAMBA	Normal					Normal	Normal	
VENGEANCE	Normal					Normal	Normal	
JUVE	Normal					Normal	Normal	

Unfiltered | Total: 89

The arrows in the lower-right corner of the Details window enable you to display the other CIs that are in the layer in quantities of 1000 CIs.

Note: You can configure the maximum number of CIs that can be displayed in a table format (default is 3000), and the number of CIs that are displayed in each bulk in the Details window (default is 1000). For details on configuring these parameters, see "Map Server Parameters" in *Mercury Application Mapping Administration Guide*.

Displaying Interdependent CIs

The **Get Related CIs** option enables you to expand the interdependency data that the map displays to other connected CIs, and get a broader perspective on the structure and state of your infrastructure.

You can display the interdependencies of a selected CI in different contexts: a specific layer, a specific view, the entire CMDB, or CIs of a specific CIT. By using this option, all CIs that are connected to the selected CI in a chosen context are displayed, either on the topology map or in a separate window. This way, you can visualize, locate and manage the interdependencies that exist among your IT resources.

The **Get Related CIs** option opens a submenu, with the following commands—one for each interdependency context—**Layer**, **View**, **Database**, or **Advanced**.

Depending on the display option you selected, an additional command appears on the shortcut menu: **Next on Layer**, **Next on View**, **Next on Database** or **Next on Advanced**. These commands appear only after using the **Layer**, **View**, **Database** or **Advanced** options.

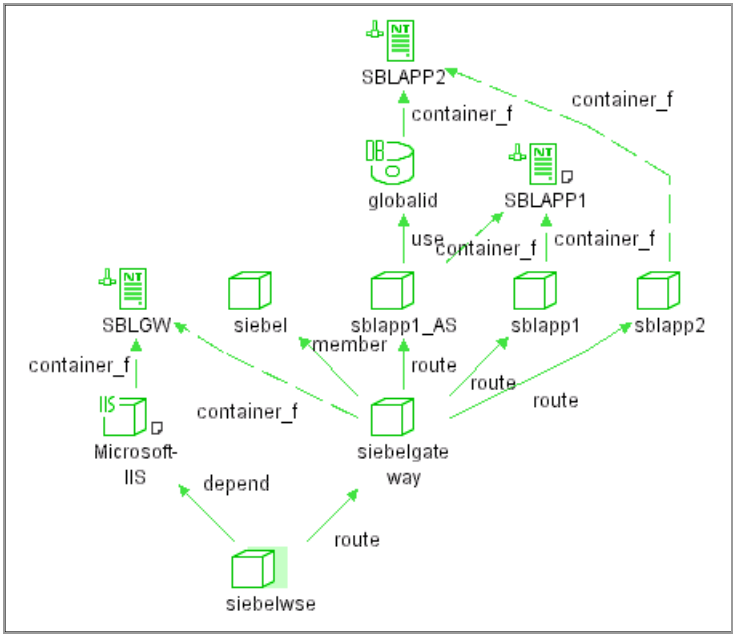
By applying one of these commands to a connected CI, additional interdependency information is displayed. You can then continue using this command, and display interdependency data for any displayed CI.

To display interdependent CIs:

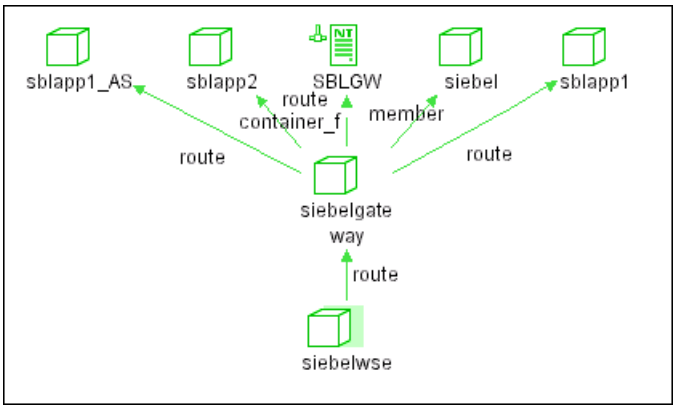
1. In the topology map, View Explorer or Information pane, right-click the CI whose interdependent CIs you want to display.
2. Click **Get Related CIs** and then select one of the following:
   - **Layer**. Displays all CIs that are connected to the selected CI via relationships in a specific layer. This option actually removes from the displayed layer all CIs that are not connected to the selected CI, thus enables you to focus on the interdependencies of a specific CI on a given layer.

Note: Once you select the **Layer** option, the new display remains as the layer's default until the view is rebuilt. To restore the original display, click the **Show Hidden Symbols** button on the toolbar.

The following example shows the way the siebelgateway CI is displayed on a regular view's layer:



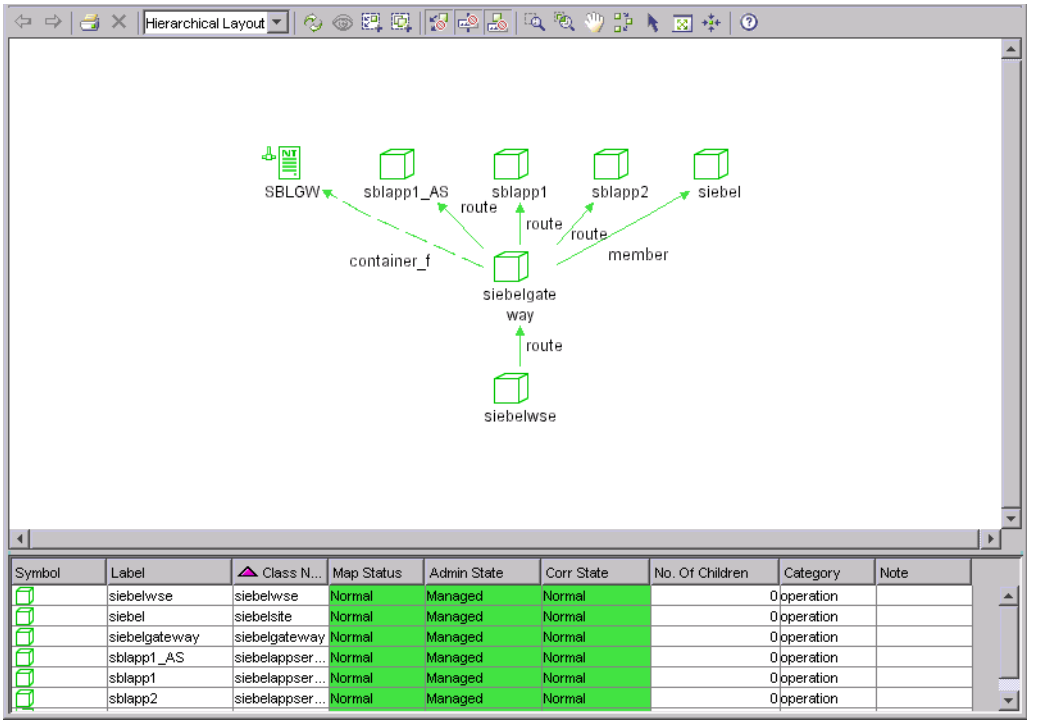
When using the **Layer** option, Mercury Application Mapping hides all CIs that are not connected to siebelgateway on this layer, and displays only its interdependent CIs:



➤ **View.** Displays all CIs, connected to a selected CI, that are part of the view's TQL, regardless of the layer in which they are located according to the view's folding rules. The View's content is displayed in a new window.

Note: The window's display is static and cannot be refreshed. If you want to update the display, you need to close the window and reopen it.

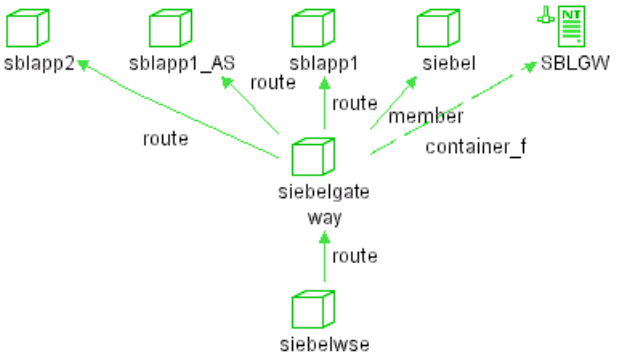
For example, when using the **View** option to display all CIs that are connected to router1 in a given view, the following window is displayed:



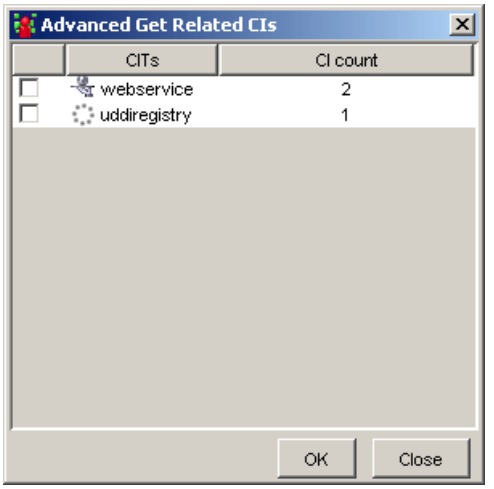
As you can see in the above window, there is one additional CI connected to siebelgateway, in comparison to the Layer display. This CI is located in a lower layer level, and therefore it does not appear on the Layer display.

- **Database**. Displays all CIs connected to the selected CI from the CMDB. Similar to the **View** option, the **Database**'s content is displayed in a new window.

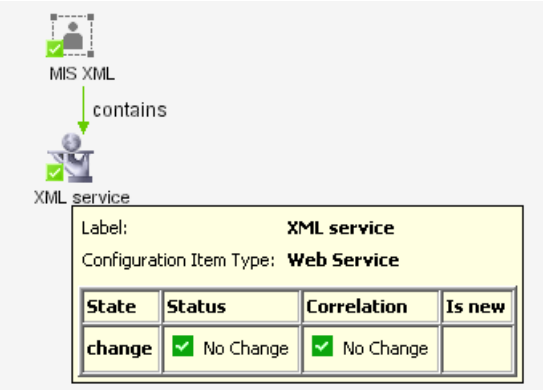
The following example shows how, when using the **Database** option, Mercury Application Mapping displays all existing CIs that are connected to siebelgateway, regardless of their position in the existing TQL scenarios:



➤ **Advanced Get Related CIs**. Displays the number of related CIs per type and allows you to specify which CIs you would like to appear in the topology map results. In the Advanced Get Related CIs dialog box that opens, select the required CIT.



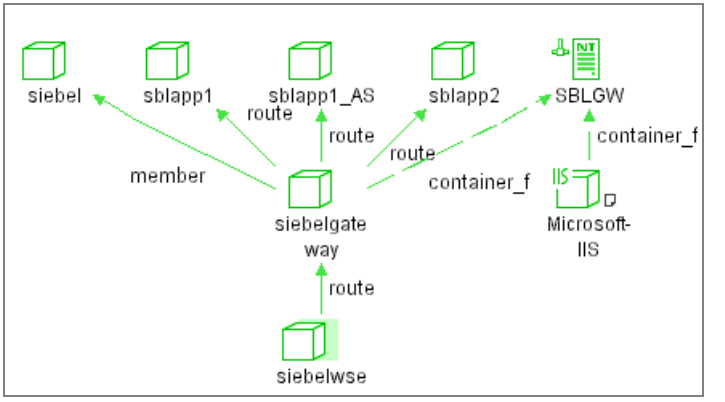
The following example shows how, when using the **Advanced Get Related CIs** option, Mercury Application Mapping displays the one existing CI of the CIT type **webservice** that is connected to **MIS XML.**



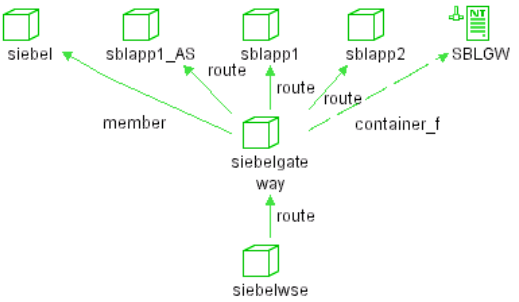
3 (Optional) To add to the displayed map interdependency information about one of the connected CIs, right-click the CI whose interdependencies you want to display. Select **Get Related CIs** and one of the following commands:

➤ **Next on Layer**. (Enabled only after using the **Layer** option) Keeps the previous Layer display on the topology map, and adds to that layer the connected CIs of one of the displayed CIs.

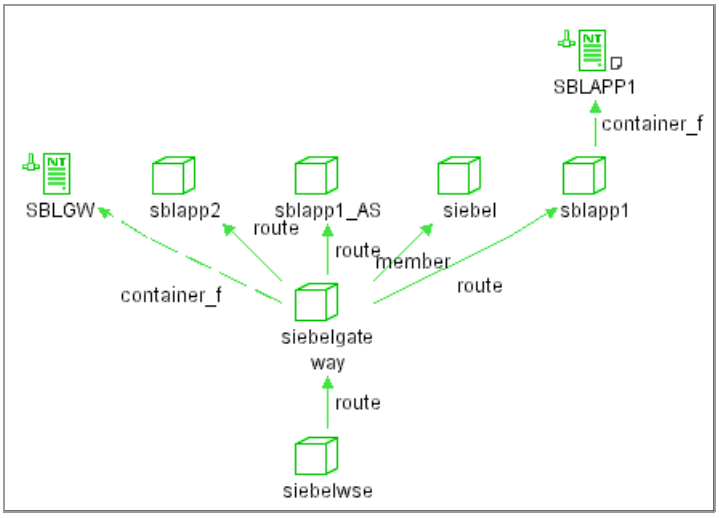
The following example shows how the Next on Layer command is applied to the SBLGW CI, and consequently, its connected CIs are added to the map:



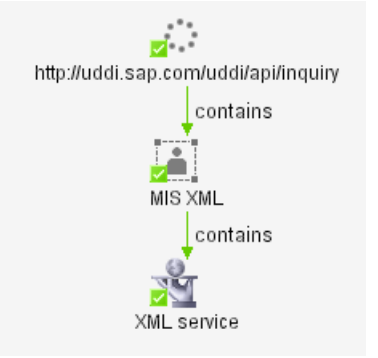
➤ **Next in View**. (Enabled only after using the **View** option) Keeps the previous View display on the topology map and adds the connected CIs from the given view of the selected CI.



➤ **Next in Database**. (Enabled only after using the **Database** option) Keeps on the topology map the previous **Database** display and adds to it the connected CIs from the database of the selected CI.



➤ **Next in Advanced**. (Enabled only after using the A**dvanced Get Related CIs** option) Keeps on the topology map the previous A**dvanced Get Related CIs** display and adds to it the CIT-specific CIs connected to the selected CI.



Showing a Correlation Impact

The **Show Impact** option enables you to select a CI, which is defined by a correlation rule as a root cause CI, and to display all the CIs that are affected by it in a separate window.

For example, suppose a correlation rule is defined for an IP, which specifies that the rule affects hosts, ports, and client-servers that are linked to the IP. By using the **Show Impact** option, you can display all CIs that are affected by the IP CI.

Note: For details on defining correlation rules, see Part VI, “Correlation Rules.”

To show the correlation impact of a root cause CI:

1 In the topology map or Information pane of Topology Map, right-click a root cause CI and select **Analysis** > **Show Impact**.

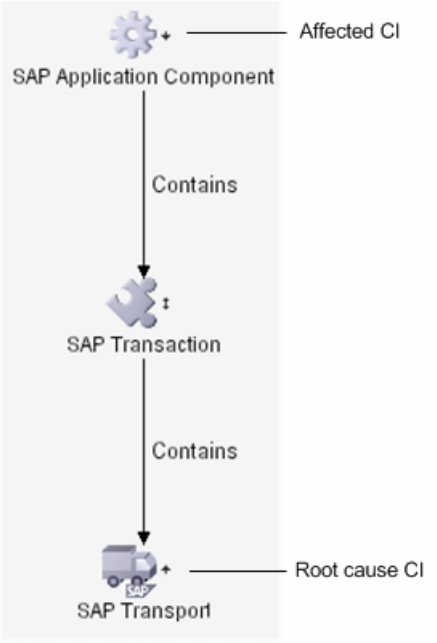
➤ If one correlation rule is defined for the selected CI, the Impact window is displayed. Skip to step 2.

➤ If several correlation rules are defined for this CI, the Impact Correlation Rules dialog box is displayed.

The Impact Correlation Rules dialog box lists all the correlation rules that define this CI as a root cause CI.

Select a correlation rule and click **OK**.

2 The Impact window is displayed:



In the above example:

➤ SAP Transport is the root cause CI, and for that reason it is marked by this indicator.

➤ SAP Transaction is part of the correlation rule, but it is neither the root cause CI nor an affected one. For that reason it is marked by this indicator.

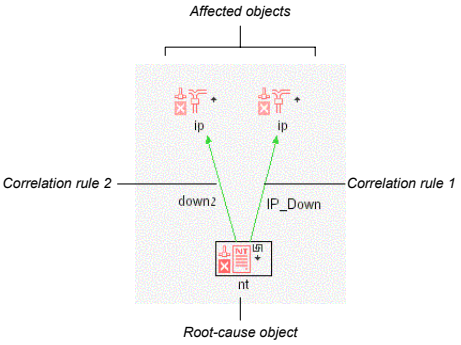
➤ The SAP Application Component CI is the affected CI, and for that reason it is marked by this indicator.

Problem Isolation

This option enables you to retrieve root cause information for CIs that are affected by a chain of correlation rules. The output of problem isolation displays a logical map that describes a chain of trigger/affected CITs that affect the CI.

To show the root cause CI:

In the Map or Information pane, right-click an affected CI and select **Analysis** > **Show Problem Isolation**. A window, as illustrated below, is displayed containing the root cause CI and all the other CITs in the correlation rule chain.



Use the **Show Problem Isolation** option on the IP CI to view, in one step, that the source of the failure is the Network CI.

To view the information about specific CIs that are triggered or affected by the correlation rule, double-click the relationship connecting the CIs. A map is displayed.

Using Meta Relationships

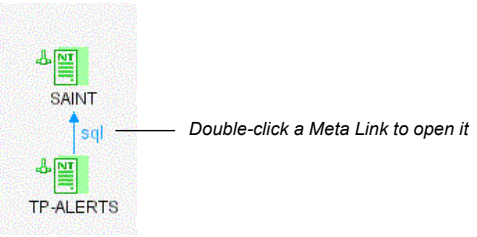
A Meta relationship is a logical relationship that represents several physical relationships between CIs that are displayed on different layers. These relationships are not displayed together on one layer, due to the hierarchal structure of the view that organizes CIs and their interdependencies in separate layers. The Meta relationship option enables you to display in one window, the full path of physical relationships that sustain relationships at upper levels.

For example, in a certain view, a Client-Server relationship connects two NTs. However, the actual relationship exists between two ports. These connected ports are not seen from the upper level layer, since they are located by organizational rules in a lower layer level.

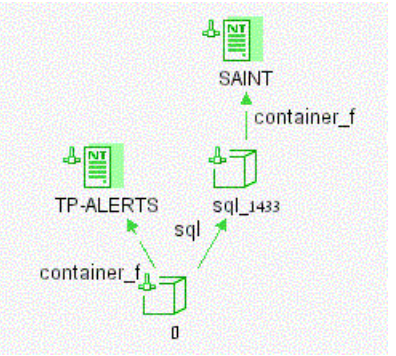
To open and display a Meta relationship:

➤ On the topology map, double-click the Meta relationship of the contents you want to display. A new Relationship Map window appears, displaying the relationships that exist between the two Meta relationship's CIs.

For example the following Meta relationship displays a logical route relationship between a host and a server:



Double-click the route relationship to display all the CIs that compose the physical path:



Note: If you double-click a relationship and a Relationship Map window is not displayed, it means that this relationship is not a Meta relationship but a regular one.

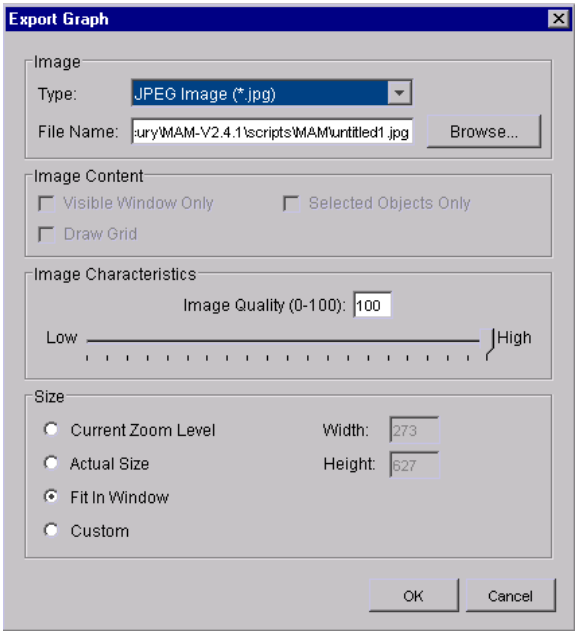
Saving a Topology Map

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 **Map** > **Export Graph** to open the Export Graph dialog box.



3 In 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).

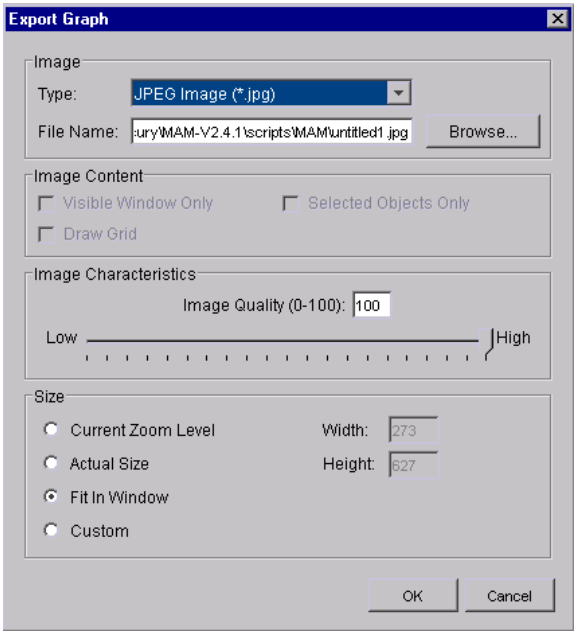
5 In the **Image Content** area:

- Select **Visible Window Only** to save only the part of the graph that appears in the window.
- Select **Draw Grid** to draw a grid in the graph.
- Select **Selected CIs Only** to save only the 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:



- Select **Actual Size** to save the view as it really is.
- Select **Fit in Window** to expand or shrink the view so it fits in the window.
- Select **Custom** to specify the size of the view you want to save in the **Width** and **Height** boxes.

8 Click **OK**.

Printing the Topology Map

You can print the contents of the topology map, as well as the contents of the tabs in the Information pane. The result is similar to a screen capture. Therefore, it is recommended to arrange the contents of the topology map and Information pane tab according to your requirements, before printing. For details, see "Printing Options" on page 41.

Sorting, Hiding, and Displaying Columns

This section describes how to sort the contents of the Information Browsers in the Information pane. You can sort the contents of a column, hide a column, or display a hidden column. For information on the Information Browsers, see "View Menu" on page 22.

This section includes the following topics:

Sorting the Contents of a Column

You can sort the contents of a column.

To sort the contents of a column:

1. Click a column header.
2. To change the sort order, click the column header again.

Note: Once a column has been sorted its header displays a pink triangle pointed upwards for ascending order or downwards for descending order.

Hiding a Column

You can hide a column.

To hide a column:

Right-click the column you want to hide and select **Hide Column**.

Displaying a Hidden Column

You can display a hidden column.

To display a hidden column:

Right-click anywhere in the column header and select **Show All Columns**.

Customizing a Display

You can hide columns or display hidden columns.

To customize a display:

1. On the selected tab, right-click one of the column headers and select **Customize** to open the Columns dialog box.
2.   To remove column(s) from the tab, select the required column(s) in the **Visible Columns** area and click the **Remove Column** button. The selected column(s) moves to the **Hidden Columns** area. (To return a column to the **Visible Columns** area, select it and click the **Add Column** button.)
3.  To change the display order of the columns, use the up and down arrows.
4. Click **OK** to apply your customization to the tab.

Adding CIs to the CMDB

CIs can be added to the CMDB in one of the following ways:

- **Through the discovery process**. For more information, see “Inserting CIs Through the Discovery Process” on page 197.
- **Manually**. For more information, see “Manual Insertion of CIs” on page 197.

This section includes the following topics:

- Inserting CIs Through the Discovery Process
- Manual Insertion of CIs
- Adding a CI to an Existing CI
- Adding a CI or Relationship to a View without Creating a Dependency on an Existing CI
- Adding Relationships Between Existing CIs

Inserting CIs Through the Discovery Process

The Mercury Application Mapping discovery process is the mechanism that enables you to collect data about your system by discovering the IT infrastructure resources and their interdependencies. It discovers CIs such as, applications, databases, network devices, different types of servers, and so forth. Each discovered IT CI is then delivered and stored in the topology database where it is represented as a managed CI. For more information on the discovery process, see *Discovery Manager Administration*.

Manual Insertion of CIs

You can manually insert CIs into the CMDB that will not be automatically discovered. For example, a CI that is located on a remote FTP site might not be included in the system's discovery scope, and, therefore, in the CMDB.

A new CI can be manually added in two different contexts. You can:

- Add a CI to an existing CI that is displayed in the topology map, which serves as the added CI's container.
- Add a CI to a view without creating a dependency on an existing CI.

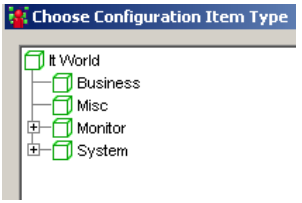
Adding a CI to an Existing CI

This section describes how to add a CI to an existing CI.

To add a CI to an existing CI:

1 In the required topology map, right-click a CI and select **Insert Configuration Item** to open the Insert Configuration Item dialog box.

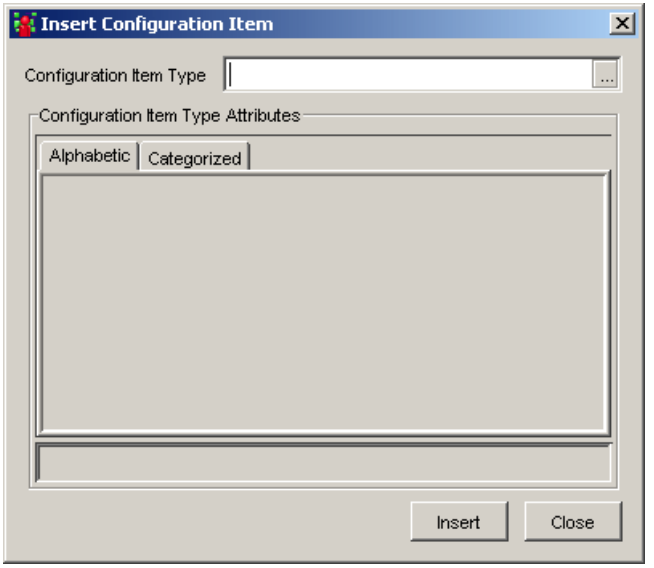
2 Click the button at the right end of the **Configuration Item Type** box to open the CI Type model tree.



3 In the CI Type model tree, select the CIT to which you want to add the new CI.

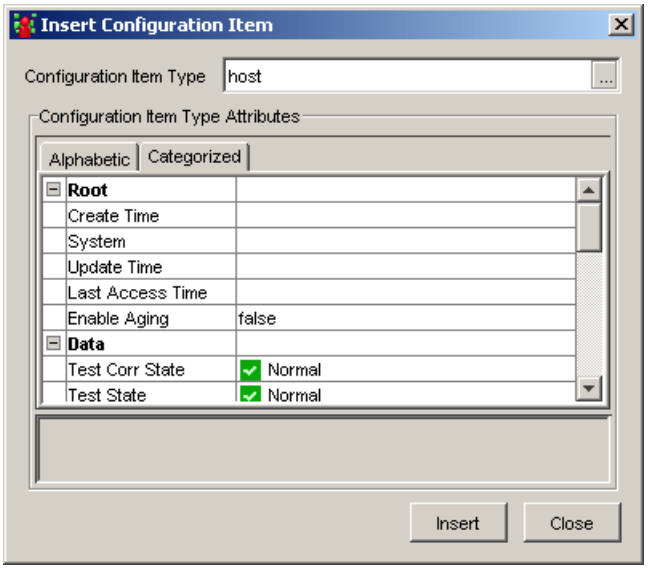
For example, select **IP** in the CI Type model tree to add a new IP address CI to the CMDB.

In the Insert Configuration Item dialog box, the **Configuration Item Type Attributes** section lists the CITs contained in this view and their attribute values.



- The CITs in the **Categorized** tab are grouped according to the categories defined in the CI Type Manager.
- The CITs in the **Alphabetic** tab are listed in alphabetical order.

4 If you are using the **Categorized** tab, click the **Expand** button to view all the CITs contained in this view.



5 Edit the attributes as required. You can only edit the attribute if a pencil icon appears at the bottom next to the attribute name.

6 Click **OK** to save your changes and close the Insert Configuration Item dialog box.

Tip: If you relate the new CI to an existing CI, and the new CI does not appear in the view, verify that the view's TQL definitions include the new CI. Use the Find option to search for the CI, or select the container CI and use the Get Neighbors option to display the connected CIs. For details, see "Displaying Interdependent CIs" on page 181.

Adding a CI or Relationship to a View without Creating a Dependency on an Existing CI

This section describes how to add a CI or relationship to a view without creating a dependency on an existing CI.

To add a CI or relationship to a view without creating a dependency on an existing CI:

1. In the Topology Map, select **Edit** > **Insert Configuration Item** to open the Insert Configuration Item dialog box.
2. Follow steps 2 to 6 in "Adding a CI to an Existing CI" on page 198.

Adding Relationships Between Existing CIs

You can add a relationship between existing CIs that are displayed in the topology map. You can only insert a relationship between two CIs from the same view.

To insert a relationship between existing CIs:

1. With the topology map displayed, select the two CIs you want to link. For details on how to select multiple relationships, see"Selecting Multiple CIs" on page 31.
2. Right-click the selected CIs and select **Insert Relationship** to open the Insert Relationship dialog box.
3. Follow steps 2 to 6 in "Adding a CI to an Existing CI" on page 198.

Tip: If the relationship does not appear in the view, verify that the view's TQL definitions include the new relationship.

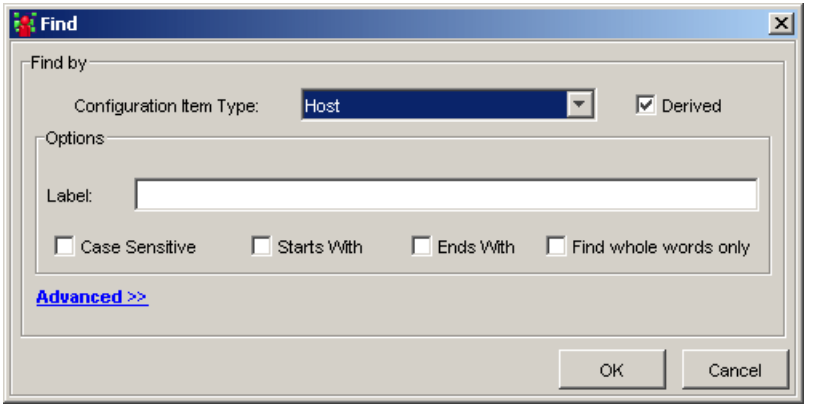
Searching for CIs

Mercury Application Mapping searching capabilities enables you to search for CIs in the topology map, either in specific views and layers or in the entire CMDB. These capabilities also provide different search criteria, through which you can search for CIs according to their CIT, label, and/or attributes.

To search for CIs:

1 (Optional) If you want to search in a specific layer, open it in the Topology Map pane.

2 From the **Edit** menu, select **Find** to open the Find dialog box.



3 From the **Configuration Item Type** list, select the CIT of the CI(s) you want to find.

4 (Optional) Select **Derived** to find and display both the selected CIT(s) and any CIs derived from the selected CIT (inheritance CITs).

5 (Optional) In the **Options** area, if you want to find a specific CI(s) whose label you know, enter the CI's label in the **Label** box. Once you have entered a label, you can use the following search options:

- **Case Sensitive**. Distinguishes between uppercase and lowercase characters. When you select **Case Sensitive**, Mercury Application Mapping finds only those instances in which the capitalization matches the text you typed in the **Label** box.
- **Find whole words only**. Searches for occurrences that are whole words and not part of a larger word.

6 (Optional) In the **Advanced** area, to search for a CI(s) according to its attribute(s), do the following:

a Click the **Add an Attribute Condition** button to open the Condition dialog box.

b Define the attribute conditions according to the following table:

- **Attribute Name**. Select the required attribute from the list.
- **Operation**. Select the required operator (such as =) from the list (for details, see 119.
- **Value**. Enter or select the value of the attribute. (The box changes according to the attribute type you selected.) If the **Operator** = **In** or **Not In**, the **Value** string must appear in single quotes. If the **Operator** = **Like** or **Not Like** (for string only), the string **Value** must be surrounded by the percentage symbol.
- **AND/OR**. Enter **And** or **Or** to link multiple conditions.

Note: Attribute conditions cannot be defined for functional relationships.

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c After you complete the attribute definition, you can change it by using the **Edit** and **Delete** buttons.

7 In the **Search in** area, select the place in which you want to conduct the search:

- **View**. Select from the **View** list the view in which you want to search.
- **My Views**. Searches only in the views that belong to your user profile.
- **Database**. Searches in the entire database.

8 (Optional) By default, **Get Full Path** is selected, and the view layers that appear above the CI(s) are displayed. Clear **Get Full Path** if you want to display only the view name in which the CI(s) is located.

9 Click **OK**. The search results are displayed in the Find Results tab in the Information pane.

13

Defining Instance Views

This chapter explains how to create an instance view. Instance views are not the result of TQL queries, but are views to which you manually attach CIs and relationships from the CMDB or from an existing view.

What is an Instance View?

Instance views provide a framework for building customized hierarchies that meet your organization's business requirements and objectives, and that monitor what is important to you. Instance views are views that are built by manually attaching individual CIs and relationships directly to the view. Instance views are not based on TQL queries. You can attach any CI from an existing view or from the CMDB into an instance view. If you choose to attach a CI from the CMDB, all existing relationships between the selected CIs are added to the view as well.

Creating an Instance View

You create a new instance view by selecting CIs from existing views or from the CMDB and attaching them to the new view. You can define additional view properties and also define organization rules to create a multi-level map. You can also perform a search for a CI or choose from a list of related CIs.

You can add a new instance view to any view folder. If you do not select a folder in the View Explorer, the new view is added to the Root folder.

This section includes the following topics:

Creating an Instance View

This section describes how to create an instance view and then attach the required CIs to the view.

Note: You do not need to attach any CIs to the view when you first create the view, but you must still click **OK** in the Instance View Definition window to create the view.

To create an instance view:

1 In the View Explorer pane of the Topology View manager, select the folder in which you want to create the instance view.

2 Click **New** on the toolbar or open the **Map** menu and click **New** to open the Instance View Definition dialog box.

3 In the **View Name** box, type a unique name for the view.

4 (Optional) In the **Description** box, enter a description of the view.

5 (Optional) Click the **Properties** button to open the **View Properties** tab in the View Properties dialog box. Define additional view properties as described in "Creating a Pattern View" on page 100.

6 (Optional) Click the **Folding Rules** button to open the Relationship Rules dialog box. Define relationship rules to define multiple relationship rules. For details, see "Defining Multiple Relationship Rules" on page 143.

7 (Optional) To exclude specific links you do not want to appear in the view, do the following:

a Click the **Filter Links** button to open the Filter Links dialog box.

b Click the check boxes of the links you want to exclude from the view.

c Click **OK** to save the changes you have made.

8 If you do not want to add any CIs to the view at this stage, click **OK** in the Instance View Definition dialog box. The view is added to the list of views in the selected folder in the View Explorer. To add CIs to the view, see "Adding CIs to the Created View" on page 207.

Adding CIs to the Created View

After defining properties for a new view, you have the option of continuing the view creation process by adding CIs to the view.

To add CIs to the created view:

1 In the left box, select the CI(s) that you want to attach to the view. You can select the CIs you want to attach to the instance view in the following ways:

- In the **Topology View** tab, select the required CI(s) at different levels of the view hierarchy. You can select multiple CIs by holding down the CTRL button and clicking the required CIs. To view and edit a CI's attributes, see "Displaying and Editing a CI's Attributes" on page 208.
- In the **Search** tab, search for CIs in existing views or in the entire CMDB. For details, see "Searching for a CI" on page 209.
- In the **Related CIs** tab, select a CI that is related to the selected CI in the **Topology View** tab. For details, see "Displaying Related CIs" on page 210.

2 Click the **Attach** button to attach the selected CIs to the view. The attached CIs appear in the **Configuration Items** box.

The Configuration Item box contains the following fields:

- **Label**. Contains the label of the attached CI.
- **Add SubGraph**. Select **Add SubGraph** if you want to attach all the children of the CI that exist in the CMDB (all the way down in the tree) to the view as well.

3 Click **OK** to create your view.

Note: It can take a few moments until the new view appears in the View Explorer pane.

Instance view and views created by TQL queries are represented by different icons, as described in the following table.

Icon	What it represents
	A view based on a TQL query.
	An instance view

Displaying and Editing a CI's Attributes

This section describes how to display and edit a CI's attributes.

To display and edit a CI's attribute:

1 In the Instance View Definition dialog box, select the **Topology View** tab.

2 Select the CI whose attributes you want to view.

3 Click the **Show CI's attributes** button to open the CI Attributes dialog box. The CI's Attributes dialog box enables you to view and edit the attributes defined for the selected CI. For details, see "Viewing and Editing CI Attributes" on page 177.

Searching for a CI

Mercury Application Mapping searching capabilities enable you to search for CIs to attach to your instance view either in specific views or in the entire CMDB. These capabilities also provide different search criteria, through which you can search for CIs according to their CI Type, label, and/or attributes.

To search for CIs:

1 In the Instance View Definition dialog box, select the **Search** tab.

2 From the **CI Type** list, select the CI Type of the CI(s) you want to find.

3 (Optional) Select **Derived** to find both CIs of the selected CIT in addition to any CI descending from the selected CIT.

4 (Optional) In the **Options** area, if you want to find a specific CI(s) whose label you know, enter the CI's label in the **Label** box. Once you have entered a label, you can use the following search options:

- **Case Sensitive**. Distinguishes between uppercase and lowercase characters. When you select **Case Sensitive**, Mercury Application Mapping finds only those instances in which the capitalization matches the text you typed in the **Label** box.
- **Find whole words only**. Searches for occurrences that are whole words and not part of a larger word.
- **Starts With**. Searches for occurrences that begin with the entered text.
- **Ends With**. Searches for occurrences that end with the entered text.

Note: The options **Starts With** and **Ends With** are only available if you have not selected **Find whole words only**.

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5 In the **Search In** area, select the place in which you want to conduct the search:

- **My Views.** Searches only in the views that belong to your user profile.
- **Database.** Searches in the entire CMDB.

6 Click **Search**. The search results are displayed in the **Search** tab.

7 To do another search, click **Back to Search**.

Displaying Related CIs

Mercury Application Mapping enables you to display the interdependencies of any selected CI (for details, see "Displaying Interdependent CIs" on page 181). When you create a new instance view, you can choose to populate the view with CIs from a list of related CIs.

You can display:

- All CIs connected to a selected CI that are part of a specific view.
- All CIs connected to the selected CI in the entire CMDB.

You select a CI in the **Topology View** tab, and the CIs related to the selected CI appears in the **Related CIs** tab.

To display the related CIs of a selected CI:

1 In the Instance View Definition dialog box, select the **Map View** tab.

2 Select the CI whose related CIs you want to display.

3 To display related CIs, do the following:

a Click the **Get Related CI from View** button to display related CIs in the selected view.

b Click the **Get Related CI from Database** button to display related CIs in the CMDB.

The related CIs are displayed in the **Related CIs** tab.

Deleting an Instance View

In the View Explorer, right-click the instance view you want to delete and select **Delete Instance View**.

Editing an Instance View

1 In the View Explorer, right-click the instance view you want to edit.

2 Select **Properties** to open the Instance View Definition dialog box.

3 Edit the instance view as required. For details, see “Creating an Instance View” on page 206.

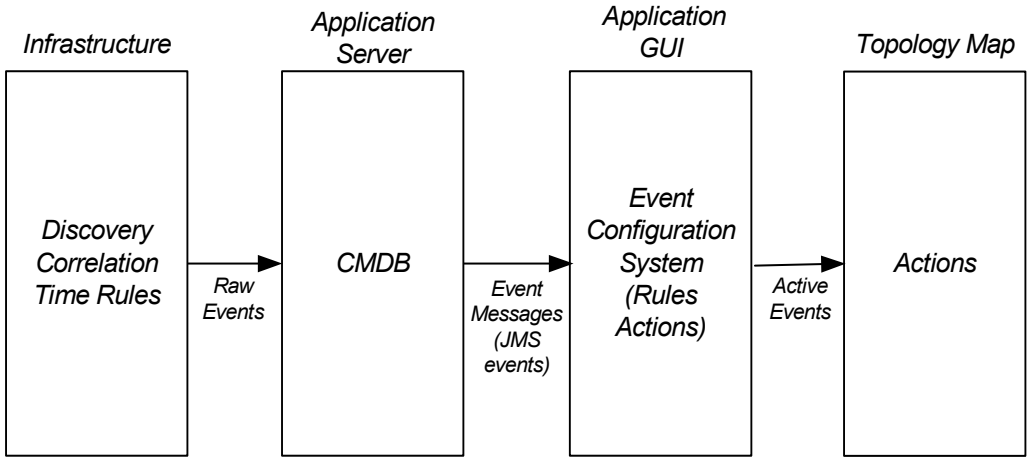
14

Event Management

This chapter introduces the Event system, which monitors the changes occurring in the managed world and delivers information about them.

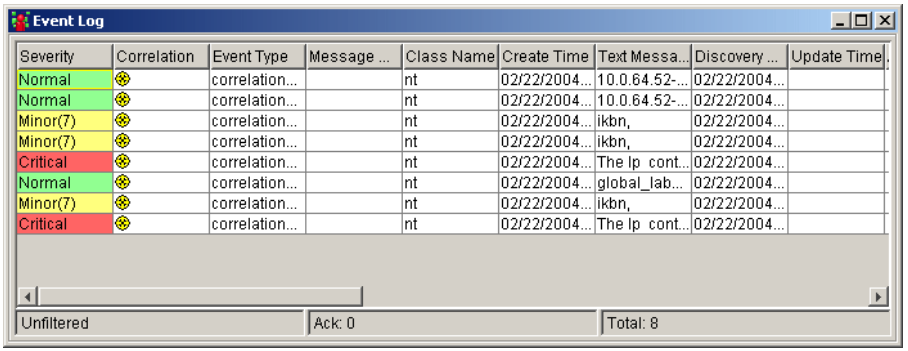
Understanding the Event System

Mercury Application Mapping uses an event system to deliver information about the state of the managed world. This information begins as raw events, which are messages that notify Mercury Application Mapping about specific changes that have occurred in managed CIs. Three of the Mercury Application Mapping sub-systems—Discovery, Correlation, and Time Rules—determine which kind of changes that occur in CI attributes are registered as raw events.



Raw Events

Raw events are saved to the CMDB. If a raw event is related to a CI that is displayed in the topology map, the raw event appears in the CI's Event log. For further details on the Event Log, see "Event Log" on page 226.



From the CMDB, the raw events are delivered, through JMS event messages, to the Event Configuration system. There, predefined event rules are applied to the raw events and determine whether these raw events affect the system and with what affect. Each event rule consists of at least one condition and at least one action. When a raw event meets one or more conditions, it triggers an action that is performed by Mercury Application Mapping.

Mercury Application Mapping enables administrators to define the rules that govern the way changes in the state of managed CIs are handled by the system. By defining these rules, administrators can determine which actions the system should take when changes that meet predefined conditions occur.

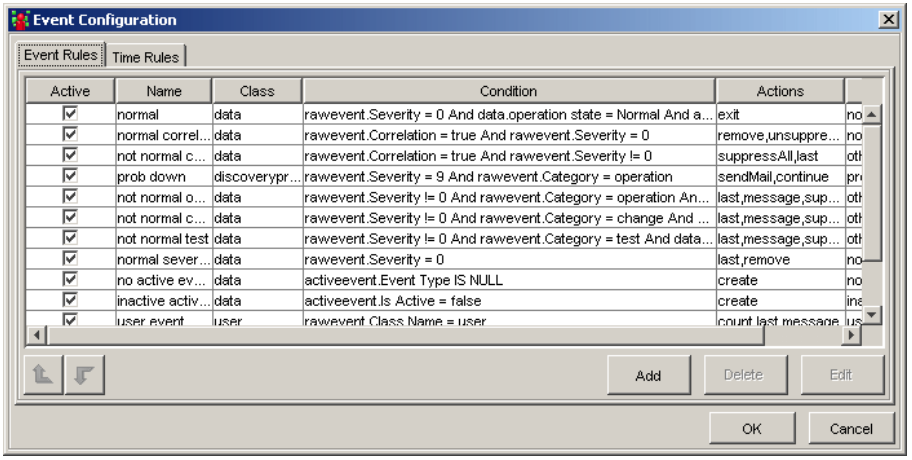
Note: For details on the configuration of the event system, see "Event Configuration" in the *Mercury Application Mapping Administration Guide*.

Example

The discovery system has determined that the administrative state of a certain CI has changed to **Unmanaged**. Consequently, it creates a new raw event that contains this information. The new raw event is sent as an event message to the Event Configuration System.

The Event Configuration System checks whether there are rules that can be applied to the new raw event. The following Event Configuration dialog box displays such a rule. The condition in the **Event Rules** list specifies that if an event message contains information about the administrative state of a CI, it should trigger an action that changes the CI's **admin** state in the Topology View.

