

iWay

iWay Resource Governor Administrator's and User's
Manual
Version 5 Release 2.0

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Preface

This manual describes how to administer Resource Governor. It provides instructions for configuring Resource Governor's usage monitoring facility and explains how to delete extraneous data from the Resource Governor Usage Monitoring and administrative databases. Features such as Rule Parameters, Build Rules, and the Custom Rule Builder are described in detail. The manual also provides a description of the various Resource Governor reports and how to access them.

How This Manual Is Organized

This manual includes the following chapters:

Chapter/Appendix		Contents
1	<i>What Is Resource Governor?</i>	Introduces Resource Governor and describes its ability to analyze site activity and contribute to performance analysis. Provides an introduction to Resource Governor's usage monitoring, rule parameters, rule building, and reporting features.
2	<i>Creating Custom Rules</i>	Explains how Resource Governor's Custom Rule Builder uses Production Rule Language (PRL) to customize rules that set limits on database queries.
3	<i>Resource Governor Administration</i>	Describes how to configure and administer Resource Governor, including usage monitoring, rule parameters, rule building, and deleting data.
4	<i>Resource Governor Reports</i>	Describes the different categories of Resource Governor reports, the individual reports within these categories, and the process for displaying reports.
A	<i>Usage Monitoring and Administrative Databases Field Descriptions</i>	Summarizes the fields in the Resource Governor Usage Monitoring and administrative (system) databases.

Documentation Conventions

Delete the items that do not apply to your manual and/or add special conventions that are unique to your manual.

The following conventions apply throughout this manual:

Convention	Description
THIS TYPEFACE or <i>this typeface</i>	Denotes syntax that you must enter exactly as shown.
<i>this typeface</i>	Represents a placeholder (or variable) in syntax for a value that you or the system must supply.
<u>underscore</u>	Indicates a default setting.
<i>this typeface</i>	Represents a placeholder (or variable) in a text paragraph, a cross-reference, or an important term. It may also indicate a button, menu item, or dialog box option you can click or select.
this typeface	Highlights a file name or command in a text paragraph that must be lowercase.
Key + Key	Indicates keys that you must press simultaneously.
{ }	Indicates two or three choices; type one of them, not the braces.
[]	Indicates a group of optional parameters. None are required, but you may select one of them. Type only the parameter in the brackets, not the brackets.
	Separates mutually exclusive choices in syntax. Type one of them, not the symbol.
...	Indicates that you can enter a parameter multiple times. Type only the parameter, not the ellipsis points (...).
. . .	Indicates that there are (or could be) intervening or additional commands.

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Customer Support

Do you have questions about Resource Governor, Resource Analyzer, or WebFOCUS?

Call Information Builders Customer Support Service (CSS) at (800) 736-6130 or (212) 736-6130. Customer Support Consultants are available Monday through Friday between 8:00 a.m. and 8:00 p.m. EST to address all your Resource Governor questions. Information Builders consultants can also give you general guidance regarding product capabilities and documentation. Please be ready to provide your six-digit site code (xxxx.xx) when you call.

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To learn about the full range of available support services, ask your Information Builders representative about InfoResponse Online, or call (800) 969-INFO.

Information You Should Have

To help our consultants answer your questions most effectively, be ready to provide the following information when you call:

- Your six-digit site code (xxxx.xx).
- Your iWay Software configuration:
 - The iWay Software version and release.
 - The communications protocol (for example, TCP/IP or LU6.2), including vendor and release.
- The stored procedure (preferably with line numbers) or SQL statements being used in server access.
- The database server release level.

User Feedback

- The database name and release level.
- The Master File and Access File.
- The exact nature of the problem:
 - Are the results or the format incorrect? Are the text or calculations missing or misplaced?
 - The error message and return code, if applicable.
 - Is this related to any other problem?
- Has the procedure or query ever worked in its present form? Has it been changed recently? How often does the problem occur?
- What release of the operating system are you using? Has it, your security system, communications protocol, or front-end software changed?
- Is this problem reproducible? If so, how?
- Have you tried to reproduce your problem in the simplest form possible? For example, if you are having problems joining two data sources, have you tried executing a query containing just the code to access the data source?
- Do you have a trace file?
- How is the problem affecting your business? Is it halting development or production? Do you just have questions about functionality or documentation?

User Feedback

In an effort to produce effective documentation, the Documentation Services staff welcomes any opinion you can offer regarding this manual. Please use the Reader Comments form at the end of this manual to relay suggestions for improving the publication or to alert us to corrections. You can also use the Documentation Feedback form on our Web site, <http://www.iwaysoftware.com>.

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CHAPTER 1

What Is Resource Governor?

Topics:

- Resource Governor Features
- Resource Governor Operations
- How Resource Governor Works
- Software Prerequisites
- Overview of the Microsoft Management Console

This manual describes the steps for administering Resource Governor. It provides instructions for configuring Resource Governor's usage monitoring facility and how to delete extraneous data from the Resource Governor Usage Monitoring and administrative databases. The following features are described in detail:

- Rule Parameters
- Build Rules
- Custom Rule Builder

This manual also describes the Resource Governor reports and how to access them.

While many companies have invested in system tools that manage and optimize transaction applications, no tools are available to Information Systems (IS) organizations to easily manage the growing volume and unpredictable nature of ad hoc data access—that is, until now. Resource Governor, together with its partner product, Resource Analyzer, has been developed by Information Builders' iWay Software specifically to help IS organizations analyze and control end-user data access, as well as provide site specific control options.

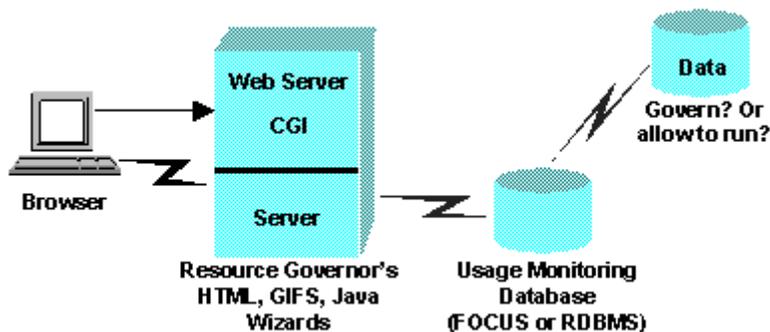
As the Web rapidly becomes the medium of choice to expedite information throughout the corporate enterprise, user and usage information becomes increasingly valuable. This new environment exposes systems to more access of more data by more users, placing increased stress on data warehouses, self-service applications, and corporate communications applications. Tuning applications for high performance, high availability, and fast response times becomes crucial.

Resource Governor's Usage Monitor facility gathers usage statistics about how data is accessed and used. An administrator defines site-specific thresholds controlling the amount of resources a request can use. Based on this usage and threshold information, Resource Governor builds rules about how to govern requests against specific data sources. The governing facility uses the rules when inspecting each request, stopping any request that is estimated to exceed the predetermined resource thresholds.

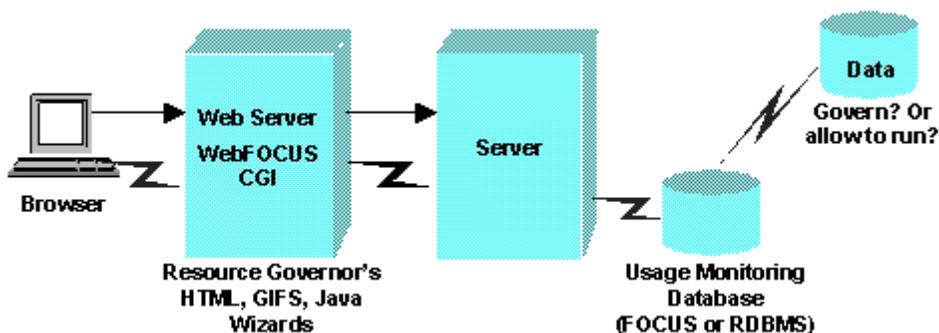
Resource Governor controls monitoring, system configuration parameters, and governing rules. It provides preemptive governing for requests issued to both relational and non-relational data sources.

You can use Resource Governor to monitor, govern, and report from multiple servers in a distributed data warehouse environment.

The following diagram illustrates Resource Governor as it resides in the server environment (Windows/NT/2000, UNIX, OS/390 Unix System Services, and OpenVMS, AS/400):



The following diagram illustrates Resource Governor as it resides in the server environment (OS/390 MVS and VM):



Resource Governor Features

To help you manage your site activity, Resource Governor controls data access by placing resource limits on requests. To establish this control, Resource Governor:

- Predicts resource usage, relative to the current threshold limits, before executing a request.
- Allows requests within acceptable usage limits to process.
- Prevents users from processing requests that are judged to exceed the specified limits.
- Governs data access based on site-specific criteria through custom rules and exceptions.

Resource Governor Operations

The following is a summary of the basic operations of Resource Governor and the steps you need to take to use them. A detailed explanation of each operation is provided later in this manual.

Operation	Description
Collect data about the system.	Turn on usage monitoring for your site. Resource Governor then records the requests and the data about resource usage.
Describe resource thresholds for various time periods.	Enter the relative resource thresholds to set limits on the amount of resources each request can use. Monitored resources include elapsed and CPU time, IOs, and the number of result rows returned to the client. These thresholds help determine which requests can run during a specific time period.
Create rules.	Use Resource Governor to create a rules file. Resource Governor then uses these rules to evaluate each request and predict whether the request operates within the thresholds specified.
Turn Governing on.	Put governing rules into effect for each data source governed.
Govern data source access.	Every time a request uses a monitored data source, Resource Governor predicts whether the request exceeds thresholds, based on the rules it has created. The only requests that are allowed to run are those estimated to use lower or equal amounts of threshold time, result rows, and IOs. Requests that are estimated to exceed the thresholds are cancelled.
Apply site-specific custom rules to add query limitations.	Customize governing to prevent or allow data access under specific conditions.

How Resource Governor Works

Resource Governor monitors request activity, logging the attributes of each request and storing them in a usage-monitoring database. Once an adequate amount of usage monitoring data has been collected, you can run Resource Governor's reports, which illustrate various aspects of request activity at your site. The process of choosing resource thresholds and building governing rules can then begin. Resource thresholds must be set before you can build automated or data rules. The rule parameters feature enables you to create shifts, which facilitate the application of date and time restrictions. Once those limits have been set, you can begin to build rules upon which data access will be governed.

At times, you may encounter certain conditions contained in requests that should never be allowed to run. In other cases, you may know that all queries should be allowed to run, such as those submitted by a user with greater privileges. On these occasions, you can create custom rules with the Custom Rule Builder to check for these kinds of conditions in order to generate cancellation messages, or allow beyond-threshold queries to run. When using custom rules only, the selection of resource thresholds is not required. All data source can be governed by data rules, custom rules, or both.

You can access Resource Governor's administrative and reporting features through the Resource Governor Administrator, a Microsoft Management Console (MMC) snap-in that you access from the iWay Data Management Console on a machine running Windows NT (Service Pack 4) or Windows 2000.

Software Prerequisites

Only site administrators should have access to configuring Resource Governor administrative settings. If you are an administrator for this product, you must have the iWay Connector installed on your PC. To use the Resource Governor Administrator, you must also install the iWay Data Management Console. For more information on the iWay Connector, see the *Connector Suite* manual.

Overview: Resource Governor Software Components

Resource Governor is comprised of different components. You must install and/or configure all these components before you can begin using the product.

- **Server.** A server must be installed and configured for Resource Governor. It is the server which houses the Resource Governor internal tables and processes the users data access requests. For more information, see the Server Installation and Configuration manuals for your appropriate platform. For more information on the basic operations of Resource Governor, see the *Server Administration* manual.

- **WebFOCUS.** If you are using Resource Governor to govern requests on an iWay server prior to release 5.2, or to govern requests on a VM or OS/390 MVS iWay server of any release level, in order to execute Resource Governor reports, you must install WebFOCUS and select the option for Resource Governor. This installs the CGI and the necessary components for executing Resource Governor reports. For more information, see the *WebFOCUS Installation* manual. If you are using Resource Governor with any other iWay server of release 5.2 and above, reporting is via the server's CGI and no additional installation is required.
- **Resource Analyzer and Resource Governor Web Application.** If you are using Resource Governor to govern requests on an iWay server prior to release 5.2, or to govern requests on a VM or OS/390 MVS iWay server of any release level, the Web Application is required to run Resource Governor reports. For more information, see the *Data Management Administration Tools Suite Installation Manual*.
- **Resource Governor Administrator.** In order to control Resource Governor administrative settings you must install the iWay Data Management Console. The Resource Governor Administrator is used to control monitoring and build rules for data sources. For more information, see Chapter 3, *Resource Governor Administration*.

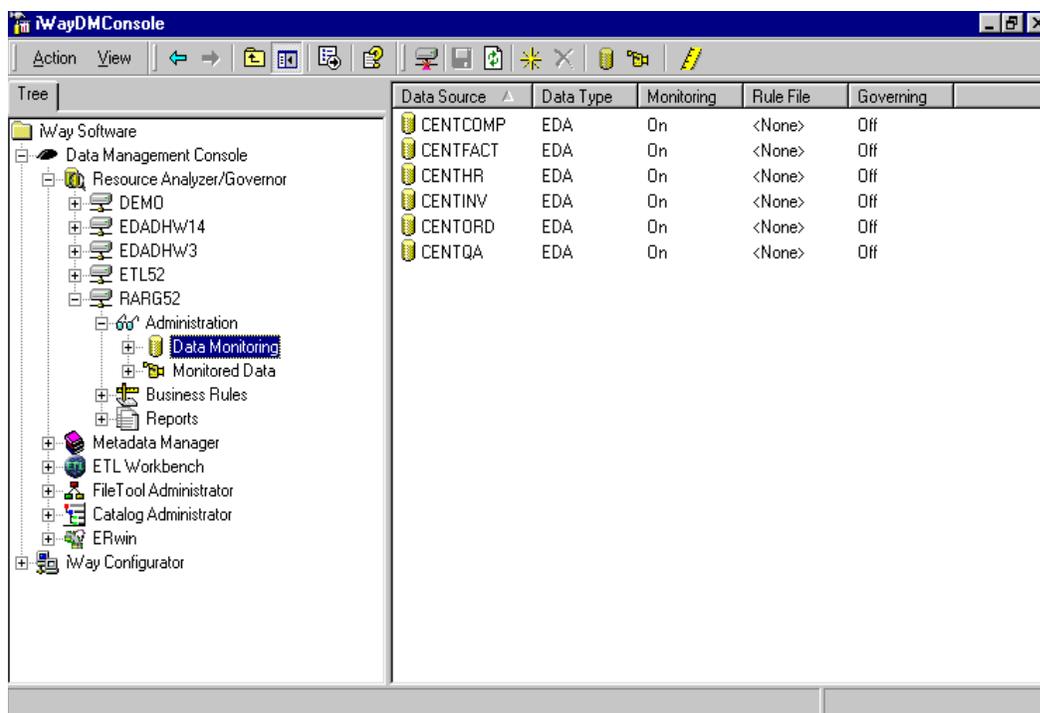
Overview of the Microsoft Management Console

In the past, network administrators relied on various management tools that offered no integration and presented the user with inconsistent interfaces. The Microsoft Management Console (MMC) is Microsoft's answer to this problem. The purpose of the MMC is to support simplified administration through integration.

MMC is a host that contains programs called *snap-ins*, which extend the console to offer the administrator management capabilities. Using COM/DCOM technology and the Microsoft Management Console, *Resource Governor* can be deployed and managed on multiple machines on your network.

Resource Governor Usage Monitoring

Before Resource Governor can monitor request information, it must know your monitoring requirements. You specify these requirements through the Resource Governor Administrator, a Microsoft Management Console (MMC) snap-in to the iWay Data Management Console. You can specify a range of monitoring configurations depending on your needs.



The monitoring process is as follows:

1. A request is issued by a user to access data from a data source.
2. The request is processed by the server, which calls the Usage Monitor prior to retrieving the first record for the request.
3. The Usage Monitor captures the request attributes and stores them until the request finishes retrieving data.
4. The Usage Monitor is called once more to gather resource usage statistics.
5. The logged information is stored in the Usage Monitoring Databases. For details about Usage Monitoring fields, see Appendix A, *Usage Monitoring and Administrative Databases Field Descriptions*.

For more information on Usage Monitoring, see Chapter 3, *Resource Governor Administration*.

Due to changing usage patterns, over time you may find that usage-monitoring data that has accumulated is no longer relevant to your current activity and analysis. When this is the case, Resource Governor allows you to delete this data from the usage monitoring database, by using the Resource Governor Administrator.

For more information about using the Resource Governor Administrator to set monitoring configurations and delete data, see Chapter 3, *Resource Governor Administration*.

Working With the Microsoft Management Console

The Microsoft Management Console (MMC) consists of one or more windows that assemble the tools, controls, tasks, and documentation required to administer specific components of the Windows NT/2000 network. Consoles are saved as files with an .msc extension. All of the configuration settings for the tools and controls are saved in the console file and restored when the file is opened.

Using Snap-ins

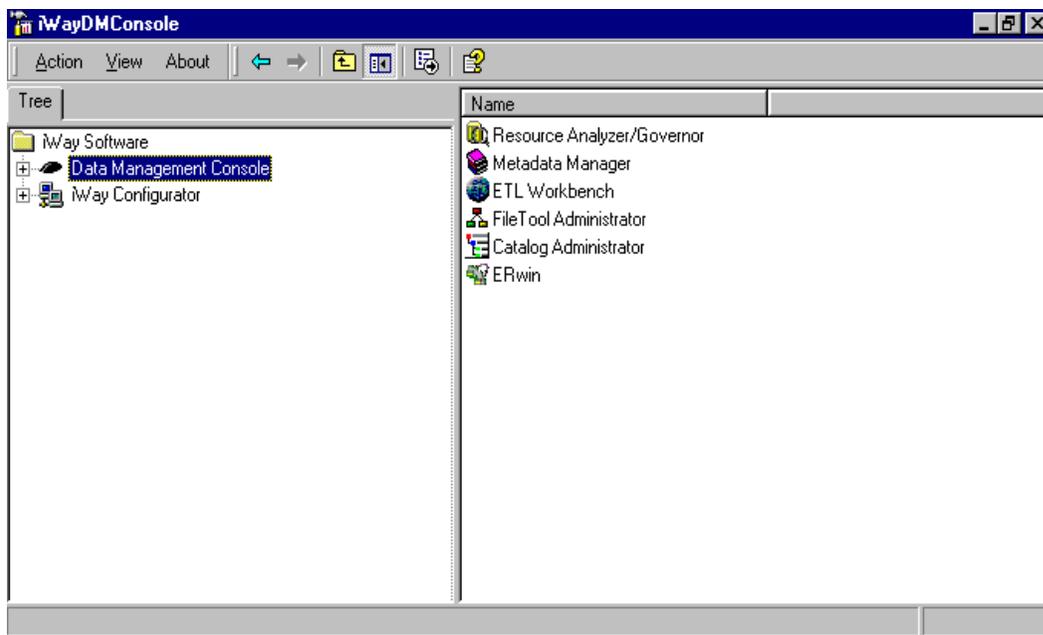
A snap-in is the basic component of the MMC. Snap-ins always reside in the console; they cannot run by themselves. When a component is installed on the Windows NT operating system and a snap-in is associated with it, the snap-in becomes available to anyone using the console.

Viewing the Microsoft Management Console Window

The Microsoft Management Console (MMC) consists of a window divided into the following two panes:

- **Console Tree.** Displays the snap-ins available in the console.
- **Details Pane.** Displays information about and functions relating to the snap-ins.

When you open the MMC, your environment will look like the following:



Note: As you click different snap-ins in the console tree, the contents of the details pane change.



Setting Rule Parameters With Resource Governor

Before Resource Governor creates the rules that establish limits on the amount of resources each request can use, you need to provide information about permissible resource thresholds at your site and the shifts that control requests made by end users. Resource Governor uses these thresholds and shifts along with the already collected usage monitoring data to build rules about how requests are to be governed against specific data sources. To create these thresholds you use Rule Parameters. Based on these rules, the Resource Governor governing facility decides if a request can execute or not. See Chapter 3, *Resource Governor Administration* for more information.

Building Rules

Before Resource Governor can begin governing queries, you must first generate the rules that are used. The rules generated by Resource Governor are based on usage monitoring data and the kinds of requests that have been monitored before governing is turned on. When a request is issued, Resource Governor looks at the request and uses the rules to determine whether the request should be permitted to run. For more information about creating, editing, or deleting rules, see Chapter 3, *Resource Governor Administration*.

Creating Custom Rules

You may, however, know of certain conditions contained in requests that should never be allowed to run. If these conditions do not occur during the representative sampling of your site's applications, they will not become part of the automated Resource Governor's rules. Likewise, you may know of certain conditions under which all queries should be allowed to run, such as a user ID with greater privileges. The Custom Rule Builder enables Resource Governor to govern immediately on conditions that are known to be unacceptable or that should never be cancelled. It also lets you designate more specific parameters beyond simply the time and row number thresholds specified in the Rule Parameters view.

For example, you can have Resource Governor govern based on the particular data source being queried, the user ID submitting the request, or even a particular field within the request. Custom rules allow for flexibility upon configuration of Resource Governor or changing Information System conditions at your site. Resource Governor uses its proprietary Business Rule Language (BRL) when building rules. For more information about BRL, see the *Server Administration* manual.

For more information on creating custom rules, see Chapter 2, *Creating Custom Rules*.

Reporting With Resource Governor

Resource Governor offers several types of reports, which show, among other things, a summary of monitoring data, a log of cancelled queries, and rules.

