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BEAWebLogic Server®

Using the WebLogic Diagnostic Framework Console Extension

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Introduction and Roadmap

The following sections describe the contents and audience for this guide— *Using the WebLogic Diagnostic Framework Console Extension*:

- "What Is the WebLogic Diagnostic Framework Console Extension?" on page 1-1

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What Is the WebLogic Diagnostic Framework Console Extension?

The WebLogic Diagnostic Framework (WLDF) Console Extension is a part of the WebLogic Diagnostic Framework that provides views and tools for graphically presenting diagnostic data about servers and applications running on them. The underlying functionality for generating, retrieving, and persisting diagnostic data is provided by the WLDF framework, and the WLDF Console Extension provides additional tools for presenting that data in tables, charts, and graphs.

The WLDF Console Extension is implemented as an extension to the BEA WebLogic Server® Administration Console, using the WebLogic Server Console Extension architecture (see *Extending the Administration Console*).

The WLDF Console Extension is included with WebLogic Server 9.2, but you must install it manually. See Chapter 2, "Installing and Displaying the WLDF Console Extension."

Document Scope and Audience

This document describes WLDF Console Extension features and installation procedures. It is written for system administrators or anyone who wants to view graphic representations of diagnostic data for WebLogic Server instances and applications deployed to them.

It is assumed that readers are familiar with Web technologies and the operating system and platform where WebLogic Server is installed.

Guide to This Document

This document is organized as follows:

- This chapter, "Introduction and Roadmap," is an overview of the WLDF Console Extension and describes the audience for this guide.

- Chapter 2, "Installing and Displaying the WLDF Console Extension," tells how to install and display the WLDF Console Extension.

- Chapter 3, "Overview of the WLDF Console Extension," describes the features and the user interface of the WLDF Console Extension.

- Chapter 4, "Understanding How Data Is Collected and Presented," describes how server and application diagnostic data is collected, maintained, and displayed by the WLDF Console Extension.

- Chapter 5, "Working with Views," describes how to create, modify, and use views, which are panels that contain charts and graphs.

- Chapter 6, "Working with All Charts and Graphs," describes how to create, modify, and use charts and graphs, which graphically display the diagnostic data.

- Appendix A, "Keyboard Reference," describes how to use the keyboard (instead of the mouse) to accomplish tasks in the WLDF Console Extension.

Related Documentation

- *Configuring and Using the WebLogic Diagnostic Framework* describes how to configure and use WLDF.

● "Configure the WebLogic Diagnostic Framework" in the *Administration Console Online Help* describes how to use the WebLogic Administration Console to configure WLDF.

New and Changed Features in this Release

The following features are new to the WLDF Console Extension in this release.

Custom Metrics

You can define custom metrics on an MBean type. Once defined, a custom metric attribute for an MBean instance can be graphed just like other attributes. See "Creating Custom Metrics" on page 7-4.

Cut, Copy, and Paste

You can cut, copy, and paste graphs and charts. This gives you more flexibility in how you organize graphs and charts and allows you to copy and move graphs and charts from one view to another. See "Arranging Charts and Graphs in Views" on page 6-13 and Appendix A, "Keyboard Reference."

Updated Visual and Interaction Design

The WLDF Console Extension has new icons, plus various improvements to the visual tools, such as additional functionality available in the context menus.

Additional Global Property Settings

On the Global Properties tab, you can now set a default viewport size (the time interval displayed in a chart) and a default zoom percentage for zooming in or out of a chart (thereby changing the viewport size). See "Setting Global Properties" on page 6-30.

Installing and Displaying the WLDF Console Extension

The WebLogic Diagnostic Framework (WLDF) Console Extension is included with BEA WebLogic Server®, but it is not installed by default. The following section describes how to install and display the WLDF Console Extension:

Installing the WLDF Console Extension

The WLDF Console Extension is delivered as a Java Archive (JAR) file, named `diagnostics-console-extension.jar`. You must install this JAR file into the Administration Server for a domain for the WLDF Console Extension to be incorporated into the WebLogic Server Console for that domain.

Installation Prerequisites

Before you can install and run the WLDF Console Extension, you need:

- BEA WebLogic Server 9.1 or higher installed

- A Web browser that meets the requirements for running the BEA Weblogic Server 9.1 Administration Console

- JRE 1.5.0_04 (J2SE Runtime Environment 5.0) or above

- Java and JavaScript enabled in your browser

Installing the Java Plug-in

If the Java plug-in 1.5 is not already installed in your Web browser, you will be prompted to initiate a download from the Sun Microsystems Java Web site. Follow the instructions on screen.

Alternatively, install the plug-in manually when you begin the installation process for the WLDF Console Extension:

1. Go the Java Software download page, at:

    `http://java.com/en/download/`

2. Follow the instructions on screen.

Installing the WLDF Console Extension

To install the WLDF Console Extension:

1. Find the `diagnostics-console-extension.jar` file in the `WL_HOME\server\lib\console-ext` directory, where `WL_HOME` is the directory in which you installed WebLogic Server.

2. Copy `diagnostics-console-extension.jar` into the `DOMAIN-DIR/console-ext` directory for every domain in which you want to use the Console Extension, where `DOMAIN-DIR` is the domain's root directory.

    For example, to display diagnostic data for the sample Medrec server that is included with WebLogic Server, copy `diagnostics-console-extension.jar` to `DRIVE:\\BEA-HOME\weblogic90\samples\domains\medrec\console-ext`.

3. Restart the Administration Server for the domain where you installed the extension. The Administration Console for the domain is then deployed with the WLDF Console Extension.

Removing the WLDF Console Extension

To remove the extension:

1. Stop the Administration Server.

2. Delete the JAR file from the `DOMAIN-DIR/console-ext` directory and restart the Administration Server.

Displaying the WLDF Console Extension

When you launch an Administration Console in which the WLDF Console Extension is installed, the Console appears with two tabs, **BEA WLS Console** and **WLDF Console Extension**, as shown in Figure 2-1.

Figure 2-1 Console Extenstion Tab

By default, the **BEA WLS Console** tab is initially selected on login, which shows the standard Administration Console. Select **WLDF Console Extension** to display the extension.

These two tabs are always present, so you can easily move back and forth between the primary Administration Console pages and the WLDF Console Extension.

Note: All WLDF Console Extension functionality occurs in the context of a Java applet. Each time you select the **WLDF Console Extension** tab, the applet is loaded.

When you select the **BEA WLS Console** tab, the applet is unloaded, and you are returned to the Administration Console context that existed before you displayed the WLDF Console Extension. All activity related to the applet and the WLDF Console Extension is terminated.

Look and Feel Support

The WLDF Console Extension does not implement a specific look and feel (that is, the visual user interface design). Rather, it adopts the look and feel of the environment in which the WLS Administration Console is running:

● For non-Windows systems, the Console Extension uses the look and feel specified in the Java environment.

● For Windows systems, the Console Extension uses the default Windows look and feel.

Overview of the WLDF Console Extension

The WLDF Console Extension provides a set of visual tools you can use to directly manipulate objects to display diagnostic information about WebLogic Server instances. The following sections provide a high level overview:

- "Scope of the Diagnostic Information Displayed"

- "Two Main Panels"

- "View Panel Overview"

- "Tabs Panel Overview"

- "Toolbar and Scrollbar Overview"

- "Displaying Tooltips for Controls, Views, Graphs, and Charts"

- "Creating Views, Graphs, and Charts: Main Steps"

- "Alternative Ways to Manipulate Objects"

Scope of the Diagnostic Information Displayed

You install the WLDF Console Extension into a domain, and you can display diagnostic data about any of the server instances in that domain and about applications running on those servers.

Two Main Panels

The WLDF Console Extension has two panels, the **Tabs** panel and the **View** panel, plus a toolbar and a status bar, as shown in Figure 3-1.

Figure 3-1 WLDF Console Extension Panels
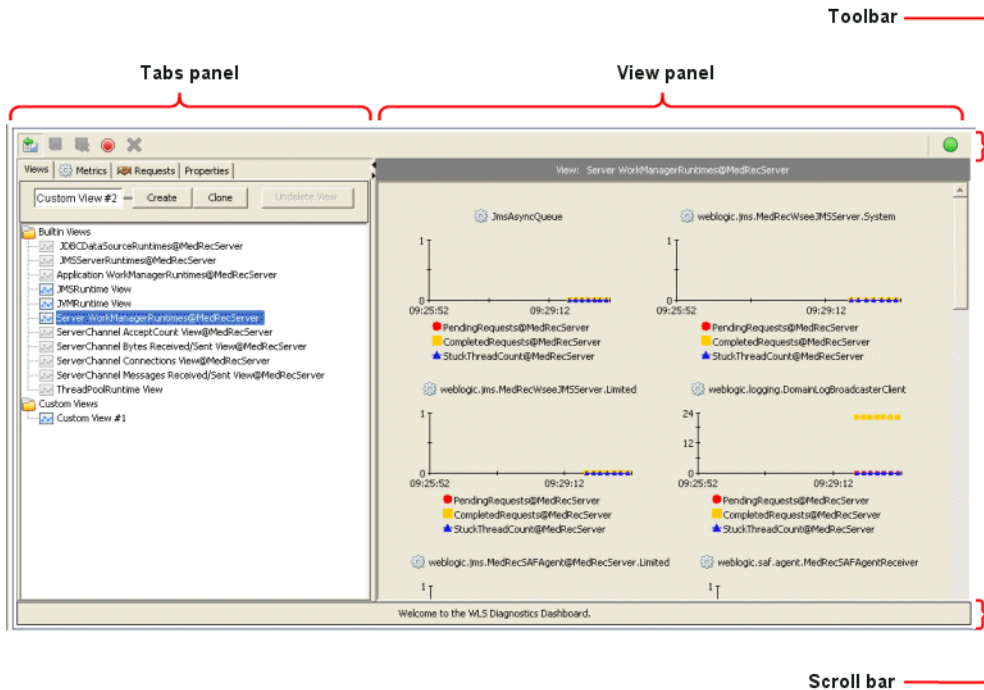
View Panel Overview

A *view* is a collection of one or more charts, which display captured monitoring and diagnostic data, as shown in Figure 3-2 and Figure 3-3. Views are displayed in the **View** panel, on the right side of the WLDF Console Extension page. The **View** panel displays a single view at a time.

Figure 3-2 A View Containing One Chart
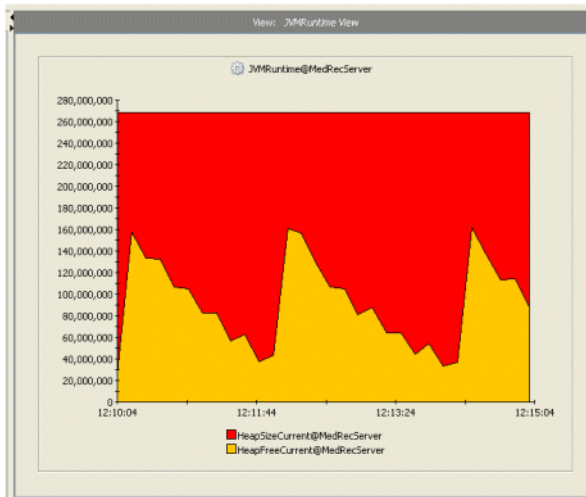
Figure 3-3 A View Containing Three Charts
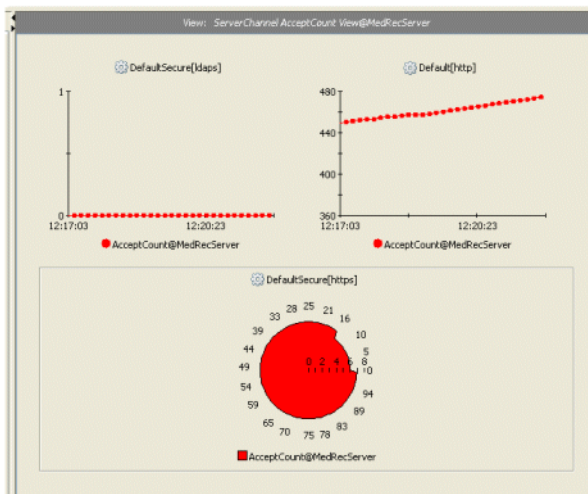
Each chart contains a legend, labels, and controls for identifying and displaying the data. A chart can display data from one or more data sources from one or more servers in the domain. The data sources include one or more metrics (that is, the value of an MBean instance attribute) or one or more instrumented methods. Each data source is displayed as a distinct *graph*, which shows the values of data points over a time span. The relationship between views, charts, and graphs is shown in Figure 3-4. In the figure, the view contains two charts, "WLDF Metrics Chart" and "JVMRuntime@MedRecServer," based on metrics data from the MedRecServer server. "WLDF Metrics Chart" contains one metrics graph, "UpTime@MedRecServer." The "JVMRuntime@MedRecServer" chart contains two metrics graphs, HeapSizeCurrent@MedRecServer" and "HeapFreeCurrent@MedRecServer."

Notes: A chart can include graphs based on data from one or more servers in the domain.

You cannot mix metrics graphs and method performance graphs in the same chart.

Figure 3-4 Relationships of Graphs to Charts and of Charts to Views
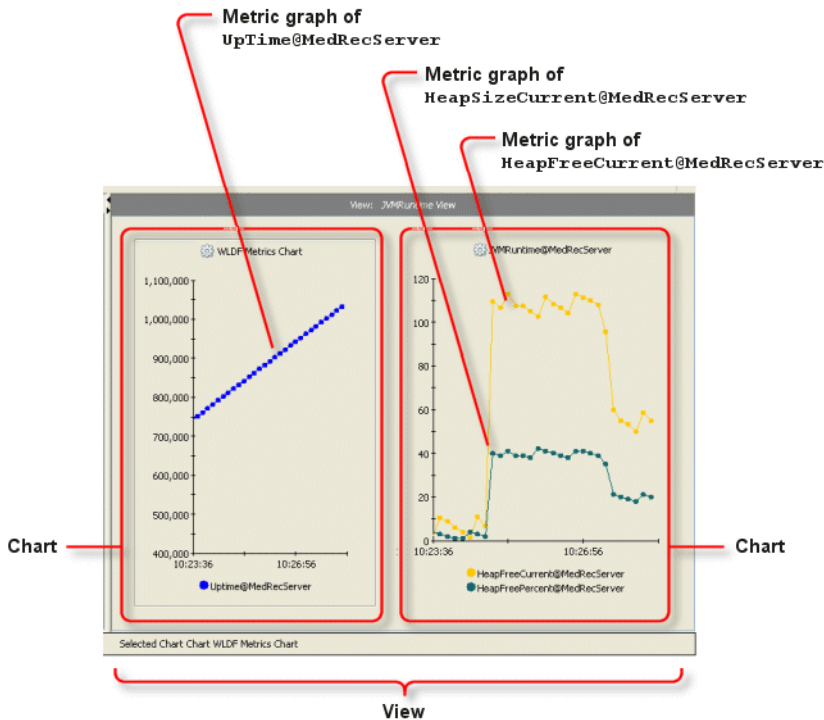
Tabs Panel Overview

The **Tabs** panel, on the left side of the page, contains tabs with controls for creating and modifying the views and charts that are displayed in the **View** panel, on the right.