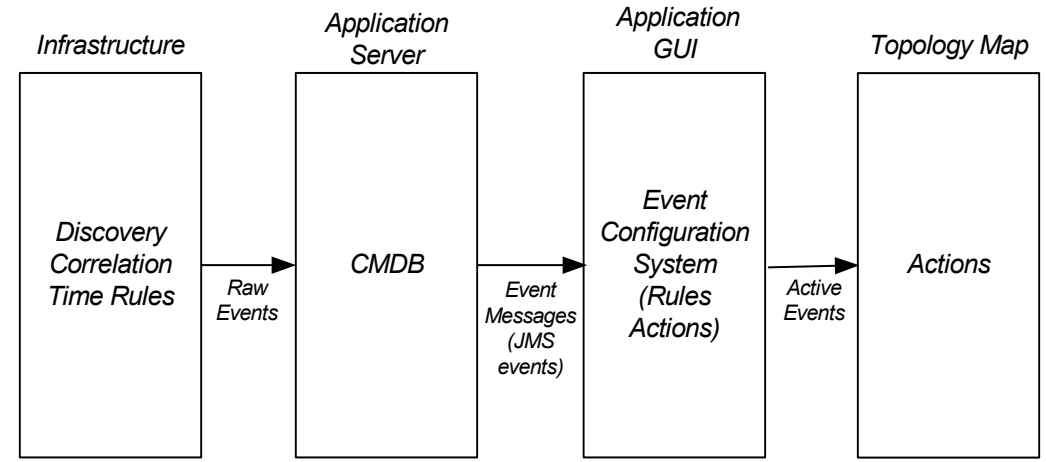
Since the new raw event meets this rule's condition, the rule's action is performed, and the **admin** state of the CI is changed accordingly.



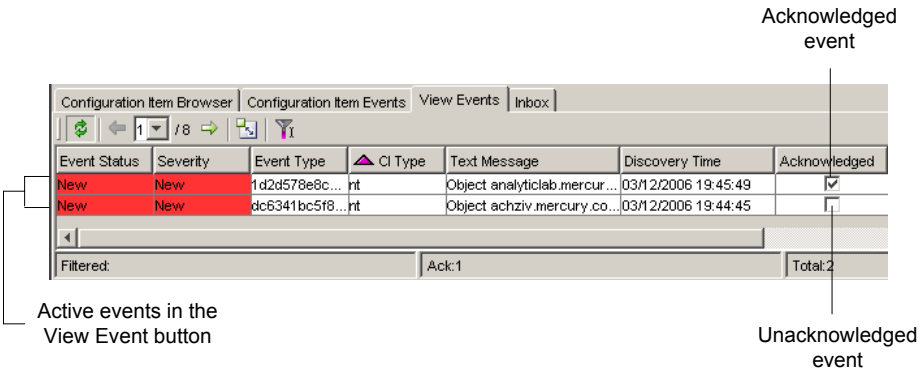
Although the Discovery, Correlation, and Time Rules systems continuously create raw events in response to changes occurring in the managed world, only those that meet at least one of the rule conditions are actually reported in Mercury Application Mapping. However, not all the raw events that meet the defined conditions are displayed in the Event browsers and manifested via state changes and icon blinks in the Topology View. (For details about Event Browsers, see "Displaying Event Browsers and Logs in Separate Windows" on page 225.) Only the raw events that are manifested and acknowledged are the ones that become active events.

The actions that are performed as a result of a condition fulfillment determine which raw events become active events and which remain as raw events. One action, which is specifically aimed at creating new active events from raw events, is called **Create.** Other actions that convert raw events into active events update the attributes of existing active events. By performing this update, they create new active events.

You use the Topology View to manage active events related to the CIs displayed in a selected view. This gives you the ability to locate problems that may be occurring in the system at the CI level. When a CI contains an event, except for an event that is a result of a correlation rule, the icon for the selected CI blinks and an exclamation mark is added before the icon in the View Explorer. You can then select the Configuration Item Events tab, or the other Event tabs and browsers, to view the event information and acknowledge the event:



Once an event is acknowledged, the related icon on the Topology map stops blinking and the exclamation point disappears from the View Explorer .



The Event Tabs in the Information Pane

This section describes the tabs in the Information pane, that enable you to manage events either at the CI or view level. For details of the attributes, see “Event Tab Definitions” on page 221.

Note: Event logs and browsers (regular and compound) display not more than 500 events.

This section includes the following topics:

Configuration Item Events

The Configuration Item Events tab displays all the events related to the CI currently selected in the View Explorer or topology map. It includes information about the attributes of each listed event.

Click the **Compound** icon to toggle between showing and hiding the events of the selected CI's children.

View Events

The View Events tab displays all events related to CIs of a selected view in the View Explorer. It includes information about the attributes of each listed event.

Filtering the Events You Want to Display

You use the Filter Settings dialog box to include only events you want to display in the Event tabs for the selected CI.

To filter the events you want to display:

1 In the View Explorer or topology map, select a view or CI to which an event has been sent.

2 Click the **Filter Settings** icon to open the Filter Settings dialog box.

3 Select **is filter active** to display only the filter conditions defined in the Filter Settings dialog box. Clear the **is filter active** check box to display all events.

4 To display events that were sent during a specified period of time:

- Select **Event creation time filter**.
- Click the date to the right of the **From** and **To** boxes to define the beginning and end of the time period.
- In the **Time** box, enter the required time.
- Click a date on the calendar. The times and dates you select are displayed in the **From** and **To** boxes.
- Click **OK**.

5 In the **Categories filter** area, select the required severity levels for the different categories.

6 From the **is Ack** list, select an option:

- **True**. Display CIs whose events have been acknowledged.
- **False**. Display CIs whose events have not been acknowledged.
- **None**. Display CIs whose events are either in an acknowledged or unacknowledged state.

7 From the **is Corr** list, select an option:

- **True**. Display CIs whose events are the result of a correlation rule.
- **False**. Display CIs whose events are not the result of a correlation rule.
- **None**. Display CIs whose events are either the result of a correlation rule or not the result of a correlation rule.

Note: Use any necessary combination of parameters you need to correctly define the filter conditions.

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8 Click **Clear** to clear all the selected options.

9 Click **OK** to save the settings you have defined. The event list is filtered according to the filter settings you set.

Determining the Number of Events That Appear on a Page

The list of events are divided into pages. The number in the **Go to chunk** list indicates which page is currently being displayed. For example, 2/4 means that it is the second out of four pages.

To determine the number of events that appear on a page:

1 Click the **Set bulk size** button to open the Set bulk size dialog box.

2 Use the up and down arrows or type the number of events you want to appear on a page and click **OK**.

3 To view other pages, use the left and right arrows.

Refreshing the Event Table

Click the **Refresh** button to toggle between two states:

➤ The **Refresh** button, when in this state, is rotating, and automatically updates the event table with the latest information from the CMDB.

➤ The **Refresh** button, when in this state, is static, and indicates that the event table is not being updated automatically.

Event Tab Definitions

The following table describes the attributes of Mercury Application Mapping active events that make up the Configuration Item Events and View Events tab columns:

Note: Since an active event is always created from a raw event, it takes the same attributes as its raw event. In addition, active events have other attributes that are specific to them.

Column	Description
Severity	The severity of the event (Normal, Warning, Minor, Major, Critical). Each severity level is displayed in a predefined color.
Correlation	Indicates whether the event is the result of a correlation rule. When the event is a result of a correlation rule, a correlation icon appears in the box.
CI Type	The CIT of the CI for which the event was sent.
Event Type	The type of the event.
Message Group	Not in use.
CIT Name	The CIT name of the event's CI.
Create Time	Not in use.
Text Message	A textual description of the event.

Column	Description
Discovery Time	The date and time in which, a change in the state of a managed CI is discovered. This discovery caused the creation of the raw event that is related to the active event.
Update Time	Not in use.
Attribute Name	For events from Collector Threshold type only. Indicates the name of the attribute that caused the event.
Attribute Value	For events from Collector Threshold type only. Indicates the attribute value that caused the event.
Data 1-10	Undefined attributes that enable you to add your own event attributes.
System Time	The date and time of the entrance of the first related raw event to the database.
CI Label	The inclusive label of the CI related to the event. Includes other CIs that identify the selected CI. For example, a disk's label includes the disk name and its host name.
Rule Tracing	The names of the rules that cause the creation of the event and/or are involved in the event.
Acknowledged	Indicates whether the event has been acknowledged. In addition to changing the acknowledged state from the shortcut menu (for details, see "CI Shortcut Menu" on page 162), you can change it from this box. To acknowledge the event, select **Acknowledged**. To reverse the acknowledgment, clear **Acknowledged**.
Acknowledged By	The user by whom the event is acknowledged or unacknowledged after prior acknowledgment. This box is automatically selected once the event is acknowledged or unacknowledged.
Acknowledgment Time	The time when the event was last acknowledged or not.

Column	Description
Note	User notes. This box can be filled in by right-clicking the event and opening the Event Attribute dialog box. In the **Value** cell of the **Note** attribute you can enter your notes.
Last System Time	The last date and time the related raw event reached the database.
Last User Time	The last date and time in which, a change that cause the creation of the related raw event is discovered.
Counter	The number of times the same active event has arrived without any severity or message change.
Create Counter	The number of times the event have switched from an inactive state to an active one. (The switch from Active to Inactive is done by the **Clear** action, which deactivates the active event. As a result, the active event is removed from the Event Browsers. However, the event can still be restored, by each of the actions that update one of the active event's attributes.)
Replace Counter	The number of times the same active event has arrived with a severity change.
Active Time	The last date and time the event has become active.
Suppressed	For correlation events mainly. Determines whether the CI's icon blinks once the event occurs, similarly to the effect of the acknowledgment action. (Both actions determines whether the icon blinks. One is performed automatically by Mercury Application Mapping, while the other is performed by the user. If one of them does not apply to the CI, the icon still blinks.) The suppression action automatically defines, for all correlation rules, that CIs that are affected by a root cause CI do not blink even though they have active events. For example, if a correlation rule is defined for the connection between a network CI and its hosts, the suppression action prevent the network's hosts from blinking once the network is down.

Column	Description
Event Status	The severity level of the CI, as adjusted for the weight according to its significance in the system. (The significance weight is set in the Status Factor tab in the View Node Definition dialog box. For details, see "Specifying the CI Status Factor" on page 133. For example, if the severity of the event is **5** and the status weight is defined at **100%**, the CI's Event Status is **5** (5*100/100). However, if the weight is defined as **60%**, the CI's status is **3** (5*60/100).
Category	The category for which the event is sent. For details on categories, see "Defining Attribute States" in *Mercury Application Mapping Administration Guide*.
Origin	Indicates the origin of the event. For example, a correlation rule, a user or a pattern.
Type	Gives additional information about the event. For example, the name of the time rule that triggered the event.

Event Shortcut Menu

The following table contains a brief description of each option in the shortcut menu, displayed by right-clicking an event in an **Event** tab or browser:

Option	Description
Delete	Deletes the selected event.
Note	Displays the Note dialog box. Enables you to add a note to a CI.
Show Event Attributes	Displays the attributes of the selected event. You can edit the values of the attributes that are displayed in italics.
Event Log	Displays a history list of all the raw events that occurred in relation to a selected CI.

Option	Description
Show Configuration Item Attributes	Displays the attributes of the CI related to the selected event. You can edit the values of the attributes that are displayed in italics.
Event Navigator	Selects the node to which the event was sent in the topology map and View Explorer.

Sorting and Customizing Event Tabs

In each tab, you can sort the displayed events and set which columns to show and in what order. For details, see "Sorting, Hiding, and Displaying Columns" on page 195.

Displaying Event Browsers and Logs in Separate Windows

In addition to viewing event information in the Event tabs, you can display event browsers and log in separate windows.

This section includes the following topics:

Event Browser

The Event browser displays the same information contained in the Configuration Item Events tab in a separate window.

To display the Event Browser in a separate window:

Right-click a CI in the View Explorer or Topology View and select **Events** > **Event Browser** to open the Event Browser window.

For details about the information displayed, see "Event Tab Definitions" on page 221.

Event Log

The Event log displays a list of raw events that occurred to a selected CI. Through this log, you can view the event history of the CI.

To display the Event log:

Right-click a CI in the Explorer or Topology map and select **Events** > **Event Log** to open the Event log.

All the columns that appear in the Event Log, except the **parameter** column, are the same as those that appear in the Event tabs and browsers. For details about the information displayed, see "Event Tab Definitions" on page 221.

The **parameter** column can contain two types of data. The first data type is displayed when the raw event is related to an action that is performed by a user. The data consists of a textual description of the action (for example, **Send Event**, **Ack**) and the name of the user that performed it. The second data type is displayed when dynamic parameters are defined in the system's Discovery Patterns. These dynamic parameters can be sent as part of the raw event values, and they can be addressed and used by the Event Rules.

Compound Event Browser

The Compound Event browser displays the information contained in the Event Browser tab, as well as event information about the selected CI's children (if children exist).

To display the Compound Event browser:

Right-click a CI in the View Explorer or topology map and select **Events** > **Compound Event Browser** to open the Compound Event Browser.

For details about the information displayed, see "Event Tab Definitions" on page 221.

Compound Event Log

The Compound Event log displays the information contained in the Event Log tab as well as event log information about the selected CI's children (if children exist).

To display the Compound Event log:

Right-click a CI in the Explorer or Topology map and select **Events** > **Compound Event Log** to open the Compound Log browser.

Receiving Change Events

This section describes the Change event type.

It includes the following topics:

Receiving Change Events When CIs Are Added or Deleted

Mercury Application Mapping enables you to receive events of the type Change when:

➤ CIs are added to maps

➤ CIs are deleted from maps

To receive events of type Change when CIs are added to, or deleted from maps:

1 In the Service View Manager, right-click the required view and then click **Properties** to open the **Properties** tab in the View Properties dialog box.

2 In the **Send notification on changes** section, select:

➤ **Added CIs -** if you want to be notified when CIs are added

➤ **Removed CIs -** if you want to be notified when CIs are removed

3 Click **OK** to save the changes you have made. An event is sent every time a CI is either added to or removed from maps.

Receiving Change Events When a Change Monitored Attribute is Modified

Mercury Application Mapping enables you to track modifications made in any CIT attribute defined as **Change Monitored**. The changes that occur appear in the Information pane.

To receive change events when a Change Monitored attribute is modified:

1. In the CI Type Manager, right-click the required CI and then select **Edit CIT**.
2. Click the **Attributes** tab and then click **Add** to open the Add Attribute dialog box.
3. In the **Configuration management only** area, ensure that **Change Monitored** is selected for the selected attribute.
4. Click **OK**.
5. In the Service View Manager, right-click the required CI and click **Properties** to open the View Properties dialog box.
6. Click the **View States** tab
7. To view change events and statuses on the maps themselves, add the Change state. For details, see "Creating a Pattern View" on page 100.
8. Click **OK** to save the changes.

Every time a change occurs, a change event is sent to the view. If the Change Monitored attribute of the CI has changed, the name of the CI that has been changed is displayed.

Sending an Event

This section describes how to define the event category that affects a CI.

To send an event:

1. Right-click a CI in the Topology View and select **Actions** > **Send Event** to open the Send Event dialog box.
2. From the **Category** list, select the category that is affected by the event. The severity list that is displayed is created in the System Type Manager. For details, see "Creating an Enumeration or List Definition" in the *Mercury Application Mapping Administration Guide*.
3. Select the required severity.
4. Click **OK**. The color and blinking of the CI are changed when the event is sent under the conditions defined in the **State Priority** list. For details, see "Creating a Pattern View" on page 100.

Clearing All Events

This option enables you to delete the events belonging to a CI of a certain category or of all categories.

To clear the events from a CI:

1. In the Topology Map, right-click the CI from which you want to clear events to open the Clear Events dialog box.
2. Choose an option as follows:
   - **Category**. Delete events belonging to a specific category. Select the required category. The list contains the categories that you defined in the Enumeration Manager.
   - **All Categories**. Delete the events belonging to all categories.

Note: When clearing all events for a specific category, the CI may still be affected by other category events. Only if you choose to delete the events for all category types, does the CI's state return to Normal.

---

3 Click **OK** to save the settings you have defined.

Part V

Generating Reports

15

Asset Reports

This chapter describes how to generate an Asset report in Mercury Application Mapping.

Generating an Asset Report

Mercury Application Mapping enables you to create a report that lists all the CIs in a selected view and their attribute values.

To generate an Asset report in Mercury Application Mapping:

1 In Topology View, right-click the view for which you want to create an Asset Report.

Note: The report contains only the attributes whose **Asset Data** check box was selected in the **Attributes** tab in the CI Type Manager. For more details, see "Creating CITs" on page 383.

---

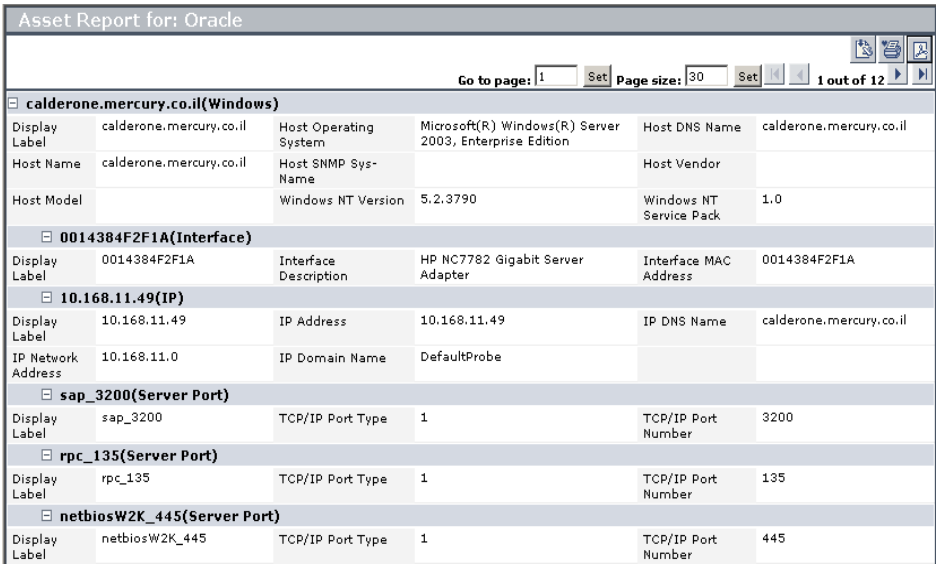
2 Select **Reports** > **Asset Report** and then one of the following:

- Select **By View** to include only CIs contained in this view.
- Select **By Database** to include additional information from the CMDB. By choosing this option, the report will include CIs that are connected by the **container_f** relationship to the CIs in selected view. For example, the report would include the CPU and memory of a server that is contained in the view.

  The Asset report opens. For details about Asset reports, see "Using Asset Reports" on page 234.

Using Asset Reports

The Asset Report retains the same hierarchical structure as in the topology map.



Asset Report for: Oracle

Go to page: 1 Set Page size: 30 Set 1 out of 12

calderone.mercury.co.il(Windows)					
Display Label	calderone.mercury.co.il	Host Operating System	Microsoft(R) Windows(R) Server 2003, Enterprise Edition	Host DNS Name	calderone.mercury.co.il
Host Name	calderone.mercury.co.il	Host SNMP Sys-Name		Host Vendor	
Host Model		Windows NT Version	5.2.3790	Windows NT Service Pack	1.0
0014384F2F1A(Interface)					
Display Label	0014384F2F1A	Interface Description	HP NC7782 Gigabit Server Adapter	Interface MAC Address	0014384F2F1A
10.168.11.49(IP)					
Display Label	10.168.11.49	IP Address	10.168.11.49	IP DNS Name	calderone.mercury.co.il
IP Network Address	10.168.11.0	IP Domain Name	DefaultProbe		
sap_3200(Server Port)					
Display Label	sap_3200	TCP/IP Port Type	1	TCP/IP Port Number	3200
rpc_135(Server Port)					
Display Label	rpc_135	TCP/IP Port Type	1	TCP/IP Port Number	135
netbiosW2K_445(Server Port)					
Display Label	netbiosW2K_445	TCP/IP Port Type	1	TCP/IP Port Number	445

To use Asset reports:

1 To determine the number of rows that appear in a table, do the following:

➤ In the **Page size** box, enter the maximum number of rows you want to appear in each table of the Asset report.

➤ Click **Set**.

2 To view other pages, use the left and right arrows. The number between the left and right arrows indicate which pages are currently being displayed. For example, 1 - 2 of 3 means that the 1st and 2nd pages out of 3 are being displayed.

3 To go to a different page, do the following.

➤ In the **Go to page** box, enter the required page number.

➤ Click **Set.**

4 To view the report in Excel format, click the **Export to Excel** button in the top-right corner of the Asset report.

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.

5 To print the contents of the report, click the **Printer Friendly** button in the top-right corner of the Asset report.

6 To convert the Asset report to PDF format, click the **Export to PDF** button in the top-right corner of the Asset report.

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Dependency Reports

This chapter describes how to generate a Dependency report in Mercury Application Mapping.

About Dependency Reports

Dependency reports are based on TQLs that are created in the Enrichment Manager that use the relationship of the type **dependency**. Mercury Application Mapping enables you to create a report that lists all the relationships of the type **dependency** that connect between servers in the selected view or between the servers in the CMDB and the servers within the selected view.

The report includes relationships that:

- Exist between databases and clients
- Exist between clients and servers
- Are created as a result of an MQ connection

Generating Dependency Reports

This section describes how to generate a Dependency report in Mercury Application Mapping.

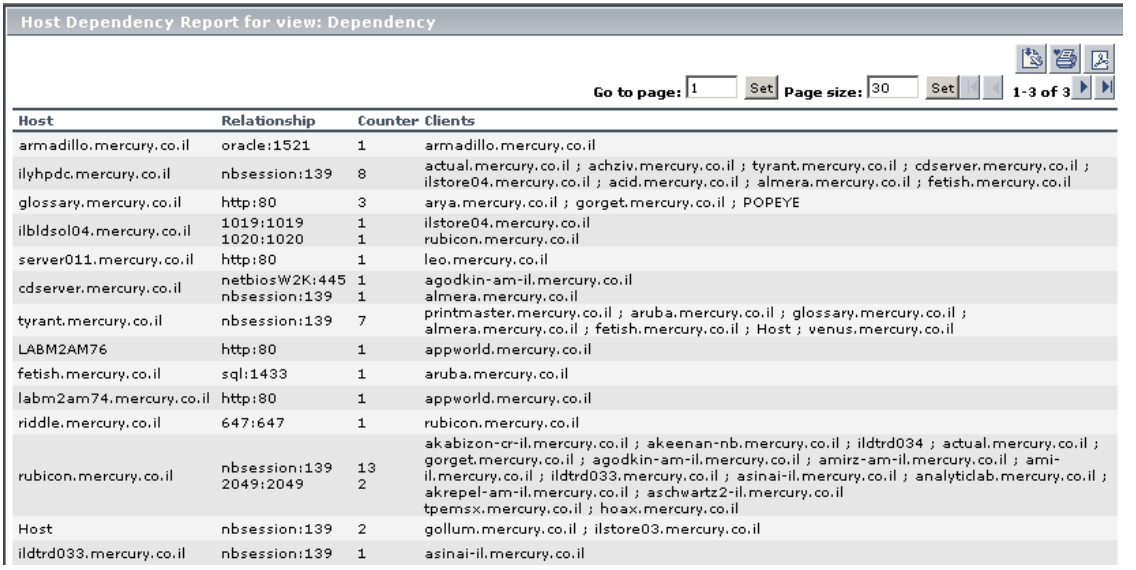
To generate a Dependency report in Mercury Application Mapping:

1 In Topology View, right-click the view for which you want to create a Dependency Report.

2 Select **Reports** > **Dependency Report** and then select one of the following:

- Select **By View** to display all the dependencies between the servers in the selected view.
- Select **By Database** to display all the servers in the CMDB that are dependent on the servers in the selected view.

The Dependency report opens.



Host Dependency Report for view: Dependency

Go to page: 1 Set Page size: 30 Set 1-3 of 3

Host	Relationship	Counter	Clients
armadillo.mercury.co.il	oracle:1521	1	armadillo.mercury.co.il
ilyhpdc.mercury.co.il	nbsession:139	8	actual.mercury.co.il ; achziv.mercury.co.il ; tyrant.mercury.co.il ; cdserver.mercury.co.il ; ilstore04.mercury.co.il ; acid.mercury.co.il ; almera.mercury.co.il ; fetish.mercury.co.il
glossary.mercury.co.il	http:80	3	arya.mercury.co.il ; gorget.mercury.co.il ; POPEYE
ilbldsol04.mercury.co.il	1019:1019 1020:1020	1 1	ilstore04.mercury.co.il rubicon.mercury.co.il
server011.mercury.co.il	http:80	1	leo.mercury.co.il
cdserver.mercury.co.il	netbiosW2K:445 nbsession:139	1 1	agodkin-am-il.mercury.co.il almera.mercury.co.il
tyrant.mercury.co.il	nbsession:139	7	printmaster.mercury.co.il ; aruba.mercury.co.il ; glossary.mercury.co.il ; almera.mercury.co.il ; fetish.mercury.co.il ; Host ; venus.mercury.co.il
LABM2AM76	http:80	1	appworld.mercury.co.il
fetish.mercury.co.il	sql:1433	1	aruba.mercury.co.il
labm2am74.mercury.co.il	http:80	1	appworld.mercury.co.il
riddle.mercury.co.il	647:647	1	rubicon.mercury.co.il
rubicon.mercury.co.il	nbsession:139 2049:2049	13 2	akabizon-cr-il.mercury.co.il ; akeenan-nb.mercury.co.il ; ildtrd034 ; actual.mercury.co.il ; gorget.mercury.co.il ; agodkin-am-il.mercury.co.il ; amirz-am-il.mercury.co.il ; ami-il.mercury.co.il ; ildtrd033.mercury.co.il ; asinai-il.mercury.co.il ; analyticlab.mercury.co.il ; akrepel-am-il.mercury.co.il ; aschwartz2-il.mercury.co.il tpemsx.mercury.co.il ; hoax.mercury.co.il
Host	nbsession:139	2	gollum.mercury.co.il ; ilstore03.mercury.co.il
ildtrd033.mercury.co.il	nbsession:139	1	asinai-il.mercury.co.il

For details about Dependency reports, see “Understanding Dependency Reports” on page 239.

Understanding Dependency Reports

The Dependency report contains the following columns:

Column	Description
Host	The servers in the selected view.
Relationship	The display label of the relationship in the topology map.
Counter	The number of clients to which the server is connected.
Clients	The list of clients that are linked to the servers.

Note: You can create new TQLs in the Enrichment Manager using the **dependency** relationship to describe the connection between hosts. Every new **dependency** relationship that is used appears in the Dependency report.

To work with the Dependency report:

1 To determine the number of rows that appear in a table:

➤ In the **Page size** box, enter the maximum number of rows you want to appear in each table of the Dependency report.

➤ Click **Set**.

2 To view other pages, use the left and right arrows. The number between the left and right arrows indicate which pages are currently being displayed. For example, 1 - 2 of 3 means that the 1st and 2nd pages out of 3 are being displayed.

3 To go to a different page, do the following.

➤ In the **Go to page** box, enter the required page number.

➤ Click **Set.**

4 To view the report in Excel format, click the **Export to Excel** button in the top-right corner of the Dependency report.

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.

5 To print the contents of the report, click the **Printer Friendly** button in the top-left corner of the Dependency report.

6 To convert the Dependency report to PDF format, click the **Export to PDF** button in the top-right corner of the Dependency report.

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Event Reports

This chapter describes how to generate an Event report in Mercury Application Mapping.

Generating Event Reports

Mercury Application Mapping enables you to generate a report displaying the events for the CIs in the selected view. You can define which events you want included in the Event Report.

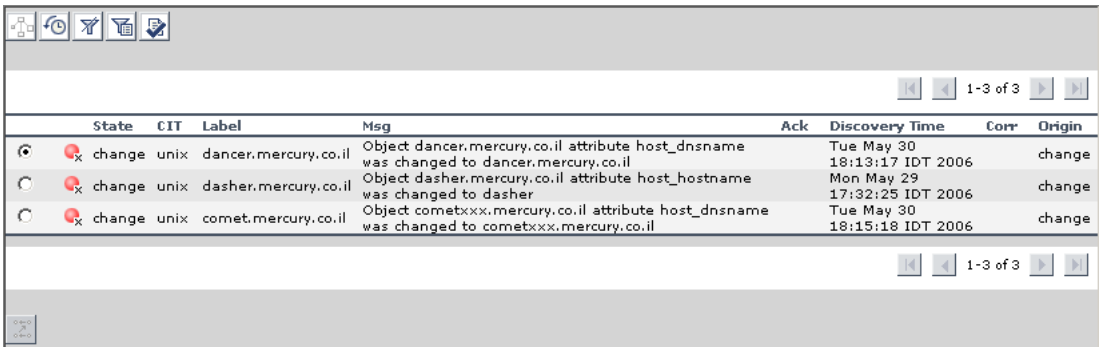
To generate an Event report in Mercury Application Mapping:

1. Right-click the view for which you want to create an Event Report.
2. Select **Reports** > **Event Report** to generate the following:

   The Event report opens. For details about Event reports, see "Understanding Event Reports" on page 242.

Understanding Event Reports

The Event report displays the Events that were sent to the selected CI.



This report contains the following fields:

- **Severity**. The severity of the event (Normal, Warning, Minor, Major, Critical). Each severity level is displayed in a different color.
- **State**. The state for which the event is sent.
- **CIT**. The CIT name of the event's CI.
- **Label**. The inclusive label of the CI related to the event. Includes other CIs that identify the selected CI. For example, a disk's label includes the disk name and its host name.
- **Msg**. A textual description of the event.
- **Ack**. Indicates whether the event has been acknowledged or not.
- **Discovery Time**. The date and time at which the event is triggered.
- **Corr**. A state that is defined in a correlation rule, and assigned to an affected CI once its root cause CI fulfills the correlation condition and a correlation event occurs. For details, see "Using the Topology Map" in the *Mercury Application Mapping User's Guide*.
- **Origin**. Indicates the origin of the event, for example, a correlation rule, a user, or a discovery pattern.

Note: You can sort the contents in each column of the Event report by clicking the sort button in the column header. To change the sort order, click the sort button in the column header again. Once a column has been sorted, its header displays a triangle pointed upwards for ascending order or downwards for descending order.

Event Report Buttons

The Event Report contains the following buttons:

Button	Description
	**Compound Events**. Toggles between showing or hiding the active events of the selected CI and of its children. For details, see "Viewing Event History" on page 244.
	**Event History**. Toggles between showing or hiding the log events of the currently selected CI and its children. Compound Events must be toggled **on** to show log events. For details, see "Viewing Event History" on page 244.
	**Toggle QuickFilter is On**. Toggles between showing or hiding the events that have been filtered in the Quick Filter dialog box. For details, see "Filtering the Events You Want to Display" on page 245. **Note:** This button only toggles if an event filter is defined for the CI.
	**Toggle QuickFilter is Off**. Includes the events that are filtered in the Quick Filter dialog box.
	**Acknowledge All**. For details, see "Acknowledging All Events Related to a Selected CI" on page 245.
	**Next Page**. Go to next page.
	**Last Page**. Go to last page.

Button	Description
	**Previous Page**. Go to previous page.
	**First Page**. Go to first page.

Viewing Event Information

You can view information about events as follows:

- "Viewing Event History" on page 244
- "Acknowledging All Events Related to a Selected CI" on page 245
- "Filtering the Events You Want to Display" on page 245
- "Viewing Other Pages" on page 246

Viewing Event History

You can view the event history of the selected CI. The Event report lists the raw and active events that occur in relation to the selected CI and its children.

Use the Compound Events and Event History buttons to toggle between four different states:

State	When This Button...	Is Pressed	Is Not Pressed	This is Displayed
State 1	**Compound Events**		√	Active events of the currently selected CI.
	Event History		√	
State 2	**Compound Events**	√		Active events of the currently selected CI and all its children.
	Event History		√	

State	When This Button...	Is Pressed	Is Not Pressed	This is Displayed
State 3	**Compound Events**		√	Raw events of the currently selected CI.
	Event History	√		
State 4	**Compound Events**	√		Raw events of the currently selected CI and all its children.
	Event History	√		

Acknowledging All Events Related to a Selected CI

This section describes how to acknowledge all events relating to a selected CI.

To acknowledge all events related to a selected CI:

Click **Acknowledge All**. A check mark appears in the **Ack** column.

Note: Acknowledge All is only for active events.

Filtering the Events You Want to Display

You use the QuickFilter Settings dialog box to include only events you want to display in the Event report for the selected CI.

To filter the events you want to display:

1 Click the **QuickFilter Settings** button to open the QuickFilter Settings dialog box.

2 To display events that were sent during a specified period of time:

a Click the date in the **From** and **To** fields to define the beginning and end of the time period in the calendar that opens.

b Select the required time and date.

c Click **Current** to select the current date.

d Click **Revert** to select the previously selected date.

e Click **OK** to save your changes and close the calendar.

3 Select the required severity levels for the different categories.

4 From the **isAck** list, select an option:

- **True**. Display CIs whose events have been acknowledged.
- **False**. Display CIs whose events have not been acknowledged.
- **None**. Display CIs whose events are either in an acknowledged or unacknowledged state.

5 From the **isCorr** list, select an option:

- **True**. Display CIs whose events are the result of a correlation rule.
- **False**. Display CIs whose events are not the result of a correlation rule.
- **None**. Display CIs whose events are either the result of a correlation rule or not the result of a correlation rule.

Note: Use any necessary combination of parameters you need to correctly define the filter conditions.

---

6 From the **Sort By** list, select the required state.

7 Click **OK** to save the settings you have defined.

8 Click the **Toggle QuickFilter button on**to display the events as defined in the Show QuickFilter dialog box.

Viewing Other Pages

To view other pages, use the left and right arrows. The number between the left and right arrows indicate which pages are currently being displayed. For example, 1 - 2 of 3 means that the 1st and 2nd pages out of 3 are being displayed.

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Change Report

This chapter describes how to generate a Change report.

Understanding Change Reports

A Change report displays information about the changes made to the properties of those CIs that were assigned to keep this information. The report displays:

- Changes that occurred in a selected CI and all its descendents.
- Information about which CI with a **Container link** relationship was added to or removed from a CI.

- Information about which CI, whose relationship was defined with a TRACK_LINK_CHANGES qualifier, was added to or removed from a CI. For information about qualifier conditions, see "Defining Qualifier Conditions" on page 123.

  A CI is displayed in the Change report only when the following conditions occur:

  - At least one of the history-sensitive properties of the CI has been updated.
  - The property that was changed had been assigned the **Change Monitored** attribute. For details, see "Creating CITs" on page 383.

Generating a Change Report for a CI

This section describes how to generate a Change report within a specific time frame. The Change report displays the changes that occurred within a defined time frame.

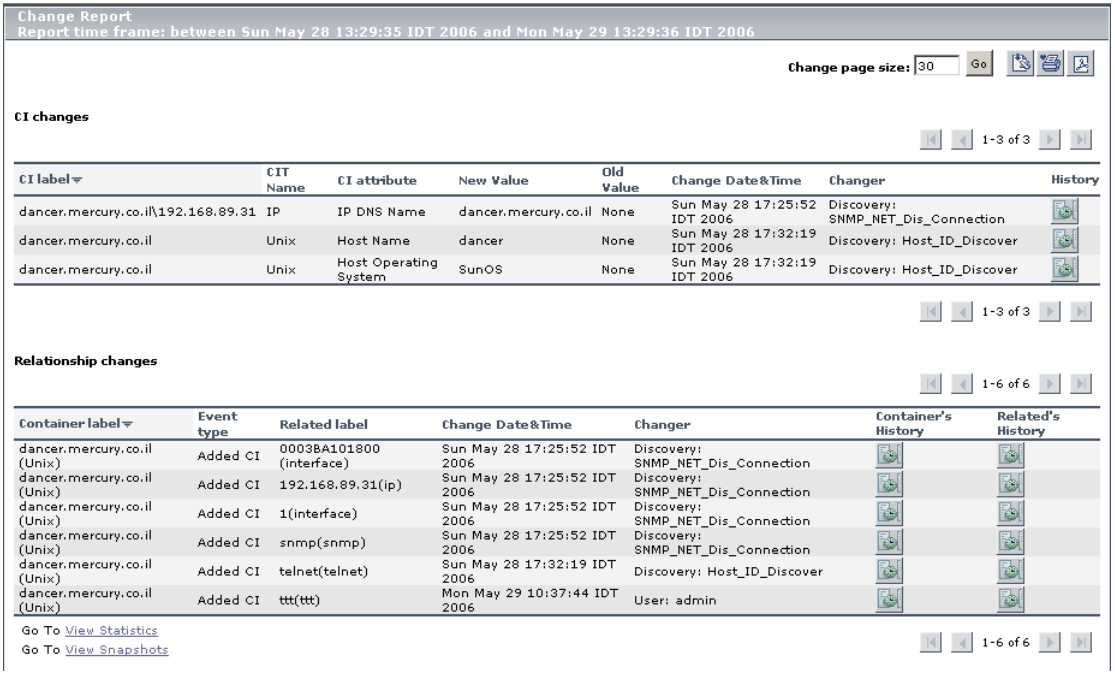
Note: The Change report option is also available for any CI or CI's descendents whose history-sensitive properties were modified.

This section includes the following topics:

Generating a Change Report

This section describes how to generate a Change report.

A typical Change report is as follows:



Change Report
Report time frame: between Sun May 28 13:29:35 IDT 2006 and Mon May 29 13:29:36 IDT 2006

Change page size: 30 Go

CI changes

1-3 of 3

CI label	CIT Name	CI attribute	New Value	Old Value	Change Date&Time	Changer	History
dancer.mercury.co.il\192.168.89.31	IP	IP DNS Name	dancer.mercury.co.il	None	Sun May 28 17:25:52 IDT 2006	Discovery: SNMP_NET_Dis_Connection	
dancer.mercury.co.il	Unix	Host Name	dancer	None	Sun May 28 17:32:19 IDT 2006	Discovery: Host_ID_Discover	
dancer.mercury.co.il	Unix	Host Operating System	SunOS	None	Sun May 28 17:32:19 IDT 2006	Discovery: Host_ID_Discover	

1-3 of 3

Relationship changes

1-6 of 6

Container label	Event type	Related label	Change Date&Time	Changer	Container's History	Related's History
dancer.mercury.co.il (Unix)	Added CI	0003BA101800 (interface)	Sun May 28 17:25:52 IDT 2006	Discovery: SNMP_NET_Dis_Connection		
dancer.mercury.co.il (Unix)	Added CI	192.168.89.31(ip)	Sun May 28 17:25:52 IDT 2006	Discovery: SNMP_NET_Dis_Connection		
dancer.mercury.co.il (Unix)	Added CI	1(interface)	Sun May 28 17:25:52 IDT 2006	Discovery: SNMP_NET_Dis_Connection		
dancer.mercury.co.il (Unix)	Added CI	snmp(snmp)	Sun May 28 17:25:52 IDT 2006	Discovery: SNMP_NET_Dis_Connection		
dancer.mercury.co.il (Unix)	Added CI	telnet(telnet)	Sun May 28 17:32:19 IDT 2006	Discovery: Host_ID_Discover		
dancer.mercury.co.il (Unix)	Added CI	ttt(ttt)	Mon May 29 10:37:44 IDT 2006	User: admin		

Go To View Statistics
Go To View Snapshots

1-6 of 6

The information in the Change report is divided into two tables:

- **CI changes**. Displays information about the changes made to the properties of CIs, which were assigned to keep this information.

  The following information is displayed in the **CI changes** table:

Item	Description
CI Label	The label of the path from the root to the CI.
CIT Name	The name of the CIT (internal).
CI Attribute	The name of the CI attribute that was updated.
New Value	The new value of the CI attribute.

Item	Description
Old Value	The previous value of the CI attribute (before the change).
Change Date & Time	The date and time at which the update was performed.
Changer	The name of the user that manually modified the CI's property, or the name of the Discovery Probe that automatically discovered a change made to the CI's property.
History	Click the icon to view the change history for the CI. For details, see "Viewing the Change History of a Specific CI" on page 253.

➤ **Relationship changes**. Contains information about which CI, with a **Container link** relationship, was added to or removed from a CI.

The following information is displayed in the **Relationship changes** table:

Item	Description
Container Label	The label of the path from the root to the container CI.
Event type	You can have one of the following values: ➤ **Added CI.** A contained CI was added to the container CI using a **Container link** relationship. ➤ **Removed CI**. A contained CI that was linked to a container CI using a **Container link** was removed.
Related label	The label of the path from the root to the contained CI.
Change Date & Time	The date and time at which the update was performed.

Item	Description
Changer	The name of the user that manually modified the CI's property, or the name of the discovery probe that automatically discovered a change made to the CI's property.
History	Click the icon to view the change history for the CI. For details, see "Viewing the Change History of a Specific CI" on page 253 and "Viewing the Change History of CIs Linked by a Container Link Relationship" on page 255.

Note: A backslash (\) in a CI name indicates a parent-child relationship with the format: <parent_CI>\<child_CI>. For example, the entry dancer.mercury.co.il\192.168.89.31 provides change information for the 192.168.89.31 CI which is the child of the dancer.mercury.co.il CI.

To generate the Change report for the selected CI and its descendents:

1 In the Topology View, right-click a CI in the View Explorer of the topology map whose properties have changed.

2 Select **Reports** > **Change Report** to open the Change Report Time Frame dialog box.

3 To define the required time frame for the Change report, do the following:

- ➤ Click the buttons to the right of the **From** and **To** fields to define the beginning and end of the required time period.
- ➤ In the calendar that opens, choose the required date and time.
- ➤ Select **Now** to define the end of the period as the current date.

4 Click **Generate** to display the Change report for the selected CI and its descendents.

Sorting the Contents of a Column in the Report

You can sort the contents of a column in the report.

To sort the contents of a column:

1. Click a column header.
2. To change the sort order, click the column header again.

Once a column has been sorted, its header displays a triangle pointed upwards for ascending order or downwards for descending order.

Viewing the Report in Excel Format

You can view the report in Excel format.

To view the report in Excel format:

Click the **Export to Excel** button in the top-right corner of the Change Report.

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.

Printing the Contents of the Report

You can print the contents of the report.

To print the contents of the report:

Click the **Print** button in the top-left corner of the Change Report.

Converting the Report to PDF Format

You can convert the report to PDF format.

To convert the report to PDF format:

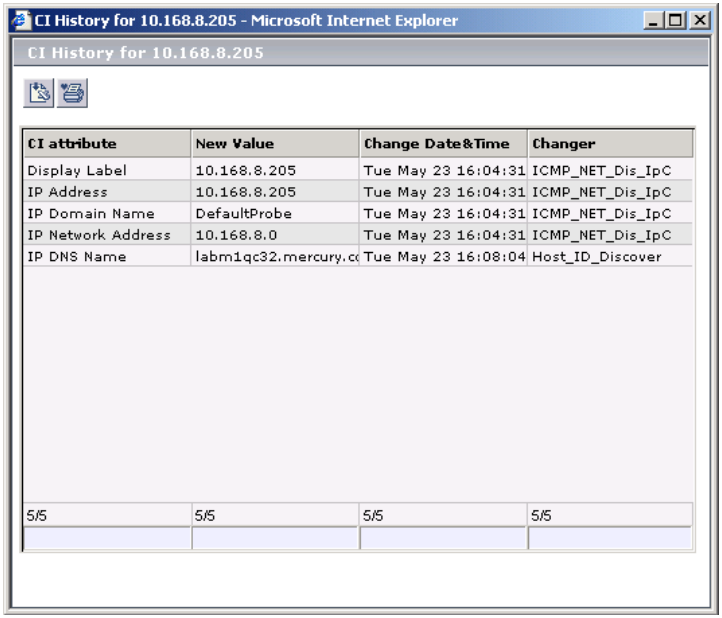
To convert the Change report to PDF format, click the **Export to PDF** button in the top-right corner.

Viewing the Change History of a Specific CI

This section describes how to view the changes in the properties of a specific CI.

Note: To display the Change History report, make sure that popups are not blocked in your browser.

A typical Change History report is as follows:



The page displays the following information:

Item	Description
CI Attribute	The name of the CI attribute that was updated.
New Value	The new value of the CI attribute.
Change Date & Time	The date and time when the update was performed.
Changer	The name of the user that manually modified the CI's property, or the name of the discovery probe that automatically discovered a change made to the CI's attribute.

To view the change history of a specific CI:

1 In the Change report, double-click the **History** icon for the required CI in the **CI changes** table. The History page opens.

2 To sort the columns of the report, see "Sorting the Contents of a Column in the Report" on page 252.

3 To view the report in Excel format, see "Viewing the Report in Excel Format" on page 252.

4 To print the contents of the report, see "Printing the Contents of the Report" on page 252.

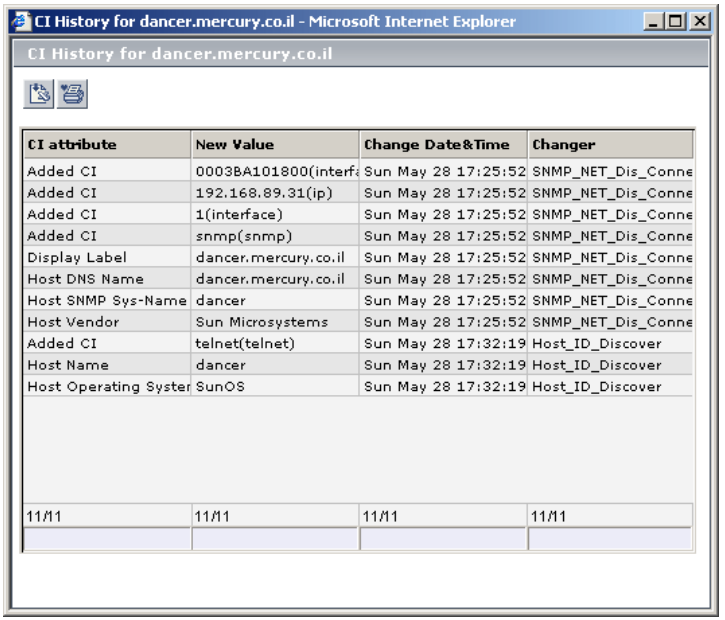
5 To convert the report to PDF format, see "Converting the Report to PDF Format" on page 253.

Viewing the Change History of CIs Linked by a Container Link Relationship

This section describes how to view the change history of CIs linked by a **Container link** relationship.

Note: To display the Change History report, ensure that popups are not blocked in your browser.