You can re-sort reports by different columns and drill down on various hyperlinks to view more detailed information and different reports.

You can also specify date range selection criteria for the reports by accessing a calendar through the Report Options hyperlink.

The following table describes the different reports:

Report Area	Report Name	Report Description
Administration	Data Sources Under Control	Shows all data sources that Resource Governor is monitoring and governing.
	Governing Parameters	Shows the current state of governing parameters (shifts and thresholds).
Usage Monitoring	Monitored Samples Summary	Shows a report summary of all monitored queries.
	Resource Usage Summary	Shows resources used by the executed queries.

Report Area	Report Name	Report Description
Governing	Canceled Requests	Shows all requests canceled by Resource Governor
	View Rules	Shows all rules for data sources, including automated rules created by Resource Governor, and custom rules created by the administrator.
	Threshold Selection Adviser	Recommends resource thresholds based on a statistical model.

For more information on running and viewing these reports, see Chapter 4, *Resource Governor Reports*.

Overview of the Microsoft Management Console

CHAPTER 2

Creating Custom Rules

Topics:

- Custom Rule Builder
- Using the Rule File Wizard
- Building Custom Rules With the Development Kit

Custom rules can be created in Resource Governor to set a variety of limits on database queries, such as establishing WHERE clause requirements or disallowing queries during specified time periods.

Resource Governor uses a language called Business Rule Language (BRL). BRL allows IF/THEN testing on certain information available when rules execute. BRL rules consist of three parts:

- The rule name, which serves as a comment or description and is not syntactically necessary to the rule.
- A supporting condition (antecedent) or procedure statement.
- A conclusion.

For more information about BRL, see the *Server Administration* manual.

Custom Rule Builder

The Custom Rule Builder contains the following features:

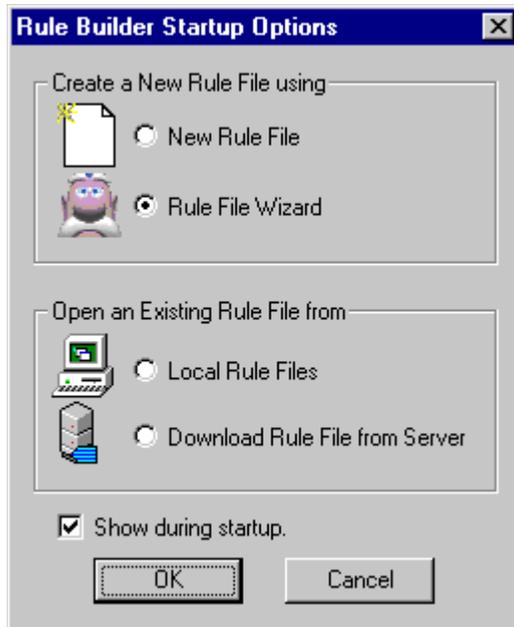
- The Rule File Wizard, which automatically generates BRL syntax for typical custom rules according to rule parameters you select.
- A Development Kit, which allows you to insert BRL syntax consisting of variables, keywords, ACTIVATE functions, and multivalued variables into a BRL file. The Help tab associated with the Development Kit provides explanations and examples for the syntax options.
- Syntax verification, which provides information about syntax errors in BRL files.

The Custom Rule Builder allows you to save and retrieve rule files either locally or from the server. Work in progress can be saved on your hard drive until you are ready to upload completed rule files to the server location. When you upload a rule file, the file is added to the SMPRL database, which is the Resource Governor rule repository. See Appendix A, *Usage Monitoring and Administrative Databases Field Descriptions*, to view the structure of the SMPRL database.

Procedure How to Start the Custom Rule Builder

1. Expand the Resource Governor object.
2. Connect to the appropriate server.
3. Click the *Custom Rule Builder* button  on the toolbar.

The Rule Builder Startup Options window displays:



4. Select one of the startup options:

- **New Rule File.** Opens a new “Untitled” rule file. Template text appears with standard rule syntax that forms the basis of a custom rule. Text between brackets (< >) needs to be replaced. The brackets must be deleted.
- **Rule File Wizard.** Starts the Rule File Wizard.
- **Local Rule Files.** Opens a browse window, allowing you to navigate to the directory that contains locally saved rule files. Rule files are identified by their .brl extension.
- **Download Rule File from Server.** Opens the Download Rules Wizard. See *Saving and Retrieving Rule Files* on page 2-16.

Note: If you unselect the *Show during startup* checkbox, the Rule Builder Startup Options window no longer appears when the Custom Rule Builder is started and the Custom Rule Builder is invoked when you click the Custom Rule Builder button. To reactivate the Startup Options window, check the Startup options command on the View menu of the Custom Rule Builder window. The options in the Startup Options window are also available from the File menu in the Custom Rule Builder window.



Using the Rule File Wizard

The Rules Wizard creates rules to govern a query that allow you to:

- Disallow the use of an SQL SELECT * to select all columns from a table.
- Determine a minimum number of required WHERE or IF clauses.
- Set a maximum number of allowed table joins.
- Prevent a Cartesian product from being issued. This prevents unqualified joins.
- Require a WHERE or IF clause with a specified column name.
- Disallow access to data during specified time periods.
- Specify super users whose queries are exempt from normal governing rules.

Procedure How to Create a Rule File Using the Rules Wizard

1. Select Rule File Wizard in the Startup Options window or select the New Wizard command from the File menu.

The Rules Builder Wizard - Step 1 of 9 window displays:

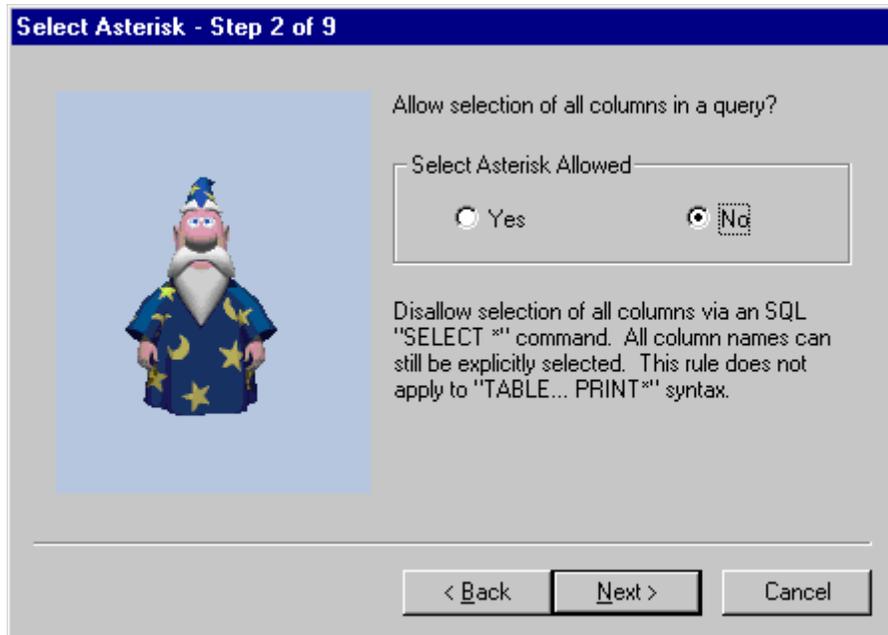


2. Click *Next*.



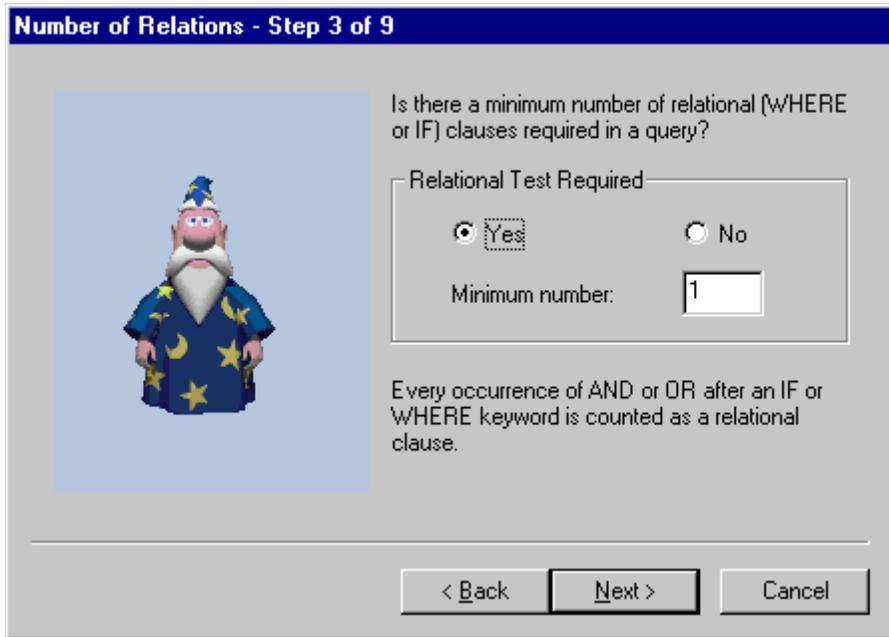
Note: Click *Cancel* from any Wizard screen to exit the Rules Builder Wizard without creating any rules.

The Select Asterisk - Step 2 of 9 window displays:



3. Select *Yes* or *No*.
 - If you select *No*, a custom rule will be created that disallows the use of an SQL `SELECT *` command. This prevents excessively wide SQL queries from being issued.
 - If you select *Yes*, no rule will be created governing the use of an SQL `SELECT *` command.

Click *Next*. The Number of Relations - Step 3 of 9 window displays:



4. Select *Yes* or *No*:

- If you select *Yes*, enter the minimum number of relational clauses required in a query. The default is one. A rule will be created specifying the number of required relational clauses.
- If you select *No*, no minimum number of relational clauses will be required in a query.

Click *Next*. The Joins - Step 4 of 9 window displays:

Joins - Step 4 of 9

Is there a limit of joins allowed?

Joins Limited

Yes No

Maximum Joins:

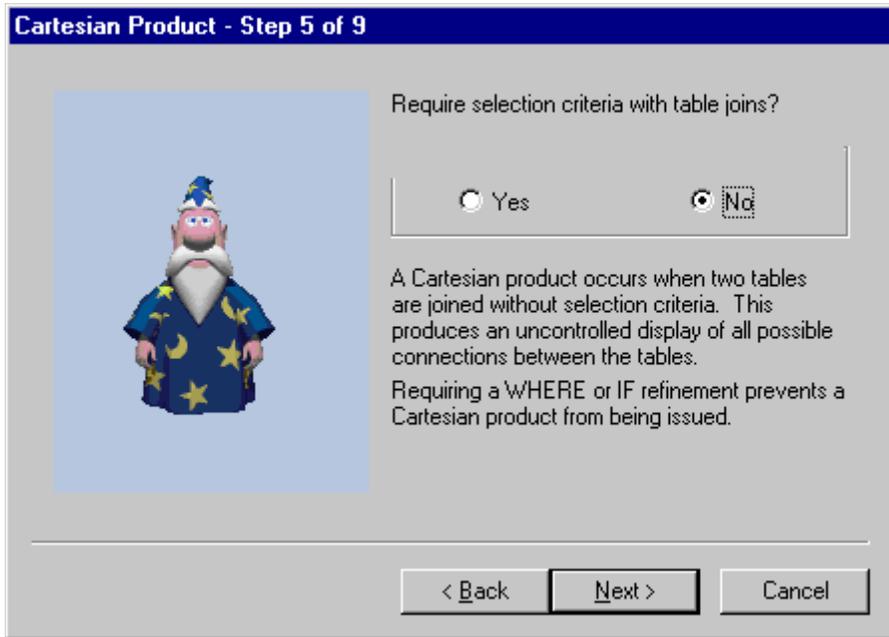
If there is a limit on the number of tables that can be used together in one query at a time, click Yes and enter the number of Maximum Joins. This number, n, is then number of n-way joins allowed.

< Back Next > Cancel

5. Select *Yes* or *No*.

- If you select *Yes*, enter a limit for the number of table joins allowed. The default is 16. Remember that the number of tables that can be joined is always one higher than the number of allowable joins, since two tables comprise one join.
- If you select *No*, Resource Governor will apply no limit to the number of joins allowed.

Click the *Next* button. The Cartesian Product - Step 5 of 9 window displays:



6. Select Yes or No.

- If you select *Yes*, a rule requiring a WHERE or IF clause with requests that issue Joins is created.
- If you select *No*, a Join can be issued without a WHERE clause.

Click *Next*. The WHERE Column Name - Step 6 of 9 window displays:

WHERE Column Name - Step 6 of 9

Require a WHERE/IF clause for a specific column name?

Require WHERE/IF Field Name

Yes No

Field Name:

Enforce the use of a WHERE/IF clause with a specific column name.

Examples: IF SSN EQ '123994567'
Where CAR = 'JAGUAR'

< Back Next > Cancel

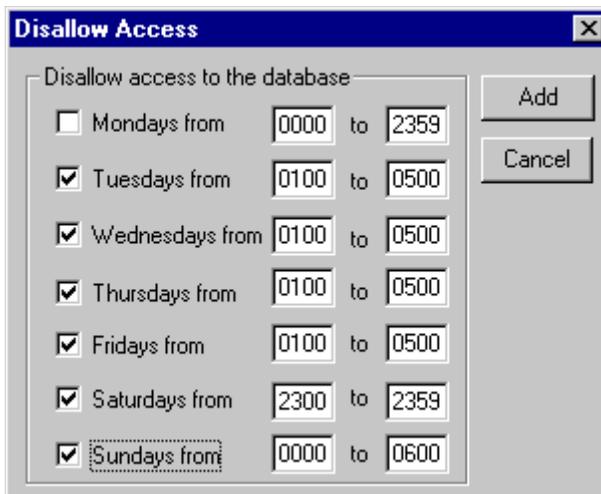
7. Select Yes or No:

- If you select *Yes*, a rule requiring a WHERE or IF clause for the column name specified in the Field Name: field is created.
- If you select *No*, no specific columns are required for use in a WHERE/IF selection.

Click *Next*. The Disallow Access - Step 7 of 9 screen displays:



8. Click the *Add* button. The Disallow Access window displays:



9. Select days of the week and time periods for which access to the database is denied.

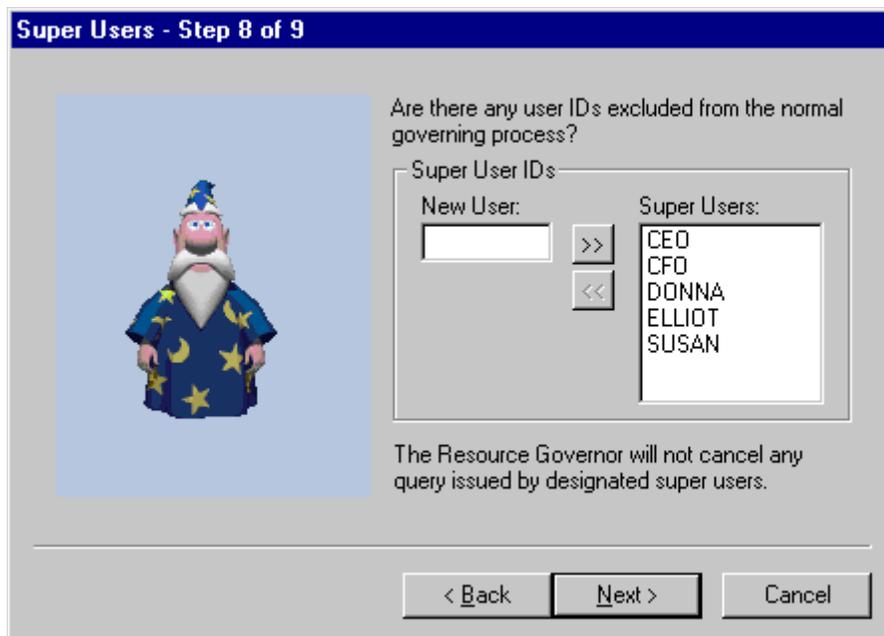
Note:  In the example Disallow Access window shown, disallowed access hours are set for 1:00 a.m. to 5:00 a.m. Tuesday through Friday. Access is also denied overnight from 11:00 p.m. Saturday until 6:00 a.m. Sunday. To bridge the two days, the Saturday time period ends at 2359 (11:59 p.m.) and the Sunday time periods begins at 0000 (midnight).

10. Click *Add* when you are satisfied with your entries. The Disallow Access - Step 7 of 9 screen re-displays with the time periods you entered displayed in the list box.

Note:  To revise entries, first remove the item in the list box that you want to change by selecting it and clicking *Remove*. Click *Add* to return to the Disallow Access window. Select only the day you need to change and enter the revised time period for that day. Click *Add*. The revised time period is added in the list box.

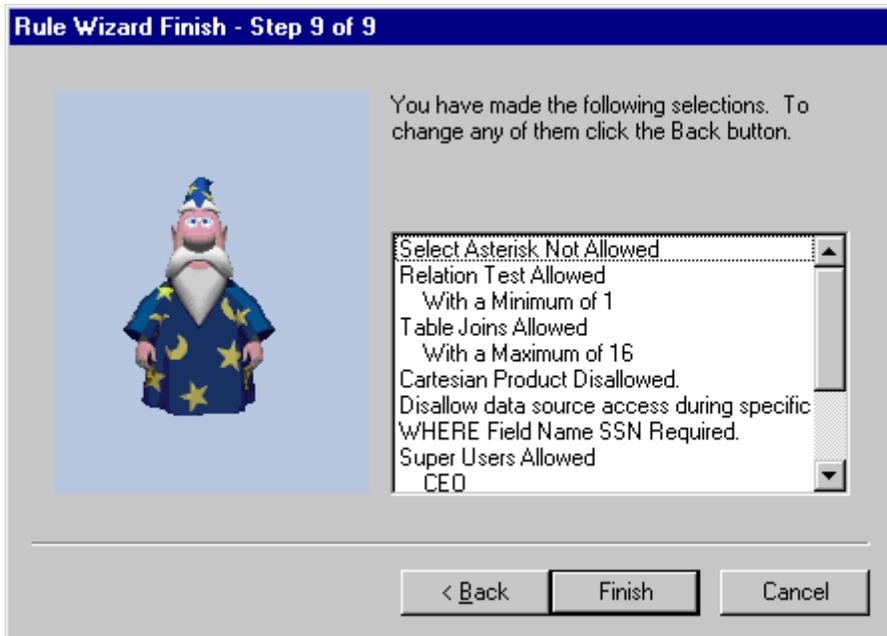
11. Click *Next* in the Wizard screen.

The Super Users - Step 8 of 9 window displays:



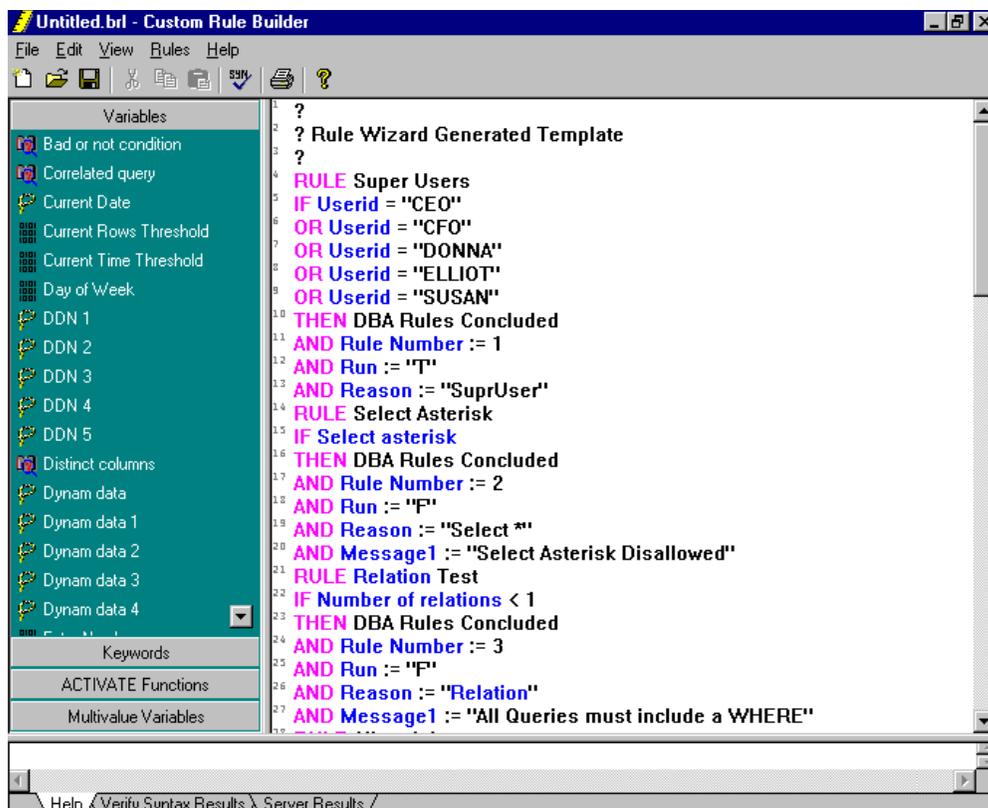
12. Enter the IDs of Super Users. Type the ID in the New User: field and then click the forward arrows button  to enter the ID as a Super User. Queries submitted by Super Users are exempt from governing rules.

Click *Next*. The Rules Wizard Finish - Step 9 of 9 window displays:



13. Check the descriptions of the rules you created. To make any changes, click *Back* until you reach the screen that needs correction. After all corrections are made, click *Finish*.

The rule text screen displays with the BRL syntax, which has been automatically generated based on your selections, displayed in the right pane:



You can make any changes or additions you want to the rules after the Wizard generates the syntax you invoked. For example, you might want to change the message text that users will see when they run a disallowed query.