The **Tabs** panel contains four tabs:

- **Views** contains a list of built-in views and custom views. It also contains controls for creating, modifying, and deleting views. See Chapter 5, "Working with Views."

- **Metrics** contains a tree of all known runtime MBean types, instances, and attributes for the selected server. You can drag attributes onto a view to create one or more graphs that show the state of those attributes over time. See Chapter 6, "Working with All Charts and Graphs."

- **Requests** contains a tree of events generated by instrumented code in the selected server. You can drag methods onto a view to create a graph that shows the execution performance (that is, the elapsed performance time) of those methods over time. See Chapter 6, "Working with All Charts and Graphs."

  Note: You must configure WLDF instrumentation for a server outside of the WLDF Console Extension for data to appear in this tab. See "Making Instrumentation Data Available for Method Performance Charts" on page 8-2.

- **Properties** contains two subtabs:

  – Use the controls in the **Properties** > **Selected Item Properties** tab to change the appearance of individual graphs and charts. See "Setting Chart Properties" on page 6-23 and "Setting Individual Graph Properties" on page 6-28.

  – Use the controls in the **Properties** > **Global Properties** tab to set polling and display properties that apply to all active views. See "Setting Global Properties" on page 6-30.

Toolbar and Scrollbar Overview

The toolbar and scrollbar are available at all times, regardless of which tab is displayed in the **Tabs** panel.

The toolbar is displayed directly above the **Tabs** and **View** panels. The buttons and icon in the toolbar are described in Table 3-1.

Table 3-1 Buttons and Icon in the Toolbar

Button or Icon	Description	Action
	Focus context	Click to change focus between the **Tabs** panel to the **View** panel.
	Save all modified views	Click to save all custom views. If no views have been modified since they were last saved, this button is disabled and is colored gray.
	Discard all unsaved view changes.	Click to discard all changes you made to all views since you last saved them.
	Stop all active views	Click to stop all active views.
	Delete	Click to delete selected graph or chart. (This button is unavailable if a built-in view is selected.
	Status of data polling	Displays the status of the data poller: • Green indicates that data is being retrieved from the server with no problem. • Yellow indicates that there are some problems retrieving data from the server. • Red indicates that no data is being retrieved from the server.

The status bar at the bottom of the page displays information about the selected item.

Displaying Tooltips for Controls, Views, Graphs, and Charts

You can display short messages, called *tooltips*, about several types of objects in the WLDF Console Extension by positioning the mouse pointer over the objects. To display a tooltip for an item, move the mouse pointer to point to the object, and pause. Do not click the mouse. After a momentary delay, a short message about the item is displayed.

In all areas of the WLDF Console Extension, you can display tooltips for standard controls such as buttons, text fields, sliders, and so forth, which tell you what each control does. But you can also display details about other objects displayed in the WLDF Console Extension and about the sources from which the diagnostic data is gathered, as described in the following sections:

- "Displaying Details About MBean Instances and Attributes in the Metrics Tab" on page 7-3

- "Displaying Details About Metrics Charts and Graphs" on page 7-3

- "Displaying Details About Requests" on page 8-4

- "Displaying Details About Instrumentation Events" on page 8-5

- "Displaying Details about Requests and Methods in the Requests Tab" on page 8-7

- "Displaying Details About Method Performance Charts" on page 8-8

Creating Views, Graphs, and Charts: Main Steps

To create a view and add charts and graphs:

1. From the **Views** tab, create or select a view. See Chapter 5, "Working with Views."

2. Decide which kind of chart you want to create and select the appropriate tab for creating that kind of chart:

   – Use the **Metrics** tab to create a metrics chart, or

   – Use the **Requests** tab to create a method performance chart.

   See Chapter 6, "Working with All Charts and Graphs."

3. In the **Metrics** tab or **Requests** tab, select the server for which you want to display diagnostic data. See Chapter 6, "Working with All Charts and Graphs."

4. Drag items from the **Metrics** or **Requests** tab in the left panel to the active view in the right panel. Drop an item into a blank area in the view to create a new chart and graph, or drop it into an existing chart to add a new graph to the other graph(s) in the chart. See Chapter 6, "Working with All Charts and Graphs."

5. Optionally, select the **Properties** tab, and use the tools on that tab to change the appearance of graph(s) and chart(s). See Chapter 6, "Working with All Charts and Graphs."

6. If are working with a custom view, save the view. See Chapter 5, "Working with Views."

Alternative Ways to Manipulate Objects

The WLDF Console Extension is a graphical user interface with visual tools for setting attributes and manipulating objects. Alternative interaction techniques are available for accomplishing many activities:

- **Drag and drop and other direct manipulation with the mouse.** For example, you can drag an MBean instance attribute from the **Tabs** panel to the **View** panel to create a new chart. Another direct manipulation technique is to **Shift**-drag across a graph in a chart to zoom in on the data.

- **Right-click, then select from a context menu.** You can right-click attributes in the **Metrics** tab, methods in the **Requests** tab, and charts in the **View** panel to display context menus, from which you can select a command to act on the selected object. For example, you can right-click an MBean instance attribute in the **Tabs** panel, then choose **Create New Chart** to incorporate it into a new chart.

- **Keyboard interaction.** You can use the **Tab** key, the arrow keys, and the **Enter** key to select different tools and objects on the page and then perform actions on them. For full documentation, see Appendix A, "Keyboard Reference."

Understanding How Data Is Collected and Presented

The following sections describe the relationship between and the process of data collection and presentation in the WLDF Console Extension:

Overview of Data Collection and Presentation

In a standard WLDF configuration, you can configure the Harvester to collect metrics for specified attributes of specified MBean instances. This information is available for programmatic access, and it is written to a standard log, `HarvestedDataArchive`, which you can view through the standard Administration Console. See "Configuring the Harvester for Metric Collection" in *Configuring and Using the WebLogic Diagnostic Framework*.

In the Instrumentation component, you can configure diagnostic actions to generate instrumentation events when the diagnostic actions are executed. See "Configuring Instrumentation" in *Configuring and Using the WebLogic Diagnostic Framework*. This information, too, is persisted in a standard log, `EventsDataArchive.`, which you can view through the standard Administration Console.

Those WLDF components and log files enable you to display data in the WLDF Console Extension:

- To view *current* metrics data in the WLDF Console Extension, it is not necessary to configure the Harvester. Data is retrieved from a data cache on the server. However, to see *historical* metric data, you must configure the Harvester to collect the data you want to monitor. Historical data is always retrieved from the `HarvestedDataArchive` log. See "How Metrics Data Is Collected and Presented" on page 4-2.

- To view current and historical data for instrumented methods, you must configure Instrumentation as part of the WLDF configuration for the server. Instrumentation data displayed in the WLDF Console Extension is always retrieved from the `EventsDataArchive` log. See "How Instrumentation Data Is Collected and Presented" on page 4-5.

Data displayed in the WLDF Console Extension is generated, collected, and optionally persisted on the server, and the WLDF Console Extension on the client periodically polls that data for display in a chart.

How Metrics Data Is Collected and Presented

When a view containing one or more metrics charts is activated in the WLDF Console Extension, data collection for viewing those metrics in real time is started on the server. The data collector continually gathers the data and places it in a "wrap-around" cache. That is, as new data fills the cache, the oldest data in the cache is lost. When a view is stopped (see "Starting and Stopping a View" on page 5-6), data collection for the contained charts is stopped. However, if the Harvester is configured to collect data for a metric, that data will continue to be harvested and persisted to the log.

To display current data, the WLDF Console Extension periodically polls the cache for a current data set and displays it in a chart.

Note: The size of the data set returned to the client is configurable. See "Setting Global Properties."

To display current metric data, no prior WLDF configuration is required. However, to display historical data for a metric, the WLDF Harvester must have been configured to harvest that data.

The following four illustrations (Figure 4-1, Figure 4-2, Figure 4-3, and Figure 4-4) show how metric data is retrieved and displayed for present and historical data, with and without harvesting.

These conceptual illustrations show a timeline from server startup to the present:

1. The tail of the arrow, on the left, represents the time when the server was started. The tip of the arrow, on the right, represents the present.

2. The point in the middle of the arrow represents the time when a view containing the metrics chart was activated and, therefore, when the Console Extension client started polling for data to display for that metric.

3. The oval represents the range of data that is being displayed in a chart in the Console Extension, sometimes called the *viewport*.

   The data cache always contains the most current data. But if polling has been taking place long enough for old data to be purged, the cache does not contain all data from the time polling started. That is why the range of data shown through the viewport is not equivalent to the range of data collected since polling began.

   If the Harvester was not configured to harvest data for this metric, no historical data is available for the metric and therefore cannot be displayed in the WLDF Console Extension client. If the Harvester was configured to harvest data for this metric, historical data is available for the metric and can be displayed by scrolling back through a chart (see "Scrolling and Zooming the Data Displayed in a Chart."

Figure 4-1 illustrates the following scenario:

1. When the server starts, the Harvester is not configured for the metric. Therefore, no data is saved for later retrieval.

2. At some point after the server is started, the Console Extension is started and the view containing the metrics chart is activated. Polling for the metric begins, and the current data fills the cache.

3. The metrics chart shows current data from the cache. If you tried to scroll to see historical data, you could not see any, since none is available.

Figure 4-1 No Harvesting; Display Current Data
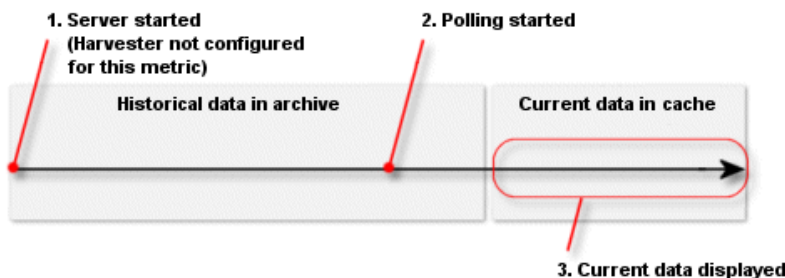
Figure 4-2 illustrates the following scenario:

1. When the server starts, the Harvester is configured for the metric and starts to harvest data when the server is started. The data is persisted to the archive, and it can be retrieved for viewing.

2. At some point after the server was started, the Console Extension is started and the view containing the metrics chart is activated. Polling for the metric begins, and the current data fills the cache.

3. The metrics chart, displayed in the client, shows current data from the cache. Because the data was harvested and archived, you can scroll the chart to see historical data. However, in this illustration, the chart is still set to display current data. Even though data for the metric is being saved in the archive, the current data is still retrieved from the cache.

Figure 4-2 Harvesting; Display Current Data
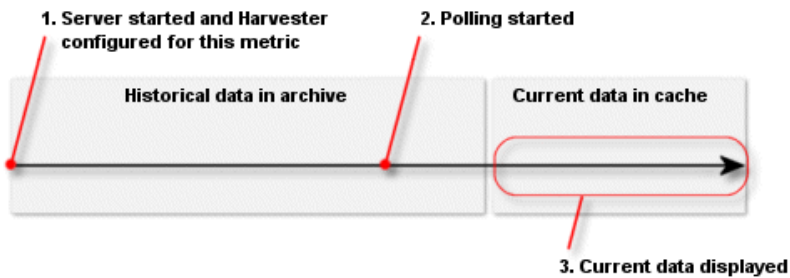
The scenario in Figure 4-3 shows the same scenario as in Figure 4-2, but in this case, the chart is scrolled to show historical data. All data is retrieved from the archive. Current data continues to fill the cache, but that data is not currently used.

Figure 4-3 Harvesting; Display Historical Data
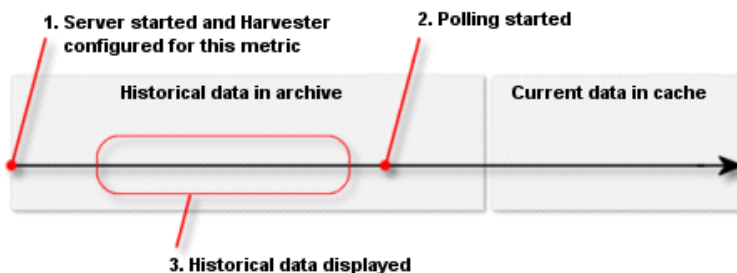
The scenario in Figure 4-4 shows the same scenario as in Figure 4-2 and Figure 4-3, but in this case, the chart is scrolled to show some historical data and some current data. The historical data is retrieved from the archive, and the current data is taken from the cache.

Figure 4-4 Harvesting; Display Current and Historical Data
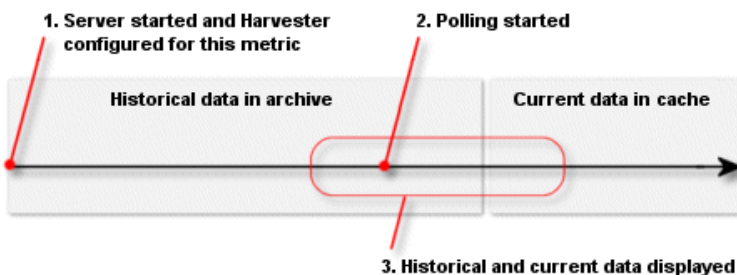
How Instrumentation Data Is Collected and Presented

For instrumentation data to be displayed in a chart, instrumentation must be configured in the WLDF configuration on the server. Data is always retrieved from the persisted store. If instrumentation is not configured and activated for a server, you will not be able to see any events in the **Requests** tab. For more about these requirements, see "Making Instrumentation Data Available for Method Performance Charts" on page 8-2.

