
WSAM User Guide v1.1.3

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About this Book

This book is the User's Guide for WebSphere® Studio Application Monitor (Application Monitor). It contains instructions and user information for the Application Monitor.

Who should read this book

Anyone who wants to learn more about how to use the Application Monitor.

Where to find more information

The following list shows the books in the Application Monitor library:

- *WebSphere Studio Application Monitor User's Guide for the Monitoring Console* contains instructions and user information for the Application Monitor.
- *WebSphere Studio Application Monitor Operations Guide* contains information about the operation of the Application Monitor and the common services address space.
- *WebSphere Studio Application Monitor Installation and Customization Guide* contains instructions on installing user exits and customizing the Application Monitor.
- *WebSphere Studio Application Monitor Messages and Codes* contains information about messages and codes generated by the Application Monitor.
- *WebSphere Studio Application Monitor Program Directory* contains complete installation instructions for the Application Monitor Engine.
- *The WebSphere Studio Application Monitor Controller* has an online help system that describes all of the commands and dialogs available from its graphical user interface.

Getting Started

Welcome to WSAM — the system that monitors the status of transactions in your J2EE application server farm without byte code modification. It also provides a complete history of all performance and availability metrics and a real-time visualization engine. You can use it to find the root cause of problems and troubleshoot them quickly, and enable capacity planning and sizing within a business context.

Product Overview

The Monitoring Console strives to make the Data Center Operator's responsibilities easier to manage by providing an application that allows them to easily answer their questions about system and application troubleshooting. The following list describes the functional components of the console based on the top-level navigation structure.



FIGURE 1. Top Navigation

Administration

The top-level navigation for Administration includes Account Management, Server Management, Monitoring on Demand™, and Managing Server.

Account Management

The Account Management section contains the User Profiles and Role Configuration. Manage your user accounts in User Profiles. Add and delete user account as necessary. Role Configuration displays the system default roles and any custom roles created by the administrator specific to the needs of their data center environment. Manage the custom roles by maintaining and updating user account access.

Server Management

Server Management contains the Server Groups and Data Collector Configuration. In Server Groups, manage the groups by creating, duplicating, and deleting groups as needed. Maintain existing groups by editing them when necessary. In Data Collector Configuration, configure and unconfigure Data Collectors, maintain your Data Collectors' status and create configurations to apply to your Data Collectors. In addition, manage your configurations by creating, applying, modifying, duplicating, and deleting to keep them up-to-date.

Monitoring on Demand™

Monitoring on Demand™ (MOD) provides the user with three different types of monitoring levels to choose from for each group or server including: L1 (Production mode), L2 (Problem Determination mode), and L3 (Tracing mode). Create a schedule to apply to a server or group of servers. Notes that the z/OS platform uses modes L1 and L3 only.

Managing Server

The Managing Server contains the System Properties, Self-Diagnosis, and Data Management. In System Properties, maintain the system settings for WSAM. Also control the settings for the following properties: Data Collection Settings, Application Overview Display and SNMP Network.

The Self-Diagnosis allows you to view all the components currently running in WSAM, and their states and attributes in the Self-Diagnosis. WSAM consists of the following components: Kernel, Data Collector Controller, Publish Server, Archive Agent and Message Dispatcher, and because WSAM is designed to work as a loosely-coupled system, the components can be up or down without affecting the integrity of the whole system. Data Management provides a method for permanently deleting excess data from the database server.

Availability

The top-level navigation for Availability includes the Application Overview and the Server Statistics Overview.

Application Overview

The Application Overview page displays information for groups of servers (i.e. server farm). It provides the highest level view of health status for the server farm in a typical Data Center. Additional data displayed on the page includes completed

requests for the group. Links are available for each of the groups to further investigate the availability and to search the group information for a request.

Server Statistics Overview

The Server Statistics Overview page provides application server-level statistics for quick assessment of server activity and related platform data. This page assists the operators in drawing an educated guess of the true availability of the applications being served in the individual application servers. This is also called activity-based availability as opposed to IP availability.

Problem Determination

The top-level navigation for Problem Determination includes the In-Flight Request Search, Server Activity Display (SAD), Memory Diagnosis, Software Consistency Check, and Trap & Alert Management.

In-Flight Request Search

The In-Flight Request Search page provides a searching component to search for a request on a troubled application server. When a client makes a request for a particular server resource, in most cases, the user requests a Web page or a Java application. To search for a request, enter in the request using alpha numeric characters or a URL string or leave it blank to search for everything.

Server Activity Display (SAD)

The Server Activity Display (SAD) page provides thread data for an application server at a specific point in time. You may filter the threads by the type, or select another filter from the drop-down list. This will limit the list to the type of thread you want to view. After pinpointing a hung thread, click the Thread's ID to review more request detail.

Memory Diagnosis

The Memory Diagnosis section provides the user with diagnostic tools to discover memory related problems in their environment. Memory Analysis provides an interface to help the user create useful server activity analysis reports regarding memory. Heap Analysis captures the runtime heap of an application server and breaks it down by the class names of the objects residing in the heap at the time of the snapshot while providing the number of instances and the size of the information. Lastly, Memory Leak helps confirm the existence of a memory leak and locates the most likely memory leak candidates.

Software Consistency Check

Access runtime environment and installed binaries information for your entire server farm through the Software Consistency Check. Perform a check on a selected server or compare one properly functioning server to up to 10 other servers in the farm. Use these functions to locate files that have not been updated or do not match.

Trap & Alert Management

Set software traps and alerts to monitor a Group of servers or selected server. By setting traps and alerts, the user will be notified immediately when the system meets the conditions of the trap and the alert they set. An action will either be sending an email or creating a record in a file.

Performance Management

The top-level navigation for Performance Management includes the System Resources, System Resource Comparison, Performance Analysis & Reporting, and Daily Statistics.

System Resources

The System Resources page displays summary information for all the resources on the selected application server. WSAM captures the data for this page every 5 minutes for display. You can configure the System Resources Overview page to monitor specific resources. From the System Resources Overview, you can use the left navigation to switch the view to data on EJBs, Database Connection Pools, Servlet/ Session Manager, Thread Pools, Transactions, Connectors, Execute Queue, Server, JMS, JCA and Web Applications.

System Resource Comparison

Compare all the servers in a group by a selected resource using the System Resource Comparison. Perform a comparison and view the specified resource for all the servers in the group. Decisions regarding taking servers off-line that are underutilized and adding servers to a group that are maximizing the server's capacity can be made using this comparison.

Performance Analysis & Reporting

Users can easily analyze application and application server data using the Performance Analysis & Reporting functions. Create reports for a Group of servers or a selected server. Analyze data for requests, methods, SQL calls, server availability, and system resources. From the report analysis, access more details on the behavior, performance, memory utilization of the application server and the percentage of the server availability.

Daily Statistics

Daily Statistics provide daily information snapshots for z/OS WebSphere servers. This feature is not available to the distributed user (UNIX/Windows) of WebSphere. WSAM gathers the day's SMF data for all running z/OS WebSphere instances every night at midnight and provides the user with the information via Daily Statistics.

Help

WSAM online Help offers you multiple ways to find answers to your questions. You can use the Contents tab to browse through the available Help topics; Index tab for an alphabetical listing of all our help text; and Search tab to find the answer to a specific question.

Glossary

Our easy to use glossary offers definitions for headings in results tables, processes, and unfamiliar terms presented in the WSAM application. Search alphabetically to quickly find a definition for the term in question.

About

About provides the current version number for WSAM and trademark information, regarding pending and approved trademarks for WSAM and International Business Machines Corporation.

Product Overview

Account Management

The Account Management section contains the functions to manage user accounts and configure their roles in WSAM. You can manage your WSAM user accounts and their roles by creating, modifying, and deleting them as necessary. You may also duplicate a role or assign a role to the appropriate user accounts. This prohibits users from accessing servers without granted access rights. In addition, WSAM associates account names with UNIX user names and passwords for authentication. Multiple WSAM user accounts may use the same UNIX account. Also, multiple concurrent logins under the same WSAM user account are allowed. That means the authentication itself and password maintenance are performed outside of WSAM.

Note: *The user name can be different from the UNIX user name, but it must be at least 6 alpha characters and no more than 50.*

User Profiles

Creating a UNIX Account

In order for the system to function properly, you must create a local user account on the Linux server that runs WSAM. Set up the UNIX user account prior to creating your accounts, since it uses UNIX user names and passwords for authentication. The administrator creates a UNIX account using the default method as follows, unless your administration programs overwrote the default settings with an alternative method.

You can have multiple WSAM accounts sharing the same UNIX user ID and password. The system does not prohibit such usage.

To create a UNIX account:

1. Login as the UNIX Root user.
2. Type in the UNIX command, `useradd newusername`.
3. Press **Enter**.
4. Type in the UNIX command, `passwd newpassword`.
5. Press **Enter**.

UNIX creates a new user account.

Creating a User Account

Add new user accounts to WSAM on the Create User Account page. Limit the rights of your user accounts to the groups of servers you select. All user accounts must have an existing UNIX user name in order to authenticate.

To create a user account:

1. From the top navigation, click **Administration > Account Management > User Profiles**.

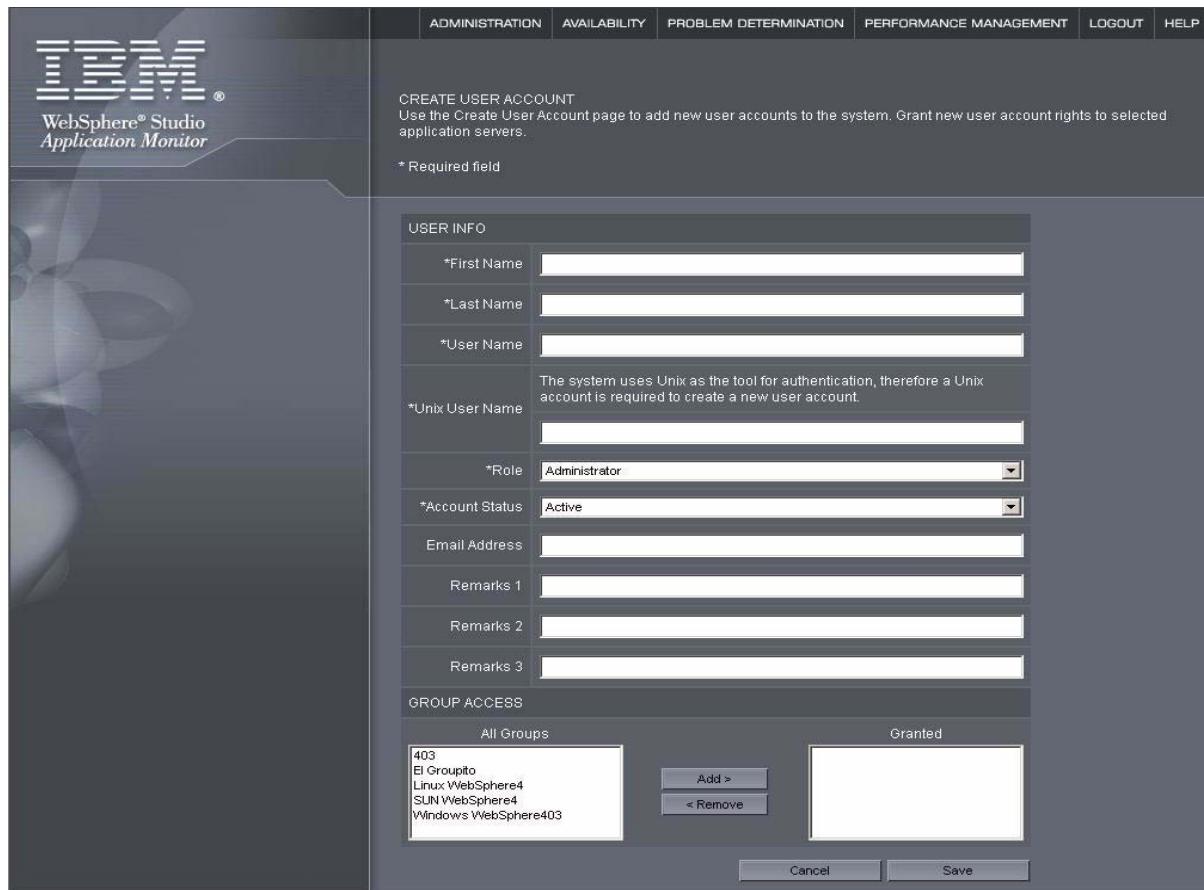
The User Profiles page opens.

The screenshot shows the 'USER PROFILES' section of the WebSphere Studio Application Monitor. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. Below the navigation bar, the title 'USER PROFILES' is displayed, followed by a sub-instruction: 'Use the User Profiles page to add and delete accounts. Edit existing account information using the link provided.' On the left side, there is a vertical menu bar with a 'Create User Account' button. The main content area is titled 'USER ACCOUNTS' and contains a table with the following data:

User Name	Last Name	First Name	
admin	Administrator	Cyanea	 Delete
cyanea	users	cyanea	 Delete
jerome	Banks	Jerome	 Delete
mniqam	nigam	meena	 Delete
galester	tester	qa	 Delete
sbutts	Butts	Sarah	 Delete

FIGURE 1. User Profiles

2. On the left navigation, click **Create User Account**.
The Create User Account page opens.



The screenshot shows the 'Create User Account' page of the IBM WebSphere Studio Application Monitor. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled 'CREATE USER ACCOUNT' with a sub-instruction: 'Use the Create User Account page to add new user accounts to the system. Grant new user account rights to selected application servers.' A note indicates that * Required field. The 'USER INFO' section contains fields for First Name, Last Name, User Name, Unix User Name (with a note about Unix authentication), Role (set to Administrator), Account Status (set to Active), Email Address, Remarks 1, Remarks 2, and Remarks 3. The 'GROUP ACCESS' section shows a list of groups under 'All Groups' (including 403, El Groupito, Linux WebSphere4, SUN WebSphere4, Windows WebSphere403) and an empty list under 'Granted'. Buttons for 'Add >' and '< Remove' are between the two lists. At the bottom are 'Cancel' and 'Save' buttons.

FIGURE 2. Create User Account

3. Enter the First Name.
4. Enter the Last Name.
5. Enter the User Name.
6. Enter the UNIX User Name.
7. Select the role you want to assign to the user account from the drop-down menu.
8. Select Active or Suspend for the Account Status.

9. Enter the user's Email Address.
10. Enter Remarks in the available fields.
11. To save the user account setup, click **Save**.

Note: A user account is not ready for use if its status is not marked **Active**.

To grant Group access rights:

1. Click to select the Group name in the All Groups box.
2. Click **Add** to grant the user account rights to the selected groups.
3. The Group name appears in the Granted box.

To remove Group access rights:

1. Click to select the Group name in the Granted box.
2. Click **Remove** to remove the user account rights from the selected groups.
The Group name disappears from the Granted box.

Modifying a User Account

Modify existing user accounts in WSAM on the Modify User Account page. Limit the rights of your user accounts to the groups you select.

To modify a user account:

1. From the top navigation, click **Administration > Account Management > User Profiles**.
The User Profiles page opens.
2. Click the user name to select the user account you want to modify.
The Modify User Account page opens.



ADMINISTRATION AVAILABILITY PROBLEM DETERMINATION PERFORMANCE MANAGEMENT LOGOUT HELP

MODIFY USER ACCOUNT
Use the Modify User Account page to change user account access. Change the user account rights to selected application servers.

* Required field

USER INFO									
*First Name	System								
*Last Name	Administrator								
*User Name	admin								
The system uses Unix as the tool for authentication, therefore a Unix account is required to create a new user account.									
*Unix User Name	admin								
*Role	Administrator								
*Account Status	Active								
Email Address									
Remarks 1									
Remarks 2									
Remarks 3									
GROUP ACCESS									
All Groups	Granted								
<input type="button" value="Add >"/>	<input type="button" value="< Remove"/>								
<table border="1"><tr><td>403</td><td>El Groupito</td></tr><tr><td></td><td>Linux WebSphere4</td></tr><tr><td></td><td>SUN WebSphere4</td></tr><tr><td></td><td>Windows WebSphere403</td></tr></table>		403	El Groupito		Linux WebSphere4		SUN WebSphere4		Windows WebSphere403
403	El Groupito								
	Linux WebSphere4								
	SUN WebSphere4								
	Windows WebSphere403								
ACCOUNT PROPERTIES									
Creation Date	Dec 16, 2002								
Last Modified	Dec 31, 2002								
<input type="button" value="Cancel"/> <input type="button" value="Save"/>									

FIGURE 3. Modify User Account

3. Select the field you want to edit, and enter the new information.
4. After entering your changes, click **Save**.

Usage Notes: You may want to suspend the user accounts when the operators are on leave. When they return, select **Active** to turn their user accounts back on.

Deleting a User Account

Keep your system up-to-date by deleting old and unused WSAM user accounts. You can delete existing user accounts on the User Profiles page.

To delete a user account:

1. From the top navigation, click **Administration > Account Management > User Profiles**.
The User Profiles page opens.
2. Click **X** or **Delete** on the last column of the user account that you want to delete from WSAM.
A confirmation box displays.
3. Click **OK** in the confirmation box to delete the user account, or click **Cancel** to return to the User Profiles page.
4. If you select **OK**, the system deletes the user account and the User Profiles page no longer displays the deleted account.
5. To sort by heading, click the heading you want to sort. Only underlined headings can be sorted. When the page refreshes, the results display sorted by the selected heading.

Role Configuration

In order to have thorough control over the user accounts accessibility to the product functions, each user account will be assigned a role that grants access to the specific product functions. A Role maps to individual product functions based on the following four sections of the system: Administration, Availability, Problem Determination, and Performance Management. There are three system default roles created in the Role Configuration page, namely Administrator, Operator, and User.

The administrator role has the permission to create custom roles to suit the needs of their specific environment.

After setting up the custom roles, the administrator assigns a role to each user account. For example, the administrator creates a custom role for the Trading application and then selects the operations that data center operators need to monitor the trading functions.

Creating a Role

The Create Role page provides the functionality to create a custom role for your environment. Design the custom role to restrict and grant privileges specific to the needs of your environment.

To create a role:

1. From the top navigation, click **Administration > Account Management > Role Configuration**.

The Role Configuration page opens.

The screenshot shows the 'Role Configuration' page of the IBM WebSphere Studio Application Monitor. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar has a 'MENU' section with 'Create Role' and 'Duplicate Role' options. The main content area is titled 'ROLE CONFIGURATION' and contains a sub-section 'ADMINISTRATION'. Below this are two tables showing role assignments for various management tasks across different users.

	Administrator	Operator	User	<input checked="" type="checkbox"/> meena	<input checked="" type="checkbox"/> sarahb	<input checked="" type="checkbox"/> hi	<input checked="" type="checkbox"/> tester	<input checked="" type="checkbox"/> testing	<input checked="" type="checkbox"/> hithere
Account Management	Y	N	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Role Management	Y	N	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Group Management	Y	N	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Data Collectors	Y	N	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Self-Diagnosis	Y	N	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
System Properties	Y	N	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring On Demand	Y	N	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Data Management	Y	N	N	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

	Administrator	Operator	User	<input checked="" type="checkbox"/> meena	<input checked="" type="checkbox"/> sarahb	<input checked="" type="checkbox"/> hi	<input checked="" type="checkbox"/> tester	<input checked="" type="checkbox"/> testing	<input checked="" type="checkbox"/> hithere
Server Availability Detail	Y	Y	Y	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

FIGURE 4. Role Configuration

2. On the left navigation, click **Create Role**.

The Create Role page opens.

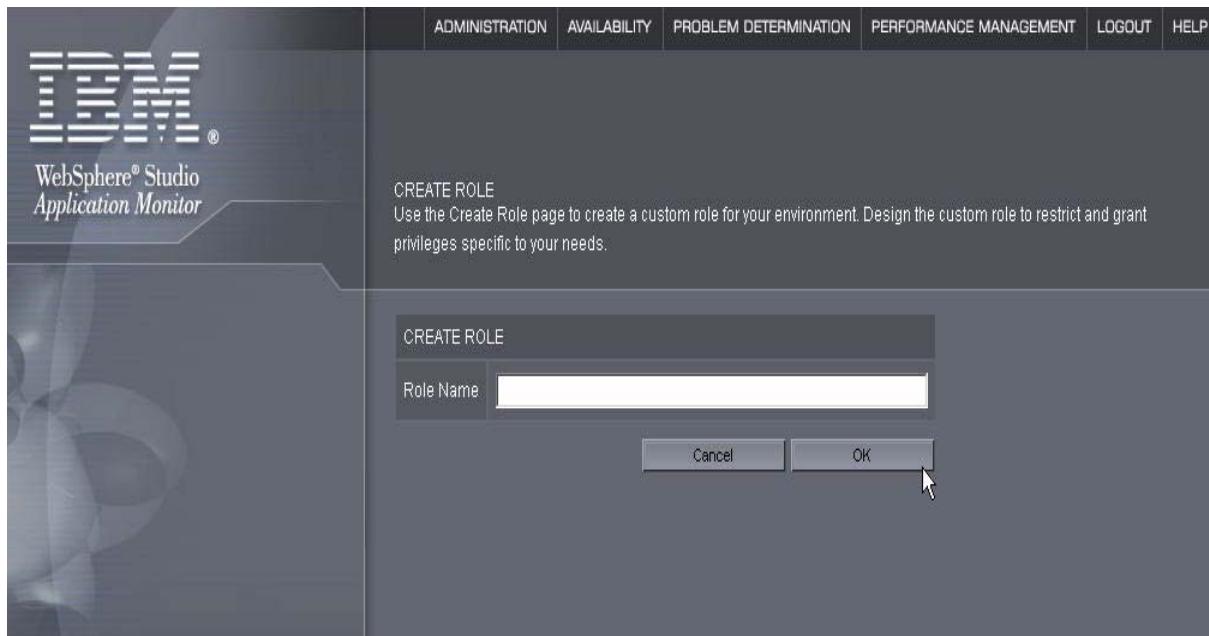


FIGURE 5. Create Role

3. Type in the name of the new role.
4. Click **OK**.
The new role displays on the Role Configuration page.
5. Click to select the privileges user accounts will access in WSAM.
6. Click **Save**.
Click **Reset** to revert to the pre-modified settings.

Duplicating a Role

To easily customize a new role, you may duplicate a role that uses a similar set of permissions rather than checking or unchecking the boxes one by one repeatedly.

To duplicate a role:

1. From the top navigation, click **Administration > Account Management > Role Configuration.**
The Role Configuration page opens.
2. On the left navigation, click **Duplicate Role**
The Duplicate Role page opens.

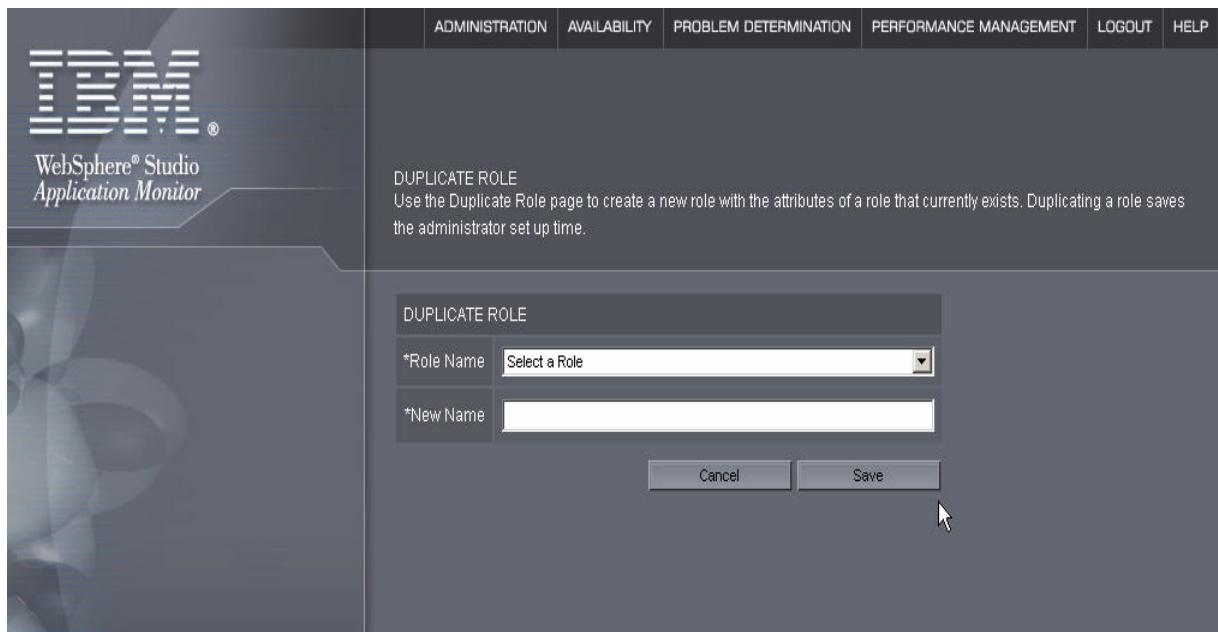


FIGURE 6. Duplicate Role

3. Select a role name for the duplicated role from the Role Name drop-down menu.
 4. Enter a new name for the duplicated role.
 5. Click **Save**.
- The new duplicated role displays on the Role Configuration page.
6. Click to select the privileges user accounts will access in WSAM.

7. Click **Save**.
8. Click **Reset** to revert to the pre-modified settings.

Note: The duplicated role does not have any users since its user-to-role relationship is not duplicated

Modifying a Role

The Role Configuration page provides the functionality to modify your custom roles. Update and delete custom roles based on the needs of your environment.

To modify a role:

1. From the top navigation, click **Administration > Account Management > Role Configuration**.
The Role Configuration page opens.
2. Change the custom role privileges users will access in WSAM.
3. Click **Save**.
4. Click **Reset** to revert to the pre-modified settings.

Assigning a Role

After creating a new role on the Role Configuration page, assign the role to user accounts on the Modify User Account page. You may also modify user accounts to assign appropriate privileges to them.

To assign a role:

1. From the top navigation, click **Administration > Account Management > User Profiles**.
The User Profiles page opens.

2. Click the user name that you want to assign a role.
The Modify User Account page opens.
3. On the Modify User Account page, from the Role drop-down menu, select the role to assign to the user account.
4. Click **Save**.

Deleting a Role

The Role Configuration page provides the functionality to delete your custom roles. Manage your custom roles based on the needs of your environment. In addition, you cannot delete a role while the system associates a user account with it.

To delete a role not assigned to a user account:

1. From the top navigation, click **Administration > Account Management > Role Configuration**.
The Role Configuration page opens.
2. Click the **X** next to the role you want to delete.
A confirmation box displays.
3. At the confirmation box, click **OK**.

To delete a role still assigned to a user account:

1. From the top navigation, click **Administration > Account Management > Role Configuration**.
The Role Configuration page opens.
2. Click the **X** next to the role you want to delete.
A confirmation box displays.
3. Click **OK** at the confirmation box.
A list of the user accounts assigned to the role appears. Since the system assigned the role to a user account, you have to change the role of the user account on the Update Role page.



FIGURE 7. Update Role

4. Click on the link to select the user account.
The Modify User Account page opens.
 5. Click to select a role for the user account from the Role drop-down list.
 6. Click **Save**.
- The system displays the Role Configuration page without the deleted role.

A group consists of a collection of servers, for example, a brokerage company might define one group of servers to handle trading requests and another group to handle quote requests. By creating and associating groups with specific WSAM accounts, you can restrict access to data and operations for the group of servers. In the brokerage example, one administrator oversees the Quote group, while the other administrator oversees the Trading group. If the users are correctly assigned to groups, WSAM will prevent the Quote group administrator from accessing information on the Trading group and vice versa.

In a z/OS environment, the servers that are being grouped here correspond to the server instances, not the server regions. Server regions that belong to a server instance are automatically grouped under the server, and they are distinguished from a server instance by having the address space ID appended to the end of their server name.

Server Groups

Creating a Group

Combine servers into groups to streamline daily server maintenance. The Create Group page provides the functionality to create groups of servers and grant users access to those groups.

To create a group:

1. From the top navigation, click **Administration > Server Management > Server Groups**.

The Server Group Management page opens.

The screenshot shows the 'Server Group Management' page of the WebSphere Studio Application Monitor. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a sidebar titled 'MENU' contains 'Create Group' and 'Duplicate Group'. The main content area is titled 'SERVER GROUP MANAGEMENT' with a sub-instruction: 'Use the Server Group Management page to add and delete server groups. Edit existing group information using the group name link provided.' Below this, a table titled 'GROUPS' lists five entries:

Group Name	Description	Action
403		<input checked="" type="checkbox"/> Delete
EL Groupito		<input checked="" type="checkbox"/> Delete
Linux WebSphere4		<input checked="" type="checkbox"/> Delete
SUN WebSphere4		<input checked="" type="checkbox"/> Delete
Windows WebSphere403		<input checked="" type="checkbox"/> Delete

FIGURE 1. Server Group Management

2. On the left navigation, click **Create Group**.
The Create Group page opens.

Server Groups

IBM®
WebSphere® Studio
Application Monitor

ADMINISTRATION AVAILABILITY PROBLEM DETERMINATION PERFORMANCE MANAGEMENT LOGOUT HELP

CREATE GROUP
Use the tools on the Create Group page to form groups of servers and grant users group access. A server can be in multiple groups and a user can be granted access to multiple groups. You can also modify the baseline indicators that show on the Application Overview page.

* Required field

GROUP INFORMATION

*Group Name

Description

APPLICATION OVERVIEW DISPLAY

BASELINE INDICATORS - Enter a percentage up to 10 times (999%) for each Indicator's response.

Indicator 1 (Slow Response) >= %

Indicator 2 (Very Slow Response) >= %

BASELINE DEFINITIONS - Select one baseline definition and fill out the appropriate information.

Rolling Date days

Fixed Date (1-31 days) Start Date End Date

Fixed Response Time (0-10,000 ms) (ms)

GROUP MEMBERS

All Servers

dev-lnx-w02:DC13
dev-lnx-w02:Test-1

Servers in Group

Add > < Remove

USER ACCESS

All Users

Granted Access

Cyanea Administrator

Add > < Remove

Cancel Save

FIGURE 2. Create Group

3. Enter a unique Group Name in the text box.
4. Enter a Description in the text box.
5. Enter the Baseline Indicator 1 in the box.
6. Enter the Baseline Indicator 2 in the box.
7. Click to select a baseline definition and fill out the information.

Usage Notes: Steps 5 through 7 are all default settings based on the settings on the System Properties page under Application Overview Display. For detailed information, see **System Properties**.

8. Click to select the server name in the All Servers box.
9. Click **Add** to select the server for the Group.
The server name appears in the Servers in Group box.
10. In the Servers in Group box, select the server you want to remove and click **Remove** to delete the server from the group.
The server name disappears from the Servers in Group box.
11. Click **Add** to grant users access to the group.
The user name appears in the Granted Access box.
12. Click **Remove** to remove the user's access to the group.
The user name disappears from the Granted Access box.
13. Click **Save** to save the group's settings.

Usage Notes: Remember to create groups sensibly. Creating too many groups makes it difficult to sort through the data. Only administrators can create groups, and no one will have access to a group until the administrator associates a user with a group. Only configured servers appear in the list of servers available to group, but the server does not have to be up and running to appear. While creating groups, use only alphanumeric characters in the name (except +, ',', \, ~, *, #, SPACE, or TAB), and remember the group names are case-sensitive.

Administrators generally group servers in three different ways: by the applications running on the servers; by the authority structure of the

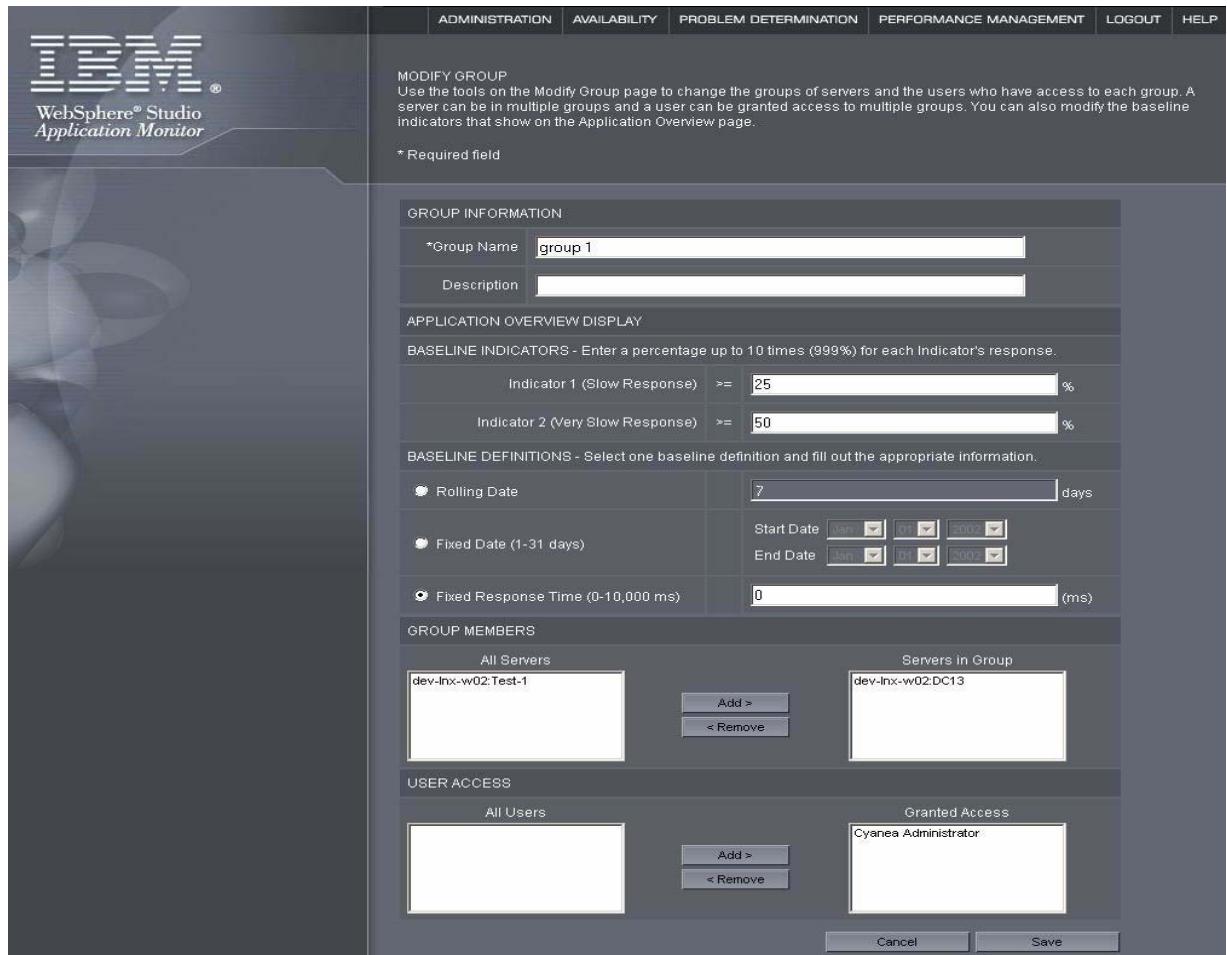
operation group; and by the capacity or platforms of the servers. For example, in a financial institution, it may be helpful to group all the servers running applications by Trading, Quotes, and Fixed Income. Grouping by authority structure involves grouping the servers by the persons responsible for maintaining them, for example, operator 1 controls servers 1 through 29 and so on. While grouping by the capacity or platform of the servers indicates that clones, mainframes, and UNIX systems are all placed in separate groups. There are times when grouping by capacity or platform makes sense, but keep in mind that the performance management data becomes diluted and statistically inaccurate if analyses are performed on a group of servers with mixed types and capacity. Create different types of groups for different purposes.

Modifying a Group

Maintain your groups with the most updated information. The Modify Group page provides the functionality to modify your groups and grant users access to those groups.

To modify a group:

1. From the top navigation, click **Administration > Server Management > Server Groups**.
The Server Group Management page opens.
2. Click the Group Name of the group you want to modify.
The Modify Group page opens and populated with the selected group's information.



The screenshot shows the 'MODIFY GROUP' page of the IBM WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled 'MODIFY GROUP' with a sub-instruction: 'Use the tools on the Modify Group page to change the groups of servers and the users who have access to each group. A server can be in multiple groups and a user can be granted access to multiple groups. You can also modify the baseline indicators that show on the Application Overview page.' Below this, a note says '* Required field'. The 'GROUP INFORMATION' section contains fields for 'Group Name' (set to 'group 1') and 'Description'. The 'APPLICATION OVERVIEW DISPLAY' section includes 'BASELINE INDICATORS' with input fields for 'Indicator 1 (Slow Response)' (set to 25%) and 'Indicator 2 (Very Slow Response)' (set to 50%). The 'BASELINE DEFINITIONS' section allows selecting a 'Rolling Date' (radio button selected), a 'Fixed Date (1-31 days)', or a 'Fixed Response Time (0-10,000 ms)'. The 'GROUP MEMBERS' section has two panels: 'All Servers' containing 'dev-Inx-w02:Test-1' and 'Servers in Group' containing 'dev-Inx-w02:DC13'. Between them are 'Add >' and '< Remove' buttons. The 'USER ACCESS' section has two panels: 'All Users' and 'Granted Access' containing 'Cyanea Administrator'. Between them are 'Add >' and '< Remove' buttons. At the bottom right are 'Cancel' and 'Save' buttons.

FIGURE 3. Modify Group

3. Select the field you want to edit and enter the new information.
4. Click **Save** to save the group's settings.

Usage Notes: Changes made to the server-to-group assignments and user-to-group grants occur immediately. Also, if an administrator removes a server from a group, anyone logged in will notice the change.

Deleting a Group

Delete outdated groups from the system. You can delete existing groups on the Server Group Management page.

To delete a group:

1. From the top navigation, click **Administration > Server Management > Server Groups**.
The Server Group Management page opens.
2. Click **X** or **Delete** next to the group name you want to delete from WSAM.
3. Click **OK** in the confirmation box to delete the group, or click **Cancel** to return to the Server Group Management page.
4. If you select **OK**, the system deletes the group and the Server Group Management page no longer displays the deleted group.

Usage Notes: Once a group is deleted, the records in the WSAM database that belong to the group via the server relationship will no longer be accessed through the group. However, they can still be accessed either via the server name or another group which contains the servers.

Before deleting a group from the WSAM database, delete all reports attached to that group in order to maintain data integrity. To delete each report, click the report's link. The group will be deleted after all reports are deleted.

Duplicating a Group

Save time by duplicating groups. Duplicating a group allows you to quickly create a new group based on the settings of an existing group.

To duplicate a group:

1. From the top navigation, click **Administration > Server Management > Server Groups.**

The Server Group Management page opens.

2. On the left navigation, click **Duplicate Group.**

The Duplicate Group page opens.