See *Building Custom Rules With the Development Kit* on page 2-14 for directions about using the Development Kit to add additional rules syntax, how to verify syntax, and save the rules you have created.

Building Custom Rules With the Development Kit

The left pane of the main Custom Rule Builder screen contains the Development Kit, a tool that allows you to build BRL statements accurately and quickly. You can use the Development Kit either to add a rule to a rule file created with the Rules Wizard, or to create a new custom rule file.

For additional information about building rules with BRL, see the *Server Administration* manual.

Procedure How to Build Rules With the Development Kit

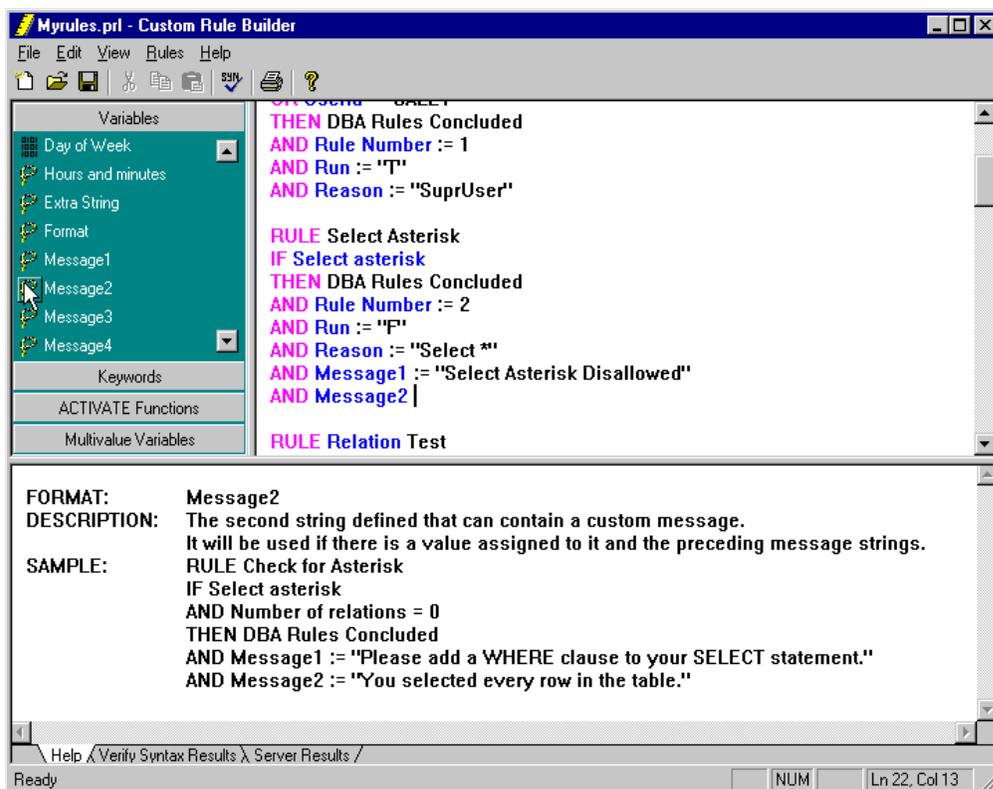
1. From the Custom Rule Builder screen, click the button in the left pane for the type of syntax you want to insert (Variable, Keyword, ACTIVATE Function, or Multivalue Variable).
2. Locate the syntax element you want to include by clicking the scroll arrow up or down. Insert syntax into the file by double-clicking the item or dragging-and-dropping. To drag and drop, click the item and hold the left mouse button. Drag the item to the correct location in the right pane of the screen and release the left mouse button.

Note:



Click any item in the Development Kit pane to activate the Help tab in the bottom pane of the screen. An explanation and example for any syntax item displays when you click the item.

In this example, the Message2 Keyword is selected. Note the Help text that appears at the bottom of the screen:



To expand the size of the bottom pane, adjust the placement of the gray separator bar with your cursor.

Procedure How to Check for Syntax Errors

You can verify BRL syntax at any point while building rules. The Custom Rules Builder requires you to save your rule file before checking syntax.

1. Click the *Verify Rule Syntax* button  or select the *Verify Rule Syntax* command from the Rules menu in the Custom Rule Builder window.

The Save As window displays.

2. Type a name and select a directory location for the rule file and click *Save*.

The Verify Syntax tab in the bottom pane of the Custom Rule Builder screen is automatically activated and displays verification results.

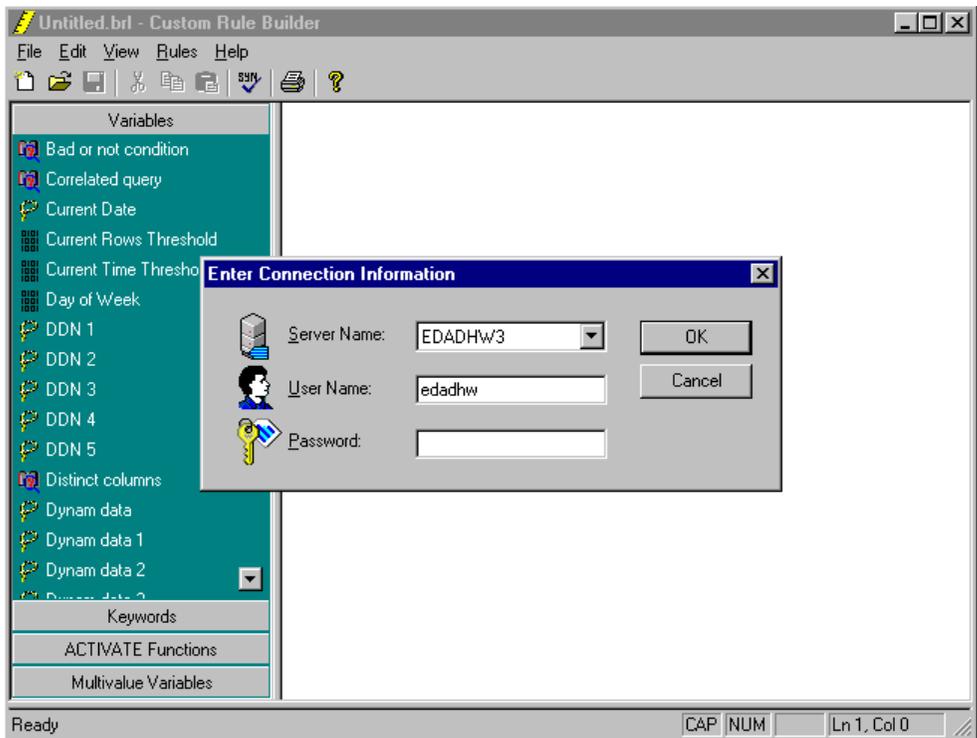
3. Double-click on any error message line in the verification results. The cursor moves to the line of syntax containing the error.
4. Make corrections as needed and repeat the verification process until no errors are found.

Saving and Retrieving Rule Files

To save rule files still under development to your local drive at any time, select the Save or Save As command from the File menu of the Custom Rule Builder window. The Custom Rule Builder also contains an Upload Wizard and a Download Wizard for saving and retrieving rule files from the SMPRL database on the server.

Procedure How to Upload Rule Files to a Server

1. After building a rule file, select *Logon Server* from the File menu of the Custom Rule Builder window.
2. Enter connection information and click OK.



3. Select *Save to Server* from the File menu.

The Upload Wizard Step 1 of 2 screen displays:



4. Type the file name and click *Next*.

The Upload Wizard - Step 2 of 2 screen displays with a message stating that the file has been successfully executed.



5. Click *Finish*.
6. Select *Exit* from the File menu.

Procedure **How to Download Rule Files From a Server**

1. Click the *Rule Builder* button on the toolbar.
 2. Click *Cancel* in the Rule Builder Startup Options window.
 3. Select the *Download Rule File from Server* option in the Rule Builder Startup Options window.
- or
- Select Logon Server from the File menu of the Custom Rule Builder window and logon.

4. Select *Open from Server* from the File menu.

The Download Wizard Step 1 of 1 screen displays with a selection list of rule files on the server.



5. Click the file you want to open and click *Finish*.

The rule displays in the Custom Rule Builder window.

Note: When you select either the *Save to Server* or *Open from Server* command, the Server Results tab in the bottom pane of the screen is activated. You can view the results status of downloads and uploads in that pane.



CHAPTER 3

Resource Governor Administration

Topics:

- The Resource Governor Administrator
- Usage Monitoring
- Deleting Usage Monitoring and Administrative Data
- Rule Parameters
- Building Rules
- Governing

Resource Governor has two major features:

- Administration, which includes:
 - Usage monitoring
 - Deleting data
 - Rule parameter selection
 - Rule building and deployment
- Reporting

The following section describes Resource Governor's administrative functions.

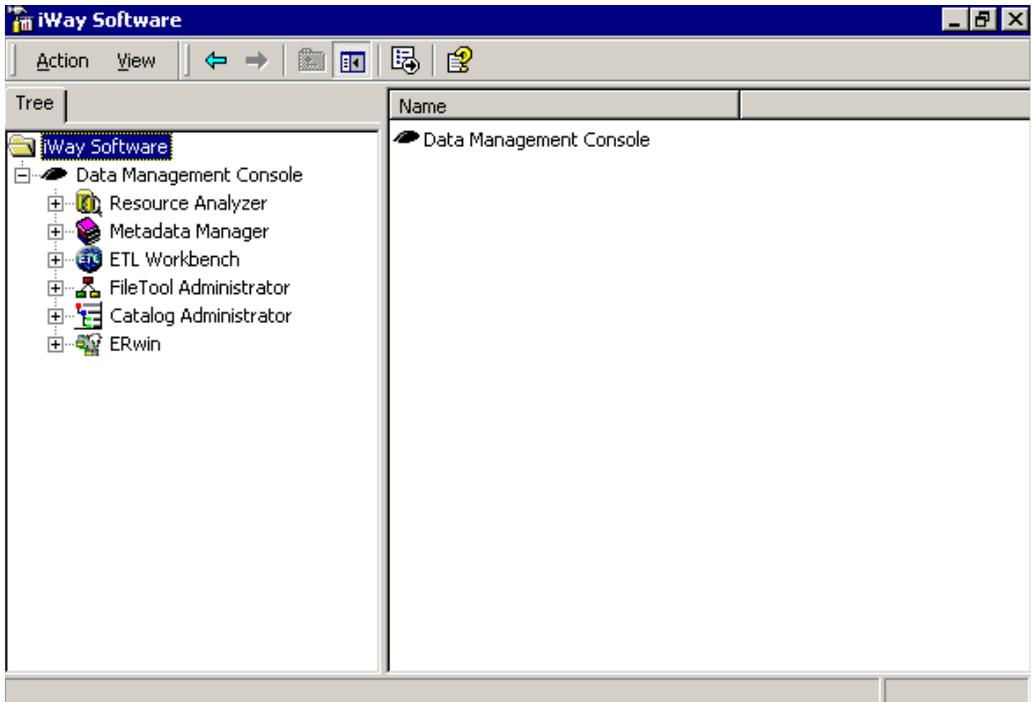
The Resource Governor Administrator

You control Resource Governor administrative settings through the Resource Governor Administrator, a Microsoft Management Console (MMC) snap-in to the iWay Data Management Console.

The Resource Governor Administrator lets you connect to servers, and implement Resource Governor administration, including usage monitoring, deleting data, rule parameter selection, and rule building.

To start the Resource Governor Administrator, click the Windows Start menu, choose Programs, iWay Data Mgt Admin Tools, and click Data Management Console.

The first time the Administrator is used for Resource Governor, you must register the Resource Governor servers. Once this is done, you can connect to the server to begin the administration tasks.



Procedure How to Register Servers

1. Launch the iWay Data Management Console by clicking the Windows Start menu, choosing Programs, iWay Data Mgt Admin Tools, and clicking Data Management Console.
2. Expand *Data Management Console*. Resource Governor displays in the Console tree as an object under Data Management Console.
3. Right-click Resource Governor and select *Register Server* from the Context Menu.
4. Enter a valid user ID and password and click *OK*.
5. Check *Save Password* to save your password, so you won't need to re-enter it each time you connect to the server.

Once you have registered servers, you can connect to them.

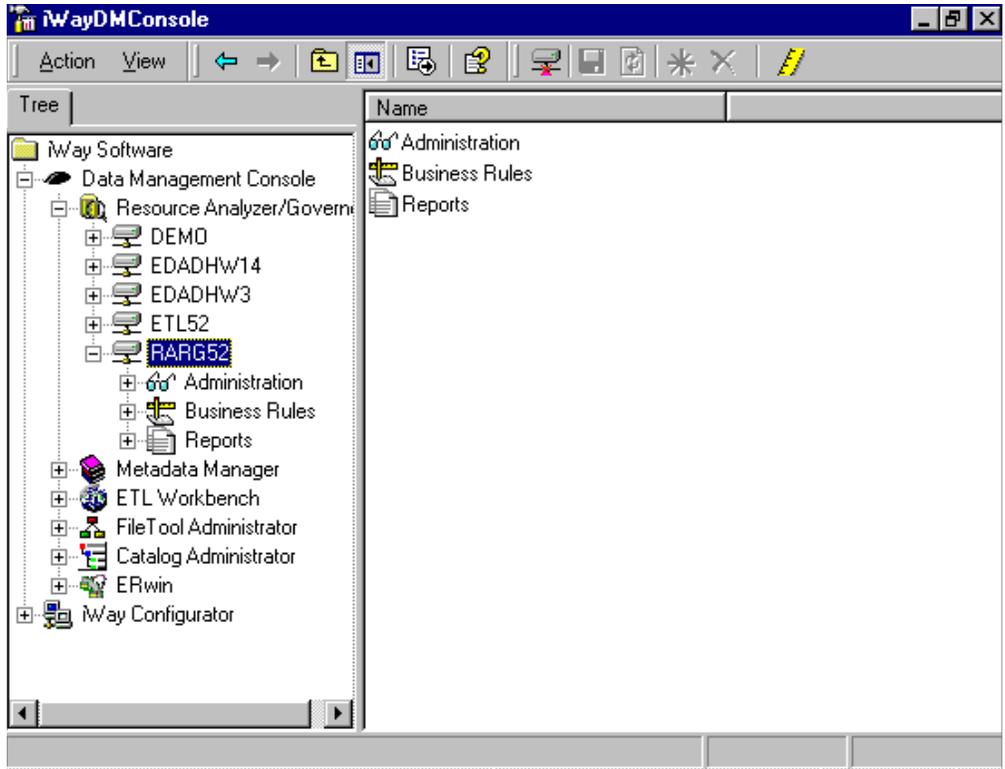
Note: If both Resource Analyzer and Resource Governor are installed, the object name will be Resource Analyzer/Governor, and not Resource Governor.

**Procedure How to Connect to a Server**

1. Launch the iWay Data Management Console by clicking the Windows Start menu, choosing Programs, iWay Data Mgt Admin Tools, and clicking Data Management Console.
2. Expand Data Management Console. Resource Analyzer/Governor displays in the console tree as an object under Data Management Console.
3. Double-click *Resource Governor*. The registered servers display.
4. Right-click a server.
5. Select *Connect* from the Context Menu.
6. Enter a valid user ID and password.

7. Click OK.

The following window displays:



There are three functions within the Resource Governor Administrator window:

- **Administration.** Allows you to select the administrative data sources for monitoring or change settings for data sources currently under Resource Governor's control, as well as delete administrative data about those data sources. This view also lists any data sources monitored from the global monitoring setting.
- **Business Rules.** Lets you create Resource Governor rules or change business rules settings for rules already stored on the server.
- **Reports.** Accesses Resource Governor's performance analysis reporting system.
- For more information on Resource Governor Reports, see Chapter 4, *Resource Governor Reports*.

To access any of these functions, click the appropriate object.

You can also access these functions by clicking the buttons on the toolbar.

Reference Resource Governor Administrator Toolbar Buttons

The following table describes the functions of the buttons on the Resource Governor Administrator toolbar:

Note: When you Click different objects in the console tree, different icons display in the toolbar.



Toolbar Button	Function
 Connect/Disconnect	Disconnects from the current server.
 Save	Saves administrative settings to the current server.
 Refresh	Refreshes administrative settings from the current server.
 Add	Adds a new data source to Resource Governor's control.
 Delete	Deletes usage monitoring or administrative data.
 Monitored Data	Allows you to view and/or delete usage monitoring data.
 Data Monitoring	Displays the list of Monitored Data Sources.
 Back	Displays the previous window.v
 Forward	Displays the next window.

Toolbar Button	Function
 Up One Level	Moves the display up one level.
 Show/Hide	Toggles between Show/Hide levels in the Console tree.
 Export List	Exports the list of objects to a text file (.txt).
 Help	Displays the online help.
 Launch Rule Builder	Displays the Custom Rule Builder.
 Build Rules	Displays the Data Sources for which you can apply rules.
 Rule Parameters	Displays the current Rule Parameters and allows you to add new Shifts and Thresholds.

Usage Monitoring

Resource Governor's usage monitoring facility allows you to monitor requests as they are submitted by users and log information about request usage. This information includes the usage statistics associated only with data retrieval. This request information is stored in Resource Governor's Usage Monitoring Databases. This information does not include the time utilized in Dialog Manager code logic, file allocation, writing of intermediate HOLD files, sorting of data retrieved, and computation time associated with user-written subroutine library functions and FOCUS DEFINE statements.

Before Resource Governor can begin to monitor request information, it must know your usage monitoring requirements. Resource Governor offers three monitoring configurations:

- **Monitoring by data source.** Resource Governor will monitor only requests made to the specified data source.
- **Global Request Monitoring.** Resource Governor will monitor every request that is processed by the server.
- **Global Request Monitoring with exceptions.** Resource Governor will monitor all requests processed except those for data sources with monitoring turned off.

Note: Resource Governor also allows you to monitor the execution of stored procedures. Custom reports can be written to report on the statistics that are collected. For more information, see Appendix A, *Usage Monitoring and Administrative Databases Field Descriptions*.

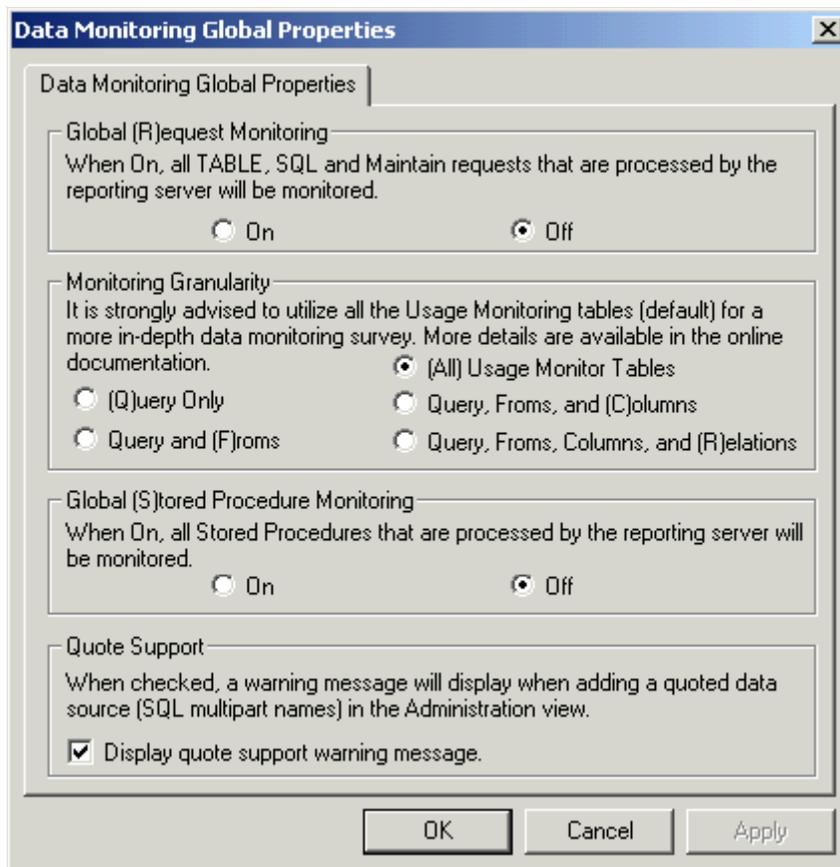


Once you have specified your monitoring requirements, you can begin logging usage information for all WebFOCUS application or server requests issued against the selected data sources. When significant request activity has occurred, you can execute Resource Governor reports and begin the process of creating governing rules. See Chapter 4, *Resource Governor Reports* for more information.

Procedure How to Set Global Request Monitoring

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Right-click Data Monitoring and select *Properties* from the Context Menu. The Data Monitoring Global Properties window displays:

Note: When you click *Data Monitoring*, all data sources already being monitored will display in the right pane.



3. Click *On* for Global Request Monitoring.
4. Click *OK*.

Procedure How to Select Monitoring Granularity

By default, when you turn on monitoring, whether globally or for specific data sources, all information that Resource Governor can monitor will be calculated and stored in the Usage Monitoring databases. The following steps describe how to change monitoring granularity:

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Right-click Data Monitoring and select *Properties* from the Context Menu.
3. Select the desired Monitoring Granularity.
4. Click *OK*.

Note: When using Resource Governor, granularity must remain as the default ((All) Usage Monitor Tables).



