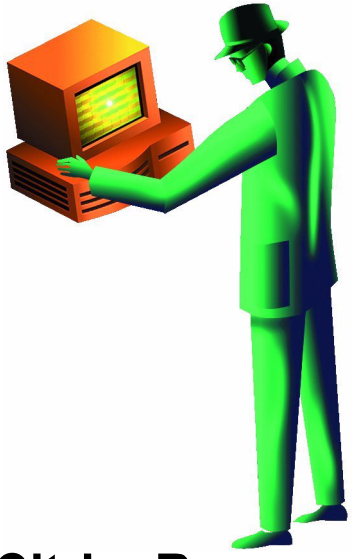
Administrator's Guide



Citrix® Resource Manager

For Citrix MetaFrame XP™e 1.0, Feature Release 2 / Service Pack 2 for Microsoft Windows

Citrix Systems, Inc.

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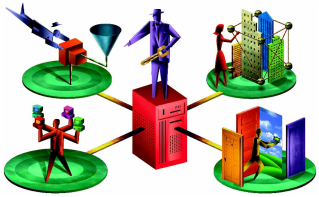
CHAPTER 1

Introduction



Overview

Welcome to Resource Manager for Citrix MetaFrame XPe 1.0, Feature Release 2. This chapter introduces you to the documentation and to Resource Manager. Topics include:

- How to use this guide
- An introduction to Resource Manager for Citrix MetaFrame XPe 1.0, Feature Release 2/Service Pack 2 and its components
- What's new in Resource Manager for Citrix MetaFrame XPe 1.0, Feature Release 2/Service Pack 2
- Details of where to find more information about Resource Manager

About this Guide

The *Citrix Resource Manager for MetaFrame XPe, Feature Release 2 Administrator's Guide* is for MetaFrame server administrators responsible for installing, configuring, and maintaining Resource Manager.

This is a task-based guide to help you set up Resource Manager quickly and easily. This chapter introduces the documentation, and the Citrix Resource Manager product, and describes what's new in Resource Manager for MetaFrame XPe Feature Release 2. Subsequent chapters explain how to deploy and configure Resource Manager, and provide you with a summary of the main ways you can use it in your MetaFrame installation.

This guide assumes knowledge of Citrix MetaFrame for Microsoft Windows. Some understanding of Microsoft SQL server or Oracle DBMS is an advantage to summary database users.

Documentation Conventions

The following conventional terms, text formats, and symbols are used throughout the documentation:

Convention	Meaning
Boldface	Commands, names of interface items such as text boxes and option buttons, and user input.
Italics	Placeholders for information or parameters that you provide. For example, *filename* in a procedure means you type the actual name of a file. Italic also are used for new terms and the titles of books.
UPPERCASE	Keyboard keys, such as CTRL for the Control key and F2 for the function key that is labelled F2.
`Monospace`	Text displayed at a command prompt or in a text file.
%SystemRoot%	The Windows system directory, which can be WINNT, WINDOWS, or other name specified when Windows is installed.
{ braces }	A series of items, one of which is required in command statements. For example, **{ yes | no }** means you must type **yes** or **no**. Do not type the braces themselves.
[brackets]	Optional items in command statements. For example, **[/ping]** means that you can type **/ping** with the command. Do not type the brackets themselves.
| (vertical bar)	A separator between items in braces or brackets in command statements. For example **{ /hold | /release | /delete }** means you type **/hold** or **/release** or **/delete**.

Convention	Meaning
... (ellipsis)	You can repeat the previous item or items in a command statements. For example, **/route:***devicename***[,...]** means you can type additional *devicenames* separated by commas.
▶	A procedure with sequential steps.
•	A list of related information, not procedural steps.

Getting More Information

Resource Manager incudes the following documentation:

- The *Citrix Resource Manager for MetaFrame XPe, Feature Release 2 Administrator's Guide* (this document)
- The documentation included in your MetaFrame package for instructions about installing, configuring, and maintaining your MetaFrame servers

This guide and other Citrix documentation are available in Adobe PDF format in the following locations:

- The \DOCS directory of your Citrix MetaFrame CD-ROM.
- The Citrix product documentation library. Select "Product Documentation" from the Support area at http://www.citrix.com

Using Adobe Acrobat Reader, you can view and search the documentation electronically or print it. To download Adobe Acrobat Reader for free, go to Adobe's Web site at http://www.adobe.com/

Important Always consult the Readme files for Citrix products for any last-minute updates, installation instructions, and corrections to the documentation.

You can also view online Help for the Resource Manager from within the Citrix Management Console. Refer to the online Help for:

- Detailed procedures for tasks within the Resource Manager user interface; for example, generating reports from summary database information
- Context-sensitive help for each setting in a dialog box or tab

To open the Help system, from the **Help** menu, select **Contents and Index** or click  on the Citrix Management Console toolbar:

For help regarding the contents of a dialog box or tab, press F1 or click the **Help** button.

You can access the task-based help topics from the left frame of the help viewer using the following tabs:

Table of Contents. Task-based help is located under the **Resource Manager** tab. For (non-context-sensitive) help about specific dialog boxes or tabs, look under **Help for**.

Index: The Resource Manager help index is located under Resource Manager. There are separate alphabetical indexes for the help system for each Citrix Management Console component. You can also search the Index by entering a word or phrase in the **Find** text box, then pressing ENTER.

Search: Search the help system by entering a word or phrase in the **Find** text box, then pressing ENTER.

Note You may find that some Resource Manager Help topics describe options or features that you do not see on the screen. Refer to "Notes on Help" in the online Help for explanations.

Citrix on the World Wide Web

Citrix offers online technical support services at http://www.citrix.com/support/ that include the following:

- A Frequently Asked Questions (FAQ) page with answers to the most common technical issues
- Software updates for download
- An extensive collection of technical articles, white papers, best practices, how to's and troubleshooting tips
- User-to-user public support forums

Providing Feedback About this Guide

We strive to provide you with accurate, clear, complete and usable documentation for Citrix products. If you have any comments, corrections, or suggestions for improving our documentation, we would be happy to hear from you. You can email the authors at:

documentation@citrix.com

Please include the name and version number of the product and the title of the document in your email.

Introducing Resource Manager

You can use Resource Manager to manage resources on single or multiple MetaFrame servers. Resource Manager enables you to collect, display, store, and analyze data about system performance, application or process use, and user activity.

Use Resource Manager to do the following:

- Watch what is happening at a particular moment for a system. This is known as *real-time monitoring*.
- Analyze and report using records of system activity. You can create reports for current activities or create reports on past activities using a summary database.
- You can create billing reports to charge users for their use of resources using a summary database.

Resource Manager can track and store information about a wide variety of system and network processes, and events. These are known as *metrics*. If the value of a metric falls outside "normal" limits, Resource Manager can inform you about this in a number of ways. During installation, Resource Manager automatically creates a set of default metrics, and assigns limits to define the normal operation of each one.

How can I use Resource Manager?

You can use Resource Manager in your server farm to help you with the following tasks:

Monitoring Your Existing Server Farm

You can use Resource Manager to monitor and analyze system performance, loading, and user behavior.

You can view information about an entire server farm, analyze individual servers and applications, or monitor specific aspects of performance.

By fine-tuning the monitoring process, you can customize the information that Resource Manager provides to suit your specific environment.

Identifying, Diagnosing, and Solving Problems

Resource Manager can warn you about any developing problems on your MetaFrame environment. If a problem does occur, you can analyze the relevant data to help you decide what action to take.

Gauging and Justifying Future Resource needs

You can produce reports about system usage that help you identify requirements for future resources, such as new servers or additional licenses.

Planning and Scaling Your Server Farm

By deploying Resource Manager on a pilot system, you can gauge how the system will cope in likely scenarios. This will help you to scale your network, set baselines, and spot potential problems before they can affect the final installation. For example, you can evaluate whether or not a computer can support the activity of a desired number of users.

What's New in Feature Release 2 / Service Pack 2?

If you are using Resource Manager for MetaFrame XPe version 1.0, you will notice a number of differences when you upgrade to Feature Release 2 or Service Pack 2.

For instructions about performing the upgrade, see "Installing Resource Manager" on page 19.

There are many improvements to the user interface for Resource Manager including:

- Full keyboard access (hotkeys) to menu and user interface items. Hotkeys are activated by pressing the ALT key in unison with the letter key underlined for the component in the user interface.
- Support for Windows high contrast display modes.
- Improved Resource Manager "light boards." The icons used for indicating the status of servers, applications, and other functions have been improved to make them more recognizable.

New Features

MetaFrame XPe 1.0, Feature Release 2 and Service Pack 2 both offer the following new Resource Manager features:

- **Increased local database storage of Resource Manager data**. Detailed Resource Manager data stored locally on each server has increased from 48 hours to 96 hours. This improves coverage for Server Snapshot reports and real-time graphs for metrics.
- **Applying server/application metrics to other servers/applications**. You now have several options for replicating metrics from one server to others, or one application to others. You can choose to select individual metrics from the metrics configured for a server or application, automatically select all modified metric configurations, or replicate the entire metric configuration of a server.

  Target servers do not need to have the same metrics already configured; any new metrics for target servers are automatically added and configured. Likewise, if you replicate a server's entire metric configuration, any *additional* metrics configured on target servers (that are not configured on the server being replicated) are removed.
- **Reboot messages**. If you use Resource Manager to automatically reboot servers, you can now send reboot warning messages to users who are connected to the server in question.

MetaFrame XPe 1.0, Feature Release 2 offers the following new Resource Manager features:

- **Indefinite storage of Resource Manager information using a summary database**. Resource Manager can now store process, event, and any Resource Manager metric information that you select in an external Microsoft SQL Server or Oracle Database DBMS. You can use a summary database to do the following:
  - Retrieve historical records on processes, server events, server metrics, and user activities for individual servers or groups of servers.You can use these records to analyze server trends or for retrospective analysis of servers
  - Generate reports to help you track and analyze resource usage and consumption. You can also generate reports from a summary database using an external package such as Crystal Reports.
- **Billing users for resource usage**. If you are using a summary database, you can set fees for various types of resource usage. Using the fee schedule, you can generate reports, known as *Billing reports*, to charge users for their use of network resources.

The Resource Manager online Help contains detailed instructions for using Resource Manager.

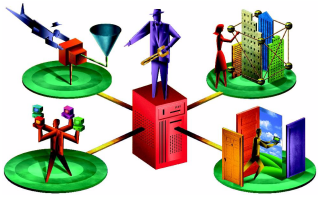
What to Read Next

For further information about Resource Manager, refer to the following sections in this guide:

To find	Refer to
Instructions about installing Resource Manager	Chapter 2: “Installing Resource Manager”
Details of the changes that installing Resource Manager makes to the Citrix Management Console	“Displaying Resource Manager and its Components” on page 30
An overview of real-time monitoring	Chapter 3: “Monitoring Servers and Applications in Real-Time”
An overview of recording the history of servers and applications using a summary database	Chapter 4: “Recording the History of Servers and Applications”
How you can generate reports from stored Resource Manager information	Chapter 5: “Reporting and Analyzing Resource Manager Information”
How you can charge users for resource usage using summary database information	Chapter 6: “Billing Users for Resource Usage”
Answers to common questions about Resource Manager	Chapter 7: “Troubleshooting”
Details about the default metrics that are configured during installation	Appendix A: “Default Metric Set”
Definitions, layout and organization of summary database schema	Appendix B: “Summary Database Schema”
Definitions of the technical terms used in this guide.	Appendix C: “Glossary”

CHAPTER 2

Installing Resource Manager



Overview

This chapter explains in detail how to install Resource Manager. Topics include:

- Issues to consider before you start, including software requirements and licensing information
- Installation instructions
- Instructions about how to upgrade to Resource Manager for MetaFrame XPe, Feature Release 2 or Service Pack 2
- An overview of the user interface and navigation
- Instructions about how to set up a summary database, including setting up a system data source name (DSN) and Database Connection Server
- How to turn the summary database on and off

Software Requirements

You would normally install Resource Manager when you install or upgrade your servers to Citrix MetaFrame XP 1.0, Feature Release 2 or Service Pack 2.

You can also install Resource Manager separately from Citrix MetaFrame XP 1.0, Feature Release 2 or Service Pack 2.

For Resource Manager, Service Pack 2 includes enhancements and new features. Feature Release 2 includes all the features in Service Pack 2 as well as summary database functionality.

For guidelines about the licensing requirements for Feature Release 2, or other XPe components, see the *Citrix MetaFrame XP 1.0, Feature Release 2/Service Pack 2 Administrator's Guide*.

If you are going to use a summary database, you will need one of the following DBMS packages to create a summary database:

- Microsoft SQL Server Versions 7 or 2000
- Oracle Database Versions 7, 8i or 9i

Licensing Information

Full Resource Manager functionality requires a MetaFrame XPe, Feature Release 2 license. Refer to "Licensing MetaFrame XP" in the *Citrix MetaFrame XP Administrator's Guide* for further details.

After you add a license, you can use your software during a grace period before you need to activate the license. You must activate each license to ensure the continued operation of your software. Refer to "Licensing MetaFrame XP" in the *Citrix MetaFrame XP Administrator's Guide* for details about how to do this.

Installing Resource Manager

Use the following procedure to install Resource Manager on an existing MetaFrame XP Feature Release 2/Service Pack 2 server. You need to follow this procedure for each server in your farm.

Before You Start

Before you install Resource Manager, Citrix recommends that you do the following:

- Ensure that the servers on which you are going to install Resource Manager meet the software requirements.
- Ensure that each server on which Resource Manager is to be installed can connect to a data store. (The data store is a database that MetaFrame XP and its components use to keep track of configuration information about the servers, applications, and configured users in the farm.).

  You set up a data store during MetaFrame installation. Resource Manager will use this data store.
- If you are going to use a summary database, you will need to install your DBMS software onto a server. This computer is the database storage facility for your farm's summary data. It does not need to be a farm server but needs to be available to the farm through the network. Make sure that this server has enough space available to store the summary database. Refer to "Managing the Resource Manager Summary Database" on page 94.

Note By default, the first server on which you install Resource Manager becomes the Farm Metric Server. The Farm Metric Server interprets metrics that apply to the entire server farm (for example, application counts) and sends alerts when required for them. Citrix recommends that the Farm Metric Server be lightly loaded and, preferably, be a MetaFrame XP Data Collector. If necessary, you can change the Farm Metric Server to a different machine after installation. See the Resource Manager online Help for instructions.

Installation Procedure

Use the following procedure to install or upgrade Resource Manager. You need to follow this procedure for each server in your farm.

Important If you are upgrading servers from a previous release of Resource Manager, make sure that you upgrade the Farm Metric Servers (primary and backup) before upgrading other Resource Manager servers in the server farm. Resource Manager uses the Farm Metric Server to interpret information collected from other servers. This may cause inconsistency if another server is running a later version of Resource Manager.

▸ **To install Resource Manager on a server**

1. Log all users off the server.
2. Close all applications on the server, including the Citrix Management Console.
3. Insert the MetaFrame XP 1.0, Feature Release 2/Service Pack 2 CD-ROM in your CD-ROM drive:
   - If your CD-ROM drive supports *Autorun*, the MetaFrame installation splash screen appears.
   - If the splash screen does not display, click **Run** from the **Start** menu and type ***d*:\Autorun.exe**, where *d* is the letter of your CD-ROM drive.
4. Click the **Install or update MetaFrame** icon.
5. Click either the **MetaFrame XP Feature Release 2** or **MetaFrame XP Service Pack 2** icon.
6. Click the **Modify** option.
7. Click **Next**.
8. Click the **Resource Manager** icon.
9. From the list, click **will be installed on local hard drive**.
10. Click **Next**.
11. Check that the server farm and installation summary details are correct, then click **Finish**.
12. At the prompt, click **Restart** to restart the server.

Resource Manager functionality is added to the MetaFrame XP server.

Note You need to install the Citrix Management Console on every server from which you want to administer servers with Resource Manager installed.

Uninstalling Resource Manager

If you want to remove Resource Manager from a MetaFrame XP server you need to do the following:

Important If you are planning on uninstalling MetaFrame XP from the Resource Manager Farm Metric Server(s) or Database Connection Server for a summary database, reassign the server before uninstalling. Also, if you are using a summary database, Citrix recommends that you update it before removing any servers from the farm.

▸ **To uninstall Resource Manager from a server**

1. Log all users off the server.
2. Close all applications on the server, including the Citrix Management Console.
3. Insert the MetaFrame XP 1.0, Feature Release 2/Service Pack 2 CD-ROM in your CD-ROM drive:
   - If your CD-ROM drive supports *Autorun*, the MetaFrame installation splash screen appears.
   - If the splash screen does not display, click **Run** from the **Start** menu and type ***d*:\Autorun.exe**, where *d* is the letter of your CD-ROM drive.
4. Click the **Install or update MetaFrame** icon.
5. Click either the **MetaFrame XP Feature Release 2** or **MetaFrame XP Service Pack 2** icon.
6. Click the **Modify** option.
7. Click **Next**.
8. Click the **Resource Manager** icon.
9. From the list, click **Entire feature will be unavailable**.
10. Click **Next**.
11. Check that the server farm and installation summary details are correct, then click **Finish**.
12. At the prompt, click **Restart** to restart the server.

Resource Manager functionality is removed from the MetaFrame XP server.

Setting Up a Summary Database

Before you can start using a summary database, you must do the following:

- Install your DBMS software onto a server and create a database on it.

  This server is the database storage facility for your farm's summary data. It does not need to be a farm server but needs to be available to the farm through the network. You need to make sure that this server has enough space available to store the summary database. Refer to "Managing the Resource Manager Summary Database" on page 94. Resource Manager supports the following DBMS software:

  - Microsoft SQL Server Versions 7 and 2000
  - Oracle Database Versions 7, 8i, and 9i.

  Important When you create your summary database on the DBMS server, the DBMS access credentials you set to be used by Resource Manager must not exceed 255 characters in length for each. This is irrespective of the limits of the DBMS software itself.

  If you are using a Microsoft SQL Server DBMS, do not use the *master* database for your summary database. The master database is used by SQL Server for internal functions. Using it for your summary database may cause database corruption problems.

  Citrix recommends that you do not install the DBMS on the Database Connection Server.

  Note If you are using an Oracle DBMS, ensure that the character set it uses contains all the characters you use in your server farm; for example, for server and application names. This includes special characters and currency symbols.

- Set a system data source name (DSN).

  The system DSN stores information about how a client can connect to a database. It is required by the Database Connection Server (the database client) to be able to communicate with the summary database DBMS. Refer to "Setting a System Data Source Name" on page 23.

- Configure a Database Connection Server.

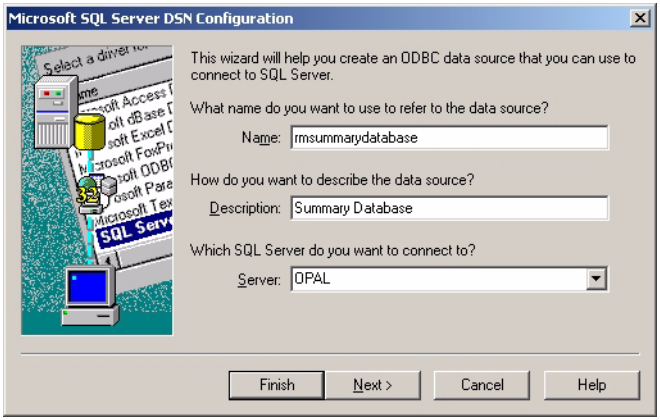
  This server enables communications between the server farm and the summary database by writing data to the database and reading data from it. It should be relatively low-load for best performance. Refer to "Configuring a Database Connection Server" on page 26.

Setting a System Data Source Name

To set a system data source name for Microsoft SQL Server DBMS

1. Choose a server to be your Database Connection Server.
2. Open the Windows Control Panel.
3. Open the ODBC Data Source Administrator dialog box. To do this, open **Administrative Tools**, then open **Data Sources (ODBC)**.
4. Click the **System DSN** tab.
5. Click **Add**.
6. In the Create New Data Source dialog box, select the **SQL Server** option.
7. Click **Finish**.
8. In the Create a New Data Source to SQL Server dialog box, type **rmsummarydatabase** in the **Name** text box. Type a description (optional), then select the server with the DBMS installed on it from the **Server** list.