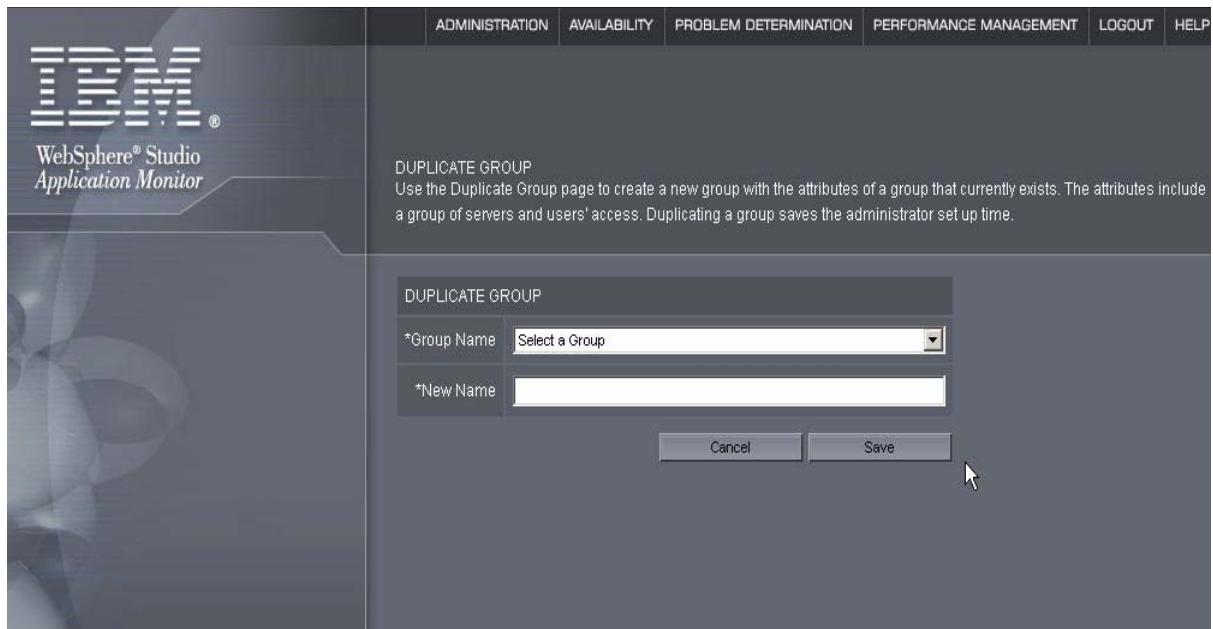


FIGURE 4. Duplicate Group

3. From the Group Name drop-down box, select the group name you want to duplicate.
4. Enter a new name for the duplicated group.
5. Click **Save** to duplicate the group.

Usage Notes: The Duplicate Group link will not appear when there is no group in the system.

Data Collectors Configuration

The Data Collector section provides lists of configured and unconfigured Data Collectors. A Data Collector is a software that runs on the application server and captures information regarding the applications running inside the application server. At times, it may be necessary to unconfigure Data Collectors on the application server or configure new Data Collectors.

There are three different levels of monitoring available for the Data Collector: L1 (Production mode), L2 (Problem Determination mode), and L3 (Tracing mode). L1 provides Availability Management, System Resources, and basic request data. L2 is the default for most Data Collectors. This mode monitors production level plus advanced request data, including CPU information, additional monitoring fields and functions. L3 monitors everything in L2 plus method and SQL-call level operations. If you want more monitoring for your applications that include the method and SQL-call level, select the L3 for the Data Collector. Also, certain Trap and Alert functions require that the user turn on the L3.

At L3 configuration, the value chosen is only effective whenever the Data Collector is up and running but **failing to contact the Monitoring on Demand™ (MOD) scheduler** – a topic which we will cover later in this book. Under normal circumstances, when the MOD is running, the system obtains the monitoring mode for the Data Collector from the MOD scheduler.

On the z/OS platform, the functions of L1 and L2 have been combined into L1. L3 is the same on all platforms.

In a z/OS environment, a WebSphere server instance is represented by a Data Collector definition. It serves as a template for all the Data Collectors in the server regions belonging to the same server instance. This means that while you may be configuring the Data Collector for a server instance, the configuration is actually used by all the Data Collectors in the server regions when monitoring the applications.

Configuring a Data Collector

Use the Data Collector Overview page to configure the Data Collectors. The top of the page shows the configured Data Collectors while the bottom displays the unconfigured Data Collectors. When you configure a Data Collector, the system

removes it from the unconfigured Data Collectors list and displays it with the configured Data Collectors. You can also apply a configuration to a Data Collector from the Apply page, see **Applying a Configuration**.

Note: The system assigns a name to the Data Collector. On the non z/OS platform, the Data Collector's name is a combination of the Admin Server name and the Application Server name. For z/OS platform, the name is a combination of the Sysplex name and the Application Server name. The name cannot be changed.

To configure a Data Collector:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.

The Data Collector Overview page opens.

Data Collectors Configuration

The screenshot shows the 'Data Collector Overview' page of the WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar with the IBM logo and the text 'WebSphere® Studio Application Monitor'. Below the sidebar is a 'MENU' section with three options: 'Overview', 'Configuration List', and 'Create a Configuration'. The main content area has two tables. The first table, 'CONFIGURED DATA COLLECTORS', lists two entries: 'qaaix' and 'qawin', each with an 'Admin Server' (qaapp-aix-s01), 'Application Server' (test), 'Platform' (WebLogic), and 'Monitoring Level' (L1). The second table, 'UNCONFIGURED DATA COLLECTORS', lists two entries: 'qalnx' (qaapp-lnx-s02) and 'qalnx' (qaapp-lnx-s03), both with 'Platform' (WebLogic) and 'Monitoring Level' (L2). A dropdown menu for 'Apply a Configuration' is open over the second entry, showing options: 'Apply a Configuration', 'default', and 'test'. An 'Apply' button is located at the bottom right of the unconfigured table.

Admin Server	Application Server	Configuration Name	Platform	Monitoring Level		Unconfigure
qaaix	qaapp-aix-s01	test	WebLogic	L1	<input type="button" value="Disable"/>	<input type="button" value=""/>
qawin	qaapp-win-s01	test	WebLogic	L1	<input type="button" value="Disable"/>	<input type="button" value=""/>

Admin Server	Application Server	Platform	Monitoring Level	Apply a Configuration
qalnx	qaapp-lnx-s02	WebLogic	L2	<input type="button" value="Apply a Configuration"/>
qalnx	qaapp-lnx-s03	WebLogic	L2	<input type="checkbox"/>

FIGURE 5. Data Collector Overview

2. Go to the Unconfigured Data Collectors on the bottom of the page.
3. Select a configuration from the Apply a Configuration drop-down box.
4. Click **Select All** or click in the check box of the unconfigured Data Collector you want to configure.
5. Click **Apply**.

The Data Collector displays in the list of configured Data Collectors at the top of the page.

Unconfiguring a Data Collector

Use the Data Collector Overview page to unconfigure the Data Collectors. In general, there is only one scenario that requires you to unconfigure a configured Data Collector. If you decide to retire or re-deploy an application server, you should unconfigure the Data Collector and the system will remove its configuration record from the WSAM database. When you unconfigure a Data Collector, the system removes it from the configured Data Collectors list and displays it with the unconfigured Data Collectors.

Warning! Once a Data Collector is retired, its data will be purged.

To unconfigure a Data Collector:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.
The Data Collector Overview page opens.
2. Go to the Configured Data Collectors at the top of the page.
3. Click the unconfigure button for the Data Collector you want to unconfigure.
The Data Collector displays in the list of unconfigured Data Collectors at the bottom of the page.

Disabling a Data Collector

If you want to stop the Data Collector from sending and receiving data, you can disable the Data Collector. This is similar to a pause as opposed to unconfiguring the Data Collector which will cause you to lose settings.

To disable a Data Collector:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.
The Data Collector Overview page opens.
2. Click **Disable** next to the Data Collector you want to disable.
The system enables the Data Collector and the button face changes to **Enable**.

Enabling a Data Collector

Enable your Data Collectors on the Data Collector Overview page. Manage monitoring on your system by enabling and disabling Data Collectors as needed.

To enable a Data Collector:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.

The Data Collector Overview page opens.

2. Click **Enable** next to the Data Collector you want to enable.

The system enables the Data Collector and the button face changes to **Disable**.

Usage Notes: If you stopped the Data Collector from sending and receiving data by disabling it, you can enable the Data Collector again when you are ready. Since a disabled Data Collector doesn't lose settings, so you can simply turn it back on without any reconfiguration.

Creating a Configuration

Use this page to create a configuration. Group those classes you do not want to monitor in the Exclude (Classname) list. Any classes that are not in the list will be monitored. If your Exclude (Classname) list of classes is too broad and you want to monitor a section from the lower level classes, put them in the Exclude Override (Classname) list. For example, the Exclude (Classname) list may include com.sun.*, while the Exclude Override (Classname) list includes com.sun.java. This means that WSAM will not monitor the main Sun site but will monitor the Java portion of the site. Name the configuration for your Data Collectors. Create multiple configurations that monitor different classes.

To create a configuration:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.

The Data Collector Overviewpage opens.

2. Click **Create a Configuration** on the left navigation.

The Create page opens.

The screenshot shows the 'CREATE' configuration page. At the top, there is a header bar with tabs: ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. Below the header, the title 'CREATE' is displayed, followed by the instruction: 'Create a new configuration for your data collectors. Enter a list of classes the monitor should ignore in the Exclude list. If you want to monitor a class, enter it in the Exclude Override list.' On the left side, there is a vertical menu titled 'MENU' with options: Overview, Configuration List, and Create a Configuration. The 'Create a Configuration' option is currently selected. The main form area contains two text input fields: 'Exclude (Classname)' and 'Exclude Override (Classname)'. The 'Exclude (Classname)' field contains the following text:
com.cyanea.* , javax.* , oracle.* , sun.* , java.* , com.sun.* , com.ibm.* , COM.rsa.* , org.w3c.* , org.omg.* , org.xml.* , com.beasys.* , utils.version.* , org.apache.* , flexlm.* , antlr.* , com.qa.*
The 'Exclude Override (Classname)' field is empty. Below these fields is a 'Configuration Name' input field, which is also empty. At the bottom of the form are three buttons: 'Cancel', 'Save', and 'Save & Apply'.

FIGURE 6. Create page

3. Enter the names of classes you want to ignore into the Exclude (Classname).
4. Enter the names of classes you want to monitor into the Exclude Override (Classname).
5. Enter a name for the configuration.
6. Click **Save** to create the configuration or **Save & Apply** to create the configuration and apply it to a Data Collector.

Usage Notes: You can configure or change these options at any time.

Applying a Configuration

Use the Apply page to apply the configuration to a Data Collector. After you create a configuration, you must apply it to a Data Collector in order to start monitoring.

To apply a configuration:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.

The Data Collector Overview page opens.

2. Click **Configuration List** on the left navigation.

The Data Collector Configuration List page opens.

The screenshot shows the 'DATA COLLECTOR CONFIGURATION LIST' page. At the top, there is a navigation bar with links: ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there is a sidebar with the IBM logo and the text 'WebSphere® Studio Application Monitor'. The main area has a title 'CONFIGURATION LIST' and a table with three rows of configuration settings.

Configuration Name	Exclude (Classname)	Exclude Override (Classname)	Associated Server	Modify	Duplicate	Apply	Delete
default	com.cyanea.*; javax.*; oracle.*; sun.*; java.*; com.sun.*; com.ibm.*; COM.rsa.*; org.w3c.*; org.omg.*; org.xml.*; com.beasys.*; utils.version.*; org.apache.*; flexlm.*; antlr.*; com.qa.*						
excludeQA	com.cyanea.*; javax.*; oracle.*; sun.*; java.*; com.sun.*; com.ibm.*; COM.rsa.*; org.w3c.*; org.omg.*; org.xml.*; com.beasys.*; utils.version.*; org.apache.*; flexlm.*; antlr.*; com.qa.*						
flexlm	com.cyanea.*; javax.*; oracle.*; sun.*; java.*; com.sun.*; com.ibm.*; COM.rsa.*; org.w3c.*; org.omg.*; org.xml.*; com.beasys.*; utils.version.*; org.apache.*; flexlm.*; antlr.*; com.qa.*	com.qa.*	devapp-aix-s02.dc_ws40_01 qaapp-win-s01.dc_ws40_01 qaapp-lnx-s02.dc_ws40_01 qaapp-sun-s01.dc_ws40_01				

FIGURE 7. Configuration List

3. Click the Apply icon next to the configuration you want to apply.
The Apply page opens.

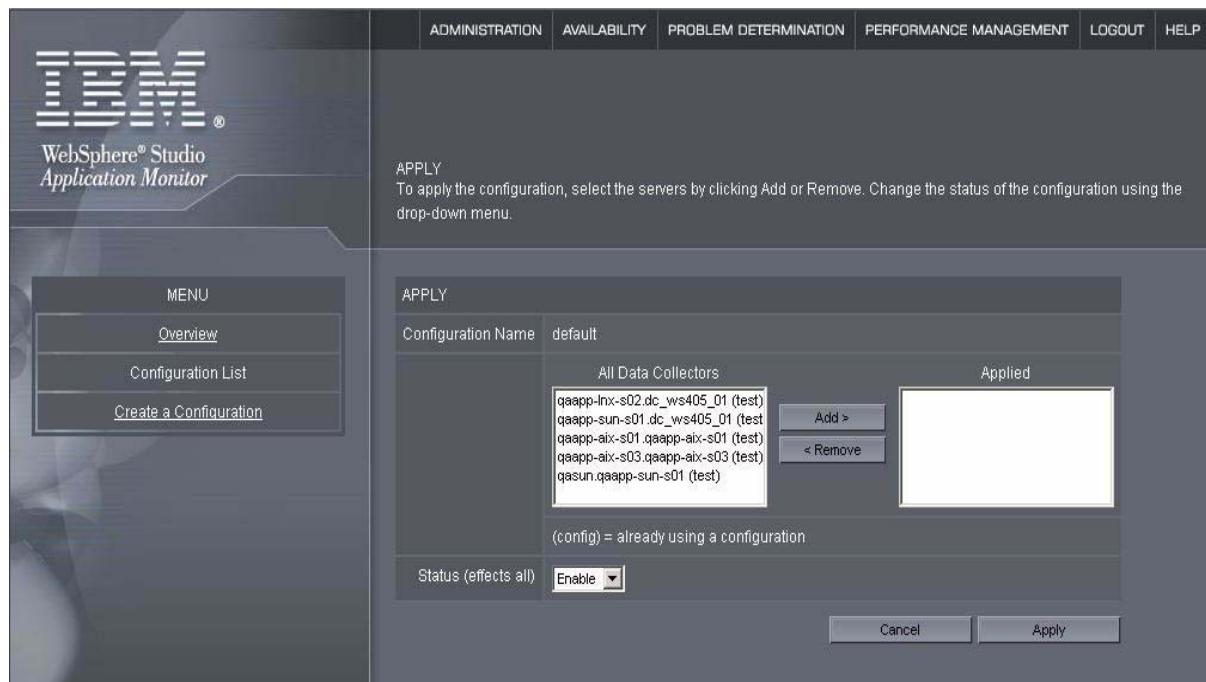


FIGURE 8. Apply page

4. Click to select the Data Collectors' name from the All Data Collectors box.
5. Click **Add** to apply the configuration to the Data Collector.
The Data Collectors' names appear in the Applied box.
6. Select **Enable** or **Disable** for the status of the configuration.
7. Click **Apply**.

You applied the configuration to the selected Data Collectors.

Modifying a Configuration

You can modify an existing configuration for your Data Collectors by updating the list of classes you monitor. Remove and add classes to the Exclude (Classname) list and Exclude Override (Classname) list to change what you monitor.

To modify a configuration:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.
The Data Collector Overview page opens.
2. Click **Configuration List** on the left navigation.
The Data Collector Configuration List page opens.
3. Click the Modify icon next to the configuration you want to modify.
The Modify page opens.

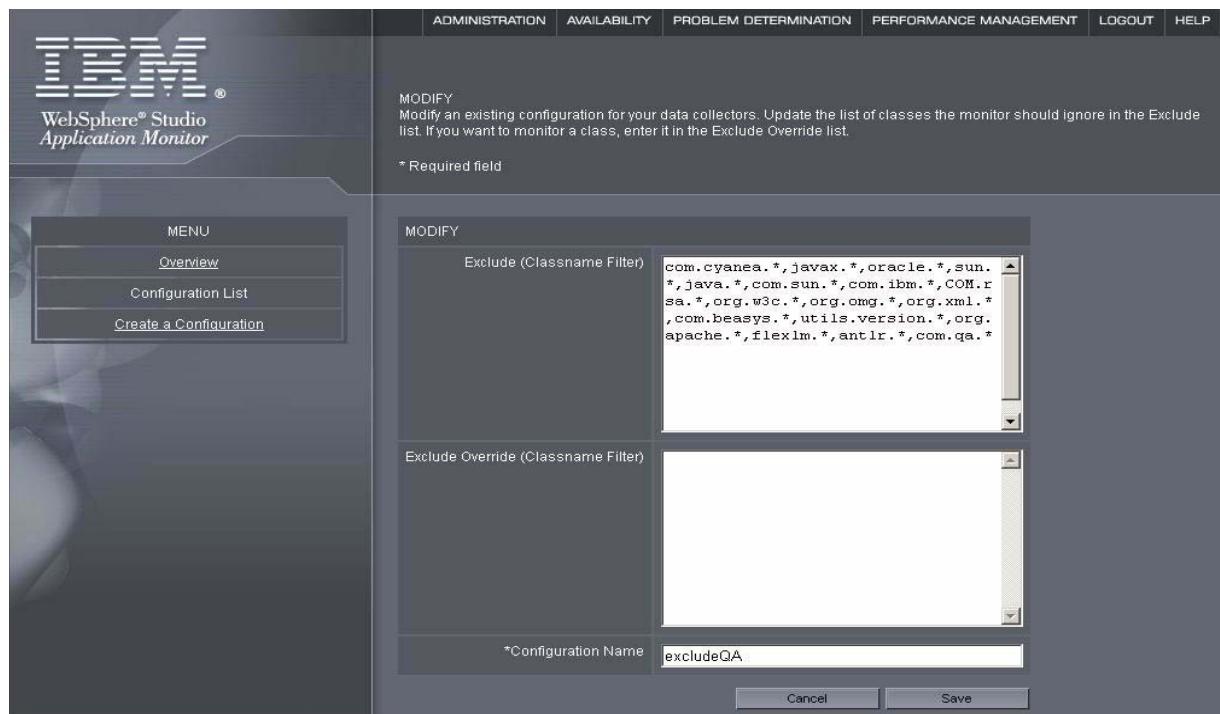


FIGURE 9. Modify page

4. Enter the names of classes you want to ignore into the Exclude (Classname) list.
 5. Enter the names of classes you want to monitor into the Exclude Override (Classname) List.
 6. Click **Save** to save your modifications to the configuration.
- The Data Collector Configuration List displays with the updated information.

Duplicating a Configuration

You can duplicate an existing configuration from your Data Collectors. Duplicate a configuration based on the selections made in an existing configuration.

To duplicate a configuration:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.
The Data Collector Overview page opens.
2. Click **Configuration List** on the left navigation.
The Data Collector Configuration List page opens.
3. Click the duplicate icon next to the configuration you want to duplicate.
The Duplicate page opens.

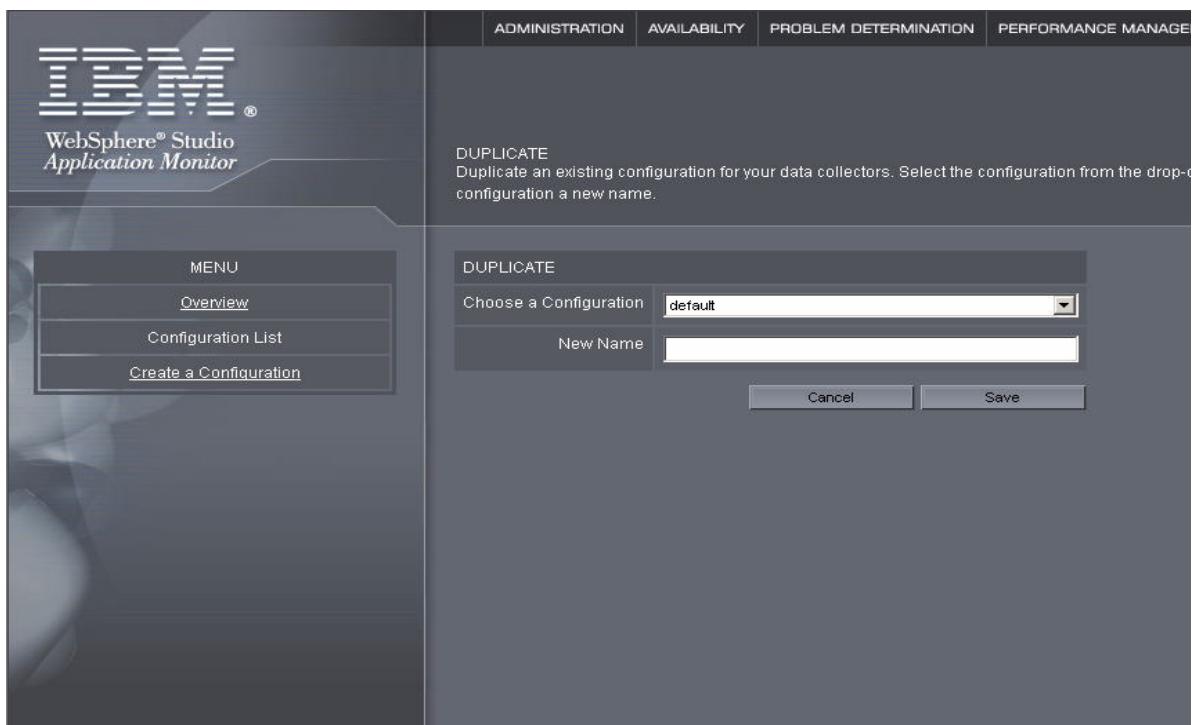


FIGURE 10. Duplicate page

4. Select an existing configuration from the drop-down menu.
5. Enter a new name for the configuration.

6. Click **Save**.

The new configuration displays in the Configuration List.

Deleting a Configuration

You can delete outdated configurations from the list to keep your list current. When you delete a configuration, the Data Collectors using that configuration will be unconfigured. See **Creating a Configuration** and **Applying a Configuration** to configure those Data Collectors.

To delete a configuration:

1. From the top navigation, click **Administration > Server Management > Data Collector Configuration**.

The Data Collector Overview page opens.

2. Click **Configuration List** on the left navigation.

The Data Collector Configuration List page opens.

3. Click the Delete icon next to the configuration you want to delete.

A confirmation box appears to warn you that deleting this configuration will unconfigure all the associated servers.

4. Click **OK** to delete the configuration.

The Configuration List displays without the deleted configuration.

Note: Remember to apply a new configuration to the servers you unconfigured while deleting the configuration.

Monitoring on Demand™

Monitoring on Demand™ (MOD) provides the user with the ability to schedule and respond, on demand, with three levels of monitoring to their applications. The three monitoring levels offer the following different functions.

For the non-z/OS platforms:

- **L1 (Production Mode)** - this monitoring level provides Availability Management, System Resources, and basic request level data.
- **L2 (Problem Determination Mode)** - this monitoring level provides production level monitoring plus advanced request data, including CPU information, additional monitoring fields and functions
- **L3 (Tracing Mode)** - this is the most powerful monitoring level. Therefore, only this level utilizes all the reporting elements available. For example, in L3, the Server Activity Display (SAD) shows additional data for the following columns: Accumulated CPU and Idle Time. In addition, on the Request Detail page, the

Method Trace with SQL statements is also available. Use this level for servers that have been selected for diagnostics and detailed workload characterization.

For the z/Os platform, due to the difference in technology, a different model is used:

- **L1 (Production Mode)** - this monitoring level provides Availability Management, System Resources, request level data including CPU information. This is equivalent to L2 of the non-z/OS platforms.
- **L3 (Tracing Mode)** - same as that of the non-z/OS platform.

The user can change the monitoring level in **Administration > System Properties > Data Collection Settings** or **Administration > Monitoring on Demand™**. In addition, create a schedule to apply to a server or group of servers. Using the schedule, the monitoring level for a server or group can be changed to match the load on the server at the time with either more intense monitoring, such as, L3 monitoring or less intense, such as, L1 monitoring.

Warning! For the non-z/OS platform, when the system changes to or from L1 to L2 or L3, the server automatically restarts. For the z/OS platform MOD scheduling applies to server instance level, i.e., all server regions will follow the same schedule and will not restart.

Formulating the Monitoring Strategy

The MOD functionality allows a comprehensive monitoring strategy to be developed. For installations which have different needs of monitoring depending on situations, MOD provides controls by level of granularity of data, hence the level of intensity of monitoring overhead. This monitoring scheme can be handled by the MOD scheduler automatically (i.e. timer control), or achieved through manual override. MOD can also be applied selectively to servers so that only a portion of the server farm is being monitored, known as zone control.

One possible monitoring scheme is depicted below:

Situation	Monitoring Level	Timer Control	Zone Control
Load Testing/Benchmarking	1	N	N
Integration Testing	3	N	N
Production – Stable Workload	1	N	N
Production – Unstable Workload	1/3	Y	N
Production – Extremely High Volume Thin Trans	1	Y	N
Production – Medium DB Transaction	1	Y	Y
Production – Complex DB Transactions	3	N	Y
Production – New/Pilot Applications	3	N	N
Application Performance Re-engineering	1/3	N	N
Capacity Planning Project	3	Y	Y
Market Peak Hours	1	Y	Y
Serious Troubleshooting	3	N	N

TABLE 1. Sample Monitoring Scheme

L1 - Production Mode

L1 monitoring should be used in most cases and should be the 'floor' level monitoring, as it has very benign CPU overhead per transaction.

L2 - Problem Determination Mode

For the non-z/OS Platform, use L2 monitoring if you anticipate problems in the applications. This additional level of monitoring is provided due to the difference in technology. Basically L2 monitoring allows the monitoring level of the application server to go up to L3 without the need to restart the server. L2 monitoring primarily provides the same monitoring points as L1, except that it does have higher overhead, but with the flexibility of switching to L3 without restarting the application server.

L3 – Tracing Mode

L3 monitoring has inherently higher overhead than L1 monitoring, as method level data is being gathered. Generally, use L3 monitoring if you anticipate problems in the applications. If the application is served by more than one server in a farm, use

L3 monitoring on the farm during a certain period of the day, and target a subset of the servers to collect critical data for detailed workload characterization.

Tracing Intent (z/OS Platform Only)

Tracing is achieved by tracing the execution path of applications at the Java class/method level. This requires JVMPPI, a feature of the JVM, to be enabled for the duration when L3 monitoring is active. The method tracing is relatively efficient compared to the amount of data that is being collected (method and SQL data), enabling analysis to be performed using metrics such as elapsed time, CPU time, SQL types, and Table names.

To guarantee long duration of tracing works, the application Java classes are required to be running in interpretive mode, or else some of the classes should be compiled by the JIT compiler, their method entry and exit trace entries may disappear. Running in interpretive mode will lose some performance but since the JVM is already running in method Tracing, the extra overhead will not impact much in practice.

When a server region is running at L3 at startup time, the application Java classes will be automatically skipped for compilation by the JIT, should attempts have indeed been made by the JIT compiler to compile them (normally, JIT attempts to compile a Java method after sufficient numbers of executions have been made). This will enable full trace data to be obtained.

However, when a server region is started up at L1, WSAM requires the user to indicate that the subject region may be adjusted to L3 via the MOD scheduler or override function and that the trace data collection is not to be impacted by the JIT compilations. This intent may be needed because there are situations where applications are anticipated to be malfunctioning (e.g. newly deployed applications) and method trace will be required to provide enough diagnostic data for troubleshooting. By indicating to WSAM that there is such intent, WSAM will instruct the JVM to skip compiling the relevant application Java classes in the EAR and WAR files during the server start up. This will ensure that trace data will be obtained whenever the server is switched to L3.

This intent switch is implemented through the use of the user variable named **WSAM_INTENT_TRACE**. Turn it on by setting it to yes. Any other value is treated as no, including not specifying the user variable.

- If the user specifies JITC_COMPILEOPT=NALL{classnames}{methodnames} in current.env, there is no possible method tracing.
- If the user specifies JITC_COMPILEOPT=SKIP{classnames}{methodnames} in the current.env, we will add it to the list of classes to trace.
- If wsam_intent_trace=no or not specified and the initial monitoring level is 1, there is no possible method tracing.
- If wsam_intent_trace=yes, the initial level is irrelevant.

The list of classes to trace is built as follows:

- We start from the list of classes that are found in the <apps> directory of the specific J2EE application server excluding the classes in the "classes_not_to_trace" environment variable in the datacollector.env.
- We then add the classes in the "classes_to_trace" environment variable in the datacollector.env.

The other user variable that needs specifying is **WSAM_APPSERVER**. Set the value to the name of the WebSphere application server (NOT server instance). Default is BBOASR2.

Put this name/value pair in the current.env file of the server instance before starting up the server regions.

Managing MOD

View current monitoring levels for all your servers. From here, you can select to create a schedule that changes the monitoring level based on a date and time when a server needs more detailed monitoring. Modulate the monitoring level at different times based on the anticipated load on the server, or override the monitoring level or change the schedule for a selected server.

To view the monitoring level for all servers:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
2. The Monitoring on Demand™ (MOD) Console page opens displaying all the servers.

Managing MOD



FIGURE 1. Monitoring on Demand™ (MOD) Console

To go to the Schedule Management page:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
The Monitoring on Demand™ (MOD) Console page opens.
2. Click **Schedule Management** on the left navigation.
The Schedule Management page opens.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. On the far left, there's a vertical menu with options like MOD Console, Schedule Management, Create Schedule, and Duplicate Schedule. The main content area is titled "SCHEDULE MANAGEMENT" and contains a brief description: "From the Schedule Management page, delete a schedule or access a schedule for modification by clicking on the schedule name." Below this, there's a table titled "SCHEDULES" with four rows. Each row has a "Schedule Name" column and an "Applies To" column. In the "Applies To" column, there's a link labeled "Delete" next to a small icon. The table rows are: 1. Sarah P Test 2, 2. Hours, 3. Days of the Week, and 4. Sarah P Test Schedule.

Schedule Name	Applies To
Sarah P Test 2	 Delete
Hours	 Delete
Days of the Week	 Delete
Sarah P Test Schedule	 Delete

FIGURE 2. Schedule Management

Overriding the Monitoring Level

Override the monitoring level for a selected server. This will override the current monitoring level until the next scheduled monitoring level occurs.

To override the monitoring level:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
The Monitoring on Demand™ (MOD) Console page opens.
2. Click to select a server.
The Schedule Selection page opens.

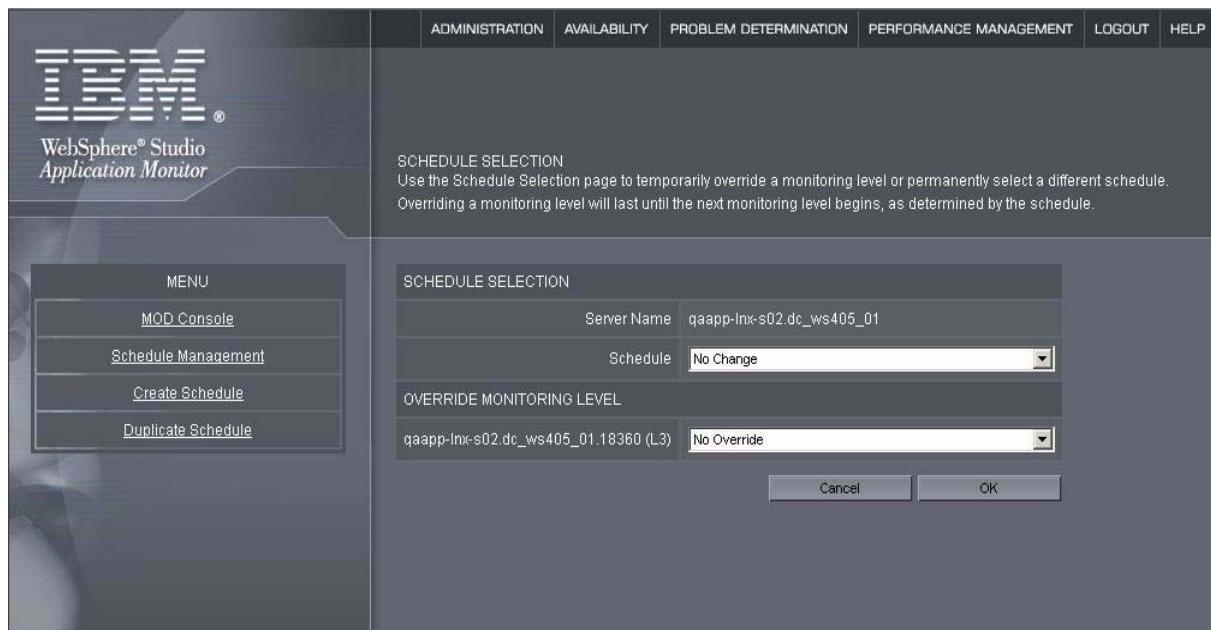


FIGURE 3. Schedule Selection

Note: For the z/OS platform, the server displayed is the name of a server instance. When a server instance is selected, all the server regions belonging to the server instance will be listed. You can override the monitoring level of a particular server region.

3. To override the monitoring level, select a monitoring level from the Override Monitoring Level drop-down menu.

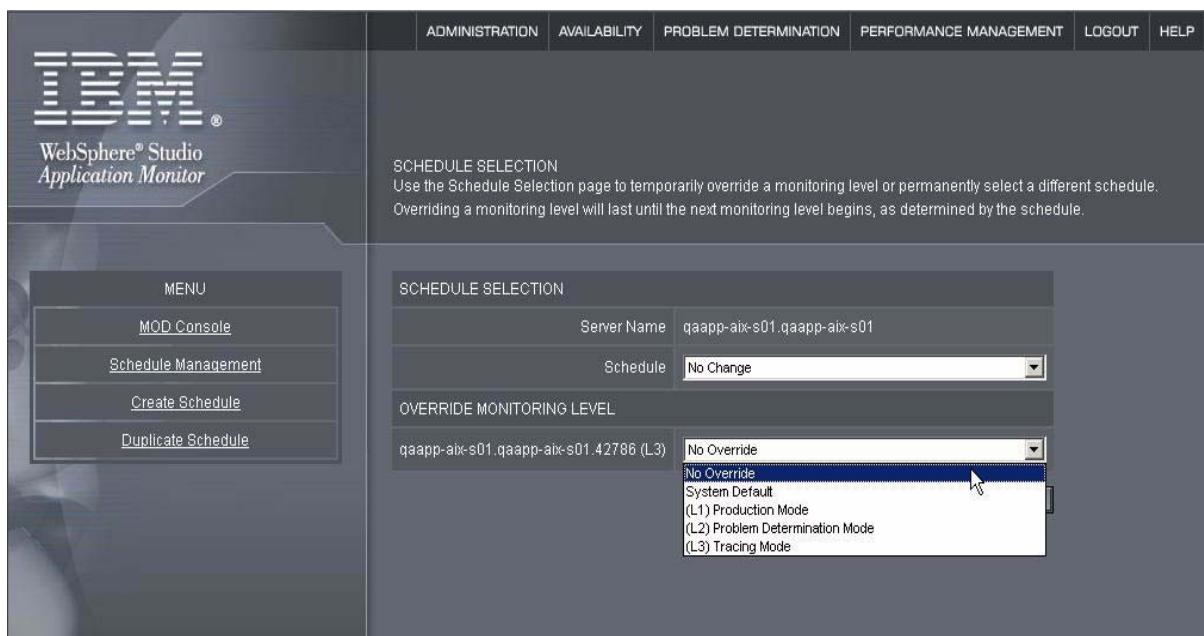


FIGURE 4. Schedule Selection

4. To set a new schedule, select a schedule from the Schedule drop-down menu.
5. Click **OK** to save your changes.

Warning! For the non-z/OS platform, when the system changes to or from L1 to L2 or L3, the server automatically restarts. For the z/OS platform, MOD scheduling applies to server instance level, i.e., all server regions will follow the same schedule and will not restart.

Changing the Default Monitoring Level

The Default Monitoring Level determines the monitoring level for all servers connected to WSAM that are not managed under the MOD scheduling yet. This is the case when configuring a server for the first time and bringing up the server under the management of WSAM.

Set the Default Monitoring Level in the Data Collection Settings page of System Properties, and it will become the 'floor' monitoring level of all servers before they become MOD managed servers. The same value is also used for MOD managed servers when there is no applicable scheduled monitoring for the servers (e.g. between schedules).

To change the default monitoring level:

1. From the top navigation, click **Administration > Managing Device > System Properties**.

The System Properties page opens.

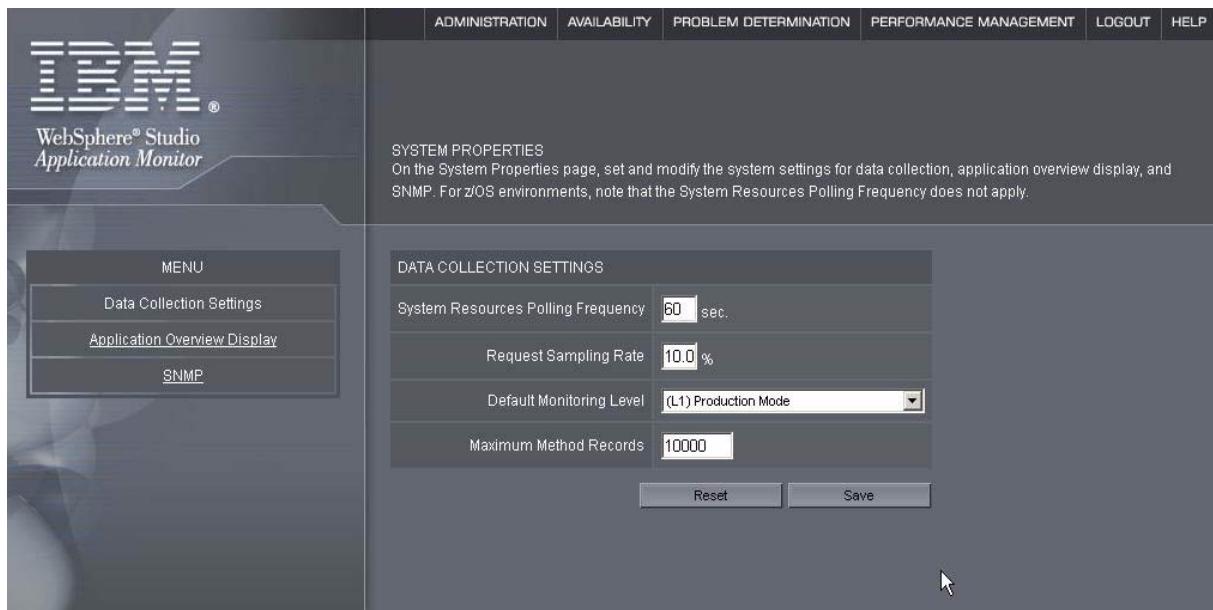


FIGURE 5. System Properties

2. Select a new default monitoring level from the Default Monitoring Level drop-down menu.
3. Click **Save**.

Warning! For the non-z/OS platform, when the system changes to or from L1 to L2 or L3, the server automatically restarts. For the z/OS platform, MOD scheduling applies to server instance level, i.e., all server regions will follow the same schedule and will not restart.

Creating a Schedule

At times a server may need more detailed monitoring; you can create a schedule that changes the monitoring level based on a specified date and time. Using the

schedule, modulate the monitoring level at different times based on the anticipated load on the server.

To create a schedule:

1. From the top navigation, click **Administration > Monitoring on Demand™**.

The Monitoring on Demand™ (MOD) Console page opens.

2. Click **Create Schedule** on the left navigation.

The Schedule Detail page opens where you can create a new schedule.

The screenshot shows the 'Schedule Detail' page of the WebSphere Studio Application Monitor MOD Console. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. On the left, a menu bar lists MOD Console, Schedule Management, Create Schedule, and Duplicate Schedule. The main content area has tabs for Schedule Properties (selected), Schedule Detail, and Add Schedule Event. The Schedule Properties tab shows 'View' set to 'Day' and 'Schedule Name' set to 'New Schedule'. The Schedule Detail tab displays a grid from 1/17/03 to 1/18/03 with columns for Day of Month, Day of Week, Hour, Minute, and Level. A message indicates '--- NO SCHEDULED EVENTS ---'. The Add Schedule Event tab allows setting Day of Month (*), Day of Week (*), Hour (00), Minute (00), and Monitoring Level (System Default). Buttons for Cancel and OK are at the bottom right.