Procedure How to Issue a Warning for Quoted Names

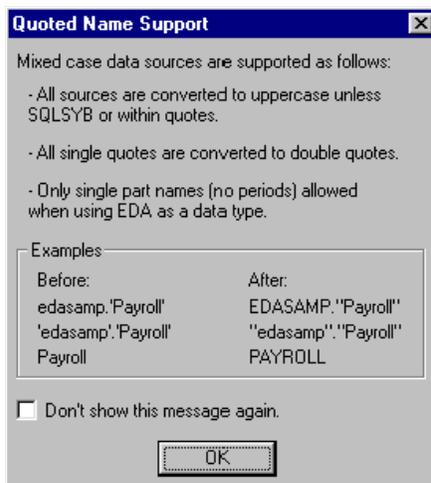
1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Right-click Data Monitoring and select *Properties* from the Context Menu.

Note: When you click Data Monitoring, all data sources already being monitored will display in the right pane.



3. Check the *Display quote support warning message*.
4. Click *OK*.

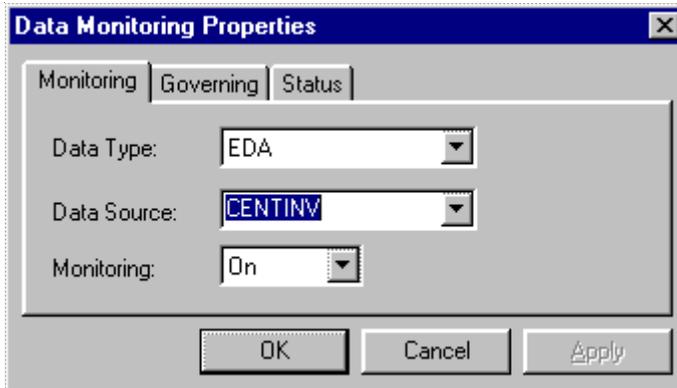
When you select the Display quote support warning message check box, when adding a multi-part name for Data Monitoring, the following message displays:



Reference **Data Monitoring Properties**

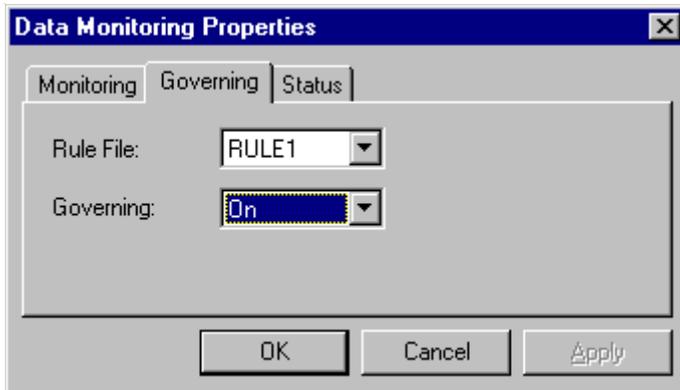
The following section describes Data Monitoring properties.

Monitoring Tab



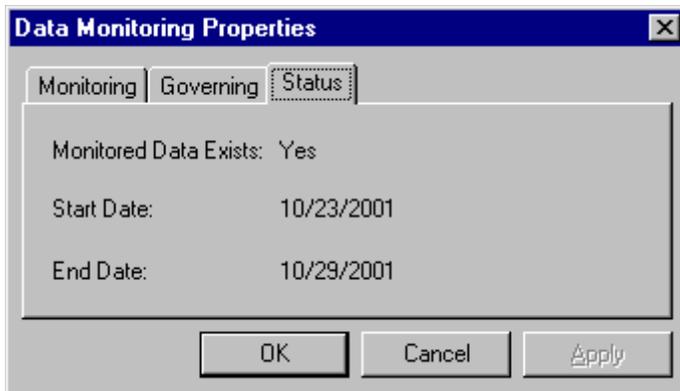
- **Data Type.** The data type specifies the actual data type of the data source. If the data source is a relational table referenced via SQL PASSTHRU, the data type is the engine name (for example, SQLMSS). If the data source is accessed via the server and has a synonym associated with it, the data type is EDA.
- **Data Source.** The data source is the name used in requests to the server. If the data source is a relational table accessed via SQL PASSTHRU, it is the two-part name (as OWNER.TABLE) or three-part name (as DATABASE.OWNER.TABLE). If the data source is accessed via the server and has a synonym associated with it, the synonym name displays in a drop-down list.
- **Monitoring.** To monitor a new data source, select *ON*. To turn off monitoring for a selected data source, select *OFF*.

Governing Tab



- **Rule File.** Indicates which Rule File, if any, is in effect for the data source.
- **Governing.** Indicates whether the data source is being governed.

Status Tab



- **Monitored Data Exists.** Indicates whether or not monitored data exists for the data source.
- **Start Date.** Indicates the earliest date that monitored data exists for the data source.
- **End Date.** Indicates the latest date that monitored data exists for the data source.

When you monitor a new data source, change or remove a data source, a letter appears next to the data source in the Data Management Console window.

- **(A)** indicates that you added monitoring to a new data source.
- **(U)** indicates that you changed the monitoring properties of a monitored data source.
- **(D)** indicates that you removed monitoring from a data source.

You must save the monitoring information to the server for the changes to take effect.

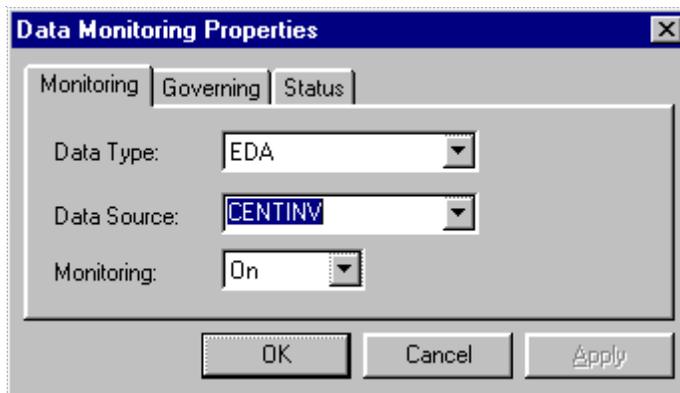
Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Monitor Data Sources

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Right-click Data Monitoring and Select *New* from the Context Menu. You can also click *Data Monitoring* and then click the *Add* button  on the toolbar.

The Data Monitoring properties window displays:



The screenshot shows a dialog box titled "Data Monitoring Properties" with a close button (X) in the top right corner. It has three tabs: "Monitoring" (selected), "Governing", and "Status". Below the tabs are three drop-down menus: "Data Type" (set to "EDA"), "Data Source" (set to "CENTINV"), and "Monitoring" (set to "On"). At the bottom of the dialog are three buttons: "OK", "Cancel", and "Apply".

3. Select the Data Type you want to monitor from the drop-down list.
4. Select the Data Source you want to monitor from the drop-down list.
5. Select *On* from the Monitoring drop-down list and click *OK*.
6. Click the *Save* button to save the changes to the server.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Change the Monitoring Setting for a Particular Data Source

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Click the *Data Monitoring* object.
3. In the right panel, right-click the data source you want to change and select *Monitoring Off* or *On* from the Context Menu.
4. To update this change on the server, click the *Save* button .

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Refresh the Data From the Server

Click the *Refresh* button  on the toolbar. The screen updates to reflect the last saved changes to the server system databases.

Procedure How to Remove a Data Source From Resource Governor's Control

To remove a data source from Resource Governor's control entirely (rather than just turning monitoring off), delete that data source's administrative data following the steps in *How to Delete Administrative Data for a Data Source* on page 3-14.

Note: When you delete a data source's administrative data, all usage monitoring data associated with that data source still remains in the Usage Monitoring Databases.



Resource Governor Monitored Data Context Menu

Resource Governor saves all Monitored Data for a data source from the first day you begin monitoring the data source. You can delete some of the data for a data source by changing the dates of the monitored information you wish to store. The date properties are displayed in the Data Source's Context Menu.

To display the Monitored Data Sources' Context Menu, expand the Monitored object and click *Data Sources*. This list of Monitored data sources appears in the right pane. Right-click a data source and a context menu displays with four options:

- **Edit Start Date.** Displays a calendar to let you edit the start date for the usage monitoring data you want to store. See *How to Delete Usage Monitoring Data by Date Range* on page 3-15 for more information.
- **Edit End Date.** Displays a calendar to let you edit the end date for the usage monitoring data you want to store. See *How to Delete Usage Monitoring Data by Date Range* on page 3-15 for more information.

- **Delete.** Lets you select the data source for deletion. Choosing this option is identical to pressing the delete key when a data source is selected. For more information about deleting data from Resource Analyzer databases, see *Deleting Usage Monitoring and Administrative Data* on page 3-14.
- **Properties.** Displays the Data Monitoring Properties window that summarizes the properties of the selected data source. For more information on the Data Monitoring Properties window, see *Data Monitoring Properties* on page 3-10.

Deleting Usage Monitoring and Administrative Data

Resource Governor stores its monitoring information on the server. In order to free up the space that Resource Governor has used on your database management system, you may want to delete data from the administrative databases (system data), the Usage Monitoring Databases (usage monitoring data logged about requests), or both. The administrative databases store information about what data sources to monitor. The Usage Monitoring Databases store all the data when TABLE, MATCH FILE, MAINTAIN, and SQL commands are processed.

Administrative data is deleted via the Data Monitoring object. Usage monitoring data is deleted via the Monitored Data Sources object.

The following procedures describe the delete tasks available from the Resource Governor Administrator.

Procedure How to Delete Administrative Data for a Data Source

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Click *Data Monitoring*.

You can also select the *Data Monitoring* button from the toolbar.

3. In the right pane, click the data source you want to delete and click the *Delete* button

 on the toolbar.

You can also right-click the data source and select *Delete* from the Context Menu that displays.

4. Click the *Save* button on the toolbar to save the changes to the server.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure **How to Delete Usage Monitoring Data for a Data Source**

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Expand the *Monitored Data* object.
3. Click the *Data Sources* object.
4. In the right pane click the data source you want to delete and click the *Delete* button  on the toolbar.

You can also right-click the data source and select *Delete* from the Context Menu that displays.

5. Click the *Save* button on the toolbar to save the changes to the server.

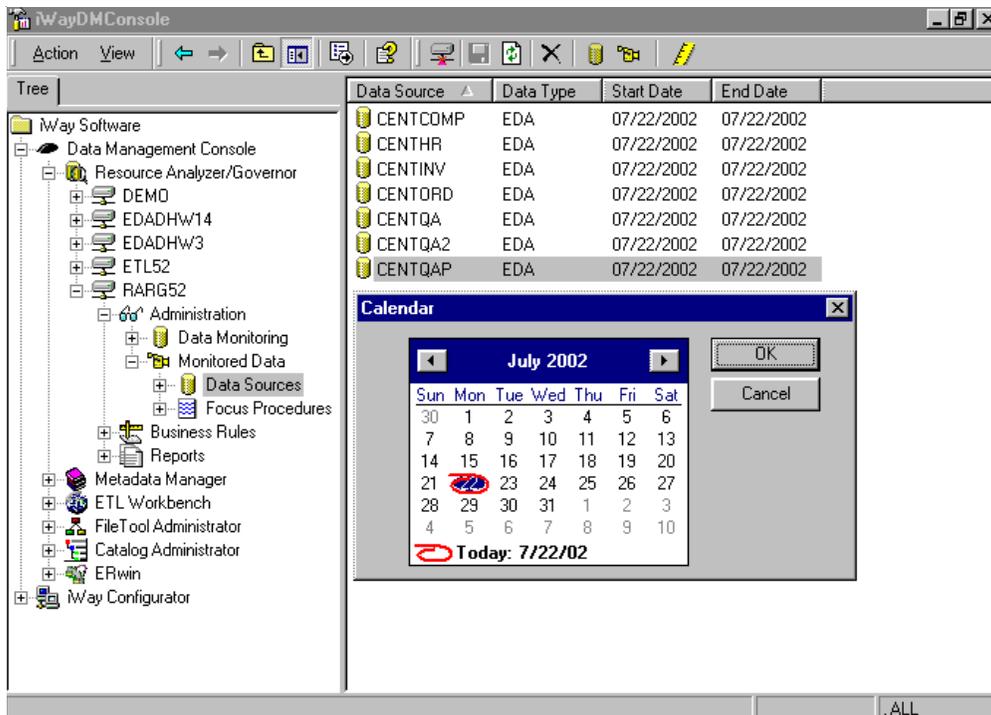
Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.

**Procedure** **How to Delete Usage Monitoring Data by Date Range**

The Administration tool displays the dates for which it has monitored data for each data source. Changing the dates allows you to control the date range of monitored data to delete for each data source.

1. Once you connect to a server, expand the *Administration* object by double-clicking it.
2. Expand the *Monitored Data* object.
3. Click the *Data Sources* object.

4. In the right pane, right-click the data source you want to delete Monitoring Data for, and select *Edit Start Date* from the Context Menu and enter the start date from the calendar that displays for the date you want to delete and click *OK*.



5. Right-click the data source and select *Edit End Date* from the Context Menu and enter the end date from the calendar that displays for the data you want to delete and click *OK*.
6. Click the *Save* button on the toolbar to save the changes to the server.

Rule Parameters

Resource Governor stores its monitoring information on the server. In order to free up the space that Resource Governor has used on your database management system, you may want to delete data from the administrative databases (system data), the Usage Monitoring Databases (usage monitoring data logged about requests), or both. The administrative databases store information about what data sources to monitor. The Usage Monitoring Databases store all the data when TABLE, MATCH FILE, MAINTAIN, and SQL commands are processed.

Rule Parameters must be set before you can build rules. Rule Parameters enable you to create shifts that control requests made by end users. A shift is a period delineated by days and times created by the system administrator in order to limit data access. In addition to controlling the hours and days that requests can be performed, Rule Parameters also set thresholds. The time restrictions and thresholds protect systems from unrealistic client requests by controlling the maximum numbers of rows returned and maximum CPU or elapsed time for requests. As a result, Rule Parameters maximize system resources and assert control over user access to data sources.

Reference Rule Parameters Properties

Before you create rules and create a knowledge base, you need to create the shifts and thresholds that control when requests against the data source can be executed.

- **Shift Threshold Tab** allows you to set up the thresholds for each shift you want in effect when the rules or knowledge base are built.

The screenshot shows a dialog box titled "Rule Parameter Properties" with a close button (X) in the top right corner. It has two tabs: "Shift Threshold" (selected) and "Shift Dates and Times". The "Shift Threshold" tab contains a "Shift" section with a "Name" field containing "HOLIDAY" and a "State" dropdown menu set to "On". Below this is a "Thresholds" section with four input fields: "Maximum Number of Rows Returned" (100000), "Maximum Elapsed (Wall Clock) Seconds" (1440), "Maximum CPU Seconds" (3600), and "Maximum Input/Output Units" (100000). At the bottom are "OK", "Cancel", and "Apply" buttons.

- **Name.** The name of the shift in effect at the time the rules are run against a current monitored query.
- **State.** Indicates whether or not the shift should be taken into account when the knowledge base is generated (when rules are built).
- **On.** Indicates the shift should be included when the knowledge base is built
- **Off.** Indicates the shift should not be included when the knowledge base is built.
- **Maximum Number of Rows Returned.** The maximum amount of rows that a request can return without being cancelled.
- **Maximum Elapsed (Wall Clock) Seconds.** The maximum amount of wall clock seconds that a request can use without being cancelled.

- **Maximum Input/Output Units.** The maximum amount of input/output units that a request can generate without being cancelled.
- **Shift Dates and Times Tab.** Indicates the dates and times for the shift and thresholds that will be in effect when the knowledge base is built.

The screenshot shows the 'Rule Parameter Properties' dialog box with the 'Shift Dates and Times' tab selected. The 'Parameter Date Range Type' section has two radio buttons: 'By Date Range' (selected) and 'By Days of Week' (unselected). The 'Date Range' section contains 'Start Date' (01 / 01) and 'End Date' (12 / 31) fields. The 'Time Range' section contains 'Start Time' (00 : 00) and 'End Time' (23 : 59) fields. The 'Days of Week' section has checkboxes for Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday, all of which are currently unchecked. At the bottom of the dialog are 'OK', 'Cancel', and 'Apply' buttons.

- **Parameter Date Range Type.** Indicates whether the shift is for a date range or for a particular day of the week.
- **By Date Range.** Indicates the shift is for a given range of dates and times.
- **By Day of Week.** Indicates the shift is for a particular day of the week for a given range of times.
- **Date Range Start Date.** The start date for the shift.
- **Date Range End Date.** The end date for the shift.
- **Time Range Start Time.** The start time for the shift.
- **Time Range Start Time.** The start time for the shift.

When you add a new shift, update the properties of an existing shift, or delete a shift, a letter appears next to the shift in the Data Management Console window.

- **(A)** Indicates that you added a new shift.
- **(U)** Indicates that you changed the properties of a shift.
- **(D)** Indicates that you deleted a shift.

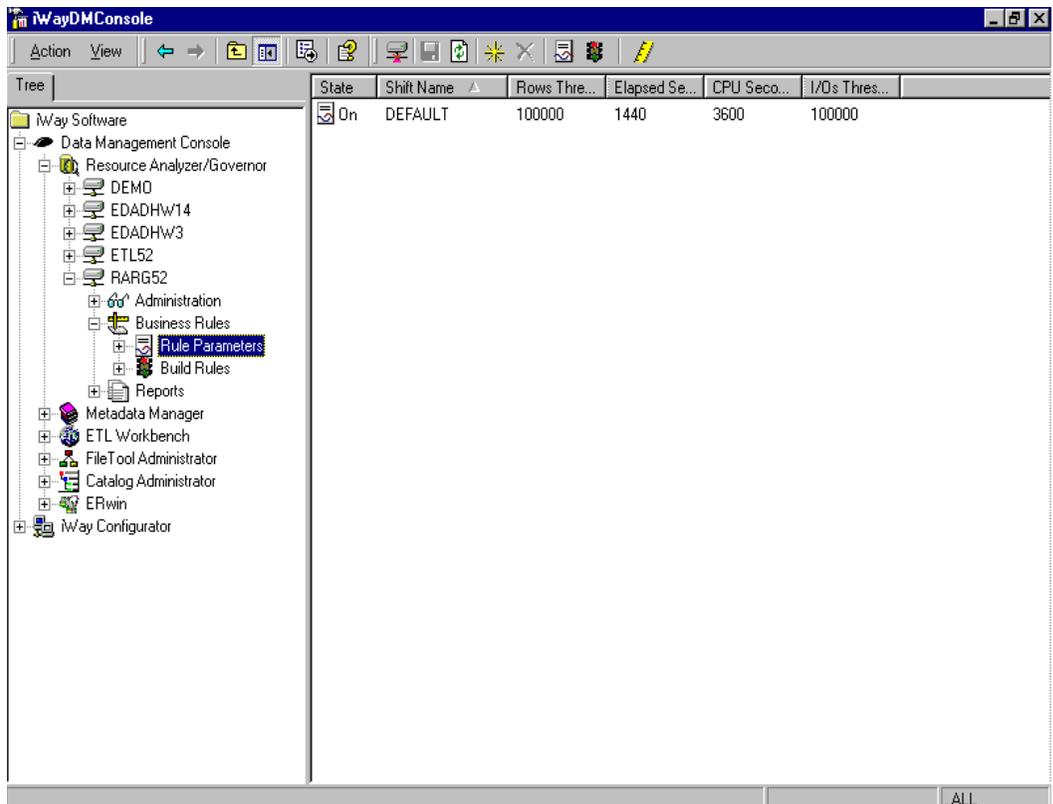
You must save the shift information to the server for the change to take effect.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure **How to View the Default Shift**

1. Once you connect to a server, expand the *Business Rules* object by double-clicking it.
2. Click the *Rules Parameters* object.



The DEFAULT shift is always displayed in the right pane. This shift is the “catchall” shift, meaning that it is activated whenever other shifts aren’t operating. Although the name and the governing state of this shift cannot be changed, you do have the ability to edit the thresholds.

Procedure How to Change the Default Shift

1. Once you connect to a server, expand the *Business Rules* object by double-clicking it.
2. Click the *Rules Parameters* object.
3. Double-click the *Default Shift* in the right pane.

The Rules Parameter Properties window displays:

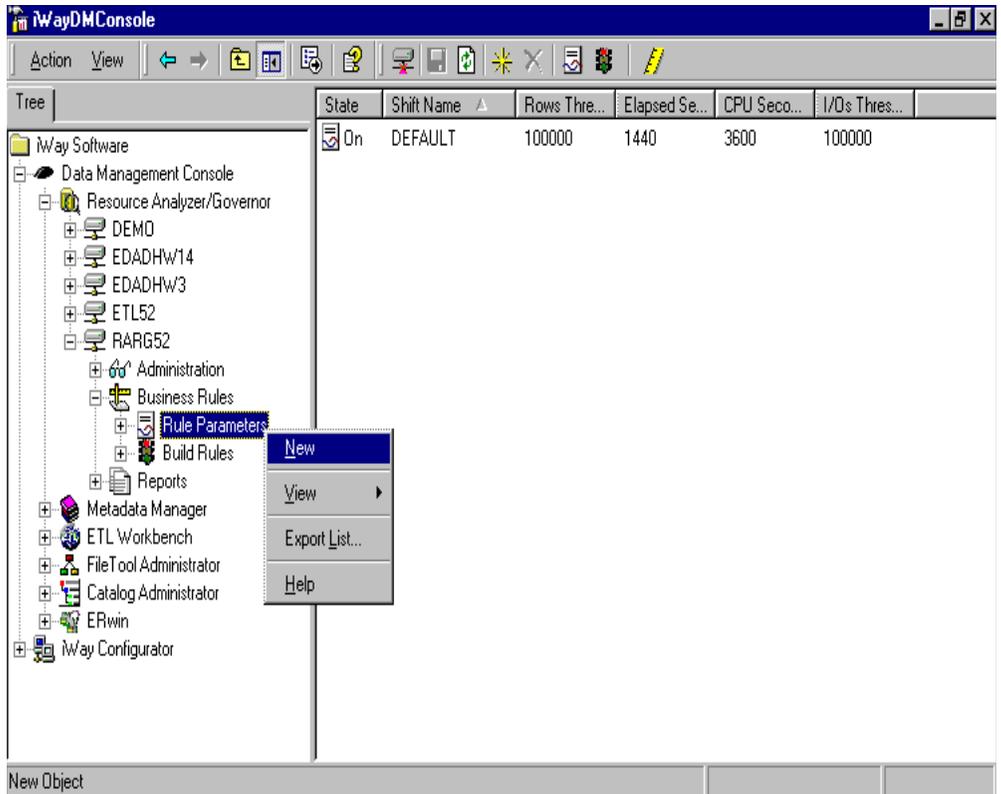
The screenshot shows the 'Rule Parameter Properties' dialog box. It has two tabs: 'Shift Threshold' and 'Shift Dates and Times'. The 'Shift Threshold' tab is selected. Inside the dialog, there is a 'Shift' section with a text box for 'Name' containing 'DEFAULT' and a dropdown menu for 'State' set to 'On'. Below this is a 'Thresholds' section with four input fields: 'Maximum Number of Rows Returned' (100000), 'Maximum Elapsed (Wall Clock) Seconds' (1440), 'Maximum CPU Seconds' (3600), and 'Maximum Input/Output Units' (100000). At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Apply'.