Working with Views

A view is a named collection of charts and graphs that present graphical information of similar diagnostic type data. The following sections describe how to work with views:

- "The Views Tab and the View Panel"

- "Displaying and Modifying an Existing View"

- "Creating a Custom View"

- "Creating a View Based on an Existing View (Cloning)"

- "Changing the Name of a View"

- "Saving A Custom View"

- "Deleting a View"

- "Starting and Stopping a View"

The Views Tab and the View Panel

The **Views** tab in the **Tabs** panel, on the left side of the page, contains a list views for all running servers in the domain. It also provides the means to create, select, modify, and delete views. When you select (click) the name of a view in the **Views** tab on the left, the view is displayed in the **View** panel on the right, as shown in Figure 5-1. That view remains displayed in the **View** panel, even when you select different tabs in the **Tabs** panel.

Figure 5-1 Views Tab and View Panel
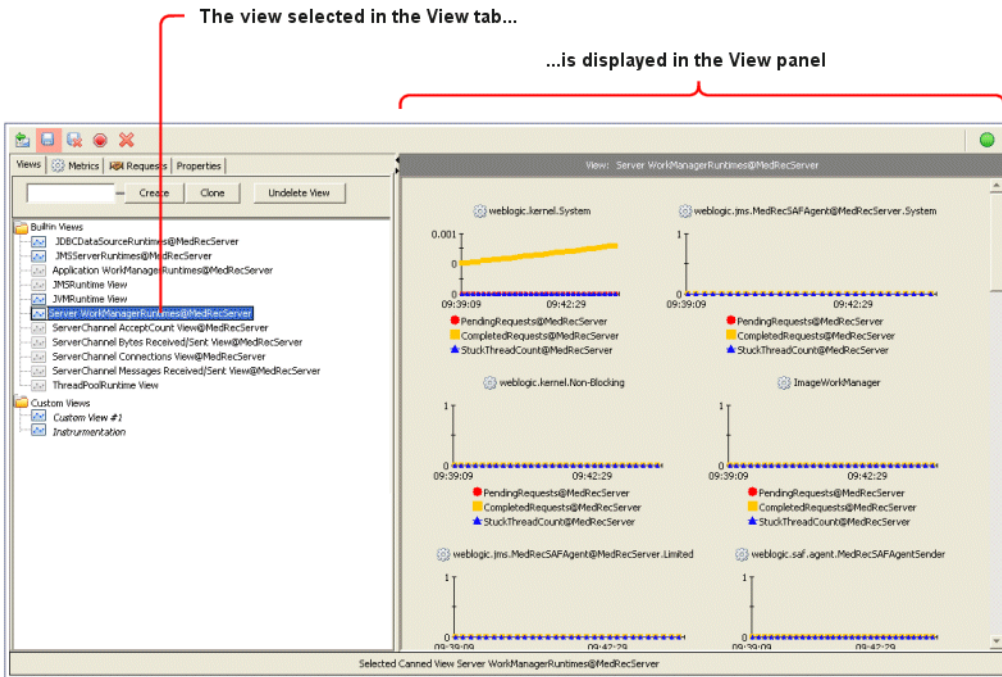
The **Views** tab lists both built-in and custom views.

- The *Built-in views* are a set of predefined views of available runtime metrics for all running WebLogic Server instances in the domain. These views surface some of the more critical runtime WebLogic Server performance metrics and serve as examples of the WLDF Console Extension's view and graphing capabilities.

  Built-in views are installed when you install the WLDF Console Extension, and they are available for every user logged into the Administration Console and using the WLDF Console Extension.

  You can modify a built-in view, but the modification is only visible during your current session; it is lost when you switch back to the primary Administration Console view. Also, no other user can access the modified view. If you want to modify and save one of the built-in views, you can clone it and save it as a custom view.

- A *custom view* is any view created by a user. Custom views are available only to the user who created them. You can save a custom view and access it again when needed.

  WLDF Console Extension provides no pre-defined custom views.

The charts and graphs in a view can display diagnostic data for any of the servers running in the domain.

The views listed in the **Views** tab are displayed in separate trees, as shown in Figure 5-2.

Figure 5-2 Built-in and Custom Views Displayed in the View Tab
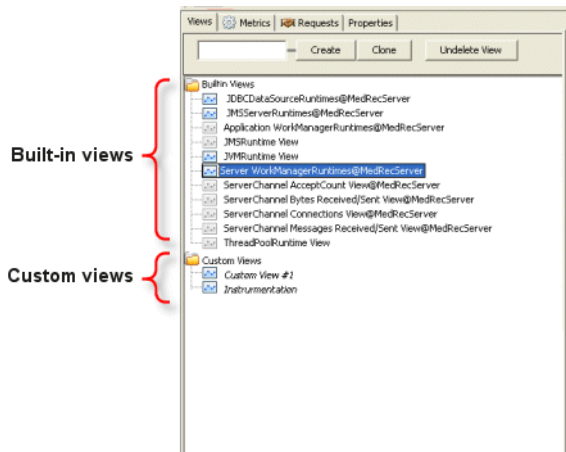
Table 5-1 describes the visual cues that help identify the views in the **Views** tab.

Table 5-1 Views Tab Icons

Visual Cue	Description	Description
ThreadPoolRuntime View	Blue and white icon adjacent to a view name	The view is active and data polling is occurring for all charts in that view. (This is true whether or not the view is currently displayed in the **View** panel.)

Table 5-1 Views Tab Icons

Visual Cue	Description	Description
JDBCRuntime view	Gray and white icon adjacent to a view name	The view is inactive and data polling is not occurring for the charts in that view.
ServerRuntimeMBean view	View name in italic font	The view has been modified but not yet saved.
		Note: You cannot save changes to a built-in view.

Displaying and Modifying an Existing View

To display and modify an existing view:

1. Select the **Views** tab to display the list of available views.

2. Click the name of the view. The view appears in the **View** panel, replacing the view that is currently displayed. (Only one view can be displayed at a time.)

3. Add and modify charts, as desired. See Chapter 6, "Working with All Charts and Graphs."

4. Save the view (custom views only):

   – In the **Views** tab, click the **Save** button, or

   – On the toolbar, click the 💾 (**Save All Modified Views**) button.

Creating a Custom View

To create and display a new custom view:

1. Click the **Views** tab.

2. In the text field at the bottom of the browser, enter a name for the view.

3. Click **Create** to create the view. The new, empty view is displayed in the **View** panel.

4. Add and modify charts, as desired. See Chapter 6, "Working with All Charts and Graphs."

5. Save the view:

- In the **Views** tab, click the **Save** button, or

- On the toolbar, click the (**Save All Modified Views**) button.

Creating a View Based on an Existing View (Cloning)

To create and display a view based on an existing view:

1. Select the **Views** tab.

2. Click the name of the existing view on which you want to base a new view.

3. In the text field at the bottom of the browser, enter a name for the new view.

4. Click **Clone**, at the bottom of the **Views** tab, to copy the current view with a new name. The new, cloned view is displayed in the **View** panel. Until you make changes, the cloned view has the same properties as the view upon which it is based.

5. Add and modify charts, as desired. See Chapter 6, "Working with All Charts and Graphs."

6. Save the view:

- In the **Views** tab, click the **Save** button, or

- On the toolbar, click the (**Save All Modified Views**) button.

Changing the Name of a View

You can change the names of custom views only. To change the name of a view:

1. Select the **Views** tab.

2. Right-click the name of the view you want to rename, select **Rename**, and type a new name. Alternatively, in the **View** panel, right-click the name of the current view at the top of the panel. Then type a new name in the field.

3. In the **Views** tab, click the **Save** button.

Saving A Custom View

While you can modify any view for the current session, you can save only custom views. To save a custom view:

1. Select the **Views** tab.

2. Click the name of the custom view you want to save.

3. Click the **Save** button.

Alternatively, click the ▨ (**Save All Modified Views**) button on the toolbar.

Deleting a View

You can only delete custom views. To delete a custom view:

1. Select the **Views** tab.

2. Click the name of the view you want to delete.

3. Click the ✖ (**Delete**) button in the toolbar. Alternatively, right-click the name of the view and select **Delete** from the context menu.

Starting and Stopping a View

When you start a view, polling commences for the charts in the view. That is, the client starts polling for data from the server, so that the data can be represented in one or more graphs. When you stop a view, polling for the view ends.

To start a view:

1. Select the **Views** tab.

2. Right-click the view you want to start, and select **Start** from the context menu.

To stop a view:

1. Click the **Views** tab.

2. Right-click the view you want to stop, and select **Stop** from the context menu.

To stop all views, click the 🔴 (**Stop All Active Views**) button on the toolbar to stop all active views.

Note: Current data for metrics charts is polled from a data cache on the server. Historical data for metrics charts and all data for method performance charts are retrieved from data

archives. If you stop all views, data is no longer added to the data cache on the server. For more information, see Chapter 4, "Understanding How Data Is Collected and Presented."

Working with All Charts and Graphs

The WLDF Console Extension supports two types of charts and graphs:

- *Metrics* charts contain one or more graphs that real-time and harvested MBean metric information.

- *Method performance* charts contain one or more graphs displaying elapsed time information for a given instrumented method.

Both kinds of charts can display information from one or more running server instances in the domain.

Many of the tasks you perform when working with charts are the same for both types. Some tasks are different for the different types. The following sections describe how to work with both kinds of charts:

- "The Parts of a Chart" on page 6-2

- "Adding Charts to Views" on page 6-4

- "Creating an Empty Chart" on page 6-8

- "Adding Graphs to Existing Charts" on page 6-8

- "Repositioning a Chart" on page 6-11

- "Merging Charts" on page 6-12

- "Moving a Graph to a Different Chart or to a New Chart" on page 6-12

- "Arranging Charts and Graphs in Views" on page 6-13

For information about tasks that are specific to the different kinds of charts and graphs, see the following:

The Parts of a Chart

A *chart* consists of the following:

- One or more *graphs* that show data points over a specified time span
- X- and Y-axes for plotting diagnostic data

- – Plots against a time-based X-axis.

- – Provides a scaled Y-axis, (adjusted based upon the plotted data series.)

- A legend that identifies the scope of each of the graphs in the chart:

  - – The legend for a metrics chart uses the scope of the form
    `attributeName@serverName`

  - – The legend for a method performance chart uses the scope of the form
    `methodName@serverName`

  The legend can be hidden or displayed.

- A scrollbar for changing the time span displayed on the chart's X-axis. The scrollbar can be hidden or displayed.

- Optional Y-axis label

These parts are shown in Figure 6-1.

Figure 6-1 Parts of a Chart
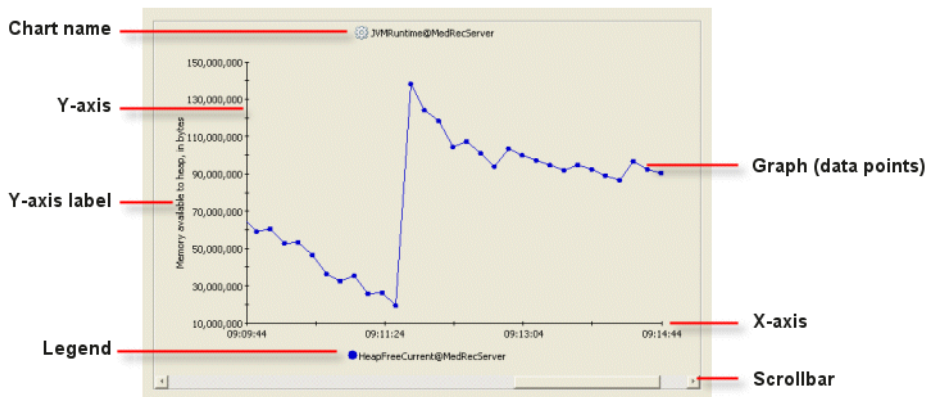
Several graph styles are available for presenting data: area, area radar, bar, plot, scatter plot, stacking area, and stacking bar. For instructions on how to set those styles, see "Setting a Chart Graphing Style" on page 6-25.

Adding Charts to Views

You create and add charts to views by dragging items from the **Metrics** tab or the **Requests** tab, as described in the following steps.

1. Select the **Views** tab and select the view to which you want to add a chart (or create a new view). Figure 6-2 shows an empty view.

Figure 6-2 Empty View
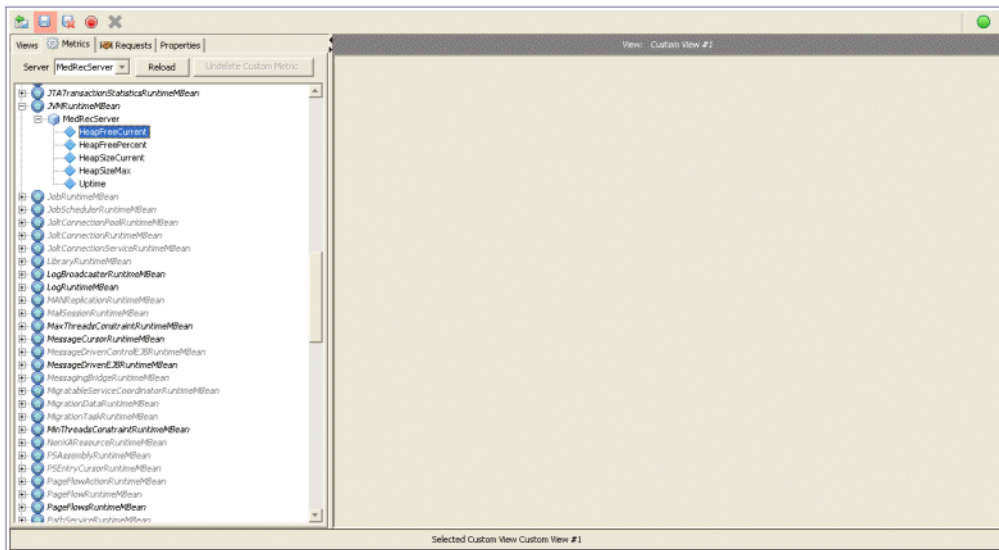
2. Select the **Metrics** tab to create a chart based on metrics, or select the **Requests** tab to create a chart based on events generated by instrumented methods.