A typical Change History report is as follows:



CI attribute	New Value	Change Date&Time	Changer
Added CI	0003BA101800(interf	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Added CI	192.168.89.31(ip)	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Added CI	1(interface)	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Added CI	snmp(snmp)	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Display Label	dancer.mercury.co.il	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Host DNS Name	dancer.mercury.co.il	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Host SNMP Sys-Name	dancer	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Host Vendor	Sun Microsystems	Sun May 28 17:25:52	SNMP_NET_Dis_Conne
Added CI	telnet(telnet)	Sun May 28 17:32:19	Host_ID_Discover
Host Name	dancer	Sun May 28 17:32:19	Host_ID_Discover
Host Operating Syster	SunOS	Sun May 28 17:32:19	Host_ID_Discover
11/11	11/11	11/11	11/11

The page displays the following information:

Item	Description
CI Attribute	The name of the CI attribute that was updated.
New Value	The new value of the CI attribute.
Change Date & Time	The date and time when the update was performed.
Changer	The name of the user that manually modified the CI's property, or the name of the discovery probe that automatically discovered a change made to the CI's attribute.

To view the change history of CIs linked by a Container link relationship:

In the Change report, do the following in the **Relationship changes** table:

➤ To view the change history of the container CI, double-click the **Container's History** icon for the required CI.

➤ To view the change history of the related CI, double-click the **Related's History** icon for the required CI.

The CI History page opens.

1 To sort the columns of the report, see "Sorting the Contents of a Column in the Report" on page 252.

2 To view the report in Excel format, see "Viewing the Report in Excel Format" on page 252.

3 To print the columns of the report, see "Printing the Contents of the Report" on page 252.

4 To convert the report to PDF format, see "Converting the Report to PDF Format" on page 253.

Performing a Snapshot Comparison

This section describes how to perform a snapshot comparison if snapshots for the selected view were saved in Mercury Application Mapping. For details about snapshots, see "Environment Comparison" on page 405.

To perform a snapshot comparison:

1 At the bottom of the Change Report window, click **View Snapshots** to open a separate window in your Web browser displaying the snapshots that were saved for the selected view.

Note: The View Snapshots option appears only if snapshots for the selected view were saved.

---

2 Select the two snapshots you want to compare.

3 Click **Compare** to open a separate window in your Web browser. The window is divided into two sections. Each side displays a hierarchical tree structure of all of the CIs in the topology map for that snapshot version.

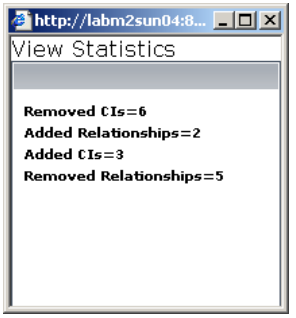
For details about the Change report, see "Generating a Change Report for a CI" on page 248.

Viewing Statistics

You can view the statistics on the number of CIs that were removed from and added to the selected view.

To view statistics regarding CIs that were added and removed from the view:

At the bottom of the Change Report window, click **View Statistics** to open the View Statistics window.



This window displays the following statistics:

Item	Description
Removed CIs	The number of CIs that were removed from the view.
Added Relationships	The number of relationships that were added to the view.
Added CIs	The number of CIs that were added to the view.
Removed Relationships	The number of relationships that were removed from the view.

For details about the Change report, see “Generating a Change Report for a CI” on page 248.

Determining the Number of Rows Per Table

The information in a Change report is divided into pages. The number of pages depends on how many rows appear in each table. You can determine the maximum number of rows you want to appear in each table (**CI Changes** and **Relationship Changes)** of the Change report.

To determine the number of rows that appear in a table:

1. In the **Change page size** box, enter the maximum number of rows you want to appear in each table of the Change report.
2. Click **Set**.
3. To view other pages, use the left and right arrows. The number between the left and right arrows indicate which pages are currently being displayed. For example, 1 - 2 of 3 means that the 1st and 2nd pages out of 3 are being displayed.

Part VI

Correlation Rules

19

Using the Correlation Manager

This chapter introduces the Correlation Manager, which enables you to create topology correlations.

Quick Tour of the Correlation Manager

Mercury Application Mapping uses topology knowledge gathered through TQL queries to automatically outline the interdependencies that exist between service components in a specific IT infrastructure. By using this information on application and management dependencies, the root causes of system alerts can be discovered. In addition, the implications and consequences of any action, update, new deployment, or a failure of the service delivery and customer experience can be evaluated and handled accordingly.

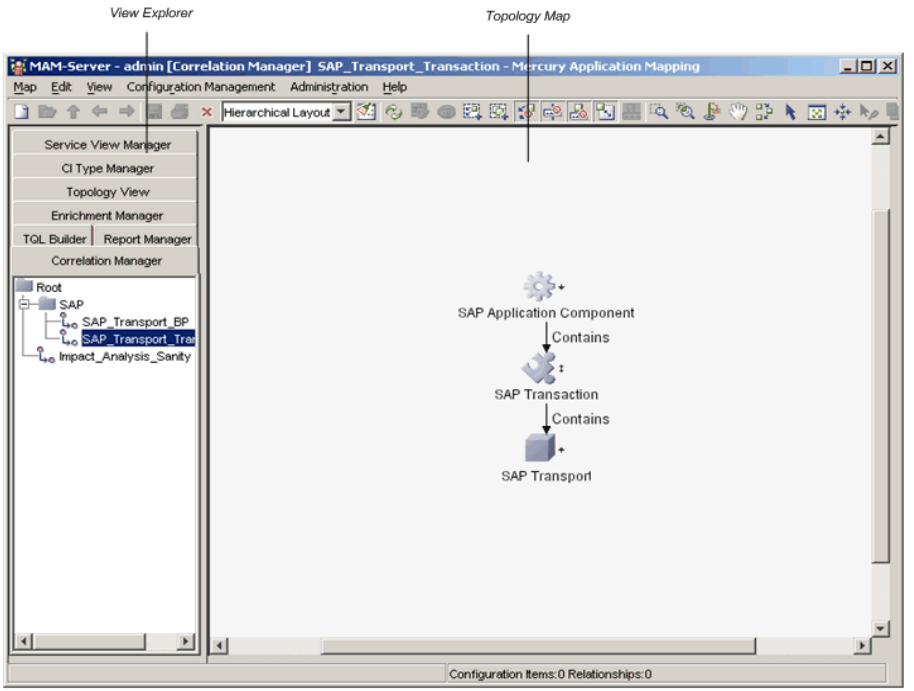
By creating correlation rules based on TQL queries, you can determine the true origin of a problem, its business impact, and its appropriate prioritization. You can also establish automatic responses to recurring problems.

The Correlation Manager, which is displayed by selecting the Correlation Manager tab in the View Explorer, enables you to define correlation rules, which specify a causal relationship between two or more correlation nodes – nodes and physical relationships. Each correlation rule you define is attached to a specific Correlation TQL query. This type of TQL query is created especially for correlation rules, and it provides them with the required dependency information for their execution.

Once the causal relationship is established, the Correlation Manager enables you to determine the effect of the events occurring in root cause nodes. You can define the type and format of correlation events that are generated by root cause nodes, how they change the Correlation and Admin states of the affected nodes, and who is notified of the correlation occurrence.

A change in the correlation state of an affected CI can alter the CI's map status, which is manifested through a change in the color of the CI's symbol. This happens when the correlation event's severity is higher than other related events' severity. However, even if the symbol's color changes, the symbol does not blink, unlike all other cases in which the CI contains unacknowledged events. This is caused by a built-in utility, which automatically suppresses the blink of an affected CI's symbol when it is caused by the occurrence of a correlation event. It is designed to help you differentiate between affected and root cause CIs, while you determine and prioritize your responses to system alerts.

For example:



Correlation events are displayed in the **Configuration Item Events**, **View Events**, and **All Event** tabs in the Information pane of the Topology View. An icon appears in the **Correlation** column, when the event is a result of a correlation occurrence. The relationship between root cause CIs and affected CIs can be examined in the Topology Map via the **Show Impact** and **Show Root Cause** options, as described "Showing a Correlation Impact" on page 188.

When the Correlation Manager tab is selected, the Mercury Application Mapping main window is divided as follows:

- **View Explorer.** Displays a hierarchical tree structure of the correlation rules you have defined. If required, you can export correlation rules and save them as XML scripts, which can be used for backup purposes.

➤ **Topology Map.** Displays the currently selected rule, which consists of nodes that are defined in the TQL query and the relationships between them. The trigger node is marked by an up arrow that is located to the right of the node's icon. Affected nodes are marked by a down arrow to the right of the affected node's icon. Nodes that are both affected and trigger nodes are marked by a double-sided arrow.



Correlation Manager Shortcut Menus

The Correlation Manager contains different right-click shortcut menus, depending on your selection.

This section includes the following topics:

➤ "Correlation Rule Shortcut Menu" on page 266

➤ "Node Shortcut Menu" on page 267

➤ "Relationship Shortcut Menu" on page 268

Correlation Rule Shortcut Menu

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking a selected correlation rule in the View Explorer:

Option	Description
New	Enables you to define a new correlation rule.
New Folder	Enables you to create a new correlation folder.
Save	(Enabled only when a new Correlation query is created or when changes are made to an existing one.) Enables you to save the correlation rule to the CMDB.
Save As	Displays the Save As dialog box, enabling you to define a new name and description for a query. This option can be used for copying queries.

Option	Description
Delete	Enables you to delete the selected correlation rule from the database. Note that deleting a correlation rule deletes all events related to the rule.
Export	Displays a standard Save As dialog box, enabling you to save the correlation rule as an XML script. This option can be used to move correlation rule from one workstation to another, provided the related TQL query is also relocated.
Properties	Enables you to change the description and activation state of the rule.

Node Shortcut Menu

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking a correlation node in the topology map.

Option	Description
Define Affected	Displays the Root Cause dialog box, enabling you to define the affected node(s) and the correlation events that are generated by events in the root cause node.
Reset Affected	Removes the **Define Affected** definition applied to that node.

Relationship Shortcut Menu

The following table provides a brief description of the option in the shortcut menu displayed by right-clicking a relationship in the topology map.

Option	Description
Straighten	(Enabled only for relationships with angles on the topology map.) Enables you to straighten relationships with angles.

Working with the Correlation Manager

Use the Correlation Manager to perform the following functions:

- Create new correlation rules, as well as duplicate and delete existing rules.
- Define which nodes are affected by the root cause node.
- Define the correlation events that are generated by events occurring in the root cause node.
- Define the format of messages sent to nodes and users regarding correlation events.
- Show or hide selected nodes and relationships in the topology map.
- Export and import selected correlation rules from XML scripts. This can be used to relocate correlation rules from one workstation to another providing the related TQL query is also relocated.
- Zoom in and out of the topology map area to view the selected layer at different levels of magnification.
- Select different layout views.

20

Defining Correlation Rules

This chapter explains how to define correlation rules.

About Defining Correlation Rules

When creating a correlation rule, you first name the rule and attach it to a specific Correlation TQL query. For details, see “Defining Topology Query Language (TQL) Queries” on page 75.

You then proceed to define which node in this scenario is the root cause node, and what nodes are affected by it. This includes defining the actions that are performed on these affected nodes, as well as the messages that are sent to particular users (or groups of users) about correlation events.

Correlation Rule Workflow

You create correlation rules according to the following workflow:

- Create a correlation rule (for details, see "Creating a Correlation Rule" on page 270).
- Define which nodes and users are affected (for details, see "Defining Affected Nodes and Users" on page 271).
- Save the correlation rule (for details, see "Saving the Correlation Rule" on page 279).

Creating a Correlation Rule

The first step when creating a correlation rule is to define a name and description for the rule, attach the rule to a specific Correlation TQL query, and define whether the rule should be active in the system from the moment it is saved.

Note:

- Any major changes made to the TQL query after creating a correlation rule causes the system to delete the rule. These changes include deleting a root cause or affected node or changing the **Min** and **Max** relationship definitions (for details, see "Defining Relationship Cardinality" on page 124).
- Minor changes, such as adding a node to the TQL, do not cause the deletion of the rule.
- The correlation TQL that serve as the basis of the correlation rule, must comply with the restrictions described "Validation Restrictions" on page 83. If the TQL is not valid, it cannot be used for the creation of a correlation rule.

To create a correlation rule:

1. Click **New** on the toolbar to open the New dialog box.
2. In the **Name** box, enter a unique name for the correlation rule.
3. (Optional) In the **Description** box, enter a description of the rule.
4. From the **Attached TQL** list, select the correlation TQL to which the correlation rule should be linked.
5. (Optional) Verify that **Active** is selected to activate the rule in the system as soon as it is saved.

Note: If the rule is not activated now, it can be activated later by right-clicking it in the View Explorer, selecting **Properties** from the shortcut menu, and selecting **Active**.

---

6. Click **OK**. The new correlation rule is displayed in the View Explorer and in the topology map.

Defining Affected Nodes and Users

The next step in the procedure is to define which node in the TQL query is the root cause node, that is, the trigger of the correlation event, and which nodes are affected by this root cause. (This information should be known beforehand, when first creating the TQL query, but the definition is performed here.)

This definition includes several stages:

- Defining the nodes that are affected by the root cause node and the users/groups that are to be notified once correlation conditions are fulfilled.
- Defining correlation conditions for the attributes of the root cause node.
- Defining how many instances of the root cause node should fulfill the conditions for activating the correlation actions.

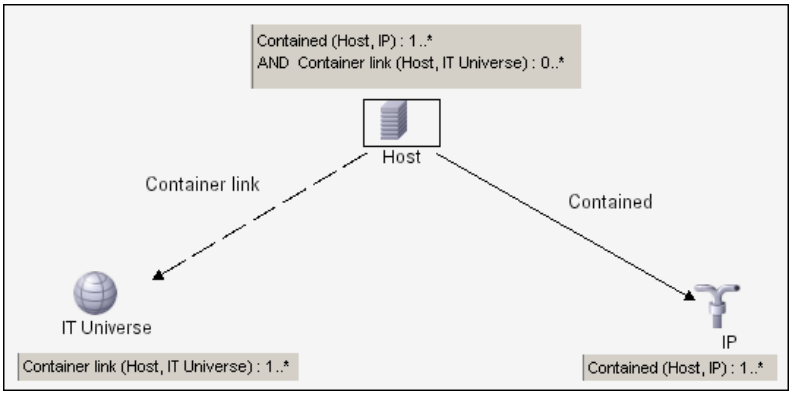
➤ Defining the actions that are to be performed once correlation conditions are fulfilled.

When selecting nodes to function as correlation triggers, they 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 (since it may or may not exist in the TQL). For details about minimum limits, see "Defining Relationship Cardinality" on page 124.

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.



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

To adjust the correlation rule definition to a management environment that contains multiple states, Mercury Application Mapping enables you to specify the state that triggered the correlation rule and the event state that is sent to the affected nodes.

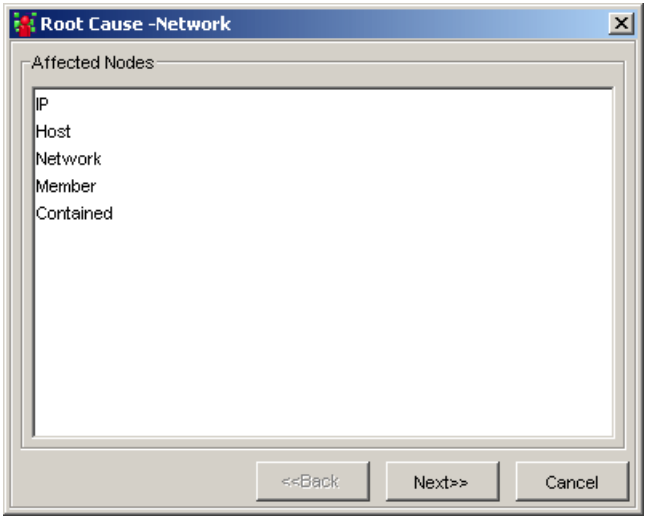
This section includes the following topics:

Setting Multiple Conditions for Defining Affected Nodes

You can set multiple conditions for defining affected nodes.

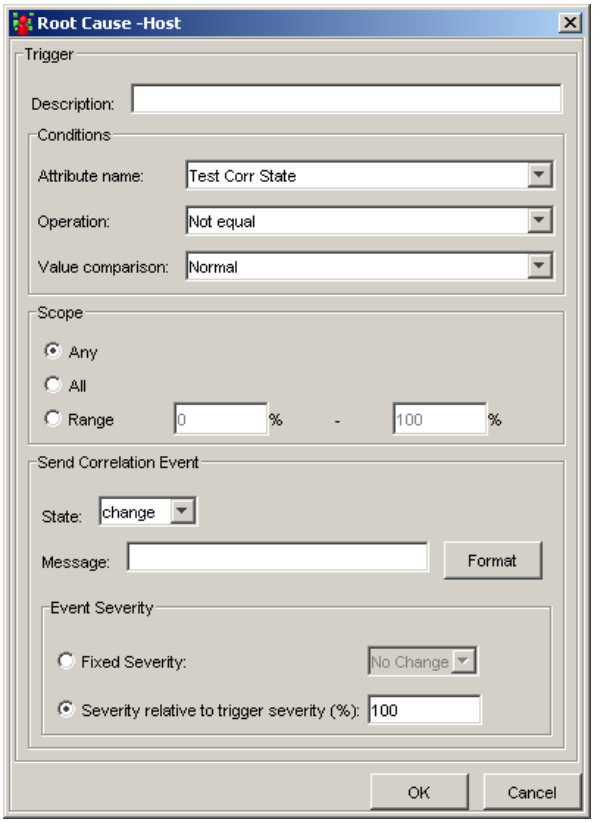
To set multiple conditions for defining affected nodes:

1. In the Correlation Manager, right-click the node or relationship that functions as a trigger.
2. Select **Define Affected** to display the nodes and relationships in the TQL.



3. Select the node or nodes to be affected by the trigger.
4. Click **Next** to add a correlation rule.

5 Click **Add** to open the Root Cause dialog box and define a correlation rule.



6 In the **Description** box, type a description of the correlation rule you are defining.

7 In the **Conditions** area, define conditions for the node's attributes. When these conditions are met, the correlation actions are triggered.

For example, you can determine a correlation condition that states that the operational state of the node is other from Normal. When the operational state of the node instances changes and is no longer Normal, the condition is met and the assigned actions are activated.

Tip: It is recommended to define conditions for non-calculated attributes (for example, CIT or Names) in the TQL Builder and conditions for calculated attributes (such as States) in the Correlation Manager.

➤ From the **Attribute name** list, choose the required attribute.

➤ From the **Operation** list, select the required operation.

The operations in the **Operation** list are:

Operation	Description
Equal	Checks whether the attribute value is equal to the value specified in the Value Comparison box.
Not equal	Checks whether the attribute value is not equal to the value specified in the **Value Comparison** box.
Greater	Checks whether the attribute value is greater than the value specified in the **Value comparison** box.
Great than or equal	Checks whether the attribute value is greater than or equal to the value specified in the **Value comparison** box.
Less	Checks whether the attribute value is less than the value specified in the **Value comparison** box.
Less than or equal	Checks whether the attribute value is less than or equal to the value specified in the **Value comparison** box.

8 In the **Scope** area, define how many instances of the root cause node should fulfill the conditions for activating the correlation actions.

For example, you can define that a correlation event is sent only when at least 10% of the system's hosts are down.

You can apply the trigger conditions not only to one of the instances of a root cause node, but also to a certain percentage of the root cause instances or to all of them. In addition, if you use the **Send Correlation Event** action, you can define whether numerous correlation events are sent, one for each root cause instance (Any), or whether one event only is sent for the entire instance group (All, Range).

Select one of the following options:

- **Any.** One instance or more should fulfill the conditions. A correlation event is sent for each instance.
- **All.** All instances should fulfill the conditions. One correlation event is sent for all instances.
- **Range.** A certain percentage of all instances should fulfill the conditions. One correlation event is sent for all the instances (of the root cause node) that are included in the range. For example, if you enter a range of 50% to 100%, the actions are triggered when 50% or more of the instances meet the conditions.

9 In the **Send Correlation Event** area:

- From the **State** list, select the state type for which you are sending the event.

Note: The state you choose must be the same state you selected in the Condition statement. For example, if the Attribute name you defined in the condition statement is **Change State**, you must select the same category from the **State** list, that is, **Change**.

- In the **Message** box, define the message to be generated by the system using simple or complex expressions, as follows:

a Click **Format** to open the Set Attributes dialog box.

b For details on how to use the Set Attributes dialog box to define simple and complex expressions, see “Setting Attribute Definitions Using Simple and Complex Expressions” on page 307.

c Click **OK**. The defined message is displayed in the **Message** box of the Root Cause dialog box.

10 In the **Event Severity** area, define the severity of the correlation event, by selecting one of the following options:

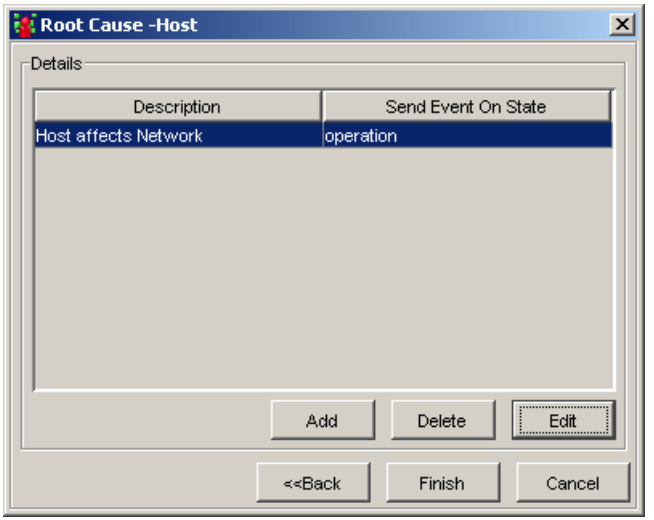
- Select **Fixed severity** to define a fixed severity level for every correlation event generated then select the required severity level from the list.
- Select **Severity relative to trigger severity (%)** (displayed when you selected the **Any** option) to define a severity level for each correlation event that is relative (as a percentage) to the severity of the trigger event. Enter the percentage in the box provided.

  For example, if the severity of the trigger event is Critical (10) and this field is set to 80%, then the severity of the correlation event is Major (8).
- Select **Function** (displayed when you selected the **All** and **Range** options) to define a severity level for the correlation event, as a function of the severity levels of all the root cause node instances that are included in the range. From the list, select either **Average** or **Max.**

  For example, if you select **Average**, the severity level of the correlation event is the average severity of all the root cause instances.

11 Repeat steps 5 to 9 to define additional correlation events related to the selected node.

12 Click **OK** to save the settings you have defined. The new correlation rule is added to the Details dialog box.



The following information is displayed:

- **Description**. The description of the new correlation rule that is created.
- **Send Event on State**. The category for which the event is sent.

13 Once you complete the affected node definitions, click **Finish**.

Editing a Correlation Rule

You can edit an existing correlation rule.

To edit a correlation rule:

1 In the Details dialog box (for details, see "Setting Multiple Conditions for Defining Affected Nodes" on page 273), select the required correlation rule and click **Edit**.

2 Make the required changes.

3 Click **Finish** to save the changes you have made.

Removing a Correlation Rule

You can remove an existing correlation rule.

To remove a correlation rule:

1 In the Details dialog box (for details, see "Setting Multiple Conditions for Defining Affected Nodes" on page 273), select the correlation rule you want to delete and click **Delete**.

2 Click **Finish**.

Saving the Correlation Rule

After you have defined the correlation rule, the last step is to save it to the CMDB. If you exit the Correlation Manager without saving, a confirmation window is displayed, requesting that you save your rule.

To save the correlation rule:

1 In the View Explorer, select the correlation rule to be saved in the CMDB.

2 Click the **Save** button on the toolbar or select a different rule or tab in the View Explorer. A message is displayed, asking if you want to save the current correlation rule. The correlation rule you have created is saved to the CMDB.

Note: If an active correlation rule is later deactivated (by clearing **Active** in the Properties dialog box), all events related to the rule are deleted from the system.

Importing a Correlation Rule

You can import XML files that contain saved correlation rules to your Correlation Manager. Use this option if you want to relocate correlation rules from one workstation to another.

Note: Before you import a correlation rule, you must verify that its attached TQL query appears in the **Attached TQL** list in the New dialog box. If the attached query does not exist in your query list, importing fails.

To import a correlation rule:

1. From the Correlation Manager, open the **Map** menu and click **Import** to open the Import dialog box.
2. Locate the correlation rule you want to import, select it and click **Import**. The imported correlation rule is added to the correlation rule list in the View Explorer.

Note: By default, an imported correlation rule is not active. To activate it, select it on the View Explorer and right-click. From the shortcut menu, select **Properties**. In the displayed Properties dialog box, select **Active**, and click **OK**.

Part VII

Enrichment Nodes and Rules

21

Introduction to Enrichment Nodes and Relationships

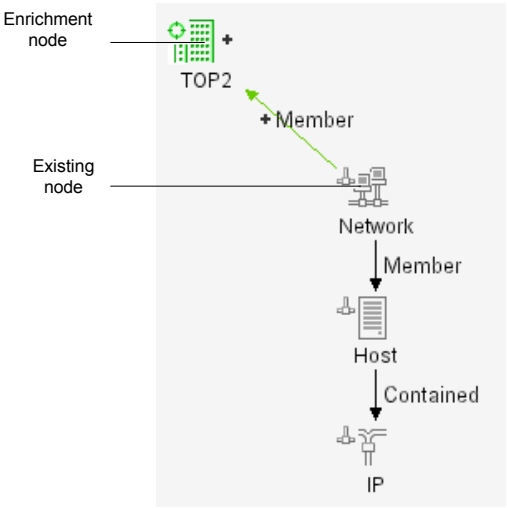
This chapter introduces the Enrichment Manager, which enables you to create enrichment nodes and rules and add them to a TQL query.

About Enrichment Nodes, Relationships, and Rules

The Enrichment Manager provides you with greater flexibility in managing queries and designing views, and enables you to integrate prior knowledge of the infrastructure with data that is found and gathered through the Mercury Application Mapping discovery process.

Enrichment nodes and relationships differ from other Mercury Application Mapping CIs and relationships in that they are not actually discovered by discovery patterns. They are conceptual deductions that represent real relationships and CIs that cannot be discovered automatically by the discovery process.

Enrichment nodes and relationships are created as part of a TQL, whose other TQL nodes are regular ones, meaning TQL nodes that already exist in the database. The following example illustrates that a regular Network node is linked to a TOP2 enrichment node by an enrichment Member relationship.



By placing an enrichment node within a TQL context, it receives data from the attributes of the other enrichment nodes in the TQL, and uses it to insert new information into the database that is inferred from an existing one, or represents existing information in a new way.

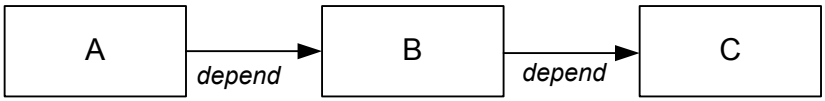
Since these enrichment nodes and relationships are usually characterized differently, their creation often entails a creation of new CITs (done through the CI Type Manager; for details, see “Introduction to the CI Type Manager” on page 373).

Enrichment CIs and Relationship Objectives

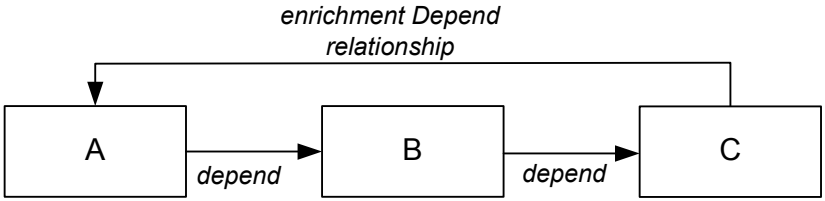
There are two main reasons for creating enrichment CIs and relationships:

- Enlarging the CMDB by adding enrichment CIs and relationships that are currently not included in the CMDB, but whose data is known or can be logically deduced from discovered CIs.

  For example, suppose it is known that a certain relationship, such as **depend**, exists between A and B, and between B and C, as shown in the following figure:



  Based on this information, it is logical to deduce that between A and C a **depend** relationship also exists, as shown in the following figure:



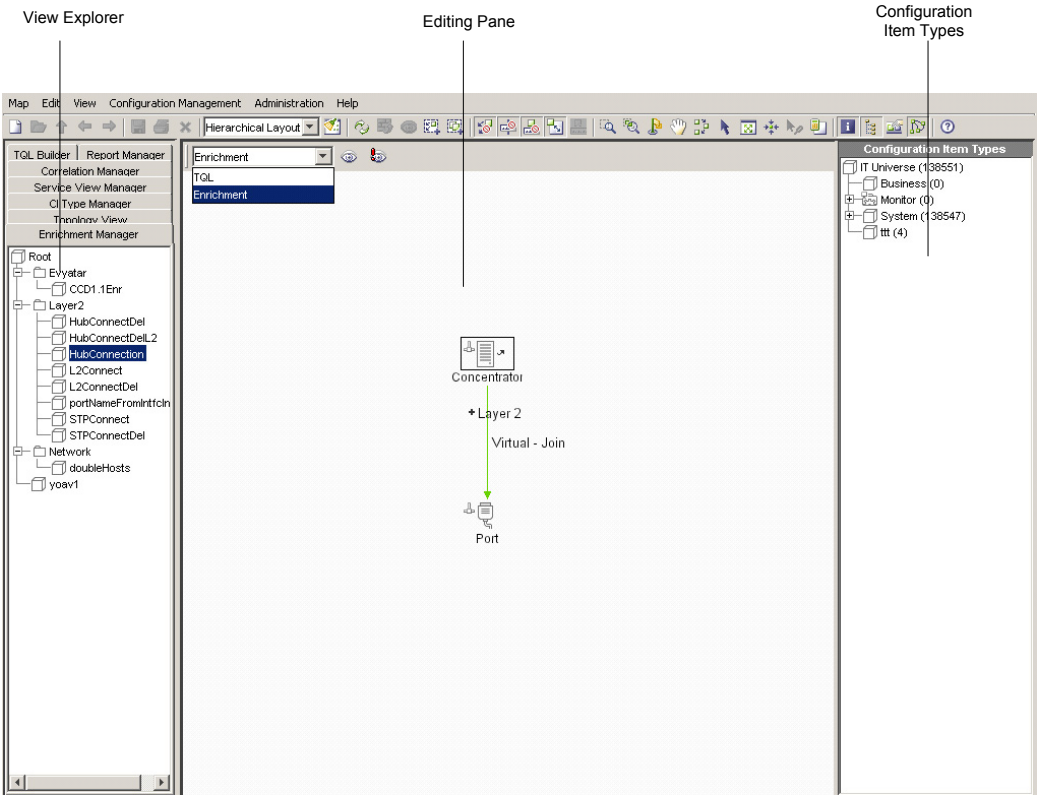
  By using an enrichment rule, you can add the relationship between A and C to the CMDB.

- Creating informative representations of your infrastructure, by simplifying data representations that are based on query results of complex structures.

Quick Tour of the Enrichment Manager

The Enrichment Manager, which is displayed by selecting the **Enrichment Manager** tab in the View Explorer, enables you to create and define enrichment rules. These rules, which are based on a specific enrichment TQL query, can be used for several purposes:

- Creating new CIs and relationships for adding data to the CMDB
- Enabling additional representation options of existing data
- Updating the value of CI attributes in the database
- Deleting CIs from the CMDB by using TQL queries



When the Enrichment Manager tab is selected, Mercury Application Mapping main window is divided as follows:

- **View Explorer.** Displays a hierarchical tree structure of the enrichment rules you have defined. If required, you can export enrichment rules and save them as XML scripts, which can be used for backup purposes.

Note: Each enrichment rule type is represented by a unique icon.

- **Editing Pane.** Displays the currently selected rule, which consists of TQL nodes that are defined in the TQL query and the relationships between them, and the enrichment nodes and relationships that are created and added to the rule.
- **Configuration Item Type Model.** Represents the CI Type Model and contains icons for each CIT as defined by the administrator. By clicking and dragging CITs to the editing pane, you can create new enrichment nodes. By defining the relationship between these enrichment nodes and existing nodes, you can create new enrichment relationships.

Understanding Enrichment Manager Modes

The Enrichment Manager has two modes in which you can work: **Enrichment** mode and **TQL** mode.

Working in:

- TQL mode enables you to define an enrichment TQL query. For details, see "Using the TQL Node Wizard" on page 128.
- Enrichment mode enables to define enrichment relationships and nodes and add them to the TQL query you defined. For details, see "Creating Enrichment Nodes and Relationships" on page 301.

Working With Enrichment Manager Shortcut Menus

The shortcut menus that appear depend on which mode you are using.

- Working in Enrichment mode enables you to:
  - Add enrichment nodes and relationships to the TQL query
  - Update attribute definitions for enrichment nodes and relationships
  - Delete enrichment nodes and relationships

Note: For details, see "Node/Relationship Shortcut Menu When Working in Enrichment Mode" on page 290.

- Working in TQL mode enables you to:
  - Create a TQL query using the TQL wizard
  - Add nodes and relationships to the query
  - Define node and relationship attribute conditions
  - Create a dependency graph
  - Display all of the instances found for each TQL node in a table

---

Note: For details, see "Node/Relationship Shortcut Menu When Working in TQL Mode" on page 291.

This section includes the following topics:

Enrichment Manager Enrichment Rule Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a selected enrichment rule in the View Explorer:

Option	Description
New	Enables you to define a new enrichment rule. For details, see "Creating an Enrichment Rule" on page 295.
New Folder	Enables you to create a new enrichment folder.
Save	Enables you to save the enrichment rule and node to the CMDB. (Enabled only when a new rule is created or when changes are made to an existing one.) For details, see "Saving the Enrichment Rule" on page 314.
Save As	Displays the Save As dialog box, enabling you to define a new name and description for the rule (used for creating a new rule based on an existing one). For details, see "Creating an Enrichment Rule Based on an Existing One" on page 313.
Delete	Enables you to delete the selected rule from the CMDB. For details, see "Deleting CIs from the CMDB Using Enrichment Rules" on page 315.
Export	Displays a standard Save As dialog box, enabling you to save the enrichment rule in XML format. This option can be used to move selected rules from one workstation to another, provided the related TQL query is also relocated. For details, see "Exporting Enrichment Rules" on page 313.
Properties	Enables you to change the properties of the rule (aside from the rule name and the Enrichment TQL query to which it is attached)."Updating CI Attributes Using Enrichment Rules" on page 304.

Node/Relationship Shortcut Menu When Working in Enrichment Mode

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking an enrichment node in the editing pane when you are working in Enrichment mode. Enrichment relationships appear in green and enrichment nodes and relationships are displayed by an added indicator.

Option	Description
Add Relationship	Enables you to add an enrichment relationship to the rule. Applicable to regular and enrichment nodes. For details, see “Adding TQL Nodes and Relationships to a Query” on page 79.
Delete	Enables you to delete the selected node/relationship. Applicable only to enrichment nodes and relationships. For details, see “Adding TQL Nodes and Relationships to a Query” on page 79.
Straighten	Enables you to straighten the relationship between two nodes. This option is only available for relationships that have angles. For details, see “Straightening a Relationship With an Angle” on page 80.
Update Relationship/Node	Enables you to update the attribute values of the selected node/relationships. This is applicable for both regular and enrichment nodes. For details, see“Updating CI Attributes Using Enrichment Rules” on page 304.
Delete Relationship/Node	Enables you to delete the selected node/relationship from the CMDB. Applicable to regular nodes and relationships only. For details, see“Deleting CIs from the CMDB Using Enrichment Rules” on page 315.
Clear	Deletes the attributes you defined for the selected node.

Node/Relationship Shortcut Menu When Working in TQL Mode

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking an enrichment node in the Editing pane when you are working in TQL mode.

Option	Description
TQL Node Wizard	Builds a TQL query. For details, see "Using the TQL Node Wizard" on page 80.
Add Relationship	Displays the Add Relationship dialog box, enabling you to create a relationship for your TQL nodes by selecting it from a predefined list. For details, see "Adding TQL Nodes and Relationships to a Query" on page 79.
TQL Node Definition	Displays the TQL Node Definition dialog box, enabling you to define the attribute conditions for the selected TQL node. For details, see "After you have created the TQL query, the next step is to add the TQL nodes and relationships that define the query. The TQL nodes represent the CITs, as defined in the CI Type Manager, and the relationships represent the connection between them. Relationships are defined one at a time for each pair of TQL nodes in the query. For details, see "Adding Nodes and Relationships to a TQL Query" on page 106." on page 79.
Delete	Enables you to delete the selected TQL node(s).
Add SubGraph	Creates a graph that represents additional TQL query data related to a specific node. For details, see "Creating a Dependency Graph" on page 80.
Show element's instances	Displays all of the instances found for each TQL node in a table. For details, see "Showing TQL Node Instances" on page 81.

Enrichment Manager Tooltip

Hold the pointer over a node or relationship to view its tooltip.

The tooltips contain the following information:

- **Element name.** The name of the node
- **CI Type**. The CI Type of the CI as defined in the Configuration Item Type Model.
- Definitions of the selected nodes and relationships. For example, the attribute conditions, as described in "Setting TQL Node and Relationship Definitions" on page 116.

Working with the Enrichment Manager

Use the Enrichment Manager to perform the following functions:

- Create enrichment TQL queries
- Create enrichment rules, as well as duplicate and delete existing rules
- Define enrichment nodes and relationships and add them to the CMDB
- Update the attribute values of existing CIs
- Delete CIs from the CMDB
- Export and import selected enrichment rules from XML scripts. This can be used to relocate enrichment rules from one workstation to another. (This can be performed providing the related TQL query is also relocated.)
- Zoom in and out of the editing pane to view the selected layer at different levels of magnification
- Select different layout views

22

Defining Enrichment Nodes and Rules

This chapter explains how to define enrichment nodes and relationships and add them to an existing TQL query.

About Defining Enrichment Nodes and Rules

When creating an enrichment rule, you first name the rule and attach it to an existing enrichment TQL query or create a new one. You then proceed to create new enrichment nodes and relationships, by dragging and dropping the enrichment nodes from the CI Type Model to the scenario on the editing pane, and connecting them to existing TQL nodes by logical and virtual relationships.

You then set the attribute values of the enrichment nodes and relationships for identifying the new CIs and relationships in the Mercury Application Mapping environment, providing them with meaningful information.

Enrichment Rule Workflow

Enrichment rules are created according to the following workflow:

- Create an enrichment rule. For details, see "Creating an Enrichment Rule" on page 295.
- Add nodes and relationships to a TQL query. For details, see "Adding Nodes and Relationships to a TQL Query" on page 298.
- Create enrichment nodes and relationships. For details, see "Creating Enrichment Nodes and Relationships" on page 301.
- Setting attribute definitions. For details, see "Updating CI Attributes Using Enrichment Rules" on page 304.
- Save the enrichment rule. For details, see "Saving the Enrichment Rule" on page 314.

Creating an Enrichment Rule

When creating a new enrichment rule, bear in mind that Mercury Application Mapping does not allow you make any changes in the TQL that are necessary for the rule. These changes include the following:

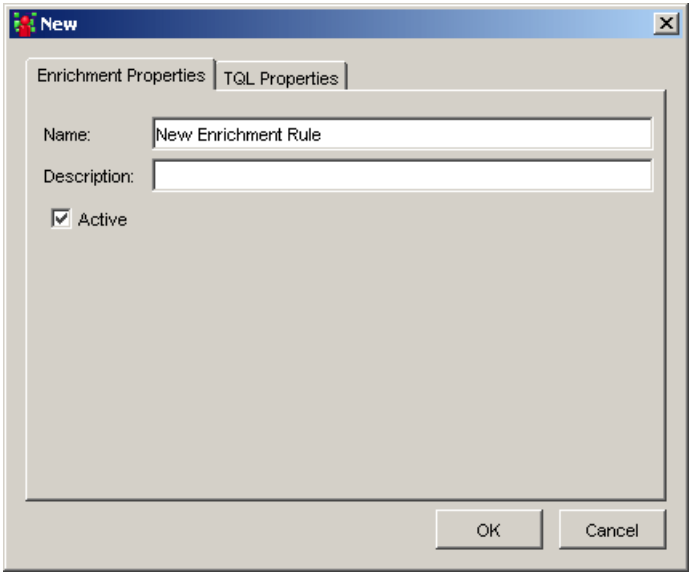
- Deleting, from the enrichment TQL, the nodes or relationships connected to the enrichment node, causing a node to become unattached to any relationship.
- You cannot change the cardinality definition to 0 (not required) of a node or relationship that is used in an enrichment rule. For example, when you define the relationship cardinality, and enter a value that defines the lower limits in an enrichment rule as 1 or more (required), you cannot change the cardinality definition to 0 (not required). For details on relationship cardinality, see "Setting TQL Node and Relationship Definitions" on page 116.

Note: The Enrichment TQL that serves as the basis for the enrichment rule, should comply with the validation restrictions. For details, see Chapter 8, "Validation Restrictions." If the TQL is not valid, it cannot be used for the creation of an enrichment rule.

To create an enrichment rule:

1 Click **New** on the toolbar to open the New dialog box.

2 Click the **Enrichment Properties** tab.



3 In the **Name** box, enter a unique name for the enrichment rule.

4 (Optional) In the **Description** box, enter a description of the rule.

5 (Optional) Select the **Active** check box to activate the rule in the system as soon as it is saved.

Note: If you do not activate the rule now, you can do it later. Select the rule in the View Explorer and right-click the rule. From the shortcut menu, select **Properties**. In the Properties dialog box, select **Active**.

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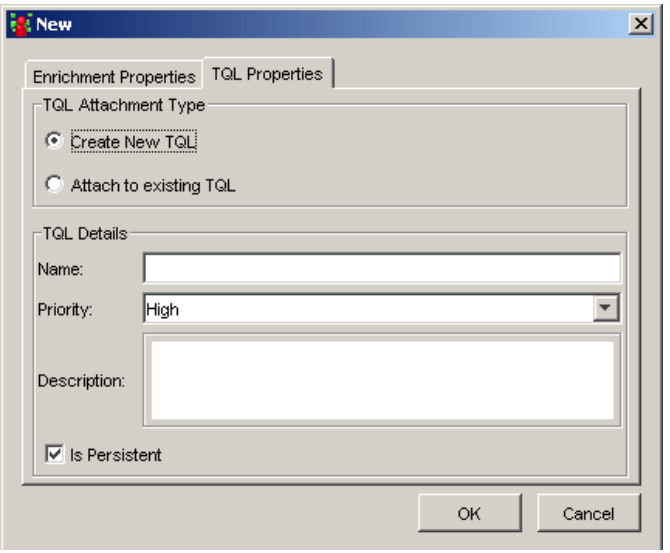
6 Click the **TQL Properties** tab to either create a new TQL or attach an existing one.



7 To create a new TQL, do the following:

- Select **Create New TQL**.
- In the **TQL Details** section, type a unique name for the TQL in the **Name** box.
- From the **Priority** list, select a priority level for the new TQL query (Low, Medium, High, Express). This setting determines how often the query is rerun automatically by the system to include updated information from the CMDB.
- (Optional) In the **Description** box, enter a description of the TQL query.
- If required, select **Is Persistent** to define whether you want the TQL to always remain in the system's memory. Use this option for TQLs that are used frequently rather than occasionally.

8 To attach an existing TQL, do the following:

- Select **Attach to existing TQL**.
- From the **Name** list, choose the enrichment TQL you want to attach to the enrichment rule.

- From the **Priority** list, select a priority level for the new TQL query (Low, Medium, High, Express). This setting determines how often the query is rerun automatically by the system to include updated information from the CMDB.
- (Optional) In the **Description** box, enter a description of the TQL query.
- If required, select **Is Persistent** to define whether you want the TQL to always remain in the system's memory. Use this option for TQLs that are used frequently rather than occasionally.

9 Click **OK**. The enrichment rule is displayed in the View Explorer.

Adding Nodes and Relationships to a TQL Query

If the Enrichment rule you have created is not attached to an existing TQL, you must add the required nodes and relationships to the TQL query.

To add nodes and relationships to a TQL query:

1 From the tree in the View Explorer, select the enrichment rule to which you want to add nodes and relationships.

2 At the top of the Enrichment Manager window, select **TQL** mode. From the tree displayed in the Configuration Item Type 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**.

The Add Relationship dialog box opens. It contains the following fields:

Field	Description
Node Label	The label of the selected node.
Relationship Direction	The direction of the relationship that indicates which node is dependent on the other.
Relationship Type	A valid relationship that defines the connection between the selected nodes.
Advanced	➤ In the list under **Advanced** to the left, select one of the following: ➤ Select **Relationship** to define the connection between two nodes using a child of the relationship in the **Relationship Type** box. ➤ Select **Function Relationship** to define the connection between two CIs using either a Join or Compound relationship. For details, see "Defining Join and Compound Relationships" on page 109.
Allow all relationships	Define how to handle relationships between identical CIs or self relationships in the query results. This list appears either when you select one node or two identical nodes. Select one of the following options: ➤ **Allow all relationship**. All relationships appear in the query results. ➤ **Allow self relationship only**. Only self relationships appear in the query results. ➤ **Discard self relationships**. Self relationships do not appear in the query results.

4 Select the required direction of the relationship.

5 If required, click **Advanced** to use the Advanced options as described above.

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

Setting TQL Node and Relationship Definitions

After you have added the TQL nodes and relationships required for your query, you can define their specific attribute conditions.

To define specific attribute conditions:

1. At the top of the Enrichment Manager window, select **TQL** mode.
2. In the Editing pane right-click the TQL node or relationship whose attribute conditions you wish to define, and select **TQL Node Definition** or **TQL Relationship Definition** to open the TQL Node/Relationship Definition dialog box.

   For further details, see "Setting TQL Node and Relationship Definitions" on page 116.

Using the TQL Node Wizard

You can use the TQL Node Wizard to build a TQL query.

To build a TQL query using the TQL Node Wizard:

1. At the top of the Enrichment Manager window, select **TQL** mode.
2. In required TQL is empty, drag a TQL node onto the Editing pane from the tree displayed in the Configuration Item Type pane.
3. Right-click the required TQL node and select **TQL Node Wizard**.

   For further details, see "Using the TQL Node Wizard" on page 128.

