OPTIMIZE

MERCURY BUSINESS AVAILABILITY CENTER™

Real User Monitor Administration

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BUSINESS TECHNOLOGY OPTIMIZATION

Mercury Business Availability Center

Real User Monitor Administration

Version 6.2

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Mercury Business Availability Center, Version 6.2
Business Process Monitor Administration

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Welcome to Real User Monitor Administration

This guide provides detailed instructions on how to install, configure, and administer the Mercury Real User Monitor data collector.

Note: If you are a Mercury Managed Services customer, you must contact a Mercury Customer Support representative to receive connection information that will enable you to work with Real User Monitor.

How This Guide Is Organized

The guide contains the following chapters:

Part I Real User Monitor Introduction and System Requirements

Introduces Real User Monitor and the platform system requirements, and explains how Real User Monitor works.

Part II Installing Real User Monitor

Explains how to install and uninstall the Real User Monitor engine. Also explains how to install one or more Real User Monitor probes.

Part III Configuring and Administering Real User Monitor

Explains how to configure a Real User Monitor probe by changing the default settings as well as how to configure and administer the Real User

Monitor engine. Also explains how to administer Real User Monitor's MySQL database.

Who Should Read This Guide

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

- Mercury Business Availability Center administrators
- Mercury Business Availability Center data collector administrators

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

Getting More Information

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

Part I

Real User Monitor Introduction and System Requirements

1

Introducing Real User Monitor Administration

This chapter introduces Mercury Real User Monitor and explains how it works.

This chapter describes:	On page:
Overview of Real User Monitor	3
How the Real User Monitor Works	4
Ports and Types of Communication Used by Real User Monitor	7
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Overview of Real User Monitor

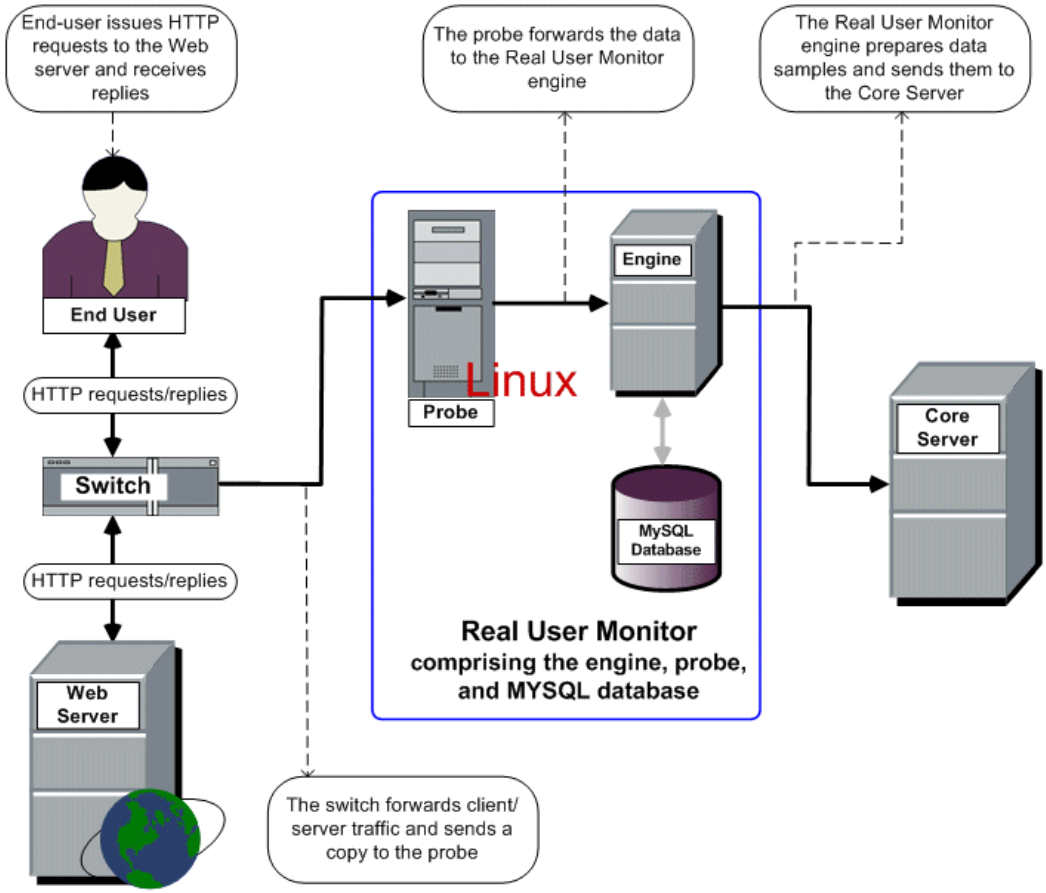
Mercury Real User Monitor measures the end-user experience of real users, enabling administrators to pinpoint the cause of delays and quantify the business impact of detected performance issues related to end users. Monitoring real traffic generated by end users, Real User Monitor collects network and server performance and availability data in real time. When performance and availability exceed specified thresholds, Mercury Business Availability Center proactively alerts application managers who, using the Real User Monitor reports, analyze the collected data in order to isolate the root cause of detected problems.

How the Real User Monitor Works

Mercury Real User Monitor consists of three major components: the probe, the engine, and the MySQL database.

- The **probe** is a non-intrusive, passive listening device that is subject to the same traffic the server receives. It is plugged into a network tap that is connected to a monitored Web server. As end-user traffic passes through the tap, the probe listens to requests and responses sent to and from the Web server. In this way, data is tracked all the way from the end-user's IP address to the Web server handling the request.
- The **engine** receives the data collected by the probe and assembles this data according to the configuration specifications it receives from Mercury Business Availability Center, that have been configured in Monitor Administration. The engine transmits the page, transaction, end-user, and server data samples it creates to the Mercury Business Availability Center Core Server. The Mercury Business Availability Center Core Server then distributes the data to the relevant Mercury Business Availability Center components, which create Real User Monitor alerts, reports, and Dashboard views.
- The **MySQL database** acts as Real User Monitor's repository for data that the Real User Monitor engine does not forward to Mercury Business Availability Center immediately, or at all. The MySQL database stores the Real User Monitor engine's configuration settings, session click-streams (pages and snapshots included in a session), and the open sessions summary.

The following diagram shows how Real User Monitor receives client/server traffic and passes it on to Mercury Business Availability Center.

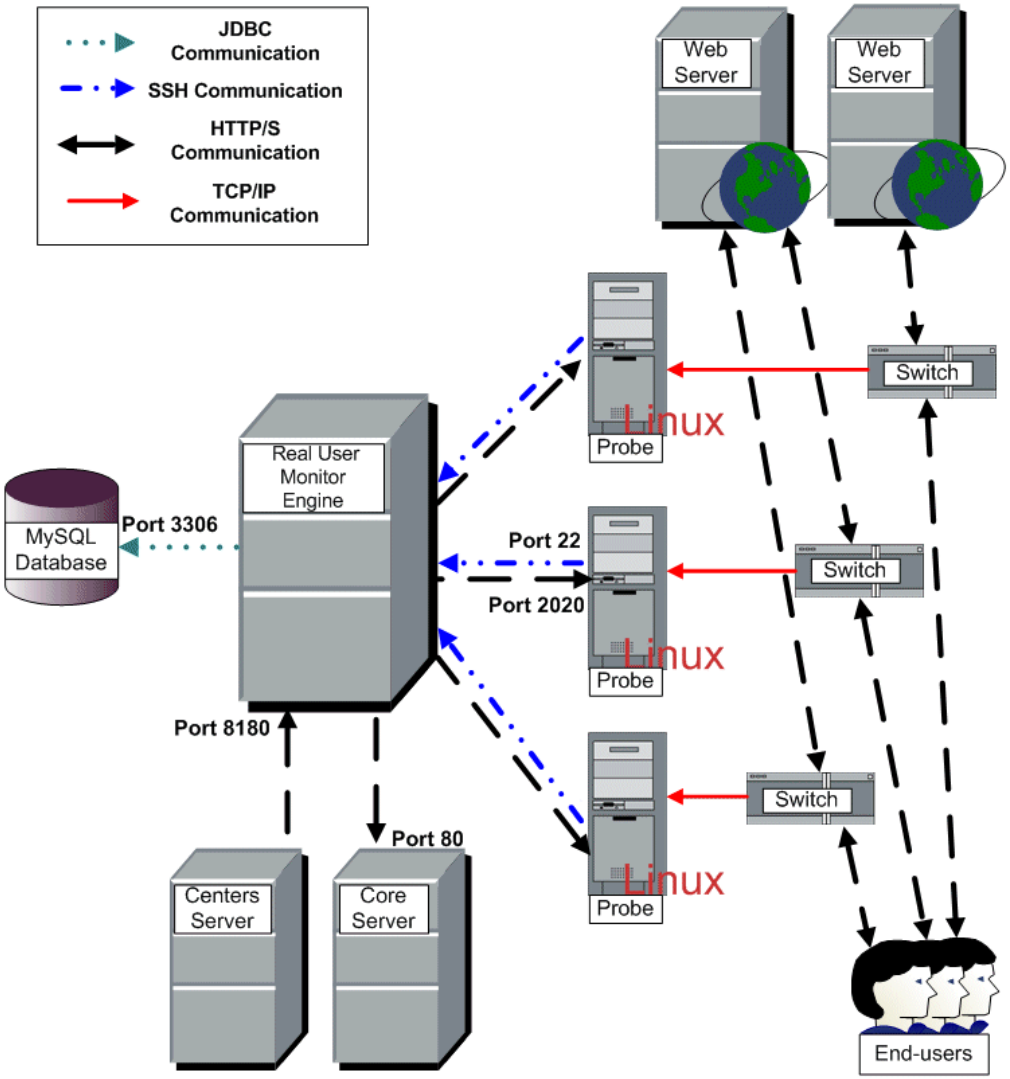


You use the Real User Monitor reports to analyze performance and availability data for the servers, pages, transactions, events, and end users that you configure for monitoring, as well as general statistics that are collected and sent by the probe(s) to the engine. When notified by an alert that a certain performance or availability threshold has been exceeded, you can examine the issue in the appropriate report(s) and try to pinpoint the cause of the problem and the time at which the problem occurred. For detailed information on Real User Monitor reports, see "Real User Monitor Reports" in *Using End User Management*.

In addition, Real User Monitor data is included in Dashboard.For information on displaying Real User Monitor data in Dashboard, see “Real User Monitor Views in Dashboard” in *Using Dashboard*.

Ports and Types of Communication Used by Real User Monitor

The following diagram shows the various ports and type of communications used by Real User Monitor, both internally and externally.



Installing and Administering Real User Monitor

To begin using Real User Monitor, you must perform the following steps (once you have installed Mercury Business Availability Center):

1 **Install the Real User Monitor engine.**

For information on installing the Real User Monitor engine and setting up the engine to connect to the Core Server, see "Installing the Real User Monitor Engine" on page 19.

2 **Create and connect to the MySQL database.**

You can create and connect to the MySQL database either as part of the Real User Monitor engine installation procedure or separately, at a later time. For details on creating the MySQL database as part of the Real User Monitor engine installation procedure, see "Installing the Real User Monitor Engine" on page 19. For details on creating the MySQL database at a later time, see "Overview of the MySQL Database" on page 113.

3 **Install one or more Real User Monitor probes.**

For information on installing a Real User Monitor probe and setting it up to report real-user activity data to the engine, see "Installing the Real User Monitor Probe" on page 29.

4 **If necessary, reconfigure the connection between the Real User Monitor and Mercury Business Availability Center.**

If connection parameters (such as SSL, proxy, and authentication) have changed since the installation of Mercury Business Availability Center, use the Real User Monitor engine's Web console to reconfigure the connection between the Real User Monitor and Mercury Business Availability Center. For detailed information, see "Using the Real User Monitor Web Console" on page 56.

5 Configure Real User Monitor in Mercury Business Availability Center Monitor Administration.

In Monitor Administration, you add the Real User Monitor engine you installed to the monitor tree. You then add one or more probes to the engine and configure the probe(s) to collect data from specific Web servers. In addition, you configure the specific pages, transactions, events, and end users you want to monitor. For more information, see "Configuring the Real User Monitor" in *End User Management Data Collector Configuration*.

Note: You can create Real User Monitor alerts if you want to be notified of certain occurrences while monitoring real-user data. You can view reports of the data collected by Real User Monitor in the End User Management application. For information on configuring alerts, see "Creating Alert Schemes" in *Platform Administration*. For information on viewing Real User Monitor reports, see "Real User Monitor Reports" in *Using End User Management*.

2

Reviewing System Requirements

This section describes the recommended system requirements for running Real User Monitor.

This chapter describes:	On page:
Real User Monitor Engine Requirements	12
Real User Monitor Repository (MySQL Database) Requirements	12
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Real User Monitor Engine Requirements

Computer/Processor	Dual-CPU Xeon 3.0 GHz Server
Operating System	**Windows:** Windows 2000 Server/Advanced Server, Service Pack 4 Windows 2003 Server standard/enterprise, Service Pack 1
Memory	2 GB
Hard Drive	70 GB
Network Card	Gigabit network adaptor

Real User Monitor Repository (MySQL Database) Requirements

Computer/Processor	Dual-CPU Xeon 3.0 GHz Server
Operating System	**Windows:** Windows 2000 Server/Advanced Server, Service Pack 4 Windows 2003 Server standard/enterprise, Service Pack 1
Memory	2 GB
Hard Drive	200 GB fast hard drive
Network Card	Gigabit network adaptor
MySQL Version	5.0 (installed by the Real User Monitor installation program)

Real User Monitor Probe Requirements

Hardware and Operating System Requirements

	Minimum	Recommended
Computer/Processor	Dual-CPU Xeon 3.0 GHz Server	Dual-CPU Xeon 3.0 GHz Server
Operating System	Red Hat Enterprise Linux (RHEL) version 4	Red Hat Enterprise Linux (RHEL) version 4
Memory	2 GB	4 GB
Hard Drive	70 GB IDE/SATA	150 GB SCSI SCSI required for high traffic levels of more than 15 MBs. Large disk space required for more than one page back on Snapshot on Error (SSOE).

	Minimum	Recommended
Network Card	**For connecting tap or port mirrored cable:** 1 Intel Pro/1000 (10/100/1000 auto-sensing) **For connecting to management port (used by RUM engine):** 1 Intel Pro/100 (10/100 auto-sensing) set for full duplex For copper connections, MT type card required. For fibre optic connections, MF type card required.	**For connecting tap or port mirrored cable:** 2 Intel Pro/1000 (10/100/1000 auto-sensing) **For connecting to management port (used by RUM engine):** 1 Intel Pro/100 (10/100 auto-sensing) set for full duplex For copper connections, MT type card required. For fibre optic connections, MF type card required.
PCI Slot		1 free 133/100/66 MHz 64 bit PCI slot

Environment and System Requirements

Requirement	Description
Perl	Perl must be installed with the following libraries: ➤ LWP::UserAgent ➤ URI::URL
ssh daemon	➤ Port 22 must be open ➤ Xinetd daemon must be up and listening to ssh clients
beatbox user	A user called **beatbox** is automatically created during installation, but you must manually configure a password for this user. When entering the Real User Monitor probe user and password in Monitor Administration, you must use either the **root** or **beatbox** user (for details, see "Adding a Real User Monitor Engine" in *End User Management Data Collector Configuration*).
Probe console port	Port 2020 is the default port used for accessing the Real User Monitor probe console. If you want to use SSL for accessing the Real User Monitor probe console, you use Apache Web Server as a proxy, limit port 2020 to localhost connections only and open port 443 on the Apache Web Server. For details, see "Using SSL to Access the Real User Monitor Probe Console" on page 42.
Permissions	The following directories must have **2770** permissions, be owned by **beatbox** and belong to the **beatbox** group: ➤ /var/spool/beatbox (and subdirectories) ➤ /etc/beatbox ➤ /var/log/beatbox

Part II

Installing Real User Monitor

3

Installing the Real User Monitor Engine

To monitor real user activity, you must first install the Mercury Real User Monitor engine.

You download the Real User Monitor engine installation file from the Downloads page, which you access from the Setup and Maintenance tab in Platform Administration.

The Real User Monitor installation procedure installs both the Real User Monitor engine and the MySQL database. You can install both the engine and the database on the same machine, or on different machines. To install the engine and database on different machines, install the MySQL database first and then install the engine and connect it to the database.

This chapter describes:	On page:
Installing the Mercury Real User Monitor Engine on a Windows Platform	19

Installing the Mercury Real User Monitor Engine on a Windows Platform

For details on the system requirements for installing the Mercury Real User Monitor engine on a Windows platform, see "Real User Monitor Engine Requirements" on page 12.