FIGURE 6. Schedule Detail

3. Select the View you want to see: Day, Week, or Month.
The screen displays the graph based on your selection.
4. Enter a Schedule Name.
5. Select the Day of the Month or the Day of the Week when you want your schedule to take effect; for example, you may want the schedule to start on the 5th of every month or on every Monday.
6. Select the Hour and Minute when the schedule starts.
7. Select the Monitoring Level that best suits your needs: L1, L2, and L3.
8. Click **Add** to insert the settings into the schedule. Each schedule can include multiple monitoring level changes; to save each change, click **Add**.
9. To save the schedule, click **OK**.

The Schedule Management page opens with the new schedule displayed.

Warning! Do not create an overly complicated schedule or else you will never know at what level of monitoring your servers are running. The rules should be simple. L1 has the smallest overhead, while L3 is heavier. When L2 applies, it has optimum overhead and allows you to switch to L3 without the need to restart. You may want minimum one or max 5% of your servers running at L3, either as dedicated servers, or only during non-peak hours. This arrangement will give you good quality data for workload Tracing and application sizing. In the case of the z/OS environment, you may want to create a server instance that runs at L3.

Modifying a Schedule

If you find that an existing schedule is not providing the correct level of monitoring, modify the schedule to reflect your needs.

To modify a schedule:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
The Monitoring on Demand™ (MOD) Console page opens.
2. Click **Schedule Management** on the left navigation.
The Schedule Management page opens.
3. Click on the schedule you want to modify.

The Schedule Detail page opens populated with the selected schedule.

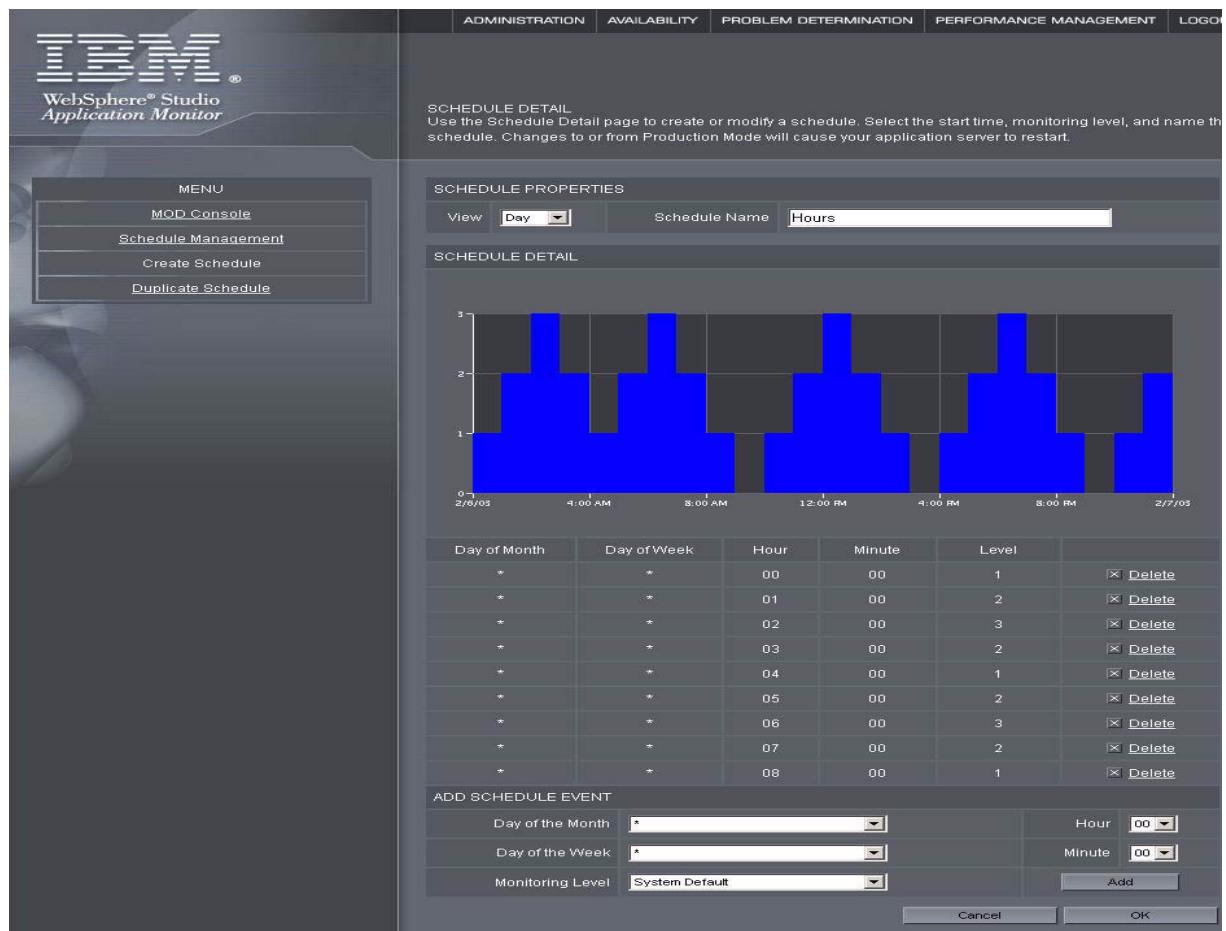


FIGURE 7. Schedule Detail

4. Add a new setting to the schedule by changing the View, Day of the Month, Day of the Week, Hour, Minute, or Monitoring Level.
5. Delete a setting for a specific day of the month or day of the week by clicking **Delete** next to the setting.

6. Click **Add** to insert the settings into the schedule. Each schedule can include multiple monitoring level changes.
7. To save your changes to the schedule, click **OK**.
The Schedule Management page opens with the modified schedule displayed.

Deleting a Schedule

Keep your schedules updated by deleting schedules from the system that are no longer in use.

To delete a schedule:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
The Monitoring on Demand™ (MOD) Console page opens.
2. Click **Schedule Management** on the left navigation.
The Schedule Management page opens.
3. Click **X** or **Delete** next to the schedule you want to remove.
4. At the confirmation box, click **OK** to delete the schedule.
The Schedule Management page displays without the deleted schedule.

Duplicating a Schedule

Save time by duplicating schedules. Duplicating a schedule allows you to quickly create a new schedule based on the settings of an existing schedule.

To duplicate a schedule:

1. From the top navigation, click **Administration > Monitoring on Demand™**.
The Monitoring on Demand™ (MOD) Console page opens.
2. Click **Duplicate Schedule** on the left navigation.
The Duplicate Schedule page opens.

Duplicating a Schedule

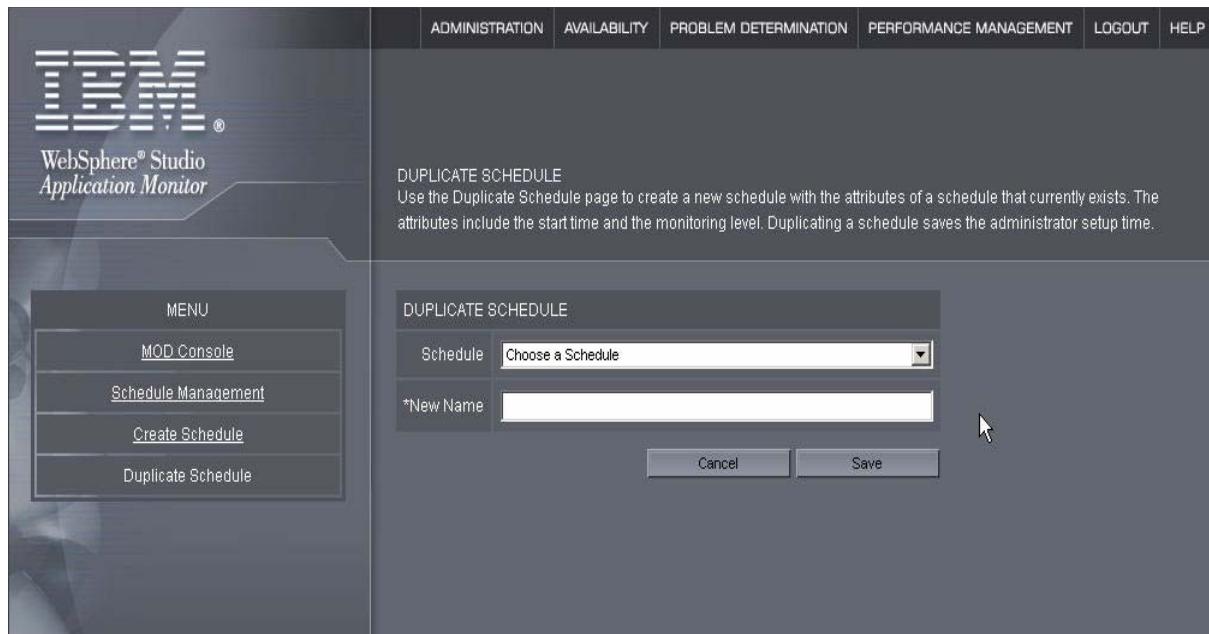


FIGURE 8. Duplicate Schedule

3. From the Schedule drop-down box, select the schedule you want to duplicate.
4. Enter a new name for the duplicated schedule.
5. Click **Save** to duplicate the schedule.

The Schedule Management page opens displaying the duplicated schedule.

The Managing Server section provides a method for setting the System Properties for the system. In addition, the Self-Diagnosis is available for servicing WSAM.

System Properties

The System Properties is separated into three sections the Data Collection Settings, the Application Overview Display, and the SNMP Network Settings. Control the setup of WSAM using these properties.

Configuring the Data Collection Settings

Use the Data Collection Settings to set and modify the system settings for the Managing Server to regulate the frequency of data collection, the percentage of data stored, the level of monitoring, and the number of entry and exit records stored.

To configure the Data Collection Settings:

- From the top navigation, click **Administration > Managing Server > System Properties**.

The System Properties page opens.

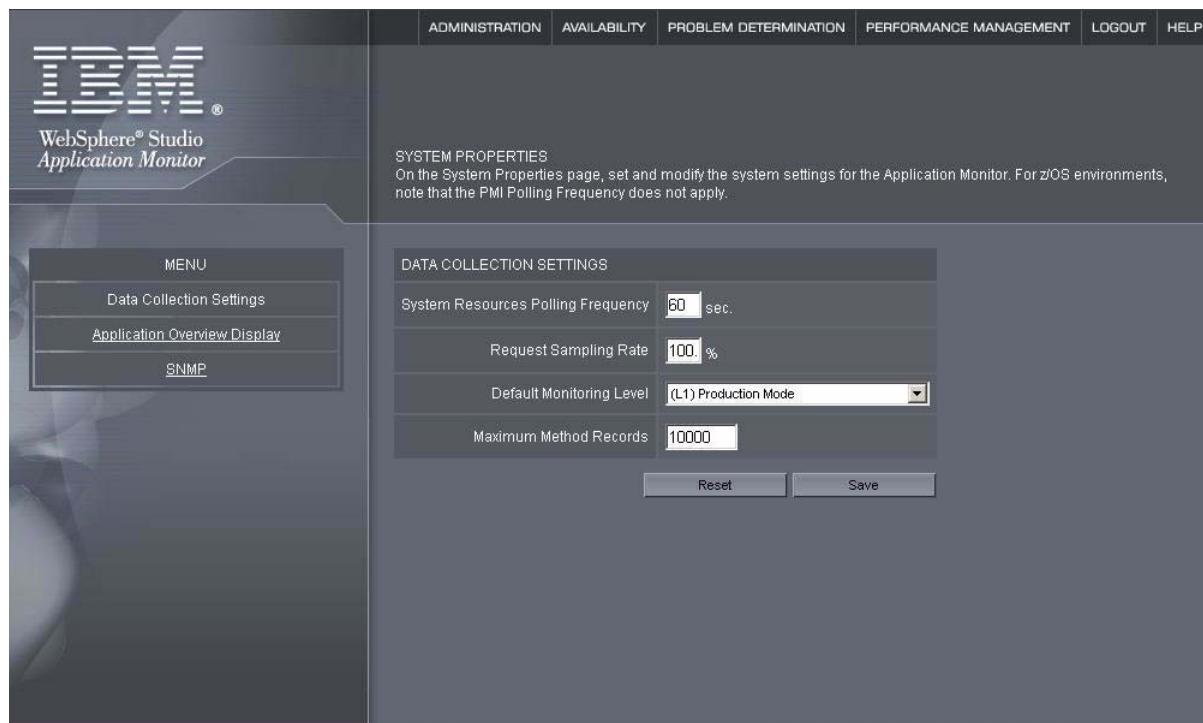


FIGURE 1. Data Collection Settings

- Enter the appropriate value for the following properties:

System Resources Polling Frequency – Set how often the system resources requests information from your application server. The default setting is 60 seconds.

Request Sampling Rate – The percentage of requests stored in the database for reporting and analysis. The default request sampling rate is 10%. Carefully

select the storage capacity; setting your storage too high may result in storage of redundant data.

Default Monitoring Level – The currently set default monitoring level for all servers connected to the Application Monitor. This is the case when configuring a server for the first time and bringing up the server under the management of the Application Monitor. The default monitoring level for the non- z/OS platform is L2 (Problem Determination). As for the z/OS platform, the default monitoring level is L1 (Production Mode).

Maximum Method Records – The maximum number of method entry/exit records. The records will be over written when they reach this value. The default value is 10,000.

3. Click **Save**.

Configuring the Application Overview Display

Use the Application Overview Display settings to set the Baseline Indicator and the Baseline Definitions. The Baseline Indicator is the percentage above the baseline that you determine to be slow or very slow, while the Baseline Definitions is the baseline the application must fall below for an average response time for all servers in the group.

To configure the Application Overview Display:

1. From the top navigation, click **Administration > Managing Server > System Properties**.
The System Properties page opens.
2. On the left navigation, click **Application Overview Display**.
The Application Overview Display page opens.

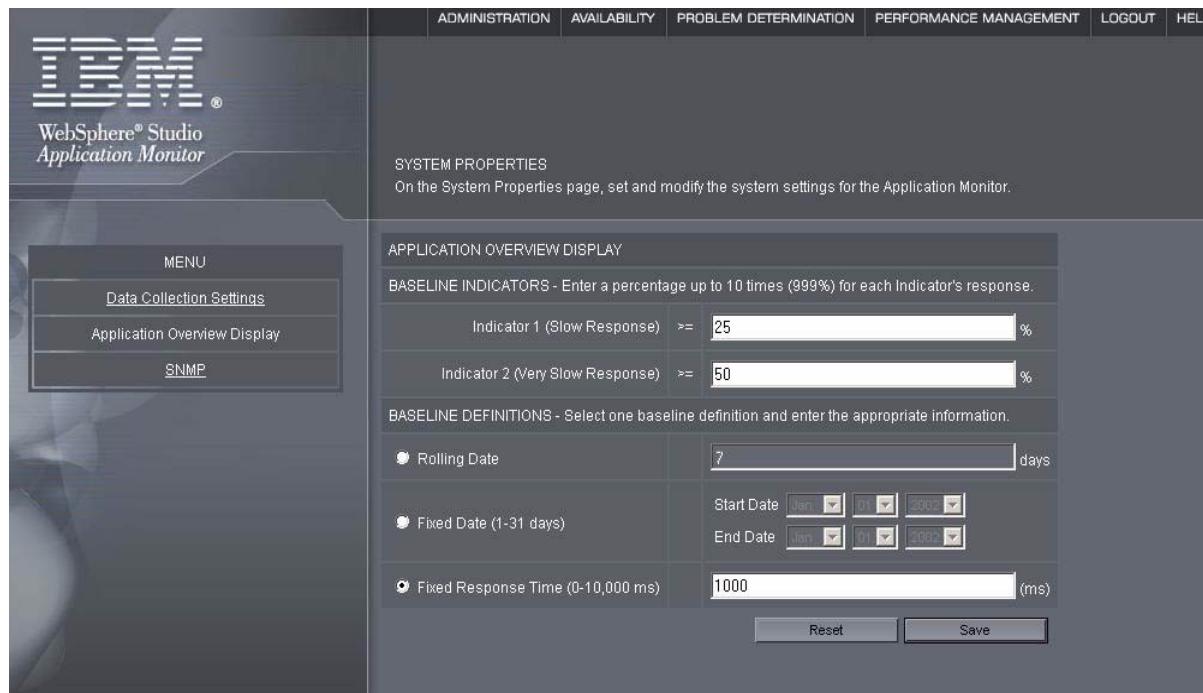


FIGURE 2. Application Overview Display Settings

3. Enter the appropriate value for the following properties:

Baseline Indicators – The percentage above the baseline that you determine to be slow or very slow. “Slow Response” means the present response time is between 26% and 50% of the baseline; “Very Slow Response” means the present response time exceeds 50% of the baseline.

Note: When the response time reaches Indicator 1, an orange indicator will display on the Application Overview page; a red indicator means the response time has exceeded Indicator 2 and the system is very unhealthy.

Baseline Definitions – The baseline the application must fall below for an average response time for all servers in the group.

Rolling Date – The number you place in this field will represent the days over which the average response will be calculated for the baseline. The response time on the Application Overview page will be compared to this baseline.

Fixed Date – The average response time per 5 minute increments from between the start date and end date will become the baseline against which your current response times on the Application Overview page will be compared.

Fixed Response Time – The response time entered in this field will become the response time against which your current response times on the Application Overview page will be compared.

4. Click **Save**.

Configuring the SNMP Network

Use the SNMP Network settings to indicate the configuration for the SNMP server. A test message will be sent to the SNMP Network Manager to test for an open connection.

To configure the SNMP Network:

1. From the top navigation, click **Administration > Managing Server > System Properties**.
The System Properties page opens.
2. On the left navigation, click **SNMP**.
The SNMP Network Configuration page opens.

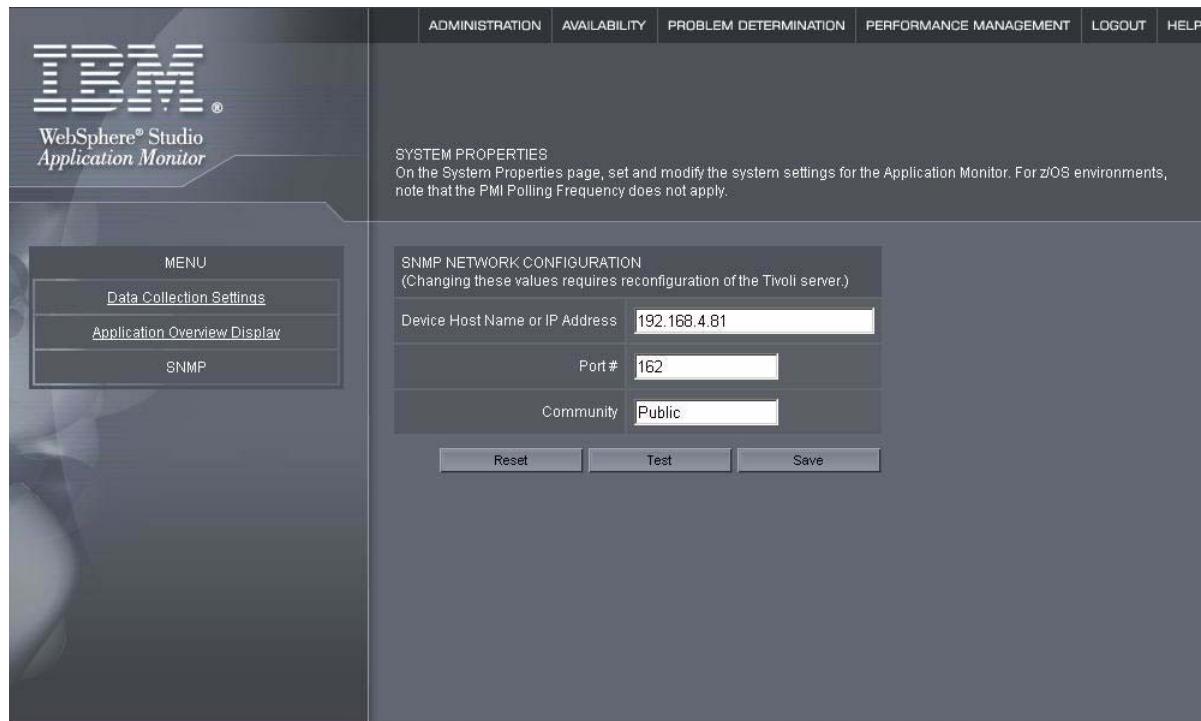


FIGURE 3. SNMP Network Configuration

3. Enter the appropriate value for the following properties:

Device Host Name or IP Address – The name or address of the machine being sent SNMP messages.

Port Number – The port number of the machine being sent SNMP messages.

Community – A string that is part of the SNMP protocol.

4. Click **Test** to send a test message to the SNMP Network Manager to test for an open connection.
5. Click **Save** to save your settings.

Self-Diagnosis

This section is designed for the Support staff to service WSAM. The Self-Diagnosis provides a view of all the components currently running, their states and attributes. WSAM consists of the following components: Kernel, Data Collector Controller, Publish Server, Message Dispatcher and Archive Agent. Since we architected WSAM to run in a loosely-coupled, dynamic environment, the components can be up or down without affecting the integrity of the whole system.

Viewing the Self-Diagnosis for the Kernel

The Kernel is a directory service dedicated to WSAM that monitors the components that join and leave the network. The Self-Diagnosis provides a view of all the components on the Kernel currently running and their attributes. There are always two copies of the Kernel running at the same time.

To view the Self-Diagnosis for the Kernel:

1. From the top navigation, click **Administration > Managing Server > Self-Diagnosis**.

The Self-Diagnosis page opens displaying the first Kernel's data.

Self-Diagnosis

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. On the left, a sidebar titled 'COMPONENTS' lists various application components like Application Monitor, Kernel Instances (Kernel 1, Kernel 2), Archive Agents, Publish Servers, Message Dispatchers, and Data Collector Controllers. A mouse cursor is hovering over the 'Message Dispatchers' link. The main content area has two tabs: 'SELF-DIAGNOSIS' and 'KERNEL 1 RUNTIME ENVIRONMENT DETAIL'. The 'SELF-DIAGNOSIS' tab contains a brief description of the Application Monitor components and their dynamic nature. The 'KERNEL 1 RUNTIME ENVIRONMENT DETAIL' tab displays detailed runtime environment information for Kernel 1, including Platform (Linux 2.4.7-10smp), IP Address (192.168.4.4), RMI Port # (9118), TCP Port # (9120), Codebase Server Port (9122), Codebase Library Path (/opt/cyaneaone/lib), Contract Renewal Interval (15), Start Time (Feb 6, 2003 3:45:18 PM), Security Policy File (/opt/cyaneaone/etc/kl.policy), JDBC Driver Name (COM.ibm.db2.jdbc.app.DB2Driver), Database URL (jdbc:db2:octigate), Total Records Sent (1971), Available Records Sent (1486), Unavailable Records Sent (474), and Disabled Records Sent (11). Below this is a 'COMPONENT OVERVIEW' table with two entries: PPEPROBE and PPECONTROLLER. The PPEPROBE entry has a Component ID of 7180a84e-f51c-d701-fe9d-000255c72e01.2054, Platform Linux 2.4.7-10smp, IP Address 192.168.4.5, Listen Port # Unknown, FirstJoin Time Feb 6, 2003 3:50:21 PM, and Last Contract Renewal Time Feb 6, 2003 4:28:45 PM. The PPECONTROLLER entry has a Component ID of 10b383a9-8922-d701-dfd-866715f3db9.45620, Platform AIX 5.1, IP Address 192.168.4.8, Listen Port # Unknown, FirstJoin Time Feb 6, 2003 3:51:33 PM, and Last Contract Renewal Time Feb 6, 2003 4:28:35 PM.

FIGURE 4. Self-Diagnosis for Kernel

2. Use the left navigation to view the Self-Diagnosis for the other Kernel in the system.

Viewing the Self-Diagnosis for the Archive Agent

The Archive Agent aggregates the data from the Publish Server and archives it into the database for reporting. The Self-Diagnosis provides a view of all the components on the Archive Agent currently running and their attributes.

To view the Self-Diagnosis for the Archive Agent:

1. From the top navigation, click **Administration > Managing Server > Self-Diagnosis**.

The Self-Diagnosis page opens.

2. From the left navigation, click the Archive Agent's link.
3. Click to select the Archive Agent you want to view.

The data for the selected Archive Agent displays.

SELF-DIAGNOSIS
The Application Monitor consists of the following components: kernel, data collector controller, data collector, publish server, email engine, and archive agent. Since the Application Monitor is a dynamic environment, the components can be up or down without affecting the integrity of the whole system. Self-Diagnosis provides a view of all the components currently running and their attributes.

ARCHIVE AGENT RUNTIME ENVIRONMENT DETAIL			
Component ID	70e3611e-2d3a-d701-da79-000255c72999		
IP Address	192.168.4.6		
Start Time	Feb 6, 2003 3:45:49 PM		
Kernel Codebase	http://qaapp-Inx-s01:9122/kernel.core.jar http://qaapp-Inx-s01:9123/kernel.core.jar		
Platform	Linux 2.4.7-10smp		
Port #	9107		
Security Policy File	/opt/cyaneaone/etc/aa.policy		
Connected Kernel	qaapp-Inx-s01:9120 qaapp-Inx-s01:9121		

PUBLISH SERVER RELATIONSHIPS			
Component ID	Platform	IP Address	Listen Port #
469w500d-3798-d601-3ccc-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9103
469w500d-3798-d601-3ccc-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9103
af45f8c3-627d-d601-c3c6-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9104
af45f8c3-627d-d601-c3c6-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9104
469w500d-3798-d601-3ccc-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9103
469w500d-3798-d601-3ccc-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9103
469w500d-3798-d601-3ccc-00065b0ea116	Linux 2.4.7-10smp	192.168.4.4	9103

FIGURE 5. Self-Diagnosis for Archive Agent

Viewing the Self-Diagnosis for the Publish Server

The Publish Server retrieves data from the Data Collector and aggregates it based on different needs. The Self-Diagnosis provides a view of all the components on the Publish Server currently running and their attributes.

To view the Self-Diagnosis for the Publish Server:

1. From the top navigation, click **Administration > Managing Server > Self-Diagnosis**.

The Self-Diagnosis page opens.

2. From the left navigation, click the Publish Server's link.
3. Click to select the Publish Server you want to view.

The data for the selected Publish Server displays.

SELF-DIAGNOSIS

The Application Monitor consists of the following components: kernel, data collector controller, data collector, publish server, email engine, and archive agent. Since the Application Monitor is a dynamic environment, the components can be up or down without affecting the integrity of the whole system. Self-Diagnosis provides a view of all the components currently running and their attributes.

PUBLISH SERVER RUNTIME ENVIRONMENT DETAIL					
Component ID	469w500d-3798-d801-3ccc-00065b0ea116				
Platform	Linux 2.4.7-10smp				
IP Address	192.168.4.4				
Port #	9103				
Start Time	Feb 6, 2003 3:45:24 PM				
Security Policy File	/opt/cyanaeone/etc/ps.policy				
Kernel Codebase	http://qaapp-lnx-s01:9122/kernel.core.jar http://qaapp-lnx-s01:9123/kernel.core.jar				
Timeout Limit	5				
Connected Kernel	qaapp-lnx-s01:9120 qaapp-lnx-s01:9121				
Sampling Frequency	100				
Buffer Size	65536				

DATA COLLECTOR RELATIONSHIPS					
Admin Server	App Server	Component ID	Platform	IP Address	Listen Port #
qaapp-win-s02	winserver	21c134ab-c91e-d701-8db0-000255c78f71.3212	Windows 2000 5.0	192.168.4.13	3600
qaapp-sun-s01	dc_ws40_01	f1611523-f81c-d701-df8f-0003ba017ab8.3617	SunOS 5.8	192.168.4.2	52759
qaapp-win-s02	server1	71a50b16-f01c-d701-3c99-000255c78f71.3064	Windows 2000 5.0	192.168.4.13	1765
qaapp-aix-s01	dc_ws40_01	20a0bcaa-f61c-d701-754d-c929d8b6b0fce.77554	AIX 5.1	192.168.4.8	36180
qaapp-aix-s01	server1	6108de10-f91c-d701-08f6-d73245c096e1.84292	AIX 5.1	192.168.4.8	36095

FIGURE 6. Self-Diagnosis for Publish Server

Viewing the Self-Diagnosis for the Data Collector Controller

The Data Collector Controller regulates the behavior of a Data Collector, including the monitoring level, filter list, and enable or disable status. The Self-Diagnosis

provides a view of all the components on the Data Collector Controller currently running and their attributes.

To view the Self-Diagnosis for the Data Collector Controller:

1. From the top navigation, click **Administration > Managing Server > Self-Diagnosis**.

The Self-Diagnosis page opens.

2. From the left navigation, click the Data Collector Controller's link.
3. Click to select the Data Collector Controller you want to view.

The data for the selected Data Collector Controller displays.

Self-Diagnosis

The screenshot shows the WebSphere Studio Application Monitor interface with the 'SELF-DIAGNOSIS' section selected. The left sidebar lists various components: Application Monitor (Kernel Instances: Kernel 1, Kernel 2), Archive Agents (Archive Agent 1), Publish Servers (Publish Server 1, Publish Server 2), Message Dispatchers, and Data Collector Controllers. The right panel displays detailed runtime environment information for the Data Collector Controller.

SELF-DIAGNOSIS
The Application Monitor consists of the following components: kernel, data collector controller, data collector, publish server, email engine, and archive agent. Since the Application Monitor is a dynamic environment, the components can be up or down without affecting the integrity of the whole system. Self-Diagnosis provides a view of all the components currently running and their attributes.

DATA COLLECTOR CONTROLLER RUNTIME ENVIRONMENT DETAIL

Component ID	9055d32a-f41c-d701-75d1-000255c72e01.12789
App Server	true
IP Address	192.168.4.5
Kernel Codebase	http://qaapp-lnx-s01:9122/kernel.core.jar http://qaapp-lnx-s01:9123/kernel.core.jar
Connected Kernel	qaapp-lnx-s01:9120 qaapp-lnx-s01:9121
Configured	true
Admin Server	qaapp-lnx-s02
Platform	Linux 2.4.7-10smp
Port #	Unknown
Start Time	Feb 7, 2003 10:52:28 AM
Configuration Profile	/opt/dc_ws40_01/etc/qaapp-lnx-s02.dc_ws40_01.datacollector.properties
Security Policy File	/opt/dc_ws40_01/etc/datacollector.policy

DATA COLLECTOR RUNTIME ENVIRONMENT DETAIL

Component ID	a07cd32a-f41c-d701-75d1-000255c72e01.12789
Enabled	true
Class Name Filter List (Exclude)	com.cyanea javax oracle sun java com.sun com.ibm COM.rsa org.w3c org.omg org.xml com.bea.sys utils.version org.apache flexim com.Tivoli
Port #	Unknown

FIGURE 7. Self-Diagnosis for Data Collector Controller

Viewing the Self-Diagnosis for the Message Dispatcher

The Message Dispatcher sends out emails of performance reports and trap results from the Performance Analysis & Reporting and the Trap & Alert Management

applications. The Self-Diagnosis shows all the attributes of the Message Dispatcher currently running such as total number of emails sent.

To view the Self-Diagnosis for the Message Dispatcher:

1. From the top navigation, click **Administration > Managing Server > Self-Diagnosis**.

The Self-Diagnosis page opens.

2. From the left navigation, click the Message Dispatchers' link.
3. Click to select the Message Dispatcher you want to view.

The data for the selected Message Dispatcher displays.

The screenshot shows the WebSphere Studio Application Monitor interface. The left sidebar lists components: Application Monitor (Kernel Instances: Kernel 1, Kernel 2), Archive Agents, Publish Servers, Message Dispatchers (Message Dispatcher 1), and Data Collector Controllers. The main content area has tabs at the top: ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The current tab is ADMINISTRATION. Below the tabs is a section titled "SELF-DIAGNOSIS" which states: "The Application Monitor consists of the following components: kernel, data collector controller, data collector, publish server, email engine, and archive agent. Since the Application Monitor is a dynamic environment, the components can be up or down without affecting the integrity of the whole system. Self-Diagnosis provides a view of all the components currently running and their attributes." Below this is a table titled "MESSAGE DISPATCHER RUNTIME ENVIRONMENT DETAIL" with the following data:

Component ID	30ca500d-3798-d601-3ccc-00065b0ea116
IP Address	192.168.4.4
Start Time	May 4, 2003 3:26:09 AM
Kernel Codebase	http://qaapp-lnx-s01:9122/kernel.core.jar http://qaapp-lnx-s01:9123/kernel.core.jar
Platform	Linux 2.4.7-10smp
Port #	9106
Security Policy File	/opt/cyaneaone/etc/md.policy
Connected Kernel	qaapp-lnx-s01:9120 qaapp-lnx-s01:9121

Below this is a section titled "EMAIL ENGINE RUNTIME ENVIRONMENT DETAIL" with the following data:

Email Server IP Address	192.168.3.12
# of Emails Sent	0

Finally, there is a section titled "SNMP ENGINE RUNTIME ENVIRONMENT DETAIL" with the following data:

Network Manager Host Name/IP Address	192.168.4.81
Port #	162
Community	Public
Number of Traps Received	0
Number of Traps Sent	0

FIGURE 8. Self-Diagnosis for Message Dispatcher

Self-Diagnosis

Availability Management

Availability Management refers to the WSAM functions that provide server availability data for the user and a quick snapshot of the available server activity. When a user logs into WSAM, the Application Overview page displays. This page is a dashboard for your data center. The overview provides a quick graphical glimpse of all the available servers and their throughput for the last hour. From this page, if you want to find a specific request, click **In-Flight Request Search** from the drop-down box under a particular group. If you want more information on a group, click **Server Statistics Overview**. If you want to compare resources across all servers in a group, click **System Resource Comparison (SRC)**.

From the Server Statistics Overview page, you can access key statistics for servers that belong to the groups you are authorized to view. These statistics include data elements such as Status, Platform, Delta Volume, Delta JVM CPU Usage, Total Volume, JVM/Total CPU%, Memory Usage, Group Name, IP Address, UP Time, Delta Platform CPU, Start Time, Data Collector Uptime, Paging Rate, Active Sessions, Average Response Time, and Application Server Platform. The screen refreshes every 15 seconds by default, and the delta statistics displayed reflect the change from the previous 15 seconds. Drill down from this page using the Tools button to view greater levels of detail for each of the servers displayed in the

Server Activity Display (SAD) page, the System Resources (SR) page, and the System Resource Comparison (SRC) page.

Application Overview

The Application Overview displays the availability for all the applications available in the assigned server groups. The page shows how many servers in a group are available and the total number of requests completed on the servers in the group.

Note: At this point, requests that are counted are the first JSP, Servlet, or EJB request coming into the application server representing the user's transaction.

The Application Overview page also provides a comparison of the current response time to a baseline response time, and historical baseline aggregated over a specified number of days. The baseline is on the server group level and can be modified on the Modify Group page. When the current response time exceeds the baseline response times, the Application Overview page provides an indicator under the current response time on the group. Mouse over the indicator to view the actual data.

To open the Application Overview page:

1. From the top navigation, click **Availability > Application Overview** or access the Application Overview page from any location in the application by clicking the WSAM logo at the top left-hand corner of your screen.

The Application Overview page opens.

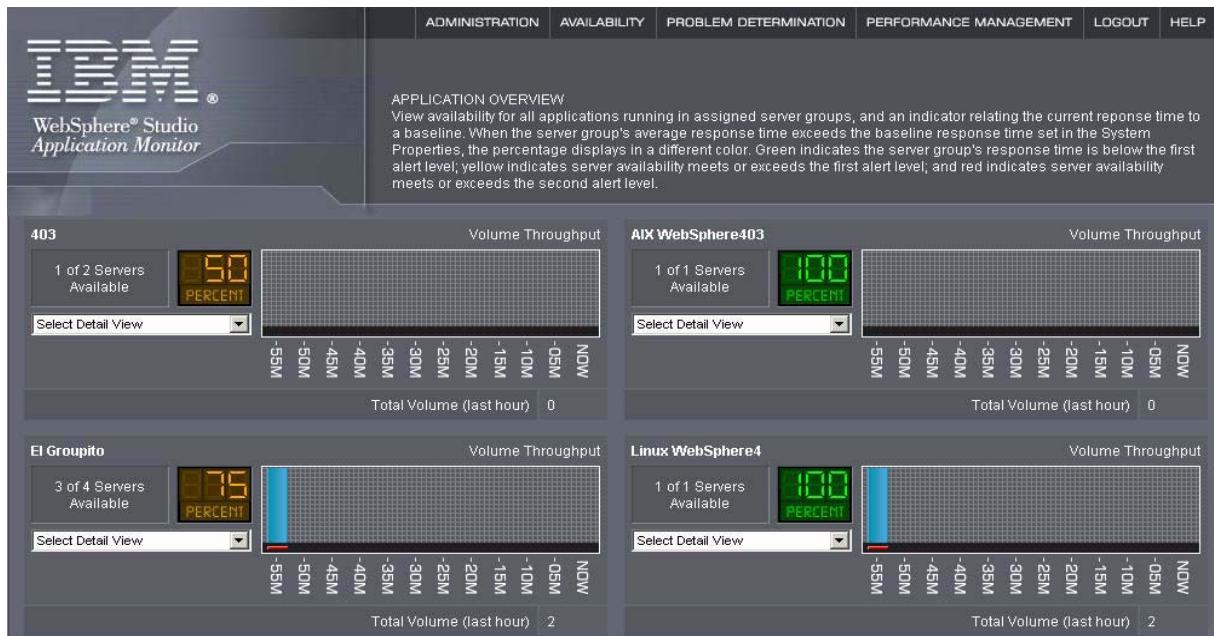


FIGURE 1. Application Overview

Usage Notes: The information that displays on the Application Overview page depends on the user's account setup. Only the servers the user has access to view will display. The numeric percentage is rounded up, i.e., the percentage of servers up and running in the group. The Volume Throughput shows the number of completed Web requests processed in five minute increments for the past hour. Each group displays in its own box labeled with the name of the group.

Viewing Server Statistics Overview

The Server Statistics Overview page displays application server data allowing easy access to the status of your servers. To alert you that a server is down, an unavailable server displays in red. For thread data or system data, or system data across a server group, click the Tools button to view the information on the SAD page, the SR page or the SRC page respectively.

To open the Server Statistics Overview page:

1. From the top navigation, click **Availability > Server Statistics Overview** or by selecting from the drop-down box of each group of the servers on the Application Overview page.
2. The Server Statistics Overview page opens.