4. Update the appropriate fields.
5. Click *OK*.
6. Click the *Save* button  on the toolbar.

Note: If at any time in this process you decide you want to cancel the changes you have made,  click the *Refresh* button on the toolbar to revert to the settings before the last save.

Procedure How to Create Shifts and Thresholds

1. Once you connect to a server, expand the *Business Rules* object by double-clicking it.
2. Right-click Rule Parameters and select *New* from the Context Menu that displays:



or

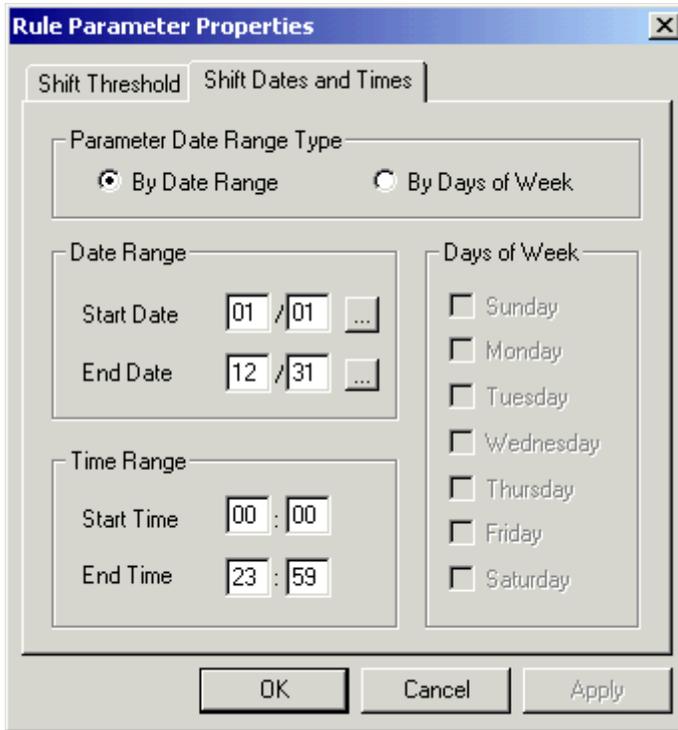
You can also click the *Add* button  on the toolbar.

The Rule Parameter Properties window displays:

The screenshot shows the 'Rule Parameter Properties' dialog box. It has two tabs: 'Shift Threshold' and 'Shift Dates and Times'. The 'Shift Threshold' tab is selected. The dialog is divided into two main sections: 'Shift' and 'Thresholds'. In the 'Shift' section, there is a 'Name' text box and a 'State' dropdown menu currently set to 'On'. The 'Thresholds' section contains four rows of labels and text boxes: 'Maximum Number of Rows Returned' (100000), 'Maximum Elapsed (Wall Clock) Seconds' (1440), 'Maximum CPU Seconds' (3600), and 'Maximum Input/Output Units' (100000). At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Apply'.

3. In the Name field, enter the name of the shift you want to create.
4. Assign a state to the shift from the State: drop-down list. A status of *On* indicates the shift is active, *Off* indicates it is inactive.
5. In the Thresholds box, you can set thresholds for four categories:
 - Maximum Number of Rows Returned
 - Maximum Elapsed (Wall Clock) Seconds
 - Maximum CPU Seconds
 - Maximum Input/Output units

- Click the *Shift Dates and Times* tab to choose the dates and times for the shift.



- For the shift to be in effect on or between certain dates, click the *By Date Range* option in the Parameter Date Range Type box.
 - Enter a Start date or click the ellipses to display a calendar. Select a date by clicking it.
 - The calendar defaults to the current month. To choose a start date from a previous month, click the arrows to the left of the current month shown at the top of the calendar. To select a date in a future month, click the arrows to the right of it. You can also use these arrows to scroll back to the previous year, or forward to the upcoming year.
 - Enter an end date, or click the ellipses to display a calendar. Select a date by clicking it. To change the date, follow the procedure indicated for Start date.
- For the shift to be in effect on certain days of the week, click the *By Days of Week* option in the Parameter Date Range Type box. Select the days by clicking the check boxes to the left of their names.
- Enter the times in the Start Time and End Time fields.

10. Click *OK*.

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

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Edit Shifts and Thresholds

1. Once you connect to a server, expand the *Business Rules* object by double-clicking it.
2. Click the *Rule Parameters* object.
3. Double-click the *Shift* in the right pane.

or

Right-click the Shift and select *Properties* from the Context Menu that displays.

The Rule Parameter Properties window displays:

4. Update the properties as necessary.
5. Click *OK*.

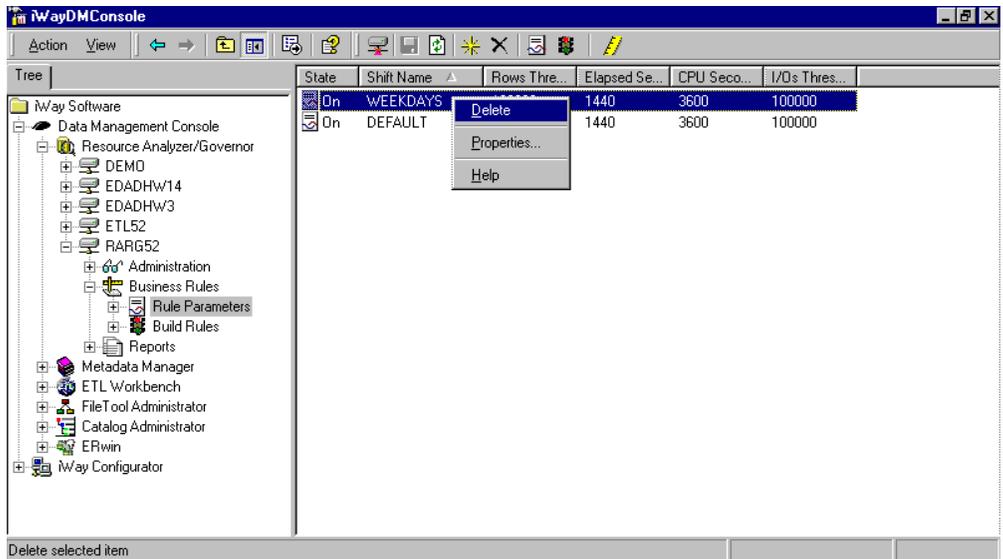
- Click the **Save** button  on the toolbar.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Delete Shifts

- Once you connect to a server, expand the *Business Rules* object by double-clicking it.
- Click the *Rule Parameters* object.
- Right-click a Shift in the right pane and select *Delete* from the Context Menu, or click the *Delete* button  on the toolbar.
- Click **OK**.



- To cancel the delete, right-click the *Shift Name* again and select *Undelete* from the Context Menu.

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

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



Procedure How to Disable Shifts

If you turn off the State of a shift, rules will not be activated for it.

1. Once you connect to a server, expand the *Business Rules* object by double-clicking it.
2. Click the *Rule Parameters* object.
3. Double-click the *Shift Name* in the right pane.

or

Right-click a Shift Name and select *Properties* from the Context Menu that displays.

The Rule Parameter Properties window displays:

The screenshot shows the 'Rule Parameter Properties' dialog box. It has two tabs: 'Shift Threshold' and 'Shift Dates and Times'. The 'Shift' section contains a 'Name' field with the value 'DAY' and a 'State' dropdown menu currently set to 'On'. The dropdown menu is open, showing 'Off' and 'On' as options. The 'Thresholds' section contains four fields: 'Maximum Number of Rows Returned' (100000), 'Maximum Elapsed (Wall Clock) Seconds' (1440), 'Maximum CPU Seconds' (3600), and 'Maximum Input/Output Units' (0). At the bottom of the dialog are three buttons: 'OK', 'Cancel', and 'Apply'.

4. Select *Off* from the State: drop-down menu.
5. Click *OK*.
6. Click the *Save* button  on the toolbar.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



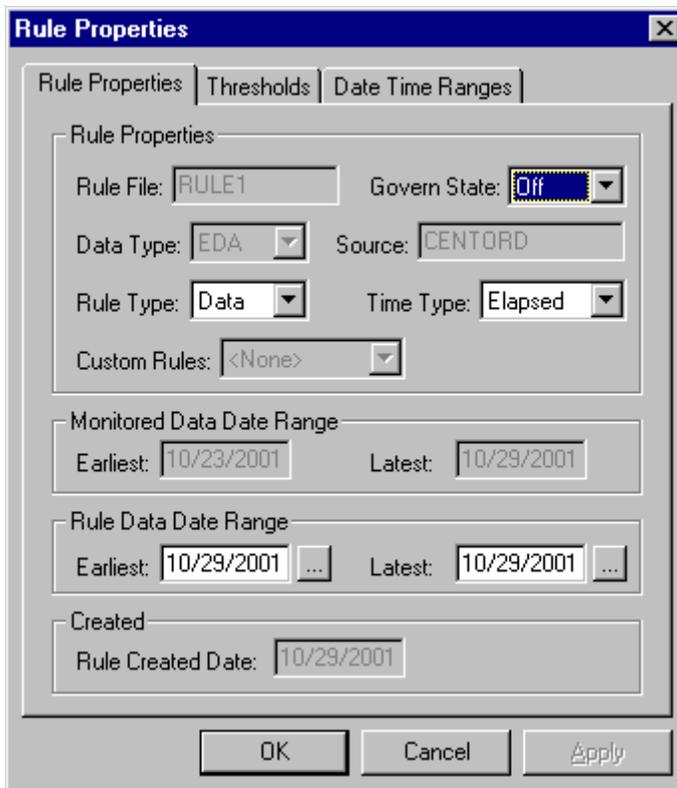
Building Rules

After shifts and thresholds have been created, you are ready to build rules. The Build Rules feature ensures that you only create rules for the active shifts within the appropriate time and date ranges. You are prevented from activating rules that exceed shift thresholds because you choose from options that were created when you set up the Rule Parameters. In addition to selecting date ranges for the use of monitored data, you are able to turn Governing on and off and apply Custom Rule Files to rules. For more information on Custom Rule Files, see Chapter 2, *Creating Custom Rules*.

Reference Rule Properties

The Build Rules function is used to create a complete program or knowledge base that contains the rules, thresholds, and active shifts for a data source. This program (referred to as a Rule File throughout this documentation) is what Resource Governor runs during query or report execution to determine whether the request against the data source should run.

Rule Properties Tab



The screenshot shows a dialog box titled "Rule Properties" with three tabs: "Rule Properties", "Thresholds", and "Date Time Ranges". The "Rule Properties" tab is selected. The dialog contains several fields and dropdown menus:

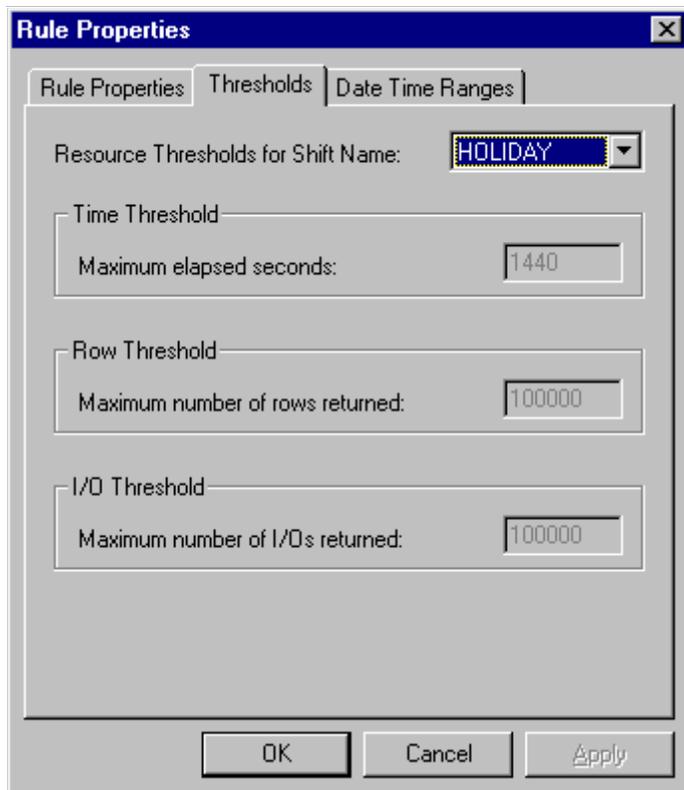
- Rule Properties:**
 - Rule File:
 - Govern State:
 - Data Type:
 - Source:
 - Rule Type:
 - Time Type:
 - Custom Rules:
- Monitored Data Date Range:**
 - Earliest:
 - Latest:
- Rule Data Date Range:**
 - Earliest: ...
 - Latest: ...
- Created:**
 - Rule Created Date:

At the bottom of the dialog are three buttons: "OK", "Cancel", and "Apply".

- **Rule File.** The name of the rule file or knowledge base that Resource Governor executes to determine whether the request can run.
- A Rule File that contains only custom rules can be associated with multiple data sources, unless those custom rules reference specific table names or column names unique to a data source and are not meant to be general.
- **Govern State.** Indicates whether or not the data source will be governed by the Rule File.
- **On.** The data source will be governed by the Rule File. Only those requests that meet the criteria of the rules in the knowledge base will be permitted to execute.
- **Off.** The data source will not be governed by the Rule File. All requests against the data source will be permitted to execute.
- **Advise.** The data source will not be governed by the Rule File. All requests against the data source which would not be permitted to execute had governing been turned on will be flagged.
- **Data Type.** The database type of the data source for which the knowledge base will be built.
- **Data Source.** The name of the data source for which the rule file or knowledge base will be built.
- **Rule Type.** The type of rule you wish to build for the data source.
 - **Data.** A rule based on the monitored data for the data source.
 - **Custom.** A rule based on a Custom Rule built with the Custom Rule Wizard or by using the Business Rules Language.
 - **Both.** Applies both a Data Rule and a Custom Rule to the data source.
- **Time Type.** The type of time for which a request should be measured. This applies to data rules only.
 - **CPU.** Indicates that CPU time should be used when building the knowledge base and in determining whether a request can run.
 - **Elapsed.** Indicates that elapsed time should be used when building the knowledge base and in determining whether a request can run.
- **Custom Rules.** The name of the Custom Rule file to be used when building the knowledge base.
- **Monitored Data Date Range.** The dates for which monitored data is used for making data rules for the data source.
- **Rule Data Date Range.** The dates used to build existing rules.
- **Rule Created Data.** The date the rule file or knowledge base was created.

Thresholds Tab

The Thresholds tab in the Rule Properties window is display only. Once you've built the knowledge base, the Threshold tab indicates the thresholds for each shift that was in effect when the knowledge base was built.



Date Time Ranges Tab

The Date Time Ranges tab in the Rule Properties window is display only. Once you've built the knowledge base, the Date Time Ranges tab indicates the dates and times for the shifts that were in effect when the knowledge base was built.

Rule Properties

Rule Properties | Thresholds | **Date Time Ranges**

Date Time Ranges for Shift Name: **HOLIDAY**

Parameter Date Range Type

By Date Range By Days of Week

Date Range

Start Date: January 01

End Date: December 31

Time Range

Start Time: 00 : 00

End Time: 23 : 59

Days of Week

Sunday

Monday

Tuesday

Wednesday

Thursday

Friday

Saturday

OK Cancel Apply

When you create a new rule file, update an existing rule file, or delete a rule file, a letter appears next to the rule file in the Data Management Console window.

- **(A)** Indicates that you added a new rule file.
- **(U)** Indicates that you changed the properties of a rule file.
- **(D)** Indicates that you deleted a rule file.

You must save the rule file information to the server for the change to take effect.

Note: If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.



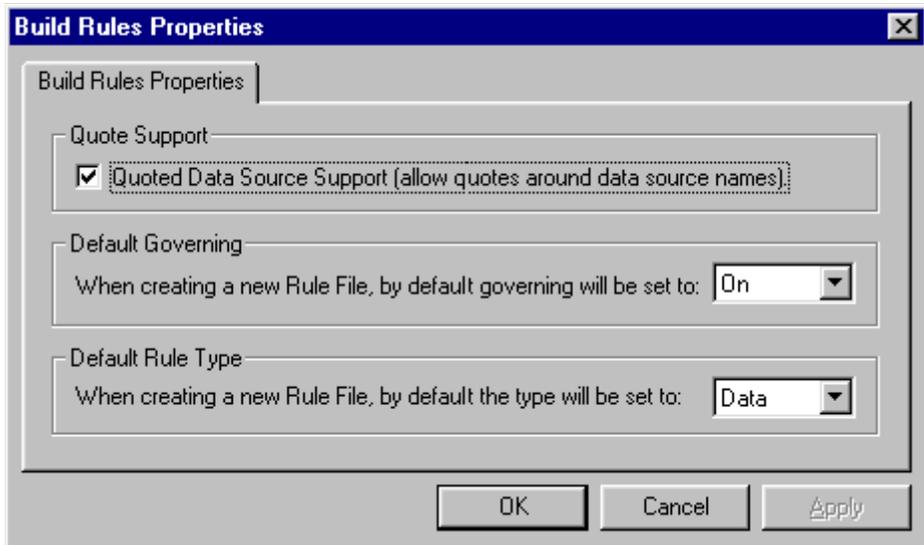
Procedure **How to Set Default Properties for Building Rules**

You can set default values for some properties to be used when you Build Rules. These properties can be overridden for individual Rule Files as necessary.

1. Once you connect to a server, expand the *Business Rules* object.
2. Right-click the Build Rules object and select *Properties* from the Context Menu that displays.

or

Click the *Add* button  on the toolbar. The Build Rules Properties window displays:



3. Check the *Quoted Data Source Support* check box to allow for the support of quoted table names when building rules.
4. Select a Default Governing state (*On*, *Off*, or *Advise*) from the Default Governing drop-down list.
5. Select a Default Rule Type (*Data*, *Custom*, or *Both*) from the Default Governing drop-down list.
6. Click *OK*.

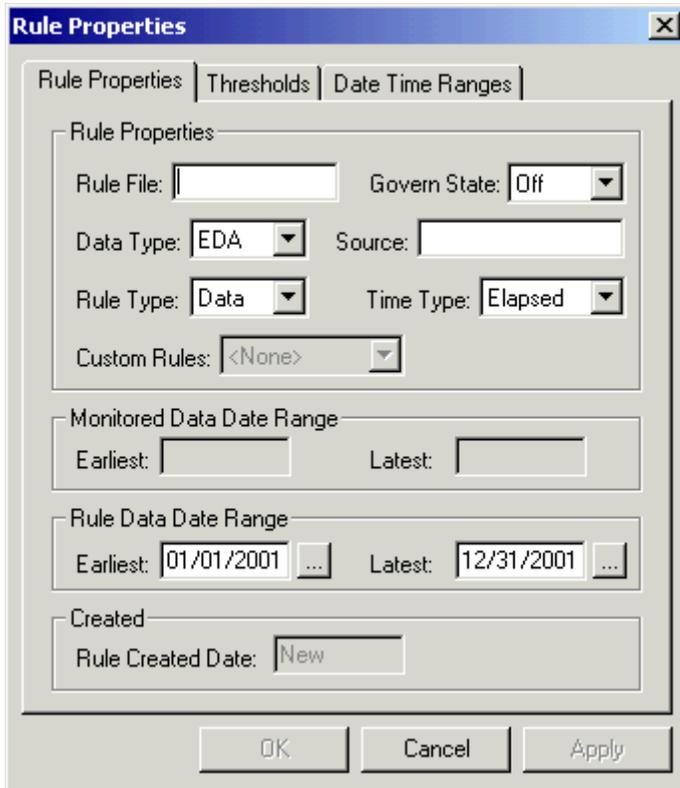
Procedure How to Build a Rule File

Before Resource Governor can govern queries, you must first generate the rules that it uses to determine whether the request is permitted to execute.

1. Once you connect to a server, expand the *Business Rules* object.
2. Right-click the Build Rules object and select *New* from the Context Menu that displays.

or

Click the *Add* button  on the toolbar. The Rule Properties window displays:



3. Enter a name for the Rule File.
4. Select *Govern State* from the drop-down list.
5. Select the Data Type for which you are creating the Rule File.
6. Enter the name of the Data Source for which you are creating the Rule File.
7. Select the Rule Type from the drop-down list.