To install the Real User Monitor engine on a Windows Platform:

1 Click the **Mercury Real User Monitor Engine for Windows** link on the Downloads page to download the **MercuryRUMSetup_win.exe** file to the machine on which you want to install the engine.

Note: For the Real User Monitor engine setup file to be available on the Downloads page, it must first be installed to Mercury Business Availability Center. For details on installing Mercury Business Availability Center components setup files, see "Installing Components Setup Files to the Mercury Business Availability Center Downloads Page" in *Deploying Servers*.

If you prefer, you can copy the Real User Monitor engine setup program directly from the Mercury Business Availability Center 6.2 Components – Windows CD-ROM, supplied with your Mercury Business Availability Center package.

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2 On this machine, navigate to the downloaded file and double click **MercuryRUMSetup_win.exe**. The Real User Monitor Engine Setup begins.

3 When the Setup Welcome screen is displayed, click **Next**.

4 Accept the terms of the license agreement and click **Next**.

5 Select the path of the directory in which you want to install the Real User Monitor engine. Accept the default path, or click **Browse** to select a different directory. Click **Next**.

6 Select the type of installation you want to perform, **Typical** or **Custom**.

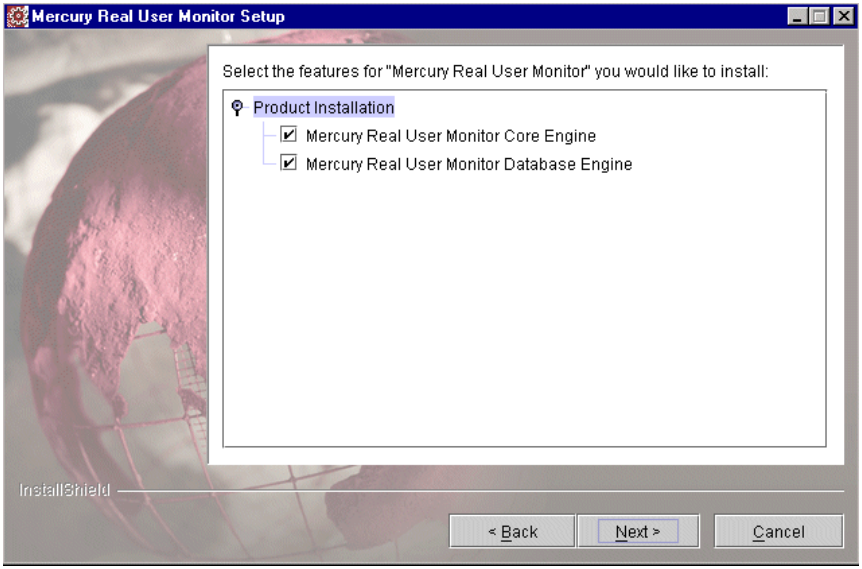
A typical installation installs both the Real User Monitor engine and the MySQL database.

In a custom installation, you can choose whether to install the Real User Monitor engine, the MySQL database, or both.

Click **Next**.

If you chose **Typical** installation, skip to step 8 to continue.

7 If you chose **Custom** installation, select the features you want to include by checking the box to the left of the required feature. You can select one, or both of the features.



Click **Next**.

Note:

If you choose **Mercury Real User Monitor Database Engine** only, the MySQL database will be installed in the specified location, but no database schema will be created.

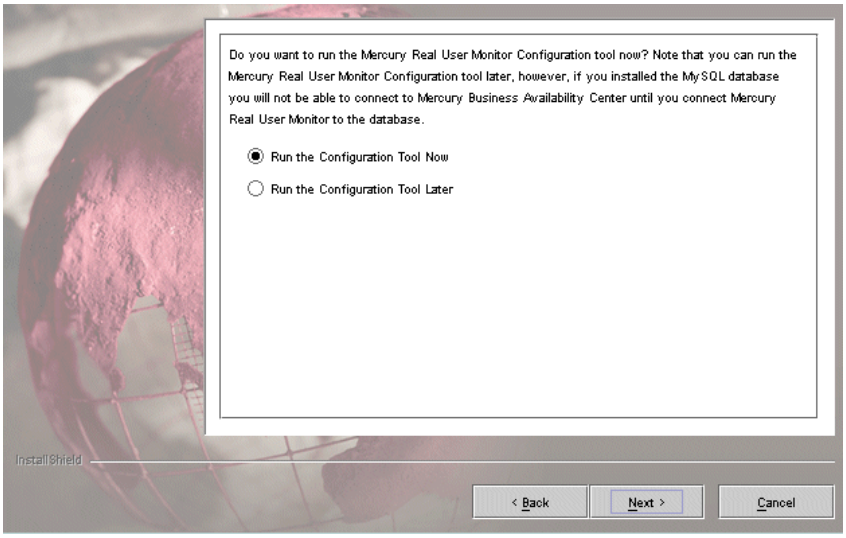
If you choose **Mercury Real User Monitor Core Engine** only and do not connect to a database, you are unable to configure connection settings to Mercury Business Availability Center during the installation. You can configure connection settings to Mercury Business Availability Center later via the Real User Monitor Web console (for details, see "BAC Connection Settings" on page 71).

---

8 Read the summary information. If it is correct, click **Next** to continue with the installation. If it is not correct, click **Back** to correct the information you previously provided.

9 If necessary, Setup prompts you to reboot the machine on which you are installing Real User Monitor. Select whether to reboot now, or at a later stage. Click **Next**.

10 Select whether you want to run the Real User Monitor Configuration tool. You can choose to run the Configuration tool at a later time, but you will not be able to work with Real User Monitor until you have configured the MySQL database settings and have connected the Real User Monitor engine to the database. For details of running the Configuration tool at a later time, see "Creating and Connecting to the MySQL Database" on page 114.



Click **Next**.

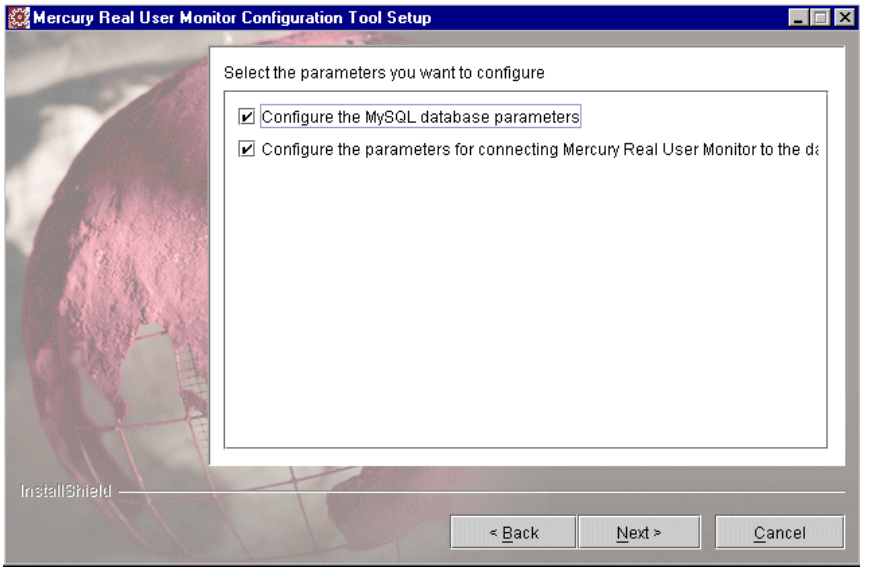
11 Click **Finish** to exit the Setup wizard.

If you chose to run the Configuration tool, continue with the following steps, but note that to configure database and connection settings you must have both a Real User Monitor engine installed and access to an existing MySQL database.

12 When the Configuration tool Welcome screen is displayed, click **Next**.

If you chose **Custom installation** > **Mercury Real User Monitor Core Engine** only, skip to step 15 to continue. Otherwise, continue with the next step.

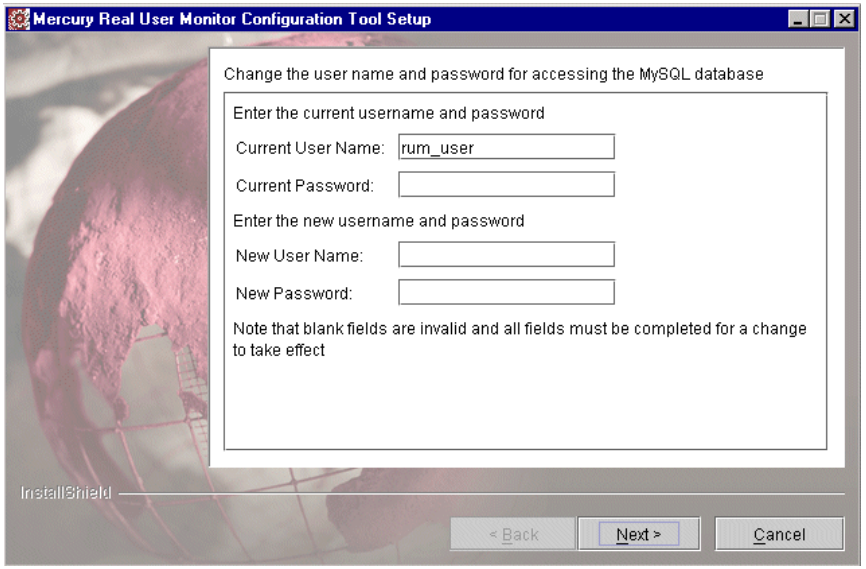
13 Select the parameters you want to configure. You can configure the MySQL database parameters, the parameters used by the Real User Monitor engine to connect to the MySQL database and to Mercury Business Availability Center, or both.



Click **Next**.

If you chose to configure the parameters used by the Real User Monitor engine to connect to the MySQL database and to Mercury Business Availability Center only, skip to step 15 to continue, otherwise proceed with the next step.

14 Enter the user name and password for accessing the MySQL database, or accept the defaults. If you change the default settings, note that blank fields are invalid and all fields must be completed for a change to take effect.

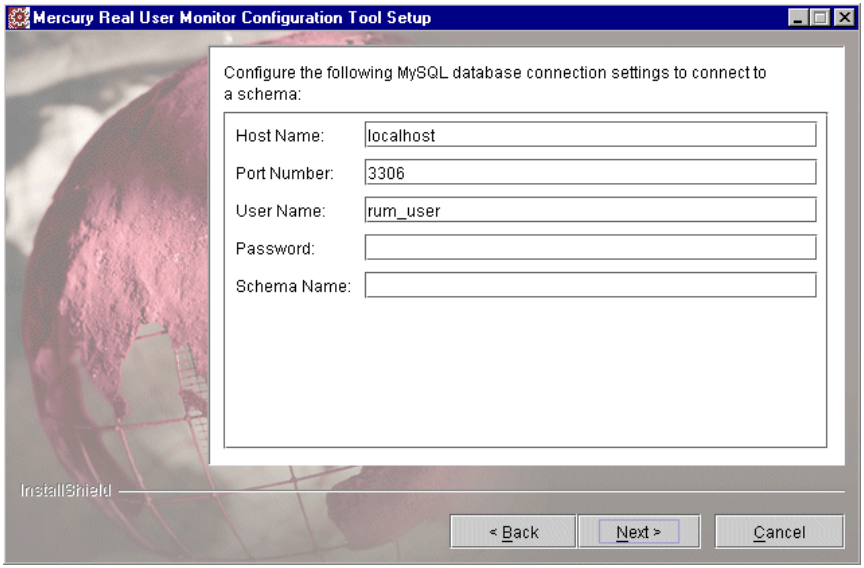


Click **Next**.

If you chose to configure the MySQL database parameters only, skip to step 20, otherwise proceed with the next step.

15 Select whether you want to create a new user schema for the MySQL database, or connect to an existing user schema. Click **Next**.

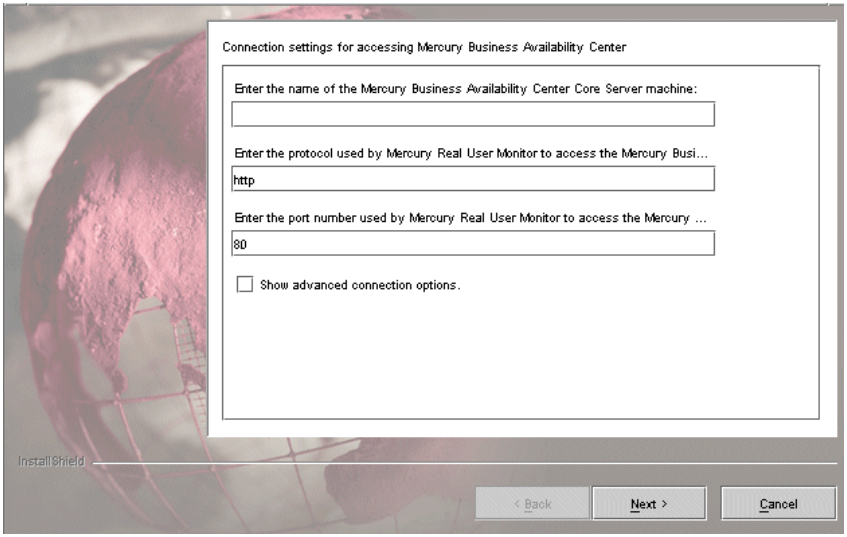
16 Configure the MySQL database settings. You can configure the host name of the machine where the MySQL database resides, as well as the port number for accessing this machine, or you can accept the default settings as they appear below. You can also change the default user name for accessing the MySQL database machine and can define a password for the user. In the **Schema Name** field, you specify the name for the MySQL database schema.



Click **Next**.

If you chose **Custom installation** > **Mercury Real User Monitor Database Engine** skip to step 20, otherwise proceed with the next step.

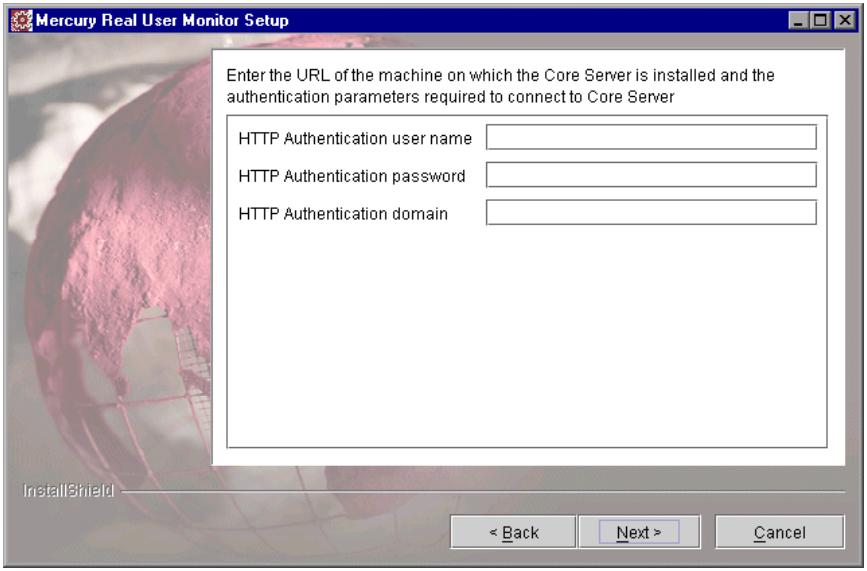
17 In the Real User Monitor Connection Settings dialog box, select the protocol (HTTP or HTTPS) via which the Real User Monitor engine connects to the Mercury Business Availability Center Core Server. (For details on configuring a reverse proxy or SSL, see "BAC Connection Settings" on page 71.) Enter the Core Server machine name and the port number through which you want the Real User Monitor engine to communicate with the Core Server. Note that by default, the port number is 80. Check the **Show advanced options** box to configure HTTP authentication or reverse proxy settings.



Click **Next**.

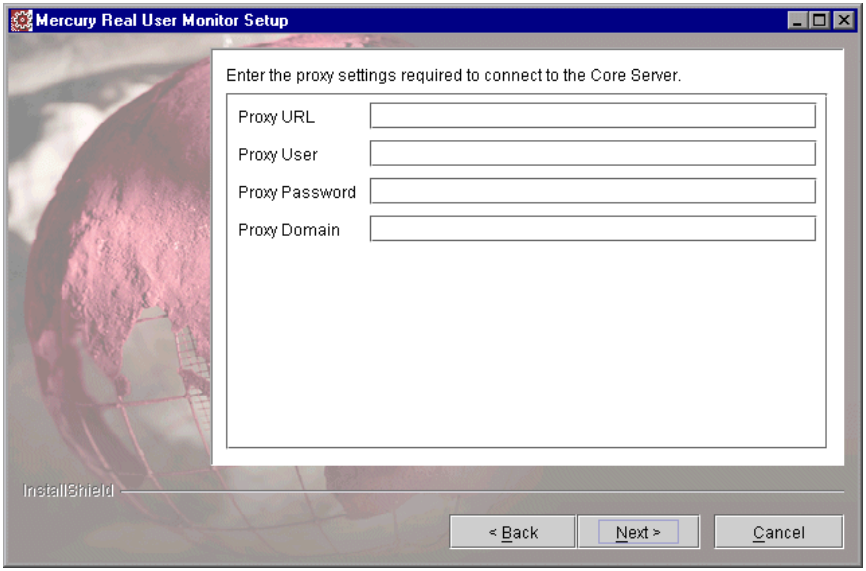
If you checked the **Show advanced options** box continue with the next step for additional connection settings. Otherwise, skip to step 20 to continue.