Important You must enter **rmsummarydatabase** exactly as the system data source name. Any spaces, or spelling errors will make the database unrecognizable to the Database Connection Server.



9. Click **Next**.

10. Select how Microsoft SQL Server authenticates your identification so you can set up the system DSN. Either:

    Click **With Windows NT authentication using the network login ID** to use Windows NT authentication.

    —Or—

    Click **With SQL Server authentication using a login ID and password entered by the user**, then select the **Connect to SQL Server to obtain default settings for the additional configuration options** check box and type a user name and password in the **Login ID** and **Password** text boxes, respectively.

11. Click **Client Configuration**.
12. In the Edit Network Library Configuration dialog box, select **TCP/IP** under **Network libraries**.
13. Click **OK**.
14. Click **Next**.
15. Select the **Change the default database to** check box, then select the database you created on the DBMS server from the list.
16. Click **Next**, then **Finish**.
17. In the ODBC Setup dialog box, you can click **Test Data Source** to confirm the DSN configuration. Click **OK**, then **OK** again to close the dialog box.
18. Click **OK** to close the ODBC Data Source Administrator dialog box.

For more information, refer to your Windows operating system and Microsoft SQL Server documentation.

▸ **To set a system data source name for Oracle DBMS**

Note The system DSN setup described may differ between Oracle versions.

1. Choose a server to be your Database Connection Server.
2. Open the Windows Control Panel.
3. Open the ODBC Data Source Administrator dialog box. To do this, open **Administrative Tools**, then open **Data Sources (ODBC)**.
4. Click the **System DSN** tab.
5. Click **Add**.
6. In the Create New Data Source dialog box, select the **Oracle ODBC Driver** option.

Note The **Oracle ODBC Driver** option is available only after the Oracle Client is installed.

7. Click **Finish**.
8. In the Oracle ODBC Driver Configuration dialog box, type **rmsummarydatabase** in the **Data Source Name** text box. Type a description (optional).

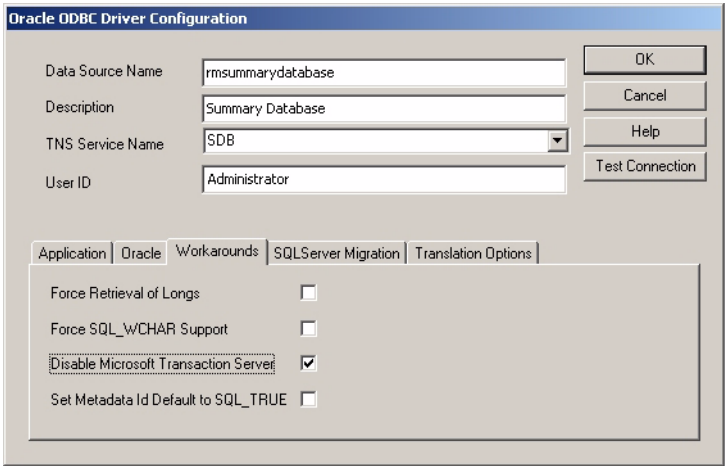
Important You must enter **rmsummarydatabase** exactly as the data source name. Any spaces, or spelling errors will make the database unrecognizable to the Database Connection Server.

9. From the **TNS Service Name** list, select the global database name of the Oracle database, and type the user name in the **User ID** text box.
10. Select **Disable Microsoft Treansaction Server** (MTS) in the **Workarounds** tab.

Note For information about why MTS needs to be disabled, refer to the following Microsoft Knowledge Base articles available from http://www.microsoft.com:

- Q180190
- Q193893

11. Click **OK** to close the Oracle ODBC Driver Configuration dialog box. Note that the dialog box shown varies between Oracle releases.



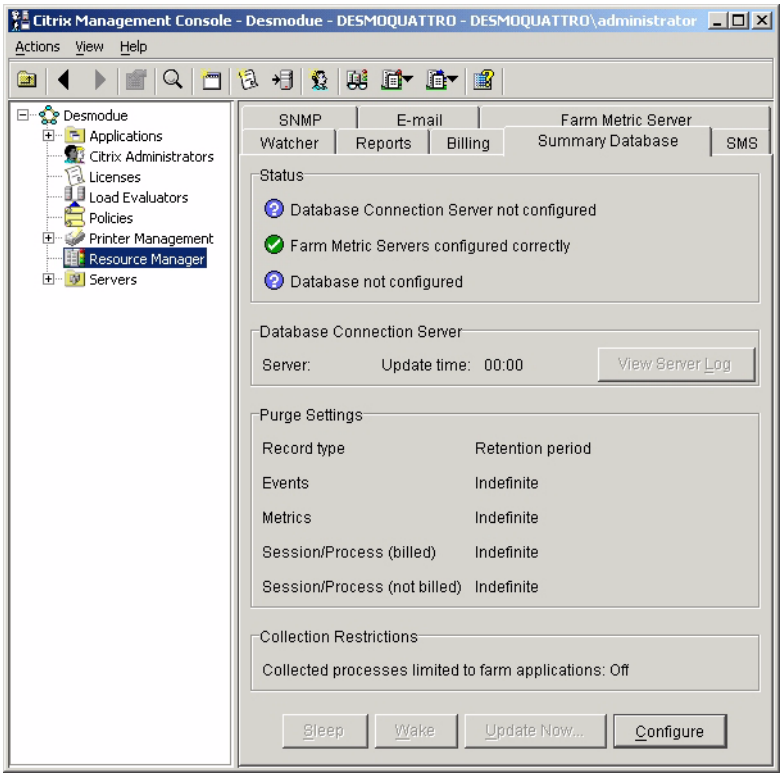
For more information, refer to your Windows operating system and Oracle Database documentation.

Configuring a Database Connection Server

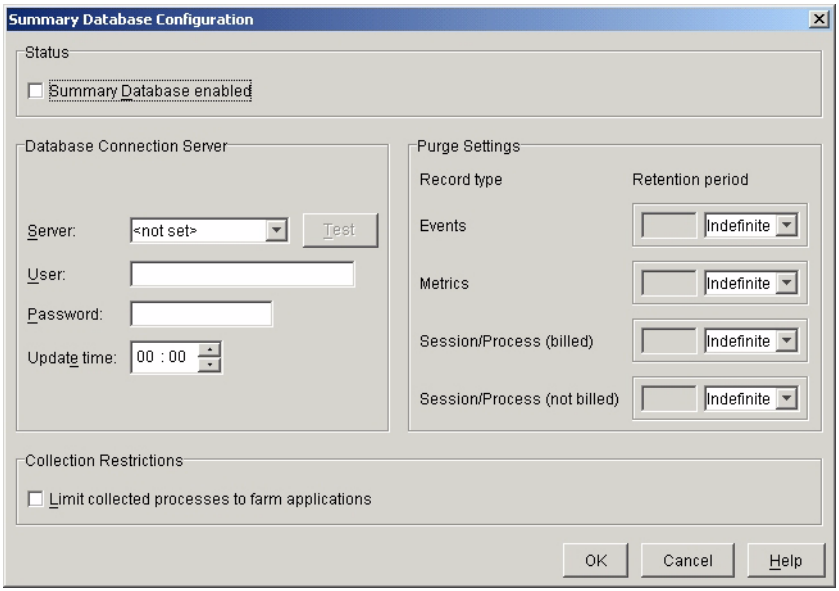
After you set up a system DSN on the Database Connection Server, you need to configure it as the Database Connection Server using the Citrix Management Console.

To configure a Database Connection Server

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Summary Database** tab.



3. Click **Configure**.



4. In the Summary Database Configuration dialog box, select the server you chose as your Database Connection Server from the **Server** list. Only Resource Manager Feature Release 2/Service Pack 2 servers appear in the list.

5. Enter the DBMS access credentials in the **User** and **Password** text boxes. These must match valid credentials defined within the supporting DBMS (the Oracle or Microsoft SQL Server database you are using).

Note Resource Manager supports Windows *NT authentication* for Microsoft SQL Server user name. The 255 character limit for the user name includes the domain name, the intervening "\", and the user name.

---

6. Click **Test** to check the connection to the database. If the test fails, refer to "Database Connection Server" on page 93 for details.

You can now activate the summary database. See "Turning the Summary Database On" on page 28.

You can further configure the Database Connection Server in the following ways:

- Configure the database update time. See "Setting the Summary Database Update Time" on page 61.
- Configure a database purging schedule. See "Removing Unwanted Information From the Database" on page 59.

- Configure data collection restrictions for all farm servers. See "Using Farm-wide Options for Reducing Summary Data" on page 58.

Turning the Summary Database On

You need to turn the summary database on after installation to begin recording data for your database. When it is on, MetaFrame XP Resource Manager servers create and store information for inclusion in the summay database.

To turn the summary database on

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Summary Database** tab.

   Note The upper icon in the **Status** panel is  when the summary database is off or a Database Connection Server is not configured. In this state, MetaFrame XP Resource Manager servers are not creating or storing information for inclusion in the summay database.

3. Click **Configure**.
4. In the Summary Database Configuration dialog box, select the **Summary Database enabled** check box.
5. Click **OK**, then **OK** again.

   The upper colored indicator in the **Status** panel is  , meaning the summary database is on and a Database Connection Server is correctly configured and in use. When the indicator is green, Resource Manager servers are collecting information for inclusion in the database. If the status icon is  , see "Database Connection Server" on page 93 for details.

Turning the Summary Database Off

If you need to stop creating summary data, you can turn the summary database off.

CAUTION When the summary database is off, MetaFrame XP Resource Manager servers will no longer create and store information for the summary database. This may result in data loss until the summary database is turned back on.

You cannot turn the summary database off for individual servers; however, you can minimize the data being contributed by ignoring periods of low server activity. For example, on weekends or late at night. Refer to "Ignoring Server Metrics During Periods of Low Server Activity" on page 59 for details.

To turn the summary database off

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Summary Database** tab.

   Note The upper icon in the **Status** panel is  when the summary database is on. In this state, Resource Manager servers are creating and storing information for inclusion in the summay database.

3. Click **Configure**.
4. In the Summary Database Configuration dialog box, clear the **Summary Database enabled** check box.
5. Click **OK**, then **OK** again.

   The upper ststus icon in the **Status** panel is  meaning the summary database is off. In this state, MetaFrame XP Resource Manager servers are not creating or storing information for inclusion in the summay database.

Displaying Resource Manager and its Components

The following procedures are designed to familiarize you with the interface so that you can quickly get up to speed with the application. The user interface for Resource Manager is integrated with the Citrix Management Console.

Open the Citrix Management Console. Either:

- From the **Start** menu, choose **Programs > Citrix > Citrix Management Console**.

  —Or—

- Click  on the Citrix MetaFrame XP toolbar.

When the Citrix Management Console starts, log on to a MetaFrame server.

When you are connected to a Citrix MetaFrame server farm, the Citrix Management Console displays a window with two main panes:

- The left pane shows a hierarchical list of the components of a server farm
- The right pane displays information about the object that is selected in the left pane

From this window you are able to access Resource Manager.

Note You need to install the Citrix Management Console on every machine from which you want to administer servers with Resource Manager installed.You can install the Citrix Management Console on a MetaFrame XPe server (at the time when you install MetaFrame XP itself), or on a remote machine. For instructions about using a remote machine, see "Remote Connection to Resource Manager Servers" on page 90.

Displaying the Main Resource Manager Screen

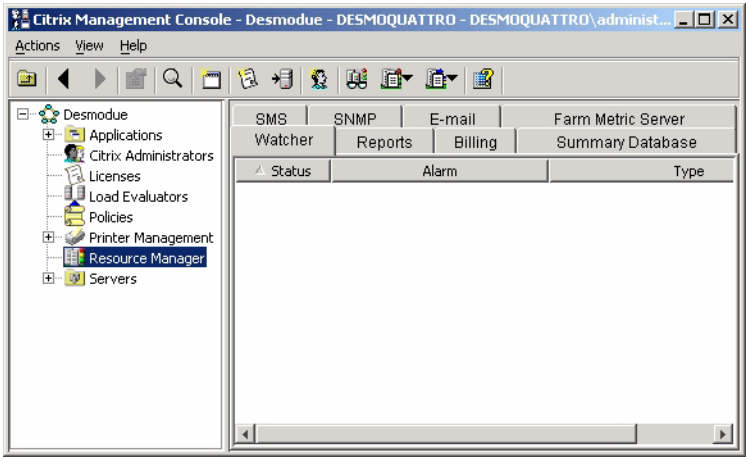
To display the main screen

In the Citrix Management Console, either:

- In the left pane, click **Resource Manager**.

  —Or—

- In the right pane, double-click **Resource Manager**.



This window displays a number of tabs that enable you to perform the following functions in Resource Manager:

- **Watcher**. Shows a real-time list of all servers in the farm that have an alarm state
- **Reports**. Generate reports about current process and user activity, and recent server status; and historical reports on process, user, and server activity if you are using a summary database
- **Summary Database**. Configure a summary database and see its status
- **Billing**. Configure fees and user groups (*cost centers*), and generate Billing reports based on resource usage if you are using a summary database
- **SMS**, **SNMP**, and **E-mail**. Configure automatic SMS, SNMP, or email alerts
- **Farm Metric Server**. See the status of Farm Metric Servers and change them

Refer to “What to Read Next” on page 15 for details about where you can find more information about these topics.

Displaying All the Servers and Folders in a Server Farm

▸ **To display all the servers and folders in a farm**

In the left pane of the Citrix Management Console, expand the **Servers** folder. (Click the plus (+) sign next to it.)

The tree expands to reveal all the servers, and folders of servers, in your farm. The contents are also listed in the right pane under the **Contents** tab. All the servers in a farm share some form of physical connection and a single data store.

Displaying Resource Manager for the Entire Server Farm

This view enables you to monitor all the servers in your farm. In this way you can gain an overall picture of the status of the server farm and spot any problems as they occur.

▸ **To display Resource Manager for a server farm**

1. In the left pane of the Citrix Management Console, click **Servers**.
2. In the right pane, click the **Resource Manager** tab.

Refer to "Organizing Servers or Applications into Folders for Monitoring" on page 38 for further details.

Displaying Resource Manager for a Single Server

▸ **To display Resource Manager for a single server**

1. In the left pane of the Citrix Management Console, navigate to the server that you want to monitor.
2. In the right pane, click the **Resource Manager** tab.

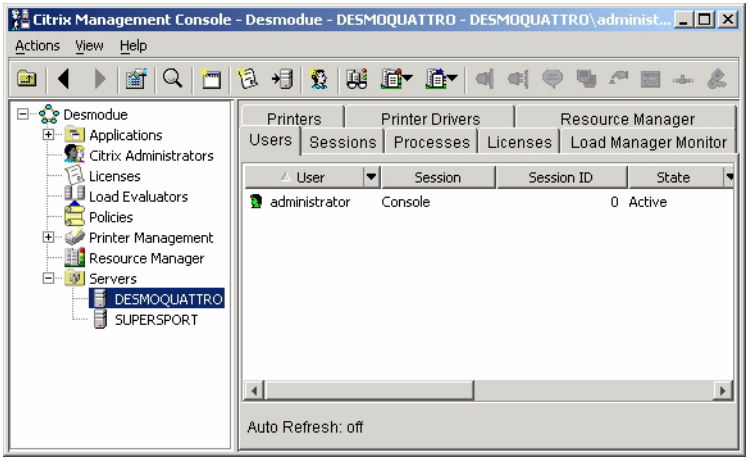
   This displays all the metrics that are being monitored for that server. If a problem arises, a status icon is displayed to warn you.

Refer to "Monitoring the Status of a Server" on page 39 for further details.

Displaying the Properties of a Single Server

To display server properties

1. In the left pane of the Citrix Management Console, navigate to the server whose properties you want to display.



2. Open the Properties dialog box for the server. Either:

   - From the **Actions** menu, click **Properties**.

     —Or—

   - Right-click the server, then click **Properties**.

   Use the Properties dialog box to alter the configuration of the server. Most server configuration options can be accessed here.

Displaying the Applications in a Server Farm

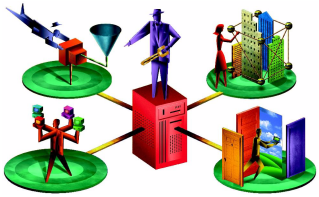
- **To see which applications are available for monitoring in a server farm**

  In the left pane of the Citrix Management Console, expand the **Applications** folder.

  You can use Resource Manager to monitor all MetaFrame XP published applications that are running on Resource Manager servers in the server farm. When you start using Resource Manager, all existing MetaFrame XP published applications are listed in the **Applications** folder.

  You can also monitor applications that are not published in MetaFrame XP by setting them up as Resource Manager applications, and identifying the servers on which you want to monitor them. When you set up a Resource Manager application, it is added to the list in the **Applications** folder. Refer to "Checking Which Metrics Are Being Monitored" on page 37.

CHAPTER 3



Monitoring Servers and Applications in Real-Time

Overview

This chapter explains how you can use Resource Manager to monitor server performance, application instances, and resource usage in real-time. Topics include:

- How you can use real-time monitoring in your network environment
- Information about status indicators and alarms
- Monitoring a single server
- Monitoring a group of servers
- Monitoring applications
- Configuring automatic alerts

Viewing the Items Resource Manager Is Monitoring

Resource Manager provides you with information about a number of system and network processes and events. Status displays show this information in real-time, enabling you to see the status of your system at a glance. You can monitor the following:

- The status of the servers in a farm
- The number of instances of specific applications that are running in a farm

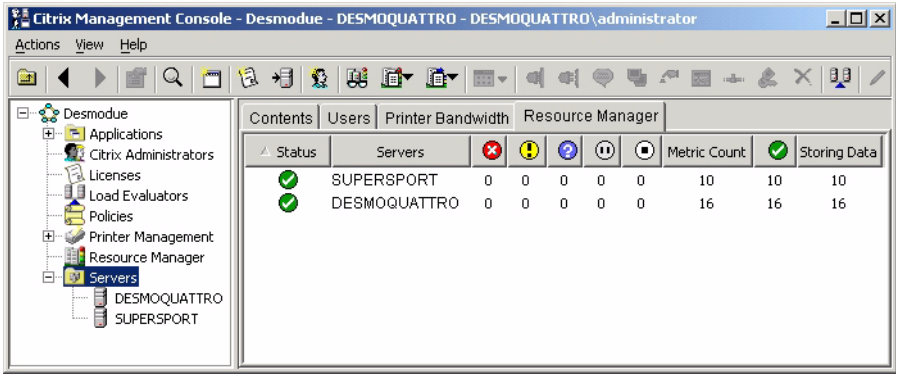
Each item that is being monitored is referred to as a *metric*.

Checking Which Servers Are Being Monitored

Use the following procedure to determine which servers in your farm are being monitored, and to gain an overall view of the real time performance of your system.

To check which servers are being monitored in your system

1. In the left pane of the Citrix Management Console, click the **Servers** folder.
2. Click the **Resource Manager** tab to display the status icons for each server.



The **Servers** column lists all the servers that Resource Manager is monitoring. For each server, the **Metric Count** column shows the number of metrics that are being monitored. The **Storing Data** column shows the number of metrics being stored in the summary database. The display also shows a current count for each type of status icon.

If you organized some of the servers into folders (see "Organizing Servers or Applications into Folders for Monitoring" on page 38), the status display for the entire server farm lists the server folders, with an icon showing the status of the servers in each folder.

Refer to "Checking the Status of the Metrics" on page 37 for details about what each status icon means.

Checking Which Metrics Are Being Monitored

Although the **Metric Count** column provides you with information about the number of different metrics that are being monitored for a server, you may want to know what metrics these include.

To determine which metrics are being monitored for a server

1. In the left pane of the Citrix Management Console, expand the **Servers** folder and click the server you want to examine.
2. Click the **Resource Manager** tab.