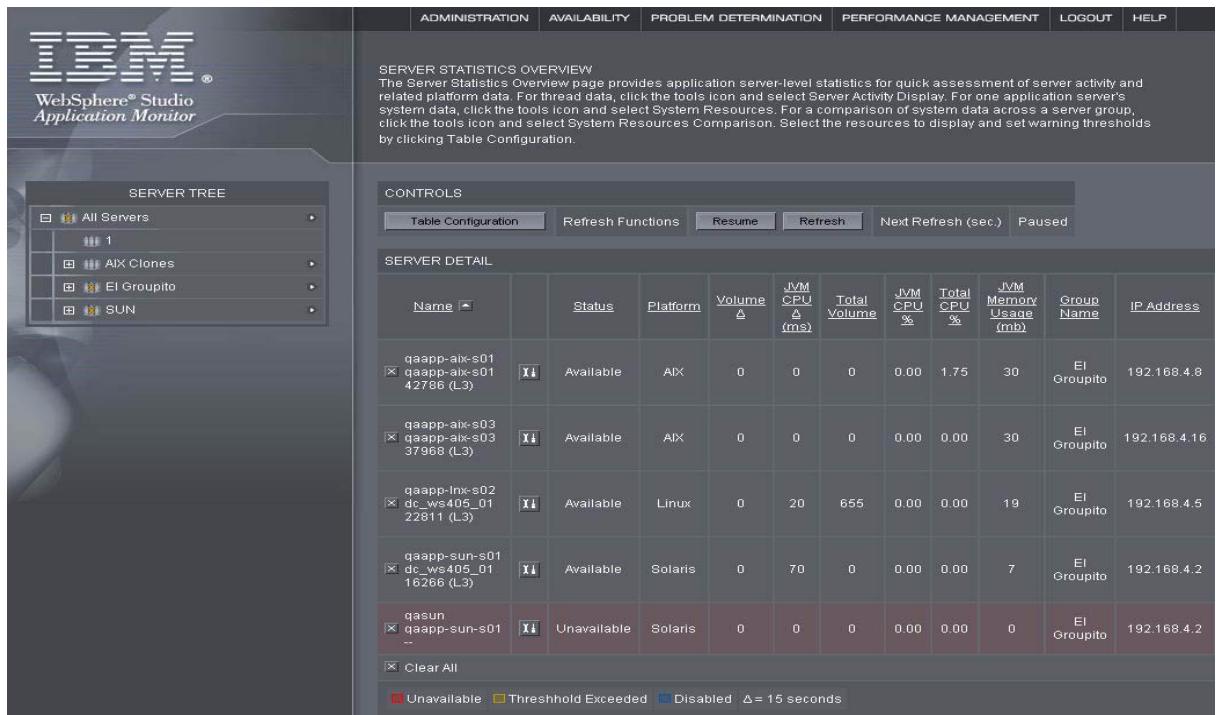


FIGURE 2. Server Statistics Overview

Usage Notes: The Server Statistics Overview page shows all the activities we track that provide important server information. This page is similar to a work bench because you choose the servers to monitor that are problematic. Using the left navigation, select the servers from your server farm that you want to monitor and change them depending on your needs.

In general, with a healthy system, Volume Delta shows numbers processing, while the Total Volume should gradually increase. The JVM CPU% shows a snapshot of the CPU used by the JVM and the Total CPU% shows the total CPU used by the platform.

When a server displays red, it is perceived by WSAM that it is not available. In other words, the Data Collector no longer sends a heart beat. This could mean the hardware is not functioning; the server is not functioning; WebSphere is not functioning; or the network between the server and WSAM is not functioning. In rare cases, the Data Collector may be stopped.

The Data Collector displays in blue when it is disabled by the user. It will not collect any performance and availability data from the WebSphere Application Server until it is enabled again.

When the data exceeds the threshold, the server name and the column will be highlighted in yellow.

If WSAM shows a server is available, it doesn't always indicate that it is processing requests. For example, you notice a malfunctioning server. In four refreshes, the delta amount of requests shows nothing, but the Delta CPU is always significant, there is a high chance that the server is not doing anything useful; it could be looping.

A server that has been up for 30 days may need to recycle in order to correct memory leaks. If you want to restart a server, you may want to select the server with the longest Uptime.

Be more careful when selecting a server if there is only one server in the group.

To display groups or servers on the page:

1. From the left navigation, click the **All Servers**' link.
The list expands and collapses all the Groups in WSAM.
2. On the left navigation, click the plus sign to view the servers in a group.
The list expands and collapses the servers in the selected group.
3. Click on the arrow next to the group or server to populate the Detail window.

Usage Notes: For the z/OS platform, the icon on the left navigation represents a server instance, where each detailed line represents a server region which belongs to the selected server instance.

To remove a server from the Server Statistics Overview page:

1. Click the **X** icon next to the server.
The server disappears from the display.
2. If you want to clear all the servers from the display, click **Clear All**.
The page refreshes clear of any servers or information.

Usage Notes: For the z/OS platform, when you remove a server region from the detail page, the system removes all the server regions belonging to that server instance from the display since the system treats them as a group of clones.

Configuring the Server Statistics Overview

The Server Statistics Overview page can be configured for each session. Currently, you can set the levels for the Volume Delta, JVM CPU Delta, Total Volume, JVM CPU%, Total CPU%, JVM Memory Usage, Group Name, IP Address, Application Server Uptime, Platform CPU Delta, Application Server Start Time, and Data Collector Uptime. Set the warning threshold for each resource to greater than or less than depending on when you want the count for the warning to begin.

To configure the Server Statistics Configuration page:

1. From the top navigation, click **Availability > Server Statistics Overview**.
The Server Statistics Overview page opens.
2. Click **Table Configuration**.
The Server Statistics Configuration window opens.

Viewing Server Statistics Overview

The screenshot shows the 'Server Statistics Configuration' dialog box. It contains a grid of configuration items with checkboxes, dropdown menus, and input fields. The items are:

SERVER STATISTICS CONFIGURATION					
<input checked="" type="checkbox"/> Volume Δ	None <input type="button"/>	<input type="text"/> Requests	<input checked="" type="checkbox"/> JVM CPU Δ	None <input type="button"/>	<input type="text"/> ms
<input checked="" type="checkbox"/> Total Volume	None <input type="button"/>	<input type="text"/> requests	<input checked="" type="checkbox"/> JVM CPU %	None <input type="button"/>	<input type="text"/> %
<input checked="" type="checkbox"/> Total CPU %	None <input type="button"/>	<input type="text"/> %	<input checked="" type="checkbox"/> JVM Memory Usage	None <input type="button"/>	<input type="text"/> mb
<input checked="" type="checkbox"/> Group Name			<input checked="" type="checkbox"/> IP Address		
<input checked="" type="checkbox"/> Application Server Uptime	None <input type="button"/>	<input type="text"/> Hour(s)	<input checked="" type="checkbox"/> Platform CPU Δ	None <input type="button"/>	<input type="text"/> ms
<input checked="" type="checkbox"/> Application Server Start Time			<input checked="" type="checkbox"/> Data Collector Uptime		
<input checked="" type="checkbox"/> Platform			<input checked="" type="checkbox"/> Paging Rate	None <input type="button"/>	<input type="text"/> KB/s
<input checked="" type="checkbox"/> Active Sessions	None <input type="button"/>	<input type="text"/>	<input checked="" type="checkbox"/> Average Response Time (1 min)	None <input type="button"/>	<input type="text"/> ms
<input checked="" type="checkbox"/> Application Server Platform					

At the bottom are buttons: Select All, Deselect All, Cancel, and Save, with the Save button being the last one and having a mouse cursor over it.

FIGURE 3. Server Statistics Configuration

3. Click **Select All** or click to select the resource you want to display.
4. Select an operator from the drop-down menu. None means no threshold monitoring required.
5. Enter a number to exceed or fall below that will cause the system to generate a warning on the detail page.
6. Click **Save**.

Usage Notes: For each data element on the Server Statistics Configuration page, set the range between 0-99999.

After setting the thresholds, the system alerts the user when a threshold is crossed by highlighting the column and the server name in yellow, while an unavailable server displays in red.

Also, for the z/OS environment, the threshold monitoring is applied to all of the server regions in the Server Statistics Overview page.

In-Flight Request Search

Locating a malfunctioning application is difficult in a server farm. WSAM provides the In-Flight Request Search to achieve this. When a client makes a request for a particular server resource, the resource is often a Web page or a Java application. To search for an in-flight request, enter in the search argument using alphanumeric characters and select a group of servers. All requests that contain the search string and are currently active on any server specified in the group will be displayed. You can also restrict a search to a specific server, or simply list out all in-flight transactions in the entire server farm.

The output for a search displays a list of requests that contain the search string. Each line will show the Server Name, the Client Request\Transaction, the Start/Date Time, Thread ID, and Total Resident Time. The user can also drill down into the specific request by clicking on the Thread ID or by clicking the Tools button to view the SAD page or the SR page for each request.

Searching for an Application Request

The In-Flight Request Search page provides a searching component for finding an open, troubled request in a server farm.

From the search results you can select the Thread ID's link to view the Request Detail. Organize your search results and sort them by heading. In addition, move to the SAD page or the SR page by clicking the Tools button.

To open the In-Flight Request Search page:

1. From the top navigation, click **Problem Determination > In-Flight Request Search**.
2. The In-Flight Request Search page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The PROBLEM DETERMINATION link is highlighted. On the left, the IBM logo and the text "WebSphere® Studio Application Monitor" are displayed. The main content area is titled "IN-FLIGHT REQUEST SEARCH" and contains a sub-instruction: "In the Search Request box, type the name of the request for which you are searching. If you leave this box empty, all active requests will display." Below this is a "SEARCH CRITERIA" section with dropdown menus for "Group" (set to "All Groups") and "Server" (set to "All Servers"), and a text input field for "Search Request/Transaction". An "OK" button is located next to the transaction input field. At the bottom, there is a "SEARCH RESULTS" section with a table showing three rows of data. The columns are labeled: Timestamp, Server Name, Client Request/Transaction, Start Date/Time, Thread ID, and Total Resident Time (ms). The data rows are as follows:

Timestamp	May 19, 2003 3:53:02 PM				
Server Name	Client Request/Transaction	Start Date/Time	Thread ID	Total Resident Time (ms)	
qaapp-lnx-s02.dc_ws405_01.22811 (L3)	[X]	/qa1/test/stacktrace	May 19, 2003 3:52:51 PM	158330076	11348
qaapp-lnx-s02.dc_ws405_01.22811 (L3)	[X]	/qa1/test/stacktrace	May 19, 2003 3:52:56 PM	158051036	6717
qaapp-lnx-s02.dc_ws405_01.22811 (L3)	[X]	/qa1/test/stacktrace	May 19, 2003 3:53:00 PM	158657964	2027

FIGURE 1. In-Flight Request Search

To search for a request:

1. Select a Group or Server from the drop-down list.

Note: If you do not select a group or server, the system will search for in-flight requests from all servers.

2. Enter a string in the Search Request box.

Note: The system will search all active URL strings (for Web requests) and active class names (for remote EJB requests) for the string entered in Step 2. If any request contains the string (Web requests or remote EJB requests), the results page will display those requests. In addition, if you leave the Search Request box empty, all in-flight requests will display.

3. Click **OK**.

All the active requests associated with your search display in the order of descending resident time.

Usage Notes: If you know the group where the request is located, but not the server, select the group and then select all servers. If you don't have enough information to locate a request by string or key word, leave the Search Request field blank, and all the currently processing requests will display sorted in descending order by Total Resident Time. Using this method, you can search for a request based on a behavior pattern, such as, a request that has been active for a long period of time. Use the search function by entering a URL or remote EJB to find all related requests currently processing. When searching, remember that the search is **case insensitive** and the results include the name of the class that makes up the remote EJB or URL. The results contain the string but do not match it exactly. All the results that contain the string will display in the results table. View the results to locate the request with the longest resident time, and drill down into the specific detail of the request.

Sorting Search Results

After your search results display, sort them by the headings. You can organize the results in alphabetical order according to the Server Name, by Client Request\Transaction, or in numeric order with Start/Date Time and Total Resident Time.

To sort the search results:

1. Click the heading to sort the results. Only underlined headings can be sorted.
2. When the page refreshes, the results display sorted by the selected heading.

Server Activity

The Server Activity chapter includes functions for a WSAM user to observe and interact with the requests currently being serviced. The user can access an overview of the requests being serviced on a particular server, and can drill down to a specific request or can even access application context information, such as, Stack Trace, Method Trace, and Request Object and Session Object, depending on the current monitoring Level.

The Server Activity Display (SAD) provides a list of the active requests that are currently being serviced by a particular server. This page has three parts. The top portion of the page displays the Snapshot Date, Snapshot Time, Platform CPU% Utilization, Application Server Name, Application Server IP Address, and Total Thread Count. The second portion includes the recent activity such as JVM CPU percentage, number of Requests/Active Sessions, JVM Heap Size, and Average Response Time. The bottom portion includes thread data for all the active requests currently being serviced by the server. The data displayed shows Thread ID, Priority, Client Request, Client Request Start, Resident Time, Last Known CPU Time, Idle Time, Thread Status, Last Known Class Name, Last Known Method. To access this page, use the top navigation or the Tools button on the Server Statistics Overview page.

From the list of threads displayed on the SAD, you can click any Thread ID's link to drill down and view the Request Detail page which provides further information regarding a specific request. The user can obtain application context information from the thread.

Usage Notes: Data in this section is constantly fluctuating. What displays on the screen is a snapshot of the data; therefore, objects in the display may disappear after executing a new task. In addition, the clocks on all the systems including the WSAM itself should be synchronized in order for the timing data to be correctly interpreted.

Server Activity Display

The SAD page provides thread data for an application server at a specific point in time. From this page, you can drill down to review more detailed information on the thread; click the Thread ID to pinpoint the cause of the problem.

The L3 (Tracing mode) is the most powerful monitoring level. Therefore, only L3 utilizes all the reporting elements available. For example, in L3, the SAD also shows data for the following columns: Accumulated CPU, Idle Time, Class Name and Current Method. In addition, on the Request Detail page, the Method Trace is available.

To open the SAD page:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection opens.

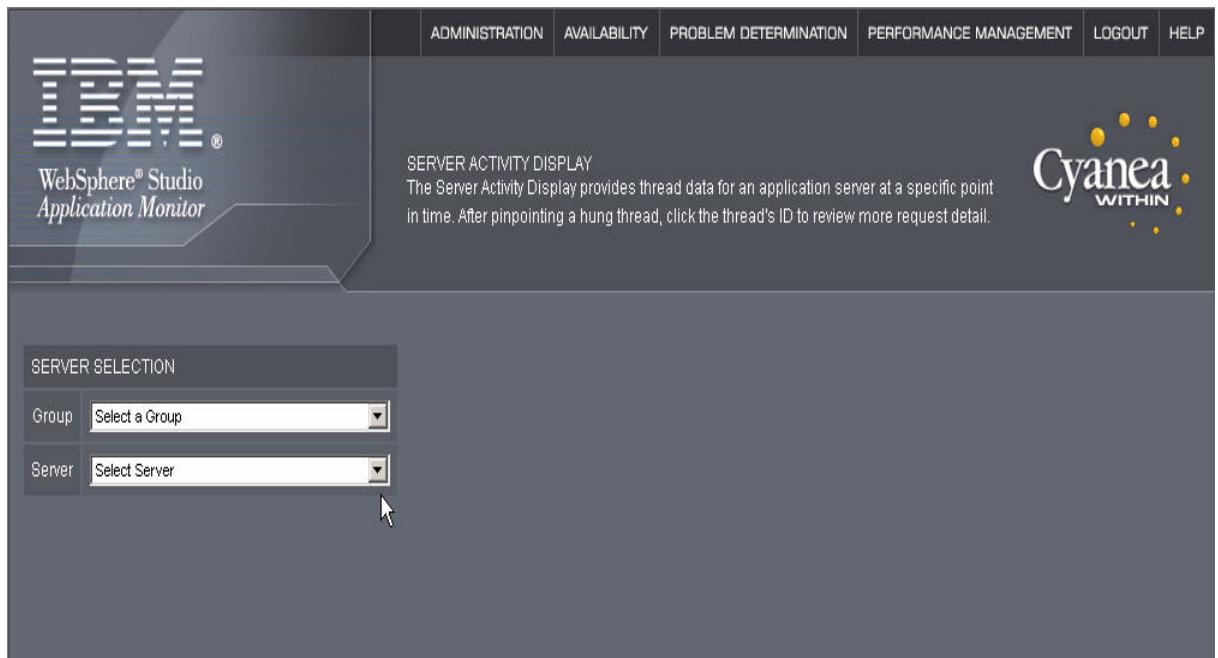


FIGURE 1. Server Selection

2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.

The SAD page opens. The information for the selected server group displays sorted by resident time.

Server Activity Display

The screenshot shows the 'Server Activity Display' page of the IBM WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar with the IBM logo and 'WebSphere® Studio Application Monitor' text. The main content area has sections for SERVER SELECTION, SERVER INFO, RECENT ACTIVITY, and THREADS.

SERVER SELECTION:
Group: El Groupito
Server: qaapp-lnx-s02.dc_ws405_01.22811 (L3)

SERVER INFO:

Snapshot Date	May 19, 2003	Application Server Name	dc_ws405_01
Snapshot Time	4:13:58 PM	Application Server IP Address	192.168.4.5
Platform CPU % Utilization	0.00%	Total Thread Count	2

RECENT ACTIVITY (Last Minute):

JVM CPU	0.00%	JVM Heap Size (MB)	18
# of Requests	1	Avg. Response Time (ms)	1
# of Active Sessions	0		

THREADS:

Filter By	Thread Type	Any	Thread Status	Any	Refresh				
Thread ID	Priority	Client Request	Client Request Start	Resident Time (ms)	Last Known CPU (ms)	Idle Time (ms)	Thread Status	Last Known Class	Last Known Method
158657964	5	/qa1/test/threadkill	May 19, 2003 4:11:21 PM	159279	0.000	159279	Waiting	com/qa/test/servlets/TestThreadKill	processRequest
158051036	5	/qa1/test/stacktrace	May 19, 2003 4:13:50 PM	10484	0.000	10484	Waiting	com/qa/test/servlets/TestStackTrace	doMethodOne

FIGURE 2. Server Activity Display

Usage Notes: The SAD displays the details of what's going on inside a server.

Threads perform the work for the server. The SAD page shows all the threads running within a client request. WSAM reports on active threads only. Use Idle Time as a measure of whether the selected request has been idle longer than other requests. Remember, however that Idle Time doesn't break down the components that cause a request to be idle.

In a normal environment, data will pass through the system quickly and may not be accessible by the SAD. Transactions in a smooth running environment are processed efficiently. Threads execute in and out of the system so quickly that a snapshot is not available.

The SAD is useful when you are looking for a problematic transaction, one that is looping, hanging, or slow. The value of the SAD is tracking transactions and requests. If you go into the SAD and there are a number of threads waiting, your system is running slowly or may be overloaded.

In the Request Detail page, check CPU Utilization and Resident Time. For instance, eighty percent utilization is high and could explain why resident time is taking longer or why things are running slowly.

To filter the thread data:

1. Select a filter from Thread Type and/or Thread Status from the drop-down lists.
 2. Click **Refresh**.
- The thread data displays based on the selected filter.

To sort the thread data:

1. Click a heading link: **Thread ID, Client Request, Resident Time, Accumulated CPU, Idle Time, Priority, or Client Request Start**.
2. The data refreshes sorted by the selected heading.

Viewing Request Detail

The Request Detail page provides data for one selected thread only. Typically, you arrive on this page by clicking a Thread ID on the SAD page. You can monitor a thread here. In addition, you can trace a stack, method, or request object and session object. If necessary, cancel a request, and change the thread's priority or status.

To open the Request Detail page:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
 2. Select a group from the Group drop-down list.
 3. Select a server from the Server drop-down list.
- The SAD page opens. The information for that server group displays unfiltered.

- To view the detail, click the Thread ID's link.

The Request Detail page for that thread opens. This page displays data for one thread only. Monitor the thread here, or trace a stack, method, or request object and session object.

REQUEST PROPERTIES

Snapshot Date	May 19, 2003	Application Server Name	dc_ws405_01
Snapshot Time	4:27:32 PM	Application Server IP Address	192.168.4.5
Platform CPU % Utilization	0.00%	Total Thread Count	1

REQUEST DETAIL

Thread ID	1166270892	Last Known CPU	0.000 ms
Client Request	/qa1/test/threadkill	Idle Time	50849 ms
Client Request Start Date	May 19, 2003	Thread Type	Servlet
Client Request Start Time	4:26:43 PM	Last Known Class Name	com/qa/test/servlets/TestThreadKill
Resident Time	50849 ms	Last Known Method	processRequest
Priority	5	Thread Status	Waiting
Change Priority	No Change	Change Thread Status	No Change

Buttons at the bottom: Cancel Request, Cancel, Save

FIGURE 3. Request Detail

Usage Notes: The Request Detail page allows you to take action on a request. To obtain further details on the request, use the left navigation to view a Stack Trace, Method Trace, or Request Object and Session Object. The Stack Trace shows the outstanding methods from a request that is not yet finished executing. The Method Trace shows all methods executing for the specific request, including completed methods. The Request Object and Session Object provides the contents for the requests and session objects, including Session Creates, Time, and Last Access Time.

Suspending a Thread

An executing thread is active, and a paused thread is suspended. Suspend a thread if there is a problem with it and you want to uncover the cause.

To suspend a thread:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. From the Change Thread Status drop-down list, select **Suspend**.
6. Click **Save**.

Usage Notes: When suspending a thread, there is a danger that the request may hold database locks or system resources. After you suspend the request, any other requests that require those locks or monitors will also be suspended.

Any locks in the application server and database server will not be released after the system suspends a thread. This can cause other applications to fail or hang.

Activating a Thread

A thread is executing if it is active, and the thread is paused when it is suspended. Select **Active** status to re-activate a suspended thread.

To activate a thread:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.

2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. From the Change Thread Status drop-down list, select **Active**.
6. Click **Save**.

Canceling a Request

If an application request from the system is looping or abusing resources, it may be necessary to cancel the request. This will terminate the request by throwing a run-time exception.

To cancel a request:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. Click **Cancel Request**.
A confirmation box displays.
6. At the confirmation box, click **OK**.
The system terminates the request.

Warning! Upon examination of the thread detail page, a user may discover a thread is misbehaving, for example, it might be looping or sleeping while holding a lock thereby preventing other requests from proceeding. In such cases, the user may decide to cancel the request. Cancellation occurs by throwing an exception. With multiple requests sharing data and the shared data in an inconsistent state at the time you can-

cel a request, there could be unexpected side effects. Use the Cancel Request function only when you are sure it is safe to do so. Also whether the request can be canceled is a matter of what state the thread is in — a decision made by the JVM eventually.

Changing a Thread's Priority

If a thread is executing too slowly, you can change the thread's priority. This will move the thread up in the stack so it will execute more quickly.

To change a thread's priority:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. From the Change Priority drop-down list, select 1-10.
Priority 1 is the lowest and priority 10 is the highest.
6. Click **Save**.

Changing a Thread's Priority

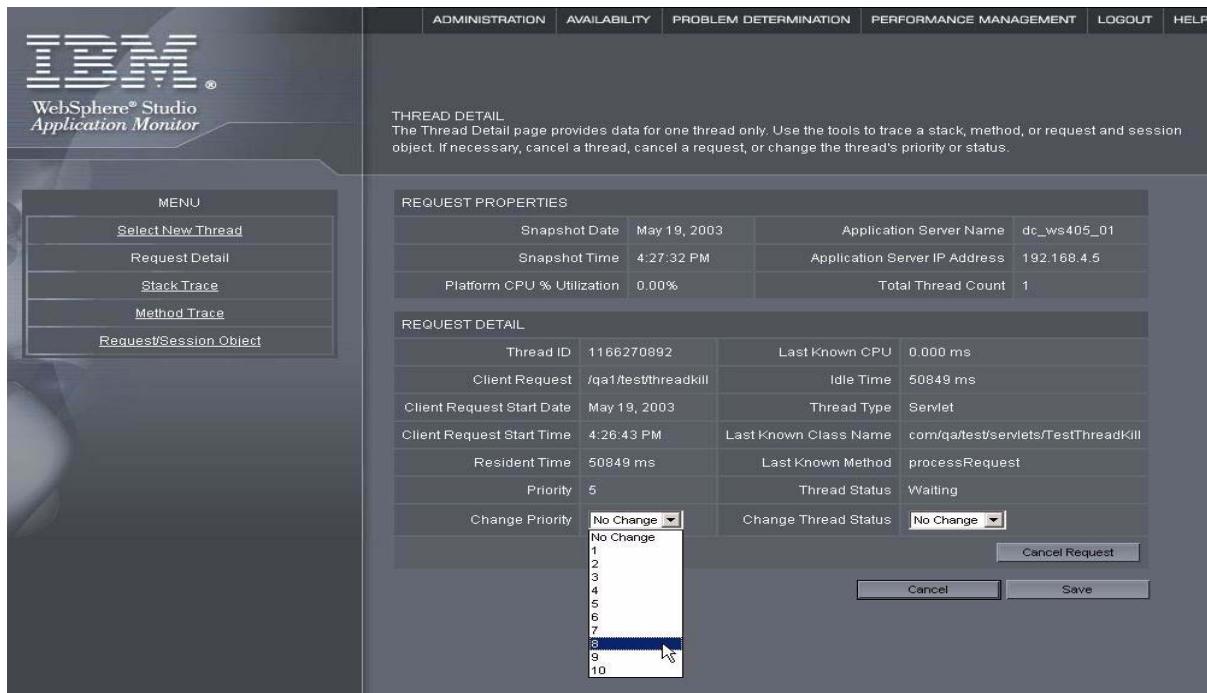


FIGURE 4. Change Thread Priority

Usage Notes: When changing a thread's priority, be aware that the new priority remains for the life of the thread. As a result, any new requests issued after the change will hold that priority even though the new priority was not meant for the new request.

Viewing a Stack Trace

The Stack Trace page displays a list of method calls starting with the method where the stack trace printed in Last in First Out order. For each method, the list includes the Class Name, Method Name, and (optionally) a line number. The last executed method displays first in the Stack Trace.

To view a stack trace:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. Click **Stack Trace** from the left navigation.
The Stack Trace page opens. The last executed method displays first in the Stack Trace.

Viewing a Stack Trace

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar with a menu containing options like Select New Thread, Request Detail, Stack Trace (which is selected), Method Trace, and Request/Session Object. The main content area is titled "STACK TRACE" and contains a message about listing JVM stack depth for methods not completed. It also displays "STACK TRACE PROPERTIES" with details such as Snapshot Date (Jan 21, 2003), Snapshot Time (3:49:16 PM), Application Server Name (dc_ws40_01), Application Server IP Address (192.168.4.8), and Platform CPU % Utilization (0.12%). Below this is a large table titled "STACKTRACE" showing 20 levels of the stack trace. Each row includes Depth, Class, Method, and a detailed description.

Depth	Class	Method	Description
0	java/lang/Thread	sleep	
1	com/qa/test/servlets/TestStackTrace	doMethodThree	
2	com/qa/test/servlets/TestStackTrace	processRequest	
3	com/qa/test/servlets/TestStackTrace	doGet	
4	javax/servlet/http/HttpServlet	service	
5	javax/servlet/http/HttpServlet	service	
6	com/ibm/servlet/engine/webapp/StrictServletInstance	doService	
7	com/ibm/servlet/engine/webapp/StrictLifecycleServlet	_service	
8	com/ibm/servlet/engine/webapp/DleServletState	service	
9	com/ibm/servlet/engine/webapp/StrictLifecycleServlet	service	
10	com/ibm/servlet/engine/webapp/ServletInstance	service	
11	com/ibm/servlet/engine/webapp/ValidServletReferenceState	dispatch	
12	com/ibm/servlet/engine/webapp/ServletInstanceReference	dispatch	
13	com/ibm/servlet/engine/webapp/WebAppRequestDispatcher	handleWebAppDispatch	
14	com/ibm/servlet/engine/webapp/WebAppRequestDispatcher	dispatch	
15	com/ibm/servlet/engine/webapp/WebAppRequestDispatcher	forward	
16	com/ibm/servlet/engine/srt/WebAppInvoker	doForward	
17	com/ibm/servlet/engine/srt/WebAppInvoker	handleInvocationHook	
18	com/ibm/servlet/engine/invocation/CachedInvocation	handleInvocation	
19	com/ibm/servlet/engine/srp/ServletRequestProcessor	dispatchByURI	
20	com/ibm/servlet/engine/oselistener/OSEListenerDispatcher	service	

FIGURE 5. Stack Trace

Usage Notes: The Stack Trace shows the outstanding methods to be completed as a result of the request. This trace reports the data unfiltered so you will see every class. In a normal environment, a request executes quickly so it may be difficult to catch a stack trace before completion. This is meant for troubleshooting a hung request.

Viewing a Method Trace (Only available in L3)

The Method Trace page lists the method flow of the request. A method trace is essentially the path of execution for a request. The trace includes the entry and exit for methods in the thread for the current request.

To view a method trace:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. Click **Method Trace** from the left navigation.
The Method Trace page opens. The last executed method displays first in the Method Trace.

Viewing a Method Trace (Only available in L3)

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled "METHOD TRACE" and contains a brief description: "The Method Trace page lists the method information for uncompleted requests. The trace includes entry and exit for methods in the thread as well as the entry and exit for any embedded methods." On the left, there is a vertical menu with options: Select New Thread, Request Detail, Stack Trace, Method Trace, and Request/Session Object. The "Method Trace" option is currently selected. The central part of the screen displays "METHOD TRACE PROPERTIES" with the following data:

Snapshot Date	May 20, 2003	Application Server Name	qaapp-aix-s03
Snapshot Time	10:43:17 AM	Application Server IP Address	192.168.4.16
Platform CPU % Utilization	0.00%	Total Thread Count	3
Current Total Elapsed Time	97193 ms	Total Method Count	5
Current Total CPU Time	0.000 ms		

Below this is the "METHOD TRACE" table, which lists the execution path of a request. It includes columns for Nesting Level, Threshold Configuration, Method Name, Date/Time, Elapsed Time (ms), CPU Time (ms), Δ Elapsed Time (ms), and Δ CPU Time (ms). The data shows three levels of nesting:

Nesting Level	Threshold Configuration	Method Name	Date/Time	Elapsed Time (ms)	CPU Time (ms)	Δ Elapsed Time (ms)	Δ CPU Time (ms)
0	Servlet Entry	MethodTrace	May 20, 2003 10:41:41 AM	0	0.000	0	0.000 ms
1	Method Entry	com/qa/test/servlets/TestInFlight doGet	May 20, 2003 10:41:41 AM	0	0.000	0	0.000 ms
2	Method Entry	com/qa/test/servlets/TestInFlight processRequest	May 20, 2003 10:41:41 AM	0	0.000	0	0.000 ms

FIGURE 6. Method Trace

Usage Notes: The Method Trace shows the path of execution for a request. The data displays how the request arrived at the current point in its execution. Additionally, the trace shows looping behavior. When you see excessive, repeated entry and exit records for the same method, it could indicate the method is caught in a loop. Furthermore, WSAM shows the cumulative CPU time and the cumulative elapsed (wall clock) time for each trace record. In other words, calculate the resources consumed by the CPU and the elapsed time while going from entry to exit, or entry to entry, or exit to exit, or

exit to entry by subtracting the CPU time of the previous trace record from that of the current one.

Using this information, you can ascertain which methods are taking the longest to execute and/or using large amounts of CPU.

Viewing the Request Object and Session Object

The Request Object and Session Object page lists information for the current request object and session object.

To view the Request Object and Session Object trace:

1. From the top navigation, click **Problem Determination > Server Activity Display**.
The Server Selection page opens.
2. Select a group from the Group drop-down list.
3. Select a server from the Server drop-down list.
The SAD page opens. The information for that server group displays unfiltered.
4. To view the detail, click the Thread ID's link.
The Request Detail page for that thread opens.
5. Click **Request/Session Object** from the left navigation.
The Request Object and Session Object page opens.

Viewing the Request Object and Session Object

The screenshot shows the WSAM interface with the following details:

Header: ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, HELP.

Left Sidebar (MENU):

- Select New Thread
- Request Detail
- StackTrace
- Method Trace
- Request/Session Object

Content Area:

REQUEST OBJECT AND SESSION OBJECT
The Request Object and Session Object page lists information for the request object and session object that did not execute. A client makes a request for a particular server resource. This resource is often a Web page or Java application. The session begins after user authentication and ends when the user logs out or the process hangs.

REQUEST OBJECT AND SESSION OBJECT PROPERTIES

Snapshot Date	Jan 21, 2003	Application Server Name	dc_ws40_01
Snapshot Time	3:56:58 PM	Application Server IP Address	192.168.4.8
Platform CPU % Utilization	0.00%	Total Thread Count	1

REQUEST OBJECT AND SESSION OBJECT

Remote IP	192.168.1.138	
Remote Host	192.168.1.138	
Request URL	http://qaapp-aix-s01:80/qa1/test/StackTrace	
Method	GET	
Session ID	No data	
Session Create Time	No data	
Last Access Time	No data	
Max Inactive Interval	No data	
Request Object Attributes	com.ibm.websphere.olt.include.bool com.ibm.servlet.engine.webapp.dispatch_type com.ibm.websphere.olt.forward.request	false forward TestStackTrace
Cookies & Attributes	No data	
Session Attributes	No data	

FIGURE 7. Request Object and Session Object

Usage Notes: In many applications, state information is stored in the Request Object and Session Objects. WSAM provides the ability to view the content on the requests and session objects, as well as, Session Creates Time and Last Access Time. The developer responsible for investigating a misbehaving request may find this information useful in resolving some issues.

The Memory Diagnosis section provides the user with diagnostic tools to discover memory related problems in their environment. Memory Analysis provides an interface to help the user create useful server activity analysis reports regarding memory. Heap Analysis captures the runtime heap of an application server and breaks it down by the class names of the objects residing in the heap at the time of the snapshot while providing the number of instances and the size of the information. Lastly, Memory Leak Detection helps confirm the existence of a memory leak and locates the most likely memory leak candidates.

Memory Analysis

Creating a Memory Analysis Report

Use Memory Analysis when you need to investigate potential memory problems relating to garbage collection and the JVM heap size. At times garbage collection may not cleanup properly or the heap may have too little memory allocated.

To create a Memory Analysis report:

1. From the top navigation, click **Problem Determination > Memory Diagnosis > Memory Analysis**.

The Memory Analysis page opens.

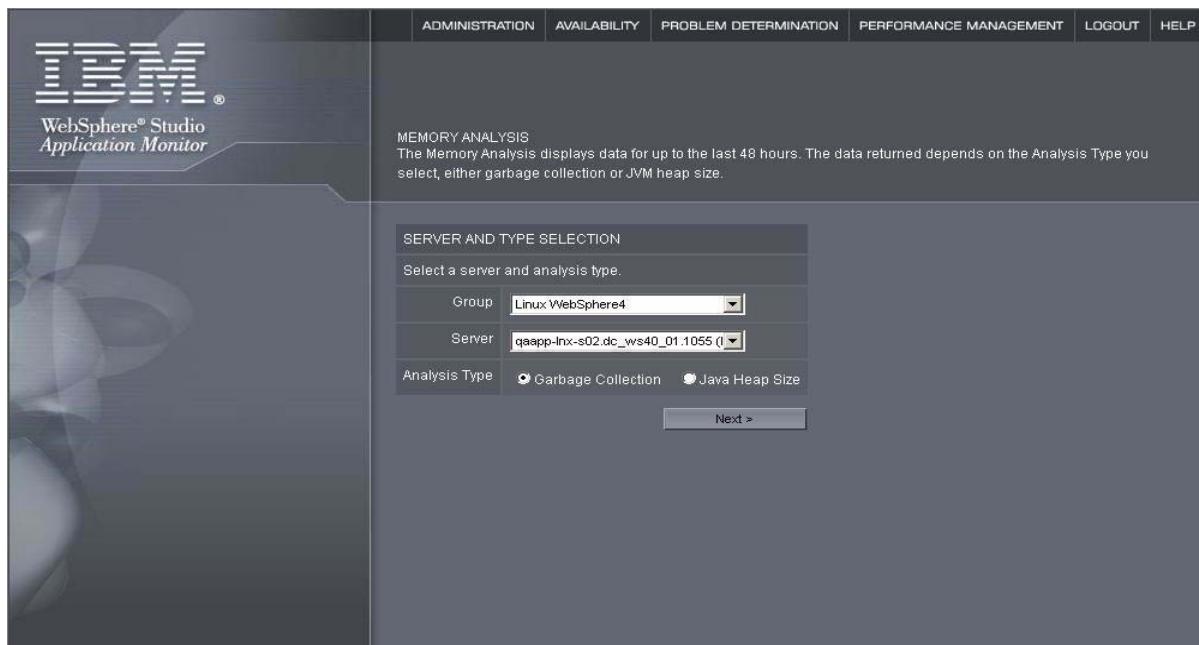


FIGURE 1. Memory Analysis

2. Select a Group and a Server from the drop-down menus.
3. Select the Analysis Type: Garbage Collection or Heap Analysis.
4. Click **Next**.

The screenshot shows the 'Metric Selection' page of the IBM WebSphere Studio Application Monitor. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main title 'IBM' is displayed prominently, followed by 'WebSphere® Studio Application Monitor'. Below the title, the sub-page title 'METRIC SELECTION' is shown, along with a brief description: 'Use the Metric Selection page to choose the two metrics you want to compare. Click View Results to generate your report.' A list of metric selection options is provided, each with a radio button and a question. The first option, 'CPU vs. GCO (GARBAGE COLLECTION OCCURRENCE)', has its radio button checked. Other options include 'Response Time vs. GCO', 'RO vs. GCO', 'GCO vs. HEAP', 'RT vs. GCD', 'RO vs. GCD', 'GCD vs. HEAP', and 'GCD vs. PAGING RATE'. At the bottom right of the page are two buttons: '< Back' and 'View Results'.

FIGURE 2. Metric Selection

5. In the Metric Selection, select the option that contains the two metrics you want to compare.
6. Click **View Results**.

The Memory Analysis report displays.

Memory Analysis

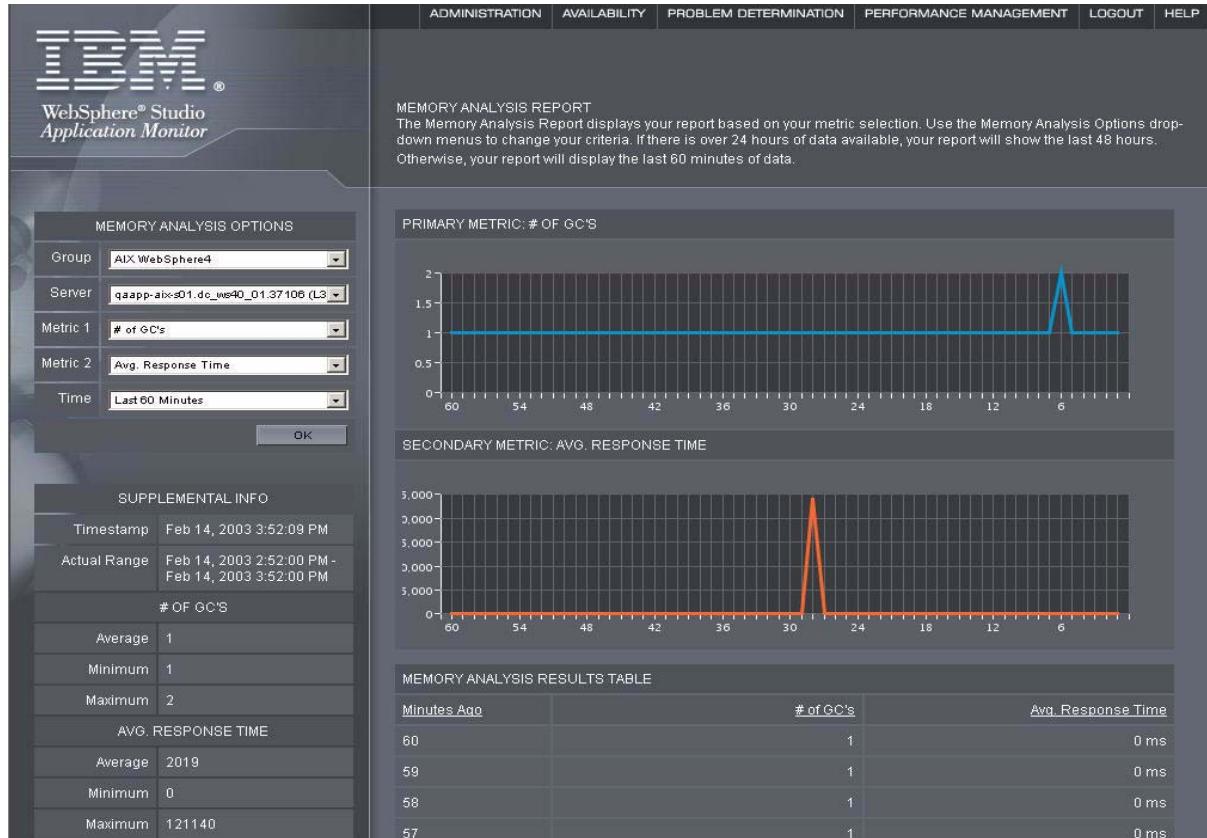


FIGURE 3. Memory Analysis Report

7. Using the Memory Analysis Options, you can select a different group or server, compare two different metrics, or view a different time increment.
A new report displays based on your new selections.