3. Drag a valid item from the tree to the view. The cursor changes shape, and the background darkens when you drag it into an area where you can insert a chart, as shown in Figure 6-3. For information about what items can be dragged from the **Metrics** tab, see Chapter 7, "Working with Metrics Charts and Graphs." For information about what items can be dragged from the **Requests** tab, see "Working with Method Performance Charts and Graphs" on page 8-1.

Figure 6-3 Dragging a Metric to Create a New Chart in an Empty View
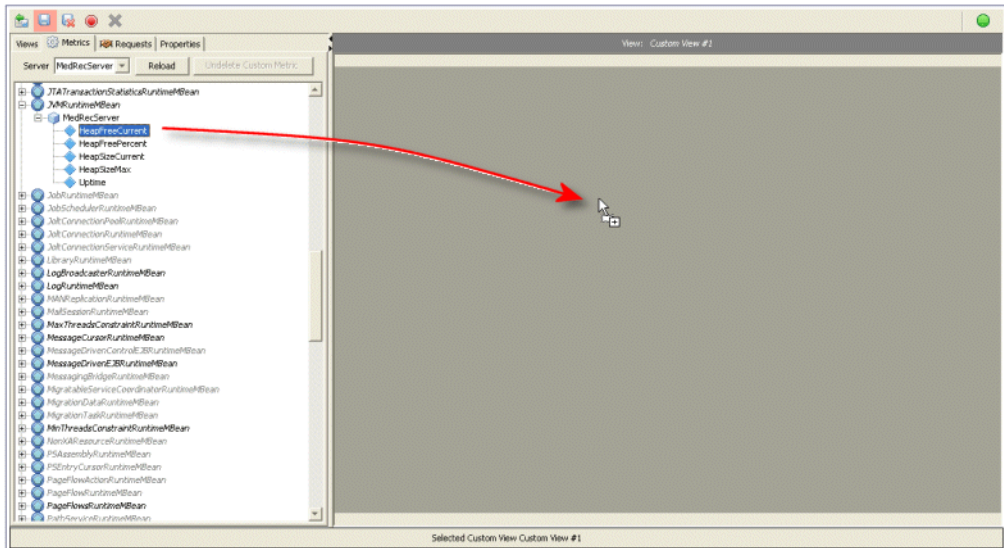
When you release the mouse button, a chart is created that contains a graph based on the item you dragged from the tree in the left panel, as shown in Figure 6-4.

Figure 6-4 A Chart in a View
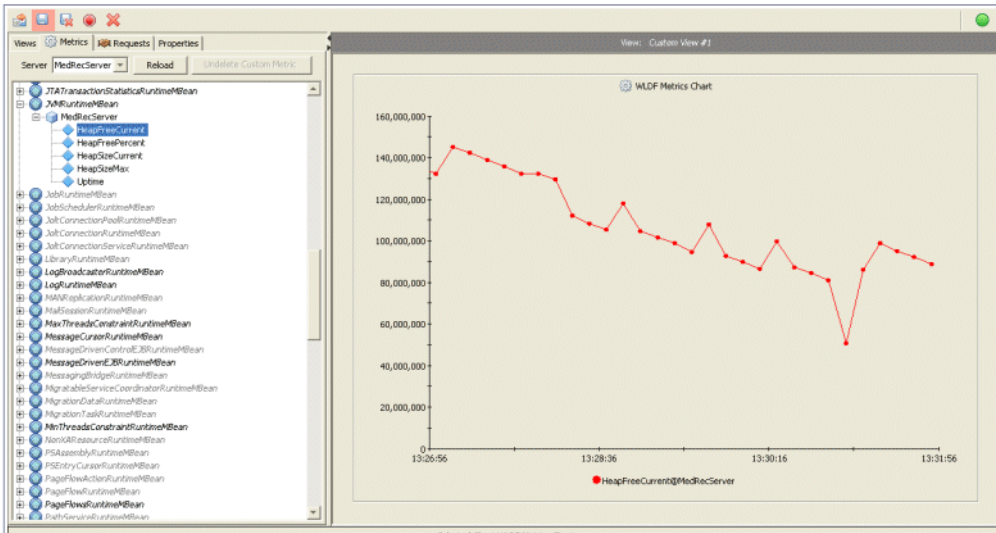
Note: An alternative to dragging an item into a chart is as follows:

- Right-click the item in left panel (the **Metrics** tab or the **Request** tab). The **Add to Chart** menu is displayed.

- Right-click an item in the **Metrics** tab or in the **Requests** tab and select **Create New Chart** to create a new chart containing a graph based on the selected item

- Right-click an item in the **Metrics** tab or in the **Requests** tab and select **Add to Chart**, then the name of an existing chart, to add a graph to the named chart.

4. To add another chart to the view, drag another item from the tree to a position above, below, or to the side of an existing chart. Figure 6-5 shows an item dragged to the right of a chart.

Figure 6-5 Dragging a Metric Into an Existing View to Create a Second Chart
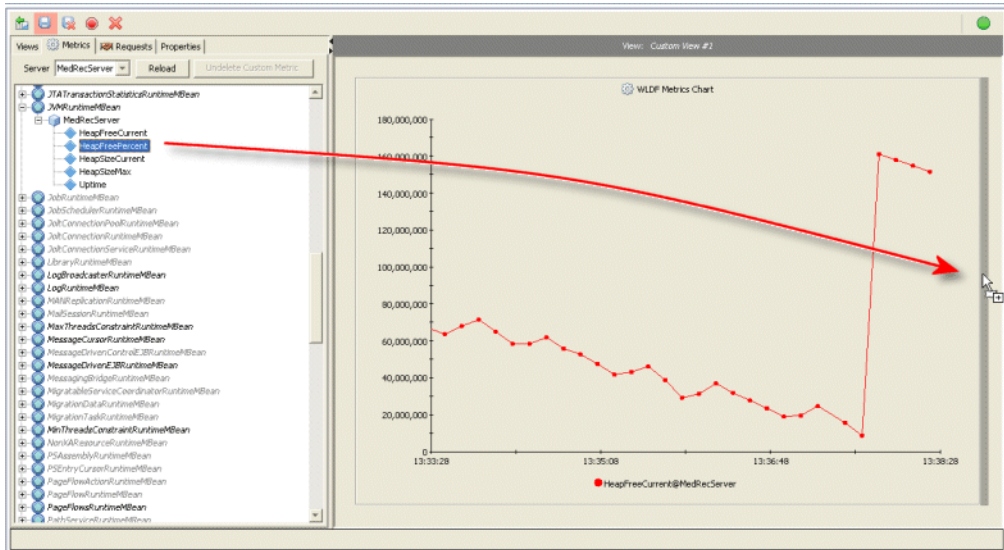
The new chart appears where it was dropped, as shown in Figure 6-6. All charts in the view are resized to fit together.

Figure 6-6 Two Charts in a View
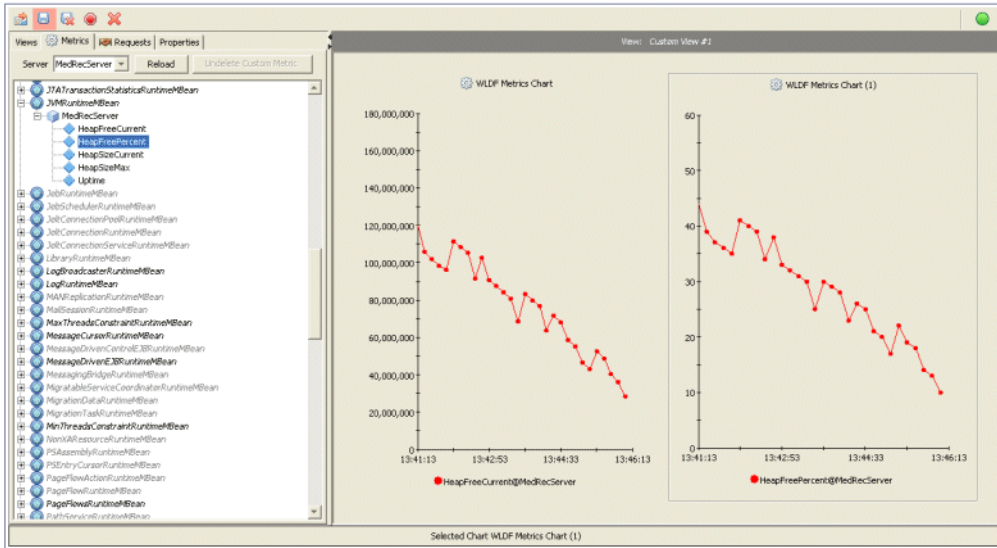
For alternative ways to arrange charts and graphs, see "Arranging Charts and Graphs in Views" on page 6-13.

Creating an Empty Chart

To create an empty chart:

1. Right-click anywhere in a view.

2. Select **New Chart**. You can now add one or more graphs to the chart, as explained in "Adding Graphs to Existing Charts" on page 6-8.

Adding Graphs to Existing Charts

To graph data from more than one data source on the same chart (that is to add a graph to an existing chart), drag the appropriate item from the **Metrics** tab or the **Requests** tab to the existing graph in the **View** panel, as described in the following steps:

1. Select the **Views** tab to display the list of views.

2. Click the view containing the chart to which you want to add another graph (data source). Figure 6-7 shows a chart with one graph.

Figure 6-7 Chart with One Graph
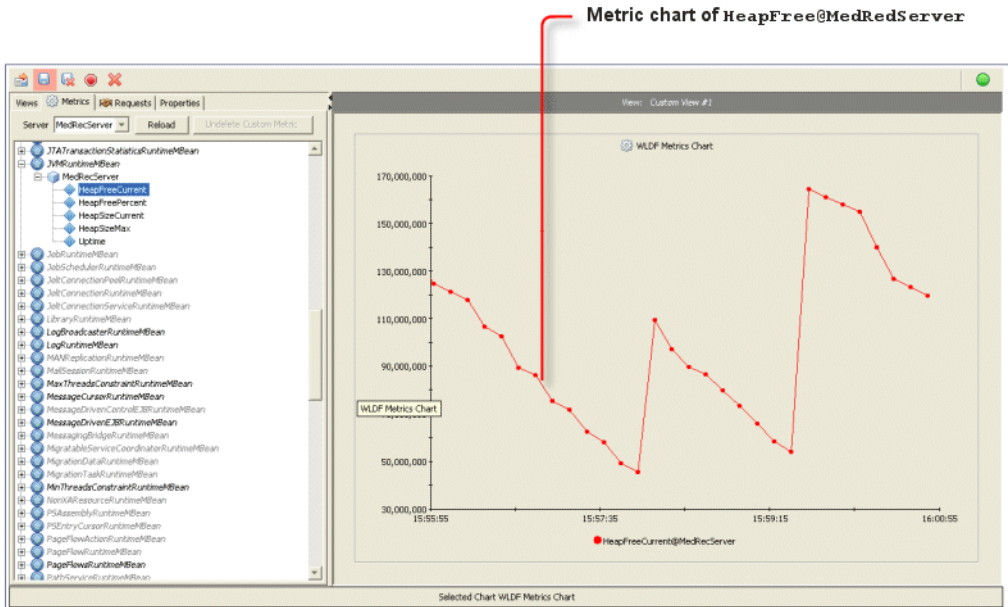
3. Select the **Metrics** tab to add a graph based on metrics, or click the **Requests** tab to add a graph based on instrumentation events.

   Note: All graphs in a chart must be based on the same type of diagnostic data. That is, you cannot add metrics data to a method performance chart or instrumentation data to a metrics chart.

4. Drag a valid item from the tree to the view, as shown in Figure 6-3. For information about what items can be dragged from the **Metrics** tab, see Chapter 7, "Working with Metrics Charts and Graphs.". For information about what items can be dragged from the **Requests** tab, see "Working with Method Performance Charts and Graphs" on page 8-1.

Figure 6-8 Dragging a New Diagnostic Data Source to an Existing Chart
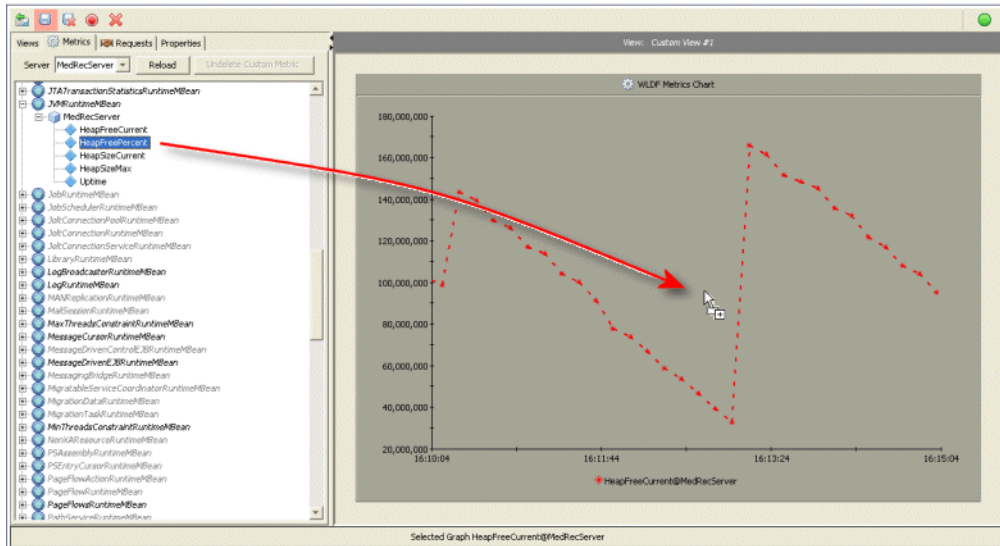
The new graph is added to the chart, as shown in Figure 6-9.