   The status for that server is displayed, which lists all the metrics that are being monitored. See "Monitoring the Status of a Server" on page 39 for details.

Checking the Status of the Metrics

For each server in your system, status icons show the status of each monitored condition or metric.

During installation, Resource Manager automatically configures a set of limits for the metrics that apply to each server. If a metric's value falls outside normal limits, the status icons show that this is the case. You may need to alter these limits to suit your specific MetaFrame environment.

The meaning of each status icon is described below:


Represents normal operation; that is, the value of the metric falls between the set limits.


Represents a warning condition. This means that a problem may be developing that will require further analysis to improve performance or to prevent the situation from becoming worse.


Represents a problem condition. This often means that some action is required to provide better application or server performance.

Both yellow and red indicators occur when the value for a metric falls outside the normal limits and remains there for a defined period of time.


Represents a metric that is not yet active, and needs to be configured.


Represents a metric that is set to "Sleep"; that is, you indefinitely suspended notification of the metric's status. See "Suspending Notification of a Metric's Status" on page 45 for details. This icon is also used (for all metrics) if the server is unlicensed.


Represents a metric that is set to "Snooze"; that is, you suspended notification of the metric's status for a fixed period. See "Suspending Notification of a Metric's Status" on page 45 for details.

Resource Manager determines the status of each metric by sampling it every 15 seconds, and updates metric status icons accordingly.

Watching for Alarms

Resource Manager enables you to monitor the status of servers in your server farm in a number of ways. You can monitor individual servers or monitor all the servers in a folder. You can also display a "Watcher Window" that enables you to watch for alarms when the status displays are not visible.

Organizing Servers or Applications into Folders for Monitoring

You can organize servers and applications in the server farm into folders and use Resource Manager to monitor each folder as a unit. You can then see an overview of the servers or applications in the folder, as well as an overview of the entire server farm.

▸ **To create a new folder and monitor it**

1. In the left pane of the Citrix Management Console, in **Servers** or **Applications**, right-click the folder in which you want to create a new folder.
2. Click **New Folder**.
3. Type a name for the folder, then click **OK**.
4. In the left pane, click and drag servers or applications to move into the new folder.
5. Click the new folder, then click the **Resource Manager** tab to view the status display for the contents of the folder.

Note You cannot have both servers and applications in the same folder.

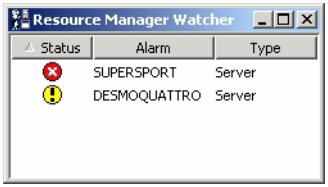
Monitoring Using the Watcher Window

At times when you do not want to show the full status display on the screen, you can monitor servers or server folders by displaying a smaller window, called the WatcherWwindow.

▸ **To display the Watcher Window**

1. Open the Resource Manager Watcher window. Either:
   - Click  on the Citrix Management Console toolbar.
     —Or—
   - From the **Actions** menu, click **Resource Manager Watcher**.

This window lists any red or yellow status indicators in the server farm.



2. Double-click a server alarm to view the status display for that server in the Citrix Management Console.

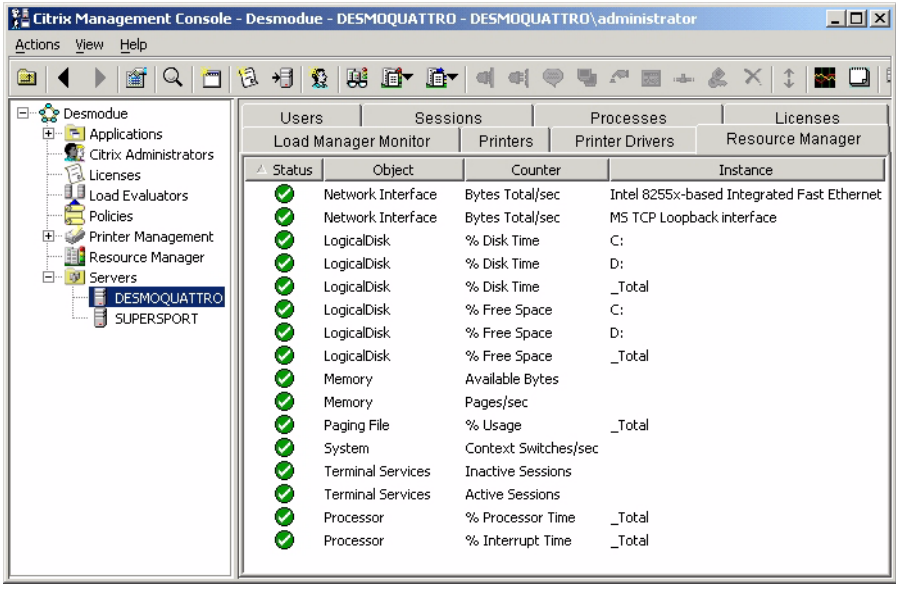
Note If the Watcher Window is blank, this indicates that no problems have been detected in the server farm.

Monitoring the Status of a Server

Use the following procedure to view the status display for an individual server.

To view the status display for a server

1. In the left pane of the Citrix Management Console, expand the **Servers**, then click the server you want to examine.
2. Click the **Resource Manager** tab to display the current set of metrics that are being monitored for the server.



When a metric's value goes beyond its defined limits, Resource Manager displays an alarm status icon for the metric. See "Checking the Status of the Metrics" on page 37 for an explanation of what each status icon represents.

Finding Out When a Server has Stopped Operating

Resource Manager can send alert messages to notify you when a server in the server farm stops operating operating unexpectedly; that is, when the IMA service was not properly stopped.

Alerts are sent in any format for which Resource Manager is configured to send in. This may be email, SNMP message, SMS message, or more than one of these formats. For full details about alert messages, refer to the Resource Manager online Help.

Note The Farm Metric Server is the server that interprets metrics that apply to the entire server farm (for example, application counts) and sends alerts when required for them. See the Resource Manager online Help for instructions about how to change to a different Farm Metric Server after installation.

The alerts work in different ways, depending on the version of Resource Manager that is installed on the server:

- For servers that are running Resource Manager for MetaFrame XPe version 1.0, Feature Release 1/Service pack1 and later, alerts are sent any time that the IMA service is not stopped properly.
- For servers that are running Resource Manager for MetaFrame XPe version 1.0, alerts are sent any time that the IMA service stops operating, including expected events such as scheduled reboots.

Keeping Track of Application Usage

You can use Resource Manager to keep a count of how many instances of specific applications are running in the server farm. Resource Manager can also notify you if the number of instances of a monitored application reaches a limit that you specify. This enables you to manage application licenses.

Important You can use Resource Manager to keep track of the usage only of 32-bit applications. You cannot monitor 16-bit applications.

Starting to Monitor an Application

▸ **To start monitoring an application**

1. Make sure that Resource Manager registers the application. The **Applications** folder in the left pane of the Citrix Management Console lists all applications that Resource Manager has registered.

   Resource Manager automatically registers MetaFrame XP published applications.

   Tip Resource Manager can monitor a MetaFrame XP published application only if you specified the *full path name* of the application in the **Properties** dialog box when you published the application in MetaFrame XP. When you publish an application in MetaFrame XP, it is a good idea to use the **Browse** button to select the executable, to make sure that you use the correct full path. For full instructions about publishing applications, refer to the *MetaFrame XP Administrator's Guide*.

2. If the application is not a MetaFrame XP published application and you do not want to publish it, you need to set it up as a Resource Manager application. To do this, right-click the **Applications** folder in the left pane of the Citrix Management Console, then click **New Resource Manager Application**.

   —Or—

   From the **Actions** menu, click **New** > **Resource Manager Application**.

   A wizard is displayed that enables you to define an application in Resource Manager to monitor. Use the online Help system for details about how to use this wizard. When you have set up the Resource Manager application, it is added to the **Applications** folder.

Important If an application is already a MetaFrame XP published application, *do not* add it again as a Resource Manager application. If you do, extra alerts may be sent for the same application problem.

3. Add the Count metric to the application. This is the metric that keeps track of the number of instances of the application that are running in the server farm. To add the Count metric, expand the **Applications** folder in the left pane of the Citrix Management Console, click the application name, right-click anywhere in the right pane, then click **Add/Remove Metrics** and select the **Count** check box.
4. Define the alarm thresholds for the Count metric. For instructions, see "Finding Out When a Server has Stopped Operating" on page 40.

Note The Resource Manager server log for the primary Farm Metric Server maintains a record of all application Count metric status changes.

Checking the Status of Monitored Applications

1. In the left pane of the Citrix Management Console, click the **Applications** folder. This folder contains all the applications that are available for monitoring: that is, all MetaFrame XP published applications and all Resource Manager applications.
2. Click the **Resource Manager** tab to display the status icons for each application.

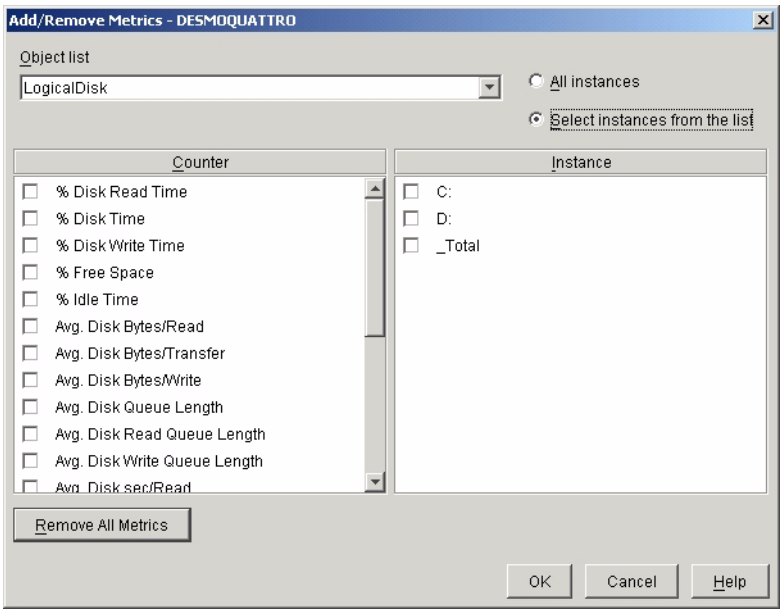
   Note that the **Metric Count** column in the status display is always set to 1. This is because Resource Manager monitors only one metric, that is, the Count metric, for each application.

Customizing Real-Time Monitoring

By changing the set of metrics that are being monitored or altering the alarm configuration for specific metrics on each server, you can tailor real-time monitoring to suit your MetaFrame environment.

To change the set of metrics that are being monitored

1. In the right pane of the Citrix Management Console, right-click any metric.
2. Click **Add/Remove Metrics**.



You will see from the Add/Remove Metrics dialog box that a metric is a combination of the following three items:

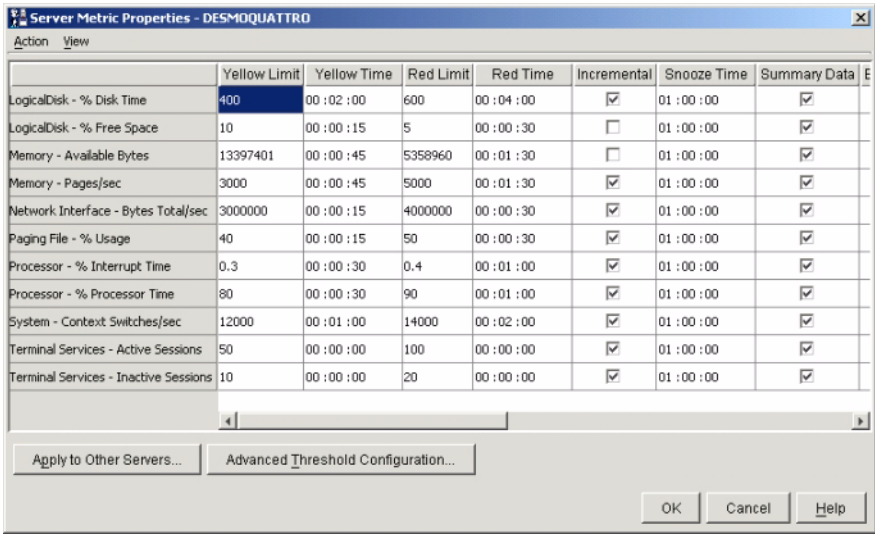
- **Object**. The category that you want to monitor. It is a physical or logical system resource; for example, a computer's hard disk.
- **Counter**. The counter to be monitored. This is the specific aspect of the object that you want to monitor; for example, disk free space.
- **Instance**. The instance of the object. An individual example of the object or a state it needs to reach in order to be counted. For example, a computer may have more than one hard disk. In this case, the instance identifies which disk you want to examine.

3. Use the options to set the metrics that you want to monitor. Citrix recommends that you limit the total number of metrics being tracked on a server to 50.

Important Some metrics have duplicate instances. This was observed, for example, with the Physical Disk metric on servers that have a zip drive installed. When a metric with duplicate instances exists, Resource Manager cannot monitor *either* instance of that metric. Do not try to add either instance of the metric in the Add/Remove Metrics dialog box.

To change the metric properties

1. In the right pane of the Citrix Management Console, right-click any metric.
2. Click **Properties**.



3. In the Server Metric Properties dialog box, you can configure how alarms should operate for each metric by doing the following:
   - Specifying the thresholds for each alarm type using the **Yellow Limit** and **Red Limit** columns.
   - Specifying the time period beyond which a limit must be exceeded to trigger an alarm using the **Yellow Time** and **Red Time** columns.

Tip To help you set appropriate thresholds for a new metric that is not yet configured (blue status indicator), you can display a graph of the current metric value and set the Yellow and Red Limits to levels that suit these values. Click any metric, then click **Advanced Threshold Configuration**.

Suspending Notification of a Metric's Status

You can stop Resource Manager giving you information about a specific metric that it is monitoring for a server or application. This is useful when, for example, you want to work on a problem without receiving repeated alarms.

When you suspend notification, Resource Manager continues recording information about the metric's values but does not display alarms or send alerts.

To stop Resource Manager notifying you about the status of a metric

1. In the status display for the server or application, select the metric for which you want to suspend monitoring (use the SHIFT or CTRL key to select more than one metric) and right-click.
2. Click either of the following:
   - **Snooze** to suspend notification for a defined period of time. The status icon changes to  .

     —Or—
   - Click **Sleep** to suspend notification for an indefinite period of time. The status indicator changes to  .
3. To resume notification, reselect the metric(s) and click either **Snooze** or **Sleep**, as necessary.

   The status icon changes again, to indicate the condition of each metric.

Preparing Your System for Resource Manager Alerts

You can use Resource Manager to send alert messages each time certain metrics change to a red alarm status () or back to normal () from a red alarm.

The alerts can be in one or more of the following forms:

- Short Message Service (SMS) text messages to cell phones
- Simple Network Management Protocol (SNMP) messages
- Email messages

To use Resource Manager to send alerts, you need to set up at least one Resource Manager server to "send" the alert messages. You need to make sure that these servers have additional hardware or software to handle each type of alert you require; for example, a modem for SMS alerts and an email system for email alerts. For SNMP alerts, you need to set up SNMP on every server that has a metric configured to send SNMP alerts.

When you have done this, you can configure settings in Resource Manager, such as who will receive the alert messages and set up the individual server and application metrics that you want to trigger the alert messages.

The alert recipients you set up will be used for all the servers in the server farm. You can modify Resource Manager alert recipients for any server. See "Setting specific SMS and email recipients for alerts on a server" in the Resource Manager online Help for details.

Preparing Your System for Email Alerts

To set up your system for email alerts, you first need to choose and configure the servers in the farm that you want to use to actually send the email messages. These servers are called *MAPI Connection Servers*.

Selecting the MAPI Connection Servers

You need to select one or more servers in the farm to be the MAPI Connection Servers; that is, the servers that send the email alert messages. You can configure metrics on any Resource Manager server to trigger email alerts, but it is the MAPI Connection Servers that actually "send" the alert messages using your email system. You might configure two or three MAPI Connection Servers in the server farm, one of which is the main email server and the others to act as backup.

Each MAPI Connection Server must be able to access a mail server (for example, Microsoft Exchange Server). It must have an email client installed (for example, Microsoft Outlook) that conforms to the X-400 protocols.

Creating a Mail Profile for Resource Manager

On each MAPI Connection Server, you need to configure a mail profile for Resource Manager to use. The profile must have the same name and details on all of your MAPI Connection Servers. Citrix recommends that you give the profile a name that is easy to recognize (for example, Citrix Resource Manager). The profile is used throughout the server farm.

When you create the mail profile, make sure that you include the mail system that you want to use; for example, Microsoft Exchange Server. You can also specify an address book for the profile.

When you are finished setting up the profile, it is a good idea to test that you can log on to your email system using the profile and that you can send a message.

Note The user who is configured to use the email profile can log on to the email system without being prompted for logon credentials.

For more information on configuring email profiles, refer to Citrix Knowledge Base article CTX333658 available at http://knowledgebase.citrix.com.

Enabling the Resource Manager Mail Service

Email alerts are managed by a service called *Resource Manager Mail*. This service is installed automatically on all servers on which you install Resource Manager. You need to enable the service on each MAPI Connection Server.

▸ **To enable the Resource Manager Mail Service on a MAPI Connection Server**

1. Open the Windows Control Panel.
2. Open the Services dialog box. To do this, open **Administrative Tools**, then open **Services**.
3. Right-click the “Resource Manager Mail” service, then click **Properties**.
4. In the Properties dialog box, click the **General** tab and ensure that the **startup type** for the service is set to **Automatic**.
5. Click the **Log On** tab and select the **This account** option.
6. Enter the details of the local user account, including the domain, that you want Resource Manager to use for email alerts. Make sure that you type the account and domain details exactly, or browse to the account so that you can be sure that the details you enter are correct.
7. Ensure that the Resource Manager Mail service is started.

Configuring Resource Manager to Use Email Alerts

After you set up the MAPI Connection Servers, you can set up Resource Manager to use email alerts for the server farm. For example, you need to set up the people who will receive the alert messages. These settings apply to the entire server farm.

▸ **To configure Resource Manager to use email**

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **E-mail** tab.
3. Check that the **MAPI Connection Servers** list displays the names of the servers you configured to send email alerts for the server farm. If necessary, use **Add** and **Delete** to edit the list.
4. Check that the **Selected MAPI Profile** exactly matches the profile that you set up for Resource Manager on the MAPI Connection Servers. If it does not, use **Edit** to change the profile.

   Note The **User ID** and **Password** text boxes in the Edit MAPI Profile dialog box are not used.

5. In **Recipient Addresses**, type the names of the users who you want to receive email alert messages for the server farm. The users can be set up in the profile you defined for Resource Manager on the MAPI Connection Servers.

Tip You may want to organize the people you want to receive email alerts into groups in the address book for the Resource Manager profile. For example, you might create a group of people who normally receive the alerts and another group who receive alerts during holiday periods.

See the Resource Manager online Help for:

- Instructions about how to set up a metric to trigger an alert
- Additional information about each dialog box or tab

Preparing Your System for SMS Alerts

If you want to use SMS alerts, ensure that at least one Resource Manager server in the server farm has a modem. This can be an analog modem or an ISDN card.

You need to investigate the modem requirements of the service providers for the cell/mobile phones to which you want to send alerts. Some service providers require a specific type of modem (usually analog). Where this is the case, at least one server with that type of modem must be in the server farm before you can use SMS alerts for that service provider.

If the people that you want to receive SMS alerts use a variety of service providers, you need to know the details of the gateway that Resource Manager must use to communicate with each service provider. Each provider is likely to have a different telephone number, and may employ a different protocol to carry the messages. Some service providers offer an analog line, others offer ISDN. You probably need to configure a range of numbers to call and a range of protocols to use.

The alert recipients you set up will be used for all the servers in the server farm. You can modify Resource Manager alert recipients for any server. See "Setting specific SMS and email recipients for alerts on a server" in the Resource Manager online Help for details.