Note: When there is over 24 hours of data, your reports will show the last 48 hours.
In all other cases, the last 60 minutes of data will display.

Usage Notes: Either heap size or garbage collection can cause a slow down in your server's performance. Find out if your heap size is too small for the number of users using the system or too small for the current workload on the system. At times, garbage collection can cause high JVM CPU usage, slow transaction response time, or a delay that impacts throughput. Analyze the memory in your system using Memory Analysis and then make the necessary adjustments.

Heap Analysis

Setting up a Heap Analysis

Query a server and learn how the server uses the heap memory. The system takes a snapshot of the heap and breaks the data down by classname. Additionally, you have the option to force a full garbage collection prior to taking a snapshot of the heap.

Warning! Using this function may cause a significant effect on system performance, especially if you have a large heap.

To set up a Heap Analysis:

1. Click **Problem Determination > Memory Diagnosis > Heap Analysis**.
The Heap Analysis page opens.

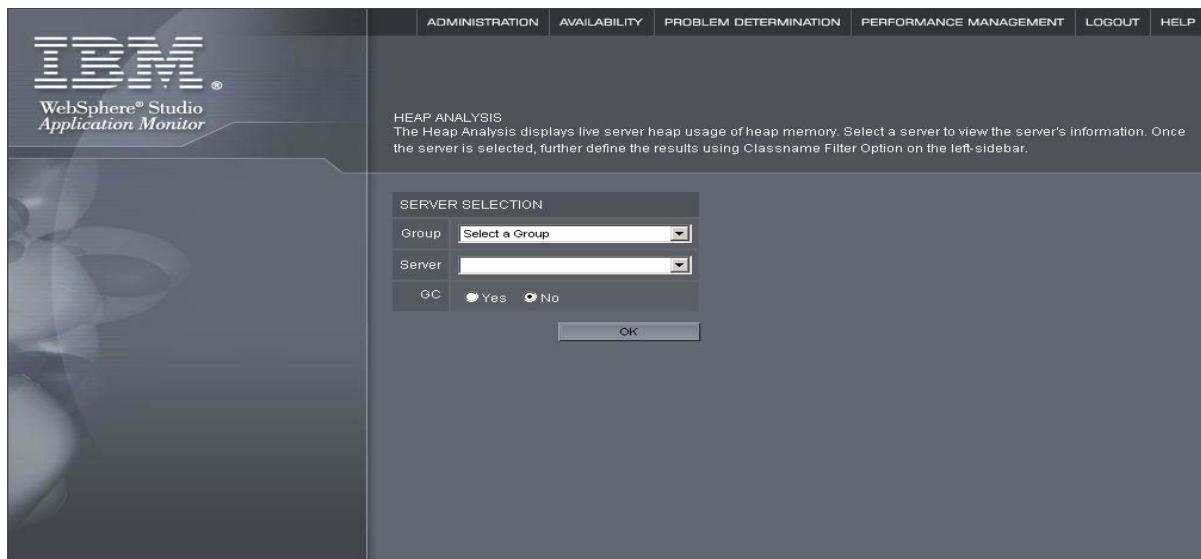


FIGURE 4. Heap Analysis

2. Select a Group and a Server.
3. Select **Yes** or **No** to perform a garbage collection on the heap prior to the Heap Analysis snapshot.
4. Click **OK**.

The Heap Analysis results display in the same window.

IBM® WebSphere® Studio Application Monitor

SERVER SELECTION

Group	E Groupito
Server	qaapp-aix-s03 qaapp-aix-s03.3796
GC	<input checked="" type="radio"/> Yes <input type="radio"/> No

OK

CLASSNAME FILTER OPTION

Exclude	com.cyanea.*;javax.*;oracle.*;sun.*; *.java.*;com.sun.*;com.ibm.*;webligic.*;COM.rsa.*;org.w3c.*;org.omg.*; *;org.xml.*;com.bea.*;util.*;versi on.*;org.apache.*;flexlm.*;anlr.*;co m.tivoli.*;SP*.*;COM.ibm.*
Exclude Override	

Apply **Reset**

HEAP ANALYSIS
The display below is Heap information related to the server selection. Further define the results by using the Classname Filter Option on the left-sidebar.

HEAP PROPERTIES

App Server	qaapp-aix-s03 qaapp-aix-s03.37968 (L3)	Time of Snapshot	May 20, 2003 11:18:58 AM
Size of Live Objects on Heap (MB)	13 (14459040 bytes)	# of Objects in Heap	541389
Force GC	No		

HEAP ANALYSIS RESULTS TABLE **20 per Page**

Class name	Total size (kb)	Percent of total size	# of instances	Percent of total #
com/qa/test/ejb/EJSRremoteStatelessTestActivityHome	0	0%	1	0%
com/qa/test/ejb/EJSStatelessTestActivityHomeBean	0	0%	1	0%
com/qa/test/ejb/_EJSRremoteStatelessTestActivityHome_Tie	0	0%	1	0%
com/qa/test/ejb/_TestActivityHome_Stub	0	0%	1	0%
com/qa/test/servlets/TestInFlight	0	0%	1	0%
com/qa/test/servlets/TestStackTrace	0	0%	1	0%
object[]	2755	19%	81952	15%
primitive[]	4219	29%	92746	17%
trade/EJSCMPAccountHomeBean	0	0%	1	0%
trade/EJSCMPHoldingHomeBean	0	0%	1	0%
trade/EJSCMPKeysEntityHomeBean	0	0%	1	0%
trade/EJSCMPProfileHomeBean	0	0%	1	0%
trade/EJSCMPQuoteHomeBean	0	0%	1	0%
trade/EJSCMPRegistryHomeBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPAccountBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPHoldingBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPKeysEntityBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPProfileBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPQuoteBean	0	0%	1	0%
trade/EJSJDBCPeristerCMPRegistryBean	0	0%	1	0%

FIGURE 5. Heap Analysis results

5. If you want to narrow the results, enter the names of the classes you want to ignore into the Exclude (Classname) list, and enter the names of classes you want to monitor into the Exclude Override (Classname) list.
6. Click **Apply**.
The new Heap Analysis displays.
7. Click **Reset** to return the classname filters to their original settings.

Usage Notes: At times, the system may not be releasing memory for a specific class properly. You can use the Heap Analysis to check the heap on your server. If the same classname is being allotted memory in the heap, you may have a memory leak. Use the Memory Leak feature to further investigate the possibility.

Memory Leak

Creating a Memory Leak Confirmation report

Uncover a memory leak trend using the Memory Leak Confirmation report. Compare two metrics to determine that there is in fact a leak, not just a change in workload. The system highlights a leak trend by comparing the average heap size after a garbage collection with a memory increase, increase in users, or increase in volume.

To create a Memory Leak Confirmation report:

1. Click **Problem Determination > Memory Diagnosis > Memory Leak**.
The Memory Leak Overview page opens.

The screenshot shows the 'Memory Leak Overview' section of the IBM WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area has a dark background with a large, stylized 'IBM' logo and the text 'WebSphere® Studio Application Monitor'. A sub-header 'MEMORY LEAK OVERVIEW' is followed by a descriptive text: 'The Memory Leak Overview provides the options to run a report and help diagnose a memory leak. In addition, perform a comparison of two heap snapshots taken at different times to find a leak candidate.' Below this, there are two sections: 'OPTION 1: MEMORY LEAK CONFIRMATION REPORT' and 'OPTION 2: MEMORY LEAK CANDIDATE FINDER'. The 'OPTION 1' section contains fields for 'Group' (dropdown menu 'Select a Group'), 'Server' (dropdown menu 'Select a Server'), and 'Report Metric Type' (radio buttons for three options: 'Is the amount of uncollected memory increasing? (Avg. Heap Size After GC)', 'Is the increase due to an increase in users? (Avg. Heap Size After GC vs. Active Sessions)', and 'Is the increase due to an increase in volume? (Avg. Heap Size After GC vs. # of Requests)'). A 'View Report' button is located to the right of these fields. The 'OPTION 2' section contains buttons for 'Create New Candidate' and 'View Existing Candidates'.

FIGURE 6. Memory Leak Overview

2. Select a Group and a Server.
3. Select the Report Metric type.
4. Click **View Report**.

The Memory Leak Confirmation report displays.

Memory Leak



FIGURE 7. Memory Leak Confirmation report

5. Use the drop-down menus in the left navigation to select a new server, comparison metric, or time.

Note: If there is over 24 hours of data available, your report will show the last 48 hours. Otherwise your report will display the last 60 minutes.

Creating a Memory Leak Candidate Finder Report

The Memory Leak Candidate Finder Report provides the user with the functionality to create a comparison report of two heap snapshots. Taking two heap snapshots will show if, over time, the number of instances of a specific class is increasing. In cases, where the instance of a class continues to rise over a period of time, the report will demonstrate this and help the user locate the memory leak.

To create a Memory Leak Candidate Finder Report:

1. From the top navigation, click **Problem Determination > Memory Diagnosis > Memory Leak**.
The Memory Leak Overview page opens.
2. At the bottom of the page, click the Create New Candidate link.
The Create New Candidate page opens.

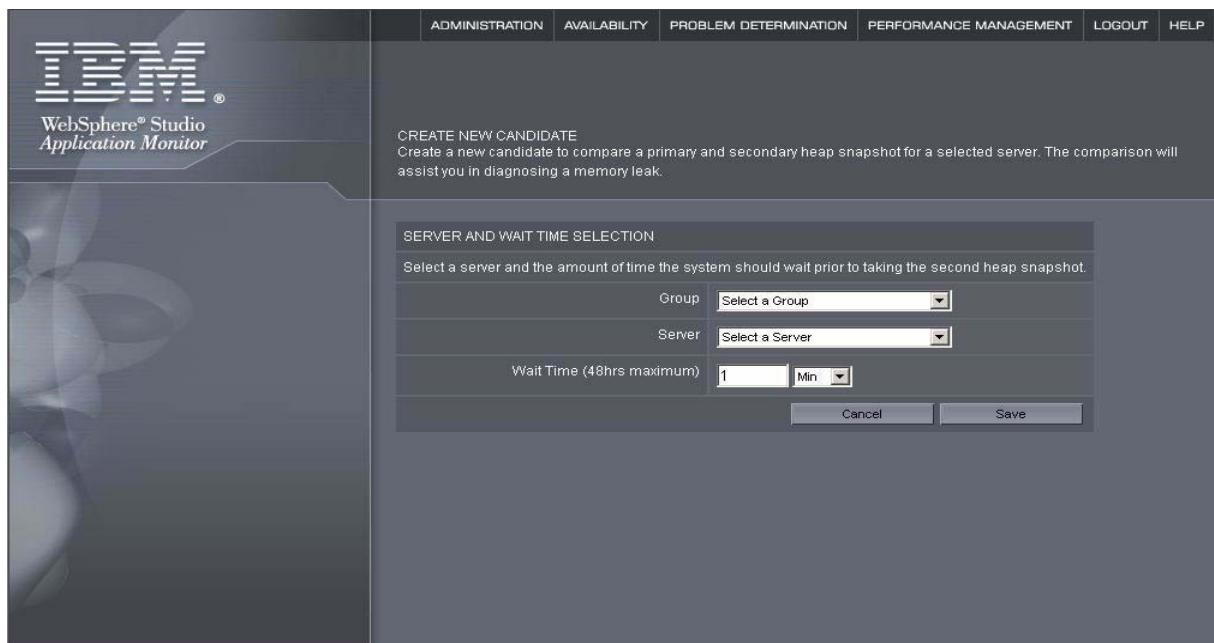


FIGURE 8. Create New Candidate

3. Select a Group and a Server.
4. Enter the Wait Time and select hours or minutes from the pull-down menu. (There is a 48 hour maximum.) The Wait Time is the amount of time the system should wait before taking the second heap snapshot.
5. Click **Save**.

The Memory Leak Candidate Finder Management page displays the report with a Waiting status. Check the report for results after your wait time elapses.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled "MEMORY LEAK CANDIDATE FINDER MANAGEMENT". It displays a message: "The Memory Leak Candidate Finder Management page displays all past candidate finder reports. View an existing report or create a new candidate." Below this is a table titled "CANDIDATE FINDER MANAGEMENT" with the following data:

Server Name	Heap 1 Time Stamp	Heap 2 Time Stamp	Status	Delete
qaapp-aix-s01.aixserver (L3)	Feb 14, 2003 10:19:25 AM	Feb 14, 2003 10:19:30 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01.aixserver (L3)	Feb 14, 2003 10:21:31 AM	Feb 14, 2003 10:21:36 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01.aixserver (L3)	Feb 14, 2003 10:58:41 AM	Feb 14, 2003 10:58:46 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01.aixserver (L3)	Feb 14, 2003 10:59:31 AM	Feb 14, 2003 10:59:36 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01.aixserver (L3)	Feb 14, 2003 10:59:43 AM	Feb 14, 2003 10:59:48 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01_dc_ws40_01	Feb 14, 2003 10:20:05 AM	Feb 14, 2003 10:20:24 AM	Completed	<input type="checkbox"/>
qaapp-aix-s01_dc_ws40_01	Feb 14, 2003 10:34:00 AM	Feb 14, 2003 10:34:18 AM	Waiting	<input type="checkbox"/>
qaapp-aix-s01_dc_ws40_01	Feb 14, 2003 03:55:45 PM	Feb 14, 2003 03:56:03 PM	Waiting	<input type="checkbox"/>
qaapp-lnx-s02.lnxserver	Feb 18, 2003 10:22:18 AM	Feb 18, 2003 10:22:31 AM	Completed	<input type="checkbox"/>
qaapp-lnx-s02.lnxserver	Feb 18, 2003 10:22:43 AM	Feb 18, 2003 10:22:57 AM	Completed	<input type="checkbox"/>

FIGURE 9. Memory Leak Candidate Finder Management

Usage Notes: When the Comparison for the Memory Leak Candidate Finder Report displays the heap snapshot data, the data includes the

Classname, the Δ # of Instances, and the Δ Total Size. Watch the Δ # of Instances increasing numbers are an indicator of a memory leak in your system.

Viewing a Memory Leak Candidate Finder Report

The Memory Leak Candidate Finder Report provides a comparison of the data between two heap snapshots. The heap results that display are unfiltered. Therefore if you want to apply a filter you can further narrow the results by filtering the classnames using the Exclude (Classname) and Exclude Override (Classname) lists.

To view a Memory Leak Candidate Finder Report:

1. From the top navigation, click **Problem Determination > Memory Diagnosis > Memory Leak**.
The Memory Leak Overview page opens.
2. At the bottom of the page, click the View Existing Candidates link.
The Memory Leak Candidate Finder Management page opens.
3. The Status for your report should be completed. Click to open your previously created report.
The Memory Leak Candidate Finder Report opens.
4. Click **Comparison Data** on the left navigation.
The comparison data displays with the data for each Heap snapshot.

Memory Leak

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. The main content area is titled "MEMORY LEAK CANDIDATE FINDER REPORT". It displays heap comparison information for a selected server, specifically "qaapp-sun-s01_dc_ws405_01 (L3)". The report includes tables for "HEAP PROPERTIES" and "HEAP COMPARISON TABLE". The "HEAP PROPERTIES" table shows details like App Server, Heap 1 Snapshot (May 19, 2003 04:41:21 PM), Heap 2 Snapshot (May 19, 2003 04:49:06 PM), Size of Live Objects on Heap (MB), and # of Objects in Heap. The "HEAP COMPARISON TABLE" lists various classes with their original instance counts, total sizes, and changes in instances and size. On the left side, there is a "CLASSNAME FILTER OPTION" section with "Exclude" and "Exclude Override" dropdown menus containing classnames, and "Apply" and "Reset" buttons.

Class name	Original # of instances	Original Total size (kb)	Δ # of instances	Δ Total size (kb)
trade_client.TradeAltAccess	3	0	0	0
trade_KeyEntityHome_Stub	1	0	0	0
trade_RegistryHome_Stub	1	0	0	0
trade_AccountHome_Stub	1	0	0	0
trade_QuoteHome_Stub	1	0	0	0
trade_HoldingHome_Stub	1	0	0	0
trade_ProfileHome_Stub	1	0	0	0
com.qa.test.ejb_TestActivityHome_Stub	1	0	0	0
trade_client.TradeAction	2	0	0	0
trade_client.TradeServletAction	2	0	0	0

FIGURE 10. Memory Leak Candidate Finder Report

5. To view each heap individually, click either Heap 1 or Heap 2 on the left navigation. This gives you another view of the heap analysis for your current data.
6. To filter your data more precisely, enter the classes you don't want to monitor into the Exclude (Classname) list, and enter the classes you do want to monitor into the Exclude Override (Classname) list. The report will refresh and display with the current data.

Usage Notes: When the Comparison for the Memory Leak Candidate Finder Report displays the heap snapshot data, the data includes the Classname, the Δ # of Instances, and the Δ Total Size. Watch the Δ # of Instances increasing numbers are an indicator of a memory leak in your system.

Software Consistency Check

The Software Consistency Check provides the users of WSAM with the ability to easily detect mismatches in software in a "clone" runtime environment, such as a server farm. You can perform a check on a selected server or compare one properly functioning server to up to 10 other servers in the farm. Use this feature to aide in troubleshooting a server that exhibits intermittent problems.

There are two categories of data that will be used for comparison: the runtime environment (i.e. the systems) and the installed binary files (i.e. the code).

The Runtime Environment

Running the Runtime Environment Check

The Runtime Environment Check page provides the runtime environment details for the selected server. Use the check to access the runtime environment information on your server.

To select a server's runtime environment:

1. From the top navigation, click **Problem Determination > Software Consistency Check > Runtime Environment Check.**

The Runtime Environment Check page opens.

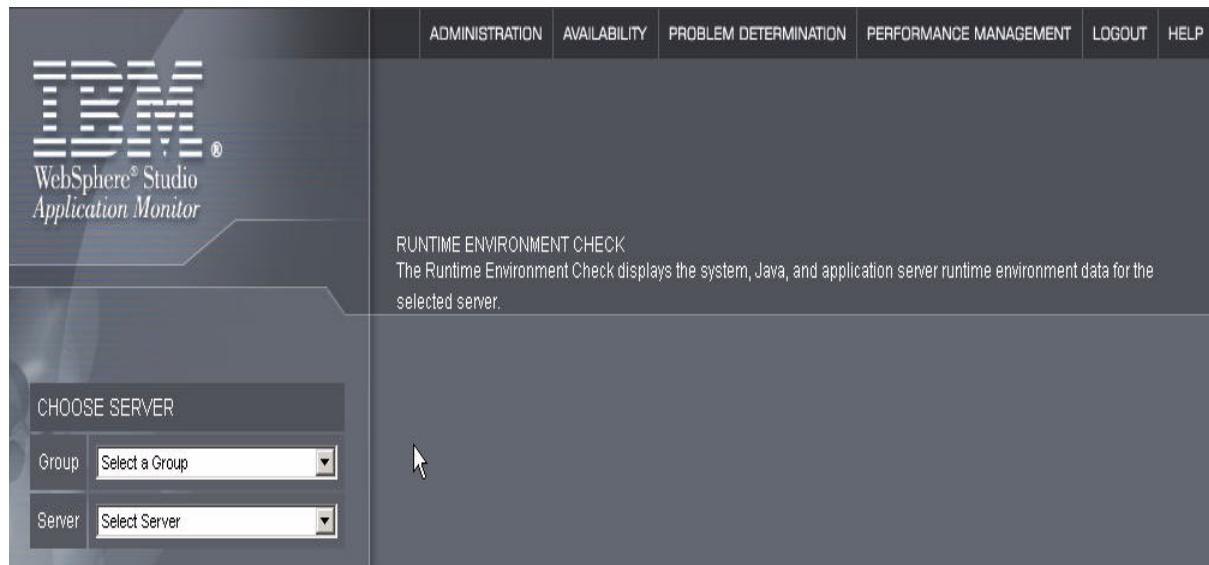


FIGURE 1. Runtime Environment Check

2. On the left navigation, select the Group and a Server from the drop-down menus.

The details of the selected server's runtime environment will be displayed.

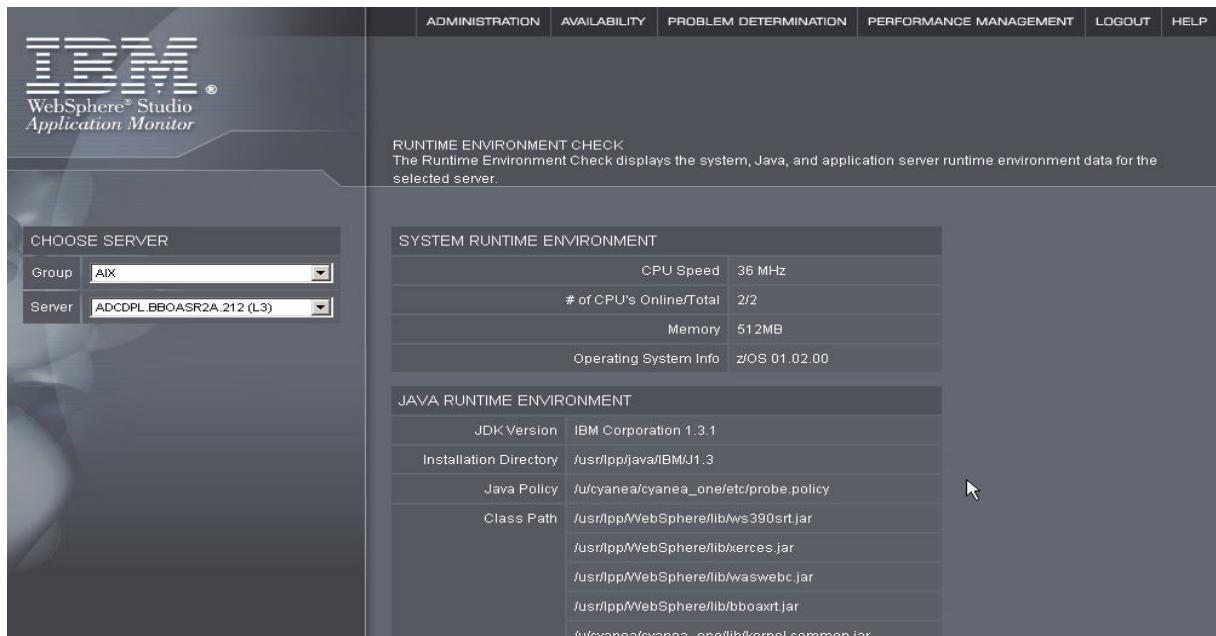


FIGURE 2. Runtime Environment Check

The Million Instructions Per Second (MIPS) power of the MVS machine is computed from an empirical formula derived from the System Resources Manager (SRM) service units/second, derived itself from the RMCTADJC field of the RMCT. RMCTADJC is the CPU rate adjustment expressed in the number of sixteenths of one CPU microsecond per CPU service unit.

Note: This feature does not apply to the Non-z/OS platform.

The computation algorithm follows :

1. Get RMCTADJC from the RMCT data area
2. Compute service units per CPU second SU = $16000000/\text{RMCTADJC}$
3. Estimate the number of MIPS per CPU by SU/48.5 (*)

4. Finally compute the estimated MIPS power of the MVS machine by multiplying by the number of CPUs.

(*) The number 48.5 is borrowed from the recommendations of Thierry Falissard's home page on OS/390, and is used by some MVS utilities in capacity planning (in particular the SHOWMVS utility).

Note: This information is only an estimation of the machine's CPU power.

Using a Runtime Environment Comparison

Analyze the data in the Runtime Environment Comparison and find out if the runtime environments on all your clone servers are setup the same. The Runtime Environment Comparison allows the operator to compare the runtime environment on a chosen server (the Authoritative Server) with up to 10 additional servers (the Comparison Servers). If you are experiencing strange behavior in your server farm, a runtime environment comparison shows which of the servers in the farm does not have the exact same environment.

To use the Runtime Environment Comparison:

1. From the top navigation, click **Problem Determination > Software Consistency Check > Runtime Environment Comparison**.

The Runtime Environment Comparison page opens.

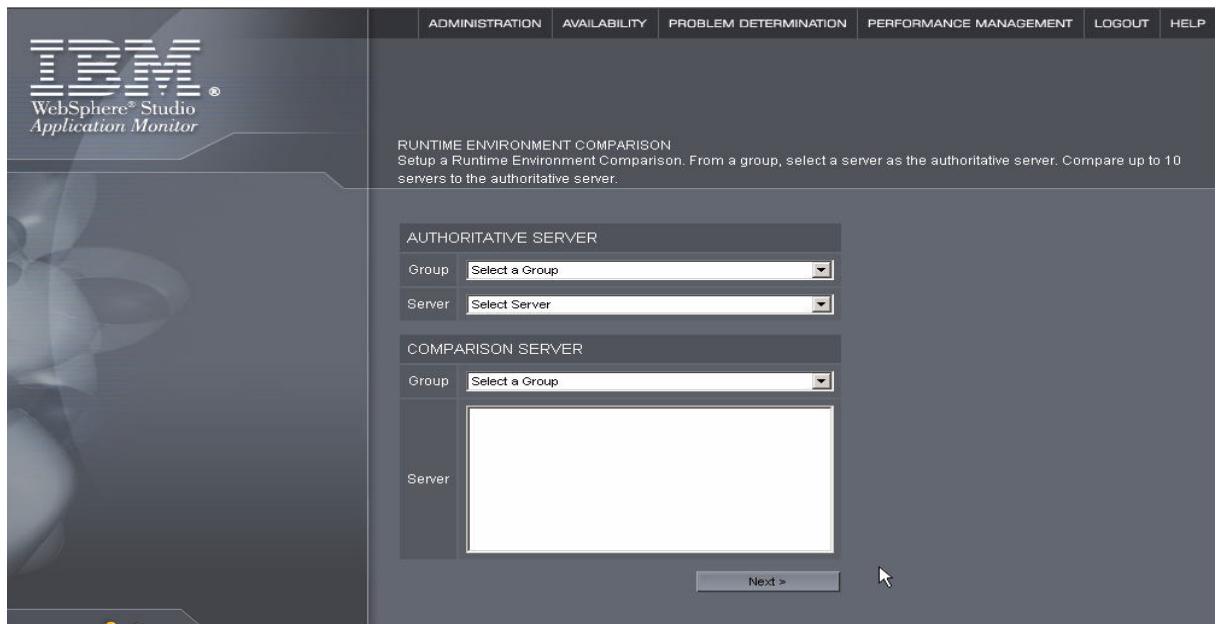


FIGURE 3. Runtime Environment Comparison

2. Under the Authoritative Server, select a Group and a Server.
3. Under the Comparison Servers, select a Group, and then select multiple servers within that group by clicking **Ctrl + server name**.
4. Click **Next** to continue.

The Runtime Environment Comparison Results page displays the data.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. On the left, there's a sidebar titled "RUNTIME ENVIRONMENTS" with options for System Runtime Environment, Java Runtime Environment, and App Server Runtime Environment. The main content area is titled "RUNTIME ENVIRONMENT COMPARISON RESULTS" and contains a message about displaying comparison results for specific environments. Below this is a table titled "SYSTEM RUNTIME ENVIRONMENT" with columns for SERVER, CPU SPEED, # ONLINE/TOTAL, MEMORY, and OPERATING SYSTEM INFO. The table lists five servers with their respective details:

SERVER	CPU SPEED	# ONLINE/TOTAL	MEMORY	OPERATING SYSTEM INFO
Authoritative Server gaapp-lnx-s02_dc_ws405_01.28348 (L3)	1261 MHz	2/2	1004 MB	Linux 2.4.7-10smp
gaapp-aix-s01 gaapp-aix-s01.42786 (L3)	602MHz	4/4	2047 MB	AIX 5.1
gaapp-aix-s03 gaapp-aix-s03.37968 (L3)	1000MHz		2047 MB	AIX 5.1
gaapp-lnx-s02_dc_ws405_01.28348 (L3)				
gaapp-sun-s01_dc_ws405_01.16266 (L3)	450MHz		2048 MB	SunOS 5.8

FIGURE 4. Runtime Environment Comparison Results

5. For specific data on the servers, click any of the options in the left navigation under System Runtime Environment, Java Runtime Environment, and the AppServer Runtime Environment. The specific data displays in the main window.
6. For a complete detail report on a particular server, click the server's name. The Runtime Environment Check page displays all the available data on the System Runtime Environment, Java Runtime Environment, and the AppServer Runtime Environment for the selected server.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. On the left, a sidebar titled "CHOOSE SERVER" shows a dropdown for "Group" set to "AIX" and another for "Server" set to "ADCDPL.BBOASR2A.212 (L3)". The main content area is titled "RUNTIME ENVIRONMENT CHECK" and contains two tables: "SYSTEM RUNTIME ENVIRONMENT" and "JAVA RUNTIME ENVIRONMENT".

SYSTEM RUNTIME ENVIRONMENT	
CPU Speed	36 MHz
# of CPU's Online/Total	2/2
Memory	512MB
Operating System Info	z/OS 01.02.00

JAVA RUNTIME ENVIRONMENT	
JDK Version	IBM Corporation 1.3.1
Installation Directory	/usr/lpp/java/IBMJ1.3
Java Policy	/u/cyanea/cyanea_one/etc/probe.policy
Class Path	<ul style="list-style-type: none"> /usr/lpp/WebSphere/lib/ws390srt.jar /usr/lpp/WebSphere/lib/xerces.jar /usr/lpp/WebSphere/lib/waswebc.jar /usr/lpp/WebSphere/lib/bboaxrt.jar /u/cyanea/cyanea_one/lib/orml/common.jar

FIGURE 5. Runtime Environment Detail Report

- Click **Change Comparison** to set up another runtime environment comparison.

The Installed Binary Files

Running the Installed Binary Check

The Installed Binary Check provides a list of the installed binaries deployed to the selected server. Use the check to access the details of the installed binaries on your server.

To run the Installed Binary Check:

1. From the top navigation, click **Problem Determination > Software Consistency Check > Installed Binary Check**.

The Installed Binary Check page opens.

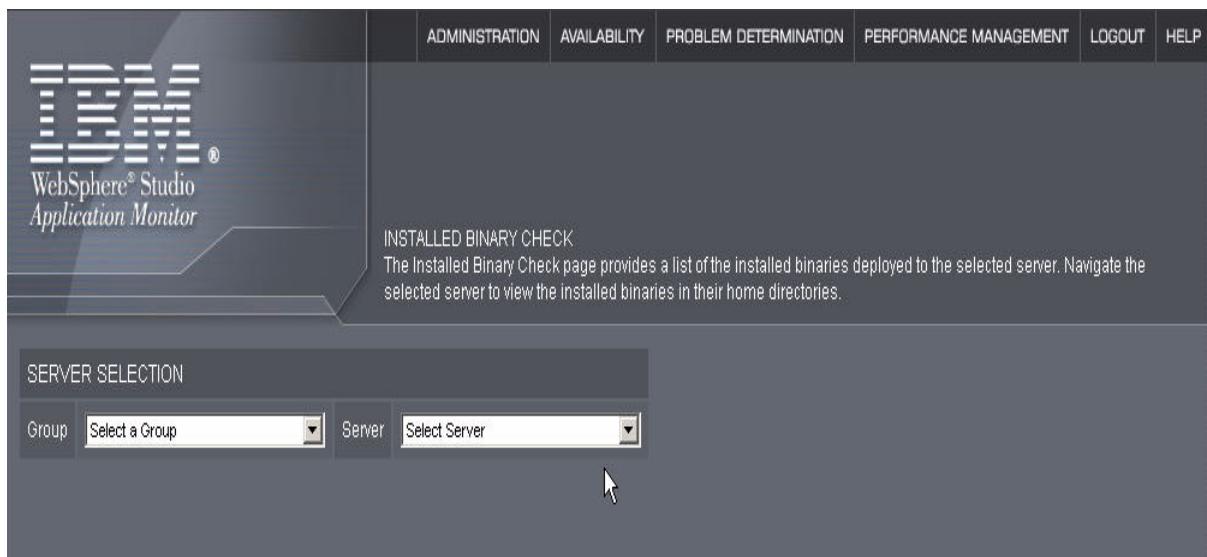


FIGURE 6. Installed Binary Check

2. Select the Group and a Server from the drop-down menus.

The details of the selected server's installed binaries displays.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main title is "INSTALLED BINARY CHECK". Below it, a sub-instruction reads: "The Installed Binary Check page provides a list of the installed binaries deployed to the selected server. Navigate the selected server to view the installed binaries in their home directories." On the left, there's a "SERVER SELECTION" panel with dropdown menus for Group ("Unassigned Servers") and Server ("ADCDPL.BBOASR2A.389 (L3)"). The main content area is titled "CURRENT PATH: Installed Applications" and shows a table of installed binaries:

Name	Type	Path	Last Modified	Size (bytes)
QA WebApp	DIR	/WebSphere390/CB390/apps/BBOASR2/QA WebApp	Aug 2, 2002 9:51:04 PM	N/A
New_Application1.ear	EAR	/WebSphere390/CB390/apps/BBOASR2/New_Application1.ear	Jul 31, 2002 7:11:07 PM	N/A
WebSphereSampleEARFile	DIR	/WebSphere390/CB390/apps/BBOASR2/WebSphereSampleEARFile	Jul 31, 2002 7:11:04 PM	N/A
PolicyVP	DIR	/WebSphere390/CB390/apps/BBOASR2/PolicyVP	Jul 31, 2002 7:11:06 PM	N/A
ws390srt.jar	JAR	/V1R2M0/usr/lpp/WebSphere/lib/ws390srt.jar	Jul 31, 2002 2:02:54 PM	15045168
xerces.jar	JAR	/V1R2M0/usr/lpp/WebSphere/lib/xerces.jar	Dec 3, 2001 8:37:53 AM	1105865
waswebc.jar	JAR	/V1R2M0/usr/lpp/WebSphere/lib/waswebc.jar	Jul 31, 2002 2:02:31 PM	934621
bboaxrt.jar	JAR	/V1R2M0/usr/lpp/WebSphere/lib/bboaxrt.jar	Jul 31, 2002 2:02:15 PM	1278053
kernel.common.jar	JAR	/u/cyanea/cyanea_one/lib/kernel.common.jar	Aug 29, 2002 12:25:49 PM	48170

FIGURE 7. Installed Binary Check

Note: View the installed binaries in their home directories by navigating through the selected server's directories.

Viewing the Installed Binary Detail

From the Installed Binary Check list of the installed binaries deployed to the selected server, an operator can drill down to the detail of the specific binary. The details include the path, last modified timestamp and size.

The screenshot shows the 'INSTALLED BINARY CHECK' page of the WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and 'WebSphere® Studio Application Monitor' are displayed. Below the navigation bar, a section titled 'INSTALLED BINARY CHECK' provides a brief description: 'The Installed Binary Check page provides a list of the installed binaries deployed to the selected server. Navigate the selected server to view the installed binaries in their home directories.' Underneath this, a 'SERVER SELECTION' panel shows 'Group: Unassigned Servers' and 'Server: ADCDPL.BBOASR2A.389 (L3)'. The main content area is titled 'CURRENT PATH: QA WebApp' and contains a table of installed binaries. The table has the following data:

Name	Type	Path	Last Modified	Size (bytes)
qa.war	WAR	/WebSphere390/CB390/apps/BBOASR2/QA WebApp/qa.war	Aug 2, 2002 9:51:04 PM	N/A
qa.war_orig	OTHER	/WebSphere390/CB390/apps/BBOASR2/QA WebApp/qa.war_orig	Aug 2, 2002 9:51:04 PM	19812
qa_WebApp.jar	JAR	/WebSphere390/CB390/apps/BBOASR2/QA WebApp/qa_WebApp.jar	Aug 2, 2002 9:51:04 PM	4956
META-DATA	DIR	/WebSphere390/CB390/apps/BBOASR2/QA WebApp/META-DATA	Aug 2, 2002 9:51:04 PM	N/A
META-INF	DIR	/WebSphere390/CB390/apps/BBOASR2/QA WebApp/META-INF	Aug 2, 2002 9:51:04 PM	N/A

FIGURE 8. Installed Binary Detail

Setting up an Installed Binary Comparison

Analyze the data from the Installed Binary Comparison to find out whether your servers contain the same installed binaries. The Installed Binary Comparison allows the operator to compare the installed binaries on a chosen server (the Authoritative Server) with up to 10 additional servers (the Comparison Servers). The comparison provides the details necessary to learn whether your servers contain the same installed binaries. Differences in the installed binaries in a server farm can cause unexplained behavior.

To set up an Installed Binary Comparison:

- From the top navigation, click **Problem Determination > Software Consistency Check > Installed Binary Comparison**.

The Installed Binary Comparison page opens.

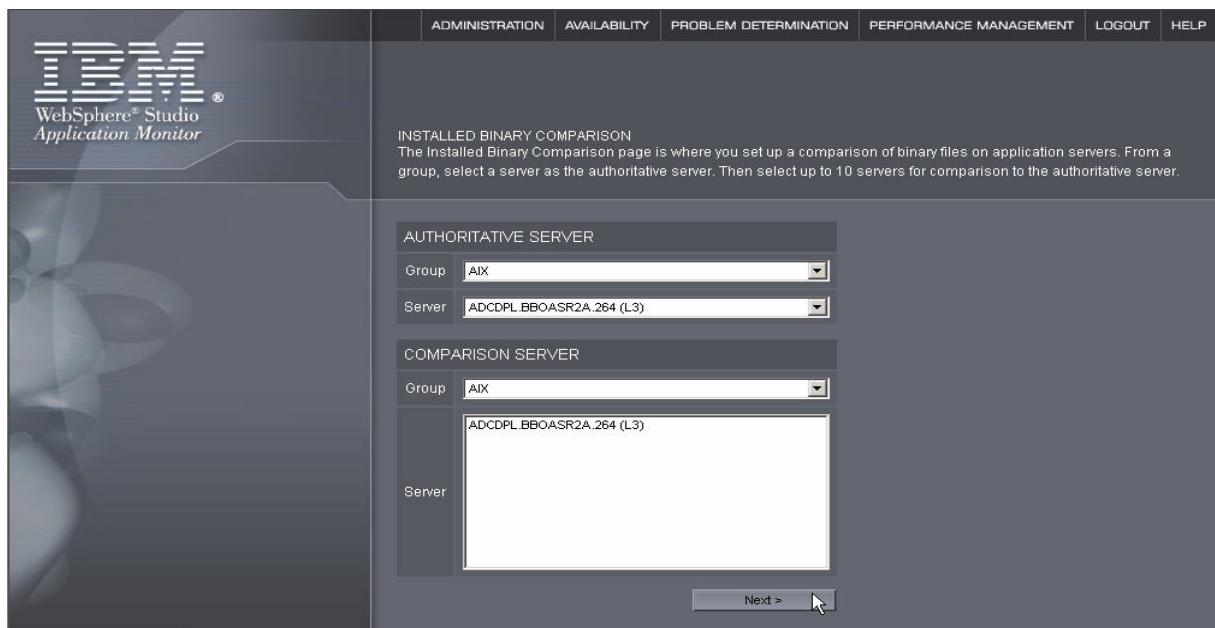


FIGURE 9. Installed Binary Comparison

2. Under the Authoritative Server, select a Group and a Server.
3. Under the Comparison Servers, select a Group and a Server, or select multiple servers within that group by clicking **Ctrl + the server name**.
4. Click **Next** to continue.

The File Selection page opens.