Creating a Dependency Graph

You can create a graph that represents additional TQL query data related to a specific CI. The discovery pattern searches for the results from TQL query as well as the dependency graph definitions. The query recursively retrieves all the related CIs by a defined depth.

To define a dependency graph:

1. At the top of the Enrichment Manager window, select **TQL** mode.
2. Right-click the required node and select **Add SubGraph** to open the Dependency List dialog box.

   For further details, see "Creating a Dependency Graph" on page 145.

Showing TQL Node Instances

You can display all of the instances found for each TQL node in a table.

To display all of the instances found for each TQL node in a table:

1. At the top of the Enrichment Manager window, select **TQL** mode.
2. In the Editing pane, right-click the required TQL and select **Show element's instances** to open the Element instances dialog box.

   For further details, see "Showing TQL Node Instances" on page 147.

Creating Enrichment Nodes and Relationships

This section describes how to create enrichment nodes and to define the relationships between them and existing TQL nodes.

For a list of the relationships you can use to link two nodes and their definitions, see "Relationship Definitions" on page 505.

This section contains the following topics:

Adding Enrichment Nodes and Relationships to Define a TQL Query

This section describes how to add enrichment nodes and relationships to the enrichment TQL query.

To create enrichment nodes and relationships:

1 From the tree in the View Explorer, select the enrichment rule to which you want to add enrichment nodes and relationships.

2 At the top of the Enrichment Manager window, select **Enrichment** mode.

3 From the tree displayed in the Configuration Item Types pane, click and drag the Configuration Item Type you want to function as an enrichment node to the editing pane. Added enrichment nodes and relationships are displayed by an added indicator.

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

---

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.

Note the following enrichment rule validations:

➤ You must link the new enrichment node to at least one of the existing TQL nodes in the rule.

➤ You cannot link enrichment nodes to one another.

➤ 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 Select the enrichment node and the existing TQL node between which you want to create a relationship, by holding down CTRL and clicking.

6 When both items are selected, right-click to display the Add Relationship dialog box and select the relationship type that defines the connection between the two items.

Note: The relationships that appear in the Add Relationship dialog box are the ones that are defined in the CI Type Manager as the relationships between the two CITs. If you create a new CIT for the enrichment node, and the relationship you need does not appear in the Add Relationship dialog box, return to the CI Type Manager and add a relationship between the two CITs, as described in "Adding Relationships Between CITs" on page 400.

+ Added enrichment relationships are displayed by an **Added** indicator.

The Add Relationship dialog box contains the following fields:

Field	Description
Node Label	The label of the selected nodes.
Relationship Direction	The direction of the relationship that indicates which node is dependent on the other.

Field	Description
Relationship Type	A valid relationship that defines the connection between the selected nodes.
Allow all relationships	Define how to handle relationships between identical CIs or self relationships in the query results. This list appears either when you select one node or two identical nodes. Select one of the following options: ➤ **Allow all relationship**. All relationships appear in the query results. ➤ **Allow self relationship only**. Only self relationships appear in the query results. ➤ **Discard self relationships**. Self relationships do not appear in the query results.

7 Select the required direction of the relationship.

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

Deleting a Node or Relationship

This section describes how to delete a node or relationship.

To delete a node or relationship:

Right-click the TQL node or relationship you want to delete and select **Delete**.

Updating CI Attributes Using Enrichment Rules

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 (for details, see "Creating an Enrichment Rule" on page 295). You can use this option, for example, for adding a note simultaneously to all instances of a CI.

To update CI attributes, you open an enrichment TQL query in the Enrichment Manager, and update the attributes of one or more of its nodes.

This section contains the following topics:

Updating CI Attributes

This section describes how to update CI attributes.

To update CI attributes:

1. At the top of the Enrichment Manager window, select **Enrichment** mode.
2. On the editing pane, right-click the node whose attribute(s) you want to update and select **Update Relationship/Node** to open the Node Definition dialog box.
3. Select the attribute you want to update and click **Edit**. Depending on the attribute type you selected, one of two Set Attributes dialog boxes is displayed.
4. Enter the updated value as described in "Defining Node and Relationship Attribute Definitions" on page 306 and "Setting Attribute Definitions Using Simple and Complex Expressions" on page 307. Updated CIs are displayed by an arrow indicator.

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

Note: If you want to cancel the update and you have not yet saved the rule, right-click the updated CI and select **Clear**. If you already saved the rule, you cannot reverse the update.

---

6. To save the rule and update the CIs, click **Save** on the toolbar.

Enrichment Rule Validation

You must fill in the value of the key attribute(s) of the enrichment node. The method you use to define these values determines the number of instances created:

If you enter a dynamic value, you can create numerous instances. For example, entering the dynamic value of a host_key for the CIT **Host** or an IP address attribute for the CIT **IP**.

Defining Node and Relationship Attribute Definitions

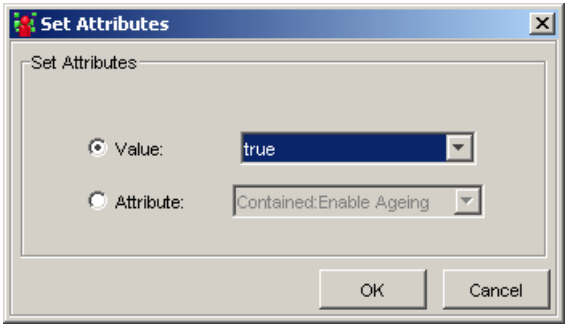
This section describes how to define node and relationship attributes for all attributes other than the type **String**.

To define node and relationship definitions for all attributes other than the type String:

1 At the top of the Enrichment Manager window, select **Enrichment** mode.

2 On the editing pane, right-click the node whose attribute(s) you want to update and select **Update Relationship/Node** to open the Node Definition dialog box.

3 Select the attribute you want to update and click **Edit**. The following Set Attributes dialog box is displayed.



4 To define a constant value, do the following:

- ➤ Select **Value**.
- ➤ Enter the required value in the **Value** box or select a value from the **Value** list.

5 To define a variable, do the following:

- ➤ Select **Attribute**.
- ➤ Select a value from the **Attribute** list.
- ➤ Click **OK** to save the changes.

The attribute definition appears in the **Value** column in the Node Definition dialog box.

Setting Attribute Definitions Using Simple and Complex Expressions

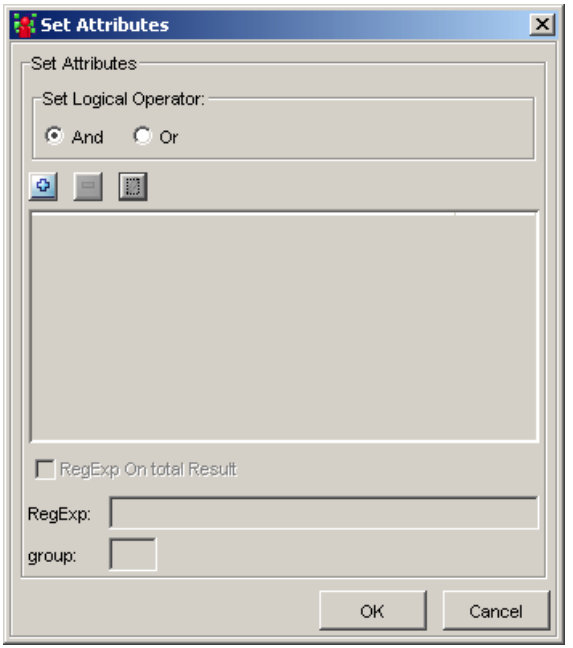
This section describes how to define node and relationship attributes of the type **String** using simple or complex expressions. You can also create complex expressions using regular expression format.

To define node and relationship definitions:

1 At the top of the Enrichment Manager window, select **Enrichment** mode.

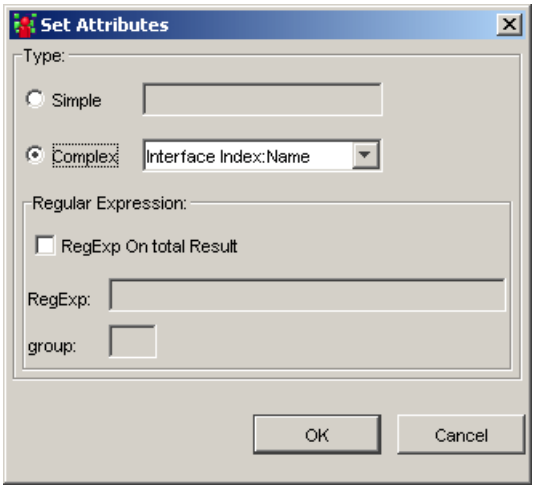
2 On the editing pane, right-click the node whose attribute(s) you want to update and select **Update Relationship/Node** to open the Node Definition dialog box.

3 Select the attribute you want to update and click **Edit**. The following Set Attributes dialog box is displayed.



Note: This dialog box only appears when you select an attribute of the type **String**.

4 Click the **Add Attribute Value** button to add an attribute value in the Type dialog box.



5 To define a constant value using a simple expression, select **Simple**.

6 Enter the required expression in the **Simple** box.

7 To define an attribute using attributes from other nodes in the TQL, select **Complex**.

8 From the **Complex** list, select the required attribute.

9 If required, you can also select **RegExp on Total Result** to add a regular expression using regular expression syntax.

10 In the **RegExp** box, enter the regular expression pattern. This is the structure of the selected attribute. For examples of how to use regular expression syntax, see “Using Regular Expressions” on page 398.

11 In the **Group** field, enter the group number. This is the part of the regular expression pattern to focus on when creating the attribute. A set of parentheses () constitutes a group.

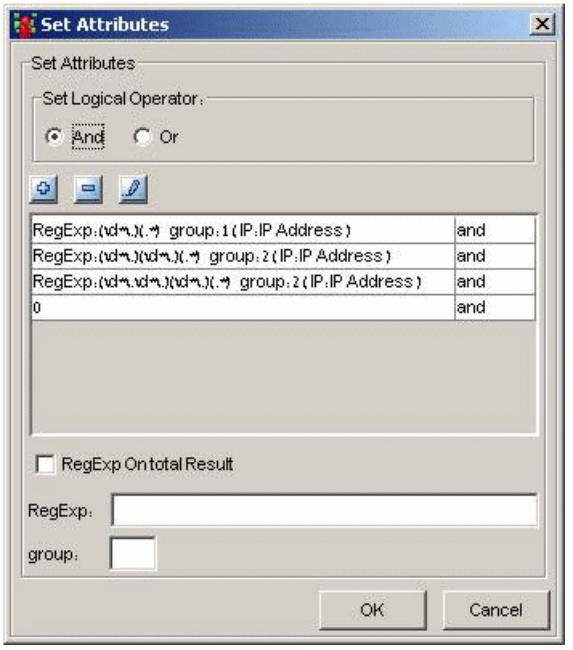
12 Click **OK** to save your attribute definitions. The attribute definition appears in the Set Attributes dialog box.

13 To define additional attribute values using simple or complex expressions, repeat steps 4 to 12.

14 In the **Select Logical Operator** area, select either **And** or **Or** to link multiple attribute definitions.

- Select **And** to use all the attribute values listed in the Set dialog box.
- Select **Or** to use the first attribute value listed in the Set dialog box that is not empty.

Following is an example of an IP address created by using simple and regular expressions.

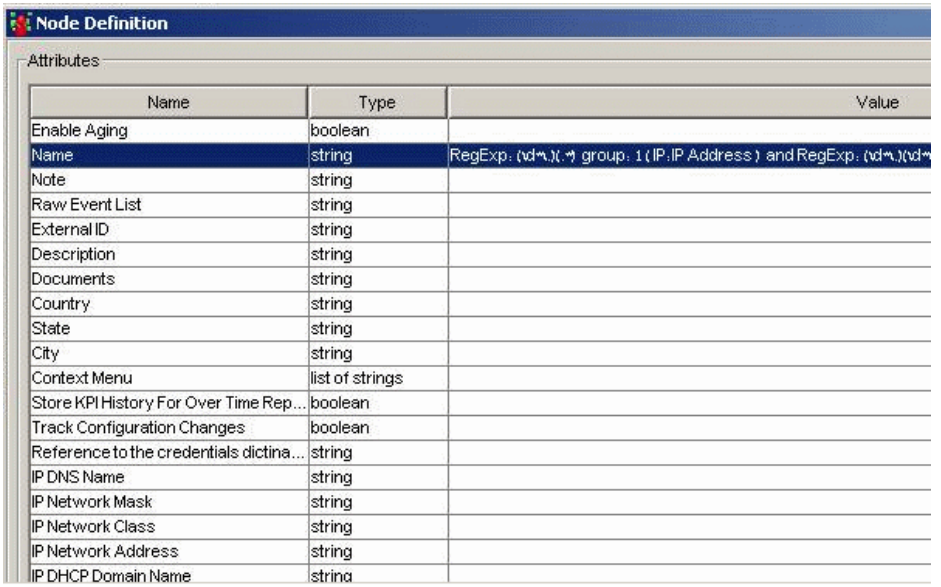


15 To remove an attribute value, select the attribute value you want to delete and click the **Remove selected attribute value** button.

16 To edit an attribute value, select the attribute value you want to edit and do the following:

- Click the **Edit selected attribute value** button to open the Set Attributes dialog box.
- Edit the attribute value as described in steps 5 through 11.

17 Click **OK**. The attribute definition appears in the **Value** column in the Node Definition dialog box.



Showing Enrichment Results

Mercury Application Mapping describes how to calculate the number of instances that were created by the enrichment rule and how to delete them from the CMDB.

This section includes the following topics:

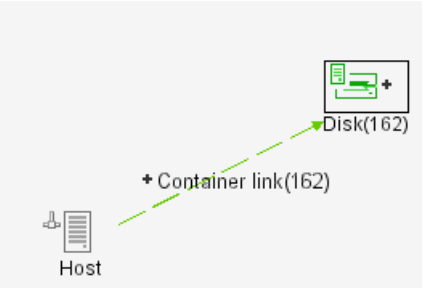
Calculating the Number of Instances That Were Created from an Enrichment Rule

This section describes how to calculate the number of Instances that were created as a result of an Enrichment Rule.

To calculate the number of instances that were created from the enrichment rule you defined:

1 In the View Explorer, select the required enrichment rule.

2 Click the **Enrichment result count** icon. The number of TQL node instances and relationships that were created appear next to the enrichment nodes/relationships.



Removing the Instances an Enrichment Rule Created from the CMDB

This section describes how to remove the instances created from an enrichment rule from the CMDB.

To remove the instances that an enrichment rule created:

1 In the View Explorer, select the required enrichment rule.

2 Click the **Remove enrichment results** icon. The instances are removed from the CMDB.

Creating an Enrichment Rule Based on an Existing One

You can create an enrichment rule based on an existing one.

To create an enrichment rule based on an existing one:

1. In the View Explorer, right-click the rule on which you want to base a new one and select **Save As**. The Save As dialog box opens.
2. Click the **Enrichment Properties** tab.
3. In the **Name** box, enter a unique name for the enrichment rule.
4. (Optional) In the **Description** box, enter a description of the rule.
5. (Optional) To activate the rule in the system as soon as it is saved, select **Active**.
6. Click **OK** to save your changes.

Exporting Enrichment Rules

You can save the enrichment rule in XML format. This option can be used to move selected rules from one server to another, provided the related TQL query is also relocated.

To export an enrichment rule:

1. Right-click the enrichment rule whose XML file you want to export and click **Export**. The Save as dialog box opens.
2. Browse to the location where you want to save the enrichment rule's XML file and click **Save**.

Saving the Enrichment Rule

After you have defined the enrichment rule, the last step is to save it to the database. If you exit the Enrichment Builder without saving, a confirmation message is displayed requesting that you save your rule.

To save the enrichment rule:

Select the rule you want to save and click **Save** on the toolbar or select a different rule or tab in the View Explorer. A message is displayed, asking if you want to save the current enrichment rule. Click **OK** to confirm the saving. The enrichment rule you have created is saved to the database.

Note: If an error message that prevents you from saving the rule is displayed, check whether you followed the rule validations. For details, see "Enrichment Rule Validation" on page 306.

Importing an Enrichment Rule

You can import XML files that contain saved enrichment rules to the Enrichment Manager. Use this option if you want to relocate enrichment rules from one server to another.

Note: Before you import an enrichment rule, you must verify that its attached TQL query appears in the **Attached TQL** list on the New dialog box. For details, see "Creating an Enrichment Rule" on page 295. If the attached query does not exist in your query list, importing fails.

To import an enrichment rule:

1. From the Enrichment Manager, open the **Map** menu and click **Import** to open the Import dialog box.
2. Locate the enrichment rule you want to import, select it, and click **Import**. The imported enrichment rule is added to the enrichment rule list in the View Explorer.

Activating an Imported Enrichment Rule

By default, an imported enrichment rule is not active. This section describes how to activate an enrichment rule that has been imported.

To activate an imported enrichment rule:

1. Right-click the rule you want to activate in the View Explorer and select **Properties** to open the Properties dialog box.
2. In the **Enrichment Properties** tab, select **Active**.
3. Click **OK** to save the changes.

Deleting CIs from the CMDB Using Enrichment Rules

The Enrichment Manager enables you to delete CIs from the CMDB by using TQL queries. You create a specific enrichment rule that is designed to delete a CI. You can use this option, for example, for removing unnecessary data from the CMDB, or for automatically deleting copies of, or partial, CIs.

To delete a CI from the CMDB:

1 On the editing pane, right-click the node whose instances you want to delete from the CMDB and select **Delete Node/Relationship**. Deleted CIs are displayed by a deleted indicator.

Note: To cancel the deletion if you have not yet saved the rule, right-click the deleted CI and select **Clear**. If you have saved the rule, you cannot reverse the deletion.

---

2 To save the rule and update the CIs, click **Save** on the toolbar.

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Creating a Sample Enrichment Rule

This chapter describes how to create a sample Enrichment rule and then display the results in the Topology View.

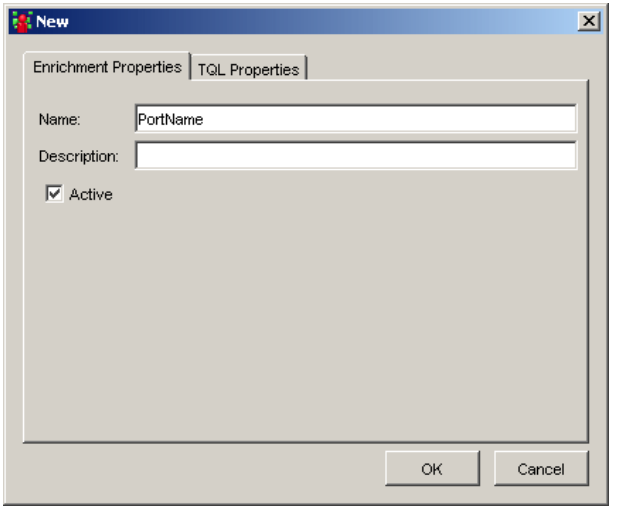
Creating an Enrichment Rule

This chapter leads you step-by-step through the process of creating a sample enrichment rule. The purpose of this exercise is to create an enrichment rule where, for every instance in the CMDB in which a **Port** CI and **Interface Index** CI are connected by a **Join** relationship, the name of the **Port** CI is created\updated from either the interface index name or the interface index description of the **Interface Index** CI.

To create a TQL query:

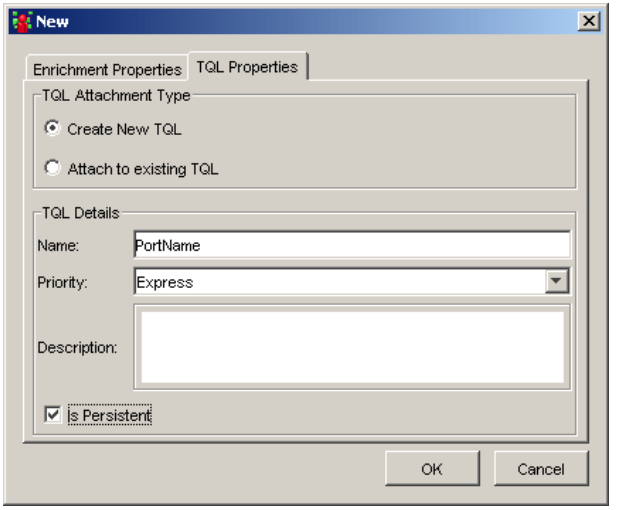
1 In the Enrichment Manager, click the **New** button to open the New dialog box.

2 Click the **Enrichment Properties** tab.



3 In the **Name** box, enter **PortName**.

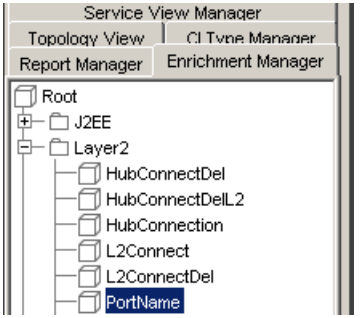
4 Click the **TQL Properties** tab.



5 Select **Create New TQL**.

6 Select **Is Persistent** to ensure that the TQL always remains in the system's memory.

7 Click **OK**. The **PortName** enrichment rule is displayed in the View Explorer.



Adding Nodes to the Port Name Enrichment Rule

This section describes how to add nodes and relationships to the **PortName** enrichment rule.

To add nodes and relationships to the PortName enrichment rule:

1 At the top of the Enrichment Manager window, select **TQL** mode.

2 With the **PortName** enrichment rule selected, click and drag the following TQL nodes to the editing pane from the Configuration Item Type Model on the right:

- **Physical Port**
- **Interface Index**

3 Select the **Physical Port** and **Interface Index** nodes and right-click.

4 Choose **Add Relationship** to open the Add Relationships dialog box.

5 Select the required direction of the relationship.

6 Click **Advanced**.

7 Open the **Relationship** list and select **Function Relationship**.

8 Select **Virtual - Join link**.

9 In the **Join Definition** area, click the **Add an attribute definition** button to open the Conditions dialog box.

10 From the **Physical Port Attribute** list, choose **Port Interface Index**.

11 From the **Operator** list, choose **Equal**.

12 From the **Interface Index Attribute** list, choose **Interface Index**.

13 Click **OK**.

14 Click the **Add an attribute definition** button to open the Conditions dialog box.

15 From the **Physical Port Attribute** list, choose **Container**.

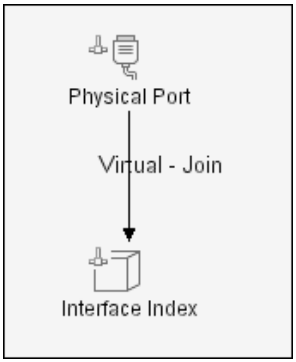
16 From the **Operator** list, choose **Equal**.

17 From the **Interface Index Attribute** list, choose **Container**.

18 Click **OK**.

19 Click **Finish**. The **Physical Port** and **Interface Index** nodes are now connected by a **Virtual - Join** relationship.

The TQL now looks like this:



Note: For details on TQL validation restrictions, see Chapter 8, “Validation Restrictions.”

20 To save the **PortName** TQL, click the **Save** button on the Enrichment Builder toolbar.

Defining the Enrichment Rule

After creating a TQL and creating a relationship between the **Physical Port** and **Interface Index** nodes, you update the **Physical Port** node using an enrichment definition.

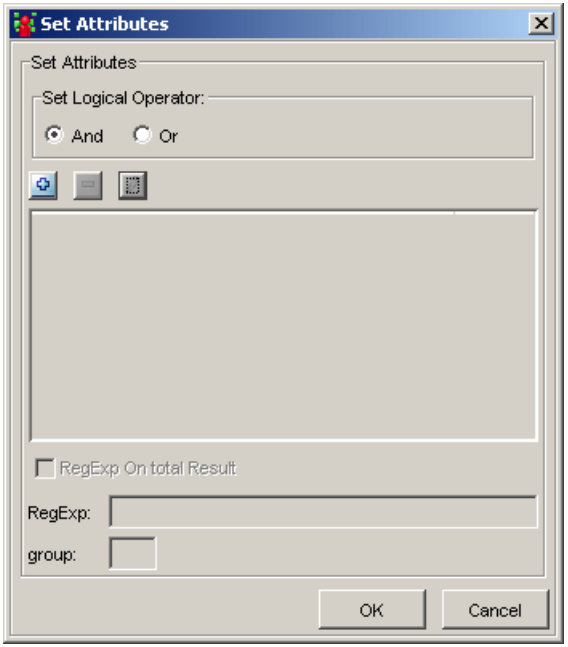
To update the Physical Port node using an enrichment definition:

1 In the View Explorer, select the **Port Name** enrichment rule.

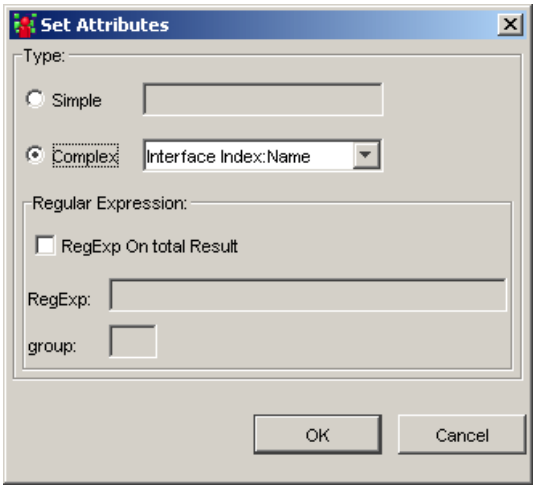
2 At the top of the Enrichment Manager window, select **Enrichment** mode.

3 Right-click the **Port** node and select **Update Relationship/Node Item** to open the Node Definition Dialog box.

4 Select the **Name** attribute and click **Edit** to open this Set Attributes dialog box.



5 Click the **Add Object** button to open the Type dialog box.



6 Select **Complex**.

7 From the **Complex** list, choose **Interface Index Name**.

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

9 Click the **Add Object** button to open the Type dialog box.

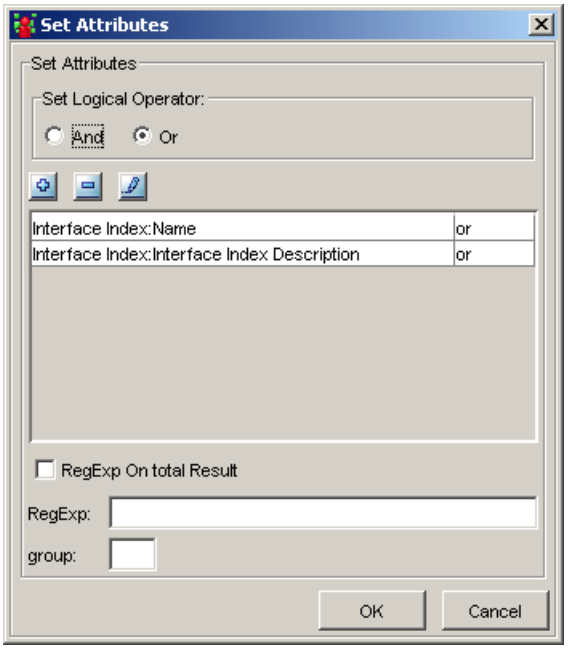
10 Select **Complex**.

11 From the **Complex** list, choose **Interface Index:Interface Index Description**.

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

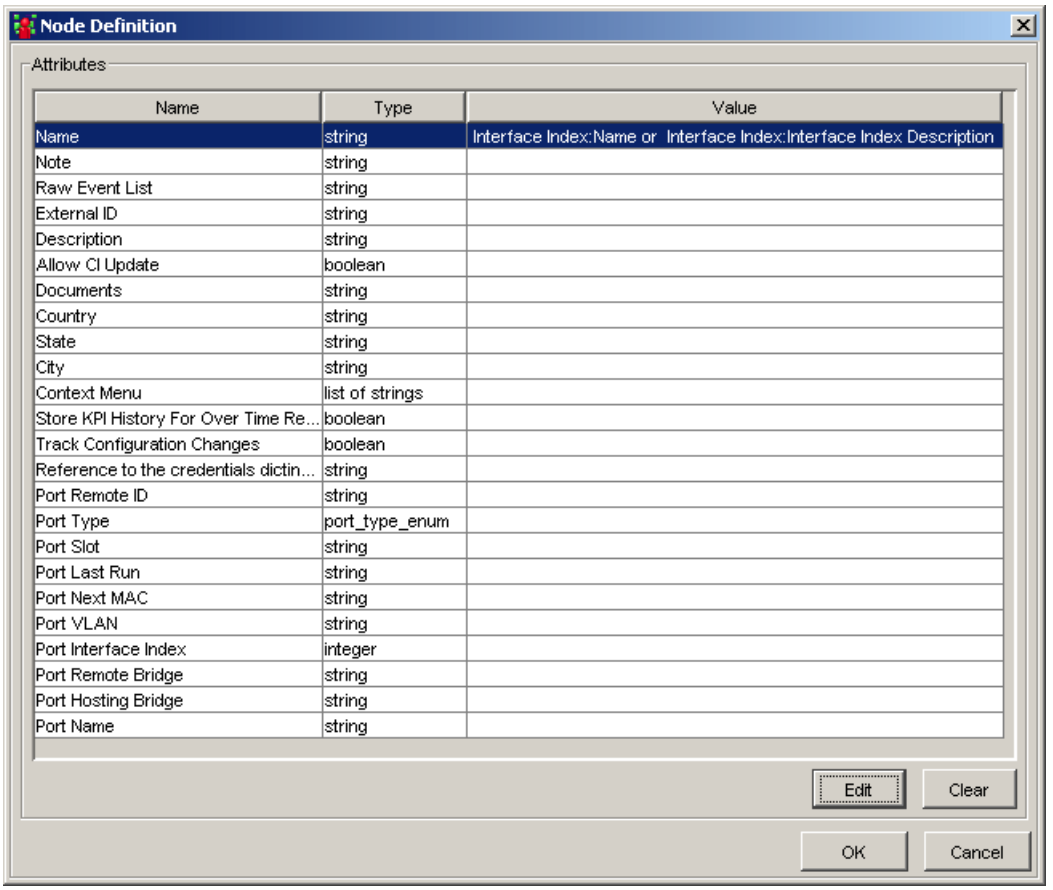
13 In the **Set Logical Operator** area, select **Or**.

The Set Attributes dialog box now looks like this.



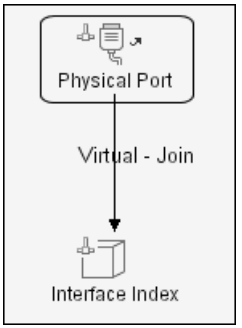
14 Click **OK**. The **Value** field for the **Name** attribute has been updated as follows:

Interface Index: Name or Interface Index:Interface Index Description



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

The **Physical Port** node now has an arrow indicator to indicate that it has been updated with an enrichment definition.



Creating a New View

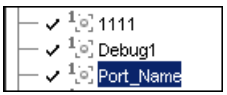
This section describes how to display the enrichment result.

To create a new view:

1. In the Service View Manager, click the **New** button to open the New dialog box.
2. In the Create New View dialog box, enter the following information:
   - In the **View Name** box, enter **Port_Name**.
   - Select **Merge Identical Instances**.
3. Click the **TQL Properties** tab.
4. Select **Create New TQL**.
5. Click **OK** to save your definitions and close the Create New View dialog box. The **Port_Name** view appears in the View Explorer.
6. With the **Port_Name** view selected, click and drag the following TQL nodes on to the editing pane:
   - **Physical Port**
   - **Interface Index**

   These are the TQL nodes that are included in the query.

7. Select the **Physical Port** and **Interface Index** nodes and right-click.
8. Choose **Add Relationship** to open the Add Relationships dialog box.
9. Select the required direction of the relationship.
10. Click **Advanced**.
11. Open the **Relationship** list and select **Function Relationship**.
12. Select **Virtual - Join link**.
13. In the **Join Definition** area, click the **Add an attribute definition** button to open the Conditions dialog box.
14. From the **Physical Port Attribute** list, choose **Port Interface Index**.
15. From the **Operator** list, choose **Equal**.
16. From the **Interface Index Attribute** list, choose **Interface Index**.
17. Click **OK**.
18. Click the **Add an attribute definition** button to open the Conditions dialog box.
19. From the **Physical Port Attribute** list, choose **Container**.
20. From the **Operator** list, choose **Equal**.
21. From the **Interface Index Attribute** list, choose **Container**.
22. Click **OK**.
23. Click **Finish**. The **Physical Port** and **Interface Index** nodes are now connected by a **Virtual - Join** relationship.
24. To save the **Port_Name** view, click the **Save** button on the toolbar.
25. Verify that a check mark is displayed beside the **Port_Name** view in the View Explorer. This indicates that the view is to be displayed in the Topology View. If the check mark is not displayed, right-click the view in the View Explorer and select **Add/Remove to Topology View**.

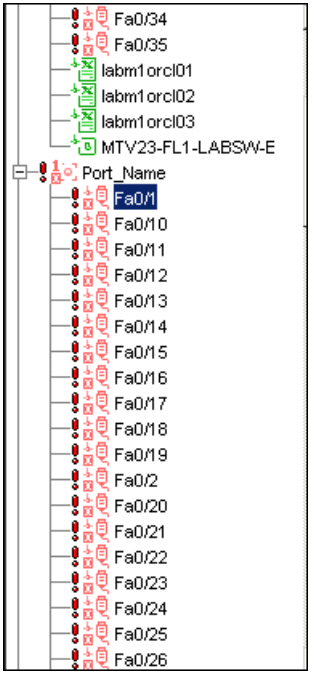


Displaying the Enrichment Results

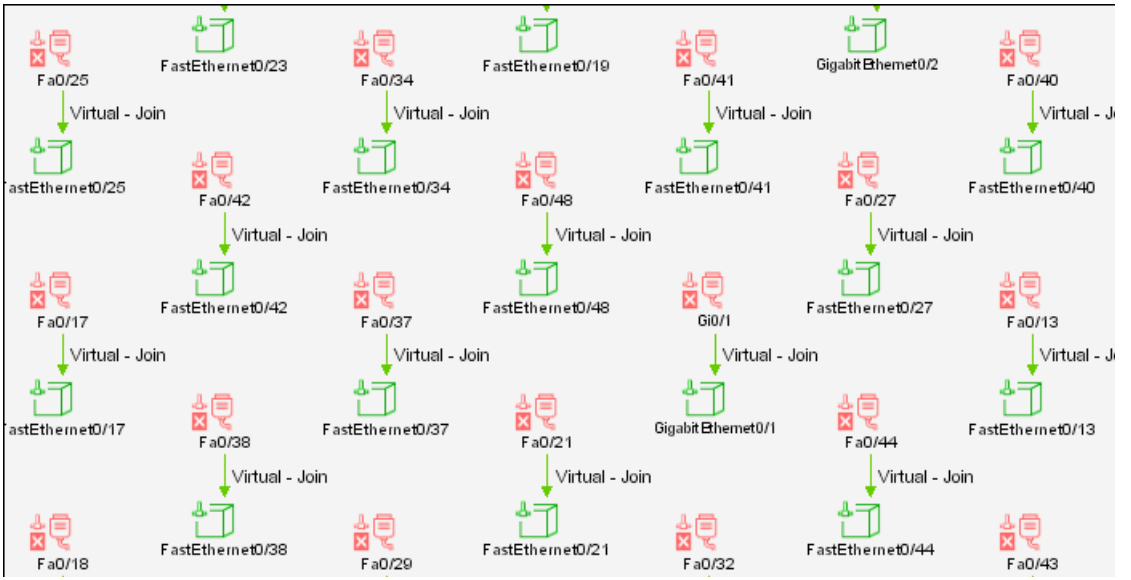
This section describes how to view the results of the enrichment rule you created.

To view the results of the enrichment rule you created:

1. Click the **Topology View** tab.
2. In the View Explorer, select the **Port_Name** view.

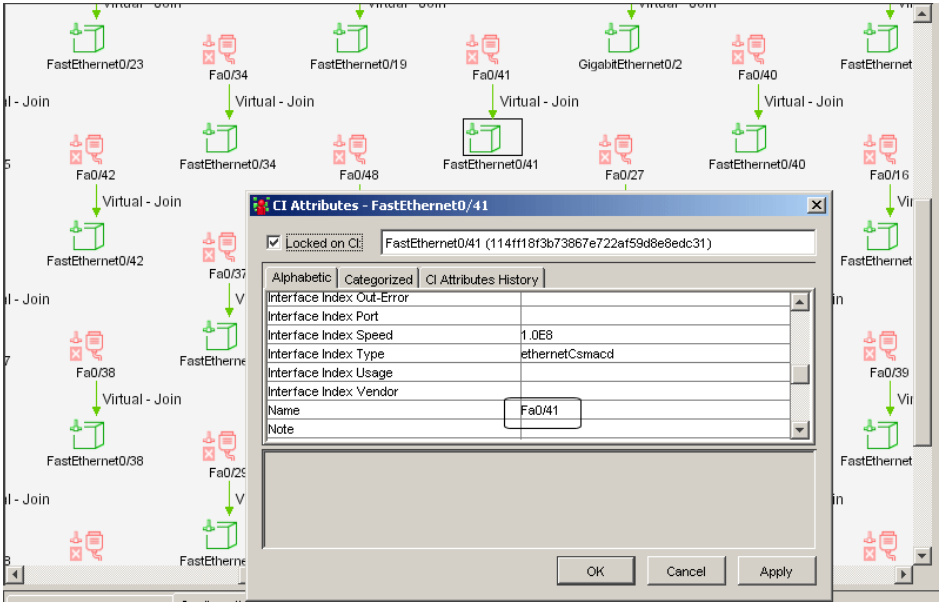


Your view should look similar to the following (depending on your system's structure):



In this case, the name of the **Port** CI, **Fa0/41**, was taken from the **Name** attribute definition of the **Interface Index** CI.

To verify this, right-click the **Interface Index** CI and choose **Show CI Attributes**. The following illustration shows that the **Name** attribute definition is **Fa0/41**.



Part VIII

System Reports

24

Introduction to the Report Manager

This chapter introduces the Report Manager, which enables you to create reports.

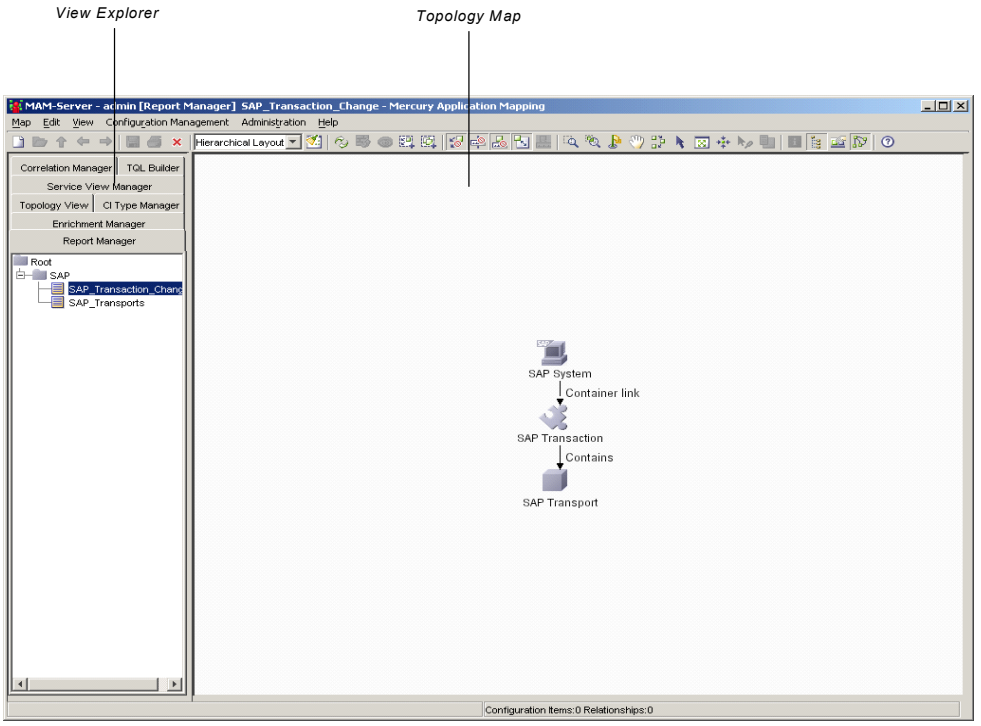
About the Report Manager

The Report Manager is displayed by selecting the Report Manager tab in the View Explorer. It enables you to define system reports about selected Report nodes in the managed world. Each report is based on a specific Report TQL query, which is created especially for it. (If required, you can define multiple reports for each query.) The Report Manager enables you to define exactly what information appears in each report, including the order in which Report nodes are listed and their placement relative to other Report nodes, and how the information within each Report node is sorted.

System reports can be displayed in three formats:

- HTML
- Table
- Excel

They can either be viewed immediately or saved for later use.



When the Report Manager tab is selected, the Mercury Application Mapping main window is divided as follows:

- **View Explorer.** Displays a hierarchical tree structure of the reports you have defined, each of which can be used only with the query to which it is attached. If required, you can export reports and save them as XML scripts, which can be used for backup purposes.
- **Topology Map.** Displays the currently selected report, which consists of Report nodes and the relationships between them. The displayed scenario is defined as a Report TQL query in the Report Manager.

Report Manager Shortcut Menus

The Report Manager contains different shortcut menus, depending on your selection.

This section includes the following topics:

Report Shortcut Menu

The following table contains a brief description of each option in the shortcut menu displayed by right-clicking a selected report in the View Explorer:

Option	Description
New	Enables you to define a new System Report.
New Folder	Enables you to create a new report folder.
Save	Enables you to save the report to the database. (Enabled only when a report is created or when changes are made to an existing one.)
Save As	Displays the Save As dialog box, enabling you to define a new name and description for the report (used for creating a new report based on an existing one).
Delete	Enables you to delete the selected report from the database.
Generate	Enables you to generate the report, and display it or save it for future use.

Option	Description
Export	Displays a standard Save As dialog box, enabling you to save the report as an XML script. This option can be used to move selected reports from one workstation to another, provided the related TQL query is also relocated.
Properties	Enables you to change the properties of the report (apart from the report name and the Report TQL query to which it is attached).

Report Node Shortcut Menu

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking a Report node in the topology map:

Option	Description
Report Node Definition	Displays the Report Node Definition dialog box, enabling you to determine the content of the report. For details, see "Defining the Report's Columns" on page 342.
Clear Node Definition	Erases the report definition for the selected Report node.
Node Order	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 "Setting the Node Order" on page 349.

Relationship Shortcut Menu

The following table provides a brief description of each option in the shortcut menu displayed by right-clicking a relationship in the topology map:

Option	Description
Sibling	Defines one Report node as a sibling of the Report node to which it is linked. In the report, the two Report nodes appear aligned under one another.
Child	Defines one Report node as a child of the Report node to which it is linked. In the report, the child Report nodes are displayed one after another beneath (and indented from) the parent Report node.
None	Does not define any rules for this relationship. In the system report, the Report nodes appear in different tables.
SonGrid	Groups all the leaf instances in a table under their parent's node. **Note:** This option applies to leaf nodes only.
Node Order	Displays the Set Node Order dialog box, enabling you to determine the order in which Report node information is displayed in the report. For details, see "Setting the Node Order" on page 349.

Working with the Report Manager

Use the Report Manager to perform the following functions:

- Create new reports, as well as duplicate and delete existing reports
- Define the information to be included in the report, including which Report nodes should appear in the report, the parameter reported for each Report node and the function to be performed on the information
- Define the sort order of the information reported for each Report node
- Determine the order of Report nodes in the report

- Define which Report nodes appear as children beneath parent Report nodes
- Export and import selected views to and from XML scripts. This can be used to relocate reports from one workstation to another. (This can be performed providing the related Report TQL query is also relocated.)
- Zoom in and out of the topology map area to view the selected layer at different levels of magnification
- Select different layout views

25

Creating System Report Templates

This chapter explains how to create system report templates.

About Creating System Report Templates

When creating a System Report template, the first step is to name the report and attach it to a specific report TQL query. You then proceed to define layout and information options for each of the nodes to be included in the report. This includes defining which parameter(s) are included for each node and the function (such as **sum** or **max**) that is performed on them.

You must also define how the information should be sorted and the order and placement of each node in the report. When the report is complete, you select the format in which it is to be displayed and saved, and can either view it right away or save it for later viewing.

Report Manager Workflow

Reports are created according to the following workflow:

- Define a report (for details, see "Creating a Report" on page 341).
- Define the report nodes (for details, see "Defining the Report's Columns" on page 342).
- Set the node order (for details, see "Setting the Node Order" on page 349).
- Refine the report layout (for details, see "Refining the Report Layout" on page 349).
- Save the report template (for details, see "Saving the System Report Template" on page 350).
- View and save the generated report (for details, see "Displaying the Generated Report" on page 351).

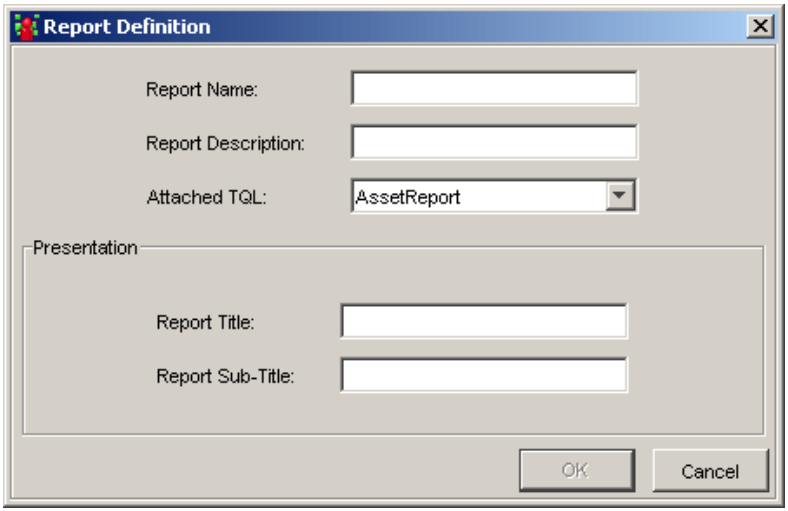
Creating a Report

To create a report, you name the report and attach it to a specific Report TQL. You also define presentation options, such as the report title and subtitle.

To define a report:

1 Select the Report Manager tab in the View Explorer pane.

2 Click the **New** button on the toolbar or open the **Map** menu and click **New** to open the Report Definition dialog box.