18 In the first advanced connection settings screen, enter the HTTP Authentication user name and password for connecting to the Core Server as well as the URL of the machine on which the Core Server is installed. For details on configuring basic authentication, see "BAC Connection Settings" on page 71.



Click **Next**.

19 In the second advanced connection settings screen, enter the proxy settings required for connecting to the Core Server. For details on configuring a reverse proxy or SSL, see "BAC Connection Settings" on page 71.



Click **Next**.

20 Once the Real User Monitor engine has been installed, click **Finish** to exit the wizard.

After successfully installing the Real User Monitor engine and connecting the engine to the MySQL database, you launch Real User Monitor on the machine on which it is installed.

You start Real User Monitor by selecting **Start** > **Programs** > **Mercury Real User Monitor** > **Administration** > **Enable Mercury Real User Monitor**.

You can stop Real User Monitor by selecting **Start** > **Programs** > **Mercury Real User Monitor** > **Administration** > **Disable Mercury Real User Monitor**.

For additional information on starting and stopping Real User Monitor, see "Administering Real User Monitor" on page 54.

4

Installing the Real User Monitor Probe

After installing the Mercury Real User Monitor engine, you must install at least one Real User Monitor probe. You then set up the probe to collect real-user data and report this data to the engine.

This chapter describes:	On page:
Physically Connecting the Probe	29
Installing the Probe	31
Stopping and Starting the Probe	33

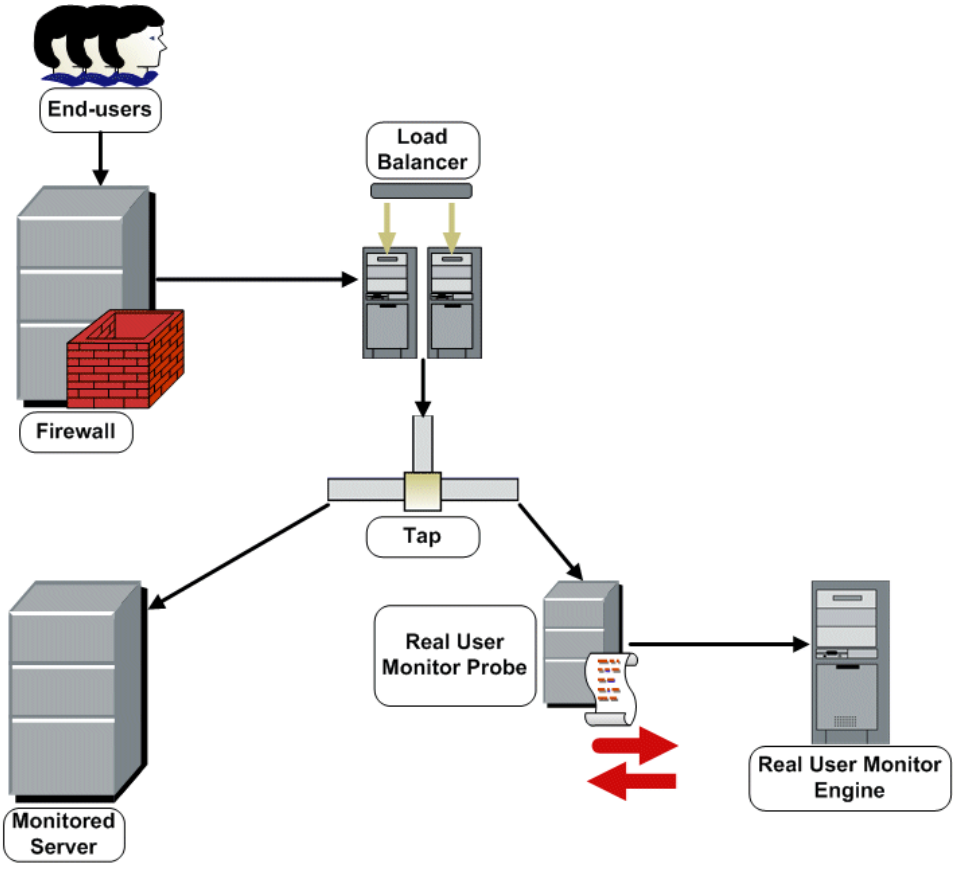
Physically Connecting the Probe

This section describes how to physically connect the Real User Monitor probe to the network.

The Real User Monitor probe runs on a Linux machine that has two network interface cards. For details on the system requirements for the Real User Monitor probe, see “Real User Monitor Probe Requirements” on page 13.

The first network card uses the Linux device **eth0** and is used to communicate with the Real User Monitor engine.

The second network card uses the Linux device **eth1** and is used to communicate with a network tap that is also attached to the server you are monitoring. The tap copies to the probe the network traffic to and from the monitored server.



Note:

- If using a load balancer, it is recommended to place the network tap behind the load balancer
- Load balancers should be configured to use the **x-forward-for** header to preserve end-user IP addresses for use by Real User Monitor.
- For small installations with a low amount of network traffic, instead of using a network tap, the **eth1** port of the Real User Monitor probe can be connected to a switch that is configured for port mirroring for the monitored server.

Installing the Probe

This section describes how to install the probe on a Linux machine.

The Real User Monitor probe is installed on a machine running the Linux operating system. For details on the system requirements for the Real User Monitor probe, see "Real User Monitor Probe Requirements" on page 13.

You download the Real User Monitor probe installation file from the **Downloads** page, which you access from **Admin** > **Platform** > **Setup and Maintenance**.

Note: The Real User Monitor probe installation must be carried out as the root user.

To install the Real User Monitor probe:

1 Click **Mercury Real User Monitor probe** on the Downloads page to download the **MercuryBeatboxSetup_linux.bin** file to the **/var/tmp** directory on the machine on which you want to install the probe. Note that if you cannot download this file directly to the Linux machine on which you are installing the probe, make sure that you download the file to a machine from which you can later FTP (in binary mode) the file to the Linux machine.

Note: For the Real User Monitor probe setup file to be available on the Downloads page, it must first be installed to Mercury Business Availability Center. For details on installing Mercury Business Availability Center components setup files, see "Installing Components Setup Files to the Mercury Business Availability Center Downloads Page" in *Deploying Servers*.

If you prefer, you can copy the Real User Monitor probe setup program directly from the Mercury Business Availability Center 6.2 Components – Linux CD-ROM, supplied with your Mercury Business Availability Center package.

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2 Run the installation script with the following commands:

- **cd /var/tmp**
- **MercuryBeatboxSetup_linux.bin**

3 Change the sshd daemon to work with xinetd by running the script **/etc/beatbox/configure_ssh.sh**.

4 It is recommended to set the network configuration automatically by running the script **/usr/bin/bb_netconfig.pl**.

5 Start the Real User Monitor probe with the command **/etc/init.d/beatbox-capture start**.

6 Verify that the Real User Monitor probe has successfully started with the command **/etc/init.d/beatbox-capture status**. The following is displayed:

```
[root@beatboxrnd rum-pages]
# /etc/init.d/beatbox-capture status
BeatBox is responding properly.
[root@beatboxrnd rum-pages]#
```

Stopping and Starting the Probe

Once installed on the Linux machine, the Real User Monitor probe will be started automatically each time the Linux machine is started. You can also manually start and stop the Real User Monitor probe.

To start the Real User Monitor probe manually:

1 Log in to the Real User Monitor probe machine as the root user.

2 Start the Real User Monitor probe with the command **/etc/init.d/beatbox-capture start**.

To stop the Real User Monitor probe manually:

1 Log in to the Real User Monitor probe machine as the root user.

2 Stop the Real User Monitor probe with the command **/etc/init.d/beatbox-capture stop**.

5

Uninstalling Real User Monitor

If you no longer want to use Real User Monitor, you can uninstall the engine.

Note: To uninstall the probe, you need only disconnect it from the network, or shut down the probe machine.

This chapter describes:	On page:
Uninstalling Mercury Real User Monitor on a Windows Platform	35

Uninstalling Mercury Real User Monitor on a Windows Platform

To uninstall the Real User Monitor engine:

1 If Mercury Real User Monitor is running, stop it by disabling it from the start menu (**Start > Programs > Mercury Real User Monitor > Administration > Disable Mercury Real User Monitor**).

2 On the machine from which you are uninstalling Mercury Real User Monitor:

a Select **Start** > **Settings** > **Control Panel**.

b Select **Add/Remove Programs**.

c Select **Mercury Real User Monitor**.

d Click **Change/Remove**.

Click **Next**.

1 When the Setup Welcome screen is displayed, click **Next**.

2 Read the summary information. If it is correct, click **Next** to continue with the uninstallation. If it is not correct, click **Back** to correct the information you previously provided.

3 Choose if you want the uninstall process to delete unused files. Click **Next**.

4 Choose whether you want the uninstall process to reboot the machine for you automatically when the uninstall process is complete, or to restart it yourself manually at a later time. Click **Next**.

5 Once the Real User Monitor engine has been uninstalled, click **Finish** to exit the uninstall process.

Note: If you delete the MySQL database only, the Real User Monitor engine will not work without the MySQL database.

Part III

Configuring and Administering Real User Monitor

6

Configuring the Real User Monitor Probe

You can configure the Real User Monitor probe by changing the default settings and adding additional configuration settings.

This chapter describes:	On page:
Configuring Real User Monitor to Monitor SSL Traffic	39
Using SSL to Access the Real User Monitor Probe Console	42
Changing the Monitored Ethernet Interface of the Probe	47
Filtering Monitored Traffic	50
Unifying Frames	51

Configuring Real User Monitor to Monitor SSL Traffic

SSL (Secure Sockets Layer) is the leading security protocol that encrypts and decrypts a message for online transmission and authentication. When an SSL session is started, the Web server sends its public key to the client. The client uses this public key to send a randomly generated private key back to the server, which facilitates a private key exchange for the session.

Because the SSL protocol encrypts traffic between the Web server and client, the Real User Monitor cannot analyze SSL traffic the same way it analyzes regular Web traffic. To analyze SSL traffic, you must configure the Real User Monitor probe to be able to use the correct private key for the traffic it is monitoring.

Configuring the Real User Monitor Probe and Engine for SSL Traffic

If you want to monitor SSL traffic using the Mercury Real User Monitor, you must configure both the Real User Monitor probe and engine.

To configure the Real User Monitor probe and engine to monitor SSL traffic:

1 Copy the private key file of the server whose SSL traffic you want to monitor to the Real User Monitor probe machine (for example, to the /etc/beatbox directory).

Note: The file must be in **pem** format. To convert a file to pem format see "Converting a Private Key File to PEM Format" on page 41.

---

2 On the Real User Monitor engine machine, edit the **<Mercury Real User Monitor engine root directory>\conf\configurationmanager\ Beatbox_Default_Const_Configuration.xml** file.

At the bottom of the **collector** section (that is, between **<collector>** and **</collector>**, add a line for each server (or range of servers) whose SSL traffic you want to monitor, in the following format:

ssl_servers <SERVERRANGE> <PORTRANGE> <PRIVATE KEY FILE>

where:

SERVERRANGE – is the IP range of the server(s) being monitored.

PORTRANGE – is the port range the server(s) uses for SSL traffic.

PRIVATE KEY FILE – is the full path and name of the private key file of the server that you copied to the Real User Monitor probe machine in step 1.

For example:

```
        <collector>
<![CDATA[
[collector]
device          eth1
device              eth2
servers         0.0.0.0/0.0.0.0   80
ssl_servers 192.168.88.10-192.168.88.12 443 /etc/beatbox/my_private_key1.pem
ssl_servers 192.168.88.15-192.168.88.17 443 /etc/beatbox/my_private_key2.pem
]]>
        </collector>
```

3 Force the Real User Monitor engine to reread the Real User Monitor probe configuration:

- Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in your Web browser:

  http://<Real User Monitor engine machine name>:8180/jmx-console

- In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=ConfigurationManagerConf**.
- Click the **Invoke** button for the **forceGetAllConfiguration** operation.

4 Restart the Real User Monitor probe.

Converting a Private Key File to PEM Format

Run the following commands from the Real User Monitor probe machine (or any other openssl machine).

Note: Do not enter any unnecessary spaces in the command line.

To convert a file from pfx (IIS) format to pem format:

openssl pkcs12 -nocerts -nodes -in <filename> -out *.pem

To check that a file is a valid pem file:

openssl rsa -in <rsa file name> -check

Using SSL to Access the Real User Monitor Probe Console

You can configure the Real User Monitor probe machine to require SSL communications to log in to the Real User Monitor probe console. To configure SSL for the Real User Monitor probe console, you carry out the following steps:

- "Install the Apache Web Server" on page 42
- "Change the Real User Monitor Probe's Default Listen Port" on page 42
- "Configure the Apache Web Server" on page 45
- "Configure Real User Monitor" on page 46

Install the Apache Web Server

Installing the Apache Web Server on the Real User Monitor probe Linux machine requires the installation of the **httpd** package. For details on installing the httpd package, refer to the Linux documentation.

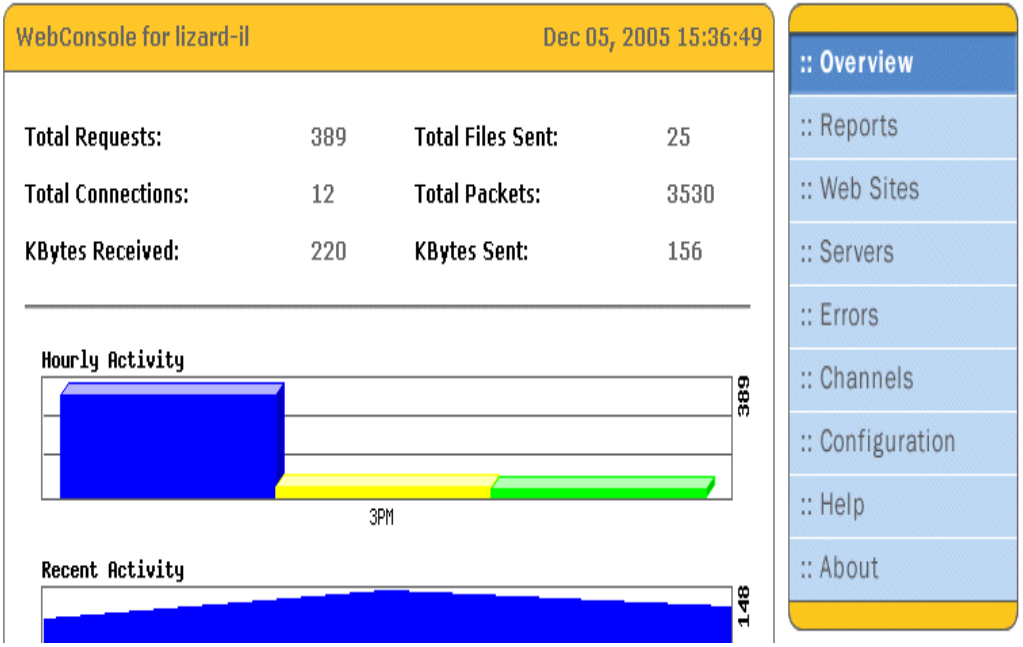
Change the Real User Monitor Probe's Default Listen Port

You change the Real User Monitor probe's default listen port via the Real User Monitor probe console.

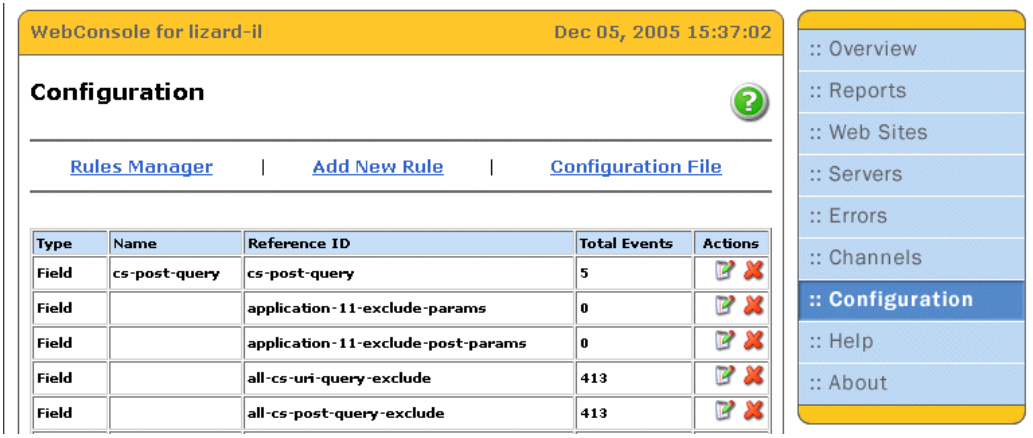
To change the Real User Monitor probe's default listen port:

1. Access the Real User Monitor probe console by launching a Web browser and using the URL **Probe_IP:2020**, where Probe_IP is the IP address of the Real User Monitor probe machine.