8. Select a Time Type from the drop-down list.
9. If you selected a Rule Type of Custom, or Both, select a Custom Rule from the drop-down list.
10. Select the earliest and latest dates for the Rule Data Date Range.
11. Click OK.
12. Click the Save button  on the toolbar.

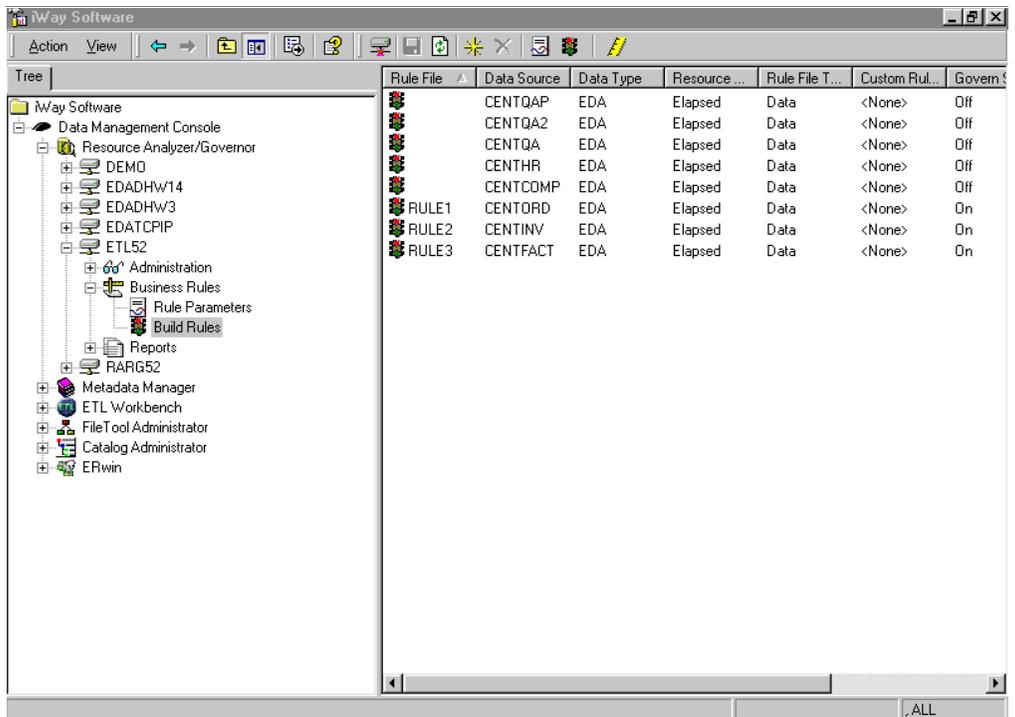
Note: If at any time in this process you decide you want to cancel the changes you have made, click the Refresh button on the toolbar to revert to the settings before the last save.



Procedure How to Modify Rule File Settings

You can modify the Rule File for a data source by updating its properties or by changing the shifts associated with it. Saving changes to the Rule File will re-create the knowledge base or rule file.

1. Once you connect to a server, expand the *Business Rules* object.
2. Click the *Build Rules* object.



3. In the right pane right-click the data source you wish to modify and select *Properties* from the Context Menu that displays.

or

Double-click the *Data Source*. The Rule Properties window displays:

The screenshot shows the 'Rule Properties' dialog box with the following settings:

- Rule Properties:**
 - Rule File: TRADES
 - Govern State: Advise
 - Data Type: EDA
 - Source: TRADES
 - Rule Type: Data
 - Time Type: Elapsed
 - Custom Rules: <None>
- Monitored Data Date Range:**
 - Earliest: 00/01/2000
 - Latest: 00/14/2000
- Rule Data Date Range:**
 - Earliest: 12/04/2000
 - Latest: 12/04/2000
- Created:**
 - Rule Created Date: 12/04/2000

Buttons at the bottom: OK, Cancel, Apply.

4. Update the properties as necessary.

Note:



If a Rule File name has already been created for a data source, you can only edit the Govern State, Rule Type, Time Type and Custom Rules name.

5. Click *OK*.

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

Note:

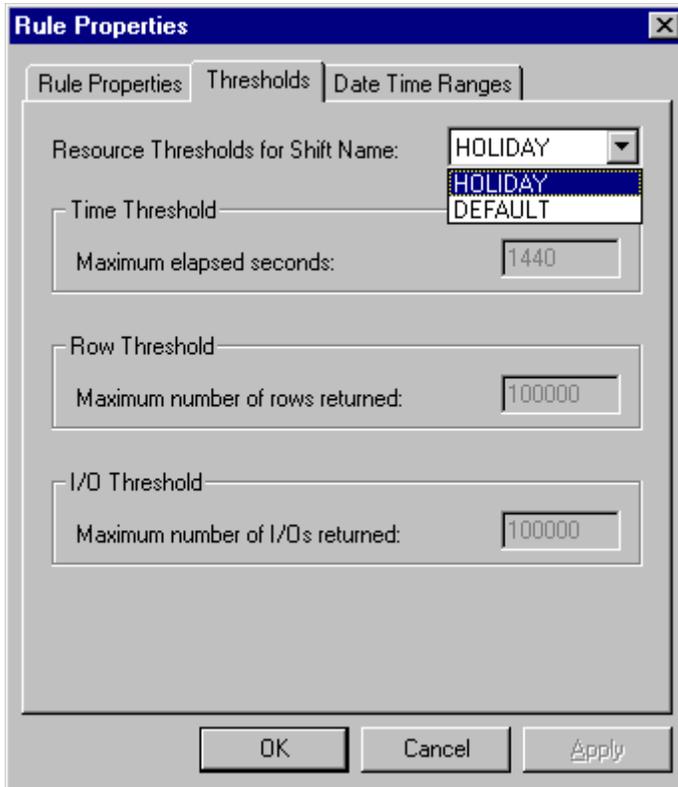


If at any time in this process you decide you want to cancel the changes you have made, click the *Refresh* button on the toolbar to revert to the settings before the last save.

Procedure **How to View Shift Thresholds and Date Time Ranges**

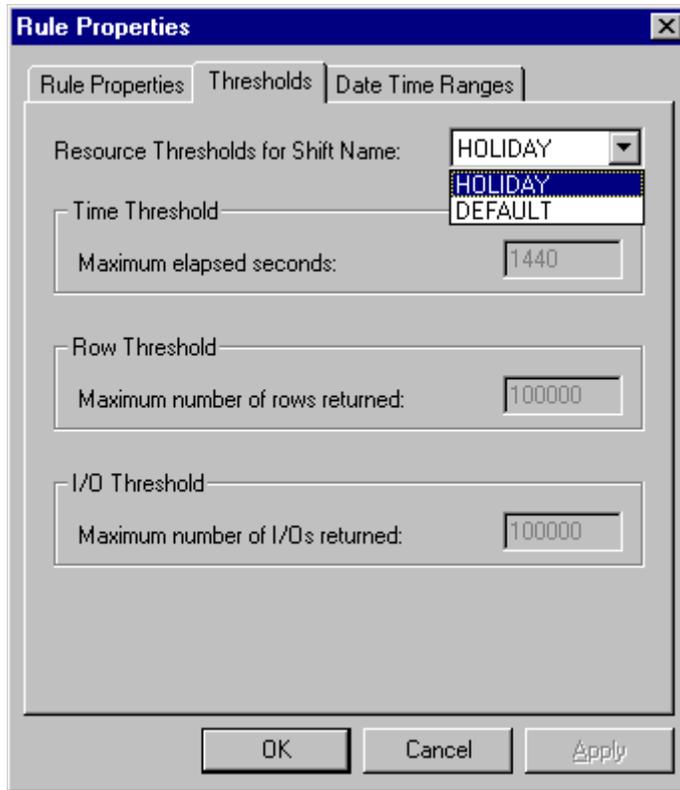
1. Once you connect to a server, expand the *Business Rules* object.
2. Click the *Build Rules* object.
3. In the right pane, click a data source with a Rule File and select *Properties* from the Context Menu that displays.

The Rule Properties window displays:



4. Click the *Thresholds* tab.
5. Click the *Resource Thresholds for Shift Name* drop-down list to see the thresholds in effect for the Rule File. This indicates that those were the active thresholds when the Rule File was created.

- Click the *Date Time Ranges* tab to view the times the Rule is in effect.



- Click *OK*.

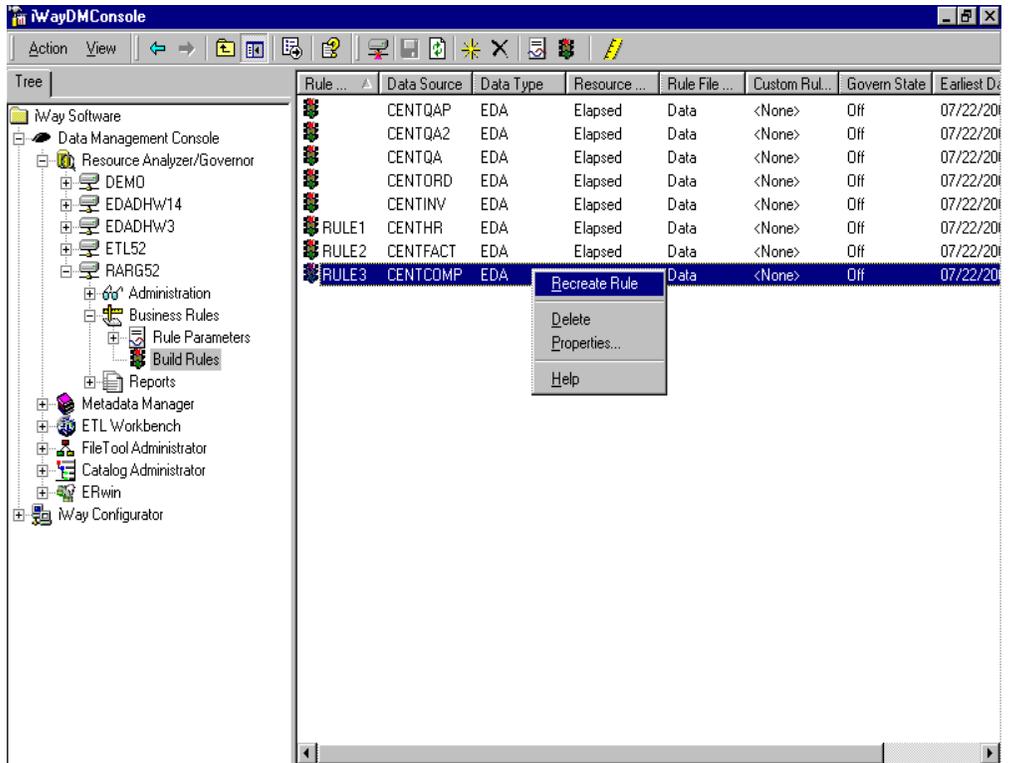
Procedure How to Recreate Rule Files

If for any reason the rules you are using for one or more of your databases are no longer appropriate, you need to re-create the Rule File. This can happen under one of the following circumstances:

- If there is additional collected or monitored data gathered from different queries since the last rules were created.
- You have made changes to thresholds or shift schedules.
- Your collected information is not representative of your actual reporting. Even if the database has not changed, you may discover that some types of recurring requests were not submitted during the time that sampling was done.
- There are significant permanent changes in the characteristics of the database or in the types of reports that are executed.
- There are seasonal differences in database or reporting characteristics.

You only recreate rules for data sources that have Rule Files assigned to them.

1. Once you connect to a server, expand the *Business Rules* object.
2. Click the *Build Rules* object.
3. In the right panel, right-click a data source with a Rule File and select *Recreate Rule* from the Context Menu that displays:



The knowledge base will be re-created based on the shifts and thresholds that are in effect at this time.

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

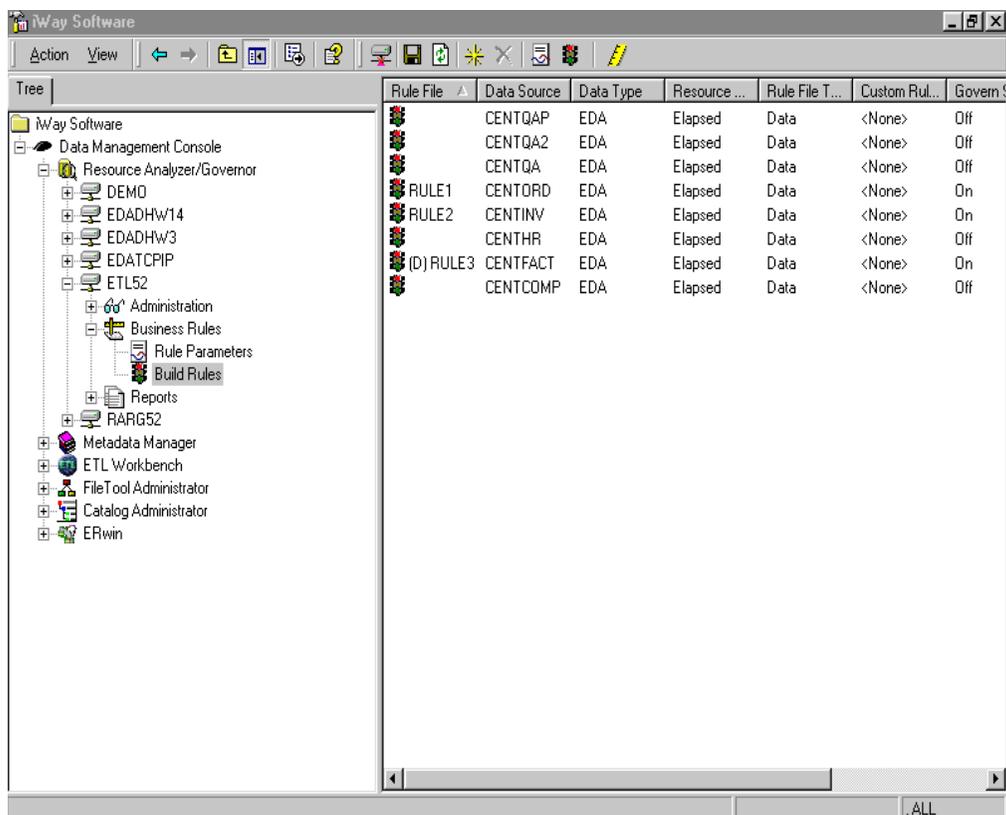
Note: If at any time in this process you decide you want to cancel the changes you have made,  click the Refresh button on the toolbar to revert to the settings before the last save.

Procedure How to Delete a Rule File From a Data Source

1. Once you connect to a server, expand the *Business Rules* object.
2. Click the *Build Rules* object.
3. In the right pane, right-click the data source containing the Rule File and select *Delete* from the Context Menu that displays.

or

Click the *Delete* button  on the toolbar.



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

Note: If at any time in this process you decide you want to cancel the changes you have made,  click the *Refresh* button on the toolbar to revert to the settings before the last save.

Governing

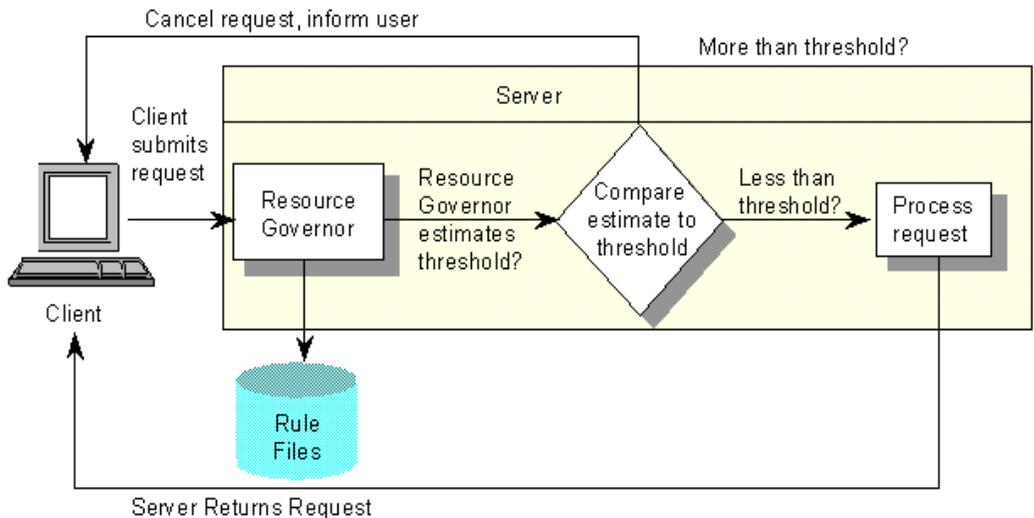
When a user submits a request against any data source monitored by Resource Governor, the governing facility performs high-speed resource usage estimates at run time, using rules that it previously determined. It uses the rules that are stored in the Rule File associated with the data source. Resource Governor decides whether to run or cancel each request based on the Rule File. Depending on the decision, one of the following actions occurs:

- **Run.** The request is allowed to execute.
- **Cancel.** The request is terminated and a cancellation message is returned to the client.
- **Advise.** Resource Governor indicates which requests would have been cancelled if Governing had been set on. For more information, see *Using ADVISE* on page 3-43.

In addition to the resources each request may use, the Resource Governor considers the time of day, the date, and detailed characteristics of the request and compares this to the information in the Rule File.

The Governor can be turned on or off for any data source at any time via the Administrator.

The following diagram illustrates the governing process:



Procedure How to Turn Governing On and Off

Once you have built a Rule File for a data source, you can begin to govern it.

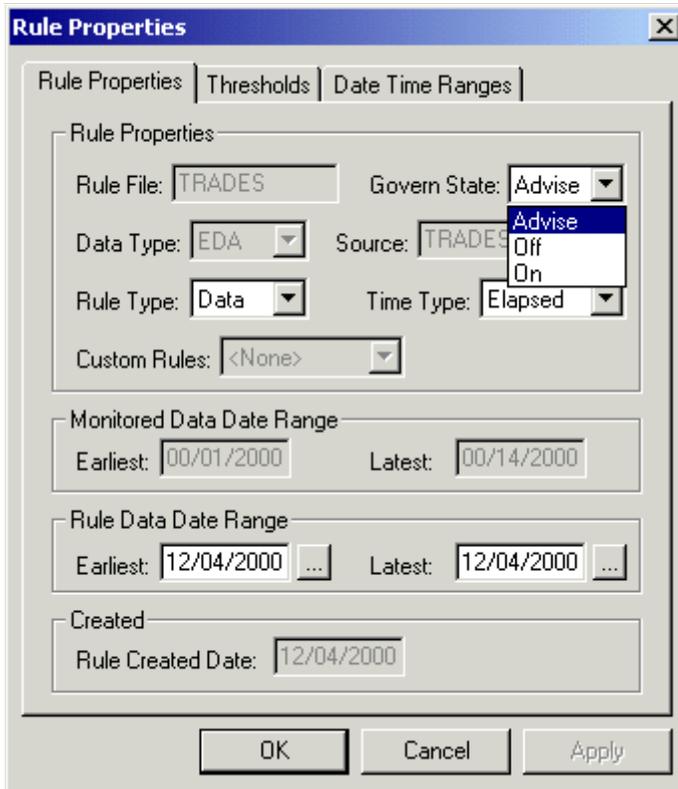
1. Once you connect to a server, expand the *Administrator* object.
2. Click the *Data Monitoring* object.
3. In the right pane, right-click a data source and select *Properties* from the Context Menu that displays.
4. Click the *Governing* tab.

**Note:**

There must be a valid Rule File name appearing under the Rule File heading for the data source you wish to govern.

- From the *Governing State* drop-down list select *On*, *Off* or *Advise*.

You can also change the Govern state by clicking *Build Rules*, then right-clicking a data source in the right pane and selecting *Properties* from the Context Menu that displays. Select the appropriate Govern state from the drop-down list.



- Click *OK*.

You can also change the govern state by clicking the Data Monitoring object in the right pane, right-clicking a data source and selecting *On*, *Off*, or *Advise* from the Context Menu.

- Click the *Save* button  on the toolbar.

Note: If at any time in this process you decide you want to cancel the changes you have made,  click the *Refresh* button on the toolbar to revert to the settings before the last save.

Using ADVISE

ADVISE is a feature that enables the system administrator to ease Resource Governor into the production environment. When the governing mode is ADVISE, the Usage Monitor indicates which request would have been cancelled if governing had been set on. A message is sent back to the client indicating that the request would have been cancelled.

ADVISE gives you the ability to log data about a request that would normally have been cancelled by Resource Governor. With this information, you can then decide if the threshold limits in effect are correct, and if governing should be turned on.

CHAPTER 4

Resource Governor Reports

Topics:

- Accessing Resource Governor Reports
- Resource Governor Report Options
- Executing a Report
- Resource Governor Report Groups

Resource Governor offers several reports, which show among other things, the following information:

- A summary of monitoring data.
- A log of cancelled queries.
- A list of the rules for data sources.

Accessing Resource Governor Reports

Once you have been monitoring data sources, you can execute reports about the monitored data, rules, and canceled requests. This chapter describes the various reports you can execute using Resource Governor.

Reports are organized into three primary groups:

- **Administration.** Verify current Resource Governor parameters for each data source.
- **Usage Monitoring.** Identify how data is accessed.
- **Governing.** Identify what is being governed, by what rules, and the procedures canceled as a result of the governing process. These reports aid in the selection of resource thresholds, and allow you to view automated and custom rules.

Procedure How to Configure Reporting (Windows/NT/2000, UNIX, OS/390 and z/OS, OpenVMS, and AS/400)

The first time you access Resource Governor reports, you are prompted for the location of the iWay Server for use during reporting. The location of the iWay server can be changed at any time.