3 In the **Report Name** box, enter a unique name for the report. This name later appears in the System Report list and helps you identify the report.

Note: The report name must not contain any spaces.

---

4 In the **Report Description** box, enter a description of the report.

5 From the **Attached TQL** list, select the Report TQL on which you want to base the report.

6 In the **Presentation** area, define report presentation options as follows:

- ➤ In the **Report Title** box, enter the title of the report. This title appears at the head of the report.
- ➤ In the **Report Sub-Title** box, enter the subtitle of the report. This title appears underneath the title at the head of the report.

7 Click **OK**. The new report is displayed in the View Explorer and in the Topology Map panes.

Defining the Report's Columns

The next step in the procedure is to define the nodes that are included in the report, that is, the report's columns. This includes determining:

- ➤ The information to be displayed for each node (attributes and functions)
- ➤ The node label (that is, the column title)
- ➤ The order of the information displayed for each node

After completing the report definition for one node, repeat the entire process for the other nodes that are to be included in the report.

Only defined nodes are included in the final report. However, other nodes are included in the report calculations, since they are part of the TQL that the report reflects, and they can influence the data that is displayed in it. For example, in a Report TQL, which consists of a linked Host and IP, the IP has an attribute condition that states that only IPs that are in a critical state are included in the query results. Consequently, the report includes only hosts that are connected to IPs in a critical state, even if the IPs themselves are not included in the report.

This section contains the following topics:

- ➤ "Defining the Report's Nodes"
- ➤ "Editing an Attribute in the Report"
- ➤ "Deleting a Node's definition"

Defining the Report's Nodes

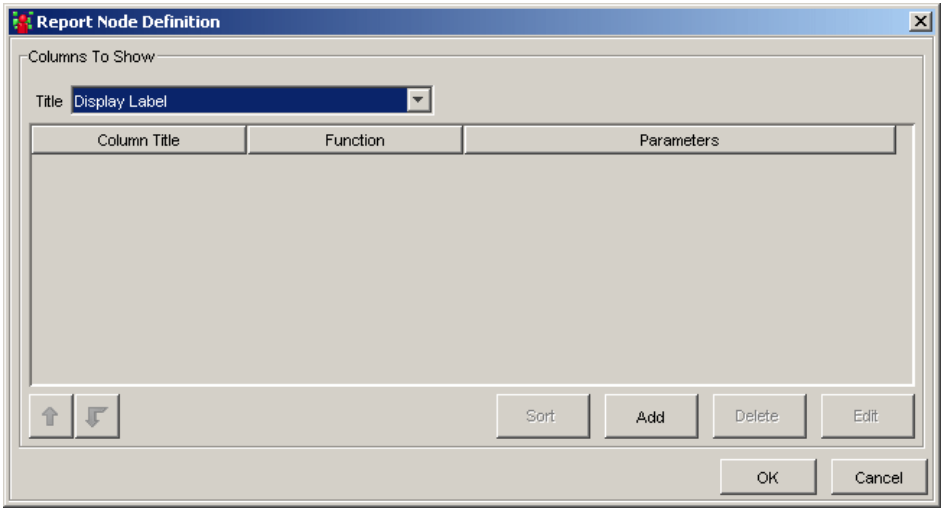
This section describes how to define the Report nodes to be included in the report.

To define the report nodes:

Note: The nodes to be included in the reports must be connected to each other through the TQL scenario. You cannot define nodes that are not linked to at least one other node that is included in the report.

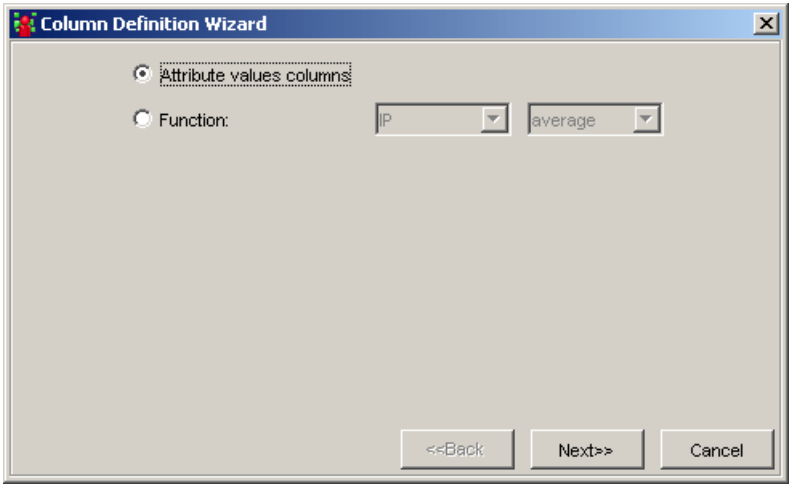
---

1 Right-click a Report node in the scenario displayed in the topology map, and select **Report Node Definition** to open the Report Node Definition dialog box.

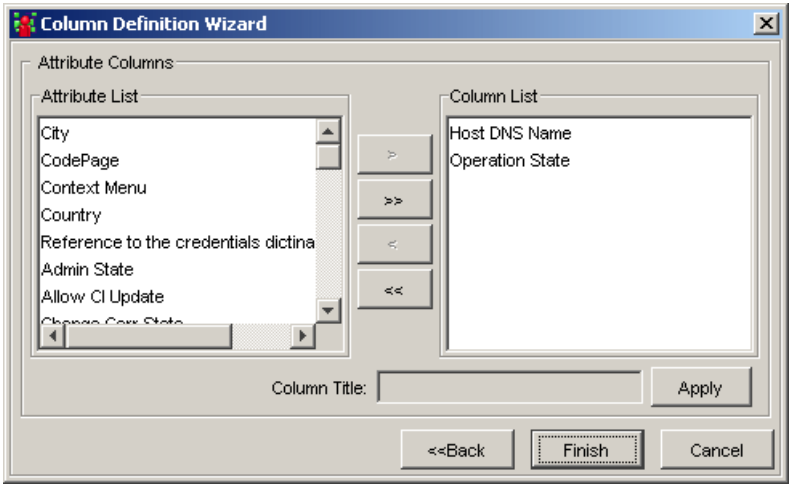


2 From the **Title** list, select the appropriate title.

3 Click the **Add** button to display the Column Definition wizard. The Column Definition wizard allows you to define the node's columns that consist of the node attributes and functions.



4 Select **Attribute values columns** and click **Next**. The Attribute Columns page opens.



5 To add a column to the report relating to the selected node:

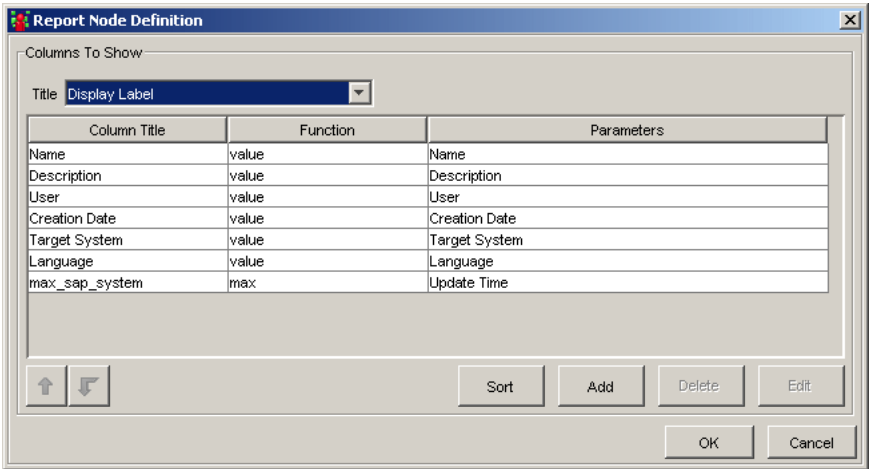
- In the **Attribute List** area, select an attribute and click the single left-to-right arrow. The selected attribute moves to the **Column List** area.
- To remove an attribute from the **Column List** area, select it and click the single right-to-left arrow.
- To include all attributes of the node in the report, click the double left-to-right arrow.
- To remove all attributes from the **Column List** area, click the double right-to-left arrow.
- By default, column titles take the same name as the selected attribute. To change the title, select the attribute in the **Column List** area, change the title in the **Column Title** box, and click **Apply**.
- Add additional attributes, if required.
- Click **Finish** to return to the Report Node Definition dialog box.

6 To define the function you want to perform on the Report node, do the following:

- In the Report Node Definition dialog box (see step 1), click the **Add** button to display the Column Definition Wizard.
- Select **Function**.
- From the **Report Node** list, select the required node.
- From the **Function** list, select the function you want to use to calculate the results on these columns. Following are the available options:
  - **average**. The average value of all the attributes of the connected nodes.
  - **count**. Calculate the number of node instances connected to the selected node.
  - **max**. The maximum value of all the attributes of the connected nodes.
  - **min**. The minimum value of all the attributes of the connected nodes.
  - **sum**. The sum of all the attributes of the connected nodes.

7 If the selected function requires additional definitions, click **Next** and define the necessary parameters.

8 Click **Finish** to close the Column Definition Wizard. The new column definitions are displayed in the Column Title of the Report Node Definition dialog box, as shown in the following figure:



Each row in the table represents a column that appears in the report.

9 Repeat steps 3 to 6 to add additional column definitions.

Note:

- You can change the order of the columns (for details, see "Setting the Node Order" on page 349).
- You can sort the information in the columns (for details, see "Sorting Column Information" on page 348).

---

10 Click **OK** to close the Report Node Definition dialog box.

11 Repeat this procedure for the other nodes in the Report TQL scenario that are to be included in the report.

Editing an Attribute in the Report

This section describes how to edit an attribute that was defined in the report.

To edit an attribute in the report:

1. Right-click a node in the scenario displayed in the topology map, and select **Report Node Definition** to open the Report Node Definition dialog box.
2. To edit an attribute, select the row and click **Edit**.
3. Edit the attribute as required. For details, see "Defining the Report's Columns" on page 342.
4. Click **OK**.

Deleting a Node's definition

This section describes how to delete a report node's definition.

To clear a node's definition:

1. Right-click a node in the scenario displayed in the topology map, and select **Report Node Definition** to open the Report Node Definition dialog box.
2. Select the row you want to delete and click **Delete**.
3. Click **OK**.

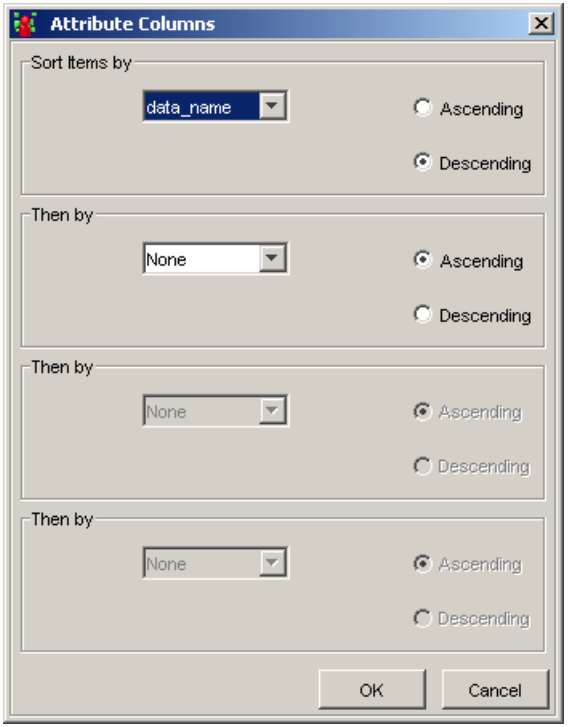
Sorting Column Information

You can sort the column information in the system report.

To sort a column information:

1 Right-click a node in the scenario displayed in the Topology map, and select **Report Node Definition** to open the Report Node Definition dialog box.

2 Select the appropriate column and click **Sort** to open the Sort dialog box.



3 Sort the column information, as follows:

- From the **Sort Items by** list, select the primary sort column, and choose whether the information is to be sorted in ascending or descending order.
- Define up to three secondary sort columns from the **Then by** lists. For each secondary sort, select **Ascending** or **Descending** to sort the information in ascending or descending order.

➤ Click **OK** to close the Sort dialog box and to re-display the Report Node Definition dialog box.

Setting the Node Order

After defining each of the nodes to include in the report, you can determine the order in which the nodes appear.

To set the node order:

1 Right-click any node displayed in the topology map and select **Node Order** to open the Set Node Order dialog box.

The Set Node Order dialog box displays a row for each node that is included in the report.

2 Use the up and down arrows to determine the order of each node included in the report.

3 Click **OK**.

Refining the Report Layout

You can choose to display nodes dependent on other nodes either aligned underneath or indented underneath the parent node. Displaying nodes indented beneath one another enables you to better distinguish between parent nodes and their dependents.

For example:

➤ In the figure below, The child node (Host) is displayed aligned underneath the parent node (Network):

10.168.8.0(Network)				
Network Class	C	Network Address	10.168.8.0	Operation State
Network Domain Name	DefaultProbe	count_host	45	
card.mercury.co.il(Windows)				
Host DNS Name	card.mercury.co.il	Operation State	Critical	count_ip

➤ In this figure, The child node (Host) is displayed indented underneath the parent node (Network):

10.168.8.0(Network)			
Network Domain Name	DefaultProbe	Network Class	C
Operation State	Normal	count_host	45
card.mercury.co.il(Windows)			
Host DNS Name	card.mercury.co.il	Operation State	Critical

To refine the report layout:

On the topology map of the Report Manager, right-click each relationship in a TQL scenario and select one of the following layout options:

- Select **Sibling** to display the child node columns next to the parent nodes in the report.
- Select **Child** to display the child node columns indented beneath the parent nodes in the report.
- Select **None** to display the child and parent nodes in different tables.
- Select **Songrid** to display all the leaf instances in a table under their parent's node.

Saving the System Report Template

After you have defined the System Report template, you must save it to the database. If you exit the Report Manager without saving, a confirmation message is displayed, requesting that you save your report.

To save the system report template rule:

Display the report to be saved in the topology map, and click **Save** on the toolbar or select a different report or tab in the View Explorer. A message is displayed, asking if you want to save the changes.

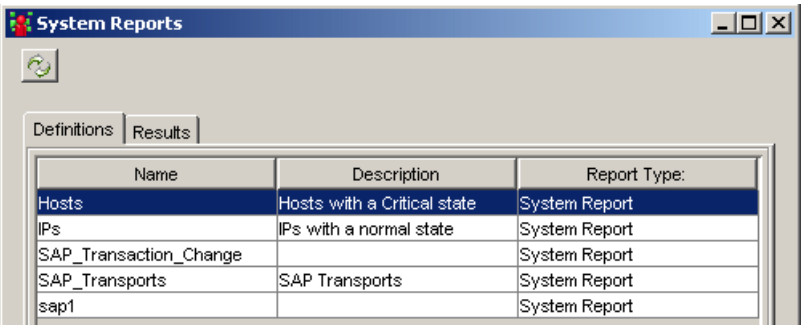
The System Report template you have created is saved to the CMDB.

Displaying the Generated Report

You can display a report in several formats: HTML, table, and Microsoft Excel. In addition, after you generate the report in HTML format, you can save it in either Excel or PDF format. By saving the report this way, you can view it at a later time, send it to other interested parties and display it independently, without the need to open and use Mercury Application Mapping.

To view and save the report:

1 From the **Configuration Management** menu, select **System Reports** to open the System Reports window.



2 Click the **Definitions** tab.

Note: For information on the Results tab, see "Displaying Scheduled Reports" on page 355.

The Definitions tab displays the Gold Master and System reports that were defined in Mercury Application Mapping. For information on Gold Master reports, see "Gold Master Comparison" on page 423.

The Definitions tab contains the following fields:

- **Name**. The name of the report as defined in the Report Definition dialog box. For details, see "Creating a Report" on page 341.
- **Description**. The report description as defined in the Report Definition dialog box. For details, see "Creating a Report" on page 341.
- **Report Type**. The report type. The possibilities are either **Gold Master Report** or **System Report**.

3 Click the **Refresh** button to update the information in the System Reports window.

4 Double-click the report you want to display, or, in the Report Manager, select the required report and click the **Generate** option. The Type dialog box opens.

5 Select the format in which you want to display and save the report:

- **Html**. Enables you to display the report in your browser. open bug:
- **Table**. Enables you to display the report in a table format.
- **Excel**. Enables you to display the report in Excel, and to use Excel functionalities to manipulate the report data. You can save the report in all the formats that are available in Excel.

Note: For the CSV formatted report to display correctly in the Excel file, 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.

---

6 Click **OK** if you are generating the report from **Configuration Management > System Report**.

7 The message: The requested report is being calculated. You will be notified when it is done is displayed. Click **OK**. The report is displayed in the defined format.

- ➤ If you selected an **HTML** or **Table** format for your report, the report is displayed.
- ➤ If you selected the **Excel** format, the File Download dialog box is displayed.

8 Click **Open** to display the report.

10.168.8.0(Network)					
Network Domain Name	DefaultProbe	Network Class	C	Network Address	10.168.8.0
Operation State	Normal	count_host	45		
card.mercury.co.il(Windows)					
Host DNS Name	card.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.61(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:32:48:172	Created By	ICMP_NET_Dis_IpC
labm1na01.mercury.co.il(Net Device)					
Host DNS Name	labm1na01.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.118(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:32:54:125	Created By	ICMP_NET_Dis_IpC
ibmxs335.mercury.co.il(Windows)					
Host DNS Name	ibmxs335.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.150(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:41:18:297	Created By	ICMP_NET_Dis_IpC
QCLAB(Windows)					
Host DNS Name		Operation State	Critical	count_ip	1
10.168.8.209(IP)					

9 To save the report to a disk:

- ➤ Select **Save** in the File Download dialog box, and click **OK** to open a Save as dialog box.
- ➤ Enter a unique name for the report and save it in the required location.
- ➤ Click **Save**.

Using System Reports

This section describes how to use System Reports.

To work with System reports:

1 To determine the number of rows that appear in a table do the following:

➤ In the **Page size** box, enter the maximum number of rows you want to appear in each table of the report.

➤ Click **Set**.

2 To view other pages, use the left and right arrows. The number between the left and right arrows indicate which pages are currently being displayed. For example, 1 - 2 of 3 means that the 1st and 2nd pages out of 3 are being displayed.

3 To go to a different page, do the following.

➤ In the **Go to page** box, enter the required page number.

➤ Click **Set.**

4 To view the report in Excel format, click the **Export to Excel** button in the top-right corner of the report.

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.

5 (Applies to reports generated in **Table** and **HTML** format) To print the contents of the report, click the **Printer Friendly** button in the top-left corner of the report.

6 (Applies only to reports generated in **HTML** format) To convert the report to PDF format, click the **Export to PDF** button in the top-right corner of the report.

Displaying Scheduled Reports

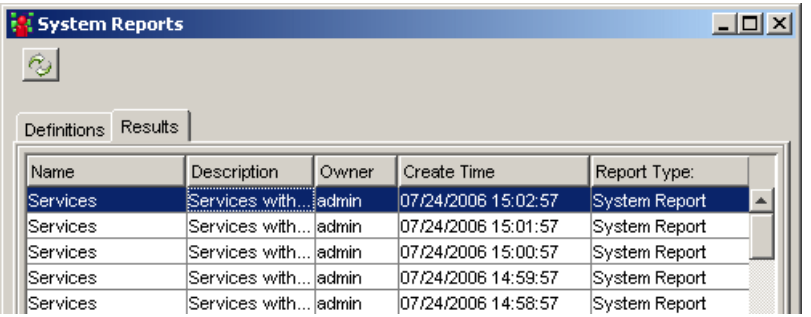
Mercury Application Mapping allows you to view the results of **Gold Master** or **System** reports that are scheduled to run on a periodic basis in the Scheduled Actions Manager using the **Generate and Save a System Report** action. The reports that are generated are saved to the CMDB and can be generated when required.

For details on using the Scheduled Actions Manager, see "Task Scheduling" in the *Mercury Application Mapping Administration Guide*.

To display scheduled reports:

1 From the **Configuration Management** menu, select **System Reports** to open the System Reports window.

2 Click the **Results** tab.



The Report Results pane contains the following fields:

- **Name**. The name of the report.
- **Description**. A description of the report.
- **Owner**. The name of the user who created the report.
- **Create Time**. The creation date of the scheduled report.

➤ **Report Type**. The report type. The options are either **Gold Master Report** or **System Report**.

3 To update the results in the System Reports window, click the **Refresh** button.

4 To generate a report, select the required report and click **Generate**. For more details on how to generate the report, see "Displaying the Generated Report" on page 351.

Importing a System Report

You can import XML files that contain saved system reports to your Report Manager. Use this option to relocate system reports from one workstation to another.

To import a system report:

1 Verify that TQL query attached to a system report appears in the **Attached TQL** list in the New dialog box. If the attached query does not exist in your query list, importing fails.

2 From the Report Manager, open the **Map** menu and click **Import** to open the Import dialog box (for details, see "Importing a TQL Query" on page 82).

3 Locate the report you want to import. Select it and click **Import.** The imported report is added to the system report list in the View Explorer.

26

Creating a Sample System Report

This chapter explains how to create a sample system report.

About Creating a Sample System Report

This section leads you step-by-step through the process of creating a sample System report. The purpose of this sample report is to display Hosts whose severity is critical.

Creating the Report TQL Query

You first create the report TQL query.

To create the report TQL query:

1. In the TQL Builder, click the **Map** > **New** buttons to open the Create New TQL dialog box.
2. In the **TQL Name** box, type Hosts.
3. From the **Type** list, select **Report**.
4. In the **Description** box, enter Malfunctioning Hosts.
5. Select **Persistent** to define whether the report should always remain in the system memory. You should only use this option for reports that are used frequently.

Note: Reports that are not persistent are recalculated by the system only when they are selected for display. This may take some time, depending on the size of the view.

---

6. Click **OK**. The Hosts TQL is displayed in the View Explorer.
7. With the Hosts TQL selected, from the Configuration Item Type Model pane, click and drag the following Report nodes to the topology map area:
   - **Network**
   - **Host**
   - **IP**

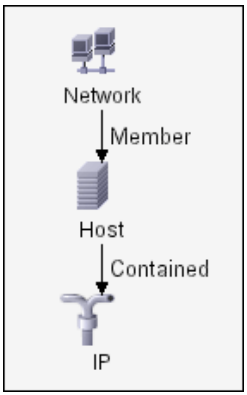
Note: To find each node in the Configuration Item Type Model pane, press the key of the letter that the node begins with until it selects the required node.

---

8 Create a relationship between the **Network** and **Host** Report nodes and between the **Host** and **IP** Report nodes as follows:

- ➤ Select the **Network** and **Host** Report nodes and right-click them.
- ➤ Select **Add Relationship** to open the Add Relationship dialog box.
- ➤ Click **Advanced**.
- ➤ Expand the IT World Links hierarchy and select the **Member** relationship.
- ➤ Click **OK**.
- ➤ Repeat this process to define a **Contained** relationship between the **Host** and **IP** Report nodes.

The Report TQL now looks like this:

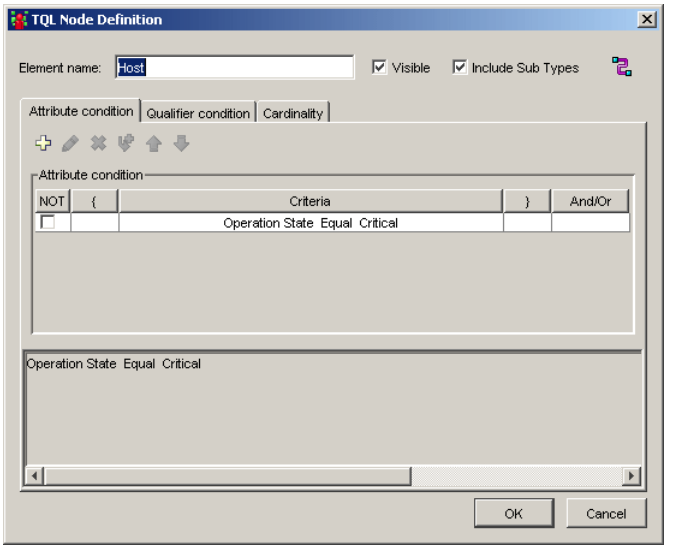


9 The next step is to define the Report TQL to retrieve only Hosts that are indicated as malfunctioning. This is done by defining the attribute condition of the Hosts Report node to retrieve only Hosts that are in a critical state. Set this definition as follows:

- ➤ In the topology map, right-click the **Host** Report node and select **TQL Node Definition** to open the TQL Node Definition dialog box.
- ➤ Click the **Add an attribute condition** button to open the Condition dialog box.
- ➤ From the **Attribute Name** list, select **Operation State**.
- ➤ From the **Operation** list, select **Equal**.

➤ In the **Value comparison** area, select **Critical**.

➤ Click **OK**. The TQL Node Definition dialog box appears as shown in the following figure:



➤ Click **OK**. When **Operation State** equals Critical, all Hosts that have a Critical state are displayed in the report query results.

10 To save the Hosts TQL, click the **Save** button on the TQL Builder toolbar.

Creating the Report

After defining the query for your report, the next step is to create a report with the Report Manager to display the query results.

To create the report:

1 Click the Report Manager tab.

2 From the Report Manager, click the **Map** > **New** button on the toolbar to open the Report Definition dialog box.

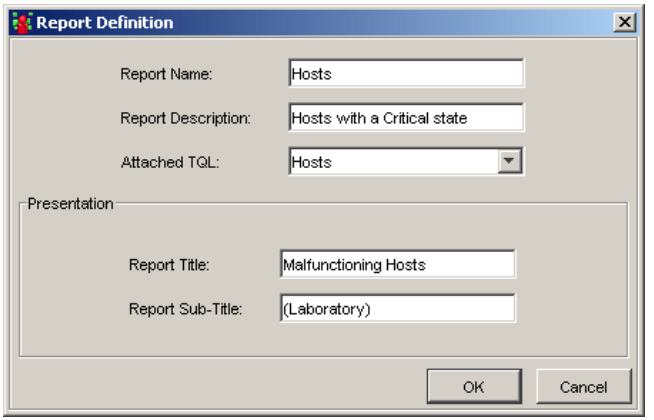
3 In the **Report Name** box, enter Hosts to define the name of the report in the **System Report** list.

4 In the **Report Description** box, enter Hosts with a Critical state.

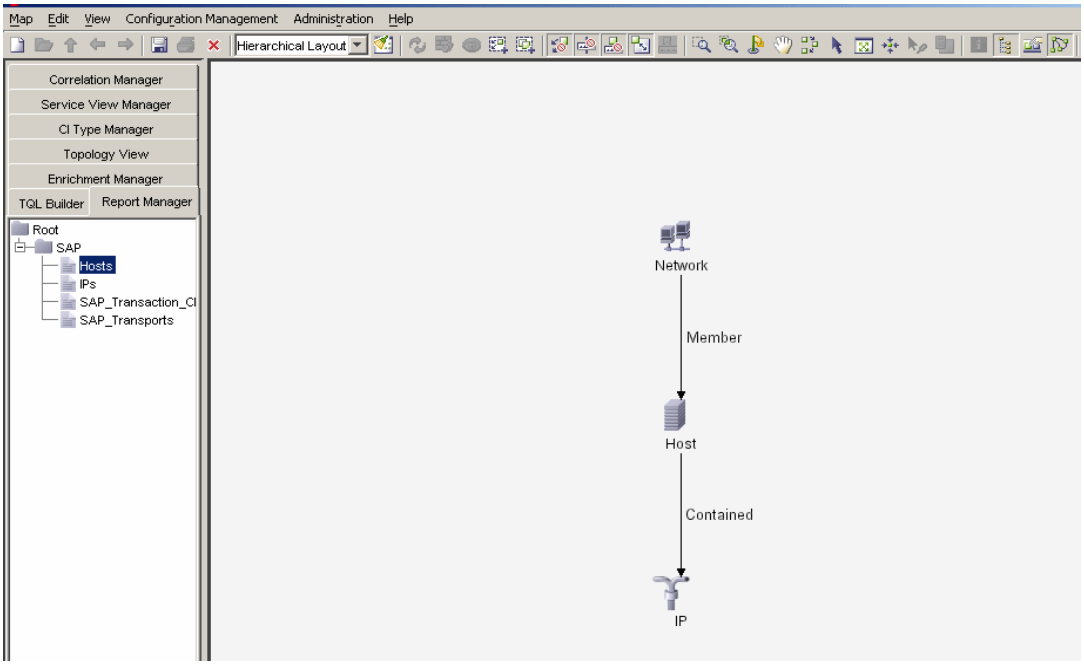
5 From the **Attached TQL** list, select **Hosts**.

6 In the **Report Title** box, enter **Malfunctioning Services**. This title is displayed at the head of the report.

7 In the **Report Sub-Title** box, enter **(Laboratory)**. This subtitle is displayed at the head of the report underneath the title. The dialog box now displays as follows:



8 Click **OK**. The new report is displayed in the View Explorer and in the topology map, as shown in the following figure:



Defining the Report Nodes

After creating the report, the next step is to define the Report nodes that are to be included in the report, that is, the report's columns. This includes determining which information is to be displayed for each Report node (attribute and function), and the Report node label (that is, the column title).

To define the report nodes:

Beginning with the **Network** Report node, select each of the Report nodes in the scenario displayed in the topology map.

1. With the **Network** Report node selected, right-click and select **Report Node Definition** to open the Report Node Definition dialog box.
2. Click the **Add** button to display the Column Definition Wizard.

   Define the content of the selected Report node's columns. You can also enter new titles for the columns. By default, column titles take the same name as the selected attributes or functions, but you can change them.
3. Select **Attribute value columns** and then click **Next**.
4. In the **Attribute List** area, select the following attributes for the **Network** Report node:

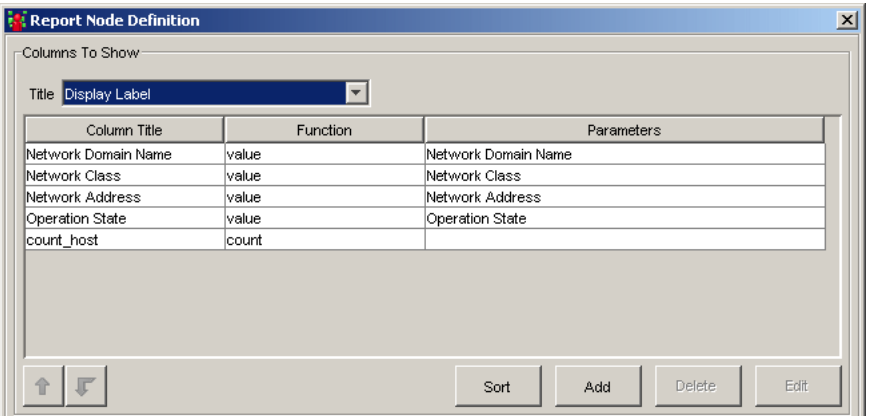
   - **Network Domain Name**
   - **Network Class**
   - **Network Address**
   - **Operation State**

5. Click the single left-to-right arrow button to move them to the **Column List** area.
6. If you wish to change the title of any attribute in the **Column List** area, click on that attribute and then enter a new title in the **Column Title** box. Click **Apply**.
7. Click **Finish**. You return to the first page of the Column Definition Wizard.
8. To display the number of Hosts that are attached to the Network node, do the following:
   - Click **Add** to open the Column Definition Wizard again (see step 2).
   - Select **Function**. There are two lists to the right of the **Function** option.
   - From the **Report Node** list, select **Host**.
   - From the **Function** list, select **count**.
   - Click **Next** to open the Column Title page.

➤ In the **Column Title** box, edit the column title if required.

➤ Click **OK** to save your changes.

The Report Node Definition dialog box of the network Report node now displays as follows:



Each row in the table represents a column that appears in the report.

9 To change the order of the network's columns, use the up and down arrows.

10 Click **OK** to save your changes and close the Report Node Definition dialog box.

11 Repeat steps 1 to 7 to add column definitions for the **Host** Report node (see step 2).

➤ Select the following attributes:

➤ **Host DNS Name**

➤ **Operation State**

12 Repeat step 8 to display the number of IPs that are attached to the Host node.

➤ From the **Report Node** list, select **IP**.

➤ From the **Function** list, choose **count**.

13 Repeat steps 1 to 7 to add column definitions for the **IP** Report node (see step 2).

- Select the following attributes:
  - **IP Network Address**
  - **Created By**
  - **Last Access Time**

Sorting the Report Node Data

You must now determine the order of the information displayed for each Report node, and the method by which the data is sorted in each column.

To sort the Report node data:

Perform the following steps for each Report node displayed in the topology map.

1 Right-click the appropriate Report node and select **Report Node Definition** to open the Report Node Definition dialog box.

2 Click the **Sort** button to open the Attribute Columns dialog box.

3 Sort the column information as follows:

Node	Sort Items by	Then by	Order of Direction
Network	Network Class		Descending
		Network Address	Descending
		Operation State	Descending
		Network Domain Name	Descending
Host	Host DNS Name		Descending
		Operation State	Descending
IP	IP Network Address		Descending

Node	Sort Items by	Then by	Order of Direction
		Created By	Descending
		Last Access Time	Descending

4 Click **OK** to close the Attribute Columns dialog box and to re-display the Report Node Definition dialog box.

5 Click **OK** to close the Report Node Definition dialog box.

Setting the Report Node Order

You must now determine the order in which the Report nodes appear in the report. For this sample report, the **Network** Report node is the parent Report node, so it should appear at the beginning of the report. The data of the **Host** Report node is displayed next followed by the events related to the **IP** Report node.

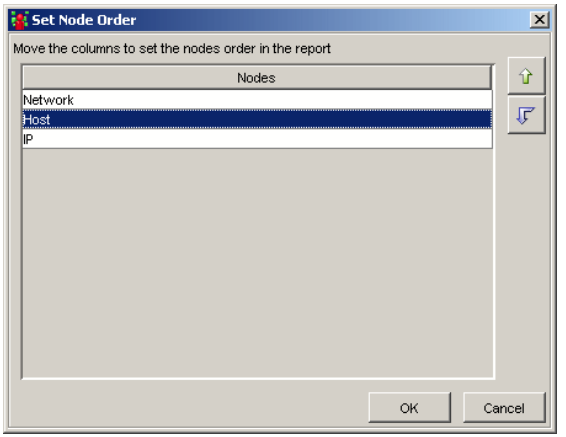
To set the Report node order:

1 Right-click any Report node displayed in the topology map and select **Node Order** to open the Set Node Order dialog box.

The Set Node Order dialog box displays a row for each Report node that is included in the report.

2 Use the up and down arrows to move the **Network** Report node to the beginning of the list and the **IP** Report node to the bottom.

The Set Node Order dialog box now displays as follows:



3 Click **OK**.

Refining and Saving the Report Layout

For better visual identification of the parent and dependent nodes, we can define the report layout to display the node data indented underneath one another. In this sample report, the report layout is defined as follows:

- The **Host** Report node is defined as the child of the **Network** Report node
- The **IP** Report node is defined as the child of the **Host** Report node

To refine and save the report layout:

1 In the topology map, right-click the relationship in between the **Network** and the **Host** Report nodes and select **Child** to display the **Host** Report node columns indented beneath the **Network** Report node in the report.

2 Right-click the relationship between the **Host** and **IP** Report nodes and select **Child** to display the **IP** Report node columns indented beneath the **Host** Report node in the report.

3 To save all the report definitions, click the **Save** button.

Viewing the System Report in HTML Format

You can view the report you created in HTML format.

To view the report:

1. From the **Configuration Management** menu, select **System Reports** to open the System Reports dialog box.
2. From the list of reports, double-click the Hosts report that you created. The Type dialog box is displayed.
3. Select **HTML** to display and view the report in your browser.
4. Click **OK**. The report is displayed:

System Report for: Hosts

Malfunctioning Hosts

(Laboratory)

Go to page: 1 Set Page size: 30 Set

10.168.8.0(Network)					
Network Domain Name	DefaultProbe	Network Class	C	Network Address	10.1
Operation State	Normal	count_host	45		
card.mercury.co.il(Windows)					
Host DNS Name	card.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.61(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:32:48:172	Created By	ICMP
labm1na01.mercury.co.il(Net Device)					
Host DNS Name	labm1na01.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.118(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:32:54:125	Created By	ICMP
ibmxs335.mercury.co.il(Windows)					
Host DNS Name	ibmxs335.mercury.co.il	Operation State	Critical	count_ip	1
10.168.8.150(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:41:18:297	Created By	ICMP
QCLAB(Windows)					
Host DNS Name		Operation State	Critical	count_ip	1
10.168.8.209(IP)					
IP Network Address	10.168.8.0	Last Access Time	2006.07.23 10:41:19:797	Created By	ICMP

As defined in the report layout, **Host** nodes are indented underneath Network nodes and **IP** nodes are indented underneath Host nodes. The columns that appear in the report are the columns defined in “Defining the Report Nodes” on page 362.

Part IX

The CI Type Manager

27

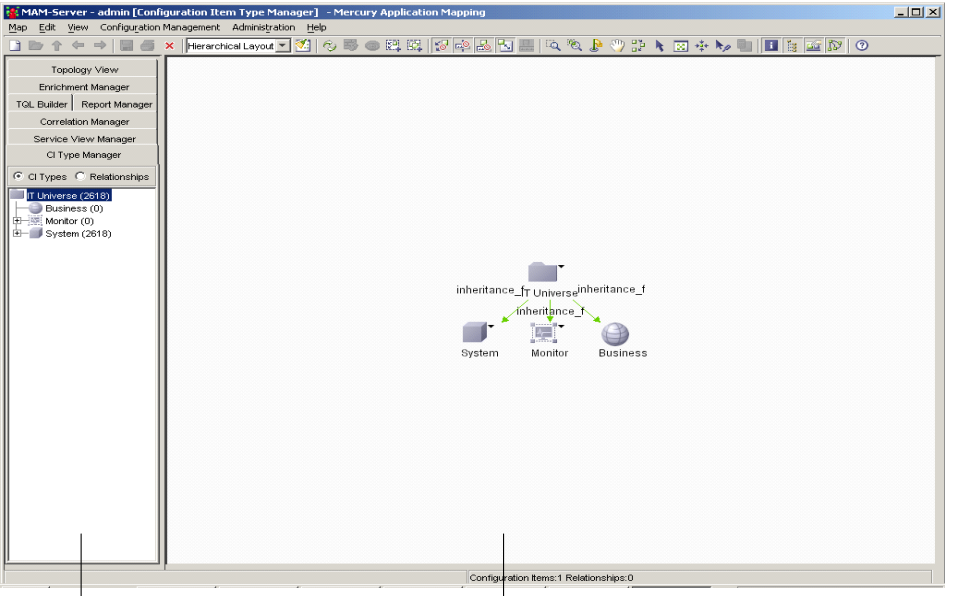
Introduction to the CI Type Manager

This chapter introduces the CI Type Manager. The CI Type Manager enables you to view the structure of your managed world.

About the CI Type Manager

The CI Type Manager is displayed by selecting the CI Type Manager tab. The CI Type Manager enables you to view the information in the CI Type model, which contains the definitions of all the configuration item types (CITs) defined in the system and the relationships that define the connections between them. Each CIT has its own attributes, as well as the attributes inherited from its parent CIT. The CI Type Manager represents the structure of Mercury Application Mapping's managed world.

The CI Type Manager visually reflects the data contained in the CMDB, including TQL queries and managed views.



The CI Type Manager tab is divided as follows:

- **Configuration Item Types.** Displays a hierarchical tree structure of the CI Type model containing the inheritance relationships among CITs. All CITs included in the CI Type Model are classified as either a CIT or a relationship. By selecting a CIT in the View Explorer, you can drill down and view the relationships and neighbors of the selected CIT in the topology map. The View Explorer displays the number of instances there are of each CIT in the CMDB.

Note: Each CIT definition type is represented by a unique icon.

- **Topology Map.** Displays various layouts of the CI Type model, including the CITs and the relationships connecting them. Each CIT has a unique icon. Its neighbors, as indicated by its connection to the CIT in the View Explorer, all share the same shape surrounding the icon. Shapes are predefined according to logical CIT groupings.

Working with the CI Type Manager

Use the CI Type Manager to perform the following functions:

- Create new CITs and edit existing ones.
- Add and remove relationships between CITs.
- Expand or collapse the View Explorer to display the required CITs and relationships in the topology map.
- View the selected CIT's neighbors, which are connected using inheritance, container and other types of relationships.
- Zoom in and out of the topology map to view the selected CIT and its neighbors at different zoom levels.

Browsing the CI Type Model

The CI Type Manager enables you to browse the CI Type model to better understand the relationships between specific CITs.

This section includes the following topics:

CI Type Manager Tooltip

When you point to a CIT in the CI Type Manager, the tooltip displays the following information:

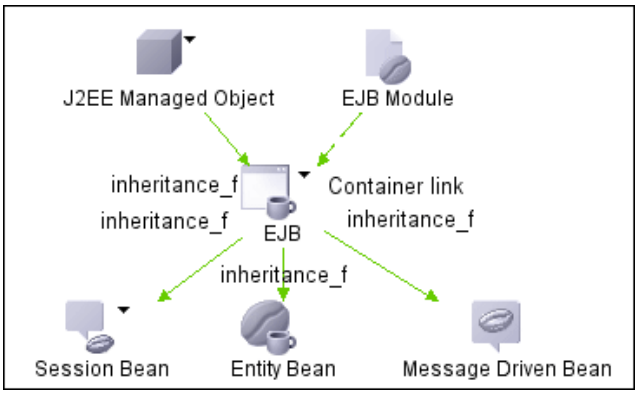
- **CI Type.** The display name of the Configuration Item type to which the item belongs.
- **Description.** A description of the CI type.

Browsing the CI Type Model

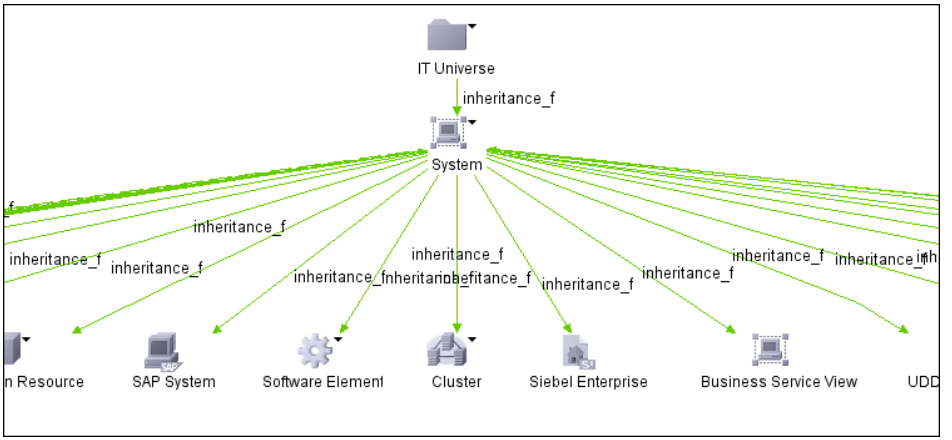
In the View Explorer, you can view inheritance relationships between CITs (such as the **Server Port**, **Client Port**, and **IP Unknown** CITs, which inherit attributes from the **TCP/IP Port** CIT). In the topology map, you can view relationships of all types that connect various CITs. If required, you can print the contents of the topology map.

To browse the CI Type model:

1 From the View Explorer, select the CIT that you want to view in the topology map. The CIT is automatically centralized in the topology map.



2 Use either the **Zoom** or **Interactive zoom** button on the toolbar to zoom in on the view area of the selected layer.



3 To return to the default view, click the **Fit To Window** button on the toolbar.

Displaying CIT Instances

You can display all of the instances found in the CMDB for each CIT in a table.

To display all of the instances found for each CIT in a table:

1 In the Topology Map or the View Explorer, right-click the required CIT and select **Show CIT instances** to open the Show all instances dialog box.

The list of CITs are divided into pages. The number at the bottom of the screen indicates which page is currently being displayed. For example, 2/4 means that it is the second out of four pages.

2 To view other pages, use the left and right arrows.

3 To determine the number of node instances that appear on a page, do the following:

- ➤ Click the **Set bulk size** button to open the Set bulk size dialog box.
- ➤ Use the up and down arrows or type the number of node instances you want to appear on a page and click **OK**.

4 To see the table updated, click the **Refresh** button.

5 Click **OK** to save the settings you have defined.

Using the Toolbar Options

For a description of each toolbar option in the View Manager, see “Toolbar Options” on page 33.

Printing the Contents of the Topology Map

For a description of how to print the contents of the topology map, see “Printing Options” on page 41.

Defining a View's Layout

For a description of how to customize the layout of a specific layer in a view, see "Defining a View's Layout" on page 45.

Understanding Layout Options

For a description of how you can display the contents of the topology map using different layout options, see Chapter 5, "Defining a View's Layout".

28

Managing CITs

This chapter explains how to create and add CITs to the CI Type Model.

Note: The CI Type Manager is not available to Mercury Managed Services customers.

About Managing CITs

If you have IT resources that are not included in the system's built-in CITs, you can create and add CITs to the Configuration Item Type Model. In addition, you can edit existing CITs to adjust them to the structure of your IT infrastructure.

For a list of the existing CITs and their descriptions, see "CI Type Descriptions" on page 461.

For a list of the existing relationships and their definitions, see "Relationship Definitions" on page 505.

CI Type Workflow

You create CITs according to the following workflow:

- **Create CITs**. For details, see "Creating CITs" on page 383.
- **Assign an icon to a CIT**. For details, see "Assigning an Icon to a CIT" on page 389.
- **Create methods for the CIT**. For details, see "Creating CIT Methods" on page 391.
- **Define CIT qualifiers**. For details, see "Defining Qualifiers" on page 395.
- **Define an attribute for the CIT label**. For details, see "Defining an Attribute for a CIT Label" on page 396.