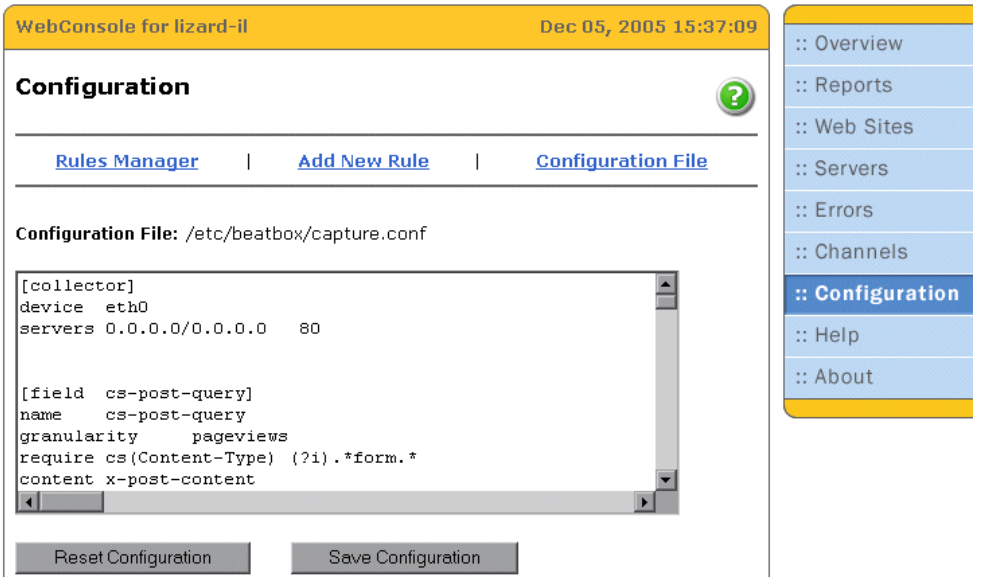
The **Main Console** screen is displayed.



2 Click the **Configuration** tab on the menu at the right of the screen. The **Configuration** screen is displayed.



3 Click **Configuration File** at the top of the screen. The configuration file is opened for editing.



4 Change the default listen port from 2020 to 3030 by adding the following lines to the configuration file:

[webconsole]

listen_port 3030

ip_allow 127.0.0.1

Note: Port 3030 is the recommended port to which to change, but you can use other ports if required.

---

5 Click **Save Configuration** to save the changes.

Configure the Apache Web Server

You configure the Apache Web Server on the Real User Monitor probe Linux machine.

To configure the Apache Web Server:

1 Edit the **/etc/httpd/conf/httpd.conf** file.

2 Change the Apache Web server's listen port by changing the line **Listen 80** to **Listen 2020**.

Note: To enable SSL connections only, remove this line entirely.

---

3 Configure the Apache Web server to redirect (proxy) requests to the Real User Monitor probe, using the Real User Monitor probe's listen port.

- Ensure that the line **LoadModule proxy_module modules/mod_proxy.so** is present.
- Uncomment the line **<IfModule mod_proxy.c>** and the corresponding **</IfModule>**.
- In the **<IfModule mod_proxy.c>** section (that is, between **<IfModule mod_proxy.c>** and **</IfModule>)** add the lines:

  ProxyRequests Off

  ProxyPass / http://127.0.0.1:3030/

  ProxyPassReverse / http://127.0.0.1:3030/

Note: The port used in this step should be the port you have configured as the Real User Monitor probe's listen port.

Configure Real User Monitor

You configure Real User Monitor on the Real User Monitor engine machine.

To configure Real User Monitor:

1 Edit the <**Mercury Real User Monitor root directory**>**conf****configurationmanager****Beatbox_Default_Const_Configuration.xml** file.

2 Add the Real User Monitor probe configuration parameters in the **collector** section.

In the <**collector**> section (that is, between <**collector**> and </**collector**>) add the lines:

[webconsole]

listen_port 3030

ip_allow 127.0.0.1

Note: The port used in this step should be the port you have configured as the Real User Monitor probe's listen port.

---

3 Save the file and exit.

4 Edit the **MercuryRUM****conf****probes****probe.default.properties** file.

5 Change the line **config.protocol=http** to **config.protocol=https**.

6 Save the file and exit.

Changing the Monitored Ethernet Interface of the Probe

By default, the Real User Monitor engine monitors the **eth1** and **eth2** ethernet interfaces of the Real User Monitor probe to collect data from the probe. You can change the monitored ethernet interface by configuring the **Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

The **Beatbox_Default_Const_Configuration.xml** file is the default configuration file used by all Real User Monitor probes. Any changes made to this file will affect all the probes connected to the Real User Monitor engine. You can change the monitored ethernet interface for a specific probe by creating an individual configuration file for the probe in question.

To change the monitored ethernet interface for all probes:

1 Edit the <**Mercury Real User Monitor root directory**>**conf\configurationmanager\Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

2 In the <**collector**> section (that is, between <**collector**> and </**collector**>) add an entry for each required ethernet interface in the format:

[collector]

device <**Ethernet Interface**>

servers <**Server Range**> <**Port Range**>

where:

Ethernet Interface. The ethernet interface number to be monitored on the Real User Monitor probe machines (for example, eth4).

Server Range. The Web servers or networks for which traffic will be collected. The server range can be in any of the following formats:

- Single IP address – for example, 100.96.123.1
- Network/netmask – for example, 100.0.0.0/255.0.0.0
- Range of addresses – for example, 100.96.123.1-100.96.123.3, 100.96.123.1-3, or 100.96.123.*

  The asterisk sign (*) is used as a wildcard.

Note:

- You can exclude servers by preceding the server range with an exclamation mark (for example, !100.96.123.*).
- You can also specify an optional client range, using the same format as the server range, to filter traffic based on client IP addresses.

Port Range. The port number(s) used to access the Real User Monitor probe machines. The port range can be a single port, or a range of ports (for example, 80-100).

3 Delete any existing collector entries that are not required.

4 Save the file and exit.

To change the monitored ethernet interface for individual probes:

1 In the <**Mercury Real User Monitor root directory**>**conf\configurationmanager** directory on the Real User Monitor engine machine, create an individual configuration file for the probe with the name **Beatbox_<Probe ID>_Const_Configuration.xml**, where <**Probe ID**> is the IP address of the specific Real User Monitor probe machine. For example:

Beatbox_100.96.123.5_Const_Configuration.xml

2 Copy the contents of the <**Mercury Real User Monitor root directory**>**conf\configurationmanager\Beatbox_Default_Const_Configuration.xml** file to the file you created in the above step.

3 Edit the newly created configuration file.

4 In the <**collector**> section (that is, between <**collector**> and </**collector**>) add an entry for each required ethernet interface in the format:

[collector]

device <**Ethernet Interface**>

servers <**Server Range**> <**Port Range**>

where:

Ethernet Interface. The ethernet interface number to be monitored on the Real User Monitor probe machines (for example, eth4).

Server Range. The Web servers or networks for which traffic will be collected. The server range can be in any of the following formats:

- Single IP address – for example, 100.96.123.1
- Network/netmask – for example, 100.0.0.0/255.0.0.0
- Range of addresses – for example, 100.96.123.1-100.96.123.3, 100.96.123.1-3, or 100.96.123.*

  The asterisk sign (*) is used as a wildcard.

Note:

- You can exclude servers by preceding the server range with an exclamation mark (for example, !100.96.123.*).
- You can also specify an optional client range, using the same format as the server range, to filter traffic based on client IP addresses.

Port Range. The port number(s) used to access the Real User Monitor probe machines. The port range can be a single port, or a range of ports (for example, 80-100).

5 Delete any existing collector entries that are not required.

6 Save the file and exit.

Filtering Monitored Traffic

The Real User Monitor probe filters the traffic that it monitors by using a kernel-mode, Berkeley-style packet filter. By default, the filter is set to monitor traffic only from ports that have been configured for applications in Monitor Administration. For example, if ports 80, 443, and 8080 have been configured for applications in Monitor Administration, the Real User Monitor probe will only monitor traffic originating from these ports and all other traffic will be ignored. For details on configuring applications in Monitor Administration, see "Configuring Applications" in *End User Management Data Collector Configuration*.

You can override the default filter by setting a filter for a specific IP address or range. You add or change filters for the Real User Monitor probe by configuring the **Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

To configure a filter:

1 Edit the <**Mercury Real User Monitor root directory**>**conf****configurationmanager****Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

2 In the <**collector**> section (that is, between <**collector**> and </**collector**>) add an entry in the format:

[collector]

kernel_filter <**Berkeley-style packet filter**>

For example, to set a filter to monitor traffic only from port 80 for an application server with the IP address of 192.168.80.152:

[collector]

kernel_filter host 192.168.80.152 tcp port 80

3 Save the file and exit.

Note:

- The filter settings will override any other server settings in the collector section of the Beatbox_Default_Const_Configuration.xml file. In the following example, only traffic from port 80 will be captured, even though the servers have a defined port range of 70-90:

  ```
  [collector]
  Servers 192.168.80.152 70-90
  Kernel_filter tcp port 80
  ```

- The syntax for the filter is similar to the Unix **tcpdump** command.

Unifying Frames

By default, the Real User Monitor probe reports each frame as a separate page.

You can configure frames to be unified so that they will be reported as one page, together with their parent component or page. If you configure a frame for unification, all its sub components will also be correlated to the same page.

Note that once a frame is configured for unification, it will always be unified and will never be reported as an individual page, until the configuration is changed.

You configure frames to be unified by the Real User Monitor probe by configuring the **Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

To configure frames to be unified:

1 Edit the **<Mercury Real User Monitor root directory>\conf\configurationmanager\Beatbox_Default_Const_Configuration.xml** file on the Real User Monitor engine machine.

2 In the **[global]** section at the bottom of the file, add an entry for each frame you want to unify in the format:

[global]

frame_url <**FRAME**>

where **FRAME** is a regular expression that must match the full URL of the frame you want to unify. The following examples show some of the ways the regular expression can be written:

[global]

frame_url http://www.mercury.com/frame1.html

or

frame_url http://www.mercury.com/[frame1|frame2].html

or

frame_url http://www.mercury.com/frame.*html

3 Save the file and exit.

7

Configuring and Administering the Real User Monitor Engine

You configure and administer the Real User Monitor engine via the Web and JMX consoles, which allow you to configure the engine, monitor system health, and use a number of diagnostic tools.

This chapter describes:	On page:
Administering Real User Monitor	54
Using the Real User Monitor Web Console	56
Using the Real User Monitor JMX Console	84
URL Correlation Parameters	88
Configuring Meaningful Page Names	91

Administering Real User Monitor

You administer Real User Monitor by using the start menu and task bar icon that are installed during a Windows installation of Real User Monitor.

Real User Monitor Windows Start Menu

To access the Real User Monitor Start menu that is added to the Windows machine on which the Real User Monitor engine is installed, select **Start** > **Programs** > **Mercury Real User Monitor**. The menu includes the following options:

Administration

The Administration menu option includes the following options:

Option	Description
RUM Configuration Tool	Runs the Mercury Real User Monitor Configuration Tool, which enables you to create a MySQL database schema, and to connect Real User Monitor to a MySQL database. For details, see "Creating and Connecting to the MySQL Database" on page 114.
Database (only if the MySQL database has been installed)	Opens a submenu with options for starting and stopping the MySQL database on the machine on which it is installed.
Disable Mercury Real User Monitor	Stops Real User Monitor on the specific machine, and disables it from being run automatically whenever the machine is started.
Enable Mercury Real User Monitor	Starts Real User Monitor on the specific machine, and sets it to be run automatically whenever the machine is started.

Open Real User Monitor Web Console

Selecting this option opens the Real User Monitor Web console used for administering Real User Monitor. For details, see "Using the Real User Monitor Web Console" on page 56.

Real User Monitor Windows Task Bar Icon



The task bar icon installed with Mercury Real User Monitor provides a menu with options for the Mercury Real User Monitor Agent service. The Mercury Real User Monitor Agent service is responsible for launching Mercury Real User Monitor and managing the processes used by it. The supervisor process manages and monitors the other processes used by Mercury Real User Monitor.

When Mercury Real User Monitor is first enabled, the icon appears with two yellow stars only. When the Mercury Real User Monitor application server has successfully started, the stars change to grey and a green tick appears above them. If there is an error during startup, or an error with JBoss after startup, the green tick in the icon changes to a red X until the problem is rectified.



The menu, which you access by right-clicking the icon, includes the following options:

Option	Description
About	Displays informational data about the Mercury Real User Monitor Agent service.
View Log	Displays the supervisor log, which includes information about the various processes being used by Mercury Real User Monitor.
Settings	Displays the processes in use by Mercury Real User Monitor, and their current settings.
Close	Stops Mercury Real User Monitor and closes the Mercury Real User Monitor Agent service.

Note:

Changing any of the process settings can cause Mercury Real User Monitor to malfunction and should not be done without consulting Mercury Customer Support.

Do not use **Close** to stop Mercury Real User Monitor. Stop Mercury Real User Monitor by using the **Disable Mercury Real User Monitor** option from the **Administration** menu in the Mercury Real User Monitor Start menu only.

Using the Real User Monitor Web Console

Once the Real User Monitor engine has been installed and started, you can use the Real User Monitor Engine Web console to view and configure the connection between Real User Monitor and Mercury Business Availability Center, view other Real User Monitor engine settings, monitor the health of Real User Monitor components, and use Real User Monitor diagnostic tools.

This section includes the following topics:

➤ "Accessing the Real User Monitor Engine Web Console" on page 57

➤ "Monitoring the Health of Real User Monitor Components" on page 59

➤ "Real User Monitor Configuration and Settings" on page 70

➤ "Real User Monitor Diagnostic Tools" on page 81

Accessing the Real User Monitor Engine Web Console

You use the Real User Monitor Engine Web console to view and configure the connection parameters between Real User Monitor and Mercury Business Availability Center. You can also view most of the Monitor Administration configuration received from Mercury Business Availability Center as well as monitor the health of Real User Monitor components (for details on configuring the Real User Monitor in Monitor Administration, see "Configuring the Real User Monitor" in *End User Management Data Collector Configuration*). The Real User Monitor Engine Web console also includes a number of diagnostic tools as well as links to the Real User Monitor JMX console.

Once you start the Real User Monitor engine after installation, you can access the Real User Monitor Engine Web console by launching a web browser and entering the following URL:

http://<Real User Monitor engine machine name or IP>:8180

Note: On a Windows machine on which the Real User Monitor engine is installed you can also access the Real User Monitor Engine Web console by selecting **Start** > **Programs** > **Mercury Real User Monitor** > **Open Real User Monitor Web Console.**

Logging In

When you access the Real User Monitor Engine Web console, the login page opens.

Enter the login parameters (login name and password) of a user defined in Real User Monitor, and click **Log In**. After logging in, the user name appears at the top right, under the top menu bar.

Initial access can be gained using the default superuser login parameters: Login Name=**admin**, Password=**admin**. It is recommended that the system superuser change this password immediately to prevent unauthorized entry.

For details on changing the password, see "Changing Login Parameters" on page 58.

The Real User Monitor Engine Web console opens, displaying the top menu bar that enables navigation to the configuration, health, tools, and help pages, as well as the Logout button.

Logging Out

When you have completed your session, it is recommended that you log out of the Web site to prevent unauthorized entry by clicking **Logout** at the top of the page.

Changing Login Parameters

You can add, change, and delete Real User Monitor users by editing the **MercuryRUM\conf\rumwebconsole\users.xml** file. In this file, there is a line for each user in the following format:

```
<user name="Administrator" login="admin" password="admin"
"encryptedPassword="" />
```

Note: It is recommended that the system superuser limit access to the **MercuryRUM\conf\rumwebconsole\users.xml** file.

To add a Real User Monitor user:

1. Open the **MercuryRUM\conf\rumwebconsole\users.xml** file in a text editor.
2. Duplicate the entry for one of the existing users.
3. In the duplicate line, enter the **user name**, **login**, and **password** parameters for the new user. Ensure that the **encryptedPassword** parameter is blank.
4. Save the file.