1. Connect to the appropriate server.
2. Click the *Server* object.
3. Expand the *Reports* object.
4. Right-click the Resource Governor object and select *Properties* from the context menu.
5. Enter the path and port of the Resource Governor server you wish to report on. For example, `http://machinename:port/`.

Note: By default port 8117 is for an ETL Server, 8101 is for a Full Function Server, and 8121 is for a WebFOCUS Server.



Procedure How to Configure Reporting (MVS and VM)

The first time you access Resource Governor reports, you are prompted for the location of the Web server for use during reporting. The location of the Web server can be changed at any time.

1. Connect to the appropriate server.
2. Click the *Server* object.
3. Expand the *Reports* object.
4. Right-click the Resource Governor object and select *Properties* from the context menu.
5. Enter the path of your WebFOCUS CGI server and point to the Resource Governor login page. For example, enter `http://webserver/ibi_html/smsa/rglogin.htm`.
6. Click *OK*.

Procedure How to Access Resource Governor Reports (Windows/NT/2000, UNIX, OS/390 and z/OS, OpenVMS, and AS/400)

1. Connect to the appropriate server.
2. Expand the *Server* object.
3. Expand the *Reports* object.
4. Click *Resource Governor*. The Web Console opens.
5. Click *Procedures*, expand *Resource Reporting*, and click *Resource Governor*.

Note: If both Resource Analyzer and Resource Governor are installed, when you expand the Reports object in the left pane, you can select whether you want to execute reports for Resource Analyzer or Resource Governor.



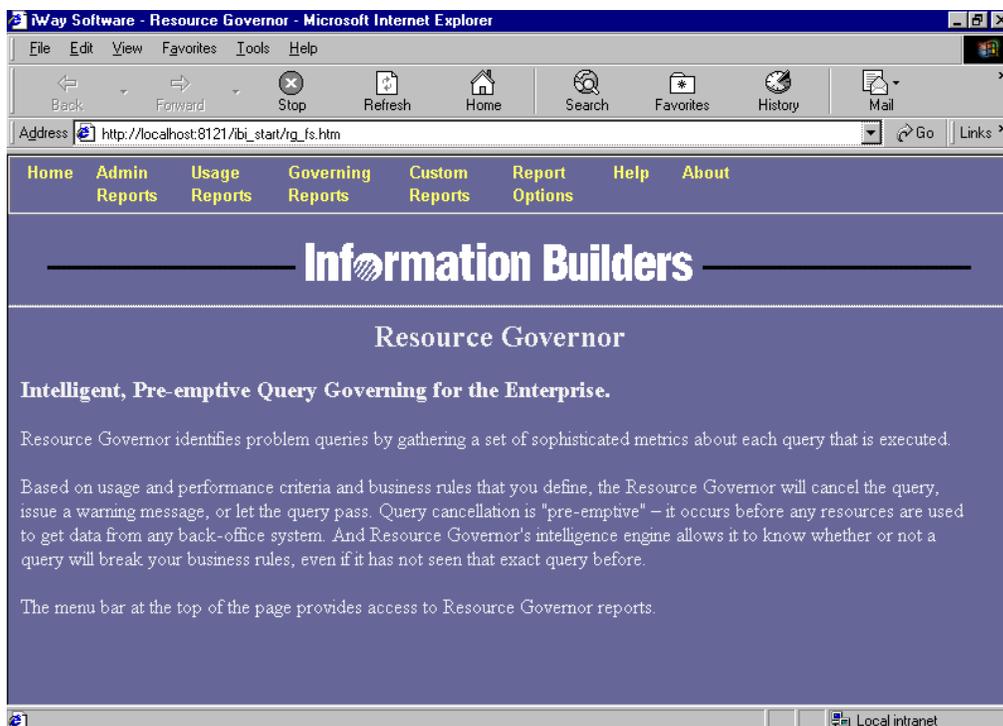
Procedure How to Access Resource Governor Reports (MVS and VM)

1. Connect to the appropriate server.
2. Expand the *Server* object.
3. Expand the *Reports* object.
4. Click *Resource Governor*.



Note: If both Resource Analyzer and Resource Governor are installed, when you expand the Reports object in the left pane, you can select whether you want to execute reports for Resource Analyzer or Resource Governor.

The following window displays for all operating systems:



5. To display the reports in a report group, highlight a report group in the menu bar.



Note: Before you begin executing and viewing the Resource Governor reports, review the general information about reporting with *Resource Governor Report Groups* on page 4-9.

Resource Governor Report Options

There is general information that applies to all Resource Governor reports. This information includes setting date requests for report selection criteria, online help, drilling down on reports for more details, and displaying reports in graphical format.

Report Options: Selection Criteria

Before you execute a report, you can select the range of usage monitoring data to include, along with other selection criteria used in the report. To specify these options, click *Report Options* on the left side of the Resource Governor Reports window. The Report options for Viewing Data window displays:

The screenshot shows a dialog box titled "Report options for Viewing Data - Microsoft Internet Explorer". The dialog has a blue background and a title bar with standard window controls. The main content area is titled "Report Options" and includes a "? Help" link in the top right corner. The settings are as follows:

- Lines per page:** A text input field containing the number "57".
- Use Peer Graphics:** A checked checkbox.
- Display CPU Time in Milliseconds:** An unchecked checkbox.
- Reporting Date Range:**
 - Start Date:** A button showing "Jan 01, 1995".
 - End Date:** A button showing "Jun 21, 2002".
- Default start date:** The text "Jan 01, 1995" is displayed below the Start Date button.
- Use Today's Date:** A checked checkbox.
- Buttons:** "Save" and "Cancel" buttons are located at the bottom center.

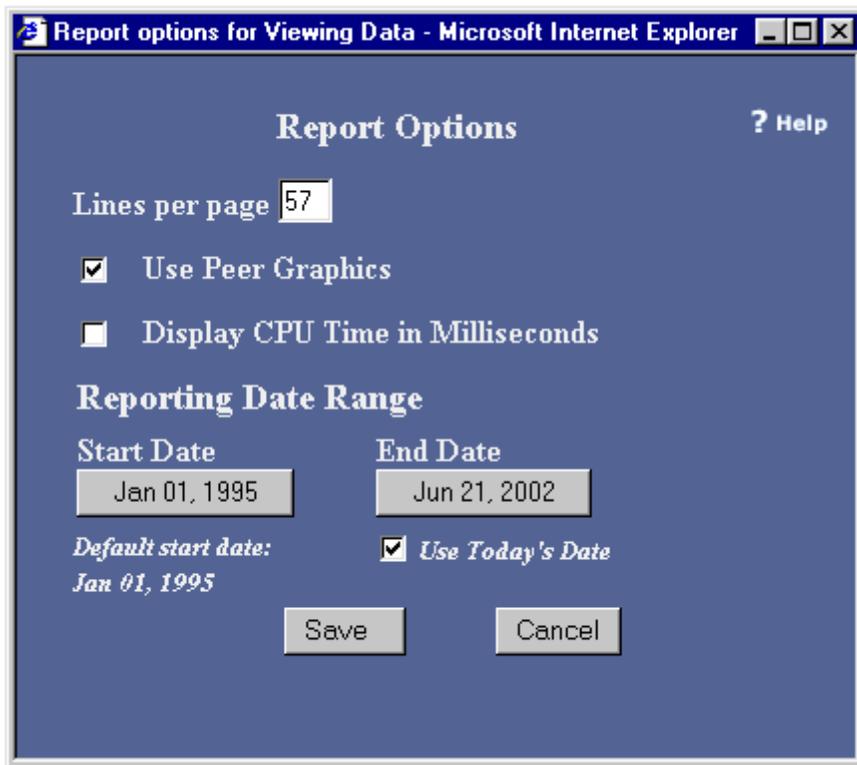
The information supplied here applies to any report you execute. To change this information, return to this window, enter and save the new criteria. Resource Governor Report Options are saved from session to session, so you will not need to reset them when you reconnect to the server.

Procedure How to Set the Lines per Page

By default, reports will display 25 lines per page. To change this, simply enter the number of lines you wish in the *Lines per Page* input box.

Procedure How to Turn Off Data Visualization

You now have the option to turn off data visualization, or peer graphics when displaying reports. By default, this feature is ON. The Use Peer Graphics check box is selected in the following window, indicating that Peer Graphics is ON:



To turn Peer Graphics OFF, uncheck the *Peer Graphics* check box, and click *Save*.

Procedure How to Display CPU Time as Milliseconds

By default, Resource Governor reports display CPU time in seconds. To display CPU time in milliseconds, simply check the *Display CPU Time as Milliseconds* check box.

Procedure How to Set Selection Criteria Dates for Reports

1. In the Reporting Date Range area of the screen, click the button under Start Date. The default start date is Jan. 01, 1995.

A calendar displays, from which you can choose the month, day, and year for the start date of the usage monitoring data on which you want to report.
2. The default end date is the current date. (Note that the *Use Today's Date* checkbox is already checked.) If you want to use an end date other than the current date, uncheck the *Use Today's Date* checkbox and click the *End Date* button. A calendar displays, from which you can select a month, day, and year for the end date of the usage monitoring data on which you want to report.
3. Click *Save*. The dates will be saved and you will be returned to the Resource Governor Reports window.

Note: Clicking Save is necessary. If you do not click Save, the new dates will not be applied.



Online Help

When you are running reports, you have an online help feature at your disposal, accessible through the Help button in the upper-right corner of the screen. The online help provides general background information about the issues applicable to and addressed by Resource Governor.

Drilling Down With Reports

When you execute Resource Governor reports, initially, you will usually see a general summary report for the category. Most of the column headings of the reports are hyperlinked. Click on these column heading links to re-sort the report by different columns. In addition, other hyperlinks in the report let you drill down to more detailed information. The drill down options are described in greater detail throughout this chapter.

Reformat As Option

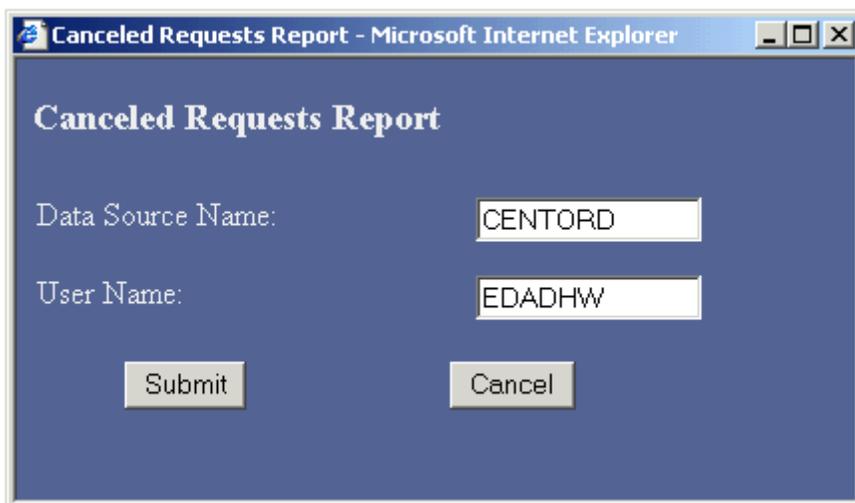
The Reformat As option is available for certain reports. If this option is applicable, the following button  is displayed in the upper-right hand corner. Click the button to invoke a helper application, which generates reports in the following formats:

- Excel
- PDF
- DOC
- WP
- PS

Executing a Report

Depending on the report you execute, you may be prompted for different selection criteria. For example, you can run a report for a specific user ID by entering that user ID in the *User Name* field when prompted. For a full report, leave each selection with its default value.

When you have completed the selection criteria, click *Submit*.



The screenshot shows a web browser window with the following content:

- Window Title: Canceled Requests Report - Microsoft Internet Explorer
- Page Title: Canceled Requests Report
- Form Fields:
 - Data Source Name: CENTORD
 - User Name: EDADHW
- Buttons: Submit, Cancel

Resource Governor Report Groups

The following section provides a description of each report group and the sample output that is generated.

Admin Reports

This report group includes reports that show the administrative values of Resource Governor's governing facility. These reports can be used to verify your server settings.

Example Displaying Monitored Sources

The following report shows all Data Sources that are currently under the control of Resource Governor.

Data Sources Under Control				
Report Date: 09/09/1999				
Server Name: LOOPBACK				
Date Range : 02/11/1999 - 09/09/1999				
<u>Data Source</u>	<u>Type</u>	<u>Rule File</u>	<u>Monitor Status</u>	
			<u>Govern Status</u>	
GLOBAL COLLECTION			OFF	OFF
BROKERS	EDA	BRO809	ON	ON
CASHFLOW	EDA		OFF	OFF
TRADES	EDA		OFF	OFF
SHORT	EDA		OFF	OFF
GGORDER	EDA		ON	OFF
GGPRODS	EDA		ON	OFF
GGSALES	EDA		ON	OFF
GGSTORES	EDA		ON	OFF

Example **Displaying Rule Parameters**

The following report shows the current state of Resource Governor’s governing parameters (shifts and thresholds).

Governing Parameters													
Report Date: 09/09/1999													
Server Name: LOOPBACK													
Date Range : 02/11/1999 - 09/09/1999													
Parameter Name	Parameter Type	Rows	Elapsed Time	CPU Time	Active	Start Date	End Date	Start Time	End Time	Monday	Tuesday	Wednesday	Thu
WEEKEND	Daily	100000	200	100	On	0810	0810	0000	2359	Off	Off	Off	Off
EVENING	Date and Time	9000	130	30	On	0810	0810	1900	2359	Off	Off	Off	Off
EARLY	Date and Time	8000	80	75	On	0101	1231	0000	2359	Off	Off	Off	Off
DEFAULT	Date and Time	9876	65	50	On	0101	1231	0000	2359	Off	Off	Off	Off
MIDDAY	Date and Time	10000	100	35	On	0101	1231	0000	2359	Off	Off	Off	Off

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Usage Monitoring Reports

This report group shows which remote procedures and ad hoc queries have been monitored and the resources used for each procedure.

Example **Displaying Monitored Objects**

The following report shows a summary of all monitored queries.

Monitored Samples Summary			
Report Date: 09/09/1999			
Server Name: LOOPBACK			
Date Range : 02/11/1999 - 09/09/1999			
Data Source	Number of Queries	First Access	Last Access
BROKERS	25	08/09/1999	09/08/1999
GGORDER	2	09/08/1999	09/08/1999
GGPRODS	3	09/08/1999	09/08/1999
GGSALLES	4	09/08/1999	09/08/1999
GGSTORES	4	09/08/1999	09/08/1999
SHORT	6	08/09/1999	09/08/1999
TRADES	25	08/09/1999	09/08/1999

To obtain more detailed reports for each data source shown in the Monitored Samples Summary report, click a Data Source name. The following drill down report shows all the queries for the Brokers data source.

Detailed Resource Usage Data for BROKERS							
Report Date: 09/09/1999							
Server Name: LOOPBACK							
Date Range : 02/11/1999 - 09/09/1999							
Date	Time	User ID	Status	Elapsed Seconds	CPU Seconds	Rows	I/Os
09/08/1999	16:39:25	EDAEIB	Monitor	34	34	29800	33985
08/09/1999	15:24:38	EDAEIB	Monitor	8	8	16983	19315
08/09/1999	15:24:29	EDAEIB	Monitor	1	0	3002	3068
08/09/1999	15:24:31	EDAEIB	Monitor	1	0	3002	3205
09/08/1999	16:38:44	EDAEIB	Monitor	0	0	3002	3068
09/08/1999	16:38:46	EDAEIB	Monitor	22	21	3002	3205
08/09/1999	15:24:27	EDAEIB	Monitor	0	0	2988	3053

Example Displaying Resource Usage

The following report shows resources used by the executed queries.

Resource Usage Summary							
Report Date: 09/09/1999							
Server Name: LOOPBACK							
Date Range : 02/11/1999 - 09/09/1999							
Data Source Name	Number Requests	Average Elapsed Seconds	Average CPU Seconds	Average Rows	Average First I/Os	Access	Last Access
BROKERS	25	3	2	3463	3830	08/09/1999	09/08/1999
GGORDER	2	0	0	4313	4827	09/08/1999	09/08/1999
GGPRODS	3	1	0	4314	4903	09/08/1999	09/08/1999
GGSALES	4	0	0	3238	3687	09/08/1999	09/08/1999
GGSTORES	4	0	0	3238	3687	09/08/1999	09/08/1999
SHORT	6	4	3	1794	2128	08/09/1999	09/08/1999
TRADES	25	3	2	3463	3830	08/09/1999	09/08/1999

Governing Reports

This report group shows which remote procedures and ad hoc queries have been governed or canceled and the rule file used to govern. The reports also show the resources used for each query.

Example **Displaying Canceled Requests**

The following report shows all requests canceled by Resource Governor.

Canceled Requests										
Report Date: 09/09/1999										
Server Name: LOOPBACK										
Date Range : 02/11/1999 - 09/09/1999										
Data Source	Rule File	Rule	Threshold	Time Type	Rows Threshold	Reason	User ID	Procedure	Date	Time
BROKERS	BRORUL	107	6 CPU	10000	TIME	EDAEIB	RUNAWAY	08/31/1999 09:41:46		
BROKERS	BRORUL	107	6 CPU	10000	TIME	EDAEIB	RUNAWAY	08/31/1999 09:52:14		
BROKERS	BRORUL	107	6 CPU	10000	TIME	EDAEIB	RUNAWAY	08/31/1999 15:10:56		
BROKERS	BRORUL	107	6 CPU	10000	TIME	EDAEIB	RUNAWAY	09/01/1999 10:39:39		
BROKERS	BRORUL	107	6 CPU	10000	TIME	EDAEIB	RUNAWAY	09/01/1999 15:35:48		
CASHFLOW	CASHRUL	1	6 CPU	10000	Select *	EDAEIB	ALLCOLS	08/31/1999 09:41:32		
CASHFLOW	CASHRUL	1	6 CPU	10000	Select *	EDAEIB	ALLCOLS	08/31/1999 09:53:07		
CASHFLOW	CASHRUL	1	6 CPU	10000	Select *	EDAEIB	ALLCOLS	09/01/1999 15:37:14		
CASHFLOW	CASHRUL	2	6 CPU	10000	Relation	EDAEIB	FULLSCAN	08/31/1999 09:41:21		
CASHFLOW	CASHRUL	2	6 CPU	10000	Relation	EDAEIB	FULLSCAN	08/31/1999 09:53:00		

To view the SQL statement for a procedure that was canceled, click on a procedure name shown in the Canceled Requests Report. The following is a drill down report for a canceled procedure.

Request on 09/01/1999 at 15:35:48
By Userid EDAEIB from Procedure RUNAWAY
Report Date: 09/09/1999
Server Name: LOOPBACK
Request
SELECT SUM(AMOUNT), TRADER_ID, B.BROKER_NAME, B.DEPARTMENT, AMOUNT F TRADES T, BROKERS B WHERE BUY_SELL= "S" OR BUY_SELL = "B" GROUP BY AMOUNT, TRADER_ID, B.BROKER_NAME, B.DEPARTMENT ORDER BY TRADER_ID, B.BROKER_NAME, B.DEPARTMENT, AMOUNT;

Example Displaying View Rules

The following report shows all rules for a data source, including automated rules created by Resource Governor and custom rules created by the administrator.

View Rules	
Report Date: 09/09/1999	
Server Name: LOOPBACK	
Date Range : 02/11/1999 - 09/09/1999	
Rule	
File	Rule Line
ACCTRULS	
	Rule Wizard Generated Template
	RULE Allow Joins
	IF Number of tables > 5
	THEN DBA Rules Concluded
	AND Rule Number := 1
	AND Run := "F"
	AND Reason := "Joins"
	AND Message1 := "Query exceeds the number of Joins allowed"

Example Displaying Threshold Adviser

The following report recommends thresholds based on a statistical model.

Threshold Adviser			
Recommended thresholds for ALL			
Report Date: 09/17/1999			
Server Name: MYSERVE			
Date Range : 01/01/1995 - 09/17/1999			
Data Source	Elapsed Time Threshold	CPU Time Threshold	Rows Threshold
BROKERS	5	3	16495
CAR	0	0	39
CASHFLOW	18	18	31122
GGORDER	1	0	4317
GGPRODS	1	0	4318
GGSALES	0	0	5502
GGSTORES	0	0	6464
SHORT	0	0	3001
TRADES	5	5	19003

APPENDIX A

Usage Monitoring and Administrative Databases Field Descriptions

Topics:

- Administrative Databases
- Usage Monitoring Databases

This appendix provides descriptions of the administrative and Usage Monitoring databases. Each description shows the database's column definitions.

Administrative Databases

This section lists the data definitions that make up the Resource Analyzer administrative databases and provides an explanation of the column values.

SMCONTROL Database (SMCNTRL.MAS)

Keeps track of which data sources are monitored, governed and have rules applied. This is the main monitoring and governing control database. It is updated every time the administrator either turns on or off collection for either Global Monitoring or individual object monitoring or governing.

Column	Value	Description
SMNAME	Alphanumeric, length=66	The SMNAME can be used for relational or non-relational data types. If it contains a relational database name, it must be fully qualified. For example, there are three identifiers contained in a complete name: 'LOCATION . CREATOR . TABLE '
SMSOURCE	Alphanumeric, length=8	The data type can be a DBMS accessed via SQL passthru, such as DB2; or the data type can be EDA, indicating that a server has access to the data type listed in its catalog. See your Server manual for a list of valid engine names.
SMKNBNAME	Alphanumeric, length=8	The rule file name used for governing.
SMCOLLECT	Alphanumeric, length=1	Indicates whether Resource Analyzer should record Usage Monitor data about any request using SMTBNAME. 0= Off 1= On
SMGOVERN	Alphanumeric, length=1	Indicates whether Resource Analyzer should govern any request using SMTBNAME. 0= Off 1= On
SMADVISE	Alphanumeric, length=1	Indicates whether Resource Analyzer should advise on canceling any request using SMTBNAME. 0= Off 1= On

SMRPCS Database (SMRPCS.MAS)

Contains information on any stored procedure or focexec execution if RPC monitoring is enabled.