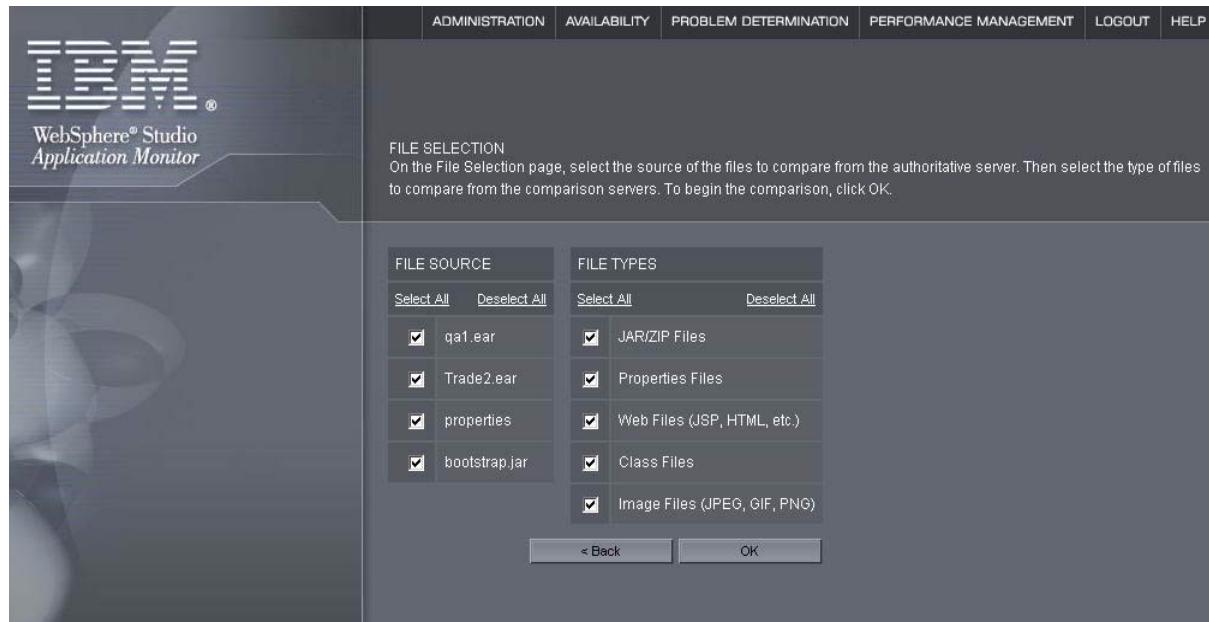


FIGURE 10. File Selection

5. Click to select the File Source (EAR file or Class Path) and the File Types (JAR, Web, Class, or Image files).
6. Click **OK**.

The Installed Binary Comparison results page displays the Overview data first with the results of the comparison.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar titled 'RESULTS NAVIGATION' with a tree view showing several server nodes. The main content area is titled 'INSTALLED BINARY COMPARISON RESULTS'. It contains a summary table for 'COMPARISON PROPERTIES' and a detailed 'OVERVIEW' table comparing binary files across multiple servers.

COMPARISON PROPERTIES						Change Comparison
Authoritative Server	qaapp-aix-s01.qaapp-aix-1.42786 (L3)					
File Source	qa1.ear, Trade2.ear, properties, bootstrap.jar					
File Types	All					
Server	Full Match	Full Pathname/Size Match	Full Pathname Match	Authoritative Only	Comparison Only	
qaapp-aix-s01.qaapp-aix-1.42786 (L3)	612	0	0	0	0	
qaapp-aix-s03.qaapp-aix-s03.37968 (L3)	612	0	0	0	0	
qaapp-lnx-s02.dc_ws405_01.28348 (L3)	559	46	6	1	0	
qaapp-sun-s01.dc_ws405_01.16266 (L2)	525	28	4	55	0	

FIGURE 11. Installed Binary Comparison Results

Viewing the Results of the Comparison

1. Navigate the results of the Binary Comparison by clicking the server name on the left navigation.
2. To view further details, click the server name and select either the Matched or Unmatched folders.
3. To view the folder contents, in the Matched folders, select Full Match, File Name/Path/Size Match, or File Name Match, and in the Unmatched folders, select either Authoritative Only or Comparison Only.

The screenshot shows the 'Matched' folder contents in the 'RESULTS NAVIGATION' sidebar. The main panel displays 'COMPARISON PROPERTIES' with details about the authoritative server (qaapp-aix-s01), comparison server (qaapp-aix-s01), file sources (qa1.ear, Trade2.ear, properties, bootstrap.jar), and file types (All). Below this is a 'FULL MATCH' table listing three files: trade_Quote_Stub.class, com/bm/xml/dom/DeepNodeListImpl.class, and com/bm/xml/pointer/ReiTerm.class, each with their respective file paths, authoritative and comparison timestamps, sizes, and MD5 status.

File	Authoritative Date/Time-stamp	Comparison Date/Time-stamp	Authoritative Size (bytes)	Comparison Size (bytes)	Perform MD5
(topWebSphere/AppServer405/installedApps/Trade2.ear/TradeEJBs.jar)	08/09/2001 04:40 AM	08/09/2001 04:40 AM	11701	11701	Perform MD5
(topWebSphere/AppServer405/properties/logbrlogbnml.jar)	08/30/1999 09:00 PM	08/30/1999 09:00 PM	1601	1601	Perform MD5
(topWebSphere/AppServer405/properties/logbrlogbnml.jar)	08/30/1999 09:05 PM	08/30/1999 09:05 PM	3237	3237	Perform MD5

FIGURE 12. Folder contents in the Matched folders

- To perform an MD5 on a file, click **Perform MD5**. You can only perform an MD5 on files that are a Full Match or a File Name/Path/Size Match.

The results display whether the files matched or not at the MD5 level.

Note: The files in the Matched folders contain files that match to varying degrees:

Full Match - indicates that everything matched, including the file name and path, size, and file system timestamp. These files are likely to be identical to each other. However, the user can opt to further perform a MD5 operation on the files. An MD5 is a unique numeric signature that is differ-

ent for each file when the contents of the files are different, even if the creation date and the file names coincide.

File Name/Path/Size Match - includes the files with matched file name and path, and size, but not timestamp. These files are likely to be the same. A user can opt to perform an MD5 on the files.

File Name Match - indicates that only the file names matched. The files are unlikely to be the same.

The files in the Unmatched folders contain files that exist on either the Authoritative Server or the Comparison Server but not on both:

An **Authoritative Only** indicates that the file only exists on the Authoritative Server.

A **Comparison Only** indicates that the file only exists on the Comparison Server.

The Installed Binary Files

Trap & Alert Management

You can set software traps and alerts to monitor a Group of servers or a selected server. When the system meets the conditions of the trap and the alert set by the user, a pre-selected action occurs. An action can be either sending an email, sending an SNMP message, or creating a log file. Setting traps and alerts simplifies server monitoring and provides the user with immediate details.

Note: Traps may add to the overhead used by your system, so use them sparingly.

Managing Traps and Alerts

Manage the software traps and alerts set on your system by adding and deleting them when necessary on the Trap and Alert Management page. Active traps display at the top of the page; a list of all the traps created displays at the bottom of the page. Maintain your existing traps and alerts by modifying them as needed.

To manage traps and alerts:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.

The Trap and Alert Management page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar with the IBM logo and the text "WebSphere® Studio Application Monitor". A "MENU" button is at the top of the sidebar, and a "Create Trap" button is highlighted. The main content area is titled "TRAP AND ALERT MANAGEMENT" and contains a sub-section "ACTIVE TRAPS" with a table showing trap details. Below that is a "TRAP LIST" section with another table. Both tables include columns for Trap Name, Description, Created By, Activate, Modify, Duplicate, and Delete.

Trap Name	Server	Duration	Time Left	Time Set	Set By	Deactivate
Avg%inUse	qaapp-aix-s01.myserver	10	9	Jan 16, 2003 1:22:04 PM	admin	
PoolSize	qaapp-lnx-s02.server1	10	9	Jan 16, 2003 1:22:22 PM	admin	

Trap Name	Description	Created By	Activate	Modify	Duplicate	Delete
Avg%inUse		admin				
AvgConnWaitTime		admin				
AvgTimeouts		admin				
CPUTime		admin				
FreeMem		admin				
MemUsed		admin				
Occurrence		admin				

FIGURE 1. Trap and Alert Management

2. From the management page, you may create, activate/deactivate, modify, duplicate, or delete existing traps.

Setting an Application Trap

An Application Trap detects metrics in a request, method, or SQL call. The system triggers the trap after exceeding the threshold for the metric you set. When the system meets the definition of the trap, an alert occurs. For example, you can set a trap to alert you after more than 10 requests include the words John Smith. The alert may include sending an email, sending an SNMP message, or creating a log to track the occurrences.

To set an Application Trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. On the left navigation, click **Create Trap**.
The Trap Type Selection page opens.

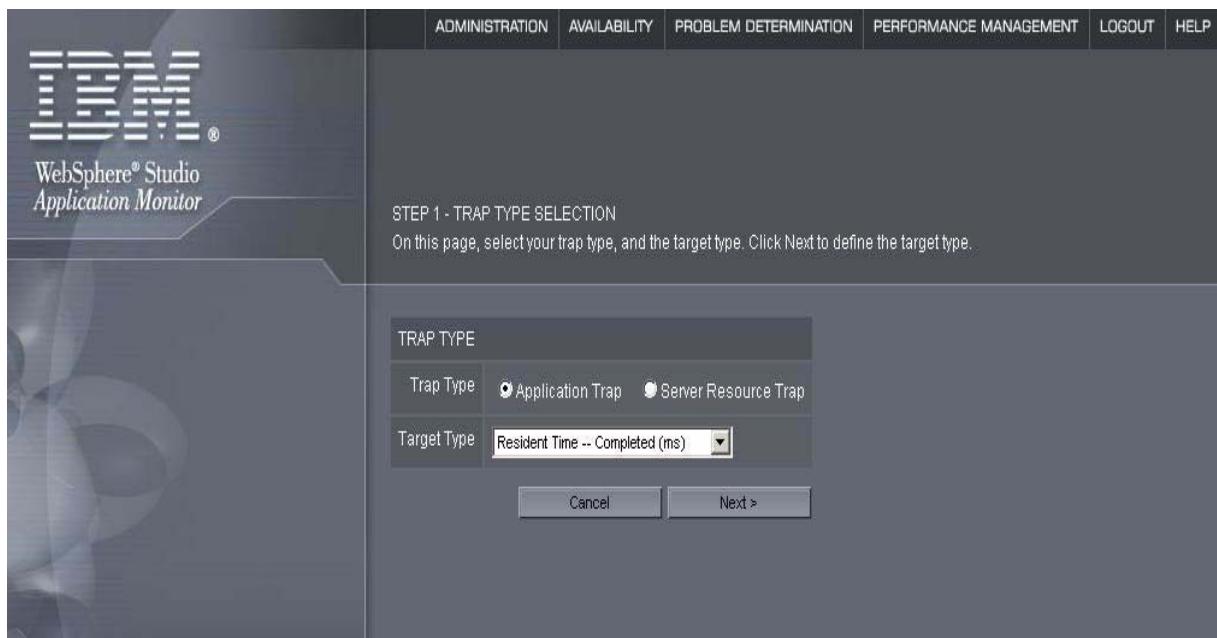


FIGURE 2. Trap Type Selection

3. Select Application Trap as the Trap Type.
4. Select one of five Target Types from the drop-down menu: Occurrences, CPU Time, Resident Time - Completed, Wait Time, and Resident Time - In Flight. Based on the Target Type you select, the system will dynamically generate the trap definition options in the next step.

Note: The logic used to find a match for your search is as follows. For Request, when you type in a substring, any string that contains that substring is a match. For Method, there must be an exact match for the method you enter.

5. Click **Next**.

The Define Trap page opens.

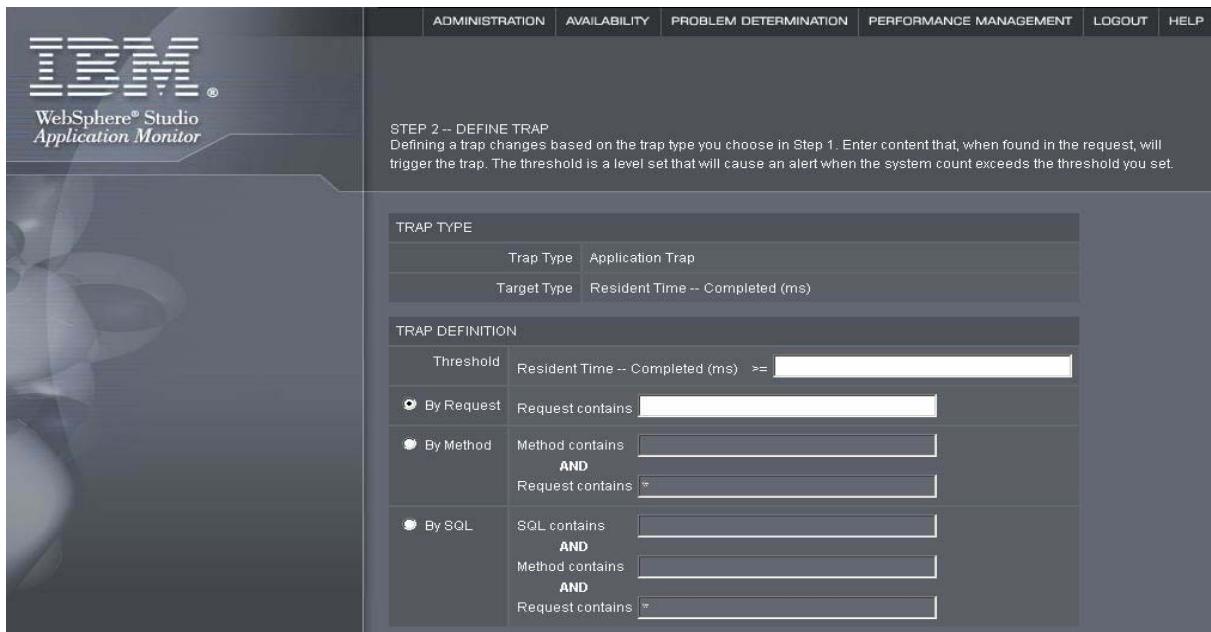


FIGURE 3. Define Trap

6. For the Trap Definition, depending on the target type selected, enter either content or a threshold that will trigger the trap after meeting the condition. For example, if you select Resident Time - Completed for the Target Type and by SQL for the definition, enter the amount of Resident Time (in milliseconds) you want to expire before the system locates the SQL call, within the method, within the request, i.e., send me an email when the system uses more than 200 milliseconds of resident time to do a SELECT SQL call within a doGet method within a Login request.
7. Click **Next**.

The Set Trap Alerts page opens.

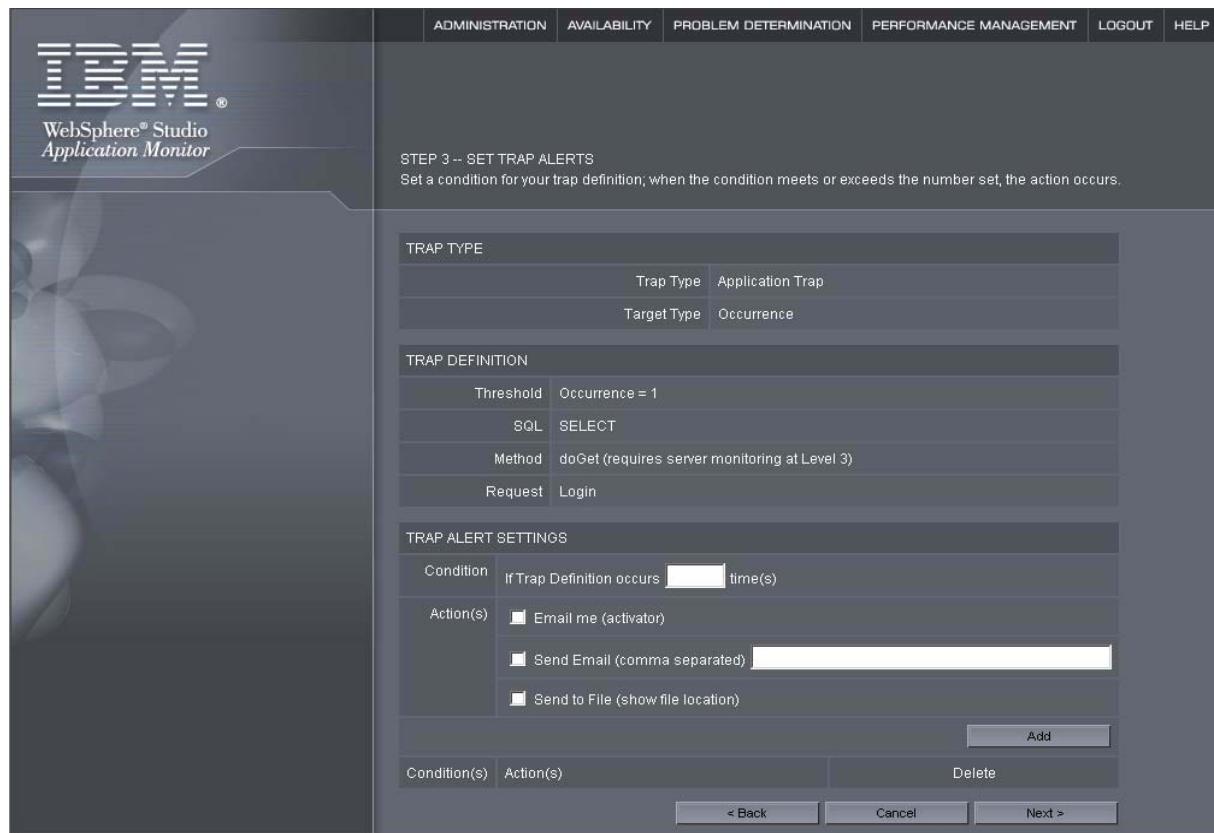


FIGURE 4. Set Trap Alerts

8. For the Trap Alert Settings, enter the number of times the trap should occur before the system takes an action, either sending an email, sending an SNMP message, or creating a log file.
9. Click **Add** to add the alert to your trap.
10. Click **Next**.

The Name Trap page opens.

Usage Notes: When setting a trap, you can select multiple alert conditions and for each alert condition, you can select multiple Actions. Each trap is required to have at least one alert condition but may have multiple Actions. For example, when the system receives 25 requests, send an email to me@company.com and create a log. Next, when the system receives 50 requests, send an email to thebigboss@company.com.

If you select to create a log for the Action, the log file is located at /opt/cyanea/logs/alert.log.

The screenshot shows the 'STEP 4 -- NAME TRAP' configuration screen. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main area is titled 'STEP 4 -- NAME TRAP' with the sub-instruction 'Enter a name and descriptive text for your trap.' Below this, there are several sections: 'TRAP TYPE' (Trap Type: Application Trap, Target Type: Occurrence), 'TRAP DEFINITION' (Threshold: Occurrence = 1, SQL: SELECT, Method: doGet (requires server monitoring at Level 3), Request: Login), 'TRAP ALERT SETTINGS' (Condition(s): >= 1, Action(s): Email me; >= 10, Action(s): Email me), and 'TRAP NAME' (Name: [empty field], Description: [empty field] (30 Character Max.)). At the bottom, there are buttons for < Back, Cancel, Save & Activate, and Save.

FIGURE 5. Name Trap

11. Enter a Name and descriptive text for your trap.
12. Click either **Save** or **Save & Activate** (**See Activating a Trap**).

The Trap List displays your new trap.

Setting a Server Resource Trap

A Server Resource Trap measures a variety of Target Types. The system will trigger a trap after exceeding the threshold for the metric you set. When the system meets the definition of the trap, an alert occurs. For example, set a trap to alert you when a server is unavailable 2 times, and after a server is unavailable, you can select to receive an email.

Note: This function is not supported on the z/OS platform.

To set a Server Resource Trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. On the left navigation, click **Create Trap**.
The Trap Type Selection page opens.

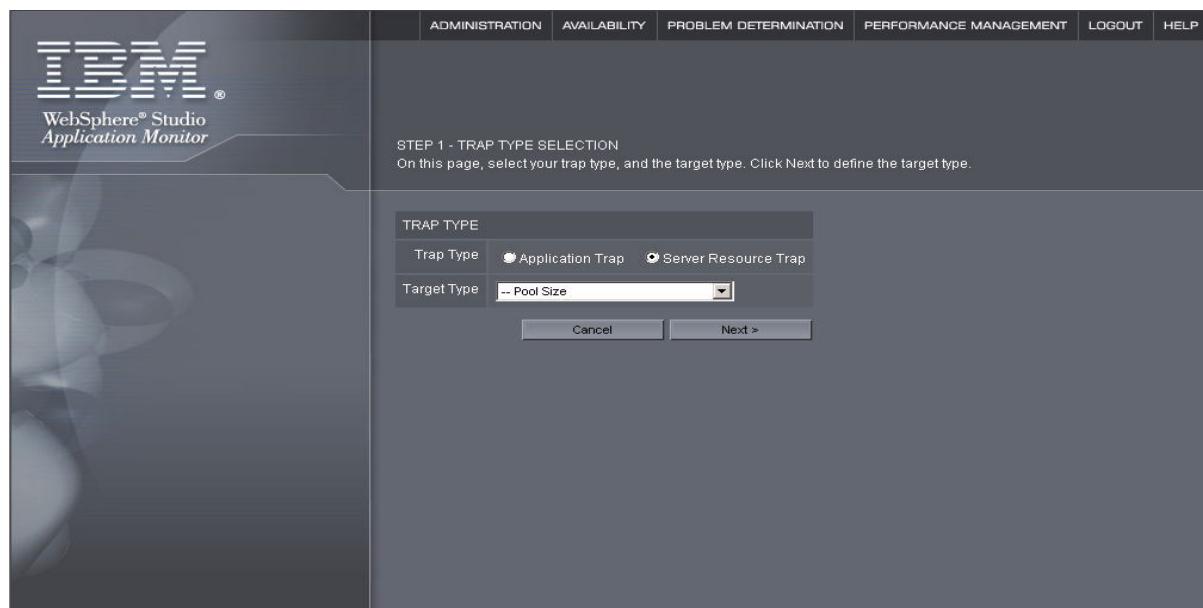


FIGURE 6. Trap Type Selection

3. Select Server Resource Trap as the Trap Type.
4. Select one of eight Target Types from the drop-down menu: Server Unavailable, DB Pool Size, DB Concurrent Waiters, DB Average Connection Wait Time, DB Number of Connection Pool Timeouts, DB Average % of Pool in Use, JVM Free Memory, and JVM Memory Used.
5. Click **Next**.

The Define Trap page opens.

STEP 2 -- DEFINE TRAP
Defining a trap changes based on the trap type you choose in Step 1. For HTTP or SQL requests, enter content that, when found in the request, will trigger the trap. For all other traps, the threshold is a level set that will cause an alert when the system count exceeds the threshold you set.

TRAP TYPE	
Trap Type	Server Resource Trap
Target Type	Pool Size

TRAP DEFINITION

Threshold	Pool Size	>=	10
-----------	-----------	----	----

< Back Cancel Next >

FIGURE 7. Define Trap

6. Enter the number you want the system to count to prior to sending an alert. For example, select Pool Size as the Target Type and enter $<=10$ as the threshold. When the system detects that the pool size is $<=10$, it sends an alert.
7. Click **Next**.

The Set Trap Alerts page opens.

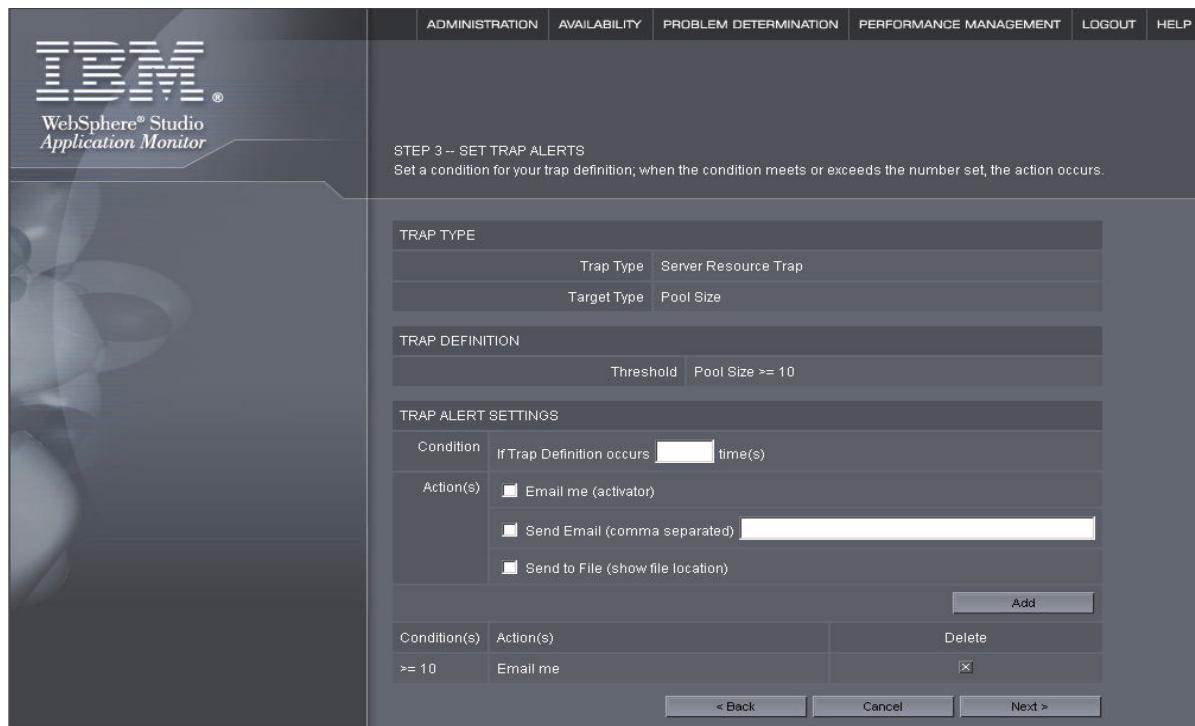
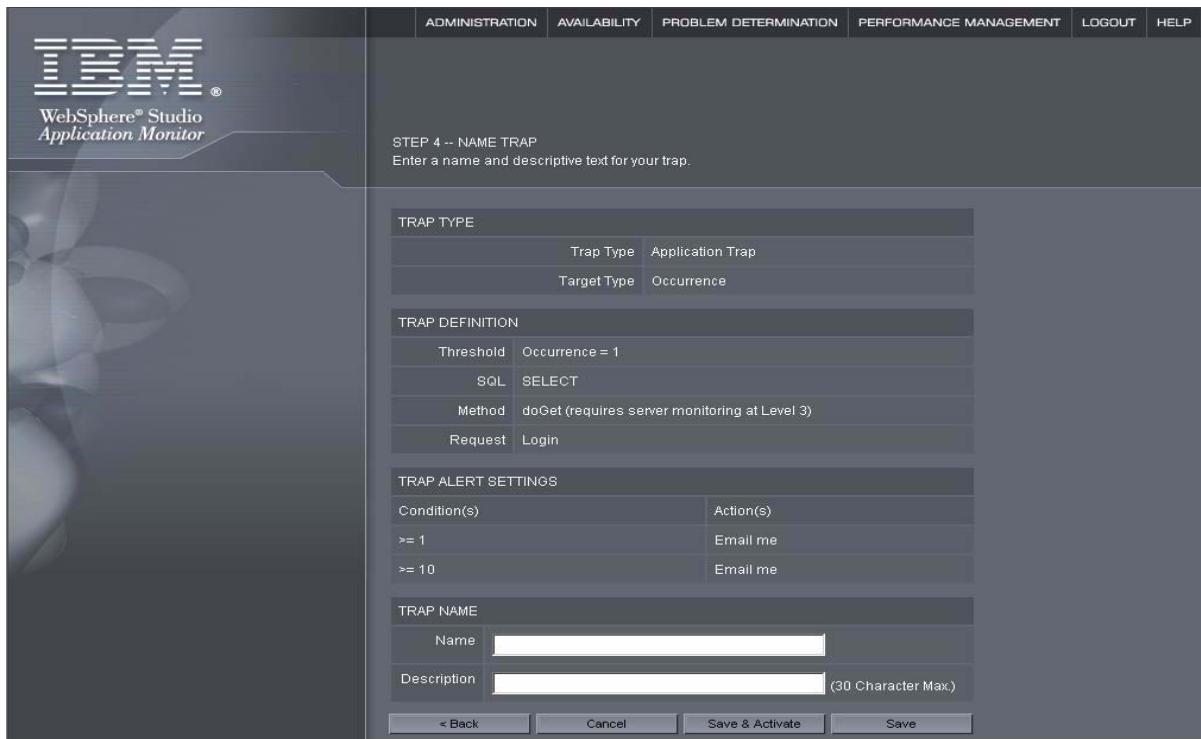


FIGURE 8. Set Trap Alerts

8. Enter the number of times the trap should occur before sending an alert.
9. Select the type of alert, either sending an email, sending an SNMP message, or creating a log file.
10. Click **Add** to add the alert to your trap.
11. Click **Next**.

The Name Trap page opens.

**FIGURE 9.** Name Trap

12. Enter a Name and descriptive text for your trap.
 13. Click either **Save** or **Save & Activate** (**See Activating a Trap**).
- The Trap List displays your new trap.

Usage Notes: When setting a trap, you can select multiple alert conditions and for each alert condition, you can select multiple Actions. Each trap is required to have at least one alert condition but may have multiple Actions. For example, when the system receives 25 requests, send an email to me@company.com and create a log. Next, when the system receives 50 requests, send an email to thebigboss@company.com.

If you select to create a log for the Action, the log file is located at /opt/cyanea/logs/alert.log.

Activating a Trap

For your convenience, you can turn traps off and on by activating and deactivating them. Since traps add overhead to your system, you may want to turn them on only at the times necessary. The traps in the Trap List are not active.

To activate a trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. In the Trap List, click **Activate** next to the trap you want to activate.
The Activate page opens.

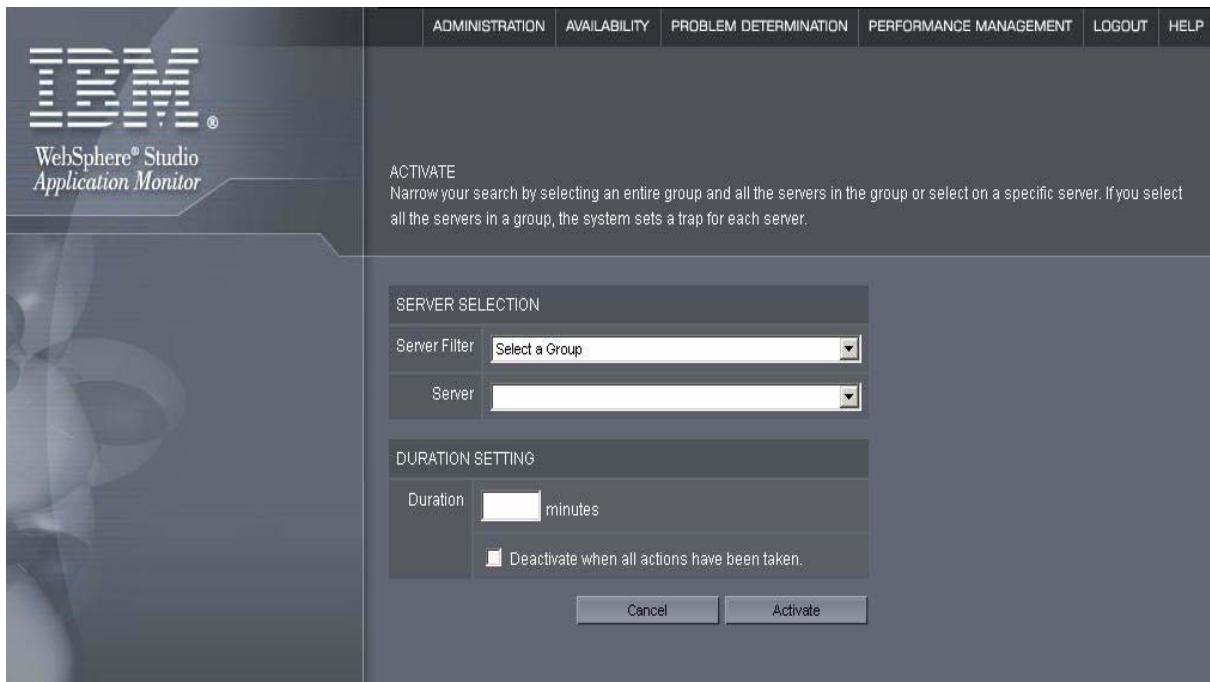


FIGURE 10. Activate page

3. Select a Group and a Server.

Note: If you select All Servers, the trap will only apply to the servers in the group at the time the system activates the trap. Any new servers created will not use the trap.

4. Enter the number of minutes you want the trap active.
5. Select whether you want to deactivate the trap after all the actions occur.
6. Click **Activate**.

The Trap and Alert Management page displays the trap in the Active Traps section at the top of the page.

Deactivating a Trap

Deactivate your traps when they are not in use since they can add overhead to the system. The traps in the Traps List are not active.

To deactivate a trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. In Active Traps, click **Deactivate** next to the trap you want to deactivate.
3. Click **OK** at the confirmation box.
The trap displays in the Trap List as deactivated.

Modifying a Trap

After creating a trap, you can modify any of the parameters of a trap. Change the Group, Server, Trap Type, Target Type, Alert Conditions, and the Action that occurs when the system meets the conditions. Using this method you can reuse and modify old traps for different servers.

Note: A trap must be deactivated prior to modification (See **Deactivating a Trap**).

To modify a trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. In the Trap List, click **Modify** next to the trap you want to modify.
The Modify page opens.

The screenshot shows the 'MODIFY' page for trap configuration in the WebSphere Studio Application Monitor. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP.

TRAP TYPE

Trap Type	Server Resource Trap
Target Type	Average % of Pool in Use

TRAP DEFINITION

Threshold	Average % of Pool in Use >= <input type="text" value="1"/>
-----------	--

TRAP ALERT SETTINGS

Condition: If Trap Definition occurs times

Action(s): Email me (activator)
 Send Email (comma separated)
 Send to File (show file location)

Condition(s) **Action(s)** **Delete**

>= 1	Email sarah.butts@cyanea.com	X
>= 1	Send to File	X

TRAP NAME

Name	<input type="text" value="Avg%inUse"/>
Description	<input type="text"/> (30 Character Max.)

Buttons: Add, Cancel, Save

FIGURE 11. Modify page

3. If you want to change the Trap Definition, enter new content or a new threshold that will trigger the trap after meeting the condition.

4. If you want to change the Trap Alert Settings, enter the number of times the trap should occur before the system takes an action, either sending an email, sending an SNMP message, or creating a log file.
5. Click **Add** to add a new alert to your trap.
6. If you want to change the name, enter a new Name and descriptive text for your trap. This will delete the old trap name and save the trap with the new name.
7. Click **Save**.

The Trap List displays your modified trap.

Usage Notes: When setting a trap, you can select multiple alert conditions and for each alert condition, you can select multiple Actions. Each trap is required to have at least one alert condition but may have multiple Actions. For example, when the system receives 25 requests send an email to me@company.com and create a log. Next, when the system receives 50 requests, send an email to thebigboss@company.com.

If you select to create a log for the Action, the log file is located at /opt/cyanea/logs/alert.log.

Duplicating a Trap

Save time by duplicating traps. Duplicating a trap allows you to quickly create a new trap based on the settings of an existing trap.

To duplicate a trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.
The Trap and Alert Management page opens.
2. In the Trap List, click **Duplicate** next to the trap you want to duplicate.
The Duplicate page opens.

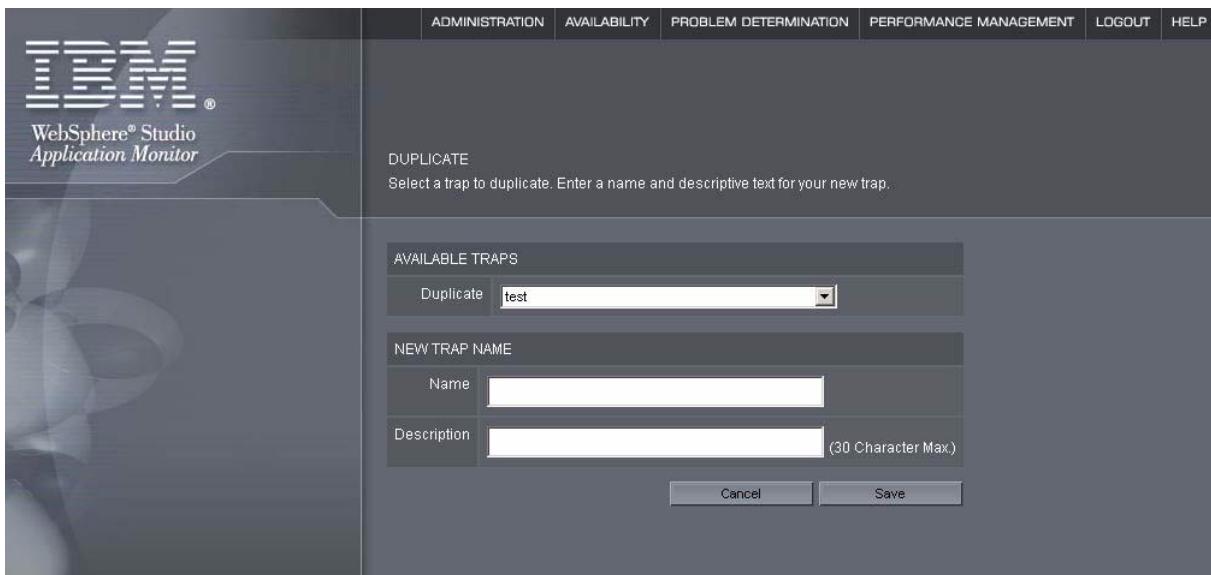


FIGURE 12. Duplicate page

3. Select the trap you want to duplicate from the drop-down menu.
4. Enter a name and descriptive text for the new trap.
5. Click **Save**.

The new trap displays in the Trap List.

Deleting a Trap

Manage your traps by keeping them up-to-date. Delete existing traps from the system that are no longer in use.

Note: A trap must be deactivated prior to deletion ([See Deactivating a Trap](#)).

To delete a trap:

1. From the top navigation, click **Problem Determination > Trap & Alert Management**.

The Trap and Alert Management page opens.

2. In the Trap List, click **Delete** next to the trap you want to delete.
3. Click **OK** at the confirmation box.

The Trap List displays without the deleted trap.

System Resources – z/OS Platform

The System Resources section displays summary information for all the system resources on the selected application server. This section consists of the System Resources Overview page which shows the system resources usage information with a 5 minute refresh rate. From this page, the user can view detailed information on Server Activity, EJB containers and Web containers by drilling down into pages such as, the Server Activity Display (SAD) page, EJB Summary page, EJB Method Summary page, and EJB Method Detail page.

The source of the data comes primarily from the SMF records published periodically by WebSphere. As these records are published, WSAM intercepts the transfer of the records and makes a copy in real time before writing it to the SMF dataset. The system collects and presents records captured in real time in this section.

Note: While you can access the System Resources at the server region level, the system displays the data aggregated at the server instance level.

Viewing the System Resources Overview

The System Resources Overview page displays summary information for all the resources on the selected application server. The system captures the data every five minutes for display.

To open the System Resources Overview page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.

The screenshot shows the 'SYSTEM RESOURCES OVERVIEW' page. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar titled 'CHOOSE SERVER' with dropdown menus for 'Group' (set to 'Select a Group') and 'Server' (set to 'Select Server'). The main content area has a title 'RESOURCE DEFINITIONS' and a table with eight rows, each containing a resource name and its description. The last row, 'EJB Calls', has a mouse cursor hovering over it. A 'Cyanea WITHIN' logo is in the bottom right corner of the main content area.