Figure 6-9 Resulting Graph with Two Charts
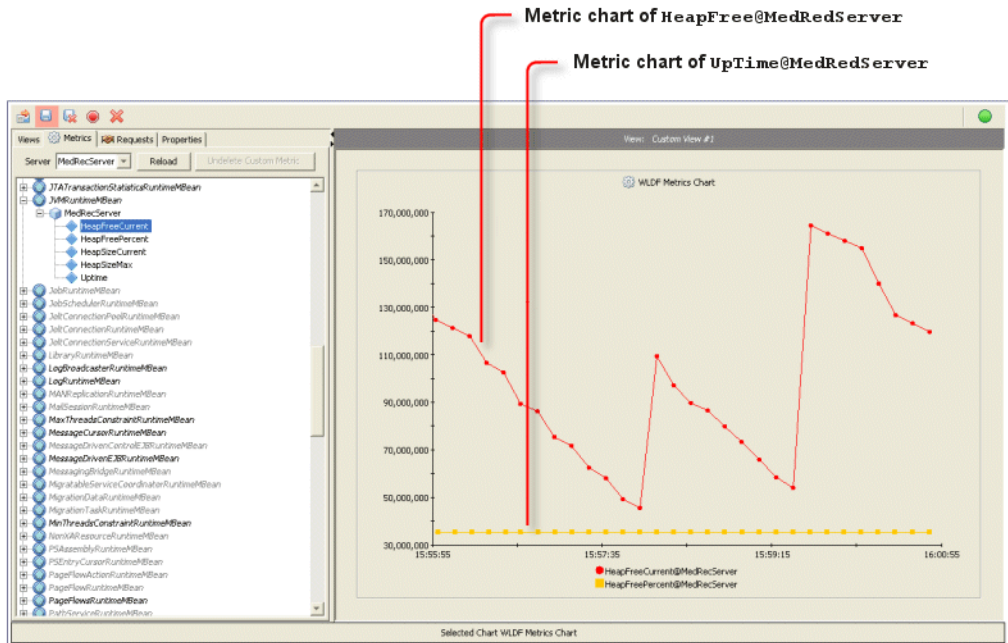
For alternative ways to arrange charts and graphs, see "Arranging Charts and Graphs in Views" on page 6-13.

Repositioning a Chart

To reposition a chart in a view:

1. Select the **Views** tab and select the view containing the chart you want to reposition.

2. Drag the chart to the new position in the view. That is, click the chart and hold the mouse button down while you drag. You position the chart above, below, to the left, or to the right of an existing chart. When the chart is in an acceptable position, a band of the background is darkened. This behavior is the same as when creating a new chart, as illustrated in Figure 6-5.

3. Release the mouse button.

For alternative ways to arrange charts and graphs, see "Arranging Charts and Graphs in Views" on page 6-13.

Merging Charts

When you merge charts, all the graphs and associated legend entries of the source chart are added to the graphs and the legend of the target chart. Properties of the target chart--such as the title, colors, and the Y-axis label--are maintained, and any conflicting properties from the source chart are lost. Once successfully merged, the source chart is deleted.

You can merge one or more charts in the same view or in different views.

To merge one chart with another in the same view:

1. Select the **Views** tab and select the view containing the charts you want to merge.

2. Drag the source chart onto the target chart. That is, click the chart and hold the mouse button down while you drag. When the source chart is positioned correctly over the target chart, the background of the target chart is darkened.

3. Release the mouse button.

   All the graphs and associated legend entries of the source chart are added to the graphs and the legend of the target chart. Properties of the target chart--such as the title, colors, and the Y-axis label--are maintained, and any conflicting properties from the source chart are lost. Once successfully merged, the source chart is deleted.

For alternative ways to arrange charts and graphs, see "Arranging Charts and Graphs in Views" on page 6-13.

Moving a Graph to a Different Chart or to a New Chart

You can move a graph to a different chart only if the target chart does not already contain a graph based on the same data source.

To move a graph from one chart to another:

1. Select the **Views** tab and select the view containing the graph you want to move. The source chart and the target chart must be in the same view.

2. **Shift**-click the graph (or its legend entry) to select it. Release the **Shift** key and the mouse button, and do not click or select anything else until you perform the instructions in the following step.

3. Drag the graph from the source chart to the target chart or to an empty area in the view. That is, click the already selected graph and hold the mouse button down while you drag. When the graph is positioned correctly over the target chart (or over the empty area), the background of the target chart (or the empty area) is darkened.

4. Release the mouse button. The graph and its legend are added to the target chart and removed from the source chart. If you dragged to an empty area, a new chart containing the graph is created.

For alternative ways to arrange charts and graphs, see "Arranging Charts and Graphs in Views" on page 6-13.

Arranging Charts and Graphs in Views

Table 6-1 shows how to copy, move, and duplicate charts and graphs by dragging and dropping with the mouse, by using context menus with the mouse, and by using the keyboard. For brevity, some common information is not repeated for each item in the table. That information is as follows:

- When you *move* a chart or graph, the original is deleted (that is, it is removed from its original position).

- When you *copy* or *duplicate* a chart or graph, the original remains unchanged.

- When you *merge* a chart, the original chart is deleted.

- *Drag and drop* means to click an item with the mouse, move it to a new location without releasing the mouse button, then releasing the mouse button to place the item in the new location.

- To copy a graph or chart by dragging and dropping, start dragging the item, press the **Ctrl** key before releasing the mouse button, then drop the item (release the button) in the selected position.

- When you right-click in the **View** panel, a *context menu* is displayed. The menu contains commands that are appropriate for the current context. Context menus in the **View** panel contain several commands for arranging charts and graphs.

- To select a chart using the mouse, click the chart in the **View** panel. To select a graph in a chart, **Shift**-click the graph, or **Shift**-click the name of the graph in the chart legend. You can then right-click the selected graph (or graph name) to display a context menu.

- To select a chart in the **View** panel using the keyboard, press **Tab** or **Shift+Tab** to cycle through the items, that is, to select one item after the other. See also Appendix A, "Keyboard Reference."

- When you select **Paste chart to new chart** from a context menu or press **Ctrl+Shift+V** from the keyboard, the most recently cut or copied item is inserted at the top of the current view. If the item is a graph, a new chart containing that graph is created.

- You can drag and drop a graph or chart to place it in a specific location above, below, or to the left or right of an existing chart. To do this, you drag the item to a border area, which is highlighted when it is selected. However, you cannot select a border area using context menus or the keyboard. Therefore you cannot use those methods to select a specific location to insert a chart. However, you can select **Paste chart to new chart** from a context menu or press **Ctrl+Shift+V** from the keyboard to insert an item at the top of the current view

- To use the keyboard to select a different view:

  a. Press **Ctrl+←** to select the **Tabs** panel.

  b. Press **Tab** repeatedly until the current tab title is selected.

  c. If the current tab is not the **Views** tab, press → or ← repeatedly until the **Views** tab is selected.

  d. Press **Tab** to enter the **Views** tab.

  e. Press ↑ or ↓ repeatedly until the desired view is selected.

  f. Press **Enter**.

  g. Press **Ctrl+** → to select the **View** panel again.

Table 6-1 Arranging Charts and Graphs

Action	Using Drag and Drop	Using Context Menus	Using the Keyboard
Move a chart to a different position in the same view	1. Drag the chart to the new position. 2. Drop the chart.	1. Right-click the chart. 2. Select **Move Chart**, then select a position from the submenus.	1. Select the chart. 2. Press **Ctrl+X**. 3. Press **Ctrl+Shift+V**.
Move a chart to a different view	Not available	1. Right-click the chart. 2. Select **Cut Chart**. 3. Select the target view. 4. Right-click anywhere in the view. 5. Select **Paste chart to new chart**.	1. Select chart. 2. Press **Ctrl+X**. 3. Select the target view. 4. Press **Ctrl-Shift-V**.
Copy a chart to a different view	Not available	1. Right-click the chart. 2. Select **Copy Chart**. 3. Select the target view. 4. Right-click in view. 5. Select **Paste chart to new chart**.	1. Select the chart. 2. Press **Ctrl+C**. 3. Select the target view. 4. Press **Ctrl+Shift+V**.
Duplicate a chart in the same view	1. Drag the chart to the new position 2. Press **Ctrl** while dragging. 3. Drop the chart.	1. Right-click the chart. 2. Select **Copy Chart**. 3. Right-click anywhere in the view. 4. Select **Paste chart to new chart**.	1. Select the chart. 2. Press **Ctrl+C**. 3. Press **Ctrl+Shift+V**.
Merge a chart with another chart in the same view	1. Drag the source chart to the target chart. 2. Drop the chart.	1. Right-click the source chart. 2. Select **Cut Chart**. 3. Right-click the target chart. 4. Select **Paste chart**.	1. Select the source chart. 2. Press **Ctrl+X**. 3. Select the target chart. 4. Press **Ctrl+V**.

Table 6-1 Arranging Charts and Graphs

Action	Using Drag and Drop	Using Context Menus	Using the Keyboard
Merge a copy of a chart with another chart in the same view	1. Drag the source chart to the target chart 2. Press **Ctrl** while dragging. 3. Drop the chart.	1. Right-click the source chart. 2. Select **Copy chart**. 3. Right-click the target chart. 4. Select **Paste chart**.	1. Select the source chart. 2. Press **Ctrl+C**. 3. Select the target chart. 4. Press **Ctrl+V**.
Merge a chart with a chart in a different view	Not available	1. Right-click the source chart. 2. Select **Cut chart**. 3. Select the other view. 4. Right-click the target chart. 5. Select **Paste chart**.	1. Select the source chart. 2. Press **Ctrl+X**. 3. Select the other view. 4. Select the target chart. 5. Press **Ctrl+V**.
Merge a copy of a chart with a chart in a different view	Not available	1. Right-click the source chart. 2. Select **Copy Chart**. 3. Select another view. 4. Right-click the target chart. 5. Select **Paste chart**.	1. Select the source chart. 2. Press **Ctrl+C**. 3. Select the other view. 4. Select the target chart. 5. Press **Ctrl+V**.
Move a graph to a different chart in the same view	1. Drag the graph to the target chart. 2. Drop the graph.	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Cut graph**. 4. Right-click the target chart. 5. Select **Paste graph**.	1. Select the source graph. 2. Press **Ctrl+X**. 3. Select the target chart. 4. Press **Ctrl+V**.

Table 6-1 Arranging Charts and Graphs

Action	Using Drag and Drop	Using Context Menus	Using the Keyboard
Copy a graph to another chart in the same view	1. Drag the graph to the target chart. 2. Press **Ctrl** while dragging. 3. Drop the graph.	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Copy graph**. 4. Right-click the target chart. 5. Select **Paste graph**.	1. Select the source graph. 2. Press **Ctrl+C**. 3. Select the target chart. 4. Press **Ctrl+V**.
Move a graph to a chart in a different view	Not available	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Cut graph**. 4. Select the other view. 5. Right-click the target chart. 6. Select **Paste graph**.	1. Select the source graph. 2. Press **Ctrl+X**. 3. Select the other view. 4. Select the target chart. 5. Press **Ctrl+V**.
Copy a graph to a chart in a different view	Not available	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Copy graph**. 4. Select the other view. 5. Right-click the target chart. 6. Select **Paste graph**.	1. Select the source graph. 2. Press **Ctrl+C**. 3. Select the target chart. 4. Press **Ctrl+V**.
Copy a graph to create a new chart in the same view	1. Drag the graph to a border in the view. 2. Press **Ctrl** while dragging. 3. Drop the graph.	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Copy graph**. 4. Right-click anywhere in the view. 5. Select **Paste chart to new chart**.	1. Select the source graph. 2. Press **Ctrl+C**. 3. Press **Ctrl+Shift+V**.

Table 6-1 Arranging Charts and Graphs

Action	Using Drag and Drop	Using Context Menus	Using the Keyboard
Move a graph to create a new chart in the same view	1. **Shift**-click the graph. 2. Drag the selected graph to a border area in the view. 3. Drop the graph to create a new chart.	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Cut graph**. 4. Right-click anywhere in the view. 5. Select **Paste chart to new chart**.	1. Select the source graph. 2. Press **Ctrl+X**. 3. Press **Ctrl+Shift+V**.
Copy a graph to create a new chart in a different view	Not available	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Copy graph**. 4. Select the other view. 5. Right-click anywhere in the view. 6. Select **Paste chart to new chart**.	1. Select the source graph. 2. Press **Ctrl+C**. 3. Select the other view. 4. Press **Ctrl+Shift+V**.
Move a graph to create a new chart in a different view	Not available	1. **Shift**-click the graph. 2. Right-click the selected graph. 3. Select **Cut graph**. 4. Select the other view. 5. Right-click anywhere in the view. 6. Select **Paste chart to new chart**.	1. Select the source graph. 2. Press **Ctrl+X**. 3. Select the other view. 4. Press **Ctrl+Shift+V**.

Starting and Stopping Data Collection for Charts in a View

To start data collection for the charts in a view:

1. Select the **Views** tab.

2. Click the name of the view you want to start. Alternatively, right-click the name of the view and select **Start**. The view is displayed in the **View** panel, and data collection begins.

To stop data collection for the charts in a view:

1. Select the **Views** tab.

2. Right-click the name of the view you want to stop and select **Stop**.

To stop all data collection for all views, click the (**Stop All Active Views**) button in the toolbar. (It is not necessary to first select the **Views** tab.)

Scrolling and Zooming the Data Displayed in a Chart

You can display or hide the scrollbar for a chart, as explained in "Turning a Chart Scrollbar On and Off" on page 6-27. The scrollbar includes controls for scrolling through data in the chart and for zooming in and out of the data in a chart.

The scrollbar and zoom controls are displayed below the chart, as shown in Figure 6-10.

Figure 6-10 Scrollbar for a Chart

The scrollbar contains controls for scrolling through historical data and for zooming in and out of a set of data to change the time span displayed in the chart. The controls are shown in Table 6-2.

Table 6-2 Controls in the Scrollbar

Control	Name	Use
	Thumb	Drag to scroll through historical data.
	Left scroll arrow	Click to scroll backwards through historical data.
	Right scroll arrow	Click to scroll forwards through historical data.

To display or hide the scrollbar for a chart:

1. Right-click anywhere in the chart.

2. From the context menu, select **Show Scrollbar** to display the scrollbar or **Hide Scrollbar** to hide it.

Scrolling Through Historical Data in a Chart

Under certain circumstances, described below, you can scroll back and forth through a chart's history, to see both historical and current data for the chart. Historical data is always retrieved from an archive, which means that historical data is only available if you have configured WLDF to gather metrics data (for metrics charts) and/or if you have configured WLDF to gather instrumentation data (for method performance charts). For more information about how this is handled, see Chapter 4, "Understanding How Data Is Collected and Presented."