Configuring Resource Manager to Use SMS

When you are sure that all the requirements for SMS alerts are present, you can set up the way in which Resource Manager uses SMS for alerts in the server farm. For example, you need to set up the people who will receive the alert messages. These settings apply to the entire server farm.

You need to select one or more servers in the farm to send the SMS alerts. A server that you have configured to send SMS alerts is called a *TAPI Server*.

You can configure SMS alerts to occur on any Resource Manager server, but it is the TAPI Servers that communicate with the service providers and instruct them to send text messages.

▸ **To configure Resource Manager to use SMS alerts**

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **SMS** tab.
3. To configure the servers that you want to communicate with the service providers, in the **TAPI Servers** list, click the server you want to configure, then click **Edit** to display a configuration dialog.
4. In the configuration dialog box, identify which modem to use (if the server has more than one modem) and specify the type of connection (analog or digital).

5. For each type of modem, you can use the **Use Prefix** text box to specify any prefix (such as a dial-out access code) that the device needs to use. Do not enter anything in the **Use Prefix** text box unless all the servers in the farm have been upgraded to at least MetaFrame XPe for Windows, Feature Release 1 or Service Pack 1. If you have servers that are not upgraded, you need to enter the prefix as part of the phone number when you set up the SMS gateway.
6. Use the **Enabled** check box to enable or disable this server for SMS alerts. By leaving this box clear, you can configure the server for SMS alerts, but specify that you do not want to use it at the present time. Similarly, if you need to reconfigure the server, you can just clear the **Enabled** box rather than reconfiguring SMS messaging.
7. Click **OK** to return to the main **SMS** tab.
8. If required, set up the gateway that is to be used for calls to *each* service provider that you want to use. The **SMS Gateways** panel shows a list of all gateways that are currently configured.
9. When one or more gateways are configured, you can set up the details of the people who can receive SMS alerts. The **Users** panel shows a list of all the people who are currently configured to receive the alerts.
10. If you want, you can organize the alert recipients into groups. The **Groups** panel shows a list of all existing groups and the number of members in each.

See the Resource Manager online Help for:

- Instructions about how to set up a metric to trigger an alert
- Additional information about each dialog box or tab

Preparing Your System for SNMP Alerts

To receive SNMP messages, a computer on a network requires an SNMP management tool that enables it to "listen" for messages. A number of third-party commercial tools are available.

You need to install and set up the Windows 2000 SNMP service on every server that has a metric configured to send SNMP alerts.

Important If you want Resource Manager to send alerts for the Count metric on any applications that are running in the server farm (see "Keeping Track of Application Usage" on page 41), make sure that the Farm Metric server has the Windows 2000 SNMP service enabled and running. The Farm Metric server interprets metrics, such as application counts, that apply to the entire server farm.

To configure Resource Manager to use SNMP alerts

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **SNMP** tab.
3. Click **Edit**.
4. Type the *exact name* of the SNMP community that is to receive the alert message. SNMP community names are case-sensitive.

See the Resource Manager online Help for:

- Instructions about how to set up a metric to trigger an alert
- Additional information about each dialog box or tab

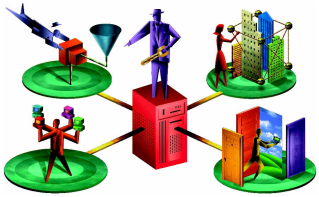
Getting More Information About Metrics and Monitoring

Resource Manager uses server performance and resource metrics derived from the Microsoft Windows Performance Monitor. To find further information about metrics, refer to the Microsoft Management Console and associated online Help.

Look in the Resource Manager online Help for more detailed information about:

- Monitoring applications. You can use Resource Manager to keep a count of how many instances of specific applications are running in the server farm, and notify you if the number of instances of a monitored application reaches a defined limit. This enables you to manage application licenses.
- Displaying a graph that tracks a metric's value in real-time.
- Changing the alarm thresholds for a metric.
- Ignoring specific processes on a server.

CHAPTER 4



Recording the History of Servers and Applications

Overview

This chapter explains how you can use Resource Manager to store server performance, application instances, and resource usage in a summary database. Topics include:

- How Resource Manager information gets into a summary database
- What information you should record in a summary database
- Scheduling data collection for a summary database

How Does Resource Manager Information get into a Summary Database?

Each Resource Manager server creates a summarized version of its daily activity. This information is known as *summary data*. There are various types of summary data. These are:

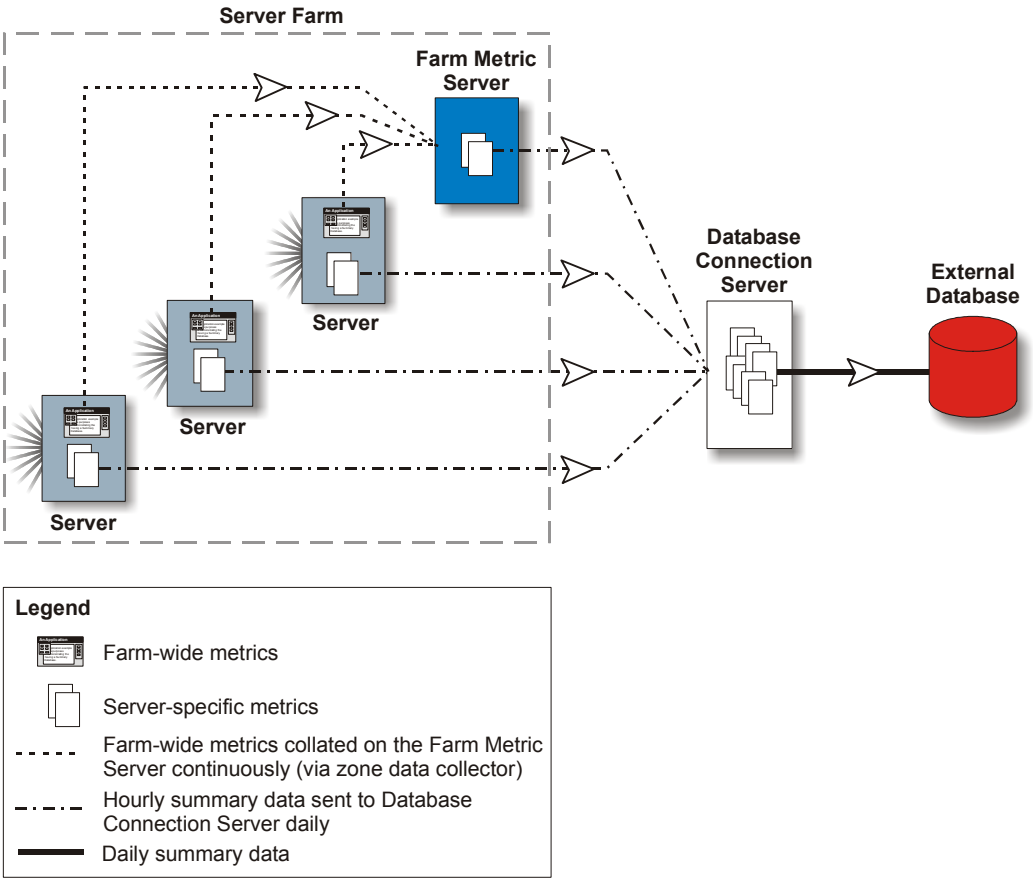
- Server-specific performance metrics
- Server-specific session information
- Farm-wide application metrics
- Farm-wide server events (for example, server-down)

Farm-wide metrics and server event information is generated as summary data by the Farm Metric Server as well as its own server-specific information and metrics. Farm-wide metrics are routed from servers to the Farm Metric Server through the zone data collector.

Summary data is kept in special temporary summary files that are stored locally on each server in a database compatible format. Each hour, Resource Manager adds the summary data gathered over the previous hour to the summary files. Summary files are stored in the \\Program Files\Citrix\Citrix Resource Manager\SummaryFiles folder.

On a daily basis, the summary data held by each server in the farm is collected by the Database Connection Server. The Database Connection Server then updates the summary database. Once the summary database has been updated, summary files are overwritten with new data

The following diagram represents a typical server farm utilizing the Resource Manager summary database. It shows the flow of both server-specific and farm-wide summary data from the farm servers to the summary database through the Database Connection Server.


Server Farm
Farm Metric Server
Server
Server
Server
Database Connection Server
External Database
Legend
Farm-wide metrics
Server-specific metrics
Farm-wide metrics collated on the Farm Metric Server continuously (via zone data collector)
Hourly summary data sent to Database Connection Server daily
Daily summary data

What Information Should I Record in the Database?

All Resource Manager servers automatically record process-related and session-related information, and server events for the summary database. This information is recorded by default and cannot be changed.

You can specify what Resource Manager metric information you want to save in the database. A number of default metrics are automatically set for inclusion in the database when you install Resource Manager.You can modify the default metric set or specify your own for individual, or multiple servers.

Issues to Consider when Selecting Database Information

You need to consider some important issues when selecting information to be stored in your database. These are outlined below.

The Benefits of Keeping Long-Term Resource Manager Information

Store information that will be useful; for example, if you are billing users for RAM usage, you can store process information until you create bills for it.

It is a waste of summary database space to store information where keeping track of it has little significance in maintaining your server farm. For example, there is limited use in recording the amount of application usage on a server if you don't care about what specific applications are being used.

Deciding Which Metrics Information to Store

You need to decide what Resource Manager metric information to store for different servers in your farm. This is important if you have several servers contributing differing metric information to the database because it may confuse an assessment of the farm as a whole when using summary database reports.

Consider the following scenario:

An administrator has selected the "LogicalDisk - % Free Space" metric to be recorded in the database for half of the servers in the farm.

At a later date, an administrator generates a report from the summary database to find the servers most in need of hard drive upgrades (least hard disk free space).

Because half of the servers in the farm are not storing this metric in the database, the administrator does not get an accurate report of the overall state of the farm for the metric.

How Can Recording a Metric Affect Database Growth?

You need to consider how quickly your summary database will grow when storing the metric information you chose, and the amount of hard disk space available to the DBMS. The larger your server farm, the more information you store, the faster your database will grow.

To help you control database growth, you can remove unwanted data from it using a *purging schedule*. Database purging automatically deletes records from the database after they have been there for a specified period of time. See "Removing Unwanted Information From the Database" on page 59 for details.

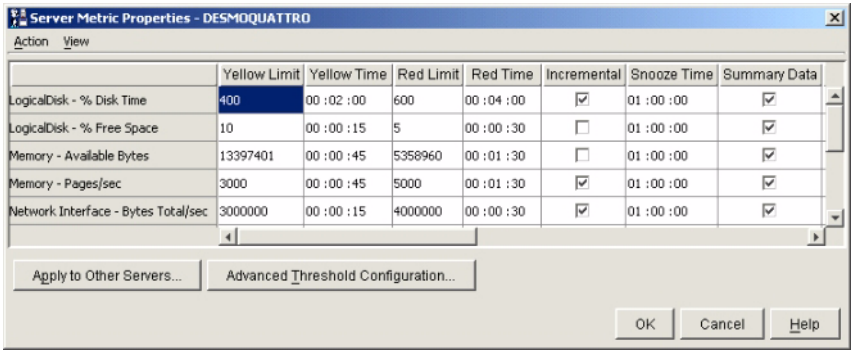
Selecting Server and Application Metrics to Record in the Database

When you install Resource Manager, the default set of Resource Manager server metrics are automatically set to be summarized and stored in the summary database. Similarly, whenever you add a new metric, it is automatically set to be summarized. If you are upgrading Resource Manager from Feature Release 1, all existing metrics are summarized. Refer to "Chapter 3, Monitoring Servers and Applications" for details about how to set and use metrics.

You can select server or application metrics for the summary database for individual servers or applications, or use one setting for multiple servers or applications.

To record a server metric in the summary database

1. In the right pane of the Citrix Management Console, right-click any server metric.
2. Click **Properties**.



3. In the Server Metric Properties dialog box, select the check boxes in the **Summary Data** column to specify the metrics you want to record in the database.

To record an application metric in the summary database

1. In the left pane of the Citrix Management Console, expand the **Applications** folder and click the application you want to set.
2. In the right pane, right-click the metric, then click **Properties**.

Note To add or configure the application count metric, refer to "Chapter 3, Monitoring Servers and Applications" for details.

3. In the Application Metric Properties dialog box, select the check box in the **Summary Data** column to specify that you want to record the application Count metric in the database.

Using Farm-wide Options for Reducing Summary Data

Resource Manager enables you to reduce the amount of farm-wide summary data being generated. Use the Collection Restrictions options to do this.

The following option is available:

- **Limit collected processes to farm applications**: Use this to create summary data for processes only connected to, or part of, MetaFrame published applications or Resource Manager applications.

Keep in mind that collection restrictions may affect resource billing because process data that is not stored in the summary database cannot be billed. See "Generating Billing Reports to Charge Users" on page 76 for details.

See the Resource Manager online Help for:

- Instructions about setting farm-wide data collection restrictions
- Additional information about each dialog box or tab

Scheduling Summary Data Collection and Removal

Resource Manager gives you control over several important aspects to maintaining historical records in your summary database. These include:

- Ignoring periods of low server activity by scheduling the collection of server metric information for the summary database
- Automatically deleting records from the summary database by scheduling their removal after they are stored for a specified time
- Enabling you to set the time of the day you want the Database Connection Server to update the summary database with the day's summary data

Ignoring Server Metrics During Periods of Low Server Activity

You can configure Resource Manager to ignore server metrics during periods of low server activity; for example, over weekends or late at night, where metric collection may be of little benefit and would increase database size unnecessarily. You can restrict server metrics from summary data on specific days of the week and/or during specific periods during each day. Note that session, process, application, and server event information is always recorded regardless of any settings you make.

You can schedule server metric summary data collection for individual servers or use one setting for multiple servers. Any previous settings for chosen servers are replaced with the new settings.

See the Resource Manager online Help for:

- Instructions about how to ignore server metrics during periods of low server activity
- Additional information about each dialog box or tab

Removing Unwanted Information From the Database

Over time, your database will grow in size as it stores summary data for the farm. Records you store in the database are kept indefinitely, by default, which can lead to a large database in a short period of time. The greater the number of servers contributing to the database, and the greater the amount of summary data being stored for each server, the faster the database will grow.

You may want to keep only some of the records stored in the database for a certain length of time. For example:

- If you record the percentage of CPU interrupt time so you can assess potential hardware problems or server overloading on a monthly basis, you may not require the information after assessment.
- If you record session and process information on your servers so you can bill users for their usage time, you may not want to keep the records after the bill is created.

You can remove unwanted data from the database using a *purging schedule*. Purging automatically deletes records from the database after they are there for a specified period of time. You can also configure data so that it can be purged only *after* a bill is created for it. You can configure database purging as most suitable for your farm using the following record type options:

- Events
- Metrics
- Sessions/processes (billed)
- Sessions/processes (not billed)

For more information about billed and not billed sessions and processes, refer to "Generating Billing Reports to Charge Users" on page 76.

Setting a Purging Schedule

When you configure your purging schedule, you must specify the age the data must reach before being purged. The age of a piece of data is calculated by subtracting its end time from the current Database Connection Server time. Database purging takes place at midnight.

Important Ensure that the operating system time and date on the originating Resource Manager servers and the Database Connection Server are synchronized. This prevents data from being purged incorrectly; for example, if one of the farm servers has the date set two days behind that of the Database Connection Server, the data from it is purged two days earlier than expected.

Note Purge settings are set to "Indefinite" upon initial setup. The Indefinite setting will never purge the associated data.

See the Resource Manager online Help for:

- Instructions about removing unwanted data from the summary database
- Additional information about each dialog box or tab

Setting the Summary Database Update Time

The Database Connection Server automatically updates the summary database with summary data from each Resource Manager server once per day. This is referred to as *update time*. The default update time on setup is 00:00 hours (midnight). If this is inconvenient, you might want to set this to a quiet time of day when server activity is low to prevent slow data transferral or interference with normal farm activities.

During an update, each server in the farm first sends a request to the Database Connection Server asking for permission to send its summary data for the day. After accepting the request, the Database Connection Server receives the servers' summary data, and then updates the summary database.

Note The update time is always interpreted in the time zone local to each server. This means that servers in different time zones will request to send their summary data to the Database Connection Server at the update time in their local time zone.

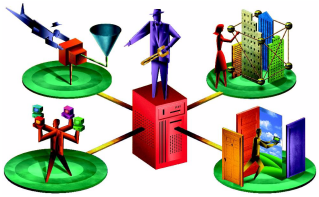
You can perform manual updates independently of the update time. You may want to do this, for example, if you want to generate reports on a fresh set of information.

You can also temporarily "Sleep" the Database Connection Server to stop the database from being updated. You may want to do this to perform some maintenance on the database.

See the Resource Manager online Help for:

- Setting the database update time
- Performing manual database updates
- Temporarily stopping database updates
- Additional information about each dialog box or tab

CHAPTER 5



Reporting and Analyzing Resource Manager Information

Overview

This chapter describes how you can generate and analyze reports using data that is held on each server or in a summary database. Topics include:

- Descriptions of the various Resource Manager reports
- Generating detailed reports about current activity
- Generating summarized reports about past activity
- Saving reports and viewing them later
- How reports from servers in different time zones and languages are handled

Generating Reports to Analyze Data

Resource Manager enables you to produce a variety of reports based on the information stored locally on each server, known as *Current* reports, or from the information in your summary database, known as *Summary* reports. The major differences between the two report types are:

- **Current**: These reports are generated from Resource Manager information stored in the local database on each server and can be generated on a per-server basis. The information is recorded at 15 second intervals and is referred to as *real-time*. The Server Snapshot report can be stepped back to any time within the last 96 hours.

  Note Servers that do not have MetaFrame XPe 1.0, Feature Release 2 or Service Pack 2 installed can generate Server Snapshot reports for the previous 48 hours.

- **Summary**: These reports are generated from Resource Manager summary data stored in the summary database and can be generated for multiple servers. Summary reports are less detailed than Current reports; however, they provide a much greater historical scope and can be stepped back through any available summary data. Summary reports can be customized to include or exclude various record types.

You can use the information from Resource Manager reports to inform others about the MetaFrame environment and to establish future resource requirements. You can identify why problems occur, and reduce the likelihood of these occurrences in the future. You can also examine server, user and process activity trends, and statistics to help you better maintain your server farm.

All reports are displayed in a report viewer window. Reports contain navigation links to allow you to step between the top of the report and any of the tables within it. You can save a report in HTML or comma separated values (CSV) format for later printing, viewing, or inclusion in documents.

Note Resource Manager uses a number of HTML templates to create reports. These are located on each server in the Templates subfolder of the Citrix Resource Manager folder. To avoid inconsistencies in the reports, do not edit the templates.

If your number format settings use commas as decimal separators, Resource Manager replaces them with semicolons (;) when saving reports to CSV format, because commas are used specifically in this format to separate the items of data in the file.

To generate a report

Access the various reports. Either:

- Click  on the Citrix Management Console toolbar, then click the report type you want to generate.

  —Or—

- In the left pane of the Citrix Management Console, click **Resource Manager**, then click the **Reports** tab.

Choose from the following types of report and refer to each section for further information:

- **Server Snapshot** - refer to “Looking Back to a Specific Time on a Server” on page 67
- **Current Process** - refer to “Reporting About the Use of Processes or Applications” on page 66
- **Current User** - refer to “Reporting on User Activity” on page 67
- **Process Summary** - see “Looking Back at Specific Processor Application Usage” on page 70
- **User Summary** - see “Looking Back at Specific Users’ Activities” on page 71
- **Server Summary** - see “Looking Back at Activities on a Specific Server” on page 72

Creating Reports on Current Activity

Current reports in Resource Manager present detailed information about your MetaFrame environment. Current reports can provide the following:

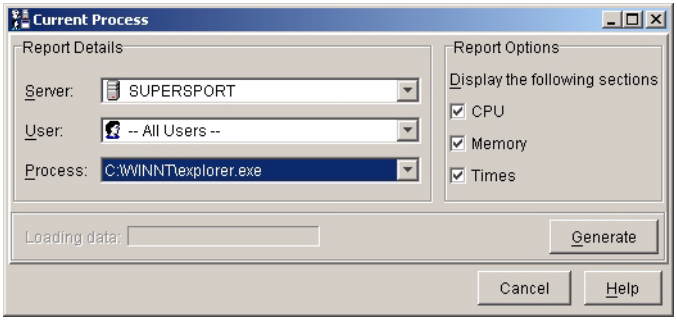
- The status of a server at a particular moment in time
- Statistics about current process activity in your server farm
- Statistics about current user activity in your server farm

Reporting About the Use of Processes or Applications

You can produce a report that displays information about the processes that are currently being monitored in the server farm and, in particular, processes that are running on a specific server.