To change a Real User Monitor user:

1. Open the **MercuryRUM\conf\rumwebconsole\users.xml** file in a text editor.
2. In the appropriate line, change the **user name** and **login** parameters as required.

3 To change a user's password, enter the new password in the **password** parameter and ensure that the **encryptedPassword** parameter is blank.

4 Save the file.

To delete a Real User Monitor user:

1 Open the **MercuryRUM\conf\rumwebconsole\users.xml** file in a text editor.

2 Delete the appropriate line.

3 Save the file.

Note: Changes to the **MercuryRUM\conf\rumwebconsole\users.xml** file only take effect when the Real User Monitor engine is restarted. When the Real User Monitor engine is started, user passwords in the **password** parameter are encrypted and removed, and the encrypted passwords are stored in the **encryptedPassword** parameter.

Monitoring the Health of Real User Monitor Components

The **Health** dropdown menu on the Real User Monitor Engine Web console menu bar includes an option to display the status of the main Real User Monitor components.

You can refresh the data displayed on the System Health page by clicking the Refresh button at the top, right hand side of the page.



For each component displayed, there are four possible statuses:

- Green – OK
- Yellow – Minor
- Red – Critical
- Grey – No status

You can drill down to see the status of the entities that comprise the Real User Monitor component by clicking the component name. The following table lists the components and their entities and describes the meaning of the different statuses:

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Configuration to Probe	Status of the last attempt to send the configuration to the Real User Monitor Probe.	Probe was configured successfully	N/A	Errors during probe configuration process
	Missing Components Channel	Status of the last attempt to connect to the channel	BeatBox Retriever has successfully connected to this channel	BeatBox Retriever experienced problems while connecting to this channel	BeatBox Retriever has failed to connect to this channel more than three consecutive times
	Pages Channel				
	Sessions Channel				

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Probe Data Flow	Status of retrieving data from the Real User Monitor Probe	Data from the probe successfully retrieved	Probe has not produced new data	N/A
	Monitor Probe Active Sessions	The number of sessions currently monitored by the Real User Monitor Probe	The number of active sessions is below the internal permitted number	The number of active sessions is close to the internal permitted number	The number of active sessions has exceeded the internal permitted number
	Monitor Probe Total Memory	The total amount of physical system memory, in kilobytes	Always	N/A	N/A
	Monitor Probe Disk Utilization	The Real User Monitor Probe disk utilization on a specific partition	Free disk space is sufficient	Free disk space is nearing its limit	Free disk space is insufficient

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Monitor Probe HTTP Bytes Received	The total number of HTTP bytes received by the Web servers from clients	The current load of HTTP received traffic is normal	The current load of HTTP received traffic is nearing the limit for a single Real User Monitor Probe	The current load of HTTP received traffic is too high for a single Real User Monitor Probe
	Monitor Probe HTTP Bytes Sent	The total number of HTTP bytes sent by the Web servers to clients	The current load of HTTP sent traffic is normal	The current load of HTTP sent traffic is nearing the limit for a single Real User Monitor Probe	The current load of HTTP sent traffic is too high for a single Real User Monitor Probe
	Monitor Probe HTTP Packets	The total number of HTTP packets processed by the Real User Monitor Probe	The HTTP packet rate is normal	The HTTP packet rate is nearing the limit for a single Real User Monitor Probe	The HTTP packet rate is too high for a single Real User Monitor Probe

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Monitor Probe HTTPS Bytes Received	The total number of HTTPS bytes received by the Web servers from clients	The current load of HTTPS received traffic is normal	The current load of HTTPS received traffic is nearing the limit for a single Real User Monitor Probe	The current load of HTTPS received traffic is too high for a single Real User Monitor Probe
	Monitor Probe HTTPS Bytes Sent	The total number of HTTPS bytes sent by the Web servers to clients	The current load of HTTPS sent traffic is normal	The current load of HTTPS sent traffic is nearing the limit for a single Real User Monitor Probe	The current load of HTTPS sent traffic is too high for a single Real User Monitor Probe
	Monitor Probe HTTPS Packets	The total number of HTTPS packets processed by the Real User Monitor Probe	The HTTPS packet rate is normal	The HTTPS packet rate is nearing the limit for a single Real User Monitor Probe	The HTTPS packet rate is too high for a single Real User Monitor Probe

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Monitor Probe Packet Queue Work	The current number of packets that have been collected from the network devices, but have not yet been processed	The packet rate is normal	The packet rate is nearing the limit for normal processing	The packet rate is too high
	Monitor Probe Packets Lost	The total number of packets that the Real User Monitor Probe has recognized as missing	The network is stable and packets are being processed normally	Possible network problems which could lead to data loss	The network is bad and the Real User Monitor Probe may loose some data
	Monitor Probe Pages Cached	The number of page views currently being cached to the Real User Monitor Probe's memory	The page rate is stable	The page rate is nearing the limit for normal caching	The page rate is too high
	Monitor Probe Process CPU Utilization	The current percentage of of probe utilization of the Beatbox process	Probe utilization is normal	Probe utilization is nearing the limit for a single Real User Monitor Probe	Probe utilization is too high for a single Real User Monitor Probe

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Real User Monitor Probe	Monitor Probe Process Memory	The total amount of non-swapped, physical memory used by the Real User Monitor Probe, in kilobytes	Always	N/A	N/A
	Monitor Probe Rec Bytes Per Network Device	The total number of bytes received per specific NIC, in bits per second	Always	N/A	N/A
	Monitor Probe Process Memory Utilization	The total amount of non-swapped physical memory used by the Beatbox process, out of the total amount of physical system memory, in kilobytes	Memory utilization is normal	Memory utilization is high	Memory utilization is nearing the maximum permissible value

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Configuration Retrieval from BAC server	Connection to BAC server	Status of the connection to Mercury Business Availability Center for retrieving Real User Monitor engine and probe configurations	Connection to BAC server is operational	N/A	Connection to BAC server is not operational
	Data type <type name> retrieval	Status of the last attempt to retrieve data type <type name> configuration from the Mercury Business Availability Center server	Configuration of data type <type name> successfully retrieved from BAC server	N/A	Errors while trying to retrieve configuration data type <type name> from BAC server

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Database	Database connectivity	Status of the connectivity between the Real User Monitor engine and the MySQL database	Connection to database OK	N/A	Connection to database not working
	Database response time	Status of the response time between the Real User Monitor engine and the MySQL database	Database response time is normal	Database response time is below normal	Database response time is slow
RUM Engine	Publish configuration to module <module name> on host <IP address>	Status of the last attempt to publish the configuration to the Real User Monitor engine internal modules	Config-uration to module <module name> on host <IP address> successfully published	N/A	Error while trying to publish configuration to module <module name> on host <IP address>
	JMS Entry	Status of the last attempt to read data from JMS	Real User Monitor is successfully reading data	Real User Monitor may not be successfully reading data	Real User Monitor fails to read data
	JMS Publisher				
	JMS Raw Entry				
	JMS Samples				

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
RUM Engine	Monitor Application Session Count	The total number of open application sessions	Always	N/A	N/A
	Monitor Free Memory	The free memory available for the Real User Monitor engine	The free memory is sufficient for the Real User Monitor engine to run under the current load	The free memory is nearing the limit for the Real User Monitor engine to run under the current load	The free memory is not sufficient for the Real User Monitor engine to run under the current load
	Monitor Publisher Samples Thrown	The total number of samples thrown	Always	N/A	N/A
	Monitor Snapshot Jobs Alive Count	The total number of open snapshot jobs waiting to be processed	The Real User Monitor can process all the open snapshots	The number of open snapshots waiting to be processed is nearing the limit for the Real User Monitor under the current load	The Real User Monitor may not be able to process all the snapshots

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
RUM Engine	Monitor Snapshot Jobs Submit Denial	The total number of submit requests for snapshot failures	Always	N/A	N/A
	Monitor Snapshot Relevant Events	The total number of events that should trigger snapshot creation	Always	N/A	N/A
	Monitor Snapshot Sessions Map Size	The total number of open sessions for which at least one snapshot was created	The number of current sessions is normal	The number of current sessions is nearing the permissible limit	The number of current sessions has exceeded the permissible limit
	Monitor Statistics Total Aggregation Size	The number of aggregation buckets in memory	The number of aggregation buckets is normal	The number of aggregation buckets is nearing the permissible limit	The number of aggregation buckets has exceeded the permissible limit
	Monitor Statistics Total Messages Ignored	The number of entities filtered out by the statistics manager	Always	N/A	N/A
	Monitor Total DNS Entries Resolved	The total number of processed DNS unique entries	Always	N/A	N/A

Component	Entity	Description	OK Status (Green)	Minor Status (Yellow)	Critical Status (Red)
Samples to BAC server	Connection to BAC server	Status of the connection between the Real User Monitor engine and Mercury Business Availability Center for publishing samples	Real User Monitor is successfully sending samples to Mercury Business Availability Center	N/A	Real User Monitor has failed in sending data to Mercury Business Availability Center
	Publisher burst state	Indication if any samples were delayed during the last attempt to publish data to Mercury Business Availability Center	All Real User Monitor samples are being sent to Mercury Business Availability Center. No samples are delayed	N/A	Real User Monitor is delaying samples so as not to overload Mercury Business Availability Center

Real User Monitor Configuration and Settings

The **Configuration** dropdown menu on the Real User Monitor Engine Web console menu bar includes the following options:

- **BAC Connection Settings** on page 71. Used to view and configure the connection parameters between the Real User Monitor and Mercury Business Availability Center.
- **Set Engine IP** on page 73. Used to set the IP address of the Mercury Real User Monitor engine machine.

- **Advanced Settings** on page 73. Provides links to specific areas of the Real User Monitor JMX console for configuring parameters and settings for individual Real User Monitor modules.
- **JMX Console** on page 74. Provides a link to the Real User Monitor JMX console for configuring parameters for URL correlation in Monitor Administration (for details on URL correlation, see "Correlating Collected Data with Configured Pages" in *End User Management Data Collector Configuration*).
- **Engine Configuration Per Data Type** on page 74. Displays general configuration data of the applications, end-users, pages, probes, transactions, and engine that have been configured for monitoring by Real User Monitor in Monitor Administration.

BAC Connection Settings

This page displays the current configuration settings for the communication channel between Real User Monitor and Mercury Business Availability Center, which you can update. The page contains the following panes:

General

This pane includes a field that contains the hostname of the Mercury Business Availability Center Core Server, a field for the port number used in communicating with the Core Server (80 by default), and a field for the communication protocol used (http by default, or https if SSL is used for communicating with the Core Server).

Note: If you are a Mercury Managed Services user, contact a Mercury Customer Support representative to receive the hostname or URL to enter.

Authentication

To instruct Real User Monitor to use basic authentication in communicating with Mercury Business Availability Center, select the **Use authentication** check box. Enter the user name, password, and domain name of a user recognized by the Core Server in the relevant fields.

For more information on using basic authentication in Mercury Business Availability Center, see "Using Basic Authentication in Mercury Business Availability Center" in *Hardening the Platform*.

Proxy

To instruct Real User Monitor to access the Core Server through a reverse proxy server, select the **Use proxy** check box. Enter the user name, password, domain name, and URL for the reverse proxy server. For information on using a reverse proxy server with Mercury Business Availability Center, see "Using a Reverse Proxy in Mercury Business Availability Center" in *Hardening the Platform*.

SSL

If Real User Monitor has been configured to use the SSL channel in communicating with the Core Server, you configure the following parameters in this pane:

- **Keystore path.** The path to the Keystore file, which is a file on the Real User Monitor engine machine that contains the private key and client-side certificate used for client authentication in SSL
- **Private Key password.** The password used for accessing the Private Key file
- **Keystore password.** The password used for accessing the Keystore file

In addition, you can select the following options by checking the box to the left of the required option:

- Validate host names on server certificates
- Validate that the server certificates are trusted
- Validate that the server certificates are not expired

For information on configuring the Real User Monitor and Mercury Business Availability Center to work with SSL, see "Using SSL in Mercury Business Availability Center" in *Hardening the Platform*.

Note: If you change the configuration, click the **Save Configuration** button to save the configuration and update the Real User Monitor engine.

Set Engine IP

The first time that the Real User Monitor engine is started, it saves the IP address of the machine on which it is running. This option allows you to change the stored IP address in the event that the machine's actual IP address has changed (for example, if it connected to a different network and was allocated a different IP address). The stored IP address is displayed, followed by a list of all the current IP addresses of the network cards installed in the Real User Monitor engine machine. You can select on of the IP addresses from the list, or enter a different address of your choice in the **Other** field. Click **Submit** to accept the change.

Advanced Settings

This option displays Real User Monitor modules and provides direct links to specific pages in the Real User Monitor JMX console for viewing and configuring the module settings. Each module listed can have any of the following links associated with it:

- **Main Module Page.** Links to general settings for the module name and status
- **Configuration Page.** Links to settings for the configuration of the Real User Monitor module retrieved from Mercury Business Availability Center
- **Settings Page.** Links to settings for the configuration of the Real User Monitor module in the Real User Monitor engine

For details on working with the JMX console, see "Using the Real User Monitor JMX Console" on page 84.

JMX Console

This option provides a link to the Real User Monitor JMX console, which you use to view and configure Real User Monitor parameters, for example, URL correlation parameters. For details on configuring URL correlation parameters, see "Correlating Collected Data with Configured Pages" in *End User Management Data Collector Configuration*. For details on working with the JMX console, see "Using the Real User Monitor JMX Console" on page 84.

Engine Configuration Per Data Type

The Engine Configuration page displays general configuration data of the applications, end-users, events, pages, probes, transactions, and engine that have been configured for monitoring by Real User Monitor in Monitor Administration.



At the top of the Engine Configuration page is the **Sync All Configuration** button, which you click to force the Real User Monitor engine to reload the Real User Monitor configuration from Mercury Business Availability Center.

You display the data type you wish to see by selecting it from the dropdown menu located at the top left corner of the page and clicking **Generate**.

Applications

When you select applications as the data type to be displayed, the following information about the configured applications is displayed:

Column	Description
ID	An internal ID number allocated by Mercury Business Availability Center.
Is Application enabled	True or False – as configured in Monitor Administration.
Name	The name of the application as configured in Monitor Administration.
Default Page time threshold	The default page time threshold, in milliseconds, as configured for the application in Monitor Administration.

Column	Description
Default Server time threshold	The default server time threshold, in milliseconds, as configured for the application in Monitor Administration.
Probes which monitor the application	The IP addresses and names of the probes configured in Monitor Administration to monitor the application.

You can filter the data displayed on the **Name** column. The filter is case sensitive.

For information on configuring applications for monitoring, see "Configuring Applications" in *End User Management Data Collector Configuration*.

End-Users

When you select end-users as the data type to be displayed, the following information about the configured end-users is displayed:

Column	Description
ID	An internal ID number allocated by Mercury Business Availability Center.
Is End User enabled	True or False – as configured in Monitor Administration.
Name	The name of the end-user group as configured in Monitor Administration.
Description	The description of the end-user group as configured in Monitor Administration.
Is Monitored (for collection)	True or False – use host name resolution as configured in Monitor Administration.

You can filter the data displayed on the **Name** column. The filter is case sensitive.

For information on configuring end-user groups for monitoring, see "Configuring End-User Groups" in *End User Management Data Collector Configuration*.

Events

When you select events as the data type to be displayed, the following information about the configured events is displayed:

Column	Description
ID	An internal ID number allocated by Mercury Business Availability Center.
Is Event enabled	True or False – as configured in Monitor Administration.
Name	The name of the event as configured in Monitor Administration.
Event type	The event type as configured in Monitor Administration.
Report As Error	True or False – as configured in Monitor Administration.
Create Snapshot	True or False – as configured in Monitor Administration.

You can filter the data displayed on the **Name** column. The filter is case sensitive.

For information on configuring events for monitoring, see "Configuring Events" in *End User Management Data Collector Configuration*.

Pages

When you select pages as the data type to be displayed, the following information about the configured pages is displayed:

Column	Description
Page ID	An internal ID number allocated by Mercury Business Availability Center.
Is Page Enabled	True or False – as configured in Monitor Administration.
Page Name	The name of the page as configured in Monitor Administration.
Application	The name of the application in which the page is included.
Description	The description of the page as configured in Monitor Administration.
Monitored Type	The monitoring condition as configured in Monitor Administration. The possible conditions are: 1 = Always 2 = Never 3 = Only as part of a transaction
Page Type	Currently not used
Page Time Threshold	The page time threshold, in milliseconds, as configured for the page in Monitor Administration.
Server Time Threshold	The server time threshold, in milliseconds, as configured for the page in Monitor Administration.
Availability Threshold	The availability threshold, in percent, configured for the page in Monitor Administration.
Timeout	The amount of time, in milliseconds, after which the page is considered to have timed out, as configured for the page in Monitor Administration.
Page URL	The URL of the page as configured in Monitor Administration.