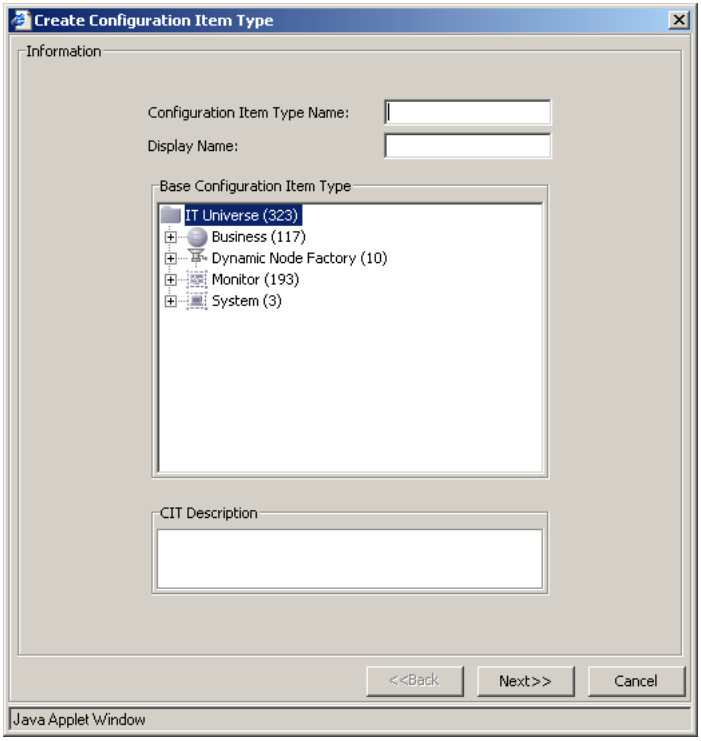
Creating CITs

You can create and add CITs to the CI Type Model.

To create a CIT:

1 Select the **CI Type Manager** tab.

2 Click the **New** button on the toolbar or select **New** from the **Map** menu. The Create Configuration Item Type dialog box is displayed.



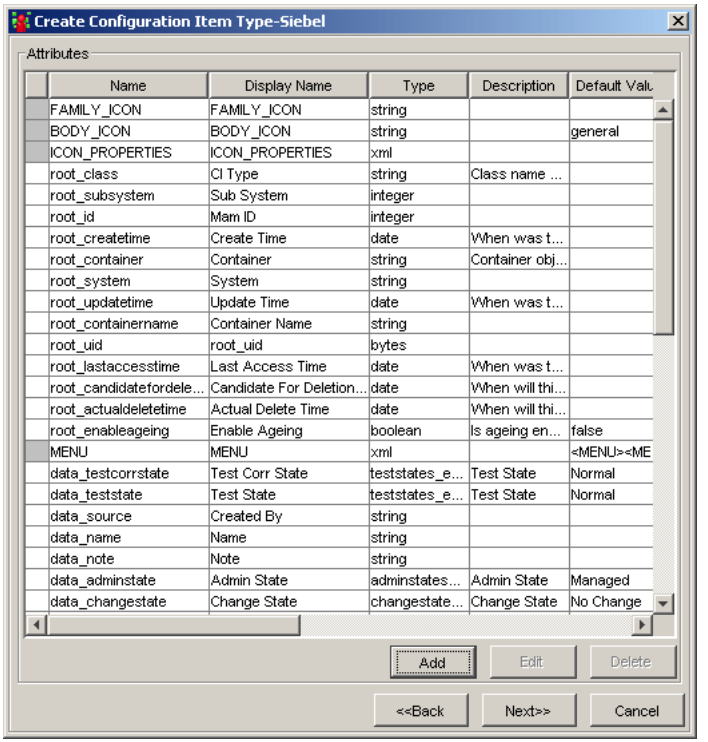
3 In the **Configuration Item Type Name** box, enter a unique name for the new CIT. Do not use a blank space or an underscore as part of the CIT name. You can use lower and upper case, but you cannot use the same name with different cases for two CITs.

4 In the **Display Name** box, type the name of the CIT as you would like it to appear on the Mercury Application Mapping interface.

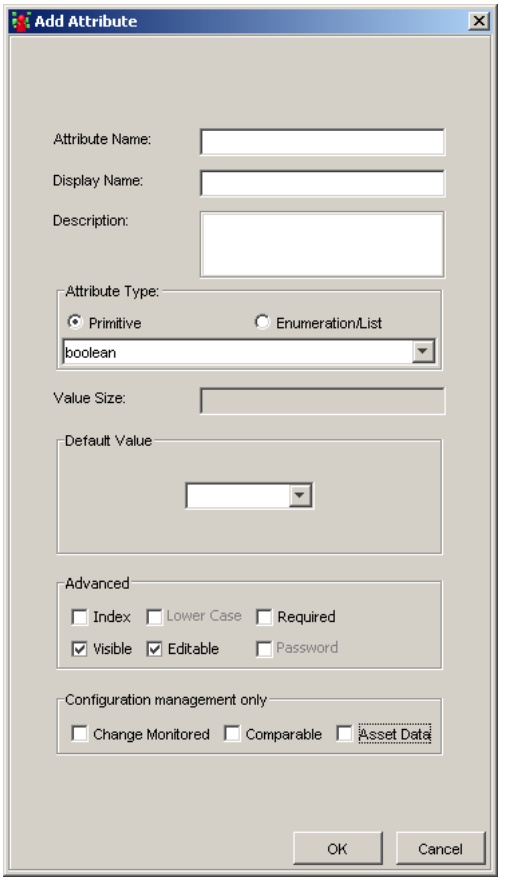
5 In the **Base Configuration Item Type** box, select a base CIT for the CIT you are creating. The new CIT inherits the base CIT's attributes.

6 (Optional) In the **Configuration Item Type Description** box, enter a description of the new CIT.

7 Click **Next**. The Attributes page displays all the attributes that the new CIT inherits from its base CIT.



8 To add attributes, click **Add** to open the Add Attribute page.



9 Enter the following information about the new attribute:

➤ **Attribute Name**. Enter a unique name for the new attribute to identify it in the database.

Note: Do not use a space as part of the attribute name.

➤ **Display Name** (Optional). Enter a name for the new attribute to identify it on the Mercury Application Mapping interface.

- **Description** (Optional). Enter a description for the new attribute.
- In the **Attribute Type** area, select one of the following:
  - **Primitive.** Choose from one of the following field types: **boolean**, **bytes**, **date**, **double**, **integer**, **float, long**, **string, xml**.
  - **Enumeration/List.** Contains a list of Enumerations/Lists defined in the Enumeration Manager dialog box (for details, see in the *Mercury Application Mapping Administration Guide*). This option enables you to define an attribute whose value has been predefined.

    For example, a location attribute might be defined by a **location** list containing the following values:

    New York, Boston, Baltimore

    The values that appear in the list in the **Attribute Type** section vary depending on the **Attribute Type** you selected.
- **Value Size**. Enter a value for the maximum physical size of the new attribute, if required. This field applies to the attribute type **string** only.
- **Default Value**. Enter a default value for the attribute, if required. This value appears when the new CIT is created and there is no runtime value for the attribute. Choose from the following fields: **Managed**, **Unmanaged**, **Unknown**, **Testing**, **Restricted**, **Disabled**.
- In the **Advanced** area:
  - (Optional) An index provides rapid access to the attribute values. Select **Index** to accelerate the attribute retrieval performance. This option is recommended for attributes that are used frequently in search conditions. For example, IP address is usually an index attribute of a host.
  - (Optional) Select **Required** to define this attribute as a required one, if its value is required for the creation of the CIT.
  - (Optional) Select **Visible** to display this attribute in the Attributes page in the topology map.
  - (Optional) Select **Editable** to enable future editing of the attribute. Only attributes that are marked as **Editable** (or ones that have values) are displayed in the Attributes page.

- In the **Configuration Management only** area:
  - (Optional) Select **Change Monitored** to define attributes whose values are being marked as **Change Monitored** in the CI Type Manager. For every change in an attribute defined as **Change Monitored**, you are notified by a Change event in the Topology View. For details on how to track modifications made in the Topology View, see "Viewing and Editing CI Attributes".
  - (Optional) Select **Comparable** to enable this attribute to be used for comparing compound CIs. For information on how to compare compound CIs, see "Gold Master Comparison" on page 423.
  - (Optional) Select **Asset Data** to display the attribute value in the Asset Report. For information on how to generate an Asset Report, see "Asset Reports" on page 233.

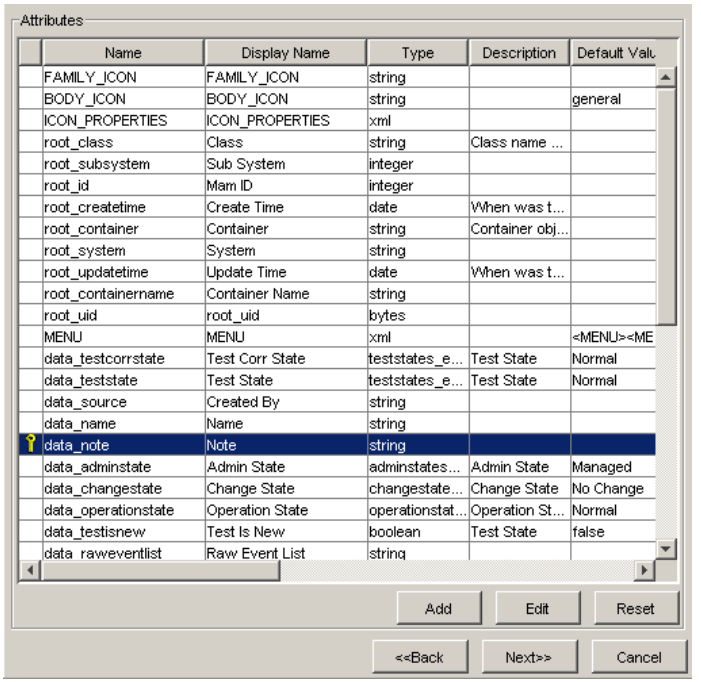
10 Click **OK** to save the changes you have made. The new CIT attribute you created appears in the Attributes page.

Note: If you modify an attribute belonging to a CIT's parent, it turns light blue. If you modify an attribute belonging to the CIT itself, it turns dark blue.

---

11 If you want to add more attributes, repeat steps 8 to 10.

12 To define an attribute as a key attribute, click in the left column beside the attribute name. A key icon appears as shown in the following figure:



13 To remove the key attribute definition, click the key icon.

14 Click **Next** to attach an icon to a new CIT (for details, see "Assigning an Icon to a CIT" below).

Assigning an Icon to a CIT

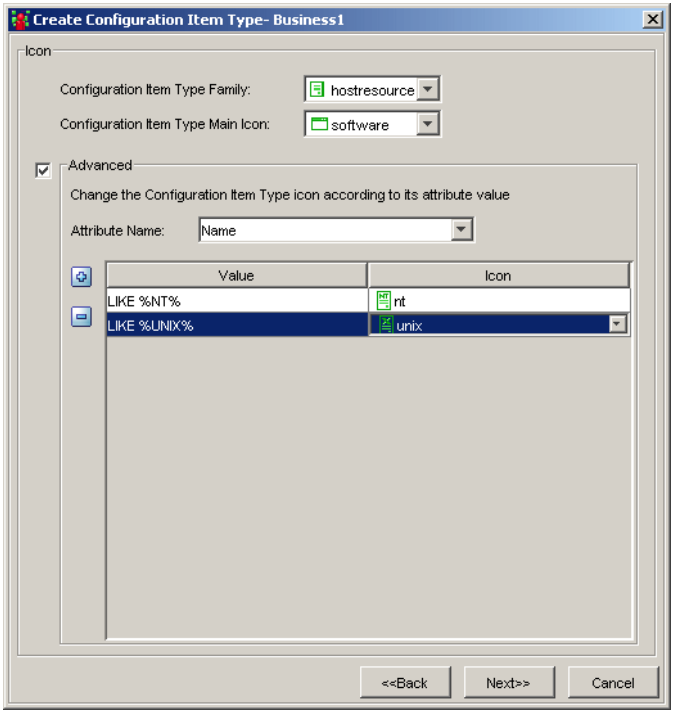
Mercury Application Mapping allows you to attach an icon to a new CIT. You can also attach different icons to the same CIT when certain conditions apply. For example, you can associate different icons with the same CIT when one of its attribute values changes.

Note: You can only assign different icons to CITs that are classified as CI Types, and not relationships.

To assign one or more icons to a CIT:

1. In the Attributes page (see step 7 in "Creating CITs" on page 383), click **Next** to open the Icon page.
2. From the **Configuration Item Type Main Icon** list, select the group to which the CIT belongs.
3. Select **Advanced** to assign different icons when the selected CIT attribute gets a different value.
4. From the **Attribute Name** list, select the attribute to which you want to attach different icons.
5. Click the **Add** button to create a new row.
6. Click inside the **Value** column and type a required numeric value.
7. Click inside the **Icon** column and select the icon you want to associate with that value.
8. To add another value, repeat steps 5 to 7.

In the following example, the computer icon is to be replaced by the NT icon when the attribute's value is **LIKE %NT%,** and by the UNIX icon when the attribute's value is **LIKE %UNIX%**.



9 To delete a row, select the row you want to delete and click the **Delete** button.

Note: If you change the icon of a CIT that appears in an existing view, the CIT's icon is not updated in the view. For details on how to update the view with the new icon, see "Updating a View" on page 399.

---

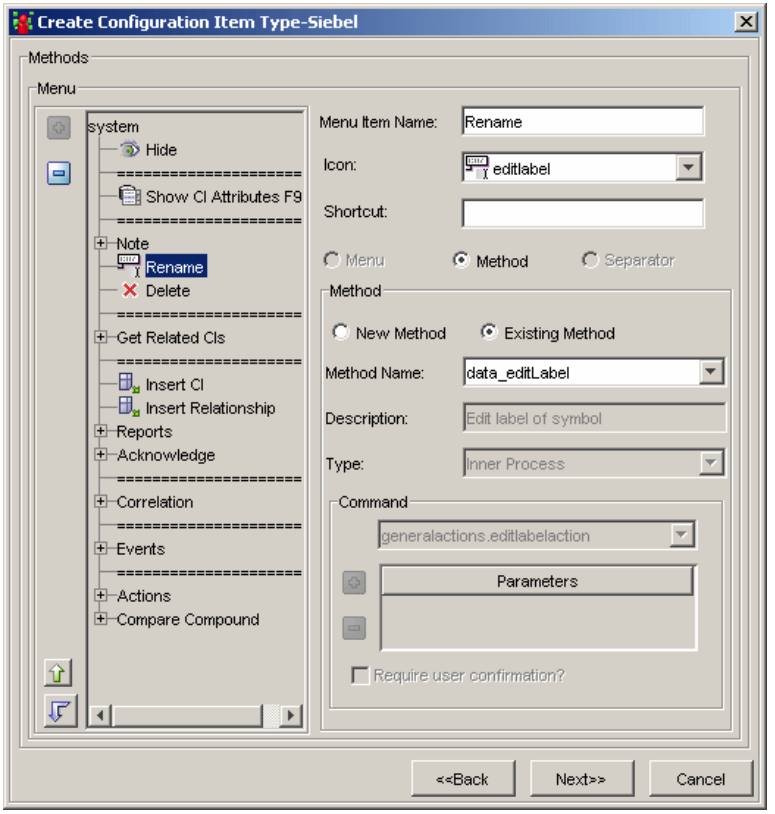
10 Click **Next** to create new CIT methods.

Creating CIT Methods

Mercury Application Mapping enables you to customize the methods (commands) and shortcut menu of a CIT in the CI Type Manager. You can define additional commands, such as ping, run a program, open a URL, and so forth. The newly customized menu is displayed when you right-click the selected CIT in the topology map.

To add a menu item:

1 In the Attribute page (for details on the Attribute page, see "Assigning an Icon to a CIT" on page 389), click **Next** to display the Methods page.



The field on the left displays a hierarchical tree containing the default menu items for the selected CIT.

Caution: It is not recommended to edit the definitions of the default menu items.

2 Select a menu item from the tree and click the plus button. A new entry appears under the selected item.

3 Select a menu option type, as follows:

- **Menu**. Enables you to create a menu option to which you can add a submenu. Continue to step 4.
- **Method**. Enables you to add a command to the menu. Skip to step 5.
- **Separator**. Places a separator between two menu items. Skip to step 8.

4 To create a menu item to which you can add a submenu, do the following:

- Click **Menu**.
- In the **Menu Item Name** box, type a name for the menu item as you want it to appear on the menu.
- (Optional) From the **Icon** list, select the icon you want to appear next to the menu option.
- (Optional) In the **Shortcut** box, press any key combination to create a shortcut for the menu item, for example, CTRL+H.
- Click **OK**. The menu option you created is added to the menu in the topology map.

5 To add a command to the menu, do the following:

- Click **Method**.
- In the **Method** area, select:
  - **New Method** to change the command that the menu item runs
  - **Existing Method** to choose a command from a list of all the defined methods inherited from the IT World CIT and all its ancestors.

Note: To create a method and not override the existing method in the selected CIT, it is recommended to create a new menu item and place the new method there. To create a new menu item, see step 4.

- ➤ In the **Method Name** box, type a name for the command.
- ➤ In the **Description** box, type a description of the command.
- ➤ From the **Type** list, choose a command type:
  - ➤ To connect you to a specific location on the World Wide Web, select **URL,** and then in the **URL** box, type the exact Internet address. For example: www.mercury.com.
  - ➤ To run a program, select **Execute,** and then click the **Find** button to display a standard Browse dialog box and select the program you want to run.
  - ➤ To display a list of internal Mercury Application Mapping actions select **Inner Process,** and then select the required action.

6 In the **Command** box, type the required command. (This option is available only if you have selected the **URL** or **Execute** command type options.)

If you use a variable in the command field, use the format **command name %1** and define the CIT attributes as described in the next step. The parameter values replace **%1** according to their order in the list. For example, **%1** is replaced by the first parameter in the list, **%2** is replaced by the second parameter in the list, and so forth.

7 To enter CIT attributes in the **Parameters** box, do the following:

- ➤ Click the plus button to create a new entry.
- ➤ Type the CIT's attribute.

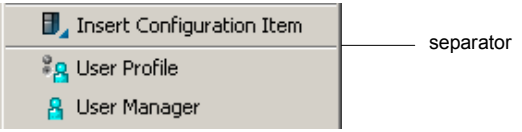
Note: To delete an existing entry, select it and click the **Delete** button.

---

8 To place a separator between two menu items, do the following:

➤ Click **Separator**.

➤ Click **OK** to place a separator underneath the selected menu option as shown in the illustration below.



9 (Optional) In the **Confirm Message** box, type the message you want to appear when you select the menu item. Select the check box to the left of the **Confirm Message** box to activate this option.

Note: To delete a menu item, select an item and click the delete button.

---

10 To change the order of the menu items, drag and drop an item into the required position.

Note: If a CIT does not have a method defined specifically for it, the CIT inherits all the menus from its parent CIT or the nearest ancestor that does have a method defined for it.

If you create or modify a menu, the change occurs only in the specific CIT that is edited.

---

11 Click **Next** to define qualifier conditions for the CIT. For details, see “Defining Qualifiers” on page 395.

Defining Qualifiers

The CI Type Manager allows you to assign qualifiers to a CIT definition. Qualifiers enable you to define added attribute definitions to the CIT. For example, you can use a qualifier to define a CIT as abstract, meaning you cannot create instances from it.

To define qualifier:

1. In the Methods page (for details on the Methods page, see "Creating CIT Methods" on page 391), click **Next** to display the Qualifiers page.
2. In the **Qualifiers** list, select the required qualifiers using the Add buttons to move your selection(s) to the **Configuration Item Type Qualifiers** list. You can make multiple selections by holding down the CTRL key.

- Use this button to move the selected qualifier(s) to the **Configuration Item Type Qualifiers** list.

- Use this button to move all the qualifiers to the **Configuration Item Type Qualifiers** list.

Select the required qualifier(s) according to the following:

- **NOTIFY_CHANGES**. For internal use only.
- **BLE_LINK_CLASS**. For internal use only.
- **ABSTRACT_CLASS**. You cannot create instances of this CIT.
- **ITU_HIDDEN_CLASS**. For internal use only.
- **CONTAINER**. Relevant for relationships only. Represents containment between two CIs.
- **HIDDEN_CLASS**. Does not appear anywhere in the application.
- **READ_ONLY_CLASS**. For internal use only.
- **PM_SUSPECT**. Defines the CIT as an element that is a possible root cause for infrastructure problems that affected the selected CI. For details, see "Problem Isolation" on page 190.

3. To remove a qualifier, select the qualifier from the **Configuration Item Type Qualifiers** list and click the **Delete** button.
4. Click **Next** to define attributes for a CIT label. For details, see "Defining an Attribute for a CIT Label" on page 396.

Defining an Attribute for a CIT Label

A label is the title that appears under a CI. Label definition can be customized to include different attribute values. For example, if in host the function label is composed of hostname and network, the displayed label is: server1 10.0.65.0.

This section includes the following topics:

Defining a CIT Label Attribute

This section describes how to define an attribute for a CIT label.

To define an attribute for the CIT label:

1. In the Qualifiers page (for details, see "Defining Qualifiers" on page 395), click **Next** to display the Default Label page.
2. Select the attribute(s) to appear in the label of the selected item (for details on how to format the text, see "Formatting Text" on page 397 below).
3. Click **Finish**. Mercury Application Mapping creates the new CIT using the information you provided, and displays it on the View Explorer and in the topology map in the Configuration Item Type Model.

Formatting Text

Select the attribute(s) to appear in the formatted text by clicking the button to the left of each attribute to display the selected attribute in the **Format** box. If required, you can use the function buttons to display multiple attributes in the label as follows:

Option	Description
()	Adds parentheses to the formatted text (used in conjunction with the other functions).
&	Places an **AND** operator between two attributes in the formatted text. For example, **network_netaddr&network_domain** displays both the network address and the domain of the node.
|	Places an **OR** operator between two attributes in the formatted text.
RegExp	Adds a regular expression using regular expression syntax to the label definition. For examples of how to use regular expression syntax, see "Using Regular Expressions" on page 398.

Note: To delete an attribute from the **Format** box, highlight it and press the DELETE key.

You can define conditions using the following combinations:

- AND
- OR
- AND NOT
- OR NOT

Using Regular Expressions

This section gives an example of how to use regular expression syntax.

To enter a regular expression:

1. In the first field, enter the regular expression pattern. This is the structure of the selected attribute.
2. In the second field, enter the group number. This is the part of the regular expression pattern to focus on when creating the label.

   For example, enter a regular expression to define the IP address (aa.yy.zz.mm), as follows:

To:	In the first field enter:	In the second field enter:
Create label by zz	(.*[.].*[.])(.*)([.].*)	2
Create label by yy	(.*[.])(.*)([.].*[.].*)	2
Create label by aa	(.*)([.].*[.].*[.].*)	1
Create label by mm	(.*[.].*[.].*[.])(.*)	2

You can also enter a regular expression to create the label by the first or last letter(s) of the selected attribute as the following example shows:

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

Updating a View

If you change the icon of a CIT that appears in an existing view, the CIT's icon is not updated in the view. This section explains how to update the view with a new icon.

To update a view with a new icon:

1 Click the Topology View manager.

2 Select the view you want to rebuild from the View Explorer.

3 Click the **Rebuild** button.

Editing Existing CITs

You can edit an existing CIT.

To edit an existing CIT:

1 In the View Explorer, right-click the CIT you want to edit and click **Edit CIT** to open the Edit Configuration Item Type dialog box.

The Edit Configuration Item Type dialog box tabs are similar to those in the Create Configuration Item Type dialog box (as described in "Creating CITs" on page 383). However, only editable fields are enabled in the Edit Configuration Item Type dialog box.

2 Make your changes in the different tabs as follows:

- **Information** (see "Creating CITs" on page 383)
- **Attributes** (see "Creating CITs" on page 383)
- **Icon** (see "Assigning an Icon to a CIT" on page 389)
- **Methods** (see "Creating CIT Methods" on page 391)
- **Qualifiers** (see "Defining Qualifiers" on page 395)
- **Default Label** (see "Defining an Attribute for a CIT Label" on page 396)

Exporting CITs

You can export XML files that contain saved CITs from your CI Type Manager. Use this option if you want to move CITs from one workstation to another.

To export a CIT:

1. Right-click the CIT whose XML file you want to export and click **Export** to open the Save as dialog box.
2. Browse to the location where you want to save the CIT's XML file and click **Save**.

Adding Relationships Between CITs

You can add relationships between CITs, either built-in or new ones, which define their physical or logical connections.

To add a relationship between two CITs:

1. From the View Explorer or the Map pane, select the two CITs you want to link by holding down CTRL and clicking the CIT names.
2. Right-click one of the CITs and select **Add/Remove Relationship** to open the Add/Remove Relationship dialog box.
3. Select the check box(es) that specifies the type of relationship with which you want to link the CITs.
4. Click **OK** to save the changes you have made.

Removing Relationships Between CITs

You can remove relationships between two CITs.

To remove a relationship between two CITs:

1. From the View Explorer or the Map pane, select the two CITs whose relationship you want to delete by holding down CTRL and clicking the CIT names.
2. Right-click one of the CITs and select **Add/Remove Relationship** to open the Add/Remove Relationship dialog box.
3. Clear the check box(es) of the relationships that link the selected CITs.
4. Click **OK** to save the changes you have made.

Part X

Applications

29

Environment Comparison

This chapter describes how Mercury Application Mapping enables you to take a snapshot of a specific view, save it and then compare it to snapshots taken of that view at different times.

About Environment Comparison

Mercury Application Mapping's environment comparison feature shows the status of a view in one snapshot as opposed to its status taken at a different time. You can compare a current snapshot to a previous snapshot or two snapshots both taken in the past.

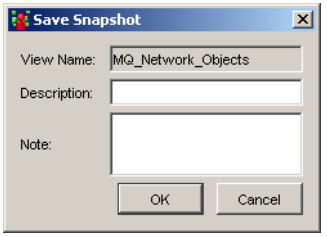
Taking a Snapshot of a View

This section describes how to take a snapshot of a view.

To take a snapshot of a view:

1 In the View Explorer or the topology map of the Topology View manager, right-click the view of which you want to take a snapshot.

2 Select **Snapshot** > **Save** to open the Save Snapshot dialog box.



3 The **View Name** box contains the name of the view as it appears in the View Explorer. You cannot edit the view's name.

4 (Optional) In the **Description** box, enter a description of the snapshot.

5 (Optional) In the **Note** box, add a note you want to add about the snapshot.

6 Click **OK** to save the snapshot you have taken in the database. If the snapshot was saved successfully, the following message appears:

Snapshot for view was saved successfully

Saving Snapshots on a Periodic Basis

You can schedule Mercury Application Mapping to take snapshots of a certain view at specified times by defining a task in the Scheduled Actions Manager.

To save snapshots on a periodic basis:

1 Select **Administration** > **Scheduler** to open the Scheduled Actions Manager.

2 Click **Add** to define the new task.

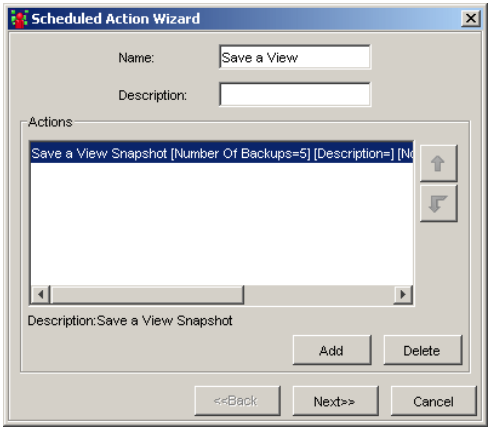
3 Click **Add** to open the Actions dialog box.

4 Select **Save a View Snapshot**.

5 Click **Next** to select the view in which you want to save the snapshots.

6 Click **Next** to display a list of parameters to define.

7 Click **Finish**. The action you have defined appears in the Scheduled Action Wizard.



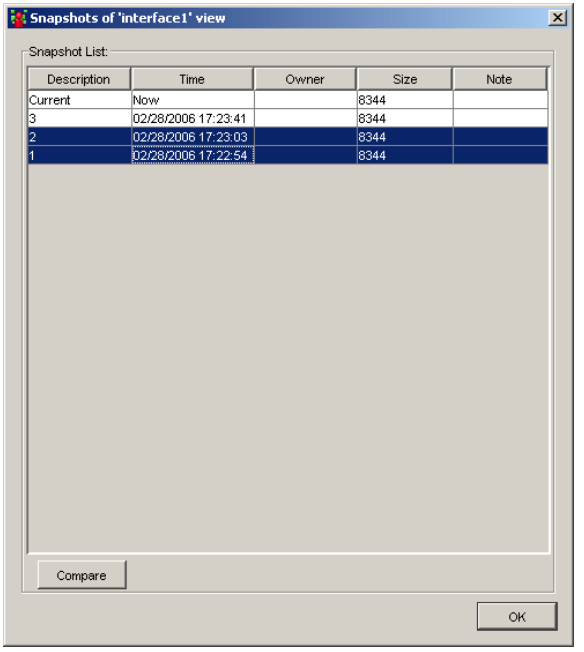
For information on how to schedule the task, see "Task Scheduling" in the *Mercury Application Mapping Administration Guide*.

Comparing Snapshots Taken at Different Times

Mercury Application Mapping allows you to compare two snapshots of a specific view taken at different times. This feature enables you to visualize the differences between the views by comparing the statuses of the view at the times the snapshots were taken.

To compare different snapshots of the same view:

1. Right-click the view of which you have taken snapshots.
2. Select **Snapshot** > **View snapshots** to open the Snapshots dialog box.



This dialog box contains a list of all the different snapshots taken of the selected view.

The following table describes the fields in the dialog box.

Field	Description
Description	The description you wrote for the snapshot in the Save Snapshot dialog box (see "Taking a Snapshot of a View" on page 406).
Time	The time at which the snapshot was saved.
Owner	The name of the user who took the snapshot.
Size	The number of CIs that were in the view when the snapshot was taken.
Note	The note you wrote for the view in the Save Snapshot dialog box (see "Taking a Snapshot of a View" on page 406).

Note: The first row always represents the status of the view in its current state.

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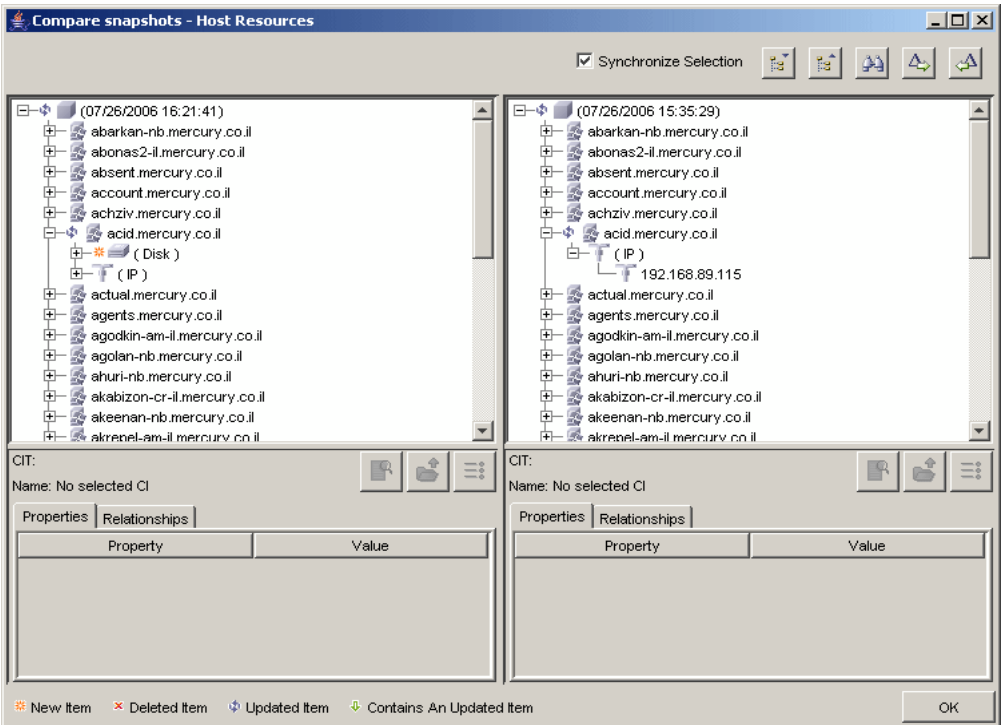
3 Select the two snapshots you want to compare.

4 Click the **Compare** button to open the Compare snapshots dialog box.



Note: For details about the Compare snapshots dialog box, see "Understanding the Compare Snapshots Dialog Box" on page 411.

Understanding the Compare Snapshots Dialog Box

The Compare Snapshots dialog box is divided into two sections. Each side displays an hierarchical tree structure of all the CIs in the topology map for that snapshot version. The left side always represents the newer of the two versions. When you select a CI on one side, the corresponding CI on the other side is automatically selected (provided the **Synchronize Selection** check box is selected).

The following information is displayed under the tree when you select a CI:

- **CIT**. The name of the CIT to which the CI belongs as defined in the CI Type model.
- **Name**. The name of the CI as defined in the CI's label.

This section contains the following topics:

Compare Snapshots Dialog Box Tabs

The Compare snapshots dialog box contains the following two tabs:

Tab	Description
Properties	Displays only the attributes of the CI whose values have been defined as either **Change Monitored**, **Asset Data**, or **Comparable** in the Add Attribute dialog box in the CI Type Manager. For details, see "Creating CITs" on page 383. The **Properties** tab has the following two fields: ➤ **Property**. Displays the attribute name for the selected CI which was marked as **Change Monitored** in the CI Type Manager. ➤ **Value**. Displays the value for the currently selected CI.
Relationships	Displays the relationships with which the different CIs are connected within the view. The **Relationships** tab has the following two fields: ➤ **Property**. Displays the relationship types. For example, **container_f** or **contained**. ➤ **Value**. Displays the direction indicator (an arrow either pointing to the left or the right) and the target/source CI to which the arrow is pointing.

Expanding and Collapsing the Entire Tree

This section describes how to expand and collapse the entire tree.

To expand the entire tree:

Select the view at the top of the tree and click the **Expand All** button.

To collapse the entire tree:

Select the view at the top of the tree and click the **Collapse All** button.

Finding Items Marked as Changed

This section describes how to find the items that have been marked as changed.

To find the next occurrence of an item marked as changed:

Click the **Next Difference** button.

To find the previous occurrence of an item marked as changed:

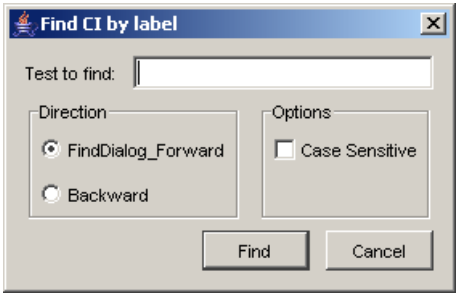
Click the **Previous Difference** button.

Finding a CI by Its Label

Mercury Application Mapping enables you to search for a CI within the selected view whose label contains the searched text. You can specify a whole word or part of it.

To find the CI by its label:

1 Click the **Find** button to open the Find CI by label dialog box.



2 In the **Text to find** box, type the text you want to find.

3 In the **Direction** section, specify whether you want to do a forward or backward search.

4 In the **Options** section, select the **Case Sensitive** box if you want the matches to be case sensitive.

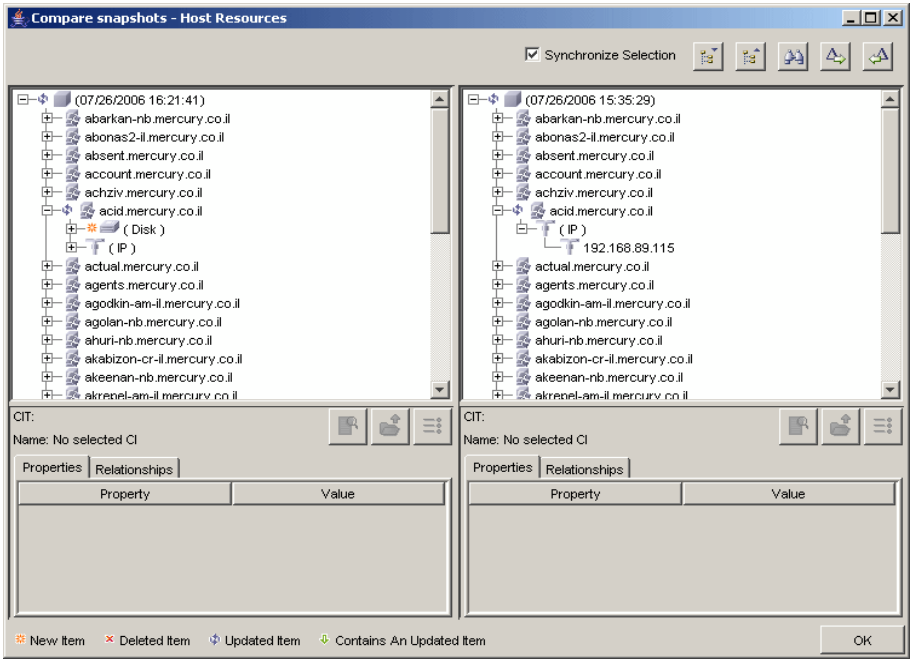
5 Click **Find**. If Mercury Application Mapping finds a match, it selects the CIs that appear in the topology map of both snapshot versions.

Change Indicators

This section describes the icons that indicate the kind of change that has occurred in the compared views. The indicator key appears at the bottom of the Compare snapshots dialog box.

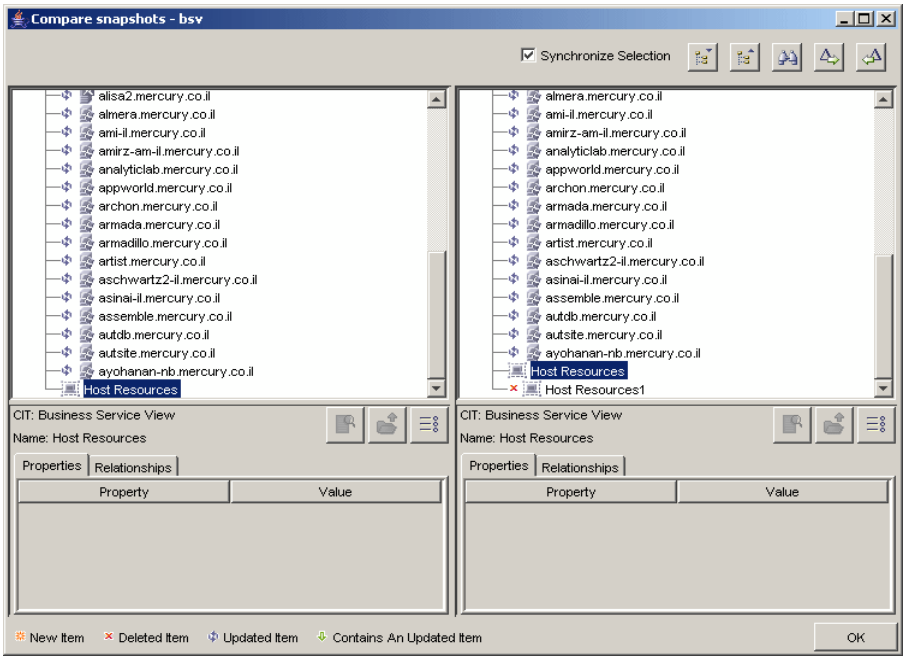
New Item Icon

The **New Item** icon indicates that a new CI has been added to the view. The example below shows that the CI **Disk** has been added to the view in the snapshot at the left.



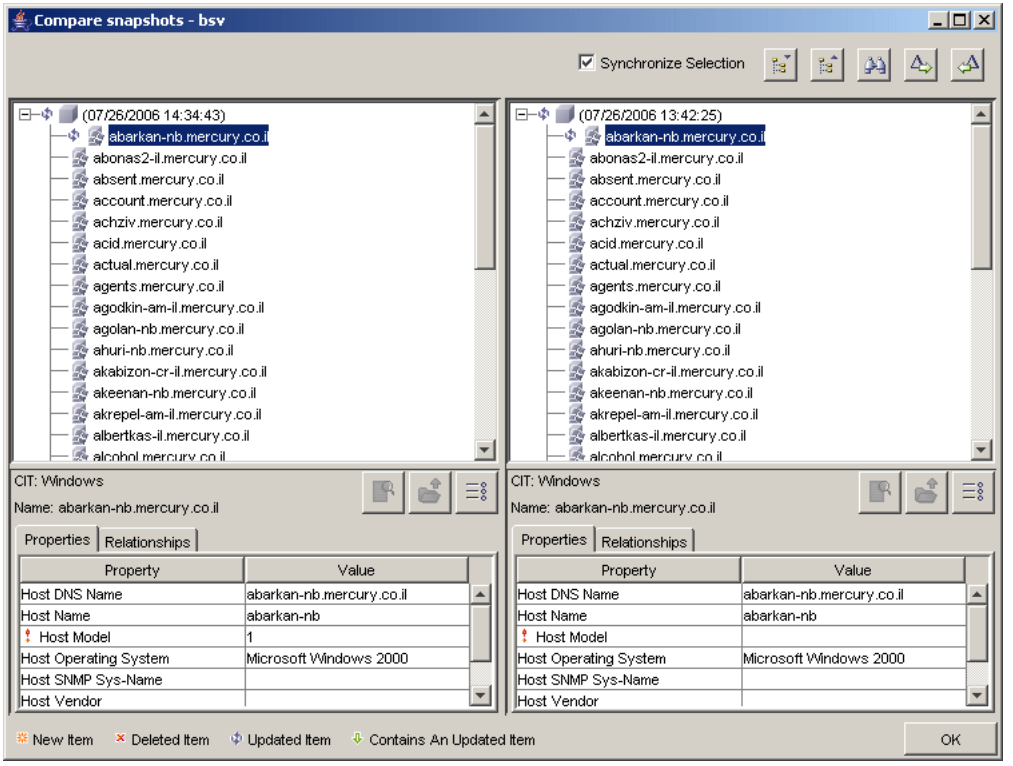
Deleted Item Icon

The **Deleted Item** icon indicates that a CI has been deleted from the view. For example, the figure below shows that the CI **HostResources1** has been deleted from the view in the snapshot at the right.



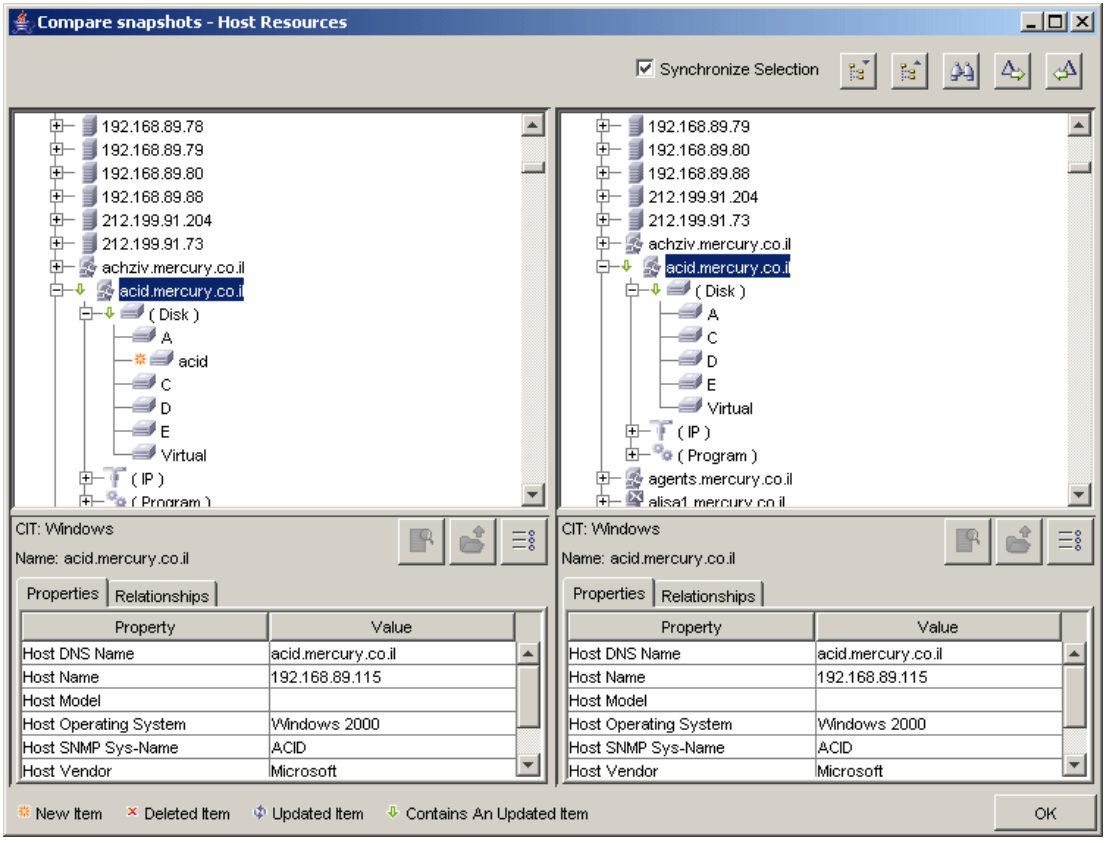
Updated Item Icon

The **Updated Item** icon indicates that a CI whose attribute value has been defined as **Change Monitored**, has changed For example, the figure below shows that the CI called **abarkan.nb.mercury.co.il** has the **Updated Item** icon because it received the new value **1** (see the **Properties** tab underneath the tree structure).



Contains an Updated Item Icon

The **Contains an Updated Item** icon indicates that either a new child CI was created for a CI or an existing child CI was edited or deleted. For example, the **acid.mercury.co.il** CI in the figure below has a **Contains an Updated Item** icon due to the changes made to its child CIs.

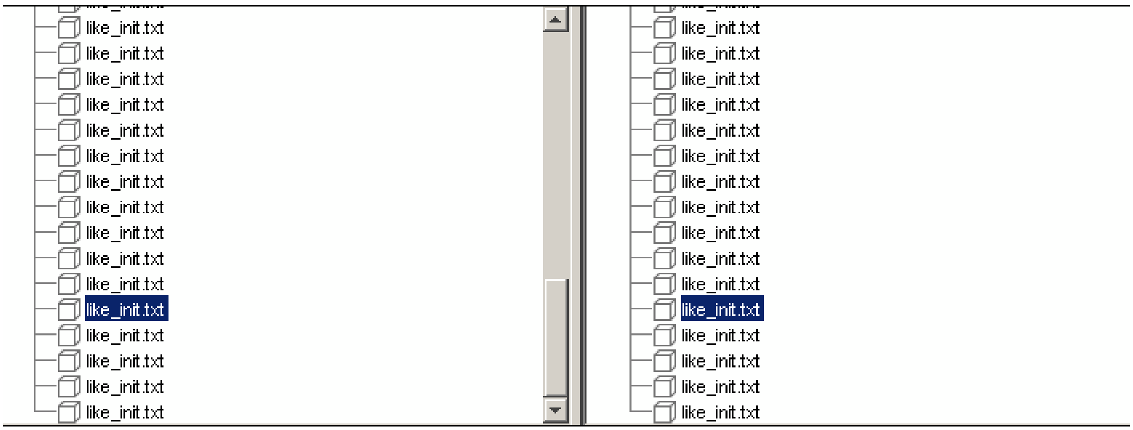


Viewing and Comparing a Configuration File

A configuration file is a file that has the content of a configuration file, a parameter file, or an **.ini** file. The Compare Snapshots dialog box enables you to view a configuration file, and also compare what the configuration file looked like at different times.