To produce a Current Process report

1. Click **Current Processes**.



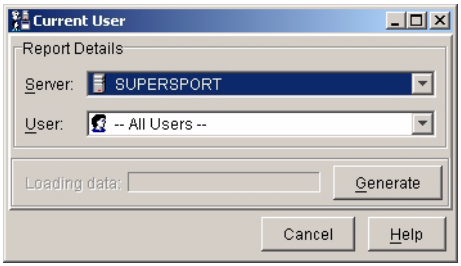
2. Choose which process, user, and server to report on, and use the check boxes under **Report Options** to specify the information that you want to include in the report.
3. Click **Generate** to create the report and view it.

Reporting on User Activity

You can use Resource Manager to provide information about how users of your server farm are currently using processes and servers.

To produce a Current User report

1. Click **Current User**.



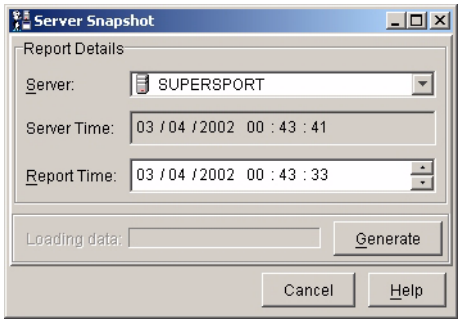
2. Select which user you want to analyze, and for which server.
3. Click **Generate** to create the report and view it.

Looking Back to a Specific Time on a Server

If there is a problem on a particular server, you can produce a report of its status, generated for a 15 second period, at the time the problem occurred. You can then use this report to evaluate why the problem happened.

To produce a Server Snapshot report

1. Click **Server Snapshot**.



2. Select the server you want to report on, and the period to report on. The **Server Time** box shows the current local time for the selected server.

Note Servers that do not have MetaFrame XPe 1.0, Feature Release 2 installed do not support displaying the selected server's local time.

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3. Click **Generate** to create the report and view it.

You can generate further Server Snapshot reports on the same server, stepped by 15 seconds each time, by clicking the **Step 15 seconds** arrow buttons in the report viewer window. You might want to do this, for example, to pinpoint the cause of a server problem. Each time you step the report, a new report is generated and displayed in the right hand pane of the window, with the report date and time for it displayed in the **Report List** in the left hand pane. Clicking a report in the **Report List** displays that report in the right hand pane.

See the Resource Manager online Help for:

- Instructions about generating and interpreting Resource Manager Current reports
- Additional information about each dialog box or tab

Creating Reports on Past Activity

Summary reports in Resource Manager present summarized information about your MetaFrame environment. Summary reports can provide the following:

- The status of a server at a particular moment in time
- Statistics about past process activity in your server farm
- Statistics about past user activity in your server farm

Important Generating more than two Summary reports at a time will overburden most systems.

You can also generate reports from the summary database using an external package such as Crystal Reports®. To help you do this, the database schema used by the summary database is described in Appendix B of this guide.

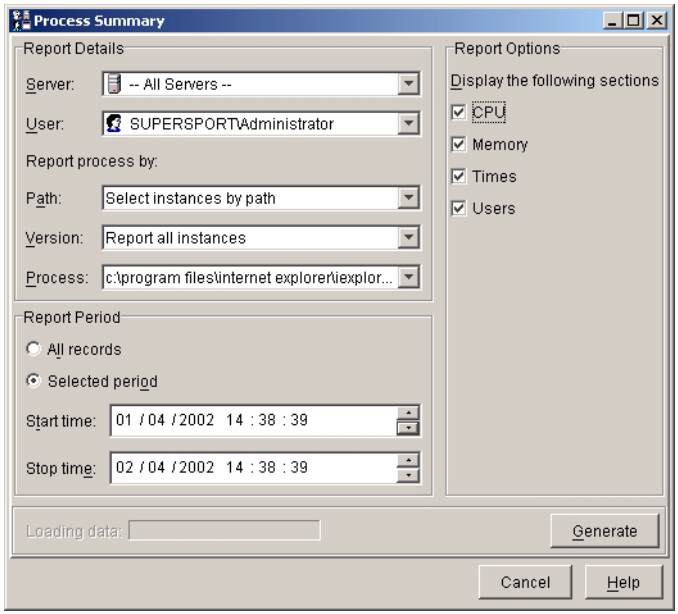
Note Citrix provides a variety Crystal Reports templates that you can use. These templates ares available in several languages, and are available for download from http://www.citrix.com/download/

Looking Back at Specific Processor Application Usage

You can use Resource Manager to provide information about how users of your server farm have been using processes and on which servers.

To generate a Process Summary report

1. Click **Process Summary**.



2. Choose which process, path, version, user, report period, and server to report on, and use the check boxes under **Report Options** to specify the information that you want to include in the report.

Note Process versions are available for only Win32 processes.

---

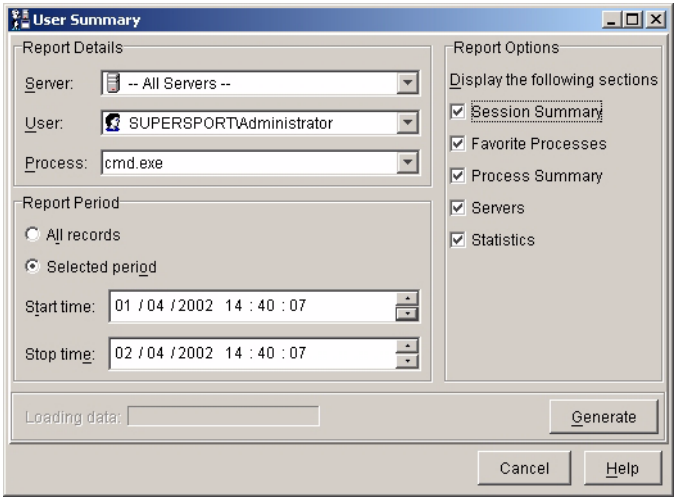
3. Click **Generate** to create the report and view it.

Looking Back at Specific Users' Activities

You can use Resource Manager to provide information about how users of your server farm are currently using processes and servers.

To generate a User Summary report

1. Click **User Summary**.



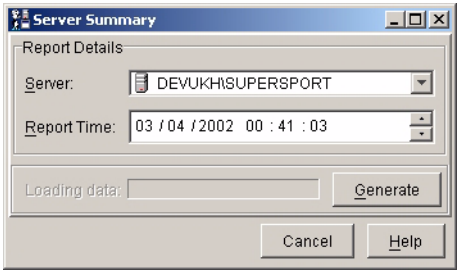
2. Choose which user, process, report period, and server to report on, and use the check boxes under **Report Options** to specify the information that you want to include in the report.
3. Click **Generate** to create the report and view it.

Looking Back at Activities on a Specific Server

You can use Resource Manager to show the users and associated processes, as well as the server metrics you've set for recording in the summary database for a specific server at a particular time.

To generate a Server Summary report

1. Click **Server Summary**.



2. Choose which server and the period to report on.
3. Click **Generate** to create the report and view it.

You can generate further Server Summary reports on the same server, stepped by an hour each time, by clicking the **Step 1 hour** arrow buttons in the report viewer window. You might want to do this, for example, if you want to track the number of users and their processes on a server over a period of several hours that occurred a week ago. Each time you step the report, a new report is generated and displayed in the right hand pane of the window, with the report date and time for it displayed in the **Report List** in the left hand pane. Clicking on a report in the **Report List** displays that report in the right hand pane.

See the Resource Manager online Help for:

- Instructions about generating and interpreting Resource Manager Summary reports
- Additional information about each dialog box or tab

Saving Reports and Viewing them Later

You can save reports form the report viewer window and also view reports that you saved.

See the Resource Manager online Help for instructions about how to save reports from the report viewer window.

- **To view a saved report**

  1. In the **Reports** tab, click **View Saved Reports**.
  2. Navigate to the location of the report, then click **Open**.

How Reports from Servers in Different Times Zones or Locales are Displayed

If you have servers in the farm that are located in different time zones and/or are localized to different languages, you need to understand how reports are displayed.

What if a Reporting Server Uses a Different Time Zone?

Times and dates that you enter when generating reports are understood by the system to be in the local time for the server on which you are reporting.

All times and dates shown in the report tables are in the local time zone for the server being reported on, with the exception of User Summary and Process Summary reports. User Summary and Process Summary reports show session times in the local time zone of the server requesting the report.

Report generation times, in the report header, show the time the report was generated in the requesting server's local time, plus any UTC (Coordinated Universal Time) offset. Server Summary reports also show UTC offset for times in the **Metrics** table.

An example scenario is a server farm with servers in various parts of the world. This example farm has:

- Resource Manager servers located in New York, United States (UTC - 5 hours)
- Resource Manager servers in Berlin, Germany (UTC + 1 hour)

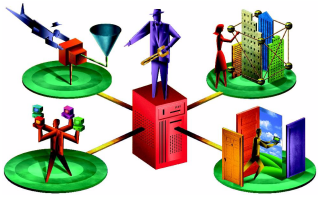
The farm administrator generates a Server Summary report for the last six hours from a server in New York at 13:00 hours local time. The report shows a generation time of "13:00-05:00" (New York time). An event that occurred two hours previously (11:00 hours in New York) in Berlin will be shown as 16:00 hours—the local time the event occurred in Berlin.

What if a Reporting Server Uses a Different Language?

Resource Manager software supports localized versions, meaning that it supports a number of languages. In a farm with differing language versions of Resource Manager present, reports are localized to the locale where the Citrix Management Console requesting the report is. In the above example, the information from Berlin (German locale) would be reported in American English (United States locale).

CHAPTER 6

Billing Users for Resource Usage



Overview

If you have a summary database, you can use Resource Manager to produce bills based on the data that is collected about resource usage. For example, you can bill the departments within your organization according to their use of shared resources. Topics include:

- Instructions about how to establish a schedule of fees for various resources
- Instructions about how to define cost centers for billing against
- Instructions about how to create billing reports for cost centers and domain users
- Selecting information to appear in Billing reports
- Saving Billing reports and viewing them later

Generating Billing Reports to Charge Users

Resource Manager enables you to produce reports, known as *Billing* reports, based on the information stored in your summary database.

Billing reports use the resource usage data from the summary database and a fee schedule to calculate the charges for users of the server farm. You can set up individual users and/or user groups into billable groups known as *cost centers*. You can also bill individual domain users.

When Resource Manager generates a Billing report, it calculates the charges by multiplying the resources used during the report period by the associated fee. For example, if you set fees for both CPU time and memory usage, and a user has used US$10.00 worth of CPU time and US$20.00 worth of memory during the report period, the user is shown in the report as using US$30.00 worth of resources.

All reports are displayed in a report viewer window. You can save a report in HTML or comma separated values (CSV) format for later printing, viewing, or inclusion in documents.

Note Resource Manager uses a number of HTML templates to create reports. These are located on each server in the Templates subfolder of the Citrix Resource Manager folder. To avoid inconsistencies in the reports, do not edit the templates.

To generate a Billing report

Access the various reports. Either:

- Click  on the Citrix Management Console toolbar, then click the report type you want to generate.

  —Or—

- In the left pane of the Citrix Management Console, click **Resource Manager**, then click the **Billing** tab.

Choose from the following types of Billing report, and refer to each section for further information:

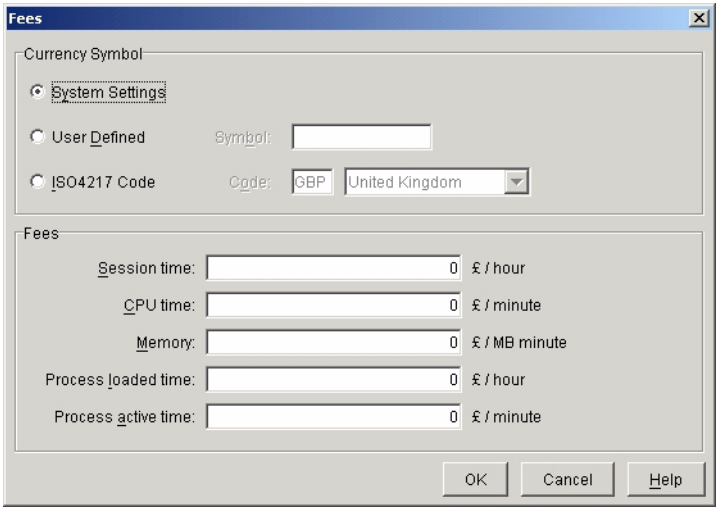
- **By Cost Center** - see "Billing Cost Centers" on page 80
- **By Domain** - see "Billing Domain Users" on page 81

Establishing a Fee Schedule

To generate Billing reports, you need to establish a schedule of fees for the resources you want to bill against. If you change the fee schedule, the new fees are effective from the next Billing report you create.

To define which items to bill for, and the fees to be charged

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Billing** tab.
3. Click **Fees**.



4. In the Fees dialog box, use the options under **Currency Symbol** to set the currency symbol to be used in the Billing reports.

Note If you choose a European country that uses the Euro currency and the Euro symbol does not automatically appear as the currency symbol, do the following: Click the User defined option, place your cursor in the Symbol text box, then press CTRL+ALT+4 to enter the Euro currency symbol.

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5. Under **Fees**, enter values in the text boxes to define the charges for one or more items available for billing.

After you configure fees, you can define cost centers or generate Billing reports. See “Organizing Users into Cost Centers for Billing” on page 78, “Billing Cost Centers” on page 80, and “Billing Domain Users” on page 81.

Organizing Users into Cost Centers for Billing

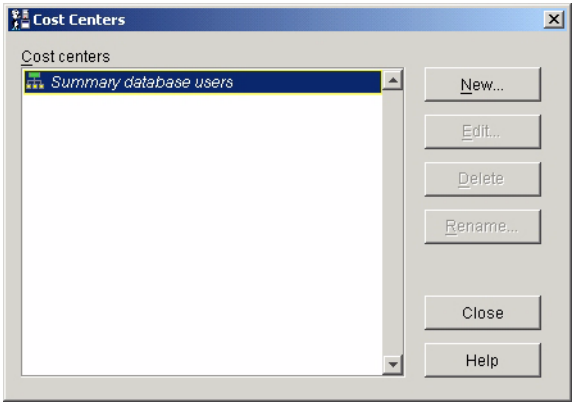
You can create a single Billing report for the resource usage of a group of users by organizing these users into a cost center. For example, if you want to charge different departments within an organization, you can create a cost center for each department. The members of the cost center are the staff in the department who use system resources. Any user can be a member of one, more than one, or no cost centers.

The "Summary database users" cost center is a predefined cost center that cannot be removed, edited, or renamed. This cost center is defined in terms of all users who have an entry in the summary database rather than through membership of cost centers, which you define in terms of Windows domain users.

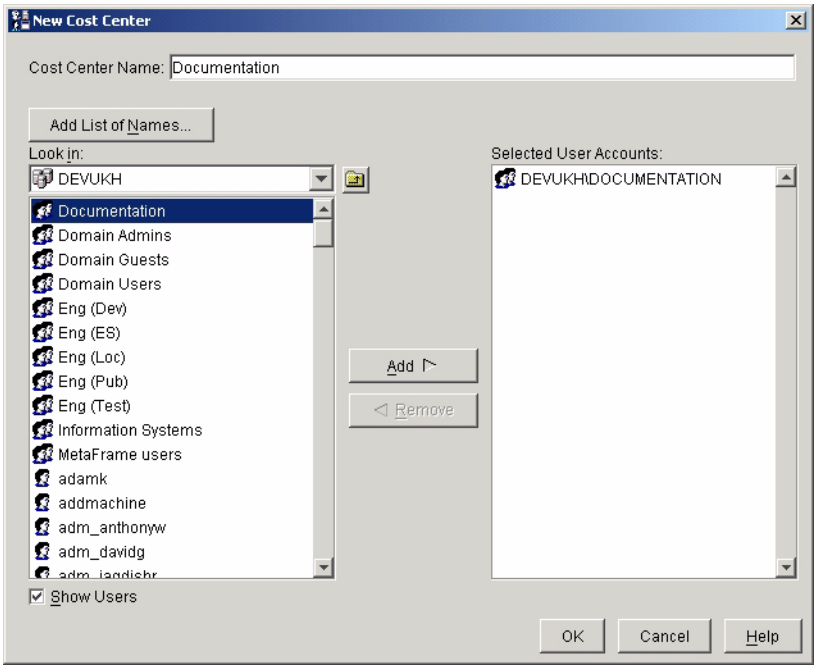
Important Local user groups on farm servers that are included in cost centers can be billed only if the server in question is currently running. This is because, when producing Billing reports, Resource Manager establishes the contents of local user groups only from active servers.

To create cost centers

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Billing** tab.
3. Click **Cost Centers**.



4. In the Cost Centers dialog box, click **New**.



5. In the New Cost Center dialog box, **Cost Center Name** text box, type a name for the cost center; for example, "Accounts Department."

6. Use the **Look In** list to select the user domain for the cost center users. Use the **Show Users** check box to display user names in the **Look In** list.

7. Select the user groups/user names in the domain to add to the cost center. Either:

   Select the users from the **Look In** list. (Use the SHIFT or CTRL keys to select more than one user.) Click **Add**. The selected user groups/user names are added to the **Selected User Accounts** list.

   —Or—

   Click **Add List of Names**. In the Add List of Names dialog box, type the Windows domain names of the user groups/user names, separated by semicolons (;), in the text box. Click **Check Names** to check the user names you entere exist in the domain. Note that checking user names may take a long time to complete on very large systems. Click **OK**. The names entered are added to the **Selected User Accounts** list in the New Cost Center dialog box.

8. Click **OK**. The new cost center is created. If the name of the cost center already exists, a warning message appears.

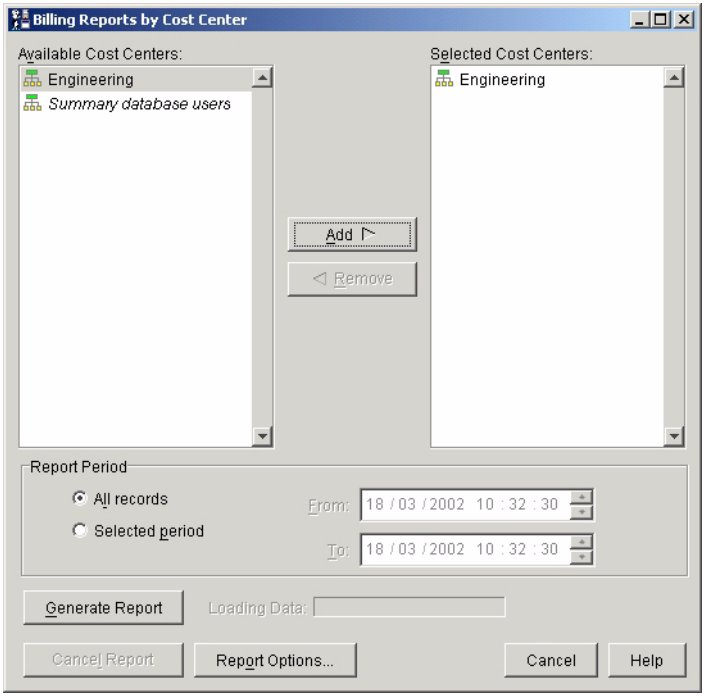
Billing Cost Centers

Billing reports are generated for cost centers. You need to have configured cost centers to generate useful Billing reports for cost centers. Refer to "Organizing Users into Cost Centers for Billing" on page 78 for details.