RESOURCE DEFINITIONS	
JVM CPU Usage	The percentage of the machine's CPU that is being used by the application server JVM.
JVM Memory Usage	The amount of memory, in megabytes, that is being used by the application server JVM.
Database Connection Pools	For each database connection pool on the selected application server, an indicator will be displayed showing the number of connections in use and the total number of connections in the pool.
Transaction Failure Rate	The percentage of the transactions handled by the application server that are not successfully completed.
Thread Pools	Usage statistics about the thread pools your application server uses to process requests.
EJB Activity	A graph indicating the number of EJB invocations on the application server in the last hour.
Servlet/JSP Activity	A graph indicating the number of requests for servlets or JSP's in the last hour.
EJB Calls	A graph indicating the distribution of EJB invocations in the last hour.

FIGURE 1. System Resources Overview

2. On the left navigation, select the Group and the Server from the drop-down list.
The information for the selected Group and the Server displays.



FIGURE 2. System Resources Overview

Note: The graphs of EJB Activity, Transaction Initiated, Bytes Sent To Clients and Servlet Activity display rolling 5-minute historical data up to one hour.

Viewing the Server Detail

The Server Detail page displays detailed report information on the select server.

To open the Server Detail Page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.

Viewing the EJB Summary

The information for the selected Group and Server displays.

3. Click **Server** from the left navigation on the System Resources Overview page.
The Server Detail page opens.

SNAPSHOT INFO			
APPLICATION SERVER NAME		ADCDPL.QATEST1	
INTERVAL START/END:		Tue Mar 11 20:58:28 PST 2003 - Wed Mar 12 14:52:29 PST 2003	
SERVER DETAIL			
Sample Start Time	Tue Mar 11 20:58:28 PST 2003	Sample End Time	Wed Mar 12 14:52:29 PST 2003
Global Transactions	5	Local Transactions	176330
Existing Sessions	0	Active Sessions	176288
Local Existing Sessions	0	Local Active Sessions	62
Remote Existing Sessions	0	Remote Active Sessions	176226
Bytes Received	75922824	Bytes Sent	1166962886
Local Bytes Received	92768	Local Bytes Sent	421291
Remote Bytes Received	75830056	Remote Bytes Sent	1166541595
Beans	6		

FIGURE 3. Server Detail

Viewing the EJB Summary

The EJB Summary page reports information for EJBs on the selected server.

To open the EJB Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.
2. On the left navigation, select the Group and Server from the drop-down list.

The information for the selected Group and Server displays.

3. Click **EJBs** from the left navigation on the System Resources Overview page.
The EJB Summary page opens.

AMC Name	EJB type	Reentrant	Methods	UUID
PolicyVP:PolicyVP.jar:PolicyCMP	0	false	1	B8D85CA536D
PolicyVP:PolicyVP.jar:PolicySession	2	false	2	B8D85CA536D
PolicyVP:PolicyVP.war:RemoteWebAppBean	2	false	3	B8D85CA536D
RemoteWebContainer:RemoteWebContainer.jar:RemoteWebContainer	2	false	4	B8D6E58834D
Trade Sample:Trade.war:RemoteWebAppBean	2	false	1	B8D74E250CD
WebSphereSampleEARFile:default_app.war:RemoteWebAppBean	2	false	2	B8D85C417CD

FIGURE 4. EJB Summary

Viewing the EJB Method Summary

The EJB Method Summary page reports information for the methods of the selected EJB.

To open the EJB Method Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.
2. On the left navigation, select the Group and Server from the drop-down list.

Viewing the EJB Method Detail

The information for the selected Group and Server displays.

3. Click **EJBs** from the left navigation on the System Resources Overview page.
The EJB Summary page opens.
4. Click to select the corresponding EJB Method page of each AMC Name.
The EJB Method Summary page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar has a menu with links for Overview, Server, EJBs (which is currently selected), Servlet Session Manager, and Web Applications. The main content area is titled 'EJB METHOD SUMMARY' and contains the message: 'The EJB Method Summary reports information for the methods of the selected enterprise java bean.' Below this is a 'SNAPSHOT INFO' section with details: APPLICATION SERVER NAME: ADCDPL.QATEST1, RESOURCE: Trade Sample::Trade.war::RemoteWebAppBean, and INTERVAL START-END: Tue Mar 11 15:18:50 PST 2003 - Tue Mar 11 20:58:28 PST 2003. The bottom section is titled 'EJB METHOD SUMMARY' and contains a table with two rows of data:

Method Signature	Invocations	Average Response Time	Max Response Time	Transaction Policy
create()	1	2	2	1
dispatch()	101281	33	56736	1

FIGURE 5. EJB Method Summary

Viewing the EJB Method Detail

The EJB Method Detail page reports complete information on the selected EJB method.

To view the EJB Method Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.
2. On the left navigation, select the Group and Server from the drop-down list.
The information for the selected Group and Server displays.
3. Click **EJBs** from the left navigation on the System Resources Overview page.
The EJB Summary page opens.
4. Click to select the corresponding EJB Method page of each AMC Name.
The EJB Method Summary opens.
5. Click on a link under the **Method Signature** column.
The EJB Method Detail page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. The main title is "EJB METHOD DETAIL" with a sub-instruction: "The Web Applications Detail reports complete information on the selected servlet." The left sidebar menu lists: Overview, Server, EJBs, Servlet Session Manager, and Web Applications. The central content area is divided into two sections: "SNAPSHOT INFO" and "EJB METHOD DETAIL".

SNAPSHOT INFO	
APPLICATION SERVER NAME	ADCDPL.QATEST1
RESOURCE	Trade Sample::Trade war::RemoteWebAppBean.dispatch 0
INTERVAL START/END:	Tue Mar 11 15:18:50 PST 2003 - Tue Mar 11 20:58:28 PST 2003

EJB METHOD DETAIL			
Method Signature	dispatch0	Invocations	101281
Average Response Time	33	Max Response Time	56736
Transaction Policy	1	EJB Roles	
ejbLoad Invocations	0	ejbLoad Average Execution Time	0
ejbLoad Maximum Execution Time	0	ejbStore Invocations	0
ejbStore Average Execution Time	0	ejbStore Maximum Execution Time	0
ejbActivate Invocations	0	ejbActivate Average Execution Time	0
ejbActivate Maximum Execution Time	0	ejbPassivate Invocations	0
ejbPassivate Average Execution Time	0	ejbPassivate Maximum Execution Time	0

FIGURE 6. EJB Method Detail

Viewing the Servlet And Session Manager Detail

The Servlet And Session Manager Detail page reports information on the HTTP sessions.

To open the Servlet And Session Manager Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources Overview page opens.
2. On the left navigation, select the Group and Server from the drop-down list.
The information for the selected Group and Server displays.
3. Click **Servlet Session Manager** in the left navigation.
The Servlet Session Manager Detail page opens.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, Logout, and Help. The left sidebar has a 'MENU' section with links for Overview, Server, EJBs, Servlet Session Manager (which is underlined to indicate it's selected), and Web Applications. The main content area is titled 'SERVLET SESSION MANAGER DETAIL' and contains the message: 'The Web Applications Detail reports complete information on the selected servlet.' Below this, there's a 'SNAPSHOT INFO' section with two rows: 'APPLICATION SERVER NAME: ADCDPLBBOASR2A' and 'INTERVAL START/END: Tue Aug 27 12:16:14 PDT 2002 - Mon Sep 02 20:32:55 PDT 2002'. A large table titled 'SERVLET SESSION MANAGER DETAIL' follows, containing the following data:

Sessions Created:	50134	Sessions Invalidated:	43884
Active Sessions:	0	Minimum Active Sessions:	0
Maximum Active Sessions:	5	Average Session Lifetime (ms):	282
Average Invalidation Time:	182	Finalized Sessions:	41632
Total Sessions:	0	Minimum Live Sessions:	0
Maximum Live Sessions:	6003		

FIGURE 7. Servlet Session Manager Detail

Viewing the Web Applications Summary

The Web Applications Summary reports information for the selected server including the Servlet name and the number of requests for the Servlet.

To open the Web Applications Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and Server from the drop-down list.
The information for the selected Group and Server displays.
3. Click **Web Applications** on the left navigation.
The Web Applications Summary page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar features a 'CHOOSE SERVER' section with dropdown menus for Group (set to QATEST1) and Server (set to ADCDPL.QATEST1). Below this is a 'MENU' section with links for Overview, Server, EJBs, Servlet Session Manager, Web Applications (which is currently selected), and Server Regions. The main content area is titled 'WEB APPLICATIONS SUMMARY' and contains a message: 'The Web Applications Summary page reports information for the selected server, including the servlet name and the number of requests for the servlet.' Below this is a 'SNAPSHOT INFO' section showing the application server name (ADCDPL.QATEST1) and the interval start/end (Tue Mar 11 20:58:28 PST 2003 - Wed Mar 12 14:58:29 PST 2003). The bottom section is titled 'WEB APPLICATIONS SUMMARY' and displays a table of servlet names and their request counts:

Servlet Name	Requests
PolicyVP-localhost_1_SimpleFileServlet	10
PolicyVP-localhost_1_Was40Ivp	2
default_app_0/error.jsp	3
default_app_0/JSP 1.1 Processor	3
default_app_0/SimpleFileServlet	3
trade Web Application_0/account.jsp	16328
trade Web Application_0/config.jsp	5

FIGURE 8. Web Applications Summary

Usage Notes: Use the Web Applications Summary page to identify the most frequently used requests.

Viewing the Web Applications Detail

The Web Applications Detail reports complete information on the selected server.

To open the Web Applications Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and Server from the drop-down list.
The information for the selected Group and Server displays.
3. Click **Web Applications** on the left navigation.
The Web Applications Summary page opens.
4. Click the Servlet Name's link to open the Web Applications Detail page.
The Web Applications Detail page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. On the left, there's a sidebar with the IBM logo and the text "WebSphere® Studio Application Monitor". Below this is a "CHOOSE SERVER" section with dropdown menus for "Group" (set to "QATEST1") and "Server" (set to "ADCDPL.QATEST1"). A "MENU" section contains links for Overview, Server, EJBs, Servlet Session Manager, Web Applications, and Server Regions. The main content area has a header "WEB APPLICATIONS DETAIL" with the sub-instruction "The Web Applications Detail reports complete information on the selected servlet." Below this is a "SNAPSHOT INFO" section with three rows: "APPLICATION SERVER NAME" (ADCDPL.QATEST1), "RESOURCE" (PolicyIP-localhost_1.SimpleFileServlet), and "INTERVAL START-END" (Tue Mar 11 20:58:28 PST 2003 - Wed Mar 12 14:58:29 PST 2003). The final section is "WEB APPLICATIONS DETAIL", which contains a table with five rows. The columns are "Servlet Name" (PolicyIP-localhost_1.SimpleFileServlet), "Requests" (10), "Average Response Time (ms)" (45), "Maximum Response Time (ms)" (128), "Minimum Response Time (ms)" (8), and "Errors" (0). The last row shows "Load Timestamp" (Wed Mar 12 00:32:33 GMT 2003).

FIGURE 9. Web Applications Detail

Usage Notes: The Web Applications Detail page provides the average response time for a particular request. If you suspect a request is abnormally terminating, check the number of errors and exceptions that have occurred.

Viewing the Server Regions' Summary

On the z/OS platform, multiple server regions can be dynamically created by the Work Load Manager to load-balance each other. You can view the system information about all the currently running server regions on the Server Regions' Summary page.

To view the Server Regions' Summary page:

1. From the top navigation, click **Performance Management > System Resources**.

Viewing the Database Connection Pool Detail

The System Resources selection page opens.

2. On the left navigation, select the Group and Server from the drop-down list.

The information for the selected Group and Server displays.

3. Click **Server Regions** on the left navigation.

The Server Regions' Summary page opens.



FIGURE 10. Server Regions' Summary

Viewing the Database Connection Pool Detail

The Database Connection Pool Detail page reports complete information on a specific database connection pool from the application server.

To view the Database Connection Pool Detail page:

1. From the top navigation, click **Performance Management > System Resources**.

The System Resources selection page opens.

2. On the left navigation, select the Group and Server from the drop-down list.
The information for the selected Group and Server displays.
3. Click **Server Regions** on the left navigation.
The Server Regions' Summary page opens.
4. Click the link on the Database Connection Pool chart.
The Database Connection Pool Detail page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main title is "DATABASE CONNECTION POOL DETAIL". Below it, a sub-header states: "The Database Connection Pool Detail reports complete information on a specific database connection pool from your application server." On the left, a "CHOOSE SERVER" panel shows "Group: QATEST1" and "Server: ADCDPL.QATEST1". A "MENU" panel includes links for Overview, Server, EJBs, Servlet Session Manager, Web Applications, and Server Regions. The central content area displays the "DATABASE CONNECTION POOL DETAIL" table with three rows of data:

Transaction Server Name	ADCDPL
Instance Name	QATEST1
Server Region Name	ADCDPL.QATEST1.6b (L1)

Below this is another table titled "CONNECTION(S) IN USE OR IN CACHE" with eight rows of data:

Database Name	Plan Name	Username	Last Known SQL Statement
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null
S390LOC	DSNJDBC	N/A	null

FIGURE 11. Database Connection Pool Detail

Viewing the Database Connection Pool Detail

Accessing the Daily Statistics

The Daily Statistics section provides daily statistics snapshots for z/OS WebSphere servers. This feature is not available for distributed (UNIX/Windows) versions of WebSphere. Every night at midnight, the Application Monitor gathers the day's SMF data for all running z/OS WebSphere instances. In addition, the system handles situations when outages occur by continuously capturing and archiving the data at the appropriate times. As a result, the system may produce more than one report per day. Cyanea/One presents the information to the user via the Daily Statistics section. The Daily Statistics snapshots are presented in a manner similar to that found in the Server Resources section.

To open the Daily Statistics :

1. From the top navigation, click Performance Management > **Daily Statistics**.
2. The Daily Statistics page opens with the previous day's data.

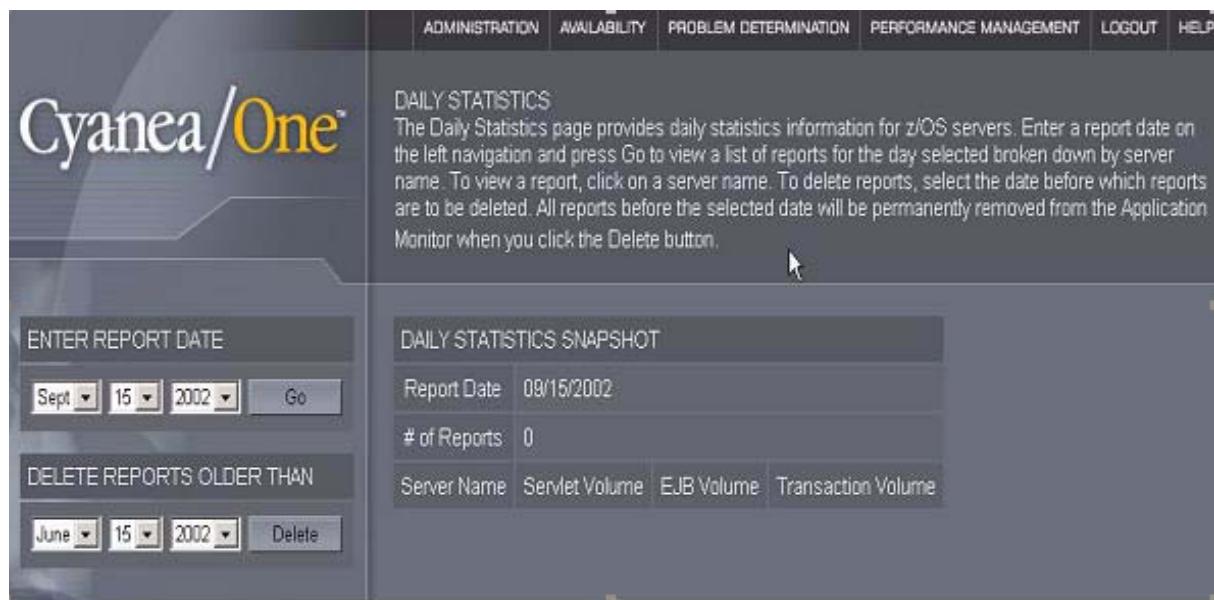


FIGURE 1. Daily Statistics

Usage Notes: You can use the Servlet, EJB, and Transaction volume fields to quickly gauge workload that the application server handled for the day. This information allows you to identify servers that have behaved abnormally.

To change the date of the report, select a month, a date and a year from the drop-down list of the left navigation.

To delete old Daily Statistics snapshots:

1. From the top navigation, click Performance Management > **Daily Statistics**. The Daily Statistics page opens.
2. Use the left navigation to select a month, day, and year under the "Delete Reports Older Than" heading.

DAILY STATISTICS SNAPSHOT			
Report Date	03/12/2003		
# of Reports	4		
Server Name	Servlet Volume	EJB Volume	Transaction Volume
ADCDPL_QATEST1	148166	244512	216360
ADCDPL_BBOASR2C	194037	359793	245663
ADCDPL_BBOASR2C	188	194	378
ADCDPL_BBOASR2C	82801	82822	176685

FIGURE 2. Daily Statistics

3. Click **Delete**.
4. Click **Yes** in the confirmation box. The system deletes all reports created earlier than the date you select.

Viewing the Daily Statistics Overview

This page displays overview information related to the selected Daily Statistics snapshot.

To open the Daily Statistics Overview page:

1. From the top navigation, click **Performance Management > Daily Statistics**.
The Daily Statistics page opens with the previous day's data.

2. If snapshots from a different date are desired, from the left navigation, select a month, day, and year under the "Enter Report Date" heading and click **Go**.
3. Click on a Server Name to view the Daily Statistics Overview, where the snapshot data will be presented.

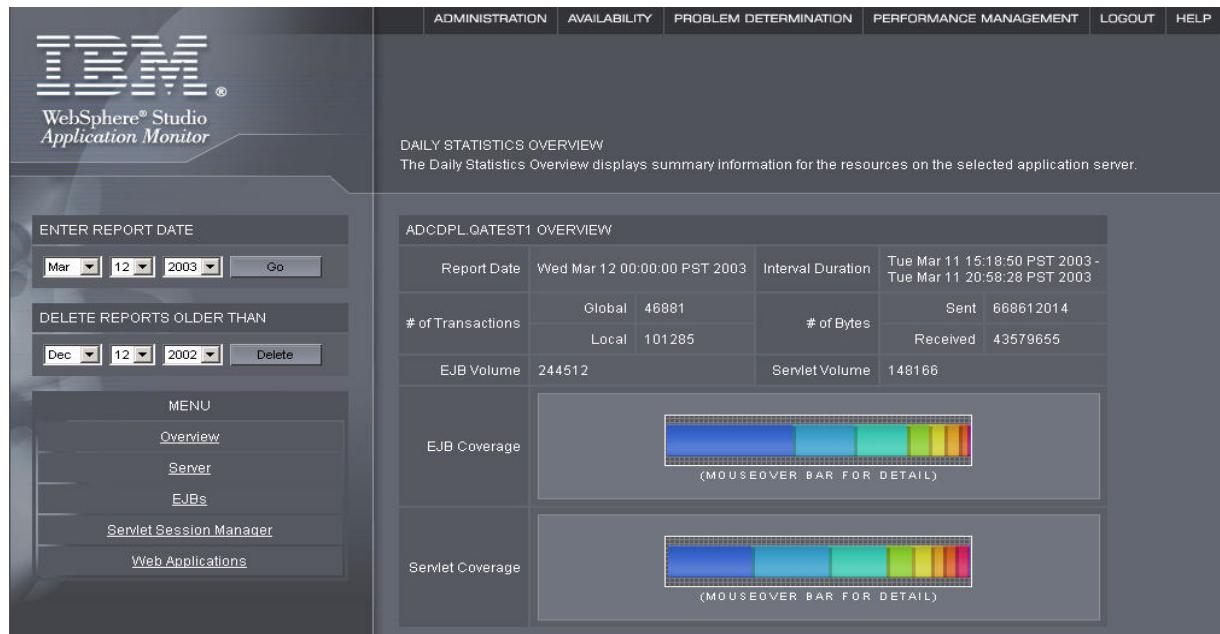


FIGURE 3. Daily Statistics Overview

To get more detailed information, the side navigation can be used to find out more information regarding: Server, EJBs, Servlet Session Manager, and Web Applications.

Descriptions of the information found in the detail sections of the Daily Statistics can be found in the System Resources Section of the User Guide.

System Resources – Non-z/OS Platform

The System Resources section displays summary information for all the system resources on the selected application server. This section consists of the System Resources Overview page which provides a quick overview of key system resource usage information for a specific application server. From this summary page, a user can drill down into pages that show detailed information on EJBs, Database/JCA Connection Pools, Servlet/Session Manager, Thread Pools, JTA Transactions, and Web Applications. Configure the System Resources Overview page to display only the information relevant to your operations.

Note: *In order to view the data in the System Resources section, the monitoring level in Websphere must be set to Maximum.*

Viewing the System Resources Overview

Typically, you access this page by using the top navigation as described below or by clicking on the Tools button on the Server Statistics Overview page. After selecting an application server from a group, the System Resources Overview page displays data for all the resources on the application server.

To open the System Resources Overview page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.

The screenshot shows the 'CHOOSE SERVER' interface. On the left, there's a dropdown menu for 'Group' with options like 'Select a Group', '403', 'AIX WebSphere403', 'El Group0', 'Linux WebSphere4', 'SUN WebSphere4', and 'Windows WebSphere403'. The 'Windows WebSphere403' option is currently selected. To the right, the main panel displays the 'SYSTEM RESOURCES OVERVIEW' section, which includes a brief description of the overview page and the Cyanea logo. Below this is the 'RESOURCE DEFINITIONS' table, which lists eight metrics with their descriptions:

RESOURCE DEFINITIONS	
JVM CPU Usage	The percentage of the machine's CPU that is being used by the application server JVM.
JVM Memory Usage	The amount of memory, in megabytes, that is being used by the application server JVM.
Database Connection Pools	For each database connection pool on the selected application server, an indicator will be displayed showing the number of connections in use and the total number of connections in the pool.
Transaction Failure Rate	The percentage of the transactions handled by the application server that are not successfully completed.
Thread Pools	Usage statistics about the thread pools your application server uses to process requests.
EJB Activity	A graph indicating the number of EJB invocations on the application server in the last hour.
Servlet/JSP Activity	A graph indicating the number of requests for servlets or JSP's in the last hour.
EJB Coverage	A graph indicating the distribution of EJB invocations in the last hour, by EJB Home name.

FIGURE 1. System Resources selection

2. On the left navigation, select the Group and the Server from the drop-down list.
- The System Resources Overview page opens displaying the information for the selected Group and Server.



FIGURE 2. System Resources Overview

Usage Notes: When an application server malfunctions, the user can go to the System Resources Overview page to view a quick summary of the resources managed by the application server, such as, database connection pools, thread pools, JVM CPU usage, memory usage, etc. When reviewing the data, pay close attention to the graphs; when there is a problematic situation, the graphs display the data in red.

To change the application server:

1. On the left navigation, select a Group from the drop-down list.
2. On the left navigation, select a Server from the drop-down list.

Note: In order to view the data in the System Resources section, the monitoring level in Websphere must be set to Maximum. Please refer to the Application Server Support table below for the supported application server of different system resources.

	WebSphere4	WebSphere5
Database Connection Pools Summary	✓	✓
Database Connection Pool Detail	✓	✓
EJB Summary	✓	✓
EJB Detail	✓	✓
EJB Method Summary		✓
J2C Connection Pools Summary		✓
JCA Connection Pool Detail		✓
JVM/System Detail		✓
ORB Detail/Interceptor Summary		✓
Servlet Summary	✓	✓
Session Manager Summary		✓
Session Manager Detail	✓	✓
Thread Pools Summary	✓	✓
JTA Transaction Detail	✓	✓
Web Application Summary	✓	✓

TABLE 1. Application Server Support

Viewing the Database Connection Pools Summary

The Database Connection Pools Summary reports information about all the database connection pools on your application server. A database connection pool is a group of database connections. The system assigns a new request to a free connection from the pool. Upon completion of the request, the system returns the connection to the pool.

Supported Application Server: WebSphere4 & WebSphere5.

To open the Database Connection Pools Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **DB Connection Pool**.
The Database Connection Pools Summary page opens.

Viewing the Database Connection Pools Summary

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main title is "DATABASE CONNECTION POOLS SUMMARY". Below it, a sub-instruction reads: "The Database Connection Pools Summary page reports information about the database connection pools on your server." On the left, a sidebar titled "CHOOSE SERVER" shows "Group: SUN WebSphere" and "Server: qaapp-sun-s01.dc_ws40_01". A "MENU" section lists "Overview", "EJBs", "DB Connection Pool" (which is selected), "JTA Transactions", "Session Manager", "Thread Pool", and "Web Applications". The main content area displays "SNAPSHOT INFO" with "APPLICATION SERVER NAME: qaapp-sun-s01.dc_ws40_01" and "TIMESTAMP OF SNAPSHOT: Apr 18, 2003 10:35:00 AM". Below this is a table titled "DATABASE CONNECTION POOLS SUMMARY" with the following data:

DB Connection Pool Name	Avg. Pool Size	Concurrent Waiters	Avg. Wait Time (ms)	Connection Pool Faults	Percent Maxed
jdbc/SampleDataSource	0	0	0	0	100
jdbc/TradeSample	1	0	0	0	0

FIGURE 3. Database Connection Pools Summary

Usage Notes: From the Server Activity Display page, you see that many requests are taking a long time to complete and Idle Time is high. One possibility is that the requests are unable to acquire the database resources needed to complete the requests. In this situation, a user can go to the System Resources Overview page to find that the database connections are heavily utilized. Drill down into the Database Connection Pools Summary page to discover if the pools are being exhausted. When a pool is exhausted you will find the number of concurrent waiters is high and the average wait time is high.

Viewing the Database Connection Pool Detail

The Database Connection Pool Detail page reports complete information on a specific database connection pool from your application server.

Supported Application Server: WebSphere4 & WebSphere5.

To open the Database Connection Pool Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **DB Connection Pool**.
The Database Connection Pools Summary page opens.
4. Click the Pool Name's link to open the Database Connection Pool Detail page.
The Database Connection Pool Detail page opens.

Viewing the Database Connection Pool Detail

The screenshot shows the WebSphere Studio Application Monitor interface. In the top left, the IBM logo and "WebSphere® Studio Application Monitor" are displayed. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a sidebar titled "CHOOSE SERVER" shows a "Group" dropdown set to "QATEST1" and a "Server" dropdown showing "ADCDPL.QATEST1". Below this is a "MENU" section with links for Overview, Server, EJBs, Servlet Session Manager, Web Applications, and Server Regions. The main content area is titled "DATABASE CONNECTION POOL DETAIL" and contains three rows of information: Transaction Server Name (ADCDPL), Instance Name (QATEST1), and Server Region Name (ADCDPL.QATEST1.6b (L1)). Below this is a table titled "CONNECTION(S) IN USE OR IN CACHE" with columns for Database Name, Plan Name, Username, and Last Known SQL Statement. The table lists eight entries, all with "DSN JDBC" in the Plan Name column and "N/A" in the other columns.

Database Name	Plan Name	Username	Last Known SQL Statement
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null
S390LOC	DSN JDBC	N/A	null

FIGURE 4. Database Connection Pool Detail

Usage Notes: If a pool appears problematic on the Database Connection Pools Summary page, drill down for greater detail on that particular pool on the detail page. This will provide helpful problem solving information for your DBA and WebSphere Administrator.

Viewing the EJB Summary

The EJB Summary page reports information for all the EJB methods including the total number of method calls and the average method response time on your application server.

Supported Application Server: WebSphere4 & WebSphere5.

To open the EJB Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **EJBs**.
The EJB Summary page opens.

Viewing the EJB Detail

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a sidebar titled 'CHOOSE SERVER' shows 'Group: SUNWebSphere4' and 'Server: qaapp-sun-s01.dc_ws4_01'. A menu on the far left lists 'Overview', 'EJBs', 'DB Connection Pool', 'JTA Transactions', 'Session Manager', 'Thread Pool', and 'Web Applications'. The main content area is titled 'EJB SUMMARY' and contains a table with the following data:

EJB Name	# Creates	# Concurrent Lives	Avg. Method Response Time (ms)	Active Methods	Avg. Drain Size	Avg. Pool Size
Default EJB Container.TestActivity	0	0	0	0	0	0
Default EJB Container.indi BeenThere	0	0	0	0	0	0
Default EJB Container.trade/AccountHome	0	1	11.11	0	0	1
Default EJB Container.trade/HoldingHome	1	5	4.74	0	0	5
Default EJB Container.trade/KeySequenceHome	0	1	46.5	0	0	1

FIGURE 5. EJB Summary

Viewing the EJB Detail

The EJB Detail page reports the complete data for a specific EJB.

Supported Application Server: WebSphere4 & WebSphere5.

To open the EJB Detail page:

1. From the top navigation, click **Performance Management > System Resources**. The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.

The System Resources Overview page opens displaying the information for the selected Group and Server.

3. On the left navigation, click **EJBs**.

The EJB Summary page opens.

4. Click the EJB Name's link to open the EJB Detail page.

The EJB Detail page opens.

SNAPSHOT INFO	
APPLICATION SERVER NAME	qaapp-lnx-s02.server1
RESOURCE	TestActivity
TIMESTAMP OF SNAPSHOT	Apr 18, 2003 11:47:34 AM

EJB DETAIL			
EJB Name	TestActivity	# Creates	0
# Removes	0	# Instantiates	1
# Destroys	0	# Concurrent Lives	1
Avg. Method Resp. Time for Create (ms)	20	Avg. Method Resp. Time for Remove (ms)	0
Total Method Calls	2	Active Methods	0
Avg. Method Response Time (ms)	60025	Method Info	Method Info
# Ready Beans/Concurrent Actives	0	Gets from Pool	1
Gets Found	0	Returns to Pool	1
Returns Discarded	0	Drains from Pool	23
Avg. Drain Size	0	Avg. Pool Size	1

FIGURE 6. EJB Detail

Viewing the EJB Method Summary

The EJB Method Summary page reports information for EJB methods including the number of invocations, response time, and number of concurrent requests.

Supported Application Server: WebSphere5.

To open the EJB Method Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **EJBs**.
The EJB Summary page opens.
4. Click the EJB Name's link to open the EJB Detail page.
The EJB Detail page opens.
5. Click the **Method Info** to open the EJB Method Summary page.
The EJB Method Summary page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a navigation menu lists various monitoring categories: CHOOSE SERVER, MENU (Overview, EJBs, JCA Connection Pool, JVM/System, DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, Web Applications), and a section for Application Monitoring. The main content area displays the EJB Method Summary. It includes a 'SNAPSHOT INFO' section with details like APPLICATION SERVER NAME: qaapp-Inx-s02.server1, RESOURCE: TestActivity, and TIMESTAMP OF SNAPSHOT: Apr 18, 2003 11:38:29 AM. Below this is the 'EJB METHOD SUMMARY' table:

EJB Method Name	# of Invocations	Avg. Response Time (ms)	# of Concurrent Requests
create	1	20	0
pause	1	0	1

FIGURE 7. EJB Method Summary

Viewing the JCA Connection Pools Summary

The JCA Connection Pools Summary page reports information on the number of JCA connection pools in use on your application server.

Supported Application Server: WebSphere 4 and WebSphere 5.

To open the JCA Connection Pools Summary page:

- From the top navigation, click **Performance Management > System Resources**. The System Resources selection page opens.
- Select a Group and a Server from the drop-down list on the left navigation.

Viewing the JCA Connection Pools Summary

- The System Resources Overview page opens.
3. On the left navigation, click **JCA Connection Pool**.
The JCA Connection Pools Summary page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled "JCA CONNECTION POOLS SUMMARY" and contains the message: "The JCA Connection Pools Summary reports information on the JCA connection pools on your application server." Below this is a "SNAPSHOT INFO" section showing the APPLICATION SERVER NAME as "dev-Inx-w10.server1" and the TIMESTAMP OF SNAPSHOT as "Jan 24, 2003 09:07:46 AM". The main summary table is titled "JCA CONNECTION POOLS SUMMARY" and has columns for JCA Connection Factory Name, Concurrent Waiters, Percent Used, Faults, Avg Wait Time, and Avg Use Time. One row is shown: "TestWS Connector" with values 10, 0, 10, 10, and 0. On the left side, there is a "CHOOSE SERVER" panel with dropdowns for Group ("Unassigned Servers") and Server ("dev-Inx-w10.server1"). A "MENU" panel on the far left lists various monitoring categories: Overview, EJBs, JCA Connection Pool (which is selected), JVM/System, DB Connection Pool, JTA Transactions, and ORB.

JCA Connection Factory Name	Concurrent Waiters	Percent Used	Faults	Avg Wait Time	Avg Use Time
TestWS Connector	10	0	10	10	0

FIGURE 8. J2C Connection Pools Summary

Note: In order to view the data in the System Resources section, the monitoring level in WebSphere must be set to Maximum.

Viewing the JCA Connection Pool Detail

The JCA Connection Pool Detail page reports complete information for the connector including the number and status of the connections.

To open the JCA Connection Pool Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens.
3. On the left navigation, click **JCA Connection Pool**.
The JCA Connection Pools Summary page opens.
4. Click the JCA Connection Factory's link to view detail.
The JCA Connection Pool Detail page opens.

Viewing the JCA Connection Pool Detail

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar titled "CHOOSE SERVER" with dropdown menus for "Group" (set to "Unassigned Servers") and "Server" (set to "dev-Inx-w10.server1"). Below this is a "MENU" sidebar with links to Overview, EJBs, JCA Connection Pool (which is highlighted), JVM/System, DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, and Web Applications. The main content area is titled "JCA CONNECTION POOL DETAIL" and contains a sub-section "SNAPSHOT INFO" with three rows: APPLICATION SERVER NAME (dev-Inx-w10.server1), RESOURCE (Test WS Connector), and TIMESTAMP OF SNAPSHOT (Jan 24, 2003 09:08:23 AM). The main section "JCA CONNECTION POOL DETAIL" displays various metrics in a grid:

JCA Connection Factory Name	Test WS Connector	Concurrent Waiters	10
Percent Used	0	Faults	10
Avg Wait Time	10	Avg Use Time	0
# Managed Connections	10	# Managed Connections Created	10
# Managed Connections Destroyed	0	# Managed Connections Allocated	10
# Managed Connections Freed	10	# Connections	10
Free Pool Size	10	Pool Size	10
Percent Maxed	0		

FIGURE 9. JCA Connection Pool Detail

Usage Notes: In order to view the data in the System Resources section, the monitoring level in WebSphere must be set to Maximum.

Viewing JTA Transaction Detail

The JTA Transaction Detail page reports transaction information for the container.

Supported Application Server: WebSphere4 & WebSphere5.

To open the JTA Transaction Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. Click **JTA Transactions** on the left navigation.
The JTA Transaction Detail page opens.

The screenshot displays the 'JTA TRANSACTIONS DETAIL' page of the WebSphere Studio Application Monitor. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar features a 'CHOOSE SERVER' section with dropdown menus for Group ('El Groupito') and Server ('qaapp-lnx-s02.dc_ws405_01'). Below this is a 'MENU' section with links to Overview, EJBs, DB Connection Pool, JCA Connection Pool, JTA Transactions (which is currently selected), Session Manager, Thread Pool, and Web Applications. The main content area is titled 'JTA TRANSACTIONS DETAIL' and contains a message: 'The Transaction Manager Detail page reports complete transaction information for the container.' It also includes a 'SNAPSHOT INFO' table and a large 'JTA TRANSACTIONS DETAIL' table with various performance metrics.

SNAPSHOT INFO	
APPLICATION SERVER NAME	qaapp-lnx-s02.dc_ws405_01
TIMESTAMP OF SNAPSHOT	May 22, 2003 12:08:24 PM

JTA TRANSACTIONS DETAIL			
Global Trans Begun	0	Local Trans Begun	0
Active Global Trans	0	Active Local Trans	0
Global Trans Duration	0	Local Trans Duration	0
Global Prepare Duration	0	Global Before Completion Duration	0
Local Before Completion Duration	0	# Optimizations	0
Global Trans Committed	0	Local Trans Committed	0
Global Trans RolledBack	0	Local Trans RolledBack	0
Global Trans Timeout	0	Local Trans Timeout	0
Global Trans Involved	0	Global Commit Duration	0
Local Commit Duration	0		

FIGURE 10. JTA Transaction Detail

Viewing the JVM/System Detail

The JVM/System Detail page reports complete usage information for memory and CPU utilization on the JVM and the system.

Supported Application Server: WebSphere5.

To open the JVM/System Detail page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **JVM/System**.
The JVM Detail page opens.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar features a 'CHOOSE SERVER' section with dropdown menus for Group (set to AIX WebSphere5) and Server (set to qaapp-aix-s01.server1). Below this is a 'MENU' section with links to Overview, EJBs, JCA Connection Pool, JVM/System (which is highlighted), DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, and Web Applications. The main content area is titled 'JVM DETAIL' and contains the message: 'JVM/System Detail reports complete usage information for the JVM and the system.' It includes two tables: 'SNAPSHOT INFO' and 'SYSTEM DETAIL'. The 'SNAPSHOT INFO' table has two rows: 'APPLICATION SERVER NAME' (qaapp-aix-s01.server1) and 'TIMESTAMP OF SNAPSHOT' (Jan 17, 2003 04:00:04 PM). The 'SYSTEM DETAIL' table has two rows: 'Percent CPU Usage' (30) and 'Avg CPU Usage' (14.054).

SNAPSHOT INFO	
APPLICATION SERVER NAME	qaapp-aix-s01.server1
TIMESTAMP OF SNAPSHOT	Jan 17, 2003 04:00:04 PM

SYSTEM DETAIL	
Percent CPU Usage	30
Avg CPU Usage	14.054
Free Memory (KB)	1040

FIGURE 11. JVM Detail

Note: In order to view the data in the System Resources section, the monitoring level in WebSphere® must be set to Maximum.

Viewing the ORB Detail/Interceptor Summary

The ORB Detail/Interceptor Summary page reports information for the object request broker and the Interceptor including the number of requests from the ORB and processing time for the interceptor.

Supported Application Server: WebSphere5.

To open the ORB Detail/Interceptor Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Orb**.
The ORB Detail/Interceptor Summary page opens.

Viewing the ORB Detail/Interceptor Summary

The screenshot shows the WebSphere Studio Application Monitor interface. On the left, there's a sidebar with a dark background and the IBM logo at the top. Below it, the title "WebSphere® Studio Application Monitor" is displayed. A "CHOOSE SERVER" section contains dropdown menus for "Group" (set to "AIX WebSphere5") and "Server" (set to "qaapp-aix-s01.server1"). To the right of this is a "MENU" section with various options like Overview, EJBs, JCA Connection Pool, JVM/System, DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, and Web Applications. The main content area has a header bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. Below this is a "ORB DETAIL" section with a sub-section titled "SNAPSHOT INFO". It shows the "APPLICATION SERVER NAME" as "qaapp-aix-s01.server1" and the "TIMESTAMP OF SNAPSHOT" as "Jan 17, 2003 04:11:06 PM". Under the "ORB DETAIL" heading, there's a table with two columns: "Reference Lookup Time (ms)" and "Number of Requests", both showing a value of 344. The "INTERCEPTOR SUMMARY" section contains a table with two columns: "Interceptor Name" and "Processing Time (ms)". The table lists several interceptors with their corresponding processing times.

Interceptor Name	Processing Time (ms)
ActivityIORInterceptor	42
ActivityServiceClientInterceptor	0
ActivityServiceServiceInterceptor	1032
ClientInterceptor	0
PMIServerRequestInterceptor	1032
ServiceInterceptor	1032
TXIORInterceptor	42
WLMLClientRequestInterceptor	0
WLMServerRequestInterceptor	1032
WLMTaggedComponentManager	42
com.ibm.debug.DebugPortableInterceptor	0
com.ibm.ejs.ras.RasContextSupport	1032
com.ibm.ws.runtime.workloadcontroller.OrbWorkloadRequestInterceptor	1032

FIGURE 12. ORB Detail

Note: In order to view the data in the System Resources section, the monitoring level in WebSphere® must be set to Maximum.