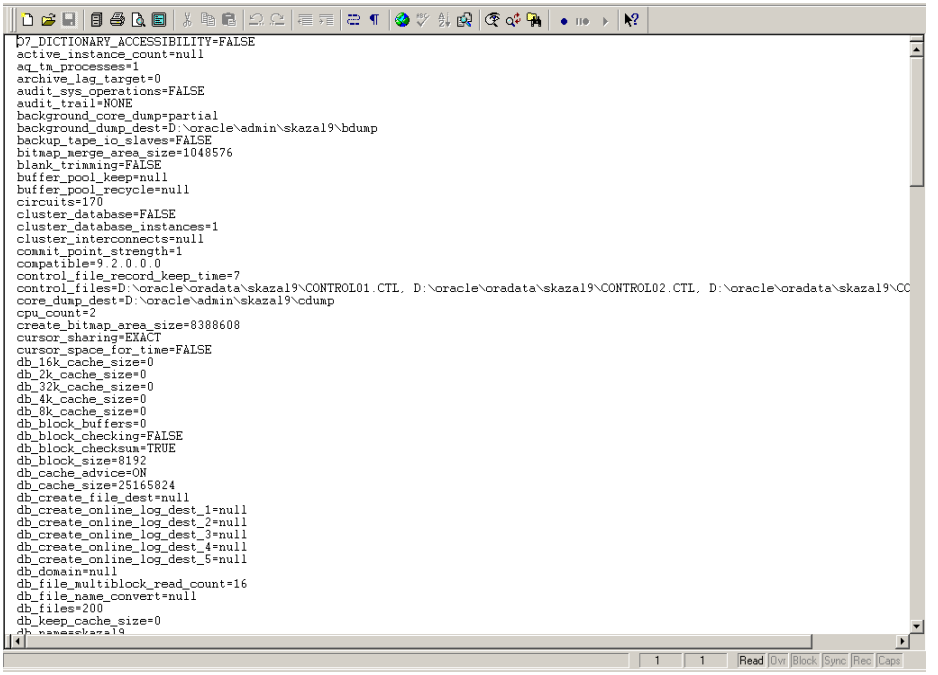
To view a configuration file:

1 In the Compare Snapshots dialog box, select a CI of the CIT **configfile** from the tree.



2 Click the **Open** button to open the configuration file.

Note: This button is only enabled if you have selected a CI of the CIT **configfile** from the tree.

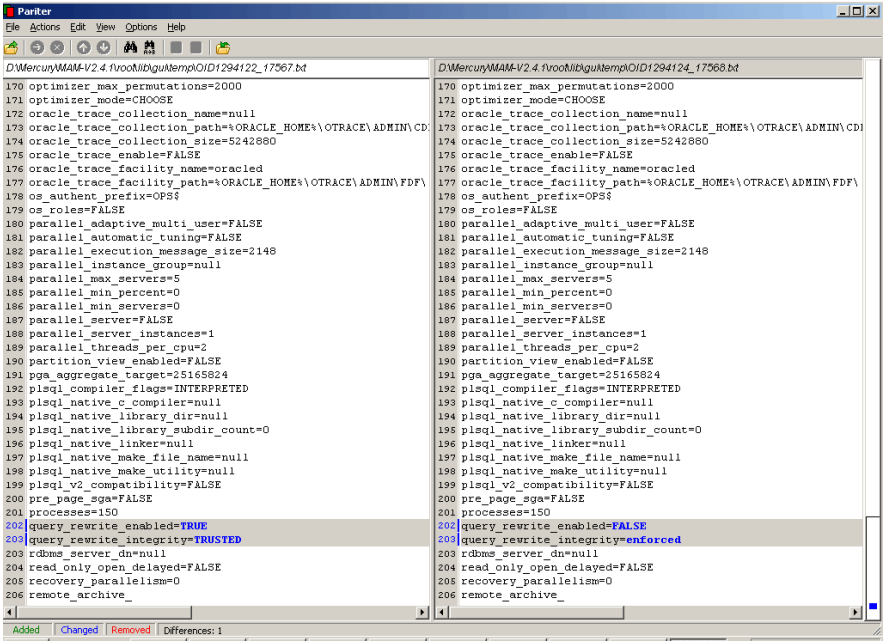


To compare what the configuration file looked like at different times:

1 In the Compare Snapshots dialog box, select a CI of the CIT **configfile** from the tree.

2 Click the **Show Difference** button to display what the configuration file looked like at the time each snapshot was taken.

Note: This button is only enabled if you have selected a CI of the CIT **configfile** from the tree.



The differences in the configuration file are marked in blue.

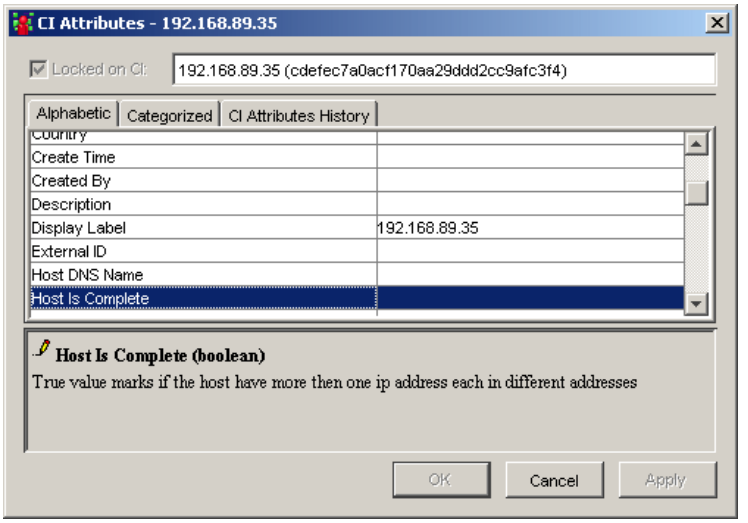
Displaying a CI's Attributes

You can display what the CI's attributes were at the time the snapshot was taken.

To display a CI's attributes:

1 In the Compare Snapshots dialog box, select a CI from one of the trees.

2 Select the **Show CI Attributes** button to open the Attributes dialog box.



Note: This dialog box is for viewing only.

The Attributes dialog box lists the CITs contained in this view and their attribute values.

- The CITs in the **Alphabetic** tab are listed in alphabetical order.
- The CITs in the **Categorized** tab are grouped according to the categories defined in the CI Type Manager. Click the **Expand** button to view all the CITs contained in this view.
- The **CI Attributes History** tab displays a list of attributes in which changes have occurred.

Note: The CI Attributes History tab only displays the attributes whose values have been defined as **Change Monitored, Asset Data**, or **Comparable** in the Add Attributes dialog box in the CI Type Manager. For details, see "Creating CIT Methods" on page 391.

The CI Attributes History tab has the following fields:

Field	Description
Attribute	The name of the attribute.
Change Date	The date when the change occurred.
Changer	Indicates the cause of the change. For example, the field can contain the name of a user or a discovery pattern.
New Value	The new value of the attribute.

You can reduce the number of attributes that appear in the CIs Attributes History tab by selecting an attribute from the **Filter by** list.

Note: The CI Attributes History tab is only updated every ten minutes.

Enabling Synchronized Selection

Select the **Synchronize Selection** check box at the top-left corner of the Compare snapshots dialog box to enable you to select a CI on one side and have its corresponding CI automatically selected on the other side.

By default, **Synchronize Selection** is selected. Clearing this check box allows you to compare two different CIs by selecting one from each of the two trees.

30

Gold Master Comparison

This chapter describes how Mercury Application Mapping enables you to compare the configuration of a Gold Master CI to other CIs of the same CIT.

Understanding Gold Master Comparison

Mercury Application Mapping enables you to generate a report that compares the configuration of a Gold Master CI to other CIs of the same CIT.

You choose the CI you want to use as the Gold Master CI. Then you choose the CIs whose configuration you want to compare to the Gold Master template. You can choose the CIs from existing views or from the CMDB.

In the report that is generated, Mercury Application Mapping specifies which of the selected CIs are configured differently.

Note: The CIs in this report appear under the following circumstances:

- Their attributes are marked as **Comparable** in the Add Attribute dialog box in the CI Type Manager.
- The CIs have descendents that are defined as **Comparable**.

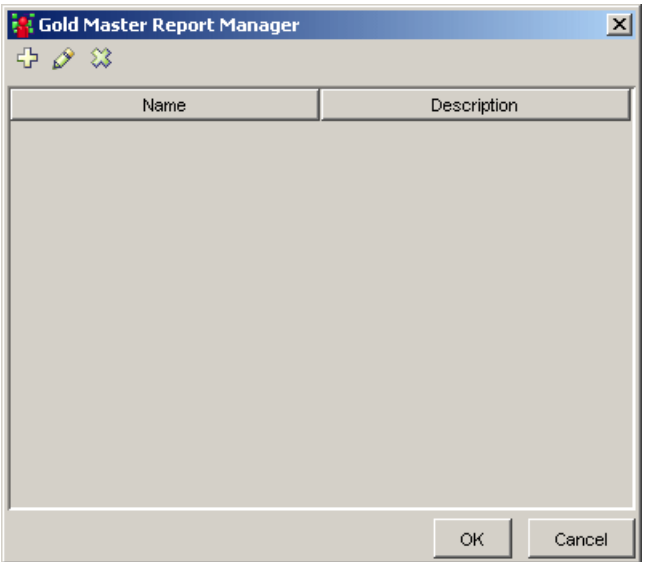
For details, see "Creating CITs" on page 383.

Comparing the Configuration of CIs to a Gold Master Template

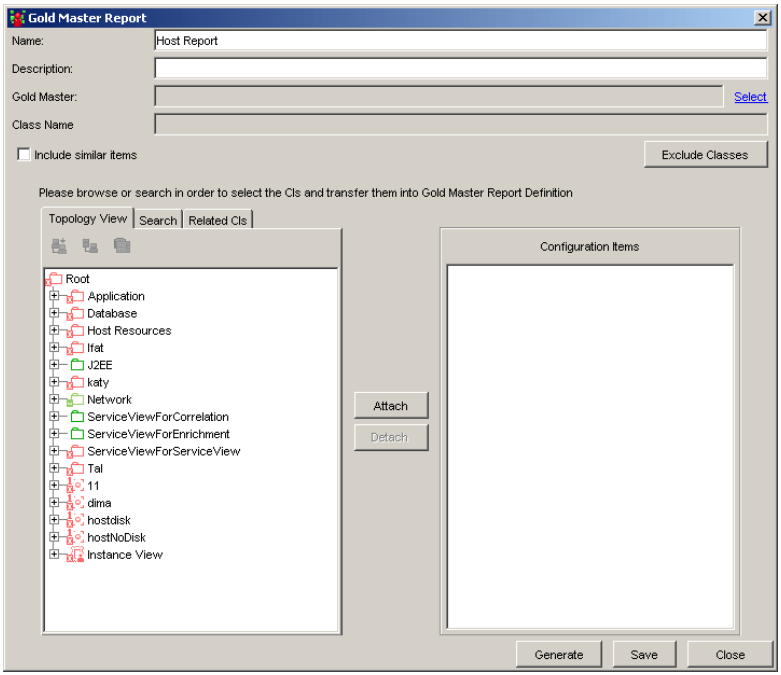
This section describes how to compare the configuration of specific CIs to a Gold Master template.

To compare the configuration of CIs to a Gold Master template:

1 In Topology View, select **Configuration Management** > **Gold Master Reports** to open the Gold Master Report Manager window.



2 Click the **Add** button to open the Gold Master Report window.



3 In the **Name** box, type a unique name for the Gold Master report.

4 (Optional) In the **Description** box, enter a description of the Gold Master report.

5 To select the CI you want to use as a Gold Master CI, click **Select** at the right end of the **Gold Master** box. The Topology View window opens.

- In the **Topology View** tab, select the required CI from different levels of the view hierarchy. To view and edit a CI's attributes, see "Displaying CI Attributes" on page 431.
- In the **Search** tab, search for a CI in existing views or in the entire CMDB. For details, see "Searching for a CI" on page 431.
- In the **Related CIs** tab, select a CI that is related to the selected CI in the **Topology View** tab. For details, see "Displaying Related CIs" on page 433.

6 Select the required CI. The selected CI appears in the **Gold Master** box and the CIT of the Gold Master CI appears in the **CIT Name** box.

7. Select the **Include similar items** check box if you want to include the compared CIs whose configuration is identical to that of the Gold Master CI.
8. To exclude a specific CIT from the Gold Master report, click **Exclude CITs** to open the Exclude CIT window.
9. From the Exclude CIT window, select the required CIT and click **OK**.
10. In the left pane, select the CI(s) that you want to compare to the Gold Master CI. You can select the CIs in the following ways:
    - In the **Topology View** tab, select the required CI(s) at different levels of the view hierarchy. You can select multiple CIs by holding down the CTRL button and clicking the required CIs. To view and edit a CI's attributes, see "Displaying CI Attributes" on page 431.
    - In the **Search** tab, search for CIs in existing views or in the entire CMDB. For details, see "Searching for a CI" on page 431.
    - In the **Related CIs** tab, select a CI that is related to the selected CI in the **Topology View** tab. For details, see "Displaying Related CIs" on page 433.
11. Use the **Attach** and **Detach** buttons to transfer to and remove CIs from the **CI Items** list. You can also select multiple CIs. The CIs that appear in the **CI Items** list are the CIs that are compared to the Gold Master CI.
12. Click **Save** in the Gold Master Report window to save the Gold Master report definition. The Gold Master report definition appears in the Gold Master Report Manager window.
13. To generate a report, click **Generate.** The Type dialog box opens. Define the format in which you want to receive the report. You can receive the report in the following formats:
    - **HTML**
    - **Excel**

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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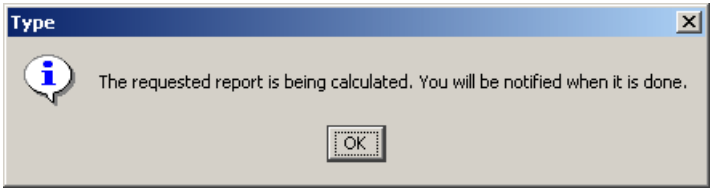
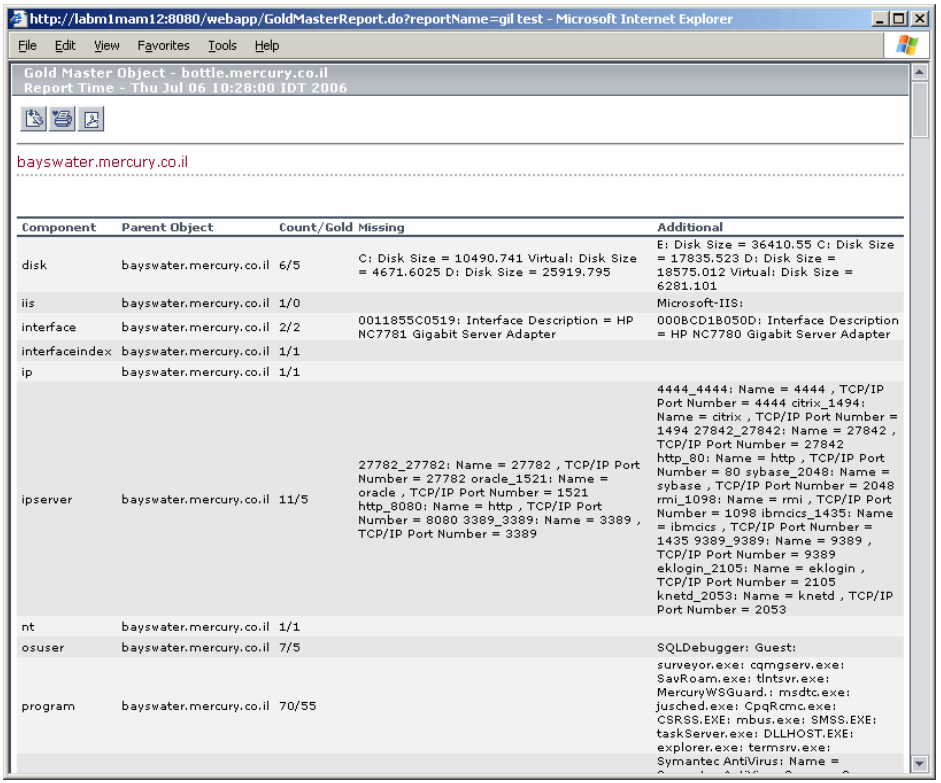
14 Click **OK**. The following message appears:



15 Click **OK** to create the report.



Component	Parent Object	Count/Gold	Missing	Additional
disk	bayswater.mercury.co.il	6/5	C: Disk Size = 10490.741 Virtual: Disk Size = 4671.6025 D: Disk Size = 25919.795	E: Disk Size = 36410.55 C: Disk Size = 17835.523 D: Disk Size = 18575.012 Virtual: Disk Size = 6281.101
iis	bayswater.mercury.co.il	1/0		Microsoft-IIS:
interface	bayswater.mercury.co.il	2/2	0011855C0519: Interface Description = HP NC7781 Gigabit Server Adapter	000BCD1B050D: Interface Description = HP NC7780 Gigabit Server Adapter
interfaceindex	bayswater.mercury.co.il	1/1		
ip	bayswater.mercury.co.il	1/1		
ipserver	bayswater.mercury.co.il	11/5	27782_27782: Name = 27782 , TCP/IP Port Number = 27782 oracle_1521: Name = oracle , TCP/IP Port Number = 1521 http_8080: Name = http , TCP/IP Port Number = 8080 3389_3389: Name = 3389 , TCP/IP Port Number = 3389	4444_4444: Name = 4444 , TCP/IP Port Number = 4444 citrix_1494: Name = citrix , TCP/IP Port Number = 1494 27842_27842: Name = 27842 , TCP/IP Port Number = 27842 http_80: Name = http , TCP/IP Port Number = 80 sybase_2048: Name = sybase , TCP/IP Port Number = 2048 rmi_1098: Name = rmi , TCP/IP Port Number = 1098 ibmcics_1435: Name = ibmcics , TCP/IP Port Number = 1435 9389_9389: Name = 9389 , TCP/IP Port Number = 9389 eklogin_2105: Name = eklogin , TCP/IP Port Number = 2105 knetd_2053: Name = knetd , TCP/IP Port Number = 2053
nt	bayswater.mercury.co.il	1/1		
osuser	bayswater.mercury.co.il	7/5		SQLDebugger: Guest:
program	bayswater.mercury.co.il	70/55		surveyor.exe: cqmgserv.exe: SavRoam.exe: tlntsvr.exe: MercuryWSGuard.: msdtc.exe: jusched.exe: CpqRcmc.exe: CSRSS.EXE: mbus.exe: SMSS.EXE: taskServer.exe: DLLHOST.EXE: explorer.exe: termsrv.exe: Symantec AntiVirus: Name =

The Gold Master report has the following fields:

Field	Description
Gold Master CI	The CI that is used as the template to which to compare the other CIs.
Report Time	The time the report was created.
Component	The CIT to which the CI belongs.
Parent CI	The CI under which the compared CI is located.
Count/Gold	Number of CIs in the compared CIs as opposed to the number of CIs in the Gold Master CI.
Missing	Lists the CIs that exist in the Gold Master CI but not in the compared CI.
Additional	Lists the CIs that exist in the compared CI but not in the Gold Master CI.

Deleting a Gold Master Report

This section describes how to delete a Gold Master report from the Gold Master Report Manager window.

To delete a Gold Master report:

1 Select **Configuration Management** > **Gold Master Reports** to open the Gold Master Report Manager window.

2 Select the Gold Master report you want to delete and click the **Delete** button.

3 Click **OK** to save the changes you have made.

Editing a Gold Master Report

This section describes how to edit a Gold Master report from the Gold Master Report Manager window.

To edit a Gold Master report:

1 Select **Configuration Management** > **Gold Master Reports** to open the Gold Master Report Manager window.

2 Select the Gold Master report you want to edit and click the **Edit** button to open the Gold Master Report window.

3 Edit the report as required. For details, see "Comparing the Configuration of CIs to a Gold Master Template" on page 425.

4 Click **OK** to save the changes you have made.

Displaying CI Attributes

This section describes how to display and edit a CI's attributes.

To display and edit a CI's attribute:

1 In the Gold Master Report window, select the **Topology View** tab.

2 Select the CI whose attributes you want to view.

3 Click the **Show CI's attributes** button to open the CI Attributes dialog box. The CI Attributes dialog box enables you to view and edit the attributes defined for the selected CI. For details, see "Viewing and Editing CI Attributes" on page 177.

Searching for a CI

Mercury Application Mapping search capabilities enable you to search for CIs to compare to the Gold Master CI either in specific views or in the entire CMDB. Theses capabilities also provide different search criteria, through which you can search for CIs according to their CIT, label, and/or attributes.

To search for CIs:

1 In the Gold Master Report window, select the **Search** tab.

2 From the **CIT** list, select the CIT of the CI(s) you want to find.

3 (Optional) Select **Derived** to find both the CI(s) of the selected CIT and any CIs derived from the selected CIT (inheritance CIs).

4 (Optional) In the **Options** area, if you want to find a specific CI(s) whose label you know, enter the CI's label in the **Label** box. Once you have entered a label, you can use the following search options:

- **Case Sensitive.** Distinguishes between uppercase and lowercase characters. When you select **Case Sensitive**, Mercury Application Mapping finds only those instances in which the capitalization matches the text you typed in the **Label** box.
- **Find whole words only.** Searches for occurrences that are whole words and not part of a larger word.
- **Starts With.** Searches for occurrences that begin with the entered text.
- **Ends With.** Searches for occurrences that end with the entered text.

Note: The options **Starts With** and **Ends With** are only available if you have not selected **Find whole words only**.

---

5 In the **Search In** area, select the place in which you want to conduct the search:

- **My Views.** Searches only in the views that belong to your user profile.
- **Database.** Searches in the entire CMDB.

6 Click **Search**. The search results are displayed in the **Search** tab.

7 To do another search, click **Back to Search**.

Displaying Related CIs

Mercury Application Mapping enables you to display the interdependencies of any selected CI (for details, see "Displaying Interdependent CIs" on page 181). You can select CIs to compare to the Gold Master CI from a list of related CIs.

You can display:

- All CIs connected to a selected CI that are part of a specific view.
- All CIs connected to the selected CI in the entire CMDB.

You select a CI in the **Topology View** tab, and the CIs related to the selected CI appears in the **Related CIs** tab.

To display the related CIs of a selected CI:

1. In the Gold Master Report window, select the **Topology View** tab.
2. Select the CI whose related CIs you want to display.
3. To display related CIs, do the following:

- Click the **Get Related CIs from View** button to display related CIs in the selected view.

- Click the **Get Related CIs from Database** button to display related CIs in the CMDB.

The related CIs are displayed in the **Related CIs** tab.

Viewing the Gold Master Report in Excel Format

This section describes how to view a Gold Master report in Excel format.

To view a Gold Master report in Excel format:

Click the **Export to Excel** button in the top-right corner of the Gold Master report.

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.

Printing a Gold Master Report

This section describes how to print a Gold Master report.

To print a Gold Master report:

Click the **Printer Friendly** button in the top-right corner of the Gold Master report.

Converting a Gold Master Report to PDF Format

This section describes how to convert a Gold Master report to PDF format.

To convert a Gold Master report to PDF format:

Click the **Export to PDF** button in the top-right corner of the Gold Master report.

31

CI Comparison

This chapter describes Mercury Application Mapping's comparison capabilities.

CI Comparison

A compound CI is a CI that is linked to another CI by a **Container link**. Comparing two compound CIs enables you to see the difference between the hierarchies of the two CIs. For example, Host A may contain only one disk whereas Host B may contain three disks. In addition, you can also see differences in the attributes defined as **Comparable** in the CI Type Manager (see "Creating CITs" on page 383). For example, there might be a difference in the operating system or disk capacity.

Note: You can only compare two CIs from the same CIT.

When you compare two compound CIs, you can either first select the CIs from the Map pane and then open the Compare compound CIs window, or, alternatively, open the Compare compound CIs window first and then select the two CIs you want to compare.

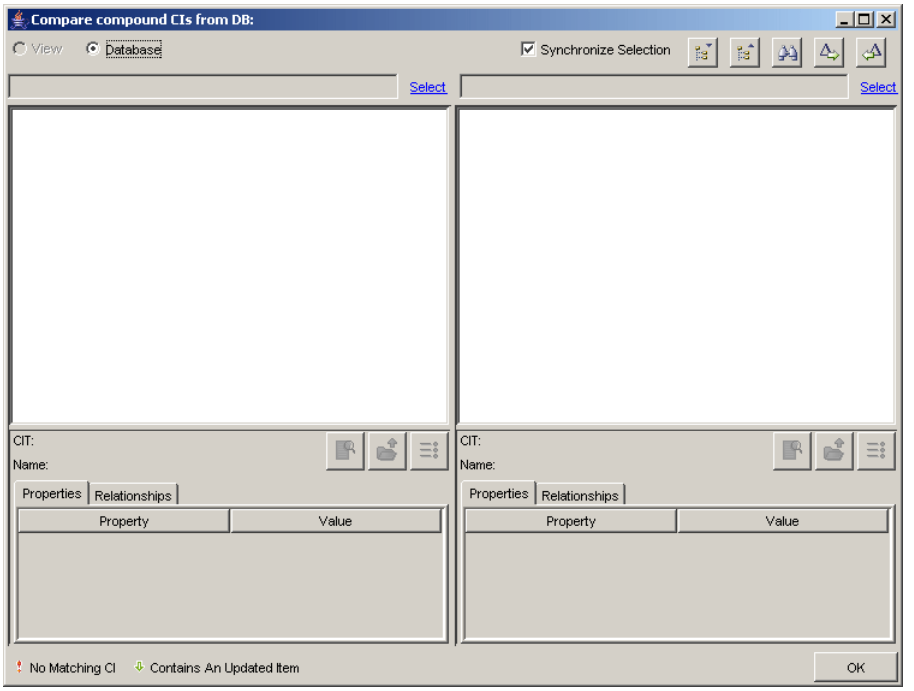
Mercury Application Mapping also allows you to display the child CIs of the compared CIs that appear in the selected view. For details, see "Comparing CIs by View or Database" on page 439.

Comparing Compound CIs

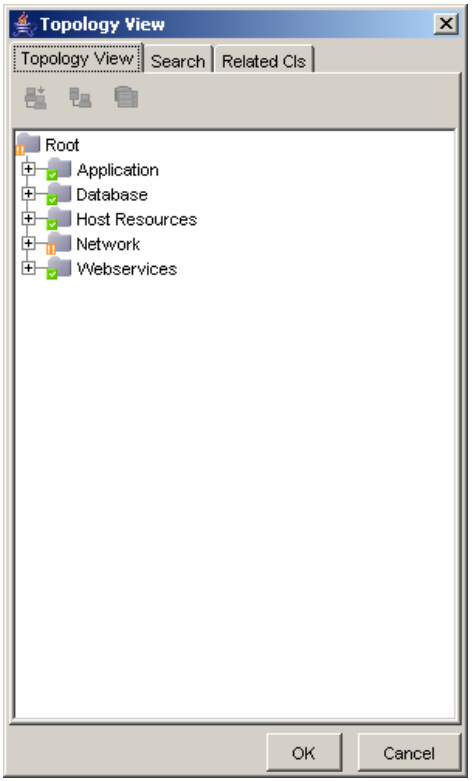
This section describes how to compare compound CIs.

To compare compound CIs:

1 Select **Configuration Management** > **Compare CIs**. The Compare compound CIs dialog box opens.



Select **2** Click **Select** above the top-right corner of each pane to select the CIs you want to compare. The following is displayed.



You can select CIs in the following ways:

- In the **Topology View** tab, select the required CI. To view and edit a CI's attributes, see "Viewing and Editing CI Attributes" on page 177.
- In the **Search** tab, search for CIs in existing views or in the entire CMDB. For details, see "Searching for CIs" on page 202.
- In the **Related CIs** tab, select a CI that is related to the selected CI in the **Topology View** tab. For details, see "Displaying Related CIs" on page 210.

Comparing CIs by View or Database

You can display the compared CIs and their child CIs that appear in the selected view or in the CMDB.

To compare CIs by view or database:

1. In the Compare Compound CIs dialog box, select the two CIs you want to compare. For details, see "Comparing Compound CIs" on page 437.
2. Select one of the following options in the top left-hand corner:
   - **View** to display the selected CIs and their child CIs that appear in the view.
   - **Database** to display the selected CIs and their child CIs that appear in the CMDB.

Understanding the Compare CIs Dialog Box

The Compare CIs dialog box is divided into two sections. Each side displays an hierarchical tree structure of the CIs you selected. When you select a CI on one side, the corresponding CI on the other side is automatically selected, provided the **Synchronize Selection** check box is selected. (For details, see "Enabling Synchronized Selection" on page 448.)

The following information is displayed under the tree when you select a CI:

- **CIT**. The name of the CIT to which the CI belongs as defined in the CI Type Manager.
- **Name**. The name of the CI as defined in the CI's label.

Understanding the Properties Tab

The **Properties** tab displays only the attributes of the CI whose values have been defined as **Comparable**. For more information about the **Comparable** option, see "Creating CITs" on page 383.

The **Properties** tab has the following two fields:

Field	Description
Property	Displays the attribute name for the selected CI which was marked as **Comparable** in the CI Type Manager.
Value	Displays the property value for the currently selected CI.

Expanding/Collapsing the Tree

This section describes how to expand and collapse the tree.

To expand the entire tree:

Select a CI and click the **Expand All** button.

To collapse the tree:

Select a CI and click the **Collapse All** button.

Finding Items Marked as Changed

This section describes how to find the items that have been marked as changed. For information on the change indicators, see "Understanding Change Indicators" on page 441.

To find the next occurrence of an item marked as changed:

Click the **Next Difference** button.

To find the previous occurrence of an item marked as changed:

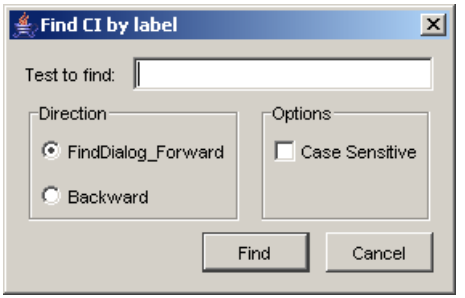
Click the **Previous Difference** button.

Finding a CI by its Label

You can search for a CI within the selected view whose label contains the searched text. You can specify a whole word or part of it.

To find the CI for which you are looking:

1 Click the **Find** button to open the Find CI by label dialog box.



2 In the **Text to find** box, type the text you want to find.

3 In the **Direction** section, specify whether you want to do a forward or backward search.

4 In the **Options** section, select the **Case Sensitive** box if you want the matches to be case sensitive.

5 Click **Find**. If Mercury Application Mapping finds a match, it selects the CIs.

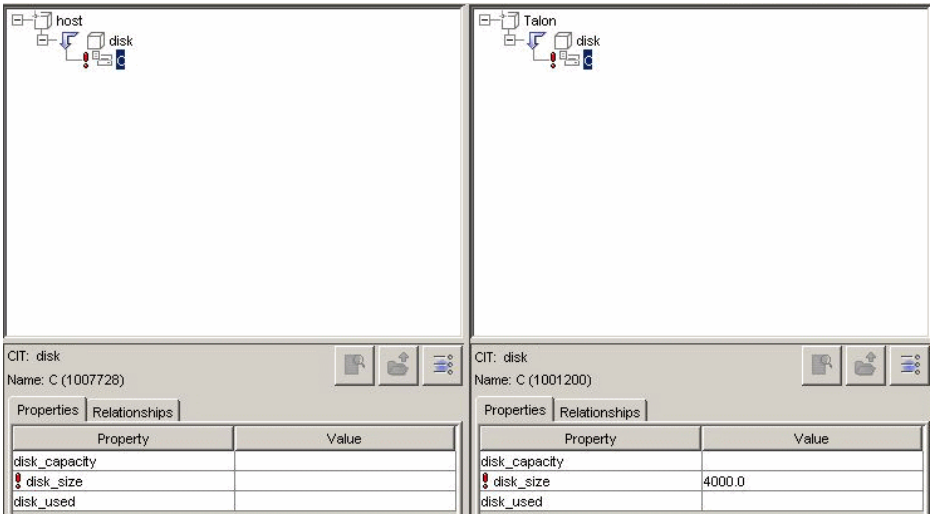
Understanding Change Indicators

This section describes the icons that indicate the kind of change that has occurred in the compared CIs. The indicator key appears at the bottom of the Compare compound CIs dialog box.

This section includes:

No Matching CI Icon

The **No Matching CI** icon indicates that a CI on one side does not match any corresponding CI on the other side. The example below shows that the CI called **C** has the **No Matching CI** icon because of the change to the disk size (see the **Properties** tab underneath the tree structure on the right side).



Has a Non-Matching Child Icon

The **Has a Non-Matching Child** icon indicates that the CI has a match but one of its children does not have a match. The **disk** CI in the illustration above has a **Has a Non-Matching Child** icon due to a change to its child CI.

Viewing and Comparing Configuration Files

The Compare compound CIs dialog box enables you to view a CI's configuration file, and also compare the configuration files of two different CIs.

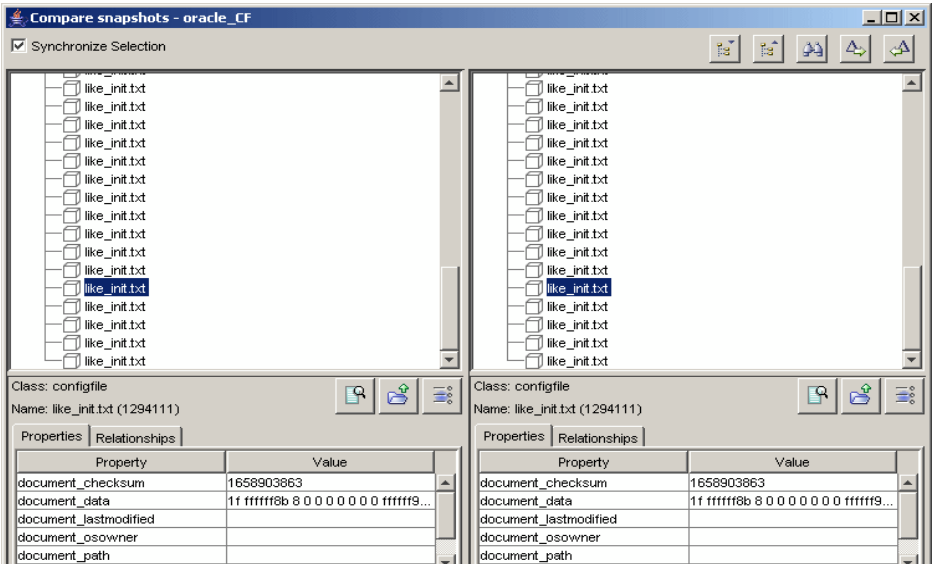
This section includes:

Viewing a CI's Configuration File

This section describes how to view a CI's configuration file.

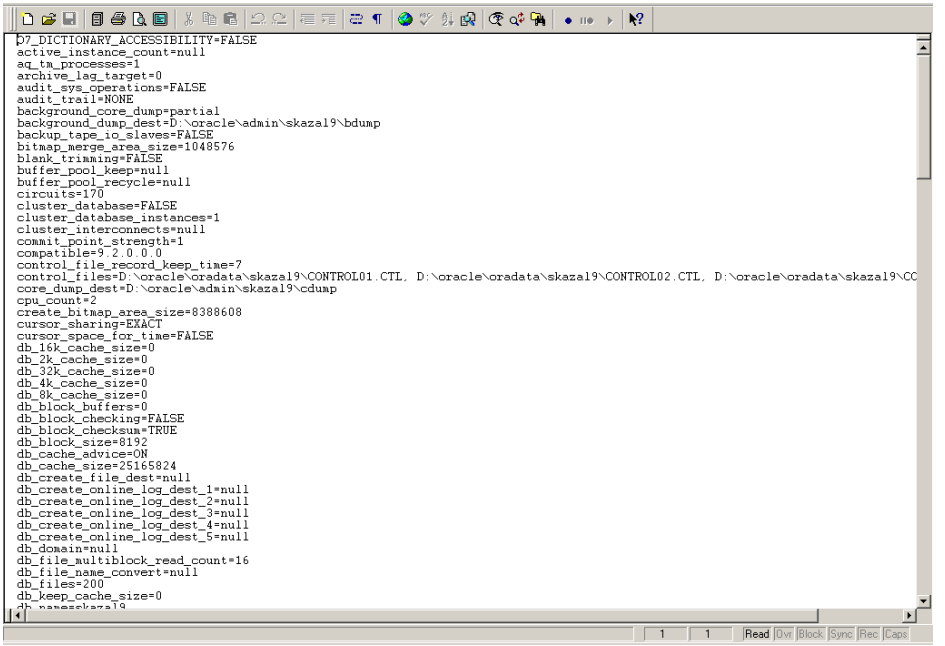
To view a CI's configuration file:

1 In the Compare compound CIs dialog box, click **Select** and select a CI of the CIT **configfile** on each side (for details, see "Comparing Compound CIs" on page 437).



2 Click the **Open** button to open the CI's configuration file.

Note: This button is only enabled if you have selected a CI of the CIT **configfile** from the tree.



Showing the Difference Between Two Configuration Files

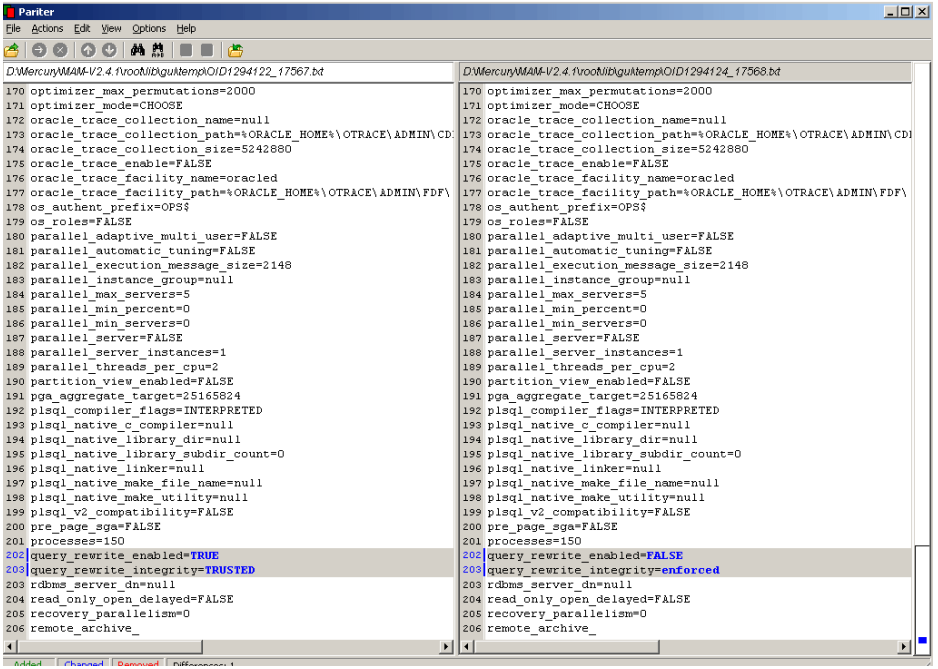
This section describes how to show the difference between two configuration files.

To show the difference between the two configuration files:

1 In the Compare compound CIs dialog box, click **Select** and select a CI of the CIT **configfile** from each side.

2 Click the **Show Difference** button.

Note: This button is only enabled if you have selected a CI of the CIT **configfile** from the tree.



The differences in the configuration files are marked in blue.

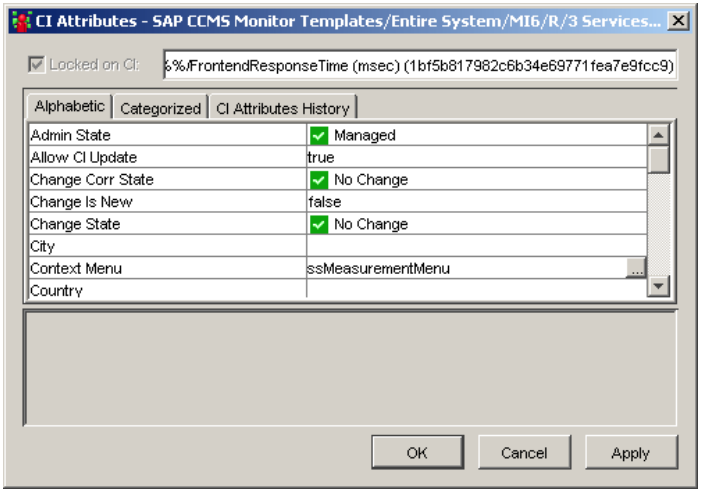
Displaying a CI's Attributes

You can display the selected CI's attributes.

To display a CI's attributes:

1 In the Compare compound CIs dialog box, select a CI from one of the trees.

2 Select the **Show CI Attributes** button to open the CI Attributes dialog box.



The CI Attributes dialog box enables you to view the attributes defined for the selected CI. The name of the selected CI appears at the top.

The CI Attributes dialog box has the following tabs:

- **Alphabetic**. Displays the CI's attributes in alphabetical order.
- **Categorized**. Displays the CI's attributes according to the CIT to which it belongs. Click the **Expand** button to display the CI attributes for that CIT.

- **CI Attributes History**. Displays a list of attributes in which changes have occurred.

Note: The CI Attributes History tab only displays the attributes whose values have been defined as **Change Monitored** in the Add Attributes dialog box in the CI Type Manager. For details, see "Creating CIT Methods" on page 391.

The CI Attributes History tab has the following fields:

Field	Description
Attribute	The name of the attribute.
Change Date	The date when the change occurred.
Changer	Indicates the cause of the change. For example, the field can contain the name of a user or a discovery pattern.
New Value	The new value of the attribute.

You can reduce the number of attributes that appear in the CIs Attributes History tab by selecting an attribute from the **Filter by** list.

Note: To view the updated information in the CI Attributes History tab, close the dialog box and then reopen it.

Enabling Synchronized Selection

Select the **Synchronize Selection** check box at the top-left corner of the Compare compound CIs dialog box to enable you to select a CI on one side and have its corresponding CI automatically selected on the other side.

The default for the **Synchronize Selection** check box is selected. Clearing this check box allows you to compare two different CIs by selecting one on each of the two trees. This allows you to compare two different CIs and see their different properties.

The nonmatching properties is marked by a **No Matching CI** icon in the **Properties** tab (see "No Matching CI Icon" on page 442).

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Configuration File Support

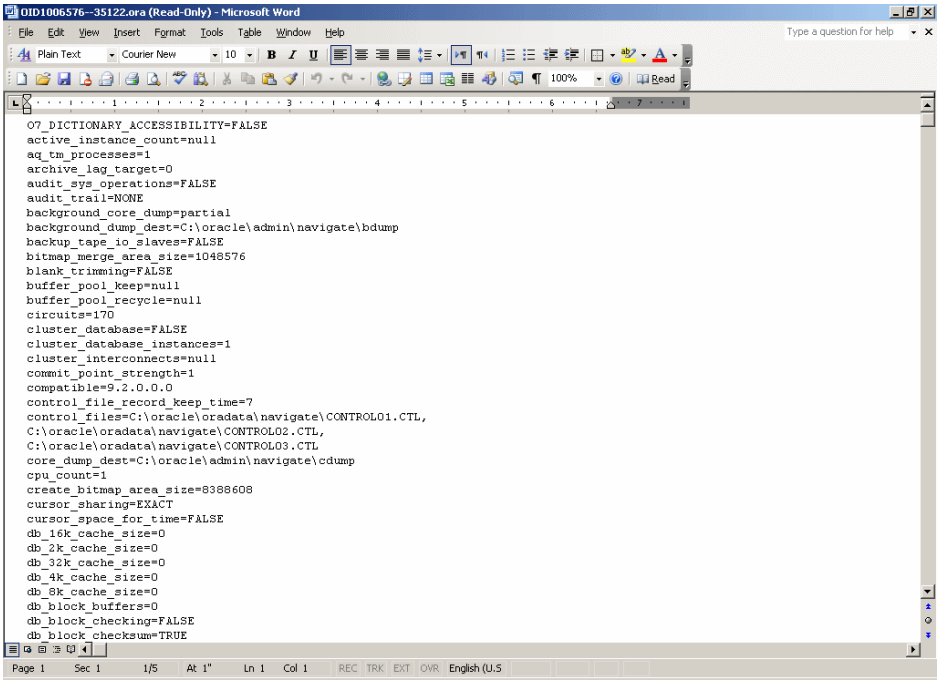
This chapter describes how to view the content of configuration files and compare the differences between them. Configuration files use the **.xml**, **.txt** or **.ini** extensions.

Viewing the Content of a Configuration File

This section describes how to open a configuration file.