Note If there are users who are not members of any cost center, you can generate Billing reports for them by billing against domain users. See "Billing Domain Users" on page 81 for details.

To generate Billing reports for cost centers

1. In the Citrix Management Console **Billing** tab, click **By Cost Center**.



2. Choose which cost centers, and the period on which to report. Choose the information that you want to be displayed in the Billing report by clicking **Report Options** and selecting the information you want. Refer to "Selecting Information to Appear in Billing Reports" on page 83 for details
3. Click **Generate Report** to create the report and view it.

Tip When you create billing reports for all cost centers, it is a good idea to also select the "Summary database users" cost center. Select it as the last cost center in the list of cost centers to be billed, and disable the **Show duplicate users in every report** check box in the Report Options dialog box. Doing this creates an additional Billing report for users with entries in the summary database who are not members of any of your defined cost centers. This will help you pick up any errors in your cost center setup and also make sure you are billing all users.

After you successfully generate the report, click **Mark Report as Billed** in the report viewer to ensure that the billed items are not included in any future Billing reports for the selected cost centers. Do this to avoid generating bills for the same item more than once.

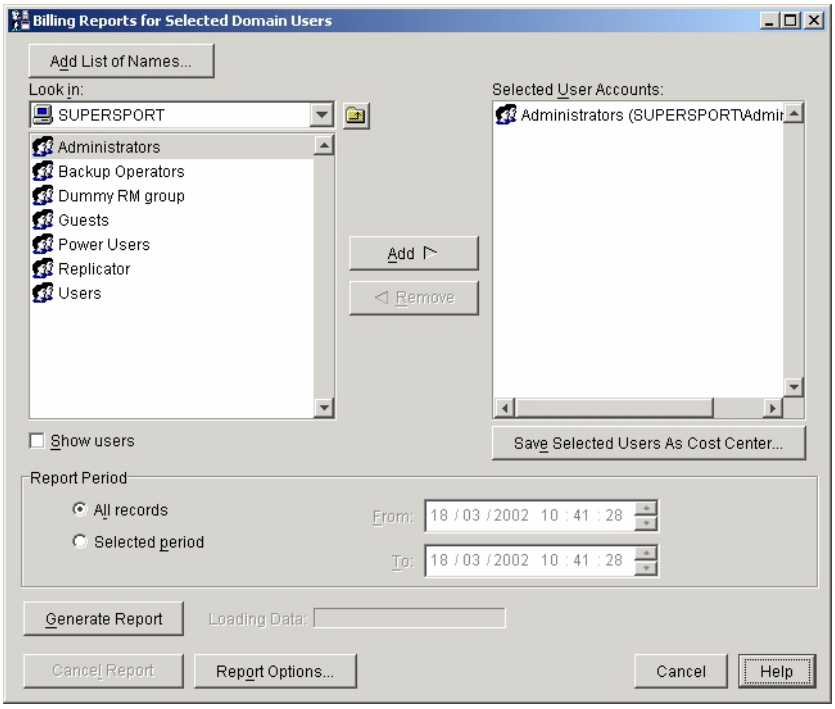
You can avoid billing for system processes by configuring Resource Manager to ignore certain processes.

Billing Domain Users

Billing reports are generated for user groups and/or users in a domain.

To generate Billing reports for domain users

1. In the Citrix Management Console **Billing** tab, click **By Domain**.



2. Choose which domain users and groups, and the period on which to report. Choose the information that you want to be displayed in the Billing report by clicking **Report Options** and selecting the information you want. See "Selecting Information to Appear in Billing Reports" on page 83 for details
3. Click **Generate Report** to create the report and view it.

Tip After you successfully generate the report, click **Mark Report as Billed** in the report viewer to ensure that the billed items are not included in any future Billing reports for the selected domain users and groups. Do this to avoid generating bills for the same item more than once.

You can avoid billing for system processes by configuring Resource Manager to ignore certain processes.

See the Resource Manager online Help for:

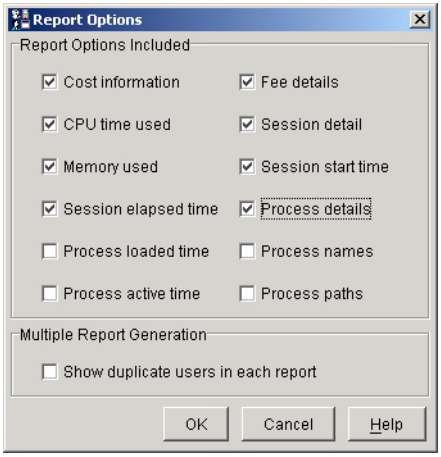
- Instructions about organizing users into cost centers
- Instructions about generating and interpreting Resource Manager Billing reports
- Instruction for how to ignore specific processes on a server
- Additional information about each dialog box or tab

Selecting Information to Appear in Billing Reports

Use the Report Options dialog box to specify the information that you want to include in a Billing report. The settings you make are saved and used as defaults the next time you generate Billing reports.

To add/remove Billing report information

1. Click **Report Options** in the Cost Center Billing Reports or Billing Reports for Selected Domain Users dialog boxes.



2. In the Report Options dialog box, select the check boxes for the information that you want to include in a report.

   If you do not select any options, the report will display basic information only. Selected options appear in individual columns in the report.

See the Resource Manager online Help for:

- Instructions about selecting information to appear in Resource Manager Billing reports
- Additional information about each dialog box or tab

Saving Billing Reports and Viewing them Later

You can save Billing reports from the report viewer window and also view reports that you saved.

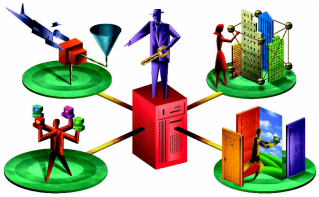
See the Resource Manager online Help for instructions about how to save reports from the report viewer window.

- **To view a saved report**

  1. In the **Reports** tab, click **View Saved Reports**.
  2. Navigate to the location of the report, then click **Open**.

CHAPTER 7

Troubleshooting



Overview

This chapter covers some common questions that you may encounter when using Resource Manager, and offers possible resolutions. It covers issues related to:

- Installing Resource Manager
- Uninstalling Resource Manager or removing servers from a farm
- Using the new functionality in Feature Release 2 / Service Pack 2
- Farm Metric Servers
- Real-time monitoring
- Remote connection to Resource Manager servers
- Time zones
- Summary database
- Database Connection Server
- Managing the Resource Manager summary database
- Summary reports
- Finding Help information

Installing Resource Manager

Q: Can I install the Feature Release 2 / Service Pack 2 version of Resource Manager without installing Resource Manager first?

Yes. The installer includes a full installation of Resource Manager.

Uninstalling Resource Manager or Removing Servers from a Server Farm

Q: Are there any things I should consider before uninstalling Resource Manager or removing a server from the server farm?

Yes. If you intend to uninstall Resource Manager from the Farm Metric Server(s), or the Database Connection Server, or remove any of them from the farm, you are advised to reassign them first. That is, change the Farm Metric Server(s) and/or the Database Connection Servers to other Resource Manager Feature Release 2 servers before uninstalling or removing from the server farm.

Using New Feature Release 2 / Service Pack 2 Functionality

Q: Do I need to upgrade the servers in my server farm in a specific order?

If you decide to upgrade servers to Feature Release 2 or Service Pack 2 over a period of time (rather than all at the same time), make sure that you upgrade the Farm Metric servers (main and backup) before upgrading other Resource Manager servers in the server farm. Resource Manager uses the Farm Metric Server to interpret information collected from the other servers. This may cause inconsistency if another server is running a later version of Resource Manager.

Q: I set up a feature in Resource Manager, but it doesn't seem to be working. What could be the problem?

Ensure the server you are monitoring was upgraded to Resource Manager for MetaFrame XPe 1.0, Feature Release 2 or Service Pack 2.

It is possible to use Resource Manager in an environment where some servers in the server farm were upgraded to Resource Manager for MetaFrame XPe 1.0, Feature Release 2 or Service Pack 2, and others were not. However, if you are monitoring a server that has not been upgraded, certain aspects of the user interface in Feature Release 2 / Service Pack 2 will not work for that server, even if the server from which you are running the Citrix Management Console was upgraded.

Managing the Resource Manager Local Database

Q: How is metric data stored for each Resource Manager server?

Each MetaFrame XPe server with Resource Manager installed has a Microsoft Jet Access database, in which it stores metric values and application information for the last 96 hours. This database is located in: ...\Citrix Resource Manager\LocalDB\RMLocalDatabase. It is accessed only when creating real-time graphs, displaying Server Snapshot reports, and running reports on that specific server.

Q: How can I manage the size of the local database on each Resource Manager server?

You do not have to. Once the IMA service is started on a server, the local Resource Manager database is automatically compacted every day.

Farm Metric Server

Q: What is the best way to select the Farm Metric Servers for Resource Manager in my server farm?

Citrix recommends that the Farm Metric Servers (primary and backup) be lightly loaded and, preferably, MetaFrame XP data collectors, because the Farm Metric Server gathers its information from the data collector.

By default, the first server on which you install Resource Manager becomes the Farm Metric Server. The second server on which you install Resource Manager becomes the backup Farm Metric server. If these servers will experience heavy loading or are not data collectors, specify different servers to be the Farm Metric Servers.

If you want Resource Manager to notify you by sending alerts when a server in the farm stops operating, the Farm Metric Server must have at least Resource Manager for MetaFrame XPe for Windows, Feature Release 1 or Service Pack 1 installed on it.

See the Resource Manager online Help for: instructions about how to change the Farm Metric Servers.

Q: How do I find out which server is currently acting as the Farm Metric Server?

▸ **To identify the Farm Metric Server**

1. On any Resource Manager server, start the Citrix Management Console.
2. In the left pane of the Citrix Management Console, click **Resource Manager**.
3. In the right pane, click the **Farm Metric Server** tab. The current Farm Metric Servers are listed.

Q: I am getting the error message: "The Farm Metric Server cannot be contacted." What can I do?

If you see this message:

- First, find out which servers are acting as the primary Farm Metric Server and the backup Farm Metric Server.
- Ensure that both the primary Farm Metric Server and the backup are operational. If either server is down, restart it.

If either server is heavily loaded, the Farm Metric Server can take some time to respond, so the error indicates a TimeOut error. If you suspect that this might be the case, wait for a few moments, or change the Farm Metric Server and the backup to servers that are more lightly loaded.

Real-time Monitoring

Q: What are metrics and where do they come from?

Metrics are the trackable items that Resource Manager measures for a server or application. A metric is a combination of:

- An object. This is the category that you want to monitor. It is a physical or logical system resource; for example, a computer's hard disk.
- The instance of the object. An individual example of the object or a state it needs to reach in order to be counted. For example, a computer may have more than one hard disk. In this case, the instance identifies which disk you want to examine.
- The counter to be monitored. This is the specific aspect of the object that you want to monitor; for example, disk free space.

Resource Manager can track any Microsoft Windows Performance Monitor counter as a server metric.

Q: How many metrics can I monitor on a server?

Citrix recommends that you limit the total number of metrics being tracked on a server to 50.

Q: For a MetaFrame XP Published Application, Resource Manager shows the application count as zero, even though some instances of the application are running. How can I see the correct application count?

Check that you specified the *full path* (rather than just the application executable) in the **Properties** dialog box for the published application in MetaFrame XP. It is a good idea to use the **Browse** button to select the executable to make sure that you are using the correct full path. For instructions about publishing applications, see the documentation for MetaFrame XP.

Q: The IMA service crashed while I was adding Resource Manager metrics to a server. What happened?

If the IMA service stops working while you are adding metrics for monitoring on a server, it may be because you tried to add a metric that has a duplicate instance. This was observed, for example, with the Physical Disk metric, on servers with a zip drive installed. If there are duplicate instances of a metric, Resource Manager cannot monitor *either* instance of that metric.

Q: Some metric values reported by Resource Manager are negative. What should I do?

Some values returned by the Windows Performance API and displayed by Resource Manager are negative. You can ignore these values.

Q: How can I monitor the disk on my Microsoft Windows 2000 Server?

By default, Resource Manager monitors the LogicalDisk performance object on Windows 2000 Server machines.

Some installations of Windows 2000 Server, without Windows 2000 Service Pack 1 installed, do not include the LogicalDisk performance object. If you have this type of installation, no disk monitoring metric is included in the default list of metrics.

You can address this in two possible ways:

- You can monitor the PhysicalDisk performance object instead, by adding appropriate PhysicalDisk metrics using Resource Manager. Unfortunately, this means that only the physical drive is monitored, not each partition, and % Disk Free Space is not monitored.
- You can install Windows 2000 Service Pack 1, which enables you to monitor the LogicalDisk object. This is preferable, because you can then also monitor the physical drive, partition, and % Disk Free Space.

Q: A server in my server farm stopped operating, but Resource Manager did not send an alert to warn me that this had happened. Why not?

Resource Manager looks at the IMA service to determine whether or not a server is operating.

To send alerts when a server stops operating, the Farm Metric Server must have at least Resource Manager for MetaFrame XPe for Windows, Feature Release 1 or Service Pack 1 installed on it. The Farm Metric Server interprets metrics that apply to the entire server farm (for example, application counts) and sends alerts if necessary. By default, the first server on which you install Resource Manager becomes the Farm Metric Server.

See the Resource Manager online Help for instructions about how to change the Farm Metric Servers.

Remote Connection to Resource Manager Servers

Q: Can I use a non-MetaFrame workstation to display Resource Manager information for a remote MetaFrame XPe server?

Yes. To do this, you need to install the MetaFrame XP 1.0, Feature Release 2 / Service Pack 2 Citrix Management Console on the workstation.

- **To install the Feature Release 2 / Service Pack 2 Citrix Management Console on a non-MetaFrame workstation**

  1. Ensure that Resource Manager is installed on the MetaFrame XPe server for which you want to view Resource Manager information.
  2. Install or upgrade the Citrix Management Console on the workstation using the setup program on the MetaFrame XP 1.0 Feature Release 2 / Service Pack 2 CD-ROM. For details about the new features, see "Using New Feature Release 2 / Service Pack 2 Functionality" on page 86.
  3. Start the Citrix Management Console on the workstation.

Q: On a non-MetaFrame workstation, how do I upgrade the Resource Manager components to Feature Release 2 / Service Pack 2?

- **To see the Feature Release 2 / Service Pack 2 functionality**

  Install the Citrix Management Console on the workstation, using the setup program on the MetaFrame XP 1.0 Feature Release 2 / Service Pack 2 CD-ROM.

  See the *MetaFrame XP Administrator's Guide* for full installation instructions for Feature Release 2 / Service Pack 2.

Time Zones

Q: I connected to a Resource Manager server in a different time zone, and saw some apparent time discrepancies. What is happening?

All dates and times displayed in the Citrix Management Console are in the context of the *server's* time zone and current local time. You also need to be aware that, when you connect to a server using an ICA Client, the clock shown on your remote desktop is in the *client* device's time zone.

If you look in the local database, note that the times stored there are in UTC (Coordinated Universal Time), and therefore cannot be directly compared with the times displayed in the Citrix Management Console.

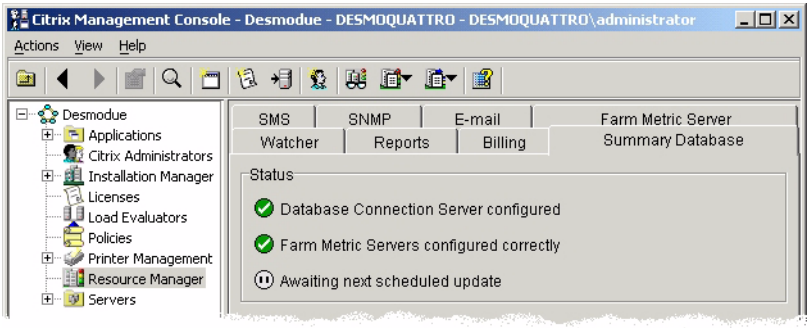
Summary Database

Q: How do I know that my summary database is working properly, and what do the status indicators mean?

You can easily check the status of the summary database using the Citrix Management Console **Summary Database** tab. Under **Status** are three icons. The top one represents on/off and configuration, the middle represents Farm Metric Server configuration, and the lower one represents the current activity.

To view the summary database status and run-time activity icons

1. In the left pane of the Citrix Management Console, click **Resource Manager**.
2. In the right pane, click the **Summary Database** tab. The **Status** area includes indicators showing the current Database Connection Server, Farm Metric Servers, and run-time process states.



The meaning of the status icons for the On/Off/Configuration indicator (upper) are:

The summary database is off or a Database Connection Server is not configured. In this state, no MetaFrame XP Resource Manager servers are creating and storing summary data for inclusion in the database.

The summary database is on and the Database Connection Server is correctly configured. In this state, MetaFrame XP Resource Manager servers are creating and storing summary data for inclusion in the database.

The summary database software version for the Database Connection Server is not accepted because another server in the server farm has a later version of the summary database software installed. You need to upgrade the software on the Database Connection Server, see Chapter 2, "Installing Resource Manager" for details.

Note, this situation can arise only when there are mixed releases of the summary database software within a farm.

The meaning of the status icons for the Farm Metric Server indicator (middle) are:

The primary Farm Metric Server is active and has an accepted version of the summary database software installed.

The summary database software version for the backup Farm Metric Server is not accepted because another server in the server farm has a later version of the summary database software installed. You need to upgrade the software on the backup Farm Metric Server, see Chapter 2, "Installing Resource Manager" for details.

Note, this situation can arise only when there are mixed releases of the summary database software within a farm.

The summary database software version for the primary Farm Metric Server is not accepted because another server in the server farm has a later version of the summary database software installed. You need to upgrade the software on the primary Farm Metric Server, see Chapter 2, "Installing Resource Manager" for details.

Note, this situation can arise only when there are mixed releases of the summary database software within a farm.

The meaning of the status icons for the Run-time indicator (lower) are:


The Database Connection Server is currently updating the database without error.


A connection problem between the Database Connection Server and the DBMS that the summary database is on has occurred during a database update. Ensure the Database Connection Server user identification and password for the DBMS is correct. See Chapter 2, "Installing Resource Manager" for details. Use the Server Log for the Database Connection Server (click **View Server Log**) for further error information.


The summary database is off or a Database Connection Server is not configured. In this state, no MetaFrame XP Resource Manager servers are creating and storing summary data for inclusion in the database.


Automatic database updates have been temporarily stopped. This is known as *Sleep mode*. See Temporarily stopping database updates in the Resource Manager online Help for details.


The Database Connection Server is in an idle state between database updates.

See the Resource Manager online Help for:

- Instructions about how to interpret the summary database status icons
- Additional information about each dialog box or tab

Q: Are there any things I should consider if I want to change my summary database DBMS between Oracle and Microsoft SQL Server?

No, unless you want to use the same Database Connection Server to access the new DBMS. If you do, you need to stop and restart the IMA service on the Database Connection Server when you change the system DSN to use the new DBMS.

Database Connection Server

Q: How do I find out which server is currently acting as the Database Connection Server?

To identify the Database Connection Server

1. On any Resource Manager server, start the Citrix Management Console.
2. In the left pane of the Citrix Management Console, click **Resource Manager**.
3. In the right pane, click the **Summary Database** tab. The current Database Connection Server is shown.

See the Resource Manager online Help for instructions about how to change the Database Connection Server.

Q: My Database Connection Server is not updating the summary database. Why?

If your Database Connection Server cannot connect to the summary database DBMS, it cannot update it with the current summary data. Your summary data is not lost; it is stored locally until the problem is rectified. The following sections describe how to recognize and fix these problems.

If your Database Connection Server cannot communicate with the summary database during a database update, in the **Summary Database** tab, under **Status**, the lower indicator changes to  .

Note Data that is delayed in reaching the summary database due to Database Connection Server problems is subject to purge settings once in the external database. For example, if you cannot update the summary database for a week and some of your stored data is set to be purged after five days, when the problems are rectified and the data is stored in the summary database, it is purged at the next purge time because it is already five days old.