You can filter the data displayed on the **Page Name** column. The filter is case sensitive.

For information on configuring pages for monitoring, see "Configuring Pages" in *End User Management Data Collector Configuration*.

Probes

When you select probes as the data type to be displayed, the following information about the configured probes is displayed:

Column	Description
ID	An internal ID number allocated by Mercury Business Availability Center.
Is probe enabled	True or False – as configured in Monitor Administration.
IP	The IP address of the probe as configured in Monitor Administration.
Login username	The user name for logging in to the probe as configured in Monitor Administration.
Name	The name of the probe as configured in Monitor Administration.
Description	The description of the probe as configured in Monitor Administration.
Monitor All Servers	True or False – as configured in Monitor Administration.

You can filter the data displayed on the **Name** column. The filter is case sensitive.

For information on configuring probes for monitoring, see "Configuring a Probe" in *End User Management Data Collector Configuration*.

Transactions

When you select transactions as the data type to be displayed, the following information about the configured transactions is displayed:

Column	Description
Trx ID	An internal ID number allocated by Mercury Business Availability Center.
Is Trx Enabled	True or False – as configured in Monitor Administration.
Trx Name	The name of the transaction as configured in Monitor Administration.
Application	The name of the application in which the transaction is included.
Description	The description of the transaction as configured in Monitor Administration.
Transaction report page	The name of the page which, if reached, will cause the transaction to be reported as unavailable, in the event of a transaction error or timeout within a session.
Refresh behavior	The page instance that is measured in case of a refresh as configured in Monitor Administration. The possible instances are: 0 = First page 1 = Last page
Timeout	The amount of time, in milliseconds, of inactivity since the last page download in a transaction, that will cause the transaction to time out, as configured for the transaction in Monitor Administration.
Gross Time Threshold	The total transaction time threshold (download time + think time), in milliseconds, as configured for the transaction in Monitor Administration.
Net Time Threshold	The net transaction time threshold, in milliseconds, for the pages included in the transaction, as configured in Monitor Administration.

Column	Description
Server Time Threshold	The server time threshold, in milliseconds, as configured for the transaction in Monitor Administration.
Availability Threshold	The availability threshold, in percent, as configured for the transaction in Monitor Administration.
Trx pages	The names of the pages included in the transaction, as configured in Monitor Administration.

You can filter the data displayed on the **Trx Name** column. The filter is case sensitive.

For information on configuring transactions for monitoring, see "Configuring Transactions" in *End User Management Data Collector Configuration*.

Engine Settings

When you select engine settings as the data type to be displayed, the following information about the configured engine is displayed:

Column	Description
Engine Name	Name of the engine as configured in Monitor Administration.
Profile ID	Internal Mercury Business Availability Center profile ID.
Profile Name	Internal Mercury Business Availability Center profile name.
Engine ID	Internal Mercury Business Availability Center engine ID.
Customer Name	Always **default client**.
Snapshot page number	Number of pages for which to collect snapshot on error, as configured in Monitor Administration.

Column	Description
Is monitoring default application	The applications that are monitored by the engine, as configured in Monitor Administration. 0 = configured applications only 1 = all applications
Default Application Name	Name of default application (for all applications not configured in Monitor Administration).
Default HTTP Port	Default HTTP port of engine machine.
Default HTTPS Port	Default HTTPS port of engine machine.
Default Application ID	Internal Mercury Business Availability Center application ID.

For information on configuring engine settings, see "Configuring Real User Monitor Engine Settings" in *End User Management Data Collector Configuration*.

Transaction Snapshot Mode

When you select transaction snapshot mode as the data type to be displayed, the following information about the transaction snapshot mode is displayed:

Column	Description
Snapshot mode on	True or False – as configured in Monitor Administration.

For information on configuring transaction snapshot settings, see "Data Reporting Settings" in *End User Management Data Collector Configuration*.

Real User Monitor Diagnostic Tools

The **Tools** dropdown menu on the Real User Monitor Engine Web console menu bar includes the following tools:

➤ **IP Translator.** Used to convert the internal number used by the engine to represent an IP address, to the actual IP address it represents, and vice versa.

- **View Probe Versions.** Used to display the versions of the Real User Monitor Probes connected to the engine.
- **Time Converter.** Used to convert a date and time to an internal number used by the engine machine to represent this value. You can also convert the number used by the engine machine to the date and time it represents.
- **Capture Log Files.** Used to create a zip file of the Real User Monitor resource and log files for use by Mercury Customer Support.

IP Translator

You use the IP Translator tool to convert an IP address into different formats. The formats to which the IP data is translated are:

- **Host name.** The name of the machine to which the IP address is assigned.
- **Signed integer.** An internal, signed number used in Real User Monitor data samples.
- **Unsigned integer.** An internal, unsigned number used in Real User Monitor data samples.
- **Dotted-format IP address.** The standard, dotted-decimal notation for the IP address.

You select one of the formats and enter the source data you want to convert to the other formats, or you select the **Resolve Engine host** option to use the IP address of the current Real User Monitor engine machine as the source data.

Click **Submit** to translate the source data to all the other formats.

View Probe Versions

You use the View Probe Versions tool to display a list of the Real User Monitor probes that are connected to the engine. The following information is displayed for each probe:

Probe Name. The name of the Real User Monitor probe as configured in Monitor Administration. For information on configuring the probe in Monitor Administration, see "Configuring Real User Monitor Engine Settings" in *End User Management Data Collector Configuration*.

- **Probe IP.** The IP address of the Real User Monitor probe.

- **Is Configurable.** This value (true or false) denotes whether the Real User Monitor engine can internally configure the Real User Monitor probe. If the probe is not configurable, the engine will not attempt to retrieve the probe's version and the Probe Version field will be empty.
- **Probe Version.** The version of the Real User Monitor probe that is installed.

You can refresh the data displayed on the Probe Versions page by clicking the Refresh button at the bottom of the page.



Time Converter

You use the Time Converter tool to convert a time into different formats. The formats to which the time is converted are:

- the number of milliseconds since January 1, 1970 – an internal number used by the Real User Monitor engine.
- time in Greenwich Mean Time.
- time in the time zone set for the Real User Monitor engine machine.
- You select one of the formats and enter the source data you want to convert to the other formats, or you select the **Current time** option to use the current time as the source data for conversion.

  Click **Submit** to convert the source data to all the other formats.

Capture Log Files

You use this tool to create a **.zip** file of the current status of the Real User Monitor for support purposes.

Click **Capture** and specify the name and location of the file.

Using the Real User Monitor JMX Console

You use the Real User Monitor Engine JMX Console to view and configure Real User Monitor settings.

This section includes the following topics:

- "Accessing the JMX Console" on page 84
- "Setting URL Correlation Parameters" on page 85
- "Configuring Real User Monitor Aggregation" on page 85

Accessing the JMX Console

Via the JMX console you can view and configure Real User Monitor parameters, view statistics for Real User Monitor modules and services, and view and configure JBoss components.

Once you start the Real User Monitor engine after installation, you can access the Real User Monitor Engine JMX Console by launching the Real User Monitor Engine Web console and choosing **JMX Console** from the **Configuration** dropdown menu. To access a specific area of the JMX Console for an individual Real User Monitor module, select **Advanced Settings** from the **Configuration** dropdown menu in the Real User Monitor Engine Web console and then click on the links for the module you wish to view. For details on the Real User Monitor Engine Web console, see "Using the Real User Monitor Web Console" on page 56.

When you access the JMX console, you are prompted for a user name and password. Use the default of **admin** for both the user name and password.

Note: You can access the Real User Monitor Engine JMX Console from a different machine by launching a Web browser and typing the following:

http://<Real User Monitor engine machine name>:8180/jmx-console

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Important: Changing any of the JMX configuration settings can cause Mercury Real User Monitor to malfunction. It is recommended not to change any of these settings.

Setting URL Correlation Parameters

You can configure a number of parameters used by Real User Monitor when correlating recorded URLs with URLs you have configured for monitoring. For details on URL correlation, see "Principles of Correlation" in *End User Management Data Collector Configuration*. For details on configuring URLs for monitoring, see "Configuring the Real User Monitor" in *End User Management Data Collector Configuration*.

Some of the URL correlation parameters are set using the Real User Monitor JMX console. For details on changing URL correlation parameters via the Real User Monitor JMX console, see "Setting URL Correlation Parameters Via the JMX Console" on page 88.

Configuring Real User Monitor Aggregation

Real User Monitor pre-aggregates a number of the data samples it sends to Mercury Business Availability Center. For details on Mercury Business Availability Center aggregation, see "Data Aggregation" in *Reference Information*. For details on Real User Monitor pre-aggregation, see "Aggregating Real User Monitor Data" in *Using End User Management*.

You can change the Real User Monitor default aggregation periods via the JMX console. The following table shows the data sample types that are pre-aggregated by Real User Monitor, their parameter names in the JMX console, and the default aggregation time period:

Data Sample Type	JMX Parameter Name	Default Aggregation Period (in milliseconds)
Page	`aggregator.DefinedPages.interval`	300000
Slow Domain	`aggregator.domains.interval`	300000
Domain		
Missing Component	`aggregator.MissingComponents.interval`	300000
Server	`aggregator.Servers.interval`	300000
Slow Page	`aggregator.SlowPages.interval`	300000
Page with Most Errors	`aggregator.pageerrorevent.interval`	300000
Top Domain	`aggregator.TopDomains.interval`	3600000
Top Page	`aggregator.TopPages.interval`	3600000

Note: The Slow Domain and Domain data sample types both use the same JMX parameter. Changing the default aggregation period for this parameter will change the aggregation period for both of the data sample types.

To change the Real User Monitor default aggregation periods via the JMX console:

1. Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in your Web browser:

   http://<Real User Monitor engine machine name>:8180/jmx-console

2. In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=StatisticsMgrConf**.

3. In the **Properties** attribute, under the commented lines (the lines beginning with #), enter the parameter and the aggregation period (in milliseconds) you want to change, in the format:

   attribute name=aggregation period

   For example, to change the aggregation period of the Server sample type to 10 minutes, enter:

   aggregator.Servers.interval=600000

4. Click the **Apply Changes** button to save the change.

5. Click the **Invoke** button for the **deployConfiguration** operation to activate the change.

Note: Changing the default aggregation periods can significantly affect the amount of data sent by Real User Monitor to Mercury Business Availability Center. It is recommended not to change the default aggregation periods.

URL Correlation Parameters

Once the Real User Monitor engine has been installed and started, you can configure a number of parameters to determine how the Real User Monitor correlates recorded URLs with Web pages you have configured for monitoring in Monitor Administration.

This section includes the following topics:

➤ "Setting URL Correlation Parameters Via the JMX Console" on page 88

➤ "Correlating Session ID Parameters" on page 89

Setting URL Correlation Parameters Via the JMX Console

You can change the default setting of a number of parameters used by Real User Monitor when correlating recorded URLs with URLs you have configured for monitoring. For details on URL correlation, see "Principles of Correlation" in *End User Management Data Collector Configuration*. For details on configuring URLs for monitoring, see "Configuring the Real User Monitor" in *End User Management Data Collector Configuration*.

You can configure the following parameters for URL correlation in the JMX console:

➤ **adaptIndexurl.** By default, the Real User Monitor considers a URL such as **http://www.mercury.com/index.html** to be different from the URL **http://www.mercury.com/**. To instruct Real User Monitor to consider two such URLs as being identical, you set this parameter to **False**.

➤ **adaptCaseSensitive.** By default, Real User Monitor URL correlation is case-insensitive, so that a recorded URL such as **http://www.mercury.com/rumEnginePage.html** will be correlated with the configured URL **http://www.mercury.com/rumenginepage.html**. To instruct Real User Monitor to use case-sensitive URL correlation (for all but the host and protocol parts of a URL), you set this parameter to **False**.

➤ **basicAuthentication.** By default, Real User Monitor ignores basic authentication when performing URL correlation. For example, the recorded URL **http://bob:my_password@www.mercury.com** will be correlated with the configured URL **http://www.mercury.com**. To instruct the Real User Monitor to consider basic authentication when performing URL correlation you set this parameter to **False**.

To change the default setting of a URL correlation parameter in the JMX console:

1 Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in your Web browser:

http://<Real User Monitor engine machine name>:8180/jmx-console

2 In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=ResolverURLMConfig**.

3 In the relevant parameter, change the setting to **False**.

4 Click the **Apply Changes** button.

Correlating Session ID Parameters

You can configure specific parameters in recorded URLs to be ignored by Real User Monitor when correlating recorded URLs with URLs you have configured for monitoring in Monitor Administration. For details on URL correlation, see "Principles of Correlation" in *End User Management Data Collector Configuration*. For details on configuring URLs for monitoring, see "Configuring the Real User Monitor" in *End User Management Data Collector Configuration*.

If you set a parameter to be ignored by Real User Monitor and the parameter is included in a recorded URL, the Real User Monitor will replace the contents of that parameter with an asterisk (*). For example, if you set Real User Monitor to ignore the **BV_SessionID** and **BV_EngineID** parameters in the following URL:

http://www.mercury.com/~anand/Ticket_Confirm.jsp?BV_SessionID=@@@@1812057630.1043567934@@@@&BV_EngineID=cccdadchgidfmlmcefecehidfhfdffk.0&value=0000144976

The URL is translated as follows:

http://www.mercury.com/~anand/Ticket_Confirm.jsp?BV_SessionID=*&BV_EngineID=*&value=0000144976

The parameters to be ignored are defined per application server.

To configure session ID parameters to be ignored:

1. Open the **MercuryRUM\conf\configurationmanager\ Application_Server_Types_configuration.xml** file in a text editor.
2. Locate the application server type for which you are configuring the parameters to be ignored. This appears in the format <AppServer name="app_server_name">, where app_server_name is the name of the application server type. For example, for a Broadvision application server, the entry is:

   <AppServer name="BroadVision">
3. Under the application server name, in the section beginning with the **<DiscardParameters>** tag, is a list of the most common session ID parameters for that application server. You can add and delete parameters to create a list of all the parameters you want Real User Monitor to ignore during correlation. Parameters are entered in the format <parameter>parameter_name</parameter>, where parameter_name is the name of the parameter. For example, for a parameter called BV_EngineID, the entry is.

   <parameter>BV_EngineID</parameter>
4. If you want Real User Monitor to consider the parameters you enter as a regular expression instead of a string (which is the default), you add **type="regEx"** to the **<DiscardParameters>** tag. For example, **<DiscardParameters type="regEx">**
5. Under the application server name, in the line:

   <attribute name="enabled">false</attribute>

   change **false** to **true**.
6. Save the file and exit the editor.

Configuring Meaningful Page Names

You can configure Real User Monitor to change the URLs of recorded pages that are not configured in Monitor Administration to more meaningful names for use in Real User Monitor reports. For information on configuring pages for monitoring, see "Configuring Pages" in *End User Management Data Collector Configuration*. For information on Real User Monitor reports, see "Real User Monitor Reports" in *Using End User Management*.

This section includes the following topics:

"About Meaningful Page Names" on page 92

"Formatting Tags" on page 93

"Rules Tags" on page 99

"Sample XML File" on page 103

"Validating Meaningful Name XML Files" on page 110

"Adding and Deleting Meaningful Name XML Files" on page 111

"Changing Meaningful Name XML Files" on page 112

About Meaningful Page Names

For each application configured in Monitor Administration, you can create an XML file to be used to give meaningful names to pages that are recorded as part of the application, but that are not configured as pages in Monitor Administration. For information on configuring applications for monitoring, see "Configuring Applications" in *End User Management Data Collector Configuration*. For information on configuring pages for monitoring, see "Configuring Pages" in *End User Management Data Collector Configuration*.

If an XML file has been created and an application linked to it, when a page that is not configured in Monitor Administration is recorded as part of the application, the page's URL will be compared to the rules in the XML file and if matches are found, the page will be given a new name for use in Real User Monitor reports. If no matches are found, or if no XML file has been created and linked to the application, the page's URL as recorded will be used in Real User Monitor reports. For information on Real User Monitor reports, see "Real User Monitor Reports" in *Using End User Management*.

The XML file must be created in the **\<Real User Monitor root directory>\conf\resolver\meaningful_pages** directory on the Real User Monitor engine machine and for convenience, it is recommended that the file name is the same as the application name. For example, an XML file created for an application called **myapplication** is:

\<Real User Monitor root directory>\conf\resolver\meaningful_pages\myapplication.xml

---

Note: Real User Monitor includes two default XML files for the PeopleSoft 8.1 and Siebel 7.5 applications.

The XML file contains the following main sections:

- **Formatting.** Contains the formatting commands for changing a URL into a meaningful name.
- **Rules.** Contains the rules that determine whether or not a page's URL will be changed to a meaningful name.