Viewing the Web Application Summary

The Web Application Summary page reports information for the selected server including the servlet name and the number of requests for the Servlet.

Supported Application Server: WebSphere4 & WebSphere5.

To Open the Web Application Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens.
3. On the left navigation, click **Web Applications**.
The Web Application Summary page opens

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area has a header "WEB APPLICATION SUMMARY" with a sub-instruction: "The Web Applications Summary page reports information for the selected server, including the servlet name and the number of requests for the servlet." Below this is a "SNAPSHOT INFO" section with two rows: "APPLICATION SERVER NAME: qaapp-lnx-s02_dc_ws40_01" and "TIMESTAMP OF SNAPSHOT: Apr 17, 2003 02:58:41 PM". Underneath is a "WEB APPLICATION SUMMARY" table with the following data:

Web Application Name	Total Requests	Concurrent Requests
dc_ws40_01 Default Application	0	0
dc_ws40_01 Examples Application	0	0
dc_ws40_01.QA Test Servlets	3	0
dc_ws40_01.theme Web Application	0	0
dc_ws40_01.trade Web Application	18	0

On the left side of the interface, there's a "CHOOSE SERVER" panel with dropdown menus for "Group" (set to "Linux WebSphere4") and "Server" (set to "qaapp-lnx-s02_dc_ws40_01"). Below this is a "MENU" section with links: Overview, EJBs, DB Connection Pool, JTA Transactions, Session Manager, Thread Pool, and Web Applications. The "Web Applications" link is underlined, indicating it's the active section.

FIGURE 13. Web Application Summary

Viewing the Servlet Summary

The Servlet Summary page reports information on requests to the servlet.

Supported Application Server: WebSphere4 & WebSphere5.

To open the Servlet Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Web Applications**.
The Web Application Summary page opens.
4. Click the Web Application Name's link to view the Servlet Summary page.
The Servlet Summary page opens.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a sidebar titled "CHOOSE SERVER" displays "Group: AIX WebSphere5" and "Server: qaapp-aix-s01.server1". Below this is a "MENU" section with various options like Overview, EJBs, JCA Connection Pool, JVM/System, DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, and Web Applications. The main content area is titled "SERVLET SUMMARY" and contains the message "The Servlet Summary reports information on requests to the servlet." It also includes a "SNAPSHOT INFO" section with details: APPLICATION SERVER NAME: qaapp-aix-s01.server1, RESOURCE: PlantsByWebSphere#PlantsByWebSphere.war, and TIMESTAMP OF SNAPSHOT: Jan 22, 2003 11:01:24 AM. A table titled "SERVLET SUMMARY: PlantsByWebSphere#PlantsByWebSphere.war" lists two entries:

Servlet Name	Response Time (ms)	# Errors	Total Requests	Concurrent Requests
JSP 1.2 Processor	0	0	0	0
SimpleFileServlet	0	0	0	0

FIGURE 14. Servlet Summary

Note: In order to view the data in the System Resources section, the monitoring level in WebSphere® must be set to Maximum.

Viewing the Session Manager Summary

The Session Manager Summary reports information on the HTTP sessions.

Supported Application Server: WebSphere5.

To open the Session Manager Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Session Manager**.
The Session Manager Summary page opens.

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. Below the navigation bar, the title "SESSION MANAGER SUMMARY" is displayed, followed by a subtitle: "The Session Manager Summary reports information on the HTTP sessions." On the left side, there's a sidebar titled "CHOOSE SERVER" with dropdown menus for "Group" (set to "AIX WebSphere5") and "Server" (set to "qaapp-aix-s01.server1"). Below the sidebar is a "MENU" section containing links for Overview, EJBs, JCA Connection Pool, JVM/System, DB Connection Pool, JTA Transactions, ORB, Session Manager, Thread Pool, and Web Applications. The main content area is titled "SNAPSHOT INFO" and shows details like "APPLICATION SERVER NAME: qaapp-aix-s01.server1" and "TIMESTAMP OF SNAPSHOT: Jan 22, 2003 11:02:50 AM". The "SESSION MANAGER SUMMARY" section contains a table with data for various web applications.

Web Application Name	Created Sessions	Invalidate Sessions	Live Sessions
DefaultApplication#DefaultWebApplication.war	0	0	0
PlantsByWebSphere#PlantsByWebSphere.war	0	0	0
PlantsByWebSphere#PlantsGallery.war	0	0	0
PlantsByWebSphere#PlantsGalleryDE.war	0	0	0
PlantsByWebSphere#PlantsGalleryEN.war	0	0	0
PlantsByWebSphere#PlantsGalleryES.war	0	0	0
PlantsByWebSphere#PlantsGalleryFR.war	0	0	0
PlantsByWebSphere#PlantsGalleryIT.war	0	0	0
PlantsByWebSphere#PlantsGalleryJA.war	0	0	0
PlantsByWebSphere#PlantsGalleryKO.war	0	0	0
PlantsByWebSphere#PlantsGalleryPT_BR.war	0	0	0
PlantsByWebSphere#PlantsGalleryZH_CN.war	0	0	0
PlantsByWebSphere#PlantsGalleryZH_TW.war	0	0	0
SamplesGallery#Gallery.war	0	0	0
SamplesGallery#GalleryDE.war	0	0	0

FIGURE 15. Session Manager Summary

Note: In order to view the data in the System Resources section, the monitoring level in WebSphere® must be set to Maximum.

Viewing the Session Manager Detail

The Session Manager Detail reports complete information on the HTTP sessions.

Supported Application Server: WebSphere4 & WebSphere5.

To open the Session Manager Detail page from WebSphere 4:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Session Manager**.
The Session Manager Summary page opens.

To open the Session Manager Detail page from WebSphere 5:

1. From the top navigation, click **Performance Management > System Resources**.
The System Resources selection page opens.
2. Select a Group and a Server from the drop-down list on the left navigation.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Session Manager**.
The Session Manager Summary page opens.
4. Click the Web Application Name's link to view detail. The Session Manager Detail page opens. Session Manager Detail

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. Below the navigation bar, the title "SESSION MANAGER DETAIL" is displayed, followed by a sub-instruction: "The Session Manager Detail reports complete information on the HTTP sessions." On the left side, there's a "CHOOSE SERVER" panel with dropdown menus for "Group" (set to "AIX WebSphere5") and "Server" (set to "qaapp-aix-s01.server1"). Below this is a "MENU" section with various options like Overview, EJBs, JCA Connection Pool, JVM/System, DB Connection Pool, JTA Transactions, ORB, and Session Manager, with "Session Manager" currently selected. The main content area is titled "SNAPSHOT INFO" and contains three rows of data: APPLICATION SERVER NAME (qaapp-aix-s01.server1), RESOURCE (ivtApp#ivt_app.war), and TIMESTAMP OF SNAPSHOT (Jan 22, 2003 11:04:12 AM). Below this is a table titled "SESSION MANAGER DETAIL" with eight rows of metrics. The table has two columns: "Metric" and "Value". The metrics are: Web Application Name (ivtApp#ivt_app.war), Session Lifetime (0), Invalidated Sessions (0), No Room for New Session (0), External Read Time (0), External Write Time (0), Affinity Breaks (0), and Invalidated via Time Out (0). The corresponding values are: Created Sessions (0), Live Sessions (0), Active Sessions (0), Cache Discards (0), External Read Size (0), External Write Size (0), Attempt to Activate Nonexistent Session (0), and Serializable Session Object Size (0).

FIGURE 16. Session Manager Detail

Viewing the Thread Pools Summary

The Thread Pools Summary page reports information for the thread pools that the application server uses to process requests.

Supported Application Server: WebSphere4 & WebSphere5.

To open the Thread Pools Summary page:

1. From the top navigation, click **Performance Management > System Resources**.
2. On the left navigation, select the Group and the Server from the drop-down list.
The System Resources Overview page opens displaying the information for the selected Group and Server.
3. On the left navigation, click **Thread Pools**.
The Thread Pools Summary page opens.

Viewing the Thread Pools Summary

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a sidebar titled "CHOOSE SERVER" shows "Group: SUN WebSphere4" and "Server: qaapp-sun-s01.dc_ws40_01". Below this is a "MENU" section with links for Overview, EJBs, DB Connection Pool, JTA Transactions, Session Manager, Thread Pool (which is highlighted in blue), and Web Applications. The main content area is titled "THREAD POOLS SUMMARY" and contains a "SNAPSHOT INFO" section with application server name "qaapp-sun-s01.dc_ws40_01" and timestamp "Apr 16, 2003 04:03:04 PM". It also features a "THREAD POOLS SUMMARY" table:

Thread Pool	Thread Creates	Thread Destroys	Active Threads	Pool Size	% Time Max In Use
ORB.thread.pool	2	0	1	2	0
Servlet.Engine.Transports	10	0	0	10	0

FIGURE 17. Thread Pools Summary

Usage Notes: The Thread Pools Summary page verifies that the thread pool is optimally configured. For example, if the Percent Max value is high, you may want to increase the pool size. Conversely, if the Active Threads are very low, your pool size may be too large.

The System Resource Comparison allows the operator to compare all the servers in a group by a selected resource. For example, you notice that a server's memory usage is very high and you want to know if other servers in the group are utilizing memory at the same pace. Perform a comparison and view the specified resource for all the servers in the group. Using this comparison, you can take servers off-line that are underutilized and add servers to a group that are maximizing the server's capacity.

To set up a System Resource Comparison:

1. From the top navigation, click Performance Management > System Resource Comparison.

The System Resource Comparison page opens.

2. Select a Group and a Resource to Compare from the drop-down list.

3. Click **OK**.

The System Resource Comparison page displays with the selected resource data specified for all the servers in the group.

The screenshot shows the 'System Resource Comparison' page of the WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and 'WebSphere® Studio Application Monitor' text are visible. On the right, the 'Cyanea WITHIN' logo is displayed. The main content area is titled 'SYSTEM RESOURCE COMPARISON' and contains a brief description: 'The System Resource Comparison allows you to compare a selected resource for all the servers in a group. The Application Monitor captures the data every 5 minutes.' Below this, there's a 'COMPARISON SETTINGS' section with dropdown menus for 'Group' (set to 'AIX') and 'Server' (set to 'Thread Pools'), and an 'OK' button. To the right, under the heading 'THREAD POOLS', there are four resource comparison boxes. Each box contains two resource monitoring charts: one for 'ORB.thread.pool' and one for 'Servlet.Engine.Transports'. The first chart in each pair shows values for servers 'gaapp-aix-s01' and 'cyanea qa_04', with metrics like '2 OF 20 MAX 10 %'. The second chart shows values for 'gaapp-aix-s01' and 'cyanea qa_01', also with metrics like '2 OF 20 MAX 10 %'. The third chart shows '10 OF 50 MAX 20 %' for both servers. The fourth chart shows '10 OF 50 MAX 20 %' for both servers.

System Resource Comparison

Performance Analysis & Reporting

The Performance Analysis & Reporting functions provide users with application and application server data for easy analysis. You can create reports on a Group of servers or a selected server. You can analyze data for requests, methods, SQL, Server Availability, and Application Server. From the report analysis, the user can access details on the requests, methods, and SQL calls.

Defining Reports

Set different requirements for generating reports to analyze the performance of application servers.

Defining a Request Analysis Report

The Request Analysis Report provides a whole picture about the behavior on the application server. After defining the Request Analysis Report, several reports become available: Trend Report, Decomposition Report, Request Report Detail, and Trace Report.

Each of these reports provides more specific data for understanding the application's performance at every level.

To define a Request Analysis Report:

- From the top navigation, click **Performance Management > Performance Analysis & Reporting**.

The Performance Analysis & Reporting Management page opens.

The screenshot shows the 'Performance Analysis & Reporting Management' page. At the top, there is a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM WebSphere Studio Application Monitor logo is visible. In the center, there is a main content area with a title 'PERFORMANCE ANALYSIS AND REPORTING MANAGEMENT' and a brief description: 'Manage the reports created on your system with the Performance Analysis and Reporting Management page. Define, modify, and delete reports. To run a report, click the report name. To create a new report, click Define Report.' A Cyanea logo is also present. Below this, a table titled 'REPORTS' lists various reports with their details:

Report Name	Group/Server	Report Type	Date Created	Owner	Actions
Carls First Report (Isnt that CUTE?!)	All Groups	Request Analysis	01/06/2003	admin	Modify Delete
Contrast	All Groups	Request Analysis	01/07/2003	admin	Modify Delete
FridayChumpx2atnoon	Linux WebSphere5	Request Analysis	01/14/2003	admin	Modify Delete
last 3 hours	All Groups	Request Analysis	01/07/2003	admin	Modify Delete
null	All Groups	Request Analysis	01/08/2003	admin	Modify Delete
req	All Groups	Request Analysis	01/16/2003	admin	Modify Delete
Request Analysis All Servers	All Groups	Request Analysis	12/20/2002	admin	Modify Delete
Request Analysis All Servers 1/16	All Groups	Request Analysis	01/16/2003	admin	Modify Delete
Request Analysis All Servers 1/7	All Groups	Request Analysis	01/07/2003	admin	Modify Delete
Request Analysis Irix WL_6_25min for 4 mins	Linux WebLogic6	Request Analysis	01/07/2003	admin	Modify Delete
Request Analysis qaapp-aix-s01.myserver.11AM	AIX WebLogic 6	Request Analysis	01/09/2003	admin	Modify Delete
Request Analysis Sarah	AIX WebSphere4	Request Analysis	01/08/2003	admin	Modify Delete
Response Time	All Groups	Request Analysis	01/14/2003	admin	Modify Delete
Server Availability	All Groups	Server Availability Analysis	01/08/2003	admin	Modify Delete

FIGURE 1. Performance Analysis & Reporting Management

2. On the left navigation, click **Define Report**.

The Server And Report Type Selection page opens.

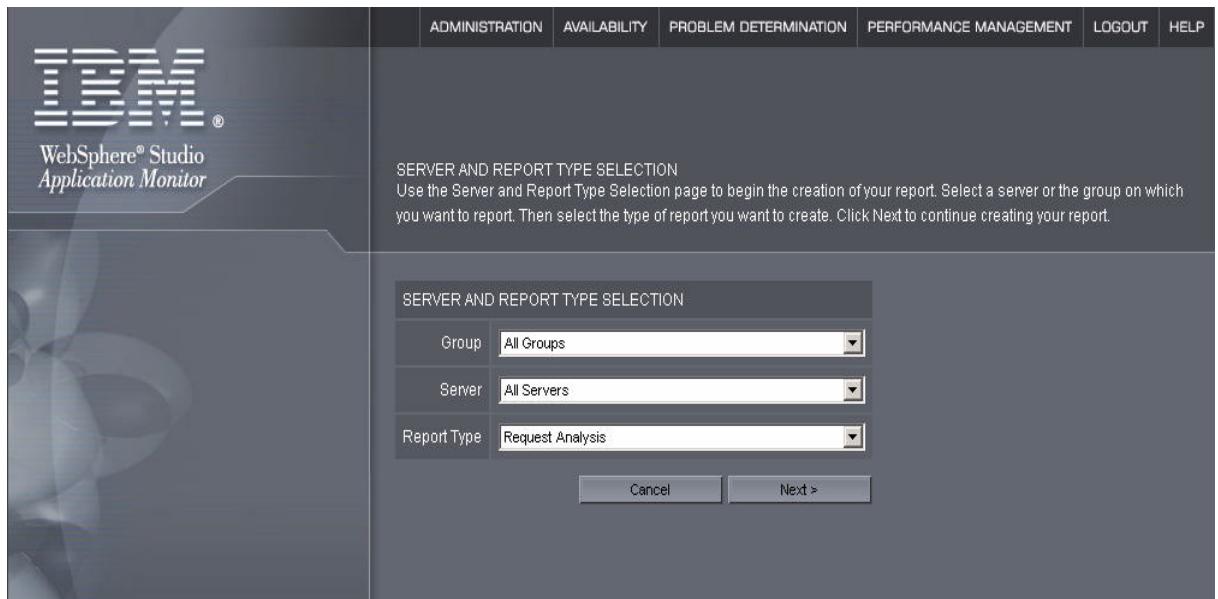


FIGURE 2. Server And Report Type Selection

3. Select the Group or the Server on which you want to report from the drop-down menu.
4. Select Request Analysis from the Report Type drop-down menu.
5. Click **Next** to continue creating the report.

The Report Filtering Options page opens. It displays the options based on the Report Type you select.

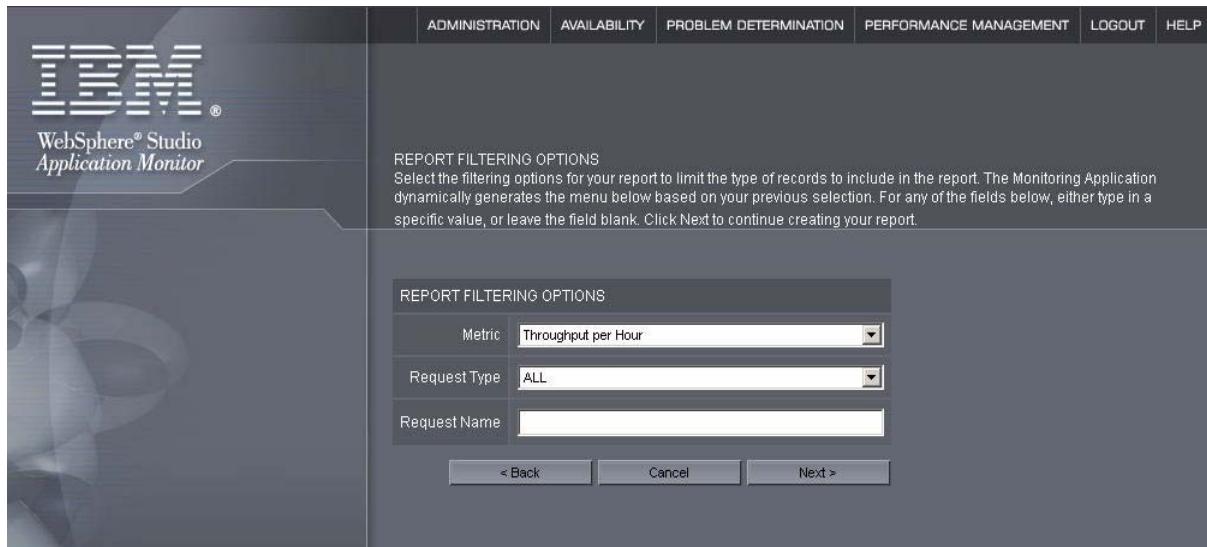


FIGURE 3. Report Filtering Options

6. Set the following options to filter the records returned in the report:
 - **Metric** - the item you want to measure: Throughput per Second, Throughput per Minute, Throughput per Hour, Response Time, or CPU Time.
 - **Request Type** - All, EJB, JSP, or Servlet.
 - **Request Name** - Unless you know exactly what the request string is, otherwise always leave the field blank to return all requests or type in the specific request name.
7. Click **Next** to continue creating the report.
The Date Range Settings page opens.

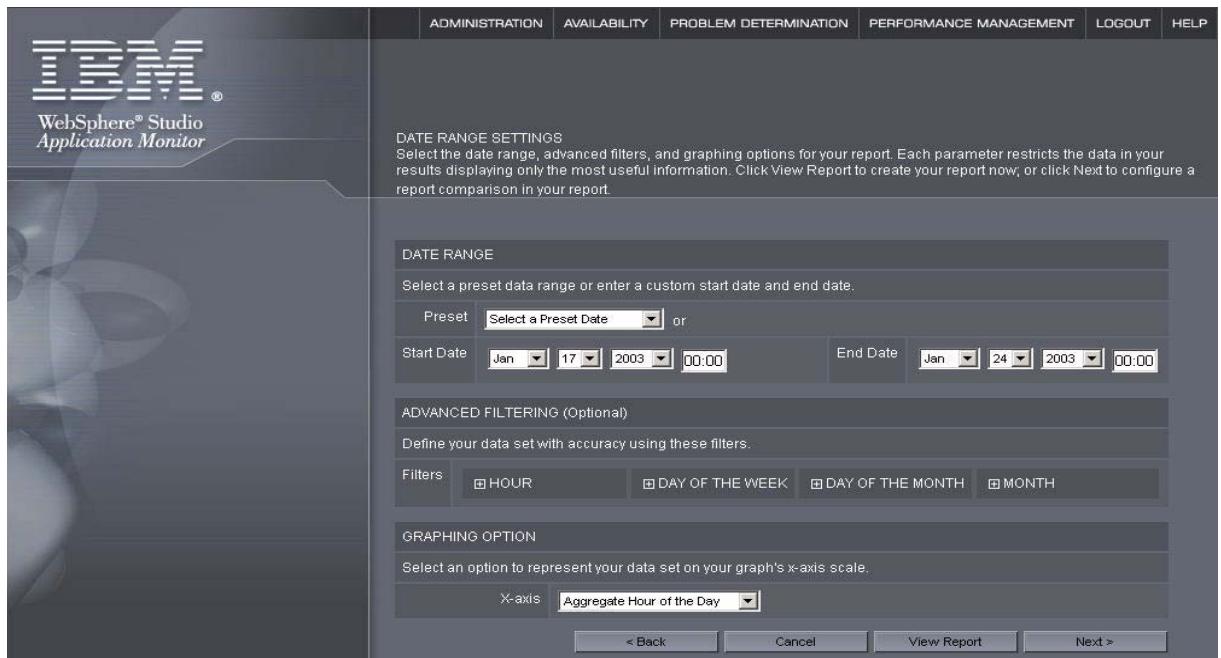


FIGURE 4. Date Range Settings

8. Set the parameters to restrict the data returned in your report. For detailed instructions, see **Understanding the Date Range Settings**.
9. Click **View Report** to view the report. If you want to get a second data set for comparative analysis, click **Next** to open the Report Comparison page.
The Report Comparison page opens.

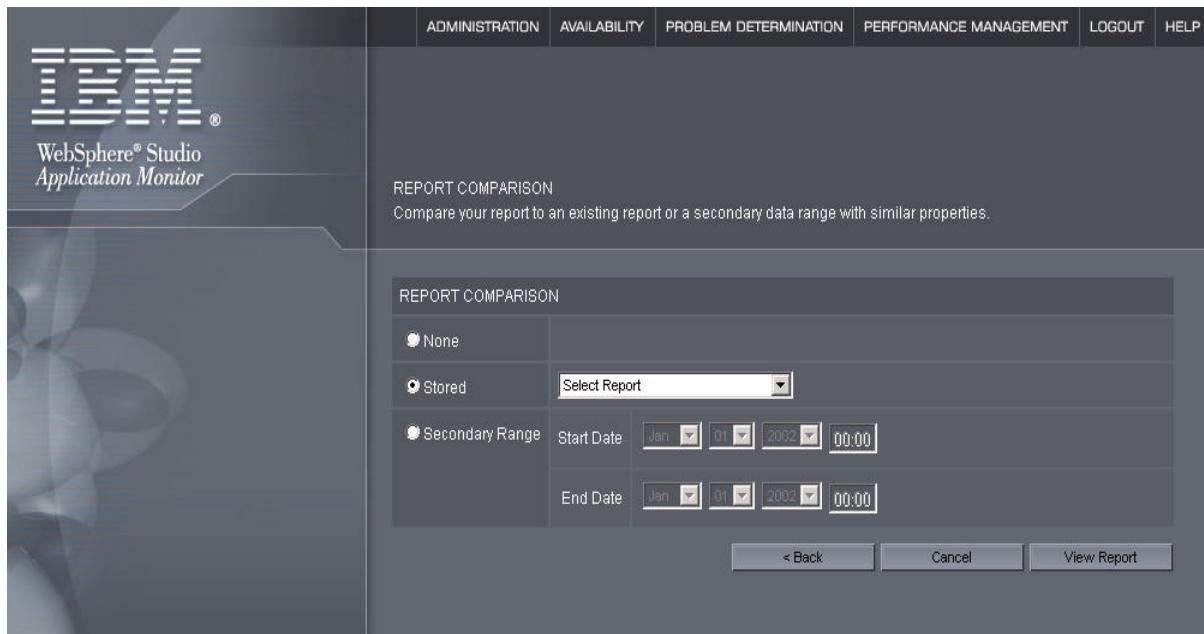


FIGURE 5. Report Comparison

10. Select a report comparison type and view the comparison report by clicking **View Report**.

Defining a Method Analysis Report

The Method Analysis Report shows you the performance of the methods in the requests that have been processed by the Application Servers. After defining the Method Analysis Report, a Trend Report, Decomposition Report, and detailed Method Report are available.

To define a Method Analysis Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.

The Performance Analysis & Reporting Management page opens.

2. On the left navigation, click **Define Report**.
The Server And Report Type Selection page opens.
3. Select the Group or the Server on which you want to report from the drop-down menu.
4. Select Method Analysis from the Report Type drop-down menu.
5. Click **Next** to continue creating the report.
The Report Filtering Options page opens. It displays the options based on the Report Type you select.

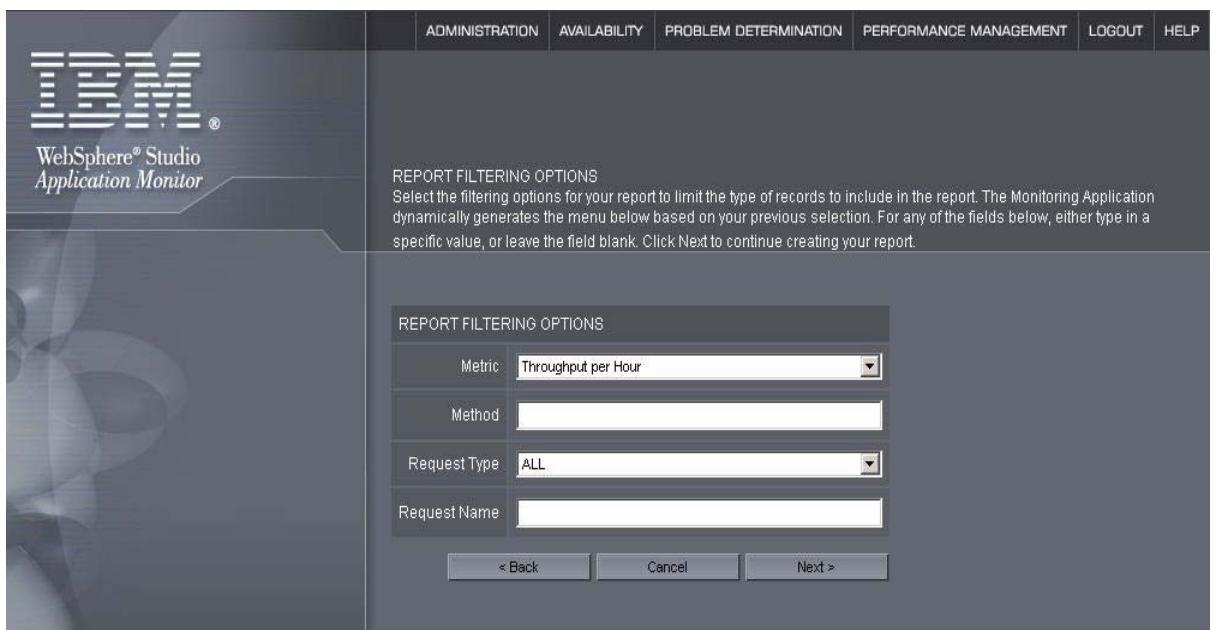


FIGURE 6. Report Filtering Options

6. Set the following options to filter the records returned in the report:
 - **Metric** - the item you want to measure: Throughput Per Second, Throughput per Minute, Throughput per Hour, Response Time, or CPU Time.
 - **Method** - leave the field blank to return all methods or type in the specific method name.

- **Request Type** - All, EJB, JSP, or Servlet.
 - **Request Name** - Unless you know exactly what the request string is, otherwise always leave the field blank to return all requests or type in the specific request name.
7. Click **Next** to continue creating the report.
The Date Range Settings page opens.
 8. Set the parameters to restrict the data returned in your report. For detailed instructions, see **Understanding the Date Range Settings**.
 9. Click **View Report** to view the report. If you want to get a second data set for comparative analysis, click **Next** to open the Report Comparison page.
The Report Comparison page opens.
 10. Select a report comparison type and view the comparison report by clicking **View Report**.

Defining a SQL Analysis Report

The SQL Analysis Report provides the information for the SQL calls' performance in the requests that have been processed by the application server. You may also view the Trend Report, Decomposition Report, and detailed SQL Report after defining the SQL Analysis Report.

To define a SQL Analysis Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. On the left navigation, click **Define Report**.
The Server And Report Type Selection page opens.
3. Select the Group and the Server on which you want to report from the drop-down menu.
4. Select SQL Analysis from the Report Type drop-down menu.
5. Click **Next** to continue creating the report.

The Report Filtering Options page opens. It displays the options based on the Report Type you select.

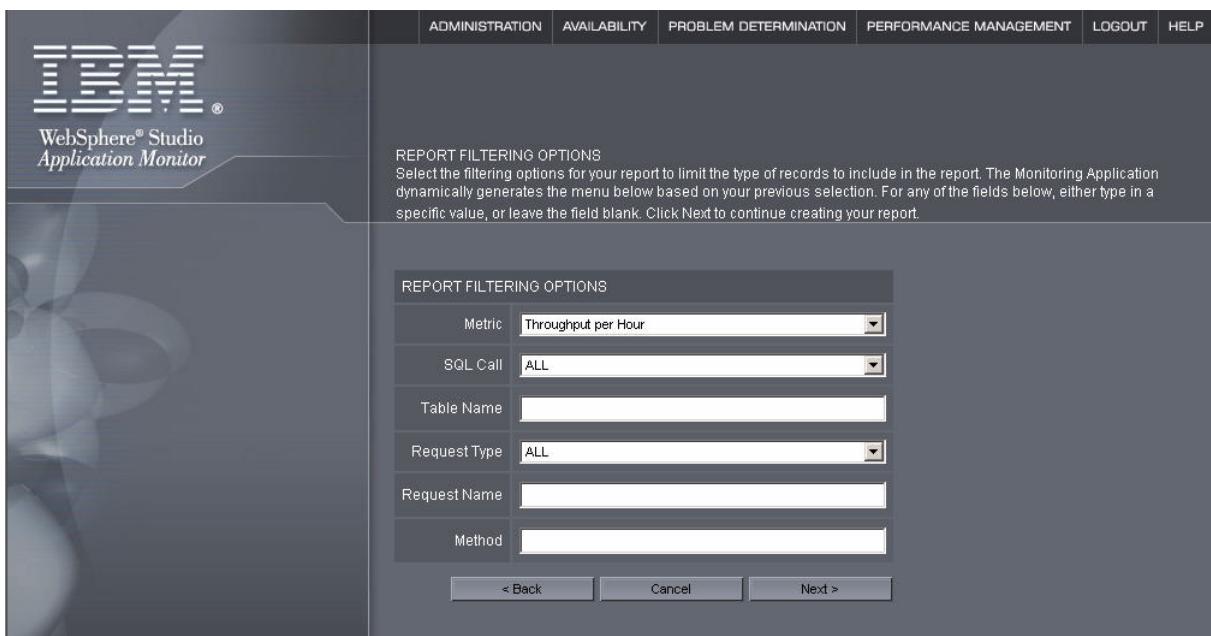


FIGURE 7. Report Filtering Options

6. Set the following options to filter the records returned in the report:
 - **Metric** - the item you want to measure: Throughput or Response Time
 - **SQL Call** - select the correct operator from the drop-down menu.
 - **Table Name** - leave the field blank to return all tables or type in the specific table name.
 - **Request Type** - All, EJB, JSP, or Servlet.
 - **Request Name** - Unless you know exactly what the request string is, otherwise always leave the field blank to return all requests or type in the specific request name.
 - **Method** - leave the field blank to return all methods or type in the specific method name.
7. Click **Next** to continue creating the report.

- The Date Range Settings page opens.
8. Set the parameters to restrict the data returned in your report. For detailed instructions, see **Understanding the Date Range Settings**.
 9. Click **View Report** to view the report. If you want to get a second data set for comparative analysis, click **Next** to open the Report Comparison page.
The Report Comparison page opens.
 10. Select a report comparison type and view the comparison report by clicking **View Report**.
The Trend Report opens.

Defining a Server Availability Analysis Report

The Server Availability Analysis Report shows the percentage of the server availability. In the group situation, availability is defined as the total amount of time when one or more servers of the group are up divided by the total elapsed time.

To define a Server Availability Analysis Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. On the left navigation, click **Define Report**.
The Server And Report Type Selection page opens.
3. Select the Group and the Server on which you want to report from the drop-down menu.
4. Select Server Availability Analysis from the Report Type drop-down menu.
5. Click **Next** to continue creating the report.
The Date Range Settings page opens.
6. Set the parameters to restrict the data returned in your report. For detailed instructions, see **Understanding the Date Range Settings**.
7. Click **View Report** to view the report. If you want to get a second data set for comparative analysis, click **Next** to open the Report Comparison page.
The Report Comparison page opens.

8. Select a report comparison type and view the comparison report by clicking **View Report**.

Defining a System Resource Analysis Report

The System Resource Analysis Report gives you the information of the utilization of the memory, and the connection pool for the application servers. You may also view a Trend Report and Decomposition Report after defining the System Resource Analysis Report.

Note: *This feature does not apply to the z/OS platform.*

To define a System Resource Analysis Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.

The Performance Analysis & Reporting Management page opens.

2. On the left navigation, click **Define Report**.

The Server And Report Type Selection page opens.

3. Select the Group and the Server on which you want to report from the drop-down menu.

4. Select System Resource Analysis from the Report Type drop-down menu.

5. Click **Next** to continue creating the report.

The Report Filtering Options page opens. It displays the options based on the Report Type you select.

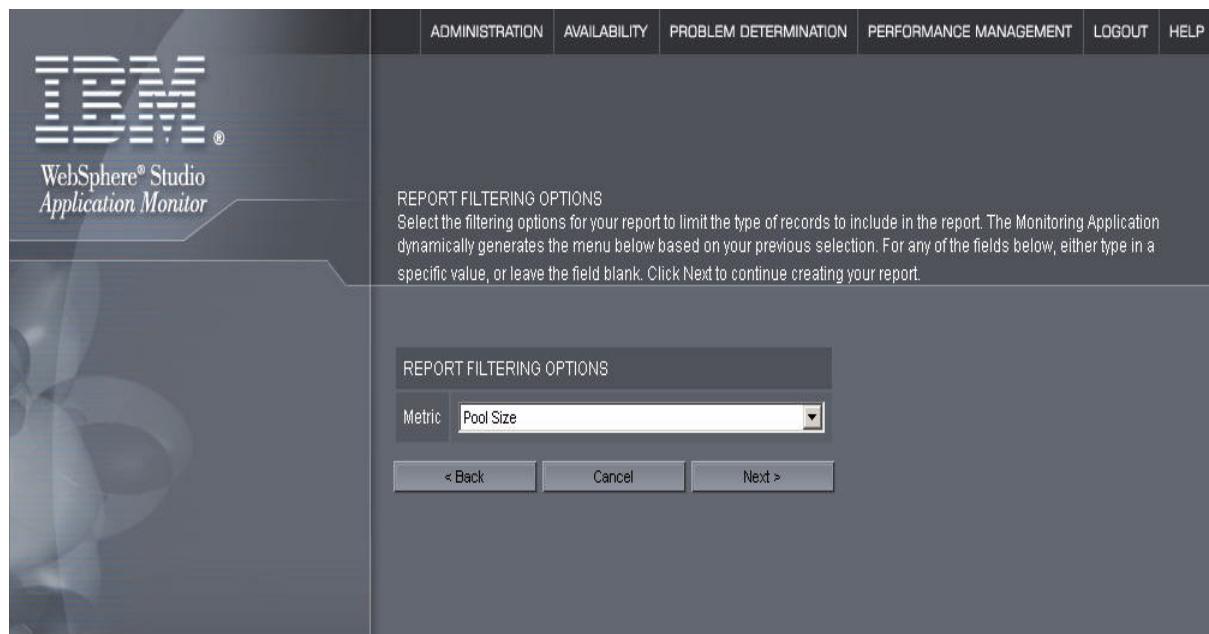


FIGURE 8. Report Filtering Options

6. Set the following options to filter the records returned in the report:

Metric - the item you want to measure: Pool Size, Average % of Pool in Use, Concurrent Waiters, Average Connection Wait Time (ms), Average Connection Pool Timeout, Amount of Free Memory (MB), and Amount of Memory Used (MB).

7. Click **Next** to continue creating the report.
The Date Range Settings page opens.
8. Set the parameters to restrict the data returned in your report. For detailed instructions on setting the parameters, see **Understanding the Date Range Settings**.
9. Click **View Report** to view the report. If you want to get a second set of data, click **Next** to open the Report Comparison page.
The Report Comparison page opens.
10. Select a report comparison type and view the comparison by clicking **View Report**.

Defining a Top Report

Top Reports are a quick and convenient way to run a report for request, method, or SQL data. Top Reports provide the top 100 results records for the selected metric.

To define a Top Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. On the left navigation, click **Define Report**.
The Server And Report Type Selection page opens.
3. Select the Group or the Server on which you want to report from the drop-down menu.
4. Click to select Top Report from the Report Type drop-down menu.
5. Click **Next**.
The Report and Date Range Selection page opens.

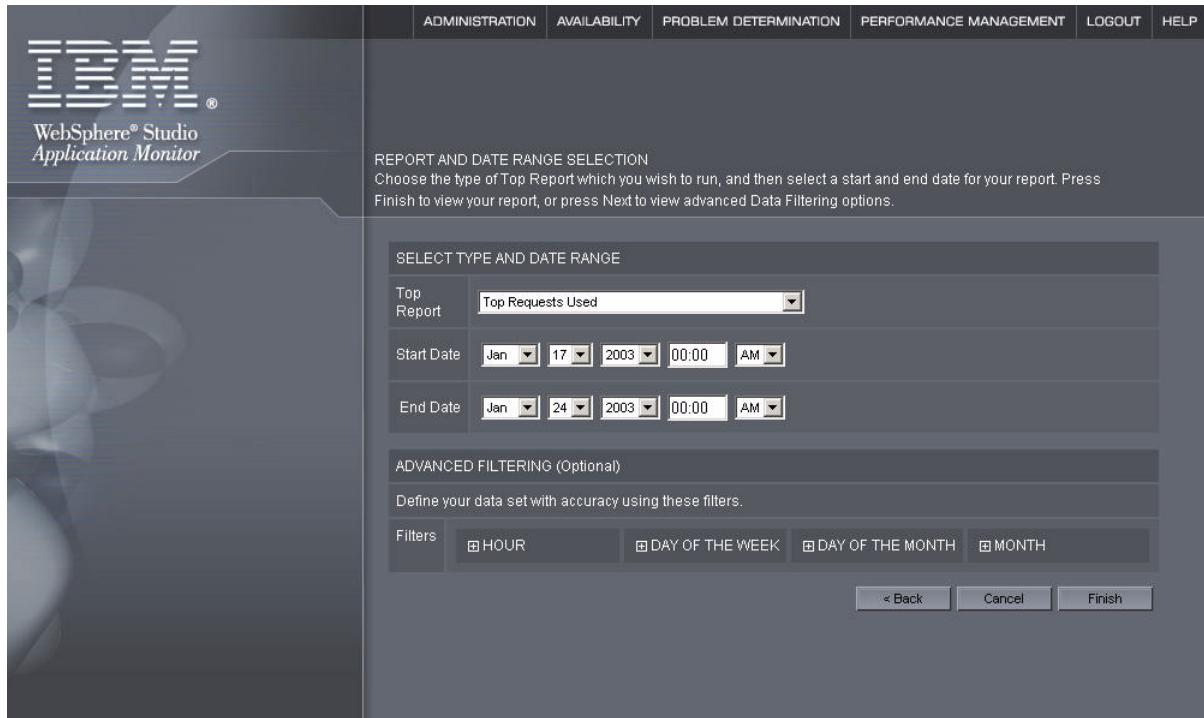