- **To fix user identification/password conflict**

  Make sure the user identification password for the Database Connection Server is correct. See "Setting a System Data Source Name" on page 23 for details.

  If the connection problem is still there, the Database Connection Server may have failed. This is also indicated by a "Server Down" status icon in the Resource Manager Watcher window. More information about the fault is available from that server's Resource Manager server log.

- **To view a Resource Manager server log**

  1. In the left pane of the Citrix Management Console, click **Resource Manager**.
  2. In the right pane, click the **Summary Database** tab.
  3. Click **View Server Log**.

Managing the Resource Manager Summary Database

Q: My summary database is using its available hard disk space too quickly. What can I do to slow it down?

Use the following sections to help you manage how much hard disk space your summary database will require over a period of time. The size of your summary database, as it grows over time, depends on the following basic factors:

- The number of servers in the farm
- The average number of processes run on a server each day

- The number of Resource Manager metrics you are storing in the database
- The average number of server events for a server each day
- The length of time the database records are kept
- The DBMS summary database transaction log

  Resource Manager does not automatically purge the DBMS summary database transaction log. The transaction log maintains a history of the data transactions for the summary database. You need to configure how the DBMS controls the transaction log to restrict its growth. See your DBMS documentation for details.

Various categories of data written to the database for the server or farm. These are:

- Process information
- Server metrics
- Session information
- Application metrics
- Server events (server-down/server-up)

Q: How can I estimate the growth of my summary database?

You can use the following equations to formulate an idea of how much information will be stored in the summary database per day. Note that these estimates are very approximate and each server or farm may vary considerably from the example. The following schedule of data is for a Resource Manager farm of 100 servers under typical loads.

Process information

- Estimate @ 600 sessions per day (with 6 processes per session)
- Estimate @ 140 bytes per row in process database table

Estimated total is 600 x 140 = 84,000 bytes per server per day

Server metrics

- Estimate @ 15 metrics per server (summarized at hourly intervals)
- Estimate @ 100 bytes per row in metrics database table

Estimated total is 15 x 100 x 24 = 36,000 bytes per server per day

Session information

- Estimate @ 100 sessions per server per day
- Estimate @ 100 bytes per row in session database table

Estimated total is 100 x 100 = 10,000 bytes per server per day

Sub Total is 84,000 + 36,000 + 10,000 = 130,000 bytes per server per day.

Application metrics

- Estimate @ 20 application metrics per server (summarized at hourly intervals)
- Estimate @ 100 bytes per row in application metric database table

Estimated total is 20 x 100 x 24 = 48,000 bytes for the farm per day (for a 100 server farm)

Server events

- Estimate @ 1% of farm servers restarted per day
- Estimate @ 20 bytes per row in event log database table

Estimated total is 1 x 20 = 20 bytes for the farm per day (for a 100 server farm)

Sub Total is 24,000 + 20 = 24,020 bytes for the farm per day (for a 100 server farm)

GRAND TOTAL is (84,000 + 36,000 + 10,000) x 100 + 24,020 = 13.02 MB of summarized information stored in the database per day on a 100 Resource Manager server farm.

Q: How can I manage summary database growth?

As described above for a typical farm, summary data stored in your database can be quite substantial. Without managing your external database appropriately, it can grow until all available storage space is used.

It is up to you to monitor the rate at which your database is growing. Do this by regularly checking how much disk space is available. You can then use this information to help you set metrics and purge schedules for your database to limit growth rates.

Some things you might want to do when using a summary database are to:

- Regularly check the available disk space on the database host computer so you can work out an average for the amount of information being stored each day.

  Tip You can configure your summary database DBMS to constrain database size.

- Regularly create reports on the information you have stored and analyze what metrics are appropriate for long term storage and historical reporting for your system.

  If you find you are keeping metrics in the database unnecessarily, remove them from the list being stored.

- Work out how often you need to check on resource usage for each metric.

  You can create reports on these items on a regular basis and set up a purging schedule to remove them from the database after you create the reports. The more regular your reporting, the sooner you can purge the database of the information.

Summary Reports

Q: I generated a Resource Manager Summary report and the information I expected to find was not there. Where is it?

When you create Summary reports, all information for the report is derived from records stored in the summary database. If you encounter problems with your summary reports, these may be due to the following reasons:

- The Resource Manager metric you want to report on is not set to be stored in the summary database.

  Check that the metric in question is set to be stored in the external database for the relevant server. See "Selecting Server and Application Metrics to Record in the Database" on page 57 for details about selecting metrics to be summarized and stored in the external database.

- The report was created during the 24 hour period between database updates.

  If you create several reports for the same information between the 24 hourly automatic database update times, the information in the reports will not change. If you need information on a server for periods between database updates use Resource Manager Current reports. See Chapter 4, "Reporting and Analyzing Information" for details.

- The report was created after the information was purged from the summary database.

  You must create reports on information before it is purged from the summary database. Check whether your purging schedule gives you time to create appropriate reports. See "Removing Unwanted Information From the Database" on page 59 for details about database purging schedules.

- The name of a contributing Resource Manager server is changed.

  Each server in the farm is identified to the summary database by the server's network identification computer name. If you change a server's name, existing records referencing the old name remain in the database until purged while new records for the new server name are applied.

Note If you change a server's name from *x* to *y*, and rename another server in the farm from *z* to *x*, new reports for server *x* are collated from data from both new server *x* and old server *x*.

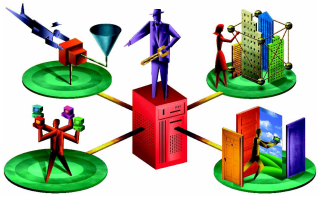
Looking for Help information

Q: I cannot find any Resource Manager terms in the Citrix Management Console Help index. Where are they?

The different components of MetaFrame XPe ship with their own JavaHelp .jar files. Because of this, when you use the Citrix Management Console Help index, you will see various alphabetical lists: one for the Citrix Management Console itself, one for Load Manager and others for additional components that you installed; for example, Resource Manager or Installation Manager. This is a JavaHelp limitation. When looking for terms in the index, make sure that you scroll down to the list for the appropriate component.

APPENDIX A

Default Metric Set



Overview

This appendix describes the default set of metrics that are monitored by Resource Manager for Microsoft Windows 2000 Server operating systems.

When you first install, Resource Manager picks a set of default metrics and settings for your server type. These settings give a good overview of the system, and mean that you can start monitoring immediately without needing to customize the settings. As you get more used to the normal ranges of your system usage, you may want to customize the settings or add different metrics.

The main factors of each server that Resource Manager is monitoring are:

- Network cards or interfaces
- Processor
- Disks
- Page files
- Session usage
- Memory

Default Set of Metrics for Microsoft Windows 2000 Server

Datastore Connection Failure

Minutes

The number of minutes since the server last successfully connected to the data store, informing you if communications between a MetaFrame server and the IMA data store fails. This could be because:

- The IMA data store DBMS system is down. This could be due to failure, or for maintenance.
- The network connection to the server with the IMA data store is down.
- The server with the IMA data store is down.

Logical Disk

Important Resource Manager Logical Disk metrics require that Windows Logical Disk counters are enabled. You can determine whether or not they are enabled by running the "diskperf" utility at the command line. For more information on the Logical Disk performance counters, run the "diskperf /?" command.

% Disk Time

Gives an indication as to how busy the disks are. The disk can become a bottleneck for a number of reasons:

- The server has too little physical memory so is "thrashing." If thrashing is occurring, the pages/sec will also be high.
- A single user is running an application or process, which makes extensive and rapid use of the disk. You can investigate such a user by running Current Process and Current User reports.
- Many users are performing large amounts of disk activity. The speed of the disks may be the server's bottleneck.

The metric % Disk Time is calculated using a number of factors and values above 100% are possible. If you see values of 100% disk time, the disk is in constant use. Values greater than 100% may indicate that the disk is too slow for the number of requests.

% Free Space

The server is running out of disk space. This can be for a number of reasons:

- A lack of remaining disk space after installing the Operating System and applications
- A large number of users have logged on (now or in the past) and their configuration data, settings, and files are taking up too much space
- A rogue process or user is consuming a large amount of disk space

Memory

Available Bytes

Informs you if too much memory is being used. This could be because:

- Too many users are logged on.
- The applications users are running are too memory hungry for the amount of memory available on the server.
- Some user or process is using a large amount of memory. Running a Current Process report may help you track this down.

Being short on memory could result in “thrashing.” The disk usage and paging metrics may also change to a red alarm state.

Pages/sec

A large amount of paging indicates either:

- The system is low on physical memory and the disk is being used extensively as virtual memory. This can be caused by too many users being logged on, too many processes running, or a rogue process “stealing” virtual memory.
- An active process or processes are making large and frequent memory accesses.

Too much paging degrades the performance of the server for all users logged on. The Available Bytes, Disk and % Processor Time metrics may also enter warning or danger states when a large amount of paging occurs. Short bursts of heavy paging are normal, but long periods of heavy paging seriously affect server performance.

Network Interface

Bytes Total/sec

Gives a good indication of how much network activity this server is generating/ receiving. If this metric changes to yellow or red, the server is experiencing unusually high network activity and may cause a network saturation. If too many users are remotely logged on for the network card to support, this metric may change to a warning or danger state. In this situation, the bottleneck could be the network or server's network card, which may decrease performance of users' sessions.

Paging File

% Usage

A high page file usage usually indicates that the server's page file size should be extended. If the Memory: Pages/sec metric is also high, it is a good idea to add more physical memory.

Processor

% Interrupt Time

The processor is spending a large amount of time responding to input and output rather than user processing. A large value for interrupt time usually indicates a hardware problem or a very busy server.

% Processor Time

A high processor time for a long period of time indicates that the processor(s) is the bottleneck of the server, too many users are logged on, or there is a rogue user or process (use the Current Process report to investigate).

System

Context Switches/sec

A large number of threads and/or processes are competing for processor time.

Terminal Services

Active Sessions

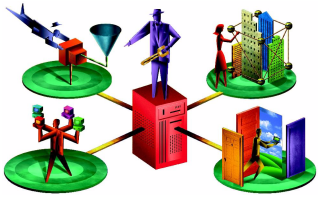
A large number of users are logged on and running applications. The server may begin running out of memory or processor time and performance for users may deteriorate. Note that current Citrix Management Console sessions are listed as “active.”

Inactive Sessions

There is a large number of disconnected sessions, which are taking up virtual memory. Remove some disconnected sessions or reduce the length of time for which disconnected sessions can persist until they are automatically destroyed.

APPENDIX B

Summary Database Schema



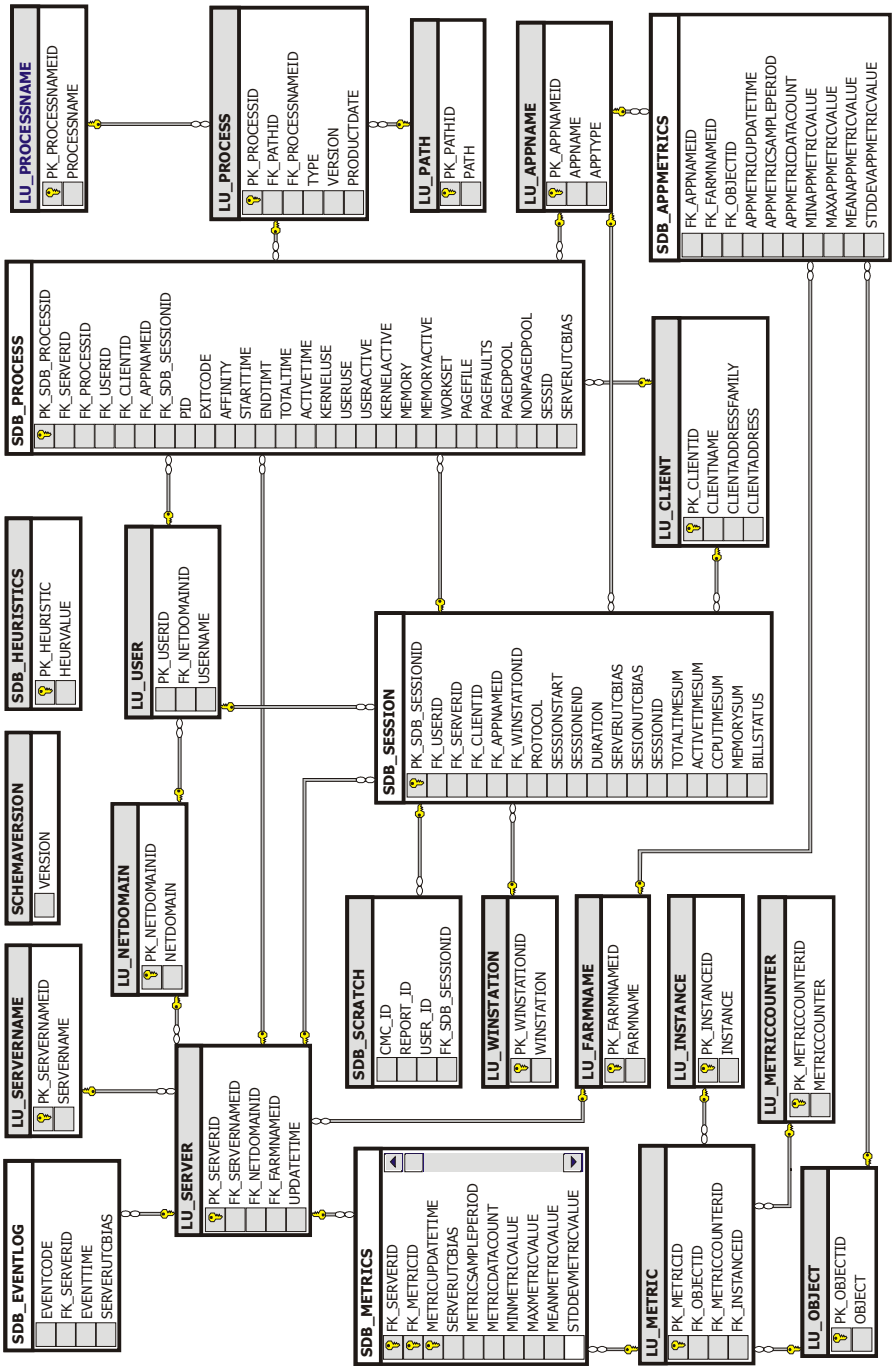
Overview

This appendix describes the layout and organization of the Resource Manager summary database *schema*. The summary database is a data warehouse made up of historical data imported from each Resource Manager server in the farm. The database schema of the local database is de-normalized, whereas the data stored in the summary database is extensively normalized to save storage space. It includes:

- A diagram of database entity relationships
- Descriptions of each database entity table

Database Entity Relationship Diagram

The following diagram shows all the tables in the schema and the links required to retrieve data. The main tables are named *SDB_xxx* and have a white background to their title bar. Supporting (or look up) tables have a gray background to their title bar and are (mostly) named *LU_xxx*. Some supporting tables are used more than once. This reduces the space required to store the data.


LU_PROCESSNAME
PK_PROCESSNAMEID
PROCESSNAME
LU_PROCESS
PK_PROCESSID
FK_PATHID
FK_PROCESSNAMEID
TYPE
VERSION
PRODUCTDATE
LU_PATH
PK_PATHID
PATH
LU_APPNAME
PK_APPNAMEID
APPNAME
APPTYPE
SDB_APPMETRICS
FK_APPNAMEID
FK_FARMNAMEID
FK_OBJECTID
APPMETRICUPDATETIME
APPMETRICSAMPLEPERIOD
APPMETRICDATACOUNT
MINAPPMETRICVALUE
MAXAPPMETRICVALUE
MEANAPPMETRICVALUE
STDDEVAPPMETRICVALUE
SDB_PROCESS
PK_SDB_PROCESSID
FK_SERVERID
FK_PROCESSID
FK_USERID
FK_CLIENTID
FK_APPNAMEID
FK_SDB_SESSIONID
PID
EXITCODE
AFFINITY
STARTTIME
ENDTIMT
TOTALTIME
ACTIVETIME
KERNELUSE
USERUSE
USERACTIVE
KERNELACTIVE
MEMORY
MEMORYACTIVE
WORKSET
PAGEFILE
PAGEFAULTS
PAGEDPOOL
NONPAGEDPOOL
SESSID
SERVERUTCBIAS
LU_CLIENT
PK_CLIENTID
CLIENTNAME
CLIENTADDRESSFAMILY
CLIENTADDRESS
SDB_HEURISTICS
PK_HEURISTIC
HEURVALUE
LU_USER
PK_USERID
FK_NETDOMAINID
USERNAME
SDB_SESSION
PK_SDB_SESSIONID
FK_USERID
FK_SERVERID
FK_CLIENTID
FK_APPNAMEID
FK_WINSTATIONID
PROTOCOL
SESSIONSTART
SESSIONEND
DURATION
SERVERUTCBIAS
SESIONUTCBIAS
SESSIONID
TOTALTIMESUM
ACTIVETIMESUM
CCPUTIMESUM
MEMORYSUM
BILLSTATUS
SCHEMAVERSION
VERSION
LU_NETDOMAIN
PK_NETDOMAINID
NETDOMAIN
SDB_SCRATCH
CMC_ID
REPORT_ID
USER_ID
FK_SDB_SESSIONID
LU_WINSTATION
PK_WINSTATIONID
WINSTATION
LU_FARMNAME
PK_FARMNAMEID
FARMNAME
LU_INSTANCE
PK_INSTANCEID
INSTANCE
LU_METRICCOUNTER
PK_METRICCOUNTERID
METRICCOUNTER
LU_SERVERNAME
PK_SERVERNAMEID
SERVERNAME
LU_SERVER
PK_SERVERID
FK_SERVERNAMEID
FK_NETDOMAINID
FK_FARMNAMEID
UPDATETIME
SDB_EVENTLOG
EVENTCODE
FK_SERVERID
EVENTTIME
SERVERUTCBIAS
SDB_METRICS
FK_SERVERID
FK_METRICID
METRICUPDATETIME
SERVERUTCBIAS
METRICSAMPLEPERIOD
METRICDATACOUNT
MINMETRICVALUE
MAXMETRICVALUE
MEANMETRICVALUE
STDDEVMETRICVALUE
LU_METRIC
PK_METRICID
FK_OBJECTID
FK_METRICCOUNTERID
FK_INSTANCEID
LU_OBJECT
PK_OBJECTID
OBJECT

Database Entity Table Descriptions

The following data types are all described using Microsoft SQL Server data types. For type mappings to other SQL databases, see the type mapping section at the end of this Appendix.

Application Metrics

SDB_APPMETRICS

This table stores a summary of all application metrics in a server farm.

SDB_APPMETRICS			
FK_APPNAMEID	int	NOT NULL	Pointer to LU_APPNAME, application name and type
FK_FARMNAMEID	int	NOT NULL	Pointer to LU_FARMNAME, farm name
FK_OBJECTID	int	NOT NULL	Pointer to LU_OBJECT, object name
APPMETRICUPDATETIME	datetime	NOT NULL	Timestamp of last application metric data point in dataset (stored in UTC)
APPMETRICSAMPLEPERIOD	int	NOT NULL	Sample period of summary record in seconds
APPMETRICDATACOUNT	int	NOT NULL	Number of data points used to summarize this row
MINAPPMETRICVALUE	float	NOT NULL	Minimum application metric value
MAXAPPMETRICVALUE	float	NOT NULL	Maximum application metric value
MEANAPPMETRICVALUE	float	NOT NULL	Mean application metric value
STDDEVAPPMETRICVALUE	float	NOT NULL	Standard deviation of application metric values

Foreign Key(s)

- FK_APPNAMEID
- FK_FARMNAMEID
- FK_OBJECTID

Unique

- FK_APPNAMEID, FK_FARMNAMEID, FK_OBJECTID, APPMETRICUPDATETIME

Support Tables Referenced

- LU_APPNAME
- LU_FARMNAME
- LU_OBJECT

Event Log

SDB_EVENTLOG

This table stores generic IMA service up and IMA service down events that occur on a server farm.