To scroll through historical data:

1. Make sure that WLDF was configured to collect the metrics or instrumentation data you want to monitor.

2. Select the chart containing the data you want to monitor.

3. Drag the scrollbar's thumb control ⬛ to the interval you want to monitor. As you drag the thumb control, a message is displayed that shows the beginning and end times of the intervals you are scrolling through.

   Alternatively, click ◀p (left scroll arrow) to scroll backwards or click ▶ (right scroll arrow) to scroll forward. Clicking these buttons scrolls the viewport (the span displayed in the chart) by 10% of the viewport width. Clicking directly on the scrollbar (not on the thumb control) scrolls the viewport by 50% of the viewport width.

While you scroll, a message is displayed showing the time intervals you are scrolling through. When you stop scrolling, the data is retrieved for the selected interval. To display the dates and times for the visible interval, position the mouse pointer anywhere on the scrollbar.

If no archived data is available for a metrics graph, only the data available in the cache of actively polled metrics can be displayed. If you scroll to a point earlier than the data available in the cache, no data is displayed for that graph.

It can happen that you scroll back to view historical data that is not backed by the WLDF archive, and then that data expires from the cache while it is still displayed in the chart. If that happens, you will not be able to view that historical data again once you scroll away from it. To alert you that the data points have expired, the chart behind those data points is darkened, and tooltips for the chart and for the expired data points display messages to report that the data has expired. For example, see Table 6-11.

Figure 6-11 Expired Data Points
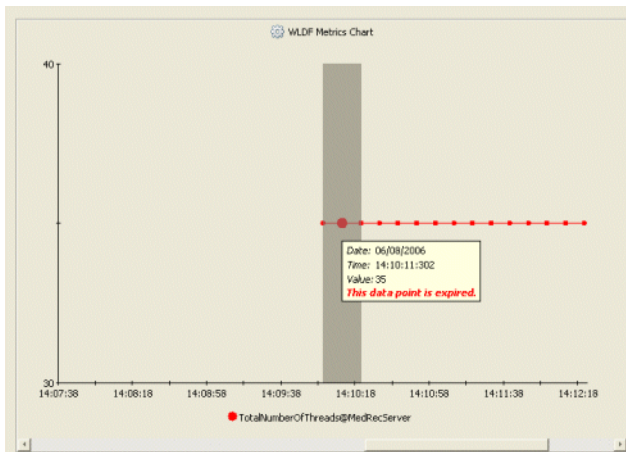
To display current data after scrolling:

1. Select the chart.

2. Do one of the following:

   – Move the thumb control all the way to the right on the scroll bar, or

   – Right-click the chart, then select **View Current Data** from the context menu.

Zooming In and Out of Data in a Chart

You can zoom into the data shown in a chart to expand the view of data points for a shorter time span, and you can zoom out to show details about a longer time span.

Zoom in and out as follows:

- To zoom in on the X-axis, right-click anywhere in the chart and select **Zoom In** (or press **Alt-z**). You zoom in to a percentage displayed time interval. Set the percentage in the **Global Properties** tab.

- To zoom out of the X-axis, right-click anywhere in the chart and select **Zoom Out** (or press **Alt-o**).

- To zoom in on the X-axis by a custom interval, **Shift**-drag over an area of the chart. That is, press and hold the **Shift** key, then drag the mouse pointer over the area of the chart you want to display. (You must release the mouse button before you release the **Shift** key.)

- To reset the interval to its state before it was zoomed, right-click the chart and select **Zoom Reset (R)** from the context menu (or press **Alt-r**). Resetting the zoom state resets the interval back to the default interval of five minutes, starting at the start time which was in effect before zooming.

Deleting a Graph from a Chart

To delete a graph from a chart:

1. Select the **Views** tab and select the view containing the chart containing the graph you want to delete.

2. Select the graph in either of the following ways:

   – **Shift**-click anywhere on the graph.

   – **Shift**-click on the legend entry for the graph.

3. Click the ✖ (Delete) button in the toolbar, or press the **Delete** key.

   Note: If you discard changes to the view containing the deleted graph, you can recover it. However, you cannot selectively discard changes, so you will lose any other changes you made, too. Once you save changes to the view, the deleted graph is permanently deleted and cannot be recovered.

Deleting a Chart

To delete a chart:

1. Select the **Views** tab and select the view containing the chart you want to delete.

2. Click the chart. A border appears around the chart to show it has been selected.

3. Click the ✖ (Delete) button in the toolbar, or press the **Delete** key.

   Note: If you discard changes to the view containing the deleted chart, you can recover it. However, you cannot selectively discard changes, so you will lose any other changes you made, too. Once you save changes to the view, the deleted chart is permanently deleted and cannot be recovered.

Setting Chart Properties

When you create a chart, it is created with default visual and control properties. To change those properties:

1. Select the **Views** tab and select the view containing the chart whose properties you want to change.

2. In the **View** panel, click anywhere in the chart to select it.

3. Select the **Properties > Selected Item Properties** tab to display controls for changing properties.

4. Make changes by setting the properties in the **Properties > Selected Item** tab, as described in the following sections:

5. Click the **Apply Changes** button to apply your changes to the selected chart.

   Note: You can change some properties directly in the View panel. For example, you can right-click a chart name or view name to display an edit field and then type a new name in the field. In that case, you do not have to click **Apply Changes**. Just click outside the text box to see your changes.

   Alternatively, click **Discard Changes** to restore the settings that were in effect when you started changing them, or click **Restore Defaults** to restore the WLDF Console Extension default settings for charts.

   Note: Applying a change to a property does not save it for future use. See step 6.

6. If this is a chart in a custom view, you can save the changes so they will be restored the next time you open the WLDF Console Extension. (You cannot save changes to a chart in a built-in view.) To save a custom chart, you must save the view, as follows:

   a. Select the **Views** tab.

   b. Click the **Save** button.

   Alternatively, on the toolbar, click the ⊟ (**Save All Modified Views**) button.

   Note: You cannot save changes to the properties of a chart in a built-in view.

Changing a Chart Name

You can change the name of charts in built-in and custom views. But you can save the name only for charts in custom views. To change the name of a chart:

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Chart Properties" on page 6-23.

2. Select the **General** subtab.

3. Enter a new name in the **Name** field.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Alternatively:

1. Display the view containing the chart.

2. Right click the name at the top of the chart.

3. Type a new name in the field.

4. Click anywhere outside the field to apply the change.

5. Save the changes, as explained in step 6 of "Setting Chart Properties" on page 6-23.

Creating a Y-Axis Label for a Chart

No Y-Axis label is assigned by default for a chart, but you can create one, as follows:

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Chart Properties" on page 6-23.

2. Select the **General** subtab.

3. In the **Y-Axis** field, enter text to be used as the Y-Axis label.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Setting a Chart Graphing Style

By default, graphs are created using the "plot" style (dots connected by lines). However, you can change the style, as follows:

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Chart Properties" on page 6-23.

2. Select the **General** subtab.

3. Select a style from the **Style** drop down list to change the visual style of each graph on the selected chart. Styles include:

Table 6-3 Graph Styles
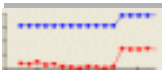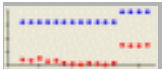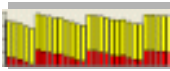
Style	Example	Description
Area		Solid area under a line

Table 6-3 Graph Styles

Area radar		Circular area, with new data sweeping clockwise, as with a radar
Bar		Bars alternating for each graph
Plot		Sequential dots connected by lines
Scatter plot		Dots only
Stacking area		Areas for each graph, stacked on top of each other
Stacking bar		Bars for each graph, one stacked on top of the other

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Turning a Chart Legend On and Off

A chart's legend identifies each graph on the chart. Each line in the legend shows the color and graphic used to plot the data points and identifies the data source for the graph.

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Chart Properties" on page 6-23.

2. Select the **General** subtab.

3. Check the **Legends** checkbox to display the legend, or uncheck it to hide the legend.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Alternatively:

1. Display the view containing the chart.

2. Right-click anywhere in the chart.

3. From the context menu, select **Hide Legend** to turn the legend off, or select **Show Legend** to turn the legend back on. (You can also press **Alt-L** to toggle the legend on and off.)

Turning a Chart Scrollbar On and Off

You can use the scrollbar to scroll back through historical data and the attached zoom controls to zoom in and out of data, as explained in "Scrolling and Zooming the Data Displayed in a Chart" on page 6-19. The scrollbar is hidden by default, however, you can display it and hide it again, as follows:

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in step 1-3 in "Setting Chart Properties" on page 6-23.

2. Select the **General** subtab.

3. Check the **Scrollbar** checkbox to display the scrollbar, or uncheck it to hide the scrollbar.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Alternatively:

1. Display the view containing the chart.

2. Right-click anywhere in the chart.

3. From the context menu, select **Hide Scrollbar** to turn the scrollbar off, or select **Show Scrollbar** to turn the scrollbar back on. (You can also press **Alt-S** to toggle the scrollbar on and off.)

Changing Chart Foreground and Background Colors

The foreground color for a chart includes the color of the text used for the legend and the color of the X- and Y-axis lines and values. The background color is the color used for the background of the entire chart.

1. Select the chart and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Chart Properties" on page 6-23.

2. Click the **Colors > Foreground** subtab to change the foreground colors, or click the **Colors > Background** subtab to change the background colors.

3. Select your preferred color chooser, by clicking one of the subtabs: **Swatches**, **HSB**, or **RGB**.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Chart Properties" on page 6-23.

Setting Individual Graph Properties

When you create a graph in a chart, it is created with default visual and control properties. To change those properties:

1. Select the **Views** tab and select the view containing the chart with the graph whose properties you want to change.

2. In the **View** panel, select the graph in either of the following ways:

   – **Shift**-click anywhere on the graph.

   – **Shift**-click on the legend entry for the graph.

3. Select the **Properties > Selected Item Properties** tab to display controls for changing graph properties.

4. Make changes by setting the properties in the **Properties > Selected Item** tab, as described in the following sections:

   – "Changing a Graph Name" on page 6-29

   – "Changing a Graph's Colors" on page 6-29

5. Click the **Apply Changes** button to apply your changes to the selected chart.

   Alternatively, click **Discard Changes** to restore the settings that were in effect when you started changing them, or click **Restore Defaults** to restore the WLDF Console Extension default settings for charts.

   Note: Applying a change to a property doesn't save it for future use. See step 6.

6. If this graph is in a chart in a custom view, you can save the changes so they will be restored the next time you open the WLDF Console Extension. (You cannot save changes to a chart in a built-in view.) To save a custom chart, you must save the view, as follows:

   a. Select the **Views** tab.

   b. Click the **Save** button.

Alternatively, on the toolbar, click the [icon] (**Save All Modified Views**) button.

Note: You cannot save changes to the properties of a chart in a built-in view.

Changing a Graph Name

When you drag an item onto a chart to create a graph of the item's data points, a name is assigned by default. This name appears in the legend for the chart containing the graph. You can change the name, as follows:

1. Select the graph and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Individual Graph Properties" on page 6-28.

2. Click the **General** subtab.

3. Enter a new name in the **Name** field.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Individual Graph Properties" on page 6-28.

Changing a Graph Scaling Factor

Adjusting the scaling factor for a graph adjusts the units used for the Y-Axis. For example, if a Y-Axis unit of 60,000 is scaled to 1, and you change the scaling factor to 10, the units are changed to 600,000. Changing the scaling factor of a graph is useful when a chart contains more than one graph, and you want to adjust the different graphs to be able to see them in relation to each other.

1. Select the graph and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Individual Graph Properties" on page 6-28.

2. Select the **General** subtab.

3. Select a scaling factor from the **Scale** dropdown list.

4. Apply, revert, or save the changes, as explained in steps 5 and 6 of "Setting Individual Graph Properties" on page 6-28.

Changing a Graph's Colors

The foreground color for a graph includes the color of the line and symbols used to plot data in the graph, where appropriate. The background color is the fill color for the graph, where

appropriate for the selected graph style. These colors are assigned by default, but you can change them, as follows:

1. Select the graph and select the **Properties > Selected Item Properties** tab, as explained in steps 1-3 in "Setting Individual Graph Properties" on page 6-28.

2. Click the **Colors > Foreground** subtab to change the foreground colors, or click the **Colors > Background** subtab to change the background colors.

3. Select your preferred color chooser, by clicking one of the subtabs: **Swatches**, **HSB**, or **RGB**.

Setting Global Properties

Global properties apply to all active views. To set global properties, click the **Properties** tab, then click the **Global Properties** subtab. You can set the following properties:

- **Polled data set size.** The number of dynamically gathered samples retained in the data cache on the server for each monitored metric. For information about the data caches, see Chapter 4, "Understanding How Data Is Collected and Presented."

- **Autoscroll Speed.** If a view contains several charts, you may have to scroll the window to see all the charts. If you drag an item from the **Tabs** panel towards an edge of such a view, the window scrolls so you can add the item to the hidden part of the view. The **Autoscroll Speed** setting sets the speed of the scrolling, in inches per second.

- **Autoscroll Insets.** The width of the region surrounding a panel that is used to trigger automatic scrolling.

- **Default Viewport Size.** The default size of the chart viewport in minutes. You can change the viewport size by zooming in or out.

- **Zoom Percentage.** The percentage by which the chart viewport size is changed during a zoom in (**Alt-z**) or a zoom out (**Alt-o**) operation.

Working with Metrics Charts and Graphs

Metrics charts and graphs plot the values of MBean instances and attributes. The values can be real-time polled metric values obtained from a running WebLogic Server, or they can provide a historical view of that metric value for all metrics maintained by the WLDF Harvester.

To create charts and graphs based on metrics data, you drag metrics attributes from the **Metrics** tab to the **View** panel. Each new graph shows the value of the selected attribute over time.

The following sections describe how to work with metrics charts and graphs:

For general information about working with metrics charts and graphs and with method performance charts and graphs, see Chapter 6, "Working with All Charts and Graphs."

Selecting a Server

The **Metrics** tab displays metrics available for a single server at a time. To select a different server, select the server from the **Server** dropdown list. The **Server** dropdown list displays all the servers in the domain.