Tip: It is recommended to create the rules before the formats.

Formatting Tags

The first main section in the XML file is the formatting section, which contains the XML tags that are used to format parts of a page's URL, which are then be used to create a meaningful name for the page.

Note: All parts of a page's URL are converted by Real User Monitor to lower case for matching and formatting.

The following formatting tags can be used, and so that the XML schema can be validated (for details, see "Validating Meaningful Name XML Files" on page 110), the tags must appear in the XML file in the order in which they are listed below:

URLDecoder

The URLDecoder tag is used to decode a source string using a specified decoder.

Syntax	<URLDecoder Name="**Command_Name**" EncodingScheme="**Scheme**"/>
Explanation	**Command_Name.** The name of the Substring formatting tag that can be used in Rule tags. **Scheme.** The decoding scheme to be used.
Example	<URLDecoder Name="DecodeUTF-8" EncodingScheme="UTF-8"/> When the DecodeUTF-8 formatting command is referenced in a rule, the string is decoded using the UTF-8 decoding scheme.
Note	If the URLDeocder tag is used, but no encoding scheme is specified, the UTF-8 scheme is used by default.

Rename

The Rename tag is used to replace the entire contents of a source string.

Syntax	<Rename Name="**Command_Name**" NewName="**Rename_String**"/>
Explanation	**Command_Name.** The name of the Rename formatting tag that can be used in Rule tags. **Rename_String.** The string to be substituted for the source string.
Example	<Rename Name="RenameToABC123" String="Mercury" When the **RenameToABC123** formatting command is referenced in a rule, the entire source string is renamed to **Mercury**.

Substring

The Substring tag is used to extract a sub string from the source string.

Syntax	<Substring Name="**Command_Name**" BeginIndex="**Start_Char_Index**" Count="**Length**"/>
Explanation	**Command_Name.** The name of the Substring formatting tag that can be used in Rule tags. **Start_Char_Index.** The position in the source string of the starting character of the substring to be extracted. The first position in the source string is the zero index. **Length.** The number of characters from the Start_Char to be extracted. If the number used is greater than the number of characters from the Start_Char to the end of the source string, the entire string from the Start_Char to the end of the source string will be extracted.
Example	<Substring Name="ExtractTenToTwelve" BeginIndex="10" Count="3"/> When the **ExtractTenToTwelve** formatting command is referenced in a rule, the tenth, eleventh, and twelfth characters of the source string are extracted.

Insert

The Insert tag is used to insert a string into a source string at a specified position.

Syntax	<Insert Name="**Command_Name**" String="**Insert_String**" ToIndex="**Start_Char_Index**" CountFromBeginning="**Direction**"/>
Explanation	**Command_Name.** The name of the Insert formatting tag that can be used in Rule tags. **Insert_String.** The string to be inserted in the source string. **Start_Char_Index.** The character number at which to insert the Insert_String in the source string. The first position in the source string is the zero index. **Direction.** Whether to start counting the Start_Char index position from the start of the source string (that is, from left to right) or from the end of the source string (that is, from right to left). The valid options are: ➤ **True.** Start counting the Start_Char index position from the start of the source string (that is, from left to right). This is the default used if no direction is specified. ➤ **False.** Start counting the Start_Char index position from the end of the source string (that is, from right to left).
Example	<Insert Name="InsertABCAfterOrder" String="ABC" ToIndex="5"/> When the **InsertABCAfterOrder** formatting command is referenced in a rule, the string **ABC** is inserted in the source string, starting at the fifth index (that is, the letter **A** becomes the fifth character in the source string).

ChangeCase

The ChangeCase tag is used to change the case of a string.

Syntax	<ChangeCase Name="**Command_Name**" Type="**Case_Type**" BeginIndex="**Start_Char_Index**" Count="**Length**"/>
Explanation	**Command_Name.** The name of the ChangeCase formatting tag that can be used in Rule tags. **Case_Type.** The type of conversion to be carried out. The valid options are: • **UpperCase.** Lower case to upper case. This is the default if no type is specified. • **LowerCase.** Upper case to lower case. • **OpposisteCase.** Switches the case of characters. **Start_Char_Index.** The position in the source string of the starting character to be converted The first position in the source string is the zero index. **Length.** The number of characters from the Start_Char to be converted.
Example	<ChangeCase Name="UpperCaseFirstChar" Type="UpperCase" BeginIndex="0" Count="1"/> When the **UpperCaseFirstChar** formatting command is referenced in a rule, the first character of the source string is converted to upper case.
Note	If **Length** is not specified, the ChangeCase conversion will be carried out from the **Start_Char** to the end of the source string.

Remove

The Remove tag is used to remove all occurrences of a specified string from a source string.

Syntax	<Remove Name="**Command_Name**" String="**Remove_String**"/>
Explanation	**Command_Name.** The name of the Remove formatting tag that can be used in Rule tags. **Remove_String.** The string to be removed from the source string.
Example	<Remove Name="Removeabc" String="abc" When the **Removeabc** formatting command is referenced in a rule, the string **abc** is removed from the source string.

RemoveNonAlpha

The RemoveNonAlpha tag is used to remove all non alpha characters from a source string.

Syntax	<RemoveNonAlpha Name="**Command_Name**">
Explanation	**Command_Name.** The name of the RemoveNonAlpha formatting tag that can be used in Rule tags.
Example	<Remove Name="RemoveAllNonAlpha" When the **RemoveAllNonAlpha** formatting command is referenced in a rule, all non alpha characters are removed from the source string.

Replace

The Replace tag is used to replace all occurrences of a sub string within a source string.

Syntax	<Replace Name="**Command_Name**" Old="**Old_String**" New="**New_String**"/>
Explanation	**Command_Name.** The name of the Replace formatting tag that can be used in Rule tags. **Old_String.** The sub string within the source string to be replaced. **New_String.** The string that replaces Old_String.
Example	<Replace Name="ReplaceabcWithXYZ" Old="abc" New="XYZ"/> When the **ReplaceabcWithXYZ** formatting command is referenced in a rule, all occurrences of **abc** in the source string are replaced with **XYZ**.

Alias

The Alias tag is used to replace all occurrences of an alphanumeric sub string within a string with an assigned alias.

Syntax	<Alias Name="**Command_Name**"> <Pair Name="**Source_String**" Alias="**Assigned_Alias**"/> </Alias>
Explanation	**Command_Name.** The name of the Alias formatting tag that can be used in Rule tags. **Source_String.** The alphanumeric string to which you are assigning an alias. **Assigned_Alias.** The alias you are assigning to replace the Source_String.

Example	<Alias Name="RelateLettersToCategory"> <Pair Name="fi" Alias="Fish"/> </Alias> When the **RelateLettersToCategory** formatting command is referenced in a rule, all occurrences of the string **fi** are replaced with the alias **Fish**.
Note	You can include multiple **Pair** tags within the same Alias tag. Each Alias replacement will be carried out on the output string from the previous Alias replacement–that is, there is only one output string at the end.

Rules Tags

The second main section in the XML file is the rules section, which contains the logic for assigning a meaningful name to a page. The rules section is responsible for matching a page to a single rule and then using the formatting tags included in the rule to assign a meaningful name to the page. Matching is carried out on the different parts of the URL–URL protocol, URL path, URL host, and parameters (both the GET and POST parameters of a page).

Rules are prioritized so that if a page's URL matches more than one rule, the rule that has the highest priority will be the single rule that is applied to the page.

The rules section uses a default string delimiter of a space (" "), but you can specify a different delimiter by including it in the **Rules** tag that begins the rules section. For example, to set a default delimiter of a right, square bracket:

```
<Rules DefaultDelimiter="]">
```

Individual rules can use a different delimiter than the general default, if specified within the specific rule.

Rules are written in the following format:

```
<Rule Priority="Priority" Name="Rule_Name">
    <Path Name="URL_Path">
    <Host Name="URL_Host">
    <Protocol Type="URL_Protocol">
    <Parameters>
        <Param Key="Param_Name" Value="Param_Value">
            <Formatter Index="Index_Number">Format_Name1</Formatter>
            <Formatter Index="Index_Number">Format_Name2
Format_Name3</Formatter>
        </Param>
    </Parameters>
</Rule>
```

where:

- **Priority.** The priority in which the rule should be applied. If more than one rule matches the source string, the rule with the highest priority is the one that will be applied. 0 is the highest priority, 1 is the second, and so forth.

  If more than one rule has the same priority, the last one that appears in the XML file is the rule that is applied.

Tip: When assigning priorities to rules, you can use increments greater than 1. For example, you can assign priorities of 10, 20, 30, and so forth. This allows flexibility for inserting new rules at a later time.

- **Rule_Name.** The name of the rule.
- **URL_Path.** The URL path that is required for the rule to be applied.
- **URL_Host.** The URL host that is required for the rule to be applied. This option does not support the use of a wildcard.
- **URL_Protocol.** The URL protocol that is required for the rule to be applied. This option does not support the use of a wildcard.
- **Param_Name.** The key (name) of a parameter in the URL that is required for the rule to be applied.

- **Param_Value.** The value in the Param_Name parameter that is required for the rule to be applied. Use "" to denote an empty parameter value.
- **Index_Number.** The position that the formatted string will occupy in the meaningful name to be created.
- **Format_Name.** The name of the format to be used on the selected string to format it into a string that will be used as part of the created meaningful name for a page. The format name must be one of the formats defined in the formatting section of the XML file (for details, see "Formatting Tags" on page 93).

Note: URL_Path, URL_Host, URL_Protocol, Param_Name, and Param_Value are always in lower case.

The following points are applicable to rules:

- Not all parts of a rule need to exist, but at least one rule should be defined and it should contain a **Formatter** tag.
- If a **Formatter** tag is placed directly under a **Param** tag, the formatting will be carried out on the parameter value. If a **Formatter** tag is placed directly under a **Path** tag, the formatting will be carried out on the URL path.
- If an asterisk (*****) or question mark (**?**) character is included in a URL path, parameter name, or parameter value, you can specify whether to treat the character as a literal (that is, purely as an asterisk or question mark), or to treat it as a wildcard character. By default, the character is treated as a literal. To treat the character as a wildcard character, you add the setting **CompareMethod="WildCard"** at the end of the rule tag in which the character appears. For example:

  <Param Key="myparam" Value="*" CompareMethod="WildCard">

  To use an asterisk or question mark character as a literal within a wildcard value, precede the character with a backslash (\). For example, the wildcard value **my*str*** will match the value **my*str123**, but will not match the value **my123str123**.

Note:

- The asterisk wildcard represents any combination of characters, whereas the question mark wildcard represents a single character only.
- Using the wildcard comparison on page parameters creates significant overhead on the Real User Monitor engine and should be used only when absolutely necessary.

- You can apply multiple format names to a Path or Param tag. If the format names are placed in individual Formatter tags one under the other, each format name will be applied to the original path or parameter value and each format name will produce its own output for inclusion in the meaningful name. If the format names are included in the same Formatter tag, each format name will be applied to the resulting value from the previous format name and only one result will be created for inclusion in the meaningful name.

  Example of multiple formatting commands in separate Formatter tags:

```
<Path Name=”/mypath/home”>
   <Formatter Index=”1”>Format_Name1</Formatter>
   <Formatter Index=”2”>Format_Name2</Formatter>
   <Formatter Index=”3”>Format_Name3</Formatter>
</Path>
```

  Each of the format names will be applied to the path **/mypath/home**.

  Example of multiple formatting commands in the same Formatter tag:

```
<Path Name=”/mypath/home”>
   <Formatter Index=”1”>Format_Name1 Format_Name2</Formatter>
</Path>
```

  Format_Name1 will be applied to the path **/mypath/home**; Format_Name2 will be applied to the output from Format_Name1.

Sample XML File

The following examples show an XML file with formatting and rule tags defined, and various examples of URLs and the meaningful names created for them based on the formatting and rule tags in the sample XML file.