SDB_EVENTLOG

EVENTCODE	int	NOT NULL	Generic event ID. SERVER_DOWN = 0, SERVER_UP = 1
FK_SERVERID	int	NOT NULL	Pointer to LU_SERVER, Resource Manager server name
EVENTTIME	datetime	NOT NULL	Timestamp of event occurrence (Date and Time)
SERVERUTCBIAS	int	NOT NULL	Bias in minutes to be subtracted from EVENTTIME to find the event time in the server's local time zone

Foreign Key(s)

- FK_SERVERID

Support Tables Referenced

- LU_SERVER

Unique

- EVENTCODE, FK_SERVERID, EVENTTIME

Administrator Configurable Server Metrics

SDB_METRICS

This table stores all metrics imported from each Resource Manager server in the server farm. The metric values are summarized to reduce data storage requirements.

SDB_METRICS

FK_SERVERID	int	NOT NULL	Pointer to LU_SERVER, Resource Manager server name
FK_METRICID	int	NOT NULL	Pointer to LU_METRIC, metric description
METRICUPDATETIME	datetime	NOT NULL	Timestamp of last metric data point in dataset (stored in UTC)
SERVERUTCBIAS	int	NOT NULL	Bias in minutes to be subtracted from EVENTTIME to find the event time in the server's local time zone
METRICSAMPLEPERIOD	int	NOT NULL	Sample period of summary record in seconds
METRICDATACOUNT	int	NOT NULL	Number of data points used to summarize this row
MINMETRICVALUE	float	NOT NULL	Minimum metric value
MAXMETRICVALUE	float	NOT NULL	Maximum metric value
MEANMETRICVALUE	float	NOT NULL	Mean metric value
STDDEVMETRICVALUE	float	NOT NULL	Standard deviation of metric values

Primary Key (Unique)

- FK_SERVERID, FK_METRICID, METRICUPDATETIME

Foreign Key(s)

- FK_METRICID
- FK_SERVERID

Support Tables Referenced

- LU_METRIC
- LU_SERVER

Processes

SDB_PROCESS

This table stores process data per user.

SDB_PROCESS

PK_SDB_PROCESSID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_SERVERID	int	NOT NULL	Pointer to LU_SERVER, Resource Manager server name
FK_PROCESSID	int	NOT NULL	Pointer to LU_PROCESS
FK_USERID	int	NOT NULL	Pointer to LU_USER, user name
FK_CLIENTID	int	NOT NULL	Pointer to LU_CLIENT, client name
FK_APPNAMEID	int	NOT NULL	Pointer to LU_APPNAME, application name and type
FK_SDB_SESSIONID	int	NOT NULL	Pointer to SDB_SESSION, session data
PID	int	NOT NULL	Process identifier (from operating system)
EXITCODE	int	NOT NULL	The exit code returned by the executable when it completes. 259 means “Still executing”
AFFINITY	int	NOT NULL	A mask indicating which processor(s) the process can use to execute itself
STARTTIME	datetime	NOT NULL	Time the process started executing
ENDTIME	datetime	NULL	Time the process completed execution - or the time the process statistics were last updated when EXITCODE = 259
TOTALTIME	float	NOT NULL	End time - Start time (in milliseconds)
ACTIVETIME	float	NOT NULL	A summation of all monitored periods of a process where the CPU time was greater than 1%
KERNELUSE	float	NOT NULL	The percentage of kernel CPU time the process has used during its lifetime
USERUSE	float	NOT NULL	The percentage of user CPU time the process has used during its lifetime
USERACTIVE	float	NOT NULL	The percentage of user CPU that was being used during the ACTIVETIME
KERNELACTIVE	float	NOT NULL	The percentage of kernel CPU that was being used during the ACTIVETIME
MEMORY	float	NOT NULL	Sum of the average number of megabytes per minute used by the process during its lifetime
MEMORYACTIVE	float	NOT NULL	The number of megabytes per minute used by the process during the ACTIVETIME
WORKSET	int	NOT NULL	The peak recorded working set of the processes at any point during its lifetime

SDB_PROCESS

PAGEFILE	int	NOT NULL	The peak page file allocated to process in bytes at any point in its lifetime
PAGEFAULTS	int	NOT NULL	The number of page faults that occurred
PAGEDPOOL	int	NOT NULL	The peak paged pool usage in bytes at any point in its lifetime
NONPAGEDPOOL	int	NOT NULL	The peak non-paged pool usage in bytes at any point in its lifetime
SESSID	int	NOT NULL	Matches the SESSIONID value in the SESSION table
SERVERUTCBIAS	int	NOT NULL	Bias, in minutes, to be subtracted from EVENTTIME to find the event time in the server's local time zone

Primary Key (Unique)

- PK_SDB_PROCESSID

Foreign Key(s)

- FK_APPNAMEID
- FK_CLIENTID
- FK_PROCESSID
- FK_SERVERID
- FK_USERID
- FK_SDB_SESSIONID

Other Indexed Columns

- FK_SERVERID, STARTTIME, PID

Unique

- FK_SERVERID, STARTTIME, PID

Support Tables Referenced

- LU_APPNAME
- LU_CLIENT
- LU_PROCESS
- LU_SERVER
- LU_USER
- SDB_SESSION

User Information

SDB_SESSION

This table stores session data per user.

SDB_SESSION

PK_SDB_SESSIONID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_USERID	int	NOT NULL	Pointer to LU_USER, user name
FK_SERVERID	int	NOT NULL	Pointer to LU_SERVER, Resource Manager server name
FK_CLIENTID	int	NOT NULL	Pointer to LU_CLIENT, client name
FK_APPNAMEID	int	NOT NULL	Pointer to LU_APPNAME, application name and type
FK_WINSTATIONID	int	NULL	Pointer to LU_WINSTATION, name of the WinStation the session is connected through
PROTOCOL	int	NULL	
SESSIONSTART	datetime	NOT NULL	Start time of the first process run under the user's session (stored in UTC)
SESSIONEND	datetime	NULL	End time of the final process to end as part of the session (stored in UTC)
DURATION	float	NULL	End time - Start time in milliseconds
SERVERUTCBIAS	int	NOT NULL	Bias in minutes to be subtracted from EVENTTIME to find the event time in the server's local time zone
SESSIONUTCBIAS	int	NOT NULL	Bias in minutes to be subtracted from SESSIONSTART in which to find the session start-time
SESSIONID	int	NOT NULL	A Session ID (generated by operating system)
TOTALTIMESUM	float	NOT NULL	Sum of the total time for all completed processes
ACTIVETIMESUM	float	NOT NULL	Sum of the active time for all completed processes
CPUTIMESUM	float	NOT NULL	Sum of the CPU time for all completed processes
MEMORYSUM	float	NOT NULL	Sum of the memory usage for all completed processes
BILLSTATUS	int	NOT NULL	0 = This session is not billed

Primary Key (Unique)

- PK_SDB_SESSIONID

Foreign Key(s)

- FK_APPNAMEID
- FK_CLIENTID
- FK_SERVERID

- FK_USERID
- FK_WINSTATIONID

Other Indexed Columns

- STARTTIME, ENDTIME

Unique

- FK_SERVERID, SESSIONSTART, SESSIONID

Support Tables Referenced

- LU_APPNAME
- LU_CLIENT
- LU_SERVER
- LU_USER
- LU_WINSTATION

Version Control

SCHEMAVERSION

This table stores the version of the summary database schema. The version number is queried on connection by the Database Connection Server to determine if it and summary database schema are compatible.

SCHEMAVERSION

VERSION	int	NOT NULL	Version number of database schema

Support and Look Up Tables

LU_APPNAME

Look up table of published application names.

LU_APPNAME

PK_APPNAMEID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
APPNAME	nvarchar (256)	NOT NULL	Application name
APPTYPE	int	NOT NULL	Application type: 0 = MetaFrame published application, 1 Resource Manager application

Primary Key (Unique)

- PK_APPNAMEID

Unique

- APPNAME, APPTYPE

LU_CLIENT

Lookup table of client names.

LU_CLIENT

PK_CLIENTID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
CLIENTNAME	nvarchar (32)	NOT NULL	Client name
CLIENTADDRESSFAMILY	int	NOT NULL	Client address family: 2 = AF_INET, 6 = AF_IPX
CLIENTADDRESS	nvarchar (20)	NOT NULL	Client address

Primary Key (Unique)

- PK_CLIENTID

Unique

- CLIENTNAME, CLIENTADDRESSFAMILY, CLIENTADDRESS

LU_FARMNAME

Look up table for farm names. It is a support table for LU_SERVER.

LU_FARMNAME

PK_FARMNAMEID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FARMNAME	nvarchar (255)	NOT NULL	Farm name

Primary Key (Unique)

- PK_FARMNAMEID

Unique

- FARMNAME

LU_INSTANCE

Lookup table of instances; for example, “C:\.”

LU_INSTANCE

PK_INSTANCEID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
INSTANCE	nvarchar (128)	NULL	Instance name

Primary Key (Unique)

- PK_INSTANCEID

Unique

- INSTANCE

LU_METRIC

Look up table of metric definitions. This table stores look up keys for objects, metric counters, and instances.

LU_METRIC

PK_METRICID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_OBJECTID	int	NOT NULL	Pointer to LU_OBJECT, object name
FK_METRICCOUNTERID	int	NOT NULL	Pointer to LU_METRICCOUNTER, metric counter name
FK_INSTANCEID	int	NOT NULL	Pointer to LU_INSTANCE, instance name

Primary Key (Unique)

- PK_METRICID

Foreign Key(s)

- FK_INSTANCEID
- FK_METRICCOUNTERID
- FK_OBJECTID

Unique

- PK_OBJECTID, FK_METRICCOUNTERID, FK_INSTANCEID

Support Table Referenced

- LU_INSTANCE
- LU_METRICCOUNTER
- LU_OBJECT

LU_METRICCOUNTER

Look up table of metric counters; for example, "% Disk time."

LU_METRICCOUNTER

PK_METRICCOUNTERID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
METRICCOUNTER	nvarchar (128)	NOT NULL	Metric counter name

Primary Key (Unique)

- PK_METRICCOUNTERID

Unique

- METRICCOUNTER

LU_NETDOMAIN

Look up table for Network Domain names. It is a support table for LU_SERVER and LU_USER.

LU_NETDOMAIN

PK_NETDOMAINID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
NETDOMAIN	nvarchar (32)	NOT NULL	Network domain name

Primary Key (Unique)

- PK_NETDOMAINID

Unique

- NETDOMAIN

LU_OBJECT

Look up table of objects; for example, "Logical Disk."

LU_OBJECT

PK_OBJECTID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
OBJECT	nvarchar (128)	NOT NULL	Object name

Primary Key (Unique)

- PK_OBJECTID

Unique

- OBJECT

LU_PATH

Look up table of Application paths. This is a support table for LU_PROCESS.

LU_PATH

PK_PATHID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
PATH	nvarchar (260)	NOT NULL	Path

Primary Key (Unique)

- PK_PATHID

Unique

- PATH

LU_PROCESS

Look up table of process details.

LU_PROCESS

PK_PROCESSID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_PATHID	int	NOT NULL	Pointer to LU_PATH, path name
FK_PROCESSNAMEID	int	NOT NULL	Pointer to LU_PROCESSNAME, executable name of the file associated with the process
TYPE	int	NOT NULL	Type of the executable. Win32, POSIX etc. -1 indexed, where -1 = system process, 0 means Win32 application
VERSION	nvarchar (24)	NOT NULL	Hexadecimal version number of executable
PRODUCTDATE	datetime	NOT NULL	Timestamp of executable (by originators)

Primary Key (Unique)

- PK_PROCESSID

Foreign Key(s)

- FK_PATHID
- FK_PROCESSNAMEID

Unique

- FK_PATHID, FK_PROCESSNAMEID, TYPE, VERSION, PRODUCTDATE

Support Tables Referenced

- LU_PATH
- LU_PROCESSNAME

LU_PROCESSNAME

Look up table of process names. This is a support table for LU_PROCESS.

LU_PROCESSNAME

PK_PROCESSNAMEID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
PROCESSNAME	nvarchar (255)	NOT NULL	Executable name of the file associated with the process

Primary Key (Unique)

- PK_PROCESSNAMEID

Unique

- PROCESSNAME

LU_SERVER

Look up table for Resource Manager server instances.

LU_SERVER

PK_SERVERID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_SERVERNAMEID	int	NOT NULL	Pointer to LU_SERVERNAME, Resource Manager server name
FK_NETDOMAINID	int	NOT NULL	Pointer to LU_NETDOMAIN, network domain name
FK_FARMNAMEID	int	NOT NULL	Pointer to LU_FARMNAME, farm name
UPDATETIME	datetime	NOT NULL	The last time summary data was written to the summary database for this particular server

Primary Key (Unique)

- PK_SERVERID

Foreign Key(s)

- FK_FARMNAMEID
- FK_NETDOMAINID
- FK_SERVERNAMEID

Unique

- FK_SERVERNAMEID, FK_NETDOMAINID, FK_FARMNAMEID

Support Tables Referenced

- LU_FARMNAME
- LU_NETDOMAIN
- LU_SERVERNAME

LU_SERVERNAME

Look up table for Resource Manager server names. It is a support table for LU_SERVER.

LU_SERVERNAME

PK_SERVERNAMEID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
SERVERNAME	nvarchar (32)	NOT NULL	server name

Primary Key (Unique)

- PK_SERVERNAMEID

Unique

- SERVERNAME

LU_USER

Look up table of user instances.

LU_USER

PK_USERID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
FK_NETDOMAINID	int	NOT NULL	Pointer to LU_NETDOMAIN, network domain name
USERNAME	nvarchar (32)	NOT NULL	User name

Primary Key (Unique)

- PK_USERID

Foreign Key(s)

- FK_NETDOMAINID

Unique

- FK_NETDOMAINID, USERNAME

Support Tables Referenced

- LU_NETDOMAIN

LU_WINSTATION

Look up table for WinStation names.

LU_WINSTATION

PK_WINSTATIONID	int	NOT NULL	Unique identifier for referential integrity (Primary Key)
WINSTATION	nvarchar (32)	NOT NULL	Name of the WinStation through which the session is connnected

Primary Key (Unique)

- PK_WINSTATIONID

Unique

- WINSTATION

SDB_SCRATCH

A cross-reference table used to identify session records contained in Billing reports so that the sessions can be updated to show they were billed.

SDB_SCRATCH

CMC_ID	int	NOT NULL	Identifies the Citrix Management Console that generated the report
REPORT_ID	intint	NOT NULL	Identifies the report in question
USER_ID		NOT NULL	Identifies a user within the report
FK_SDB_SESIONID	int	NOT NULL	Pointer to SDB_SESSION, the session

Primary Key (Unique)

- None

Foreign Key(s)

- FK_SDB_SESSIONID

Unique

- FK_SDB_SESSIONID

SDB_HEURISTICS

This table holds miscellaneous data used by Resource Manager.

SDB_HEURISTICS

PK_HEURISTIC	nvarchar (64)	NOT NULL	Name of heuristic
HEURVALUE	float	NOT NULL	Value of heuristic

String Length Table

This table lists the maximum string lengths available.

String	Length	Justification/Reference
LU_SERVERNAME\SERVERNAME	32	CNLEN=15 in LMCONS.H (NT Header), padded to RM1 size
LU_NETDOMAIN\NET\NETDOMAIN	32	DNLEN=15 in LMCONS.H (NT Header), padded to RM1 size
LU_FARMNAME\FARMNAME	256	MAXLEN_FARMNAME=255 in Cconfig.H (MF header)
LU_OBJECT\OBJECT	128	Taken from Monitor Subsystem
LU_METRICCOUNTER\METRICCOUNTER	128	Taken from Monitor Subsystem
LU_INSTANCE\INSTANCE	128	Taken from Monitor Subsystem
LU_APPNAME\APPNAME	39	PNDATA_BROWSERNAME_LENGTH in imacommonapplicationdefs.h (MF)
LU_USER\USERNAME	32	UNLEN=15 in LMCONS.H (NT Header), padded to RM1 size
LU_CLIENT\CLIENTNAME	32	CNLEN=15 in LMCONS.H (NT Header), padded to RM1 size
LU_CLIENT\CLIENTADDRESS	20	ADDRESS size = 20 in Wtsapi32.h (NT Header)
LU_WINSTATION\WINSTATION	32	WINSTATIONNAME_LENGTH=32 in CTXDEF.H (MF header)
LU_PATH\PATH	260	MAX_PATH in WINDEF.H (NT header)
LU_PROCESSNAME\PROCESSNAME	255	MAX_PATH in WINDEF.H (NT header)

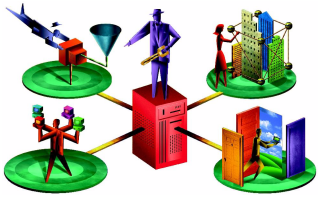
SQL Data Type Mapping

Column data types vary between different SQL databases. A list of all data types used in the summary database for all supported SQL databases follows:

Description	Microsoft SQL Server	Oracle
Integer numbers	int	int
Small integer numbers	tinyint	smallint
Floating point numbers	float	float
Date and time	datetime	date
National variable length strings (Unicode)	nvarchar	varchar2

APPENDIX C

Glossary



Citrix Management Console Citrix's tool for administering Citrix servers and management products.

CSV Comma separated values. A file format used as a portable representation of a database. Each line is one entry or record and the data fields in a record are separated by commas. Commas can be followed by spaces and/or tab characters that are ignored. If a field includes a comma, the whole field must be surrounded with double quotes.

database A file composed of records, each containing fields together with an instruction set for searching, sorting, and other functions.

Database Connection Server A Resource Manager server that writes data to, and reads data from, a summary database.

data store A data store that centralizes configuration information about published applications, users, printers, and servers. Each Citrix server farm has a single data store.

data source name A name used by a client to access a DBMS. In the case of Resource Manager, the client is the Database Connection Server.

DBMS Database management system. A software interface between the database and the user. A DBMS handles user requests for database actions with provision for data security and integrity requirements.

Farm Metric Server This server interprets farm-wide metrics and processes it as part of its summary data. Application count is an example of a farm-wide metric. You can also have a backup Farm Metric Server.

farm-wide Pertaining to all servers in a farm.

HTML Hypertext markup language. The markup language used for documents that are interpreted for display by Web browser software. HTML uses tags to mark elements, such as text and graphics, in a document to indicate how browsers will display these elements to the user.

Independent Management Architecture (IMA) Citrix's server-to-server infrastructure that provides robust, secure, and scalable tools for managing any size server farm. Among other features, IMA enables centralized platform-independent management, an ODBC-compliant data store, and a suite of management products that plug in to the Citrix Management Console.

license number An alphanumeric string displayed by Citrix Management Console when you enter a product serial number. You enter the license number on the Citrix Activation System Web page to receive an activation code for the MetaFrame XP server license.

MetaFrame Citrix's server-based computing solution that incorporates Citrix's Independent Computing Architecture (ICA) protocol.

metric One of a series of measurable items for a server or application. You can select which metrics you want to monitor for a particular server.

monitoring This occurs when Resource Manager is actively looking at the data on servers.

process An instance of a program that is being executed.

Resource Manager application An application that is not a MetaFrame published application but is still recognized by the Resource Manager system.

schema A description of a database to a DBMS in the language provided by the DBMS. A schema defines aspects of the database, such as attributes (fields) and attribute parameters.

purging To systematically eliminate old or unneeded information.

server farm A group of servers that are managed as a single unit, and that share some form of physical connection and a single data store.

server-specific Pertaining to an individual server.

status icon A colored signal in the status display that shows the status of each metric. When a status icon in the display changes, an alarm condition occurs.

summary data An averaged calculation of metrics information recorded on a Resource Manager server once each hour. Summarized data is stored by a DBMS for reporting purposes.

UTC Coordinated Universal Time. UTC is the same time as Greenwich Meridian Time (GMT), and is the reference time zone used for calculating world time zones.

Web browser A client application that enables a user to view HTML documents. Examples are Microsoft Internet Explorer and Netscape Navigator.

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