Column	Value	Description
SMRPCKEY	Alphanumeric, length=40	Key for a single remote procedure.
SMRPCNUM	Integer	Remote procedure sequence in an execution chain.
SMRPCNAME	Alphanumeric, length=67	Long name of an executed remote procedure.
WFRPCNAME	Alphanumeric, length=66	Long name of an executed WebFOCUS remote procedure.
SMDATE	Alphanumeric, length=8	The date of the RPC run in format 'YYYYMMDD'.
SMTIME	Alphanumeric, length=6	The start time of the RPC run.
SMUSERID	Alphanumeric, length=30	The user identifier that made the connection to the Reporting Server.
SMCPU TIME	Integer	The total CPU time for the RPC in milliseconds.
SMELAP TIME	Integer	The total wall clock time in seconds.
SMIOS	Integer	The total IO for this RPC.
SMROWS	Integer	The total rows returned to the client.
SMROWWIDTH	Integer	The byte count of the widest row returned.
SMCONNADDR	Alphanumeric, length=32	The connection address.
SMCONNTYPE	Integer	The connection type. 1=TCP 2=SNA 3=IPX

Column	Value	Description
SMRPCNUM	Integer	The parent SMRPCNUM. 0=Root RPC
SMJOINFLD	Alphanumeric, length=1	Join field, the element needed to join this database to RCAPRMS database.
SABANDWIDTH	Integer	The computed value of SMROWS * SMROWWIDTH.
SAMO	Alphanumeric, length=2	The numeric value of the month the request was executed.
SAYEAR	Alphanumeric, length=4	The numeric value of the year the request was executed.
SAMONTH	Alphanumeric, length=9	The character name of the month the request was executed.
SACONNTYPE	Alphanumeric, length=7	Indicates connection method used when the request was executed: 1 - TCP 2 - SNA 3 - IPX 0 - Unknown
SACPUTIME	Integer	The total CPU time for the RPC (in seconds).

SMKBASE Database (SMKBASE.MAS)

This is the database that is updated during the Build Rules process. It contains information on all Knowledge Base files created for the data objects.

Note: This database is created during installation/configuration. It is only used with Resource Governor.



Column	Value	Description
SMNAME	Alphanumeric, length=66	The SMNAME can be used for relational or non-relational data types. If it contains a relational table name, it must be qualified. For example, there are three identifiers contained in a complete name: 'LOCATION . CREATOR . TABLE '
SMSOURCE	Alphanumeric, length=8	The data type can be a DBMS accessed via SQL passthru, such as DB2; or the data type can be EDA, indicating that a server has access to the data type listed in its catalog. See your EDA Server manual for a list of valid engine names.
SMKNBNAME	Alphanumeric, length=8	The rule file name used for governing.
SMSHIFTNAME	Alphanumeric, length=8	The name for a time shift. Each rule file occurrence has at least the DEFAULT shift associated to it.
SMSTARTDATE	Alphanumeric, length=4	The start date for a specific shift in the format: 'MMDD ' For example, if the shift is a holiday, such as Christmas, then the SMSTARTDATE= '1225'.
SMENDDATE	Alphanumeric, length=4	The end date for a specific shift in the format: 'MMDD ' For example, if the shift is a holiday, such as Christmas, then the SMENDDATE= '1225'.

Column	Value	Description
SMSTARTTIME	Alphanumeric, length=4	The start time for the thresholds to take effect. The format is 'hhmm,' which designates the hours and minutes.
SMENDTIME	Alphanumeric, length=4	The end time for the thresholds to take effect. The format is 'hhmm,' which designates the hours and minutes.
SMCUSTOM	Alphanumeric, length=8	The name of the custom rule file.
SMTIMETYPE	Alphanumeric, length=8	The time parameter passed to GKERULE or GKEKNB that indicates either CPU or ELAPSED time.
SMCREATED	Alphanumeric, length=8	The date/time that the rule file was created, in the format 'YYYYMMDD'.
SMFIRSTDATE	Alphanumeric, length=8	The effective start date of the Usage Monitor data used, in the format 'YYYYMMDD'.
SMLASTDATE	Alphanumeric, length=8	The effective end date of the Usage Monitor data used, in the format 'YYYYMMDD'.
SMMONDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTTYPE=D.
SMTUESDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTTYPE=D.

Column	Value	Description
SMWEDNESDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMTHURSDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMFRIDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMSATURDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMSUNDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMSHIFTYPE	Alphanumeric, length=1	The flag indicating whether the shift date range or shift day of the week is used. S= By date range D= By day of week
SMROWS	Integer	The shift's row threshold.
SMTIME	Integer	The shift's time threshold.

Column	Value	Description
SMIOS	Integer	The shift's IOS threshold.
SMSTATUS	Integer	The status of the rule induction process. 0 = Complete 1 = Submitted 2 = In progress
SMKNBTYPE	Alphanumeric, length=1	A flag that indicates the Knowledge Base type. D = Data rules C = Custom rules B = Both

SMPRL Database (SMPRL.MAS)

This database is updated during the Build Rules process or the Custom Rule Builder wizard and contains all PRL statements generated by the data induction process or the custom rule build wizard.

Note: This database is created during installation and configuration. It is only used with Resource Governor.



Column	Value	Description
SMKNBNAME	Alphanumeric, length=8	The rule file name used for governing.
SMSEGNUM	Integer	The sequence number.
SMPRLLINE	Alphanumeric, length=80	Each line of the rule file governing program written in Production Rule Language (PRL).
SMPRLTYPE	Alphanumeric, length=1	The Production Rule Language (PRL) code was produced by the Resource Analyzer rule engine or by custom rule building. A= Produced by rule engine C= Produced by custom rule building

SMPARAMETERS Database (SMPRMTRS.MAS)

This database contains all shift parameters and thresholds.

Note: This database is created during installation/configuration. It is only used with Resource Governor.



Column	Value	Description
SMSHIFTNAME	Alphanumeric, length=8	The shift name.
SMSTARTTIME	Alphanumeric, length=4	The start time for the thresholds to take effect. The format is 'hhmm,' which designates the hours and minutes.
SMENDTIME	Alphanumeric, length=4	The end time for the thresholds to take effect. The format is 'hhmm,' which designates the hours and minutes.
SMSTARTDATE	Alphanumeric, length=4	The start date for the thresholds to take effect. The format is 'MMDD,' which designates the month and day.
SMENDDATE	Alphanumeric, length=4	The end date for the thresholds to take effect. The format is 'MMDD,' which designates the month and day.
SMCPU TIME	Integer	The CPU time threshold is the CPU seconds that are allowed to be consumed by the server process executing a request.
SMELAP TIME	Integer	The elapsed time threshold is the physical seconds that are allowed to be consumed by the server process executing a request.
SMROWS	Integer	The threshold representing the maximum number of result rows that can be returned to a client.
SMIOS	Integer	The threshold representing the maximum number of IOs that are allowed to be consumed by the server process executing the request.

Column	Value	Description
SMUSED	Alphanumeric, length=1	The status flag indicating that the shift is in use. 0= The shift is not in effect for all subsequent rule building. 1= The shift is in effect for all subsequent rule building.
SMMONDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMTUESDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMWEDNESDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMTHURSDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.
SMFRIDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTYPE=D.

Column	Value	Description
SMSATURDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTTYPE=D.
SMSUNDAY	Alphanumeric, length=1	A flag that indicates whether this day of the week is used for this shift. 0= Do not use this day of the week for the shift. 1= Use this day of the week for the shift. Note: Used only when SMSHIFTTYPE=D.
SMSHIFTTYPE	Alphanumeric, length=1	The flag indicating whether the shift date range or shift day of the week is used. S= By date range D= By day of week

Usage Monitoring Databases

This section lists the data definitions that comprise the Resource Analyzer Usage Monitoring Databases, and provides an explanation of the column values. A unique index is also created for the SMQUERY database.

SMQUERY Database (SMQUERY.MAS)

Contains the analysis of the query. This is the main record created for each request that is monitored or governed.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMDATE	Alphanumeric, length=8	The date in the format 'YYYYMMDD'.
SMTIME	Alphanumeric, length=6	The time in the format 'hhmmss'.
SMUSERID	Alphanumeric, length=30	The user identifier that made the connection to the server.

Column	Value	Description
SMGROUPNAME	Alphanumeric, length=8	The security group identifier used for the current user ID.
SMEDASERVER	Alphanumeric, length=8	The server name as defined in the GKESET FOCEXEC file.
SMEDASERVTYPE	Integer	The server type as defined in the GKESET FOCEXEC file. 1 = Gateway 2 = Full-function 3 = Hub
SMCOLLECT	Alphanumeric, length=1	0 = Usage Monitor is turned on in GKTABLE 1 = Unable to estimate 2 = Cancelled 3 = ADVISE
SMALLROWS	Alphanumeric, length=1	0 = Incomplete result set 1 = Complete result set 2 = Incomplete, resource limited by the data engine
SMCORRQRY	Alphanumeric, length=1	Indicates whether this is a correlated request. 0 = No 1 = Yes
SMSETALL	Alphanumeric, length=1	Indicates whether SET ALL is used. 0 = No 1 = Yes
SMELAPTIME	Integer	The amount of elapsed time used by the request in seconds.
SMCPUTIME	Integer	The amount of CPU time used by the request in milliseconds.
SMROWS	Integer	The number of result rows returned to client.
SMIOS	Integer	The number of input/output operations used by the server to satisfy the request.

Column	Value	Description
SMRECLIMIT	Integer	The maximum number of result rows that has been set by the request or by the server. The value is zero if there is no limit.
SMHOLDFILE	Alphanumeric, length=8	The name of the HOLD file used.
SMRPCNAME	Alphanumeric, length=66	The long remote procedure name if the request originated in a remote procedure.
SMUNIONS	Integer	The number of UNION statements in the request.
SMUNIONALLS	Integer	The number of UNION ALL statements in the request.
SMNUMFROMS	Integer	The number of data types used in the request. Also, the number of rows entered in SMFROMS database.
SMNUMCOLUMNS	Integer	The number of columns used in the request. An asterisk (*) will be counted as 1.
SMNUMREQUESTS	Integer	The number of rows stored in the SMREQUESTS database, based on 72 characters per line of the original request.
SMNUMRELATIONS	Integer	The number of relational clauses in the request.
SMNUMGROUPBYS	Integer	The number of GROUP BYs in the request.
SMNUMORDERBYS	Integer	The number of ORDER BYs in the request.
SMNUMBYS	Integer	The number of FOCUS BYs in the request.
SMNUMFUNCTIONS	Integer	The number of functions used in the request.
SMREADLIMIT	Integer	The read limit value.
SMVIEWSEG	Integer	The view segment number.
SMVIEWFLD	Integer	The view field number.
SMVIEWIDX	Integer	The view index number, or 0 for none.

Column	Value	Description
SMCACHESIZE	Integer	The size of cache in 4K pages.
SMQUERYTYPE	Integer	The query type: 0=SQL 1=Table 2=TableF 8=Modify 25=Graph 28=Analyse 32=Match 66=Maintain
SMHYPERFOC	Alphanumeric, length=1	Reserved.
SMEXTSORT	Alphanumeric, length=1	Indicates whether external sort was used. 0=No 1=Yes
SMLIVE	Alphanumeric, length=1	Indicates whether request is interactive, batch, or network. T=Interactive N=Network S=Batch
SMOUTPUT	Alphanumeric, length=1	Indicates whether output is online or offline. 0=Online 1=Offline
SMSCREEN	Alphanumeric, length=1	Indicates whether set screen is used. 0=No 1=Yes
SMSUNAME	Alphanumeric, length=8	The name used in USE FOCUS command.

Column	Value	Description
SMRECTYPE	Alphanumeric, length=1	Indicates the request type: S=SQL Select E=Execute C=Create (SQL) D=Drop (SQL) R=Alter (SQL) U=Update (SQL) I=Insert Into (SQL) D=Delete (SQL) T=Table (FOCUS) F=TableF (FOCUS) M=Match File (FOCUS) G=Graph (FOCUS) Y=Modify (FOCUS) N=Maintain
SMCONNADDR	Alphanumeric, length=32	Indicates the connection address: <ul style="list-style-type: none"> • TCPIP • SNA • IPX MAC
SMCONNTYPE	Integer	Indicates the connection type: 1=TCP 2=SNA 3=IPX
SMRPCLNO	Integer	The RPC line number of the request stack run.
SMROWWIDTH	Integer	The total byte count of row retrieval.
SMRPCKEY	Alphanumeric, length=40	The key of a single RPC.
SMRPCNUM	Integer	The level of an RPC call.
SMHOLDFORMAT	Integer	The format type indicator. (See SAHOLDFORMAT.)
SMHOLDTYPE	Integer	The hold type indicator. (See SAHOLDTYPE.)

Column	Value	Description
SMREMARKS	Alphanumeric, length=20	The comment available for the administrator's use.
SABANDWIDTH	Integer	The computed value of SMROWS * SMROWWIDTH.
SAMO	Alphanumeric, length=2	The numeric value of the month of the request.
SAYEAR	Alphanumeric, length=4	The numeric value of the year of the request.
SAMONTH	Alphanumeric, length=9	The character value of the month of the request.
SACONNTYPE	Alphanumeric, length=7	Indicates the connection method used when the request was executed. 1 TCPIP 2 SNA 3 IPX 0 UNKNOWN

Column	Value	Description
SAHOLDFORMAT	Alphanumeric, length=8	Indicates type of hold file being created: 1 DIF 2 ALPHA 3 LOTUS 4 WP 5 IFPS 6 SLYK 7 CALC 8 FOCUS 9 DOC 10 BINARY 11 POSTSC 12 PS 13 ROLLUP 14 HTML 15 HTMTAB 16 COMMA 17 FUSION 18 GIF 19 BMP 20 WMF 21 EXCEL 22 GRAPH 23 SCREEN 24 FXF 25 VIEWER 26 CLIP 27 RTF 28 PDF 29 EXL4 30 EXL2K 31 NOTES 32 TABS 33 FXSL 34 INTERNAL 35 WK1 36 DBASE 37 DBASEIII 0 UNKNOWN

Column	Value	Description
SAHOLDTYPE	Alphanumeric, length=8	Indicates the kind of HOLD being performed: 1 HOLD 2 PCHOLD 3 SAVE 4 SAVB 0 UNKNOWN
SACPUTIME	Integer	The amount of CPU time used by the request in seconds.

SMREQUESTS Database (SMREQSTS.MAS)

Contains the actual query that was monitored.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMRPCNUM	Integer	The RPC number.
SMSEGNUM	Integer	The sequence number.
SMSQLLINE	Alphanumeric, length=72	A line of the request.

SMFROMS Database (SMFROMS.MAS)

Contains the list of DBs that are queried against. This is always created as any request must have at least one data source.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMSEGNUM	Integer	The sequence number.
SMNAME	Alphanumeric, length=66	The database name or data type name used in the request.
SMDBMS	Alphanumeric, length=8	The name of the EDA engine and the engine name EDA when using Master/Access passthru.

Column	Value	Description
SMSUFFIX	Alphanumeric, length=8	The engine type of the source, for example, FOC, SQLMSS.
SMALIAS	Alphanumeric, length=66	The name defined by the USE command.
SMMORE	Alphanumeric, length=1	1=MORE FILE
SMUSE	Alphanumeric, length=1	1=via USE
SMSU	Alphanumeric, length=1	1=SU 0=ALLOCATED
SMSUNAME	Alphanumeric, length=8	The name of the FDS Server.

SMCOLUMNS Database (SMCOLMNS.MAS)

Contains information about the columns used in queries. A select * against a relational database using pass thru will not have a smcolumns table update.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMSEGNUM	Integer	The sequence number.
SMNAME	Alphanumeric, length=66	The database name or data type name used in the request.
SMCOLUMN	Alphanumeric, length=66	The column or field name used in the request.
SMDISTROWS	Alphanumeric, length=1	Indicates whether DISTINCT was used for this column. 0 = No 1 = Yes

Column	Value	Description
SMALLCOLS	Alphanumeric, length=1	Indicates whether a SELECT * or FOCUS PRINT was used. 0 = No 1 = Yes
SMDEFINES	Alphanumeric, length=1	Indicates what type of temporary field is created (the default is relational). 0 = Unknown 1 = Real 2 = Permanent define 3 = Temporary define 4 = Compute
SMLITERAL	Alphanumeric, length=32	The literal used for column.
SMFORMAT	Alphanumeric, length=8	The format of the field or column.
SMUSAGE	Integer	The Master File usage of field or column. 0 = Unknown 1 = Integer 2 = Float 3 = Double 4 = Pack 5 = Zone 6 = Alpha 7 = Hex 8 = Exponent 9 = Date 11 = Text 12 = DBCS 13 = BLOB 14 = CLOB 15 = Time 16 = Datetime 23 = JDE_PACK
SMSIZE	Integer	The length of column in bytes.
SMDEC	Integer	The number of places to the right of the decimal.

Column	Value	Description
SMIDXKEY	Alphanumeric, length=1	Is this an indexed column in a Master File? 0=No 1=Yes
SATYPE	Alphanumeric, length=16	Indicates the type of field: 1 Real field defined in the MFD 2 Field DEFINEd in the MFD 3 Field DEFINEd in the procedure 4 Field COMPUTEd in the procedure 0 Unknown
SAUSAGE	Alphanumeric, length=8	Indicates the format of the field: 1 INTEGER 2 FLOAT 3 DOUBLE 4 PACK 5 ZONE 6 ALPHA 7 HEX 8 EXPONENT 9 DATE 11 TEXT 12 DBCS 13 BLOB 14 CLOB 15 TIME 16 DATETIME 23 JDE_PACK 0 UNKNOWN

SMRELATIONS Database (SMRELTNS.MAS)

Tracks the operations used on the column. This will be updated only if the request has a where or if test.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMSEGNUM	Integer	The sequence number.
SMOPERATOR	Alphanumeric, length=8	The operator used in a clause, such as '<' or '='.
SMAOPERATOR	Alphanumeric, length=1	The arithmetic operator used in a clause, such as '+' or '*'.
SMANDOR	Alphanumeric, length=3	The connector in or between clauses.
SMRNAME	Alphanumeric, length=66	The database name or data type name used in the request.
SMRCOLUMN	Alphanumeric, length=66	The right column or field name used in the relation.
SMLNAME	Alphanumeric, length=66	The database name or data type name used in the request.
SMLCOLUMN	Alphanumeric, length=66	The left column or field name used in the relation.
SMNOT	Alphanumeric, length=1	Indicates whether the NOT keyword was used. 0 = No 1 = Yes
SMALL	Alphanumeric, length=1	Indicates whether the ALL keyword was used. 0 = No 1 = Yes
SMANY	Alphanumeric, length=1	Indicates whether the ANY keyword was used. 0 = No 1 = Yes

Column	Value	Description
SMLITERAL	Alphanumeric, length=32	The literal used.
SMEXISTS	Alphanumeric, length=1	Indicates whether the EXISTS keyword was used. 0 = No 1 = Yes
SMRELTYPE	Alphanumeric, length=8	Indicates whether a WHERE, HAVING, or IF was used in this relation clause.
SMCORRELATED	Alphanumeric, length=1	Indicates whether this relation caused a correlation. 0 = No 1 = Yes
SMCORRCOLUMN	Alphanumeric, length=1	Indicates whether a column used caused a correlation. 0 = No 1 = Yes

SMBYS Database

Contains the BY or ORDER BY column Name or number.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMSEGNUM	Integer	The sequence number.
SMNAME	Alphanumeric, length=66	The database name or data type name used in the request.
SMCOLUMN	Alphanumeric, length=66	The column or field name used as the target of the SORT BY or GROUP BY.
SMCOLNBR	Alphanumeric, length=4	The column number used in an SQL ORDER BY.
SMORDER	Alphanumeric, length=1	A = Ascending sort D = Descending sort
SMBYTYPE	Alphanumeric, length=1	Indicates whether sorting or grouping was performed on the column. B = Sort G = SQL Group

SMFUNCTIONS Database (SMFNCTNS.MAS)

Tracks functions used on columns. This is updated if the request used a function such as MIN, MAX, SUM or AVE.

Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMSEGNUM	Integer	The sequence number.
SMALLROWS	Alphanumeric, length=1	Indicates whether '*' was used.
SMFUNCTION	Alphanumeric, length=12	The function used.
SMNAME	Alphanumeric, length=66	The database name or data type name used in the request.

Column	Value	Description
SMCOLUMN	Alphanumeric, length=66	The column or field name used.
SMLITERAL	Alphanumeric, length=32	The literal used.

SMGOVERN Database (SMGOVEND.MAS)

This database is updated if a request is either governed or if advise is on.

Note: This database is created during installation and configuration. It is only used with Resource Governor.



Column	Value	Description
SMKEY	Alphanumeric, length=40	The request key.
SMELAPTHRESH	Integer	The elapsed time threshold in effect.
SMROWTHRESH	Integer	The result row threshold in effect.
SMIOTHRESH	Integer	The IO threshold in effect.
SMCANCELTHRESH	Alphanumeric, length=8	The threshold that was exceeded by name. This can be ELAPSED, ROWS, NOEST, or RUN.
SMRULENUM	Integer	The rule number that caused the governing result or decision.
SMKBNAME	Alphanumeric, length=8	The rule files name that governed.

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