XML File

```
<?xml version="1.0"?>
<Meaningful_Pages xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:noNamespaceSchemaLocation="./meaningfulpages.xsd">
   <Formating>
      <Rename Name="RenameToWelcome" NewName="Welcome"/>
      <Rename Name="RenameToSignIn" NewName="Sign In"/>
     <Rename Name="RenameToStoreEntrance" NewName="Store Entrance"/>
      <Rename Name="RenameToEditAccount" NewName="Edit Account"/>
      <Rename Name="RenameToProduct" NewName="Product"/>
      <Rename Name="RenameToCheckOut" NewName="Check Out"/>
        <Rename Name="RenameToOrderSubmitted" NewName="Order
Submitted"/>
      <Rename Name="RenameToSignOut" NewName="Signed Out"/>
      <SubString Name="ExtractTwoFirstLetters" BeginIndex="0" Count="2"/>
      <SubString Name="ExtractItem" BeginIndex="20" Count="4"/>
      <SubString Name="ExtractUpdate" BeginIndex="16" Count="6"/>
      <SubString Name="ExtractCart" BeginIndex="22" Count="4"/>
      <SubString Name="ExtractQuantities" BeginIndex="26" Count="10"/>
      <Insert Name="AppendCategory" String="Category " ToIndex="0"/>
      <Insert Name="AppendAddItemPrefix" String="Add Item " ToIndex="0"/>
      <Insert Name="AppendToCartSuffix" String=" to Cart" ToIndex="0"
CountFromBeginning="false"/>
      <Insert Name="AppendRemoveItemPrefix" String="Remove Item "
ToIndex="0"/>
      <Insert Name="AppendFromCartSuffix" String=" from Cart" ToIndex="0"
CountFromBeginning="false"/>
      <Insert Name="InsertSpaceAfterOrder" String=" " ToIndex="5"/>
      <Insert Name="InsertSpaceAfterConfirm" String=" " ToIndex="7"/>
      <Insert Name="InsertNotAfterOrder" String="Not " ToIndex="6"/>
      <ChangeCase Name="UpperCaseFirstChar" Type="UpperCase"
BeginIndex="0" Count="1"/>
```

```
        <ChangeCase Name="UpperCaseAll" Type="UpperCase"
BeginIndex="0"/>
        <ChangeCase Name="UpperCaseSixthLetter" Type="UpperCase"
BeginIndex="6" Count="1"/>
        <ChangeCase Name="UpperCaseEigthLetter" Type="UpperCase"
BeginIndex="8" Count="1"/>
        <Remove Name="RemoveNew" String="/jpetstore/shop/new"/>
        <Remove Name="RemoveSHTML" String=".shtml"/>
        <Replace Name="ReplaceNewWithConfirm" Old="/jpetstore/shop/new"
New="Confirm"/>
        <Alias Name="RelateLettersToCategory">
          <Pair Name="FI" Alias="Fish"/>
          <Pair Name="K9" Alias="Dogs"/>
          <Pair Name="RP" Alias="Reptiles"/>
          <Pair Name="FL" Alias="Cats"/>
          <Pair Name="AV" Alias="Birds"/>
        </Alias>
        <Alias Name="RelateProductIdToProductName">
          <Pair Name="FI-FW-01" Alias="'Koi'"/>
          <Pair Name="FI-FW-02" Alias="'Goldfish'"/>
          <Pair Name="FI-SW-01" Alias="'Angelfish'"/>
          <Pair Name="FI-SW-02" Alias="'Tiger Shark'"/>
          <Pair Name="K9-BD-01" Alias="'Bulldog'"/>
          <Pair Name="K9-CW-01" Alias="'Chihuahua'"/>
          <Pair Name="K9-DL-01" Alias="'Dalmation'"/>
          <Pair Name="K9-PO-02" Alias="'Poodle'"/>
          <Pair Name="K9-RT-01" Alias="'Golden Retriever'"/>
          <Pair Name="K9-RT-02" Alias="'Labrador Retriever'"/>
          <Pair Name="RP-LI-02" Alias="'Iguana'"/>
          <Pair Name="RP-SN-01" Alias="'Rattlesnake'"/>
          <Pair Name="FL-DLH-02" Alias="'Persian'"/>
          <Pair Name="FL-DSH-01" Alias="'Manx'"/>
          <Pair Name="AV-CB-01" Alias="'Amazon Parrot'"/>
          <Pair Name="AV-SB-02" Alias="'Finch'"/>
        </Alias>
        <Alias Name="RelateItemNameToItemDesc">
          <Pair Name="EST-28" Alias="'Adult Female Golden Retriever'"/>
          <Pair Name="EST-27" Alias="'Adult Female Chihuahua'"/>
          <Pair Name="EST-26" Alias="'Adult Male Chihuahua'"/>
```

```
        <Pair Name="EST-25" Alias="'Adult Female Labrador Retriever'"/>
        <Pair Name="EST-24" Alias="'Adult Male Labrador Retriever'"/>
        <Pair Name="EST-23" Alias="'Adult Female Labrador Retriever'"/>
        <Pair Name="EST-22" Alias="'Adult Male Labrador Retriever'"/>
        <Pair Name="EST-21" Alias="'Adult Female Goldfish'"/>
        <Pair Name="EST-20" Alias="'Adult Male Goldfish'"/>
        <Pair Name="EST-19" Alias="'Adult Male Finch'"/>
        <Pair Name="EST-18" Alias="'Adult Male Amazon Parrot'"/>
        <Pair Name="EST-17" Alias="'Adult Male Persian'"/>
        <Pair Name="EST-16" Alias="'Adult Female Persian'"/>
        <Pair Name="EST-15" Alias="'With tail Manx'"/>
        <Pair Name="EST-14" Alias="'Tailless Manx'"/>
        <Pair Name="EST-13" Alias="'Green Adult Iguana'"/>
        <Pair Name="EST-12" Alias="'Rattleless Rattlesnake'"/>
        <Pair Name="EST-11" Alias="'Venomless Rattlesnake'"/>
        <Pair Name="EST-10" Alias="'Spotted Adult Female Dalmation'"/>
        <Pair Name="EST-9" Alias="'Spotless Male Puppy Dalmation'"/>
        <Pair Name="EST-8" Alias="'Male Puppy Poodle'"/>
        <Pair Name="EST-7" Alias="'Female Puppy Bulldog'"/>
        <Pair Name="EST-6" Alias="'Male Adult Bulldog'"/>
        <Pair Name="EST-5" Alias="'Spotless Koi'"/>
        <Pair Name="EST-4" Alias="'Spotted Koi'"/>
        <Pair Name="EST-3" Alias="'Toothless Tiger Shark'"/>
        <Pair Name="EST-2" Alias="'Small Angelfish'"/>
        <Pair Name="EST-1" Alias="'Large Angelfish'"/>
    </Alias>
</Formating>
<Rules DefaultDelimiter=" ">
    <Rule Priority="0" Name="Welcome">
        <Path Name="/jpetstore/">
            <Formatter Index="1">RenameToWelcome</Formatter>
        </Path>
    </Rule>
    <Rule Priority="1" Name="Welcome">
        <Path Name="/jpetstore/index.html">
            <Formatter Index="1">RenameToWelcome</Formatter>
        </Path>
    </Rule>
    <Rule Priority="2" Name="Sign In">
```

```
            <Path Name="/jpetstore/shop/signonForm.shtml">
              <Formatter Index="1">RenameToSignIn</Formatter>
            </Path>
          </Rule>
          <Rule Priority="3" Name="Store Entrance">
            <Path Name="/jpetstore/shop/signon.shtml">
              <Formatter Index="1">RenameToStoreEntrance</Formatter>
            </Path>
          </Rule>
          <Rule Priority="4" Name="Category [any]">
            <Path Name="/jpetstore/shop/viewCategory.shtml"/>
            <Parameters>
              <Param Key="categoryId" Value="*" CompareMethod="WildCard">
                <Formatter Index="1">UpperCaseAll AppendCategory</Formatter>
              </Param>
            </Parameters>
          </Rule>
          <Rule Priority="5" Name="Edit Account">
            <Path Name="/jpetstore/shop/editAccountForm.shtml">
              <Formatter Index="1">RenameToEditAccount</Formatter>
            </Path>
          </Rule>
          <Rule Priority="6" Name="Any Product [product]">
            <Path Name="/jpetstore/shop/v*Product.shtml"
CompareMethod="WildCard"/>
            <Parameters>
              <Param Key="productId" Value="*" CompareMethod="WildCard">
                <Formatter Index="1">ExtractTwoFirstLetters
RelateLettersToCategory</Formatter>
                <Formatter Index="2">RenameToProduct</Formatter>
               <Formatter Index="3">RelateProductIdToProductName</Formatter>
              </Param>
            </Parameters>
          </Rule>
          <Rule Priority="7" Name="Item [any]">
            <Path Name="/jpetstore/shop/viewItem.shtml">
              <Formatter Index="1">ExtractItem UpperCaseFirstChar</Formatter>
            </Path>
            <Parameters>
```

```
            <Param Key="itemId" Value="*" CompareMethod="WildCard">
              <Formatter Index="2">RelateItemNameToItemDesc</Formatter>
            </Param>
          </Parameters>
        </Rule>
        <Rule Priority="8" Name="Add Item [any] To Cart">
          <Path Name="/jpetstore/shop/addItemToCart.shtml"/>
          <Parameters>
            <Param Key="workingItemId" Value="*" CompareMethod="WildCard">
              <Formatter Index="1">RelateItemNameToItemDesc
AppendAddItemPrefix AppendToCartSuffix</Formatter>
            </Param>
          </Parameters>
        </Rule>
        <Rule Priority="9" Name="Update Cart">
          <Path Name="/jpetstore/shop/updateCartQuantities.shtml">
            <Formatter Index="1">ExtractUpdate
UpperCaseFirstChar</Formatter>
            <Formatter Index="2">ExtractCart UpperCaseFirstChar</Formatter>
            <Formatter Index="3">ExtractQuantities
UpperCaseFirstChar</Formatter>
          </Path>
        </Rule>
        <Rule Priority="10" Name="Remove Item [any] From Cart">
          <Path Name="/jpetstore/shop/removeItemFromCart.shtml"/>
          <Parameters>
            <Param Key="workingItemId" Value="*" CompareMethod="WildCard">
              <Formatter Index="1">RelateItemNameToItemDesc
AppendRemoveItemPrefix AppendFromCartSuffix</Formatter>
            </Param>
          </Parameters>
        </Rule>
        <Rule Priority="11" Name="Check Out">
          <Path Name="/jpetstore/shop/checkout.shtml">
            <Formatter Index="1">RenameToCheckOut</Formatter>
          </Path>
        </Rule>
        <Rule Priority="12" Name="Order Form">
          <Path Name="/jpetstore/shop/newOrderForm.shtml">
```

```
            <Formatter Index="1">RemoveNew InsertSpaceAfterOrder
RemoveSHTML UpperCaseFirstChar UpperCaseSixthLetter</Formatter>
          </Path>
        </Rule>
        <Rule Priority="13" Name="Order Submitted">
          <Path Name="/jpetstore/shop/newOrder.shtml">
            <Formatter Index="1">RenameToOrderSubmitted</Formatter>
          </Path>
          <Parameters>
            <Param Key="confirmed" Value="true"/>
          </Parameters>
        </Rule>
        <Rule Priority="14" Name="Order Not Submitted">
          <Path Name="/jpetstore/shop/newOrder.shtml">
            <Formatter Index="1">RenameToOrderSubmitted
InsertNotAfterOrder</Formatter>
          </Path>
          <Parameters>
            <Param Key="confirmed" Value="false"/>
          </Parameters>
        </Rule>
        <Rule Priority="15" Name="Confirm Order">
          <Path Name="/jpetstore/shop/newOrder.shtml">
            <Formatter Index="1">ReplaceNewWithConfirm
InsertSpaceAfterConfirm RemoveSHTML UpperCaseEigthLetter</Formatter>
          </Path>
        </Rule>
        <Rule Priority="16" Name="Sign Out">
          <Path Name="/jpetstore/shop/signoff.shtml">
            <Formatter Index="1">RenameToSignOut</Formatter>
          </Path>
        </Rule>
      </Rules>
</Meaningful_Pages>
```

Examples of Meangingful Names for URLs

URL	Meaningful Name
http://shimshon:8080/jpetstore/	Welcome
http://shimshon:8080/jpetstore/index.html	Welcome
http://shimshon:8080/jpetstore/shop/signonForm.shtml	Sign In
http://shimshon:8080/jpetstore/shop/signon.shtml	Store Entrance
http://shimshon:8080/jpetstore/shop/viewCategory.shtml?categoryId=CATS	Category CATS
http://shimshon:8080/jpetstore/shop/editAccountForm.shtml	Edit Account
http://shimshon:8080/jpetstore/shop/viewProduct.shtml?productId=FI-FW-01	Fish Product 'Koi' (FI=Fish, K9=Dogs, RP=Reptiles, FL=Cats, AV=Birds)
http://shimshon:8080/jpetstore/shop/viewItem.shtml?itemId=EST-4	Item 'Spotted Koi'
http://shimshon:8080/jpetstore/shop/addItemToCart.shtml?workingItemId=EST-6	Add Item 'Male Adult Bulldog' to Cart
http://shimshon:8080/jpetstore/shop/updateCartQuantities.shtml	Update Cart Quantities
http://shimshon:8080/jpetstore/shop/removeItemFromCart.shtml?workingItemId=EST-6	Remove Item 'Male Adult Bulldog' from Cart
http://shimshon:8080/jpetstore/shop/checkout.shtml	Check Out
http://shimshon:8080/jpetstore/shop/newOrderForm.shtml	Order Form

URL	Meaningful Name
http://shimshon:8080/jpetstore/shop/newOrder.shtml	Confirm Order
http://shimshon:8080/jpetstore/shop/newOrder.shtml?confirmed=true	Order Submitted
http://shimshon:8080/jpetstore/shop/newOrder.shtml?confirmed=false	Order Not Submitted
http://shimshon:8080/jpetstore/shop/signoff.shtml	Signed Out

Validating Meaningful Name XML Files

You can validate a meaningful name XML file against a predefined XML schema to ensure that the structure and format of the file are valid. The validation is made using the xerces-j 2.8.0 XML parser.

The schema file against which the XML file is validated is:

\<Real User Monitor root directory>\conf\resolver\meaningfulpages.xsd

To validate a meaningful XML file:

1 Insert the following line at the beginning of the XML file:

<Meaningful_Pages xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:noNamespaceSchemaLocation="./meaningfulpages.xsd"

Note: If this line is omitted from the XML file and the validation is run, a message that the validation was successful will be displayed, but no validation will actually have been done.

---

2 In Monitor Administration, configure the application to use the XML file for meaningful names. For information on configuring applications for monitoring, see "Configuring Applications" in *End User Management Data Collector Configuration*.

3 Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in your Web browser:

http://<Real User Monitor engine machine name>:8180/jmx-console

4 In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=ResolverMeaningfulPagesConfig**.

5 In the **validateConfiguration** option, enter the application name (as defined in Monitor Administration) by which the XML file is being used and click **Invoke**. The XML file is validated against the predefined schema file.

6 Any errors encountered are displayed, or a message that the validation was successful.

Note: The Formatting tags must be included in the XML file in a specific order (for details, see "Formatting Tags" on page 93). If the Formatting tags are not in the correct order, a validation error message is displayed, but no indication of the order mismatch is given.

Adding and Deleting Meaningful Name XML Files

If you add or delete a meaningful name XML file in an application in Monitor Administration and would like to apply the change immediately, you can force Mercury Real User Monitor to reread the Monitor Administration configuration. For information on configuring applications for monitoring, see "Configuring Applications" in *End User Management Data Collector Configuration*.

To force Mercury Real User Monitor to reread the Monitor Administration configuration:

1 Access the Real User Monitor Web console (for details, see "Accessing the Real User Monitor Engine Web Console" on page 57).

2 From the **Configuration** menu, select **Engine Configuration Per Data Type**. The Engine Configuration Page opens.

3 Click the **Sync All Configuration** button to force the Real User Monitor engine to reload the Real User Monitor configuration from Mercury Business Availability Center.

Changing Meaningful Name XML Files

If you change the content of an existing meaningful page XML file that is used by an application, you must force Mercury Real User Monitor to reload the configuration for the specific application. For information on configuring applications for monitoring, see "Configuring Applications" in *End User Management Data Collector Configuration*.

To force Mercury Real User Monitor to reload the configuration for an application:

1 Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in your Web browser:

http://<Real User Monitor engine machine name>:8180/jmx-console

2 In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=ResolverMeaningfulPagesConfig**.

3 In the **reloadConfiguration** option, enter the application name (as defined in Monitor Administration) by which the XML file is being used and click **Invoke**. The application's configuration is reloaded in Mercury Real User Monitor.

Note: To reload the configuration for all applications, click **Invoke** for the **reloadCurrentConfigurations** option.

8

Administering the MySQL Database

For Real User Monitor to work, it must be connected to a MySQL database that has been created and started.

This chapter describes:	On page:
Overview of the MySQL Database	113
Creating and Connecting to the MySQL Database	114
Starting and Stopping the MySQL Database	114
Maintaining the MySQL Database	115

Overview of the MySQL Database

The MySQL database is the Real User Monitor's data repository. The data that is stored in the MySQL database is data that is either not forwarded at all to Mercury Business Availability Center, or that is only sent on request.

Data that is not forwarded at all to Mercury Business Availability Center is Real User Monitor configuration data. Data that is sent to Mercury Business Availability Center on request is open session data and session click-stream data (data and snapshots of pages included in sessions). Click-stream data accounts for the majority of the data stored in the MySQL database.

The MySQL database can be installed on the same machine as the Real User Monitor engine or on its own machine. For system requirements for the MySQL database, see "Reviewing System Requirements" on page 11.

Creating and Connecting to the MySQL Database

The Real User Monitor engine MySQL database is created during the Real User Monitor engine installation process, if that option is selected. When the MySQL database is created during the installation process, the Real User Monitor engine is connected to it, and the MySQL database is started automatically. The MySQL database to which the Real User Monitor engine is connected must be started for the Real User Monitor engine to work.

You can create a new MySQL database schema and connect the Real User Monitor engine to it, or connect the Real User Monitor engine to a different, existing MySQL database completely, if required.

Note: The Real User Monitor engine can only be connected to one MySQL database.

To create schemas and connect to MySQL databases on a Real User Monitor Windows installation:

On the machine on which the Real User Monitor engine is installed, select **Start** > **Programs** > **Mercury Real User Monitor** > **Administration** > **RUM Configuration Tool**. The Real User Monitor Configuration tool starts. For details on working with the Real User Monitor Configuration tool, see step 12 in "Installing the Mercury Real User Monitor Engine on a Windows Platform" on page 19.

Starting and Stopping the MySQL Database

When the MySQL database is created during Real User Monitor installation, it is started automatically as part of the process. You can start and stop the MySQL database manually if required.

To start the MySQL database on a Real User Monitor Windows installation:

On the machine on which the Real User Monitor engine is installed, select **Start** > **Programs** > **Mercury Real User Monitor** > **Administration** > **Database** > **Start Real User Monitor Database**.

To stop the MySQL database on a Real User Monitor Windows installation:

On the machine on which the Real User Monitor engine is installed, select **Start** > **Programs** > **Mercury Real User Monitor** > **Administration** > **Database** > **Stop Real User Monitor Database**.

Maintaining the MySQL Database

For details on maintaining the MySQL database, including strategies and procedures for backing up and restoring the database, refer to the Database Administration chapter in the MySQL Reference Manual on the MySQL Web site (http://dev.mysql.com/doc/refman/5.0/en/database-administration.html).

Purging MySQL Binary Log Files

The MySQL binary log contains all statements that updated data in the MySQL database.

The purpose of the binary log is to help update the database to the most current status during a restore operation, as it contains all updates made since the last backup. For details on MySQL binary log files and restoring databases, refer to the Database Administration chapter in the MySQL Reference Manual on the MySQL Web site (http://dev.mysql.com/doc/refman/5.0/en/database-administration.html).

Real User Monitor purges the MySQL binary log files on a daily basis, by deleting all the log files older than five days. You can change the default number of days for which to keep the MySQL binary log files.

To change the default number of days for which to keep MySQL binary log files:

1. Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in you Web browser:

   http://<Real User Monitor engine machine name>:8180/jmx-console

2. In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=MaintenanceDBConfigurationJMX**.

3 In the **MySQLBinaryLogsDaysCount** parameter, change the setting to the required number of days.

4 Click the **Apply Changes** button.

Purging Session Click-Stream Data

The majority of the data stored in the MySQL database is session click-stream data. This data comprises the details and snapshots of pages included in sessions and is sent to Mercury Business Availability Center on request.

Session click-stream data is kept in the MySQL database for a default period of 14 days, after which it is automatically purged from the database. The amount of time for which session click-stream data is stored in the MySQL database can be changed to any number of days between 7 and 100.

To change the period for which session click-stream data is stored in the database:

1 Access the JMX console by choosing **JMX Console** from the Configuration dropdown menu in the Real User Monitor Web console, or by using the following URL in you Web browser:

http://<Real User Monitor engine machine name>:8180/jmx-console

2 In the JMX Agent View, scroll down to the **RUM.modules** section and click **service=MaintenanceDBConfigurationJMX**.

3 In the **PurgingDaysCounter** parameter, change the setting to the required number of days (between 7 and 100).

4 Click the **Apply Changes** button.

Note: By increasing the number of days for which session click-stream data is stored, you may significantly increase the size of the database, which may necessitate additional disk capacity.

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