To open a configuration file:

1. Select a CI of the CIT **configfile**.
2. Right-click and select **Open** to view the content.

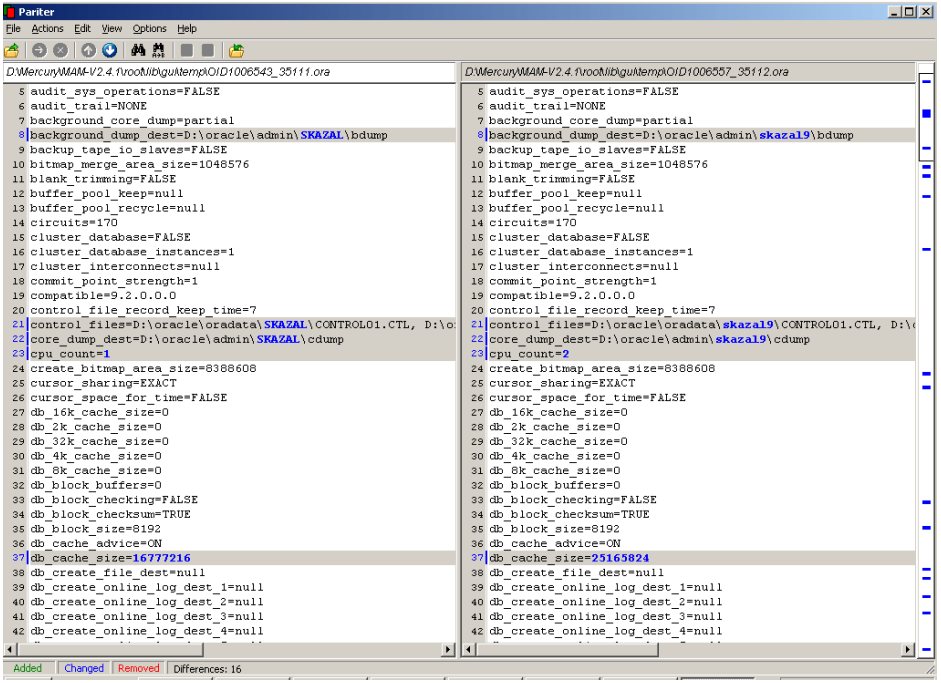


Showing the Difference between Two Configuration Files

This section describes how to compare the content of two configuration files.

To show the difference between the content of two configuration files:

1. Select two configuration files whose content you want to compare.
2. Right-click and select **Show Differences** to display the differences between the two configuration files.



33

Impact Analysis

This chapter explains how Mercury Application Mapping enables you to assess the impact of infrastructure events.

About Evaluating the Impact of Infrastructure Events

Mercury Application Mapping enables you to simulate how changes you want to make will impact your system. Using the Ticket Manager, you create a Ticket, which includes the changes you want to make in the system. For example, a new software installation or upgrade. You then add the required CI(s) to the Ticket. The CIs you add to the Ticket represent the changes you want to make to the system. Mercury Application Mapping evaluates the impact the CIs associated with the Ticket will have on the system when these CIs are in downtime. You then generate a report displaying the CIs in the system, which will be impacted by the changes specified in the Ticket.

Setting Ticket Manager Configurations

The Ticket Manager can appear in different modes, depending on how you configure the following definitions in the **appilogConfig.properties** file, located in: **\<Mercury Application Mapping root directory>\MAMServer\root\lib\server**.

- **impact.analysis.allow.ci.edit**. Determines whether or not you can:
  - Modify the list of assets in a ticket.
  - Add or remove CIs and save those changes.

  False = does not enable you to create new Tickets. False is the default.

  True = enables you to create new Tickets.
- **impact.analysis.read.only**. Determines whether or not you can create and modify ticket properties.

  False = does not enable you to modify Ticket properties.

  True = enables you to modify Ticket properties. True is the default.

Evaluating the Impact of Infrastructure Events

This section describes how to evaluate the impact of infrastructure events.

To evaluate the impact of infrastructure events:

1 Click **Configuration Management** > **Impact Analysis** to open the Ticket Manager screen.

The Ticket Manager screen is divided into the following panes:

Pane	Description
Ticket List	Contains the following columns: ➤ A list of the Tickets that were created ➤ The report that was generated for that Ticket
Ticket Details	The Ticket's details.

2 In the Ticket List pane, click the **Add New Ticket** button to create a new Ticket. The **Create** button appears in the Ticket Details pane.

3 In the Ticket Details pane, define the Ticket's details as required and click **Create**. The new Ticket appears in the Ticket List pane.

4 To remove an existing ticket from the Ticket List pane, select the ticket you want to remove and click the **Delete Ticket** button.

5 Click **Asset Selection** in the Ticket Details pane to open a window that allows you to select the CI(s) you want associated with the selected Ticket.

6 In the **Tree** tab, select the check box to the left of the required CI(s) and use the right arrow to add CIs to the Ticket Details pane.

7 To remove a CI from a Ticket, select the check box to the left of the required CI(s) in the Ticket Details pane and click the left arrow.

8 To find a CI using the Search tab, do the following:

- Click the **Search** tab.
- Enter the text of the label of the CI for which you want to search.
- Click **Go**. The Search tab returns all CI occurrences whose labels contain the text entered or part of it.
- Select the check box to the left of the required CI(s) and use the right arrow to add CIs to the Ticket Details pane.
- To remove CIs from the Ticket Details pane, select the check box to the left of the required CI(s) in the Ticket Details pane and click the left arrow.

9 Click the **Show Impact** button to generate an Impact Analysis report. This report displays a list of CIs that are impacted in the system as a result of the simulated changes.

The Impact Analysis report displays the results as follows:

- The CIs in the **Impacted Services** tab are grouped according to the hierarchy of the folders and views in the Explorer Tree pane.
- The CIs in the **Impacted Resources** tab are sorted by CIT.

Note: You can also use a URL to create an Impact Analysis report. For details, see "Creating an Impact Analysis Report User Reports Using a URL" on page 456 below.

Creating an Impact Analysis Report User Reports Using a URL

You can build a URL that opens an Impact Analysis Report directly in the browser, without being located in the Mercury Application Mapping context.

Build the URL using the following syntax:

http://<**serverName**>:<**serverPort**>/webapp/GenerateImpactReport.do?impactCategory=<**impactCategory**>&impact_severity=<**impact_severity**>&objectIds=<**[xxx,yyy,zzz]**>&userName=<**userName**>&userPassword=<**userPassword**>

The parameters whose values must be provided are described below:

- <**ServerName**>. The name of the Mercury Application Mapping server.
- <**impactCategory**>. The name of the category to be analyzed.
- <**impact_severity**>. 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://mamserver:8080/webapp/GenerateImpactReport.do?impactCategory=change&impact_severity=2&objectIds=[700737a29899f4f66c70a67c6b9cb386,9a6faadff8b547a2c62fc454dfd3661b,e5659759ed3b41cf01dfbb47191892fa]&userName=admin&userPassword=admin
```

Modifying a Ticket's Details

This section describes how to modify an existing Ticket.

To modify an existing Ticket:

1. In the Ticket List pane, select the Ticket you want to modify.
2. In the Ticket Details pane, make the required changes.

   Click **Save**.

Part XI

Appendixes

A

CI Type Descriptions

This section provides additional information about CI Types, permitted relationships between CIs, and key attributes of CITs.

Diagram of CI Type Host and Permitted Relationships

A CI can represent hardware, software, services, business processes, and so forth. CIs with similar properties are grouped into a CI type (CIT). Each CIT provides a template for creating a new CI and its associated properties.

A relationship defines the link between two CIs. Relationships represent the dependencies and connections between the entities in your IT environment. As an example, in the diagram below all CITs that can connect to CIT host are listed with the permitted relationships between them.

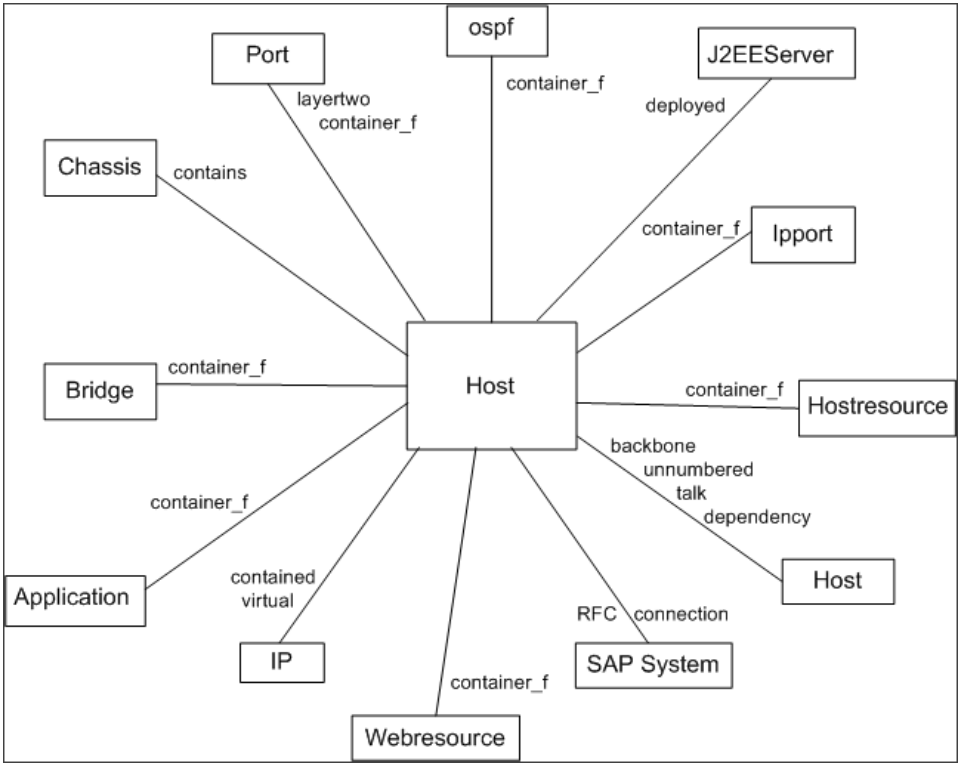
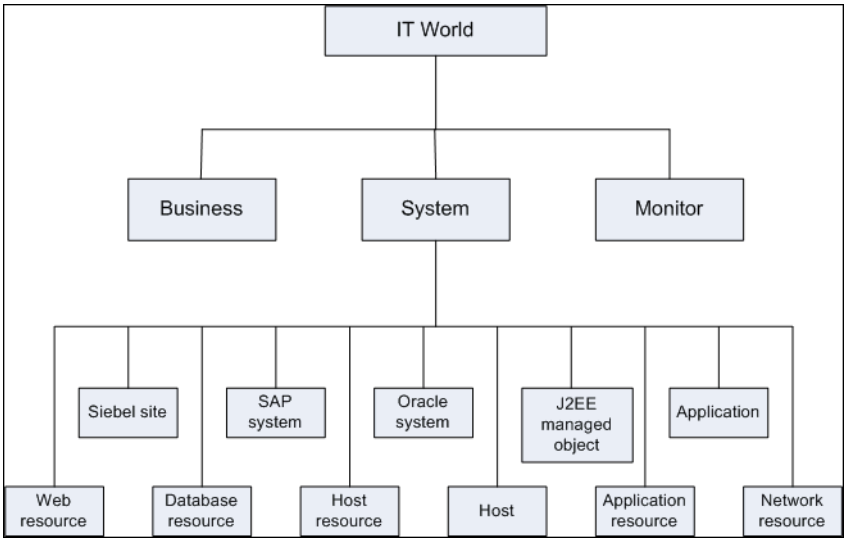


Diagram of CITs Whose Parent Is System

The following diagram depicts all CITs whose immediate parent is system. To view the entire list of CITs under system, see "List of Parent, Description, and Key Attributes of All CI Types" below.



List of Parent, Description, and Key Attributes of All CI Types

The following table lists all CITs defined in the CIT Manager, the CIT's parent, a brief description, and key attributes if they exist.

CI Type Name	Parent	Description	Key Attributes
agent	application	Virtual class to all agents.	
apache	webserver	Apache Web Server.	webserver_configfile
apachevirtualhost	applicationresource	Apache Virtual Host.	

CI Type Name	Parent	Description	Key Attributes
oracleapplication	oracleappsresource	Oracle E-Business Suite Application.	
applicationresource	system	Virtual class to all application resources.	root_container, data_name
atmport	networkresource	A port on an Asyschronous Transmit Mode switch.	atmport_pnniportnumber, atmswitching_pninodeaddress
atmswitch	host	Asynchronous Transfer Mode switch: a network technology that supports realtime voice, video, and data. The topology uses switches that establish a logical end-to-end circuit.	
atmswitching	networkresource	Asynchronous Transfer Mode switching.	ress
bridge	networkresource	A device that connects one local area network (LAN) to another.	bridge_basemacaddr
business	it_world	Business classes.	

CI Type Name	Parent	Description	Key Attributes
chassis	networkresource	A chassis that holds Asynchronous Transfer Mode (ATM) switches.	chassis_uniqueid
ipclient	ipport	The client port to which the server port is connected.	ipclient_remoteip, ipclient_remoteport
concentrator	host	A switch or a hub with no SNMP agent.	host_key, data_name
configfile	document	Holds data from a configuration file of an application.	
connectionpool	jdbcresource	A cache of database connections maintained in the database's memory so that the connections can be reused when the database receives future requests for data. Connection pools are used to enhance the performance of executing commands on a database.	

CI Type Name	Parent	Description	Key Attributes
cpu	hostresource	Central Processing Unit.	cpu_cid
csqlprocesses	sqlprocesses	An CI representing a Complete SQL process.	
database	application	A collection of data that is organized so that its contents can be easily accessed, managed, and updated.	
databaseresource	system	A virtual class to all database resources.	root_container, data_name
dbarchivefile	file	An archive file for a Microsoft SQL Server 2000 Analysis Services database. It contains the contents of the directory whose name is the same as the database name.	
dbcontrolfile	file	A database file containing information needed to maintain and verify database integrity.	

CI Type Name	Parent	Description	Key Attributes
dbdatafile	databaseresource	The database file that contains the database's data.	dbdatafile_fileid
dbextent	databaseresource	A additional unit of space allocated to a SQL Server CI, such as a table or index, whenever the CI needs more space.	dbextent_segment type, dbextent_segment name, dbextent_extenti, dbextent_owner
dbindex	databaseresource	A mechanism to locate and access data within a database. An index may refer to one or more columns and be a means of enforcing uniqueness in column values.	dbindex_owner
dbjob	databaseresource	A specified series of operations performed sequentially by the database manager.	dbjob_jobid

CI Type Name	Parent	Description	Key Attributes
dblinkobj	databaseresource	The link between databases that stores information about how to connect to the remote database.	
dbredofile	file	A transaction log that records data modifications made in the database.	
dbsegment	databaseresource	Contains the component database and any utilities provided by the developers for the DBA's use in installing and filling that particular database.	dbsegment_owne, dbsegment_segmenttype
dbsnapshot	databaseresource	A backup that can be created from an entire database or individual files.	
dbtable	databaseresource	Organizes the information about a single topic into rows and columns.	dbtable_owner

CI Type Name	Parent	Description	Key Attributes
dbtablespace	databaseresource	Represents the amount of space required to store the data in a table.	
dbuser	databaseresource	A defined user in the database.	
db2	database	An IBM database management system that serves a number of different operating system platforms.	
dbaobjects	databaseresource	An CI that represents a database procedure, function, package, and package-body.	dbaobjects_type
daemon	hostresource	A program that forwards requests to other programs or processes.	
dir	file	The name of a group of files in the same location.	file_path
disk	hostresource	A logical division of a hard disk.	

CI Type Name	Parent	Description	Key Attributes
document	applicationresource	A physical file.	
drive	logicaldisk	A hard disk drive.	
ejb	j2eemanagedobject	EJB component in Sun's J2EE platform that provides a Java environment for developing and running distributed applications.	
ejbmodule	j2eemodule	A module containing Enterprise JavaBeans.	
elan	networkresource	Emulated Local Area Network:can be created using ATM LAN emulation technology to join together existing LANs running protocols such as IP, Novell IPX, AppleTalk, and DECnet.	

CI Type Name	Parent	Description	Key Attributes
enterasyse7blade	host	The atmswitch class represents a network element which its oid represents an enterasyse7blade.	
entitybean	ejb	An Enterprise JavaBean entity.	
eum_monitor	monitor	Monitor system classes.	
eventlog	hostresource	Microsoft event log data.	eventlog_type, eventlog_application
file	hostresource	An entity of data.	
filesystem	logicaldisk	UNIX file system.	
firewall	host	A gateway that limits access between networks in accordance with local security policy.	
host	system	A network element that has a unique IP address.	host_key
hostresource	system	Virtual class to all host resources.	root_container,data_name

CI Type Name	Parent	Description	Key Attributes
httpcontext	applicationresource	An IBM HTTP server plug-in.	root_container, data_name
ibmhttpserver	webserver	An IBM HTTP server.	webserver_configfile
mqaliasq	mqqueuelocal	The Message Queue alias queue to a local queue or to a remote queue definition.	root_container, data_name
mqchannel	applicationresource	Message Queue channel data.	root_container, data_name
mqchclntconn	mqmqichannel	Message Queue client connection channel for Message Queue Interface (MQI) calls.	root_container, data_name
mqcluster	applicationresource	Message Queue cluster data.	
mqchclusrcvr	mqmsgreceiverchannel	Message Queue cluster receiver channel.	root_container, data_name
mqchclussdr	mqmsgsenderchannel	Message Queue cluster sender channel.	root_container, data_name
mqmsgchannel	mqchannel	Message Queue channel data.	root_container, data_name
mqmsgreceiverchannel	mqmsgchannel	Message Queue channel data.	root_container, data_name
mqmsgsenderchannel	mqmsgchannel	Message Queue channel data.	root_container, data_name

CI Type Name	Parent	Description	Key Attributes
mqmqichannel	mqchannel	Message Queue channel data.	root_container, data_name
mqqueue	applicationresource	Message Queue definition data.	
mqqueuelocal	mqqueue	A local Message Queue queue.	root_container, data_name
mqqueuemanager	applicationresource	Message Queue manager data.	
mqqueueremote	mqqueue	A remote Message Queue queue definition.	root_container, data_name
mqchrcvr	mqmsgreceiverchannel	Message Queue receiver channel.	root_container, data_name
mqchrqstr	mqmsgreceiverchannel	Message Queue requester channel.	root_container, data_name
mqchsdr	mqmsgsenderchannel	Message Queue sender channel.	root_container, data_name
mqchsvr	mqmsgsenderchannel	Message Queue server channel.	root_container, data_name
mqchsvrconn	mqmqichannel	Message Queue server connection channel for Message Queue Interface (MQI) calls.	root_container, data_name
mqxmitq	mqqueuelocal	An Message Queue transmission queue.	root_container, data_name

CI Type Name	Parent	Description	Key Attributes
webspheremq	application	Message Queue for WebSphere data.	
iis	webserver	Internet Information Server.	
interface	networkresource	A physical and logical way to support an attachment of any device to a connector or to another device.	interface_macaddr
interfaceindex	networkresource	Represents the unique number of an interface.	interfaceindex_index
ip	networkresource	Internet Protocol: the address which identifies the sender or the receiver of information sent across the internet.	ip_address, ip_domain
ipfw	ip	The IP address of a firewall.	ipfw_hopnumber, ipfw_trailid
ipunknown	ipport	Unknown TCP/UDP port.	
j2eeapplication	j2eedeployedobject	An application inside the application server.	

CI Type Name	Parent	Description	Key Attributes
j2eecluster	j2eeresource	A group of application servers that run a J2EE application as if they were a single server.	data_name
j2eedeployedobject	j2eemanagedobject	J2EE deployed CI.	root_container, data_name
j2eedomain	j2eemanagedobject	An application server domain.	
executequeue	j2eeresource	executequeue	data_name
j2eemanagedobject	system	A virtual class to all J2EE resources.	root_container, data_name
j2eemodule	j2eedeployedobject	J2EE deployed CI.	
j2eeresource	j2eemanagedobject	A virtual class to all J2EE resources.	
j2eeserver	application	A server within a J2EE application server.	
jdbcdatasource	j2eemanagedobject	Java Database Connectivity data source.	
jdbcprovider	jdbcresource	A provider for Java Database Connectivity.	

CI Type Name	Parent	Description	Key Attributes
jdbcresource	j2eeresource	A virtual class to all Java Database Connectivity resources.	
jmsdatastore	jmsresource	Java Messaging Service data store.	
jmsdestination	jmsresource	Java Messaging Service destination.	
jmsprovider	jmsresource	A provider for Java Messaging Service.	
jmsresource	j2eeresource	A virtual class to all Java Messaging Service resources.	
jmsserver	jmsresource	Java Messaging Service server.	
JVM	j2eemanagedobject	Java Virtual Machine.	
lb	host	Load Balancer:distributes processing and communication activity evenly across a network so that no single device is overwhelmed.	
logdir	dir	Log directory definition.	file_path

CI Type Name	Parent	Description	Key Attributes
logfile	file	Requested information which is kept in a file.	
logicaldisk	hostresource	A logical disk.	
lpar	host	Logical partition: the division of a computer's processors, memory, and storage into multiple sets of resources so that each set of resources can be operated independently with its own operating system instance and applications.	
mainframe	host	Main computer that can serve many users.	
marconiatmswitch	atmswitch	AMarconi ATM switch.	
memory	hostresource	Random access memory (RAM).	

CI Type Name	Parent	Description	Key Attributes
messagedrivenbean	ejb	Enterprise JavaBeans in Sun's J2EE platform. Message driven beans are generated to process Java Messaging Service (JMS) messages.	
mibtree	hostresource	Management Information Base tree: a database of CIs that can be monitored by a management system. SNMP is a management protocol of MIB.	mibtree_oid
monitor	it_world	Monitoring classes.	
msdomain	networkresource	Represents Microsoft domains and workgroups in a Microsoft network.	
netdevice	host	A network device.	
netprinter	netdevice	A printer device that serves the network's users.	

CI Type Name	Parent	Description	Key Attributes
network	networkresource	A series of elements or nodes connected to each other by communication paths.	network_domain, network_netmask, network_netaddr
networkresource	system	A virtual class to all network resources.	root_container, data_name
nt	host	Host with Microsoft operation system NT.	
service	hostresource	Software that can be controlled by the Microsoft Management Console (MMC).	
ntcmd	shell	xcmd or pstools. NT command line tools: allows you to execute applications on remote systems without installing any client software. Examples of such tools are xCmd and PsTools.	
oracle	database	Oracle database.	

CI Type Name	Parent	Description	Key Attributes
oraclesystem	system	Oracle E-Business Suite.	oraclesystem_dbaddress
oracleappsresource	applicationresource	Oracle E-Business Suite Resource.	
oracleias	j2eeserver	Oracle Internet Application Server.	
osuser	hostresource	Operating system user.	
ospf	networkresource	Open Shortest Path First (OSPF) protocol: an interior gateway protocol used to distribute routing information within a single autonomous system.	ospf_areaid
port	networkresource	A place which being physically connected to another device.	port_number, root_container
printq	hostresource	A printer queue.	
printer	hostresource	A printer device.	
process	hostresource	An instance of a program.	
program	process	Name of an installed application or software.	data_name

CI Type Name	Parent	Description	Key Attributes
ras	host	RAS (row address strobe) is a signal which is sent to dynamic random access memory (DRAM) Row Address Strobe: a clock signal in a dynamic random access memory (DRAM) chip used to pinpoint the row of a particular bit in a row-column matrix. Remote Access Server.	
router	host	A device or software connected to at least two networks. It decides the next network point to which to send the information packet.	

CI Type Name	Parent	Description	Key Attributes
sap_application_component	sap_resource	A group of SAP transactions with common application components.	type
sap_app_server	application	SAP Application Server.	
sap_business_process	sap_resource	SAP Business Process.	
sap_business_scenario	sap_resource	SAP Business Scenario.	
sap_client	sap_resource	SAP Client.	
sap_gateway	application	SAP Gateway.	
sap_its_agate	application	SAP Internet Transaction Server AGate: an application gateway that establishes a link to the R/3 system and performs the processing tasks required to move data between an R/3 application and the Internet.	

CI Type Name	Parent	Description	Key Attributes
sap_its_wgate	sap_resource	SAP Internet Transaction Server WGate: a web gatewaythat establishes a connection between Internet Transaction Server (ITS) and the web server. It forwards user requests to the AGate.	
sap_j2ee_app_server	sap_app_server	Represents an instance of the J2EE Application server.	
sap_j2ee_dispatcher	sap_resource	Receives a client request and forwards it to the server process with the lowest capacity usage.	
sap_j2ee_server_process	sap_resource	A single J2EE server process instance.	
sap_process_step	sap_resource	SAP Process Step.	
sap_bp_project	sap_resource	SAP Business Blueprint Project.	

CI Type Name	Parent	Description	Key Attributes
sap_r3_server	sap_app_server	SAP's integrated software solution for client/server and distributed open systems.	
sap_resource	applicationresource	SAP Resource.	
sap_system	system	A logical unit that groups SAP-related entities and possibly other entities into one homogenous SAP deployment.	data_name
sap_transaction	sap_resource	A business process defined in the SAP System.	root_container, data_name
sap_transport	sap_resource	SAP Transport.	
sap_transport_change	sap_resource	SAP Transport Change.	
sap_work_process	sap_resource	A logical single-instance representation of a certain type of work process.	
ipserver	ipport	A known server port listening to or connected to a client port.	

CI Type Name	Parent	Description	Key Attributes
oracleappservice	oracleappsresource	Oracle E-Business Suite Application Service.	
oracleappservicemanager	oracleappsresource	Oracle E-Business Suite Service Manager.	
servlet	j2eemanagedobject	A server-side Java program that provides additional features to the server.	
sessionbean	ejb	An Enterprise JavaBean session.	
shell	application	xcmd or pstools	
siebel_app_server	application	A server application running the Siebel business logic tier.	root_container, data_name
siebel_component	applicationresource	A process on the Siebel Application Server incorporating some Siebel application functionality.	alias

CI Type Name	Parent	Description	Key Attributes
siebel_comp_grp	applicationresource	An collection of Siebel components running on the Siebel application server.	alias
siebel_gateway	application	A coordinating server that routes requests to the correct component.	
siebel_site	system	A logical unit describing a group of servers functioning together to build a complete Siebel toolset experience.	gateway_address, data_name
siebel_web_app	applicationresource	A Siebel application's location on the web server.	
siebel_wse	applicationresource	Web Server Extension: a supported add-on to a web server.	

CI Type Name	Parent	Description	Key Attributes
snmp	agent	Simple Network Management Protocol: protocol used by network hosts to exchange information used in network management.	snmp_port
software	hostresource	The general name of a program.	data_name
application	system	A virtual class to all applications.	root_container, data_name
sqlalert	databaseresource	SQL Server Agent compares events to user-defined alerts. When the Agent finds a match, it fires an alert.	sqlalert_alertid
sqlbackup	databaseresource	A backup file generated by the system or by user requests.	
sqldatabase	databaseresource	A SQL database from Microsoft.	
sqlfile	databaseresource	A SQL file.	

CI Type Name	Parent	Description	Key Attributes
sqljob	databaseresource	A specified series of operations performed sequentially by a SQL Server Agent. A job can perform a wide range of activities, including running Transact-SQL script, command line applications, and Microsoft ActiveX scripts.	sqljob_jobid
sqljobstep	databaseresource	An action that the job performs on a database or a server. Every job must have at least one job step.	sqljobstep_stepid
sqlperformancemonitor	databaseresource	Performance monitor constants that describe Microsoft Windows NT Performance Monitor polling behavior.	

CI Type Name	Parent	Description	Key Attributes
sqlprocesses	applicationresource	SQL processes.	sqlprocesses_hostname, sqlprocesses_databasename, sqlprocesses_program
sqlserver	database	SQL server.	
ssh	shell	Secure Shell: an agent that provides secure encrypted communication between two untrusted hosts over an insecure network.	
statefulsessionbean	sessionbean	EJB stateful: an Enterprise JavaBean that is associated with one client at a time. It is assigned to a new client only after a previous client releases it or it times out.	
statelesssessionbean	sessionbean	EJB stateless: an Enterprise JavaBean that is context independent. It does not maintain a state between session calls.	

CI Type Name	Parent	Description	Key Attributes
sunoneserver	webserver	Sun ONE Web Server.	
switch	host	A device that sends incoming data from any of multiple input ports to a specific output port in order to move the data toward its intended destination.	
switchrouter	switch	A switch that also acts as a router.	
sybase	database	Sybase.	
sybasedb	databaseresource	Sybase database.	
sysplex	networkresource	SYStem comPLEX: the multiprocessing capability of IBM MVS/ESA and OS/390 mainframes.	
system	it_world	System classes.	
system_monitor	monitor	Monitor system classes.	
ipport	networkresource	A logical connection between ports using TCP/IP Internet Protocol.	ipport_number

CI Type Name	Parent	Description	Key Attributes
telnet	shell	A telnet connection for TCP/IP networks that allows you to execute programs on a remote computer.	
terminalserver	host	A device that provides terminals with a common connection using RS232 protocol.	
tomcat	webserver	A web server from the Apache Software Foundation that executes Java servlets and displays web pages that have embedded Java code.	
trail	networkresource	The Trail element describes the path from one network to another.	trail_destnetmask, trail_destnetaddr, trail_srcnetdomain, trail_srcnetaddr, trail_srcnetmask, trail_destnetdomain
unix	host	UNIX operating system.	

CI Type Name	Parent	Description	Key Attributes
url	webresource	Uniform Resource Locator: the address of a resource on the Internet.	url_connectstring
vax	host	VAX:Virtual Address eXtension machine.	
vlan	networkresource	Virtual LAN: a network of computers that behave as if they are connected to the same wire even though they may be physically located on different segments of a LAN.	vlan_number
webapplication	j2eedeployedobject	Web application.	
oraclewebcomponent	oracleappsresource	Oracle E-Business Suite Web Component.	
webmodule	j2eemodule	J2EE deployed CI.	
webresource	system	A virtual class to all web resources.	root_container, data_name

CI Type Name	Parent	Description	Key Attributes
webserver	application	A web server.	
websphere	application	A WebSphere application server based on a Java 2 platform.	root_container, data_name
wmi	agent	Windows Management Instrumentation : a connection allowing scripts to monitor and control managed resources throughout the network.	
xterminal	host	A device using X11 emulation to connect to a UNIX machine.	
db2user	databaseresource	A user in a DB2 database.	

Permitted Relationships Between CI Types

The following table lists all CI types defined under CIT system and their permitted relationship with other CI types. For more information about CI types, see "List of Parent, Description, and Key Attributes of All CI Types" on page 463. The definition of each relationship can be found in Relationship Definitions.

CI Type 1	CI Type 2	Relationship
application	applicationresource	container_f
atmport	atmport	pnniconnection
	interfaceindex	parent
	ip	uniconnection
atmswitch	atmswitching	container_f
atmswitching	atmport	container_f
bridge	port	container_f
	port	contains
chassis	elan	chassiselanmap
concentrator	port	layertwo
connectionpool	database	depend

CI Type 1	CI Type 2	Relationship
database	daemon	depend
	dbaobjects	container_f
	dbarchivefile	container_f
	dbcontrolfile	container_f
	dbdatafile	container_f
	dbjob	container_f
	dblinkobj	container_f
	dbredofile	container_f
	dbsegment	container_f
	dbsnapshot	container_f
	dbtablespace	container_f
	dbuser	container_f
	process	dbclient
	service	depend
dbdatafile	dbextent	container_f
dbindex	dbextent	resource
dblinkobj	database	dblink
dbsegment	dbextent	resource
dbsnapshot	dbjob	depend
	dblinkobj	resource
dbtable	dbextent	resource
dbtablespace	dbdatafile	resource
	dbindex	container_f
	dbsegment	resource
	dbtable	container_f

CI Type 1	CI Type 2	Relationship
dbuser	dbaobjects	owner
	dbextent	owner
	dbindex	owner
	dbjob	owner
	dblinkobj	owner
	dbsnapshot	owner
	dbtable	owner
dir	file	container_f
drive	drive	share
ejbmodule	ejb	container_f
elan	chassis	chassisvlanmap
	switch	bcastdomain
filesystem	filesystem	nfs

CI Type 1	CI Type 2	Relationship
host	application	container_f
	bridge	container_f
	chassis	contains
	host	backbone
	host	unnumbered
	host	talk
	host	dependency
	hostresource	container_f
	interface	container_f
	interfaceindex	container_f
	ip	virtual
	ip	contained
	ipport	container_f
	j2eeserver	deployed
	ospf	container_f
	port	layertwo
	port	container_f
	webresource	container_f
httpcontext	j2eeapplication	use
interface	interface	usb
	port	layertwo
interfaceindex	interface	parent

CI Type 1	CI Type 2	Relationship
ip	interface	parent
	interfaceindex	parent
	ip	depend
	ip	route
	ip	traffic
	ipserver	clientserver
ipport	ip	use
	ipport	tcp
	ipserver	clientserver
j2eeapplication	j2eemodule	container_f
	jdbcdatasource	use
j2eecluster	database	member
	j2eemanagedobject	container_f
	j2eeserver	member
	sap_j2ee_app_server	member
j2eedomain	j2eemanagedobject	container_f
	j2eeserver	member
j2eemanagedobject	jvm	use

CI Type 1	CI Type 2	Relationship
j2eeserver	executequeue	use
	ip	j2eesocket
	ip	depend
	ipport	depend
	j2eemanagedobject	deployed
	j2eemanagedobject	container_f
	j2eeserver	container_f
	jvm	use
jdbcdatasource	connectionpool	depend
	database	depend
jdbcprovider	jdbcdatasource	container_f
jmsserver	jmsdatastore	container_f
	jmsdestination	container_f
logdir	logfile	container_f
	logfile	parent
logicaldisk	dir	container_f
	disk	parent
	file	container_f
mainframe	lpar	member
	sysplex	member
mqchannel	mqchannel	mqmsglink
mqchclusrcvr	mqchclussdr	mqmsglink
mqchrcvr	mqchsdr	mqmsglink
	mqchsvr	mqmsglink

CI Type 1	CI Type 2	Relationship
mqchrqstr	mqchsdr	mqmsglink
	mqchsvr	mqmsglink
mqchsvrconn	mqchclntconn	mqmqilink
mqcluster	mqchannel	member
	mqqueue	member
	mqqueuemanager	mqrepository
	mqqueuemanager	member
mqmsgreceiverchannel	mqmsgsenderchannel	mqmsglink
mqqueue	mqaliasq	mqalias
	mqqueue	mqresolve
mqqueuelocal	mqqueueremote	mqresolve
mqqueuemanager	mqchannel	container_f
	mqqueue	container_f
mqqueueremote	mqxmitq	use
mqxmitq	mqchannel	mqchannelof
msdomain	host	member
network	host	member
	ip	member
nt	drive	container_f
	service	container_f
oracle	dbtns	container_f
oracleapplication	dbtablespace	use
	oracleapplication	depend
oracleappservice	process	resource
oracleappservicemanager	oracleappservice	member

CI Type 1	CI Type 2	Relationship
oracleias	oracleappsresource	deployed
	oracleappsresource	container_f
oraclesystem	oracle	member
	oracleappsresource	container_f
	oracleias	member
osuser	dir	container_f
port	bridge	contained
	bridge	bridgebackbone
	interfaceindex	parent
	port	backbone
	vlan	vlanmembership
printer	printq	parent
printq	printq	parent
process	daemon	brother
	file	use
	ipport	use
	printq	use
	service	brother
sap_application_component	sap_application_component	container_f
	sap_transaction	contains
sap_bp_project	sap_business_scenario	container_f
sap_business_process	sap_process_step	container_f
sap_business_scenario	sap_business_process	container_f
sap_its_agate	sap_its_wgate	depend
sap_j2ee_server_process	j2eemanagedobject	deployed

CI Type 1	CI Type 2	Relationship
sap_process_step	sap_transaction	execute
sap_r3_server	configfile	use
	sap_its_agate	depend
	sap_work_process	container_f
sap_system	database	depend
	host	sap_rfc_connection
	sap_gateway	member
	sap_r3_server	member
	sap_resource	container_f
sap_transport	sap_transaction	use
	sap_transport_change	container_f
sap_transport_change	sap_transaction	use
service	ipport	use
	service	depend
	sqlserver	depend
siebel_app_server	database	depend
	siebel_comp_grp	container_f
	siebel_gateway	depend
siebel_comp_grp	siebel_component	container_f
siebel_component	siebel_web_app	depend
siebel_gateway	siebel_wse	depend
siebel_site	host	contains
	siebel_app_server	member
	siebel_gateway	member
siebel_wse	siebel_web_app	container_f

CI Type 1	CI Type 2	Relationship
snmp	mibtree	container_f
sqldatabase	sqlalert	deployed
	sqlbackup	container_f
	sqlfile	container_f
	sqlperformancemonitor	container_f
	sqlprocesses	deployed
sqlfile	disk	depend
sqljob	sqljobstep	container_f
sqlprocesses	process	dbclient
sqlserver	sqlalert	container_f
	sqldatabase	container_f
	sqljob	container_f
	sqlperformancemonitor	container_f
	sqlprocesses	container_f
switch	vlan	container_f
sybase	sybasedb	container_f
sybasedb	process	dbclient
sysplex	lpar	member
unix	daemon	container_f
	filesystem	container_f
vlan	bridge	vlantobridge
	elan	elanvlanmap
webapplication	servlet	container_f
webmodule	servlet	container_f

CI Type 1	CI Type 2	Relationship
webserver	sap_its_wgate	container_f
	siebel_wse	container_f
websphere	j2eecluster	container_f
	j2eeserver	container_f
webspheremq	mqcluster	container_f
	mqqueuemanager	container_f

B

Relationship Definitions

This document defines relationships used throughout Mercury Application Mapping documentation.

backbone

Represents a physical connection between two switches. The relationship is discovered by the Discover layer 2 service.

bcastdomain

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

bridgebackbone

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

brother

The relationship among elements who 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

Represents a row of data from the tcpConnLocalAddress table in the Management Information Base (MIB) tree. This data has information about the TCP connection between two hosts' ports when you can differentiate between the server port and the client port. The tcpConnLocalAddress table is in the MIB address 1.3.6.1.2.1.6.13.1.2. The clientserver relationship is discovered by the Discover TCP connection collector.

contained

The relationship between two CIs whereby a second CI is included in the first CI. This relationship is found only between 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 a functionality of another CI.

dependency

The relationship wherein one CI needs a 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

Represents the physical connection between a switch and a host. It is discovered by the Discover 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 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

Represents a row of data from the routing table in the Management Information Base (MIB) containing the data of the next_hop ip address and the destination network address. The routing table is in the MIB address 1.3.6.1.2.1.4.21.1.7. The relationship is discovered by the Discover 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

Represents a row of data from the tcpConnLocalAddress table in the Management Information Base (MIB). This data has information about the TCP connection between two hosts' ports when you cannot differentiate between the server port and the client port. The tcpConnLocalAddress table is in the MIB address 1.3.6.1.2.1.6.13.1.2. The relationship is discovered by the Discover 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

Represents a row of data from the routing table in the Management Information Base (MIB). This data has information about the next_hop IP address and the destination network address. The routing table is 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.

C

Glossary

This document lists terminology that is used throughout the Mercury Application Mapping documentation.

acknowledge

Indicates that an event that has occurred in the system has been recognized. The acknowledgment action is manifested through the stopping of the blink of the CI that is related to the event.

active event

An event that is displayed on the Event Browsers and Tabs, and manifested via state changes and icons blinks in the Topology Map. It is created when a raw event meets a certain condition, and as a result is converted to an active event.

admin state

The administrative state of a selected CI (Disabled, Restricted, Testing, Unknown, Managed, or Unmanaged). Any value other than **Managed** indicates that any event information coming from the selected CI is not reliable because the CI is disabled, undergoing testing or is otherwise unmanaged. The admin state of a CI does not propagate upwards to CIs at higher levels.

attribute

A specific characteristic of a selected CI that is defined in the configuration item type model and belongs to one of following categories: Key, Attribute, Dynamic Attribute.

auto-discovery

A type of discovery where a discovery method automatically detects resources that are not previously known.

availability rules

Rules that are defined for views and nodes, which enable calculating and monitoring the availability of managed CIs during predefined periods. The availability of a CI is measured as a percentage of "up time" versus "total time."

CI

An entity in a managed world that is distinguished from other CIs by its CIT and key attributes.

CIT

An entity contained in the configuration item type model.

compound

The children of a selected CI.

compound status

Exists in parent CIs only and indicates the maximum status of the selected CI's children. This status does not include the map status of the parent CI.

configuration item type model

The set of defined topology CIs and their relationships that describes a managed world.

configuration management database (CMDB)

The core information repository of Mercury Application Mapping. The database stores and handles the infrastructure data collected and updated by the discovery system. The information concerning discovered CIs and relationships is deposited, grouped, and updated in the form of CIT definitions according to CI-oriented methodology.

container relationship

A functional relationship that connects a host and a CI that is fully dependent on the host.

correlation rule

A rule that specifies a causal relationship between two nodes.

correlation state

A state that is defined in a correlation rule and assigned to an affected CI once its root cause CI fulfills the correlation condition and a correlation event occurs. There are two ways to define this state: 1- It can be fixed in advance (for example. when the correlation event occurs, the Corr State of the affected CI is always Critical); 2- It can be defined as percentage of the Oper State of its root cause CI (for example, when the correlation event occurs, the Corr State of the affected CI is 50% of the root cause CI's Oper State.) When several correlation events are simultaneously related to a CI, the correlation state is the maximum severity of all the events.

discovery

The process of finding resources within an IT infrastructure.

Discovery Manager

A subsystem, whose function is to manage the discovery process by defining the discovery scope, defining the protocol, defining the connection data for the protocol, and activating the discovery pattern(s).

discovery method

The component that performs the actual discovery. Each discovery method is designed to discover a specific resource. The methods can be used individually or combined with each other to collect data from and about IT resources.

discovery pattern

An XML template which contains invocation definitions of one or more discovery tasks. The template defines which data is collected, through which protocol, when the data should be passed to the CMDB, and the executing schedule of the pattern.

Discovery Probe

A component that hosts discovery methods and provides management services that enable their manipulation. The Discovery Probe receives a task, delivers its parameters to a discovery method, manages the discovery method performance, and returns the task results to the Discovery Manager.

discovery task

The executable part of a discovery pattern, which triggers discovery methods to begin discovering the data defined in the pattern. Several discovery tasks can be defined in one pattern and executed from it. The discovery tasks include static parameters that are directly received from the discovery pattern (such as threshold and schedule), as well as runtime parameters that are obtained from the data that is collected by the pattern's trigger.

derived (node)

A view's node definition that determines that both the selected CI and any CIs derived from the selected CI (inheritance CIs) are displayed in the topology map.

event

Some change that occurs in the managed world.

event CI

A CI created from a raw event that contains all the attributes of the event, including the CI to which it is related.

event filter

A predefined condition that filters events displayed in the Event Browser, Tabs and Log. When applied only those events that meet the criteria defined by the selected filter are displayed.

event message

A predefined message sent in response to the occurrence of particular events.

event severity

An attribute of an event CI that indicates the severity of the event (Normal, Warning, Minor, Major, Critical). Each severity level is displayed in a different color. This event severity determines the operational state of the related CI.

filter editor

A tool that enables the creation and use of existing event filters to reduce the number of events displayed in the Event tabs, browsers and log.

inheritance relationship

CITs that inherit the attributes and behavior (such as the label function) of the CIT above it. For example, the IPserver and IPclient CITs inherit attributes from the IPport CIT.

interdependencies

See the glossary item **relationship**.

join_f link

A relationship that connects two CIs that have at least one comparable value. For example, it is possible to compare the values of IP domain and network domain, and host DNS and IP address.

label

The title that appears under a CI in a map. Label definition can be customized to include different attribute values. For example, if in host the function label is composed of hostname & network, the displayed label will be: server1 10.0.65.0.

layer

Each map in MAM can be represented in a layered structure. The CIs are divided into layers and you can drill down from one layer to the next to see more CIs.

managed world

Any self-contained environment that can be described using a topology model.

managed view

A series of rules and definitions for displaying query results in Mercury Application Mapping.

management categories

Categories, such as performance and change, with which you can manage any business service.

map status

The operational state of the CI, as adjusted for the weight accorded to its significance in the system. (The significance weight is set as the node's status factor.) For example, if the state (the maximum severity) of the event is **5** and the status weight is defined at 100%, the CI's map status is **5** (5*100/100). If the weight is defined as 60%, the CI's status is **3** (5*60/100). If the CI has children, the map status value is the maximum status of the CI and all its children.

oper state

The current operational state of the selected CI, which is the maximum severity of any event currently occurring to the CI.

organizational (folding) rules

Rules that define how linked CIs are displayed in the topology map. There are four folding rules: parent, child, right sibling and left sibling.

patterns

See discovery pattern.

priority indicators

Different priority levels of views, which are expressed in the colors of the view icons: high = yellow, medium = purple, low = grey. Priority levels are defined as part of a view's properties, and can help differentiate between the types of attention and support that each view requires.

propagation

The transmission to higher view levels of managed CI data, such as status or blink.

raw event

A message that notifies Mercury Application Mapping that a specific change has occurred in a managed CI.

relationship

Also known as interdependencies. An entity that defines the relationship between two CIs. Relationships can describe either a physical or logical connection between two CIs, or a functional relationship.

resources

Applications, databases, network devices (hardware and software), and servers that are discovered and managed by Mercury Application Mapping.

severity

Indicates the gravity level of an event (Normal, Warning, Minor, Major, Critical). Each severity level is displayed in a different color, and it determines the Operational State of the CI that is related to the event.

status factor

A value (in percent) that defines the significance of the CI status. This is useful for reducing the significance of CIs whose status can fluctuate on a regular basis, such as processes, which continuously change. By reducing the significance of such CIs in the system, events are prevented from generating an overflow of critical messages. For example, if the state of an event is **5** and the status weight of the process is defined at 40%, then the CI status is **2** (5*40/100).

system report

A report that is based on a specific Report TQL query. The report display statistics about a query results and can be defined to display very detailed and focused information.

TQL

A language and a tool for discovering, organizing, and managing IT infrastructure data. TQL is an abbreviation for Topology Query Language. It a language that extends standard SQL, by adding the ability to draw conceptual relationships between CIs and create visual images of IT infrastructure resources.

topology

A visual description of the configuration or arrangement of an IT infrastructure, including its nodes and connecting relationships.

topology CI

Any member of a CIT that exists within the topology of the managed world.

view

A collection of CIs and relationships represented by icons. These CIs and relationships are the result of a TQL query, and are displayed as a view according to display and organizational rules that are assigned to them. Each CI/relationship can be presented in multiple views or by multiple icons in different view layers.

View Explorer

Displays a hierarchical tree structure of defined items (queries, views, and so forth).

viewing layer

A two-dimensional arrangement of topology CIs to be viewed by a user.

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