Understanding the Contents of the MBean Tree in the Metrics Tab

The **Metrics** tab displays a tree containing the following:

- WebLogic MBean types
- Currently registered instances of the WebLogic MBean types
- Currently registered instances of custom MBean types
- Attributes of the listed registered instances

The icons described in Table 7-1 help to identify items in the tree:.

Table 7-1 Visual Cues in the MBean Tree in the Metrics tab

Icon	Represents...
⊙	WebLogic MBean type
ⓘ	JMX MBean type
ⓞ	Custom MBean type
▢	MBean instance
◆	Attribute of an MBean instance

Displaying Items in the Metrics tab

The tree shows the MBean types, instances, and attributes for a server. Display items in the **Metrics** tab, as follows:

- To view the MBeans from a different server in the domain, select the server from the **Select server** dropdown list. (You can display MBeans from only one server instance at a time, but you can create a chart using data from more than one server.)

- To refresh the tree for the selected server, click the **Reload** button.

- To show all currently registered instances of a listed MBean type, click the ⊞ (Expand) button to the left of the type name.

  Note: If the MBean type has no registered instances, the name of the MBean type appears in a gray, italic font. If no instances are registered, you cannot expand the node.

- To show all attributes of a listed MBean instance, click the ⊞ (Expand) button to the left of the left of the MBean name.

Displaying Details About MBean Instances and Attributes in the Metrics Tab

You can display details about MBean instances and attributes by placing the mouse pointer over items in the tree of MBeans displayed in the **Metrics** tab:

- Point to an MBean instance name to display the full object name of the MBean instance.

- Point to an MBean attribute name to display the type and description of the attribute.

For more information about displaying these kinds of details, see "Displaying Tooltips for Controls, Views, Graphs, and Charts."

Displaying Details About Metrics Charts and Graphs

You can display details about metrics charts and graphs displayed in the **View** panel by pointing the mouse pointer at objects in the panel:

- Point to a data point in a graph to display the time the data point was plotted and the sampled metric value at that time.

- Point to a chart legend to display the object instance name for each attribute listed in the legend.

- Point to a chart scrollbar to display the beginning data and time and the ending date and time for the visible interval. This tooltip also tells if this interval is the current interval.

For information about displaying these details, see "Displaying Tooltips for Controls, Views, Graphs, and Charts."

Creating Custom Metrics

You can track a metric based on an attribute of any registered MBean simply by dragging the attribute to a chart. You can also create more complex custom metrics by performing a variety of functions on one or more MBean instance attribute values. The custom metric is then available for creating graphs for all instances of a type.

To create a custom metric:

1. In the **Metrics** tab, right-click the name of the MBean type for which you want to create a custom metric.

2. From the context menu, select **Create Custom Metric**. The Custom Metric Editor is displayed in the right panel, replacing any view displayed in the **View** panel.

   Note: The Custom Metric Editor provides comprehensive help through *tooltips*. To display a tooltip, point the mouse at a field, function, or item in an expression, then pause for a moment until the tooltip is displayed.

3. Define a custom metric by constructing an expression in the **Expression** field of the Custom Metric Editor, as follows:

   – To insert a function, drag the function from the **Available Functions** box and drop it into the appropriate position in the **Expression** field. The available functions are explained in Table 7-2, Table 7-3, and Table 7-4. The positions where you can drop an item are described later in this step

   – To insert a simple metric based on an MBean attribute, drag the attribute (metric) from the **Metrics** tab and drop it into the appropriate position in the **Expression** field. (You can also drag a previously defined custom metric into the **Expression** field to create a nested custom metric.)

   – To edit a scalar value in an expression, right click the value in the **Expression** field, select **Edit** from the context menu, then enter a new value.

   – To delete an item from the expression in the **Expression** field, right-click the item, then select **Delete** from the context menu.

   The Custom Metric Editor enforces where you can drop a function or attribute. When you drag an item to an allowed position in the **Expression** field, the position is highlighted to indicate you can drop an item there. You can drop into the following positions:

- Drag a metric or a function directly onto another metric or function to replace it.

  Note: If no metric or function has yet been inserted where one is required, The placeholder `<MP>` (that is, a *metric placeholder*) appears wherever a metric or function is required but none has yet been added. You can drag a function or metric onto any occurrence of `<MP>`.

- Drag a function onto an *insert area* to insert it into that position, without replacing any existing items. Any terms to the right of the inserted function are included as the first argument to the function.

  Note: To display symbols that indicate where the insert areas are, check the **Show Insert Areas** checkbox under the **Expression** field.

4. Click **Save** to save the metric or **Cancel** to close the Custom Metric Editor without saving the metric.

Note: When you display the Custom Metric Editor for an MBean type, you can use the editor to build an expression for that MBean type only. If you want to create a custom metric for a different MBean type, you must save or cancel the expression you are building, then right-click the different MBean type to create a custom metric for it.

Editing and Deleting Custom Metrics

To edit or delete a custom metric:

1. In the **Metrics** tab, find the MBean type for which you defined the custom metric.

2. Click the ⊞ icon next to the name of the MBean type to display its instances, if they are not already displayed.

3. Click the ⊞ icon of any MBean instance to display its metrics, if none are already displayed. A custom metric defined for an MBean type is displayed for every MBean instance derived from the type.

4. Right click the name of the custom metric.

5. Select **Edit Custom Metric** to edit it or **Delete Custom Metric** to delete it. When you edit a custom metric, it is changed for every MBean instance of the type. When you delete a custom metric from the list of metrics for an MBean instance, it is deleted from all the instances of the type.

Changing the Name of a Custom Metric

To create a copy of a custom metric:

1. In the **Metrics** tab, find the MBean type for which you defined the custom metric whose name you want to change.

2. Right-click the name of the custom metric.

3. Select **Edit Custom Metric**.

4. In the **Metric Name** field, change the metric's name.

5. Click **Save**.

Creating a Copy of a Custom Metric

To create a copy of a custom metric:

1. In the **Metrics** tab, find the MBean type for which you defined the custom metric you want to copy.

2. Right-click the name of the custom metric.

3. Select **Edit Custom Metric**.

4. In the **Metric Name** field, change the metric's name.

5. Click **Save As**.

Functions for Creating Custom Metrics

The **Available Functions** box in the Custom Metric Editor lists all the functions you can use to construct an expression. To display a note about what each function does, point the mouse to the function and pause. A tooltip is displayed. The functions are listed by type and explained in the following tables:

- Table 7-2, "Functions Accepting Vector and/or Scalar Data but Not Requiring State from Previous Data," on page 7-7

- Table 7-3, "Functions Accepting Vector and/or Scalar Data and Requiring State from Previous Data," on page 7-8

- Table 7-4, "Functions that Operate Over an Interval," on page 7-8.

Note: In the tables, `<MP>` represents a function or a defined metric.

Table 7-2 describes functions that accept vector and/or scalar data but do not require a computed state from previous data for comparing results.

Table 7-2 Functions Accepting Vector and/or Scalar Data but Not Requiring State from Previous Data

Function	Description
`Abs(<MP>)`	Absolute value of the argument
`Change(<MP>)`	Difference between the current value and the last observed value of the argument
`Difference(<MP>,<MP>)`	Difference of the observed values of the arguments, for example, *A1-A2*.
`Difference(<MP>,NumericValue)`	Value determined by subtracting the provided scalar value from the current value
`Inverse(<MP>)`	Inverse of the observed value of the argument, for example (1/*value*)
`Negative(<MP>)`	Negative of the observed value of the argument, that is, 0-*value*
`Over(<MP>,Threshold)`	Boolean value (0 or 1) indicating when the value of the first argument falls below the provided constant threshold
`Product(<MP>,<MP>)`	Multiple of the observed values of the arguments, for example, *A1*A2*
`Product(<MP,NumericValue>)`	Value determined by multiplying the current value by the provided scalar value
`Ratio(<MP>,NumericValue)`	Ratio of the observed values of the arguments, for example, *A1/A2*
`Ratio(<MP,<MP>>)`	Value determined by multiplying the current value by the provided scalar value
`Sum(<MP>,<MP>)`	Sum of the observed values of the arguments, for example, *A1+A2*

Table 7-2 Functions Accepting Vector and/or Scalar Data but Not Requiring State from Previous Data

Function	Description
`Sum(<MP>,NumericValue)`	Value determined by adding the provider scalar to the current value
`Under(<MP>,Threshold)`	Boolean value (`0` or `1`) indicating when the value of the first argument falls below the provided constant threshold

Table 7-3 describes functions that accept vector and/or scalar data and that do require a computed state from previous data for computing results.

Table 7-3 Functions Accepting Vector and/or Scalar Data and Requiring State from Previous Data

Function	Description
`Count(<MP>)`	Number of observed values of the argument
`Max(<MP>)`	Maximum observed value of the argument
`Mean(<MP>)`	Mean of the observed values of the argument
`Min(<MP>)`	Minimum observed value of the argument
`StandardDeviation(<MP>)`	Standard deviation of the observed values of the argument
`Summation(<MP>)`	Sum of all the observed values of the argument

Table 7-4 describes functions that operate over an interval.

Table 7-4 Functions that Operate Over an Interval

Function	Description
`Change(<MP>,Interval)`	Difference between the current value and the first value at a time greater than or equal to the time $T-I$ where I is the millisecond interval value provided
`HighModel(<MP>,Interval)`	Median of the observed values of the argument over the interval defined by the provided value

Table 7-4 Functions that Operate Over an Interval

Function	Description
LowModel(<MP>,Interval)	Median of the observed values of the argument over the interval defined by the provided value
Median(<MP>,Interval)	Median of the observed values of the argument over the interval defined by the provided value

Working with Method Performance Charts and Graphs

Method performance charts and graphs plot method performance information that is based upon the real-time and historical views of method performance that can be captured through the WLDF instrumentation capabilities.

The following sections describe how to work with method performance charts and graphs:

For general information about working with metrics charts and graphs and with method performance charts and graphs, see Chapter 6, "Working with All Charts and Graphs."

Making Instrumentation Data Available for Method Performance Charts

You must configure WLDF instrumentation outside of the WLDF Console Extension to make instrumentation data available for creating method performance charts and graphs. The following criteria must be met:

- A WLDF system resource must be created and targeted to the server. Create the system resource by creating a `weblogic-diagnostics.xml` descriptor. You can do that using the WebLogic Server Administration Console, using the WebLogic Scripting Tool (WLST), or by creating it directly in an editor.

- Instrumentation in the targeted WLDF system resource must be enabled.

- Application instrumentation must be enabled with a `META-INF/weblogic-diagnostics.xml` descriptor in the application

- Application instrumentation descriptors must use `TraceElapsedTimeAction` diagnostic actions attached to "Around" type diagnostic monitors. For example, a descriptor could contain the following:

```
<instrumentation>
  <enabled>true</enabled>
    <wldf-instrumentation-monitor>
      <name>Connector_Around_Inbound</name>
      <action>TraceElapsedTimeAction</action>
    </wldf-instrumentation-monitor>
</instrumentation>
```

  See "Diagnostic Monitor Library" in *Configuring and Using the WebLogic Diagnostic Framework* for a list of "Around" type monitors.

See "Configuring Instrumentation" in *Configuring and Using the WebLogic Diagnostic Framework* for more information about how to accomplish these tasks outside of the WLDF Console Extension.

If instrumentation is not configured and enabled for the selected server, no data will appear in the WLDF Console Extension **Requests** tab.

Selecting a Server

The **Requests** tab displays instrumented methods available for a single server at a time. To select a different server, select the server from the **Server** dropdown list. The **Server** dropdown list displays all the servers in the domain.

Creating Method Performance Charts and Graphs

To create and modify charts and graphs based on instrumented methods, you drag methods from the **Requests** tab to the **View** panel to create or modify a method performance chart. Each graph shows the elapsed invocation times of the selected method over time.

**Figure 8-1 Requests Tree and a Method Performance Chart**
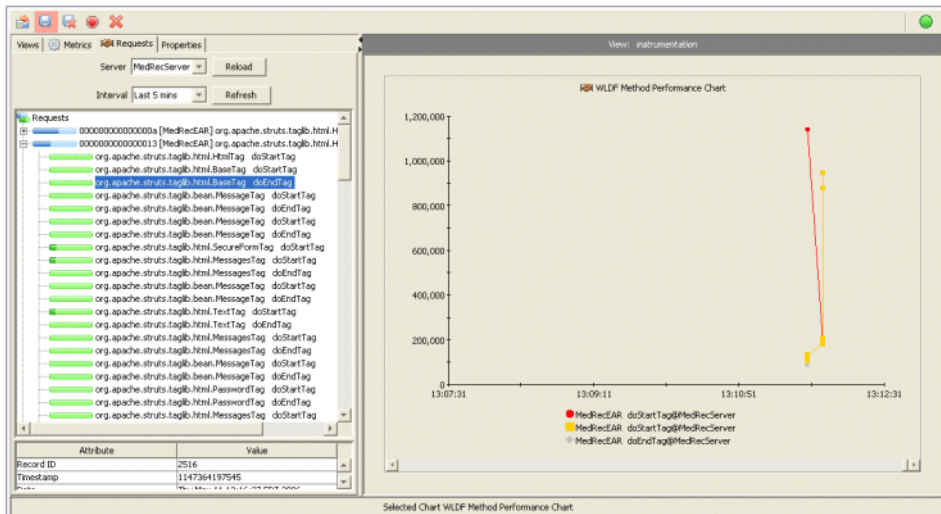
Displaying Requests and Methods in the Requests Tab

The **Requests** tab shows information about requests that flow through instrumented code. When such requests execute instrumented methods, instrumentation events are generated at the start and end of the methods.

The **Requests** tab includes a tree of method calls for identified requests. At the top level, the tree shows all identified requests from the specified server within a specified interval, as shown in Figure 8-2.

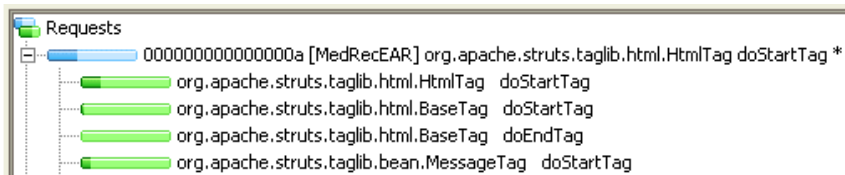**Figure 8-2 Requests Listed in the Requests Tab**
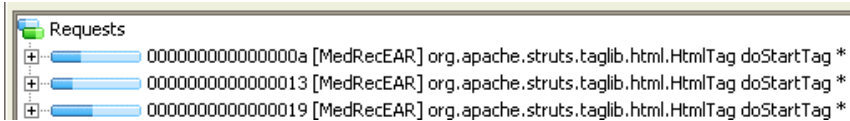
Requests are identified by:

- A unique request ID

- The name of the application

- Information about the top level method executed by the request

- The execution time of the request is shown by a horizontal bar, whose length is proportional to the relative weight of the node with respect to all its siblings at the same level in the method invocation tree.
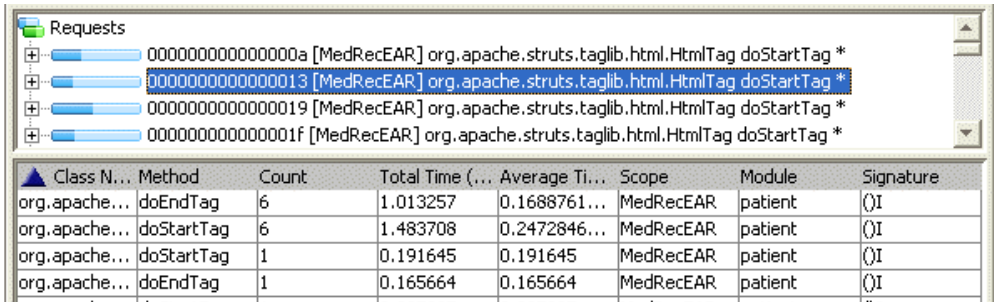
Expanding a request node shows its top level instrumented method, as shown in Figure 8-3. Within the call tree, if a method calls other instrumented methods, they are shown as its children. A method node in the call tree shows the instrumented class and method name.

Figure 8-3 Expanded Request Node in the Requests Tab

Displaying Details About Requests

To display details about a request listed in the **Requests** tree, click the string that identifies the request (not the ⊞ (**Expand**) or ⊟ (**Collapse**) buttons). The information is displayed in the panel below the tree, as shown in Figure 8-4.

Figure 8-4 Details About a Request

The attributes listed in this panel are described in Table 8-1.
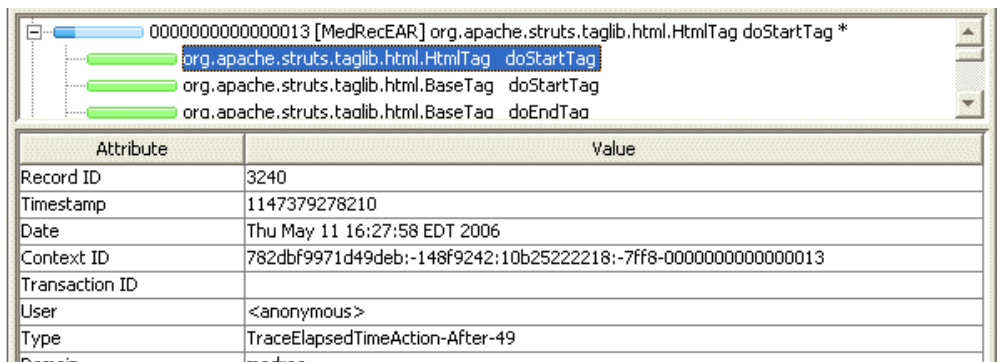
Table 8-1 Request Values Displayed in Request Panel

Attribute	Description
Class Name	A Java class containing a method that handled this request.
Method	The method that handled this request.
Count	The number of times this method handled this request.
Total Time (ms)	The total time taken by this method to handle this request, in milliseconds.
Average Time (ms)	The average time taken by this method to handle this request, in milliseconds.
Scope	The scope of the class containing the instrumented code.
Module	The application module containing this class.
Signature	The signature of the method.

Displaying Details About Instrumentation Events

To display details about the instrumentation event associated with a method invocation, click the method invocation node. The information is displayed in the panel below the call tree, as shown in Table 8-2.

Figure 8-5 Details About an Event

The attributes listed in this panel are described in Table 8-2.

Table 8-2 Event Values Displayed in Request Panel

Attribute	Description
Record ID	Unique identifier to identify this record in the log.
Timestamp	Date when this event was generated.
Context ID	Diagnostic context information to correlate messages coming from a specific request or application.
Transaction ID	The identifier for the transaction that initiated this diagnostic event. Present only for messages logged in the context of a transaction.
User	The user ID under which this diagnostic event was executed.
Type	Type of diagnostic action triggered by this diagnostic event.
Domain	Domain in which this event was generated.
Server	The name of the WebLogic Server instance on which this event was generated.
Scope	Server or application scope in which this diagnostic event was generated.
Module	Diagnostic module through which this diagnostic event was generated.

Table 8-2 Event Values Displayed in Request Panel

Attribute	Description
Monitor	Diagnostic monitor that triggered this diagnostic event.
File Name	Name of the Java file containing the instrumented method that generated this diagnostic event.
Line Number	Line in the source file where instrumented code exists.
Class Name	Name of the Java class containing the instrumented method.
Method Name	Name of the instrumented method that generated this diagnostic event.
Method signature	The signature of the method that generated this diagnostic event.
Payload	The payload.
Context Payload	The diagnostic context payload associated with diagnostic event.
Dyes	The diagnostic dyes associated with the method that initiated this event.

Displaying Details about Requests and Methods in the Requests Tab

You can display details about the requests and method calls by placing the mouse pointer over items in the tree of requests and methods displayed in the **Requests** tab:

- Point to a request node to display the request ID, request start time, and request elapsed time.

- Point to a method invocation node to display the method elapsed time, percentage with respect to the parent method, and application name.

For more information about displaying these kinds of details, see "Displaying Tooltips for Controls, Views, Graphs, and Charts."

Selecting a Time Interval for Obtaining Request Data

You can create a graph based on events executed during a specified time interval, as described in the following table:

To specify a predefined interval that ends in the present	From the **Interval** drop down list, select one of the following: • **Last 5 minutes** to display events data for the previous five minutes • **Last 15 minutes** to display events data for the previous fifteen minutes • **Last 30 minutes** to display events data for the previous 30 minutes • **Last 1 hour** to display events data for the previous hour

To specify a custom interval that ends in the present	1. From the **Interval** drop down list, select **Last dd hh mm**. The **Duration (DD HH MM)** text entry field appears.
	2. Enter a value for the interval, in the format DD HH MM, where
	  - **DD** is the number of previous days
	  - **HH** is the number of previous hours
	  - **MM** is the number of previous hours

To specify a custom interval that may not end in the present:	1. From the **Interval** drop down list, select **Custom**. A set of fields for entering the duration appears. 2. Click the **Start** drop down control to display a calendar. Select a start date. 3. Specify a starting hour and minute by replacing **HH MM** in the text entry box with the starting hour and minutes. 4. Enter a duration by replacing **DD HH MM** in the **Duration** text entry box with the desired days, hours, and minutes.

Displaying Details About Method Performance Charts

You can display details about method performance charts and graphs displayed in the **View** panel:

- Point to a data point in a graph to display the time the data point was plotted and its value when it was plotted, in nanoseconds.

- Point to a chart's scroll bar to display the beginning date and time and ending date and time for the visible interval. This tooltip also reports if the interval is the current interval.

- Point to a chart's legend to display the following for each entry in the legend:

– Class name containing the instrumented method

– Scope of the instrumented method

– Signature of the instrumented method

For information about displaying these details, see "Displaying Tooltips for Controls, Views, Graphs, and Charts."

Keyboard Reference

Most of the WLDF Console Extension documentation tells how to accomplish tasks using the mouse. However, you can accomplish virtually all of those tasks using the keyboard only, as described in the following sections:

- "Terms and Conventions" on page A-1
- "Navigating and Selecting" on page A-2
- "Keyboard Reference" on page A-2

Terms and Conventions

The following terms and conventions are used in Table A-1:

- *Controls* are items such as buttons, tabs, text fields, and sliders that you use to perform actions or view information. In some circumstances, a control may be *disabled*, which means that it is not available in the current context. For example, if no views have unsaved changes, the button for saving all views is disabled, and you are unable to select it using the keyboard. In that case, the appearance of the button is changed; for example it may be all gray, depending on the platform.

- Two key names separated by a + (plus sign), for example **Shift**+**Tab**, indicates that you must hold down the first key, then press the second named key, then release both keys.

Navigating and Selecting

You can use the keyboard to navigate through the WLDF Console Extension, for example, press the **Tab** key to move from one control to the other. However, navigating to a control does not initiate an action with the control; it simply makes it available for receiving the next keyboard input. For example, you can press **Tab** to navigate to a button but you must then press **Enter** to press the button. In most cases, this is straightforward, and you do not have to be aware of the distinction. A visual cue indicates that an item is selected. For example, a chart is surrounded by a box, or the data points and (legend entry icon) in a scatter plot graph may be displayed as stars. (The visual cues may be different on different platforms.)

The WLDF Console Extension has two main panels, the **Tabs** panel and the **View** panel, and one of those tabs is always active. Keyboard input affects whatever control is selected in the active panel. For example, if an edit field is selected in the active panel, any characters you type on the keyboard are added to that edit field.

Certain actions affect the selected item in the panel that is not active. For example, you can navigate to a chart in the **View** panel and select the chart. You can then navigate to the **Selected Item Properties** tab in the **Tabs** panel and make a change to a property (that is, select the control that sets the property's value, change the value, navigate to the **Apply Changes** button, and press **Enter** to push the button). When you apply the changes, the property is changed in the chart selected in the (non-active) **View** tab.

The ▣ (**Focus Context**) button on the toolbar indicates which panel is active. When the arrow on the button points left, the **Tabs** panel (on the left) is active. When it points right, the **View** panel (on the right) is active.

Keyboard Reference

Table A-1 describes how to use the keyboard to accomplish tasks in the WLDF Console Extension.

Table A-1 WLDF Console Extension Keyboard Access

Pressing this key or these keys...	When this item is selected...	Does this...
Enter	Any button	Presses the button.
Tab	**Tabs** panel (the panel on the left side of the page)	Selects the next active control. Repeatedly pressing the **Tab** key cycles through all active controls in the toolbar and the current tab. (That is, one control after another is selected, while the previously selected control is deselected. After the last control is selected, pressing the **Tab** key again starts the process again.)
Shift+Tab	**Tabs** panel	Same as **Tab**, above, but selects the previous instead of the next active control.
Tab	**View** panel (the panel on the right side of the page)	Selects the next chart in the view. Repeatedly pressing the **Tab** key cycles through all the charts.
Shift+**Tab**	**View** panel	Same as **Tab**, above, but selects the previous instead of the next chart.
→ (Right arrow)	Toolbar	Selects the next active button in the toolbar. Repeatedly pressing the arrows cycles through the active buttons in the toolbar.
← (Left arrow)	Toolbar	Same as →, above, but selects the previous instead of the next button.
→ (Right arrow)	Tab controls (labels) in the **Tabs** panel	Selects the next tab. Repeatedly pressing the arrows cycles through all tabs.
← (Left arrow)	Tab controls (labels) in the **Tabs** panel	Same as →, above, but selects the previous instead of the next tab.
↓ (Down arrow)	Tree of view names in the **Views** tab	Selects the next view or folder.

Table A-1 WLDF Console Extension Keyboard Access

Pressing this key or these keys...	When this item is selected...	Does this...
↑ (Up arrow)	Tree of view names in the **Views** tab	Selects the previous view or folder.
Shift+→ (Right arrow)	**View** panel	Selects the next chart in the current view. Repeatedly pressing the Shift+→ cycles through all the charts in the view. **Note:** If the Tabs panel is active when you click **Shift+** →, the **View** panel becomes active, and the next chart is selected.
Shift+← (Left arrow)	**View** panel	Same as **Shift+**→, above, but selects the previous instead of the next chart.
Shift+↓ (Down arrow)	**View** panel	Selects the next graph in the current chart, or if there are no more graphs in the chart, selects the first graph in the next chart. Repeatedly pressing **Shift+**↓ cycles through all the graphs in all the charts in the view. **Note:** If the **Tabs** panel has is active when you click **Shift+**↓, the **View** panel becomes active, and the next graph is selected.
Shift+↑ (Up arrow)	**View** panel	Same as **Shift+**←, above, but selects the previous instead of the next graph.
↓ (Down arrow)	**View** panel	Scrolls the contents of the panel up, if they extend beyond the visible area.
↑ (Up arrow)	**View** panel	Scrolls the contents of the panel down, if they extend beyond the visible area.
→ (Right arrow)	Slider control	Moves the slider control to the right.

Table A-1 WLDF Console Extension Keyboard Access

Pressing this key or these keys...	When this item is selected...	Does this...
← (Left arrow)	Slider control	Moves the slider control to the left.
Space bar	Check box	Selects or deselects the check box.
r	Chart in the **View** panel.	Displays current data in the selected chart. You can use this to return to showing current data after viewing historical data.
Ctrl+X	Chart or graph in the **View** panel.	Cuts the selected chart or graph and places it onto the Clipboard so it can be pasted to a new location.
Ctrl+C	Chart or graph in the **View** panel.	Copies the selected chart or graph onto the Clipboard so it can be pasted to a new location.
Ctrl+V	Chart in the **View** panel.	Pastes the most recently cut or copied graph or chart into the selected chart. If a *graph* was cut or copied, it is added to the chart. If a *chart* was cut or copied, it is merged with the selected chart.
		Note: You can paste a graph or chart into a different view than the one containing the source graph or chart.
Ctrl+Shift+V	View in the **View** panel.	Creates a new chart, based on the most recently cut or copied graph or chart. If a *graph* was cut or copied, a new chart containing that graph is created. If a *chart* was cut or copied, a duplicate of the source chart is created.
		Note: You can paste a graph or chart into a different view than the one containing the source graph or chart.
Esc	Anywhere	Deselects the currently selected item(s).
		If an in-place edit field is selected (for example, you can right-click the name of the view or of a chart in the **View** panel to edit it), pressing **Esc** first deselects the edit field. Pressing **Esc** again deselects the chart.
Del	Anywhere	Deletes the currently selected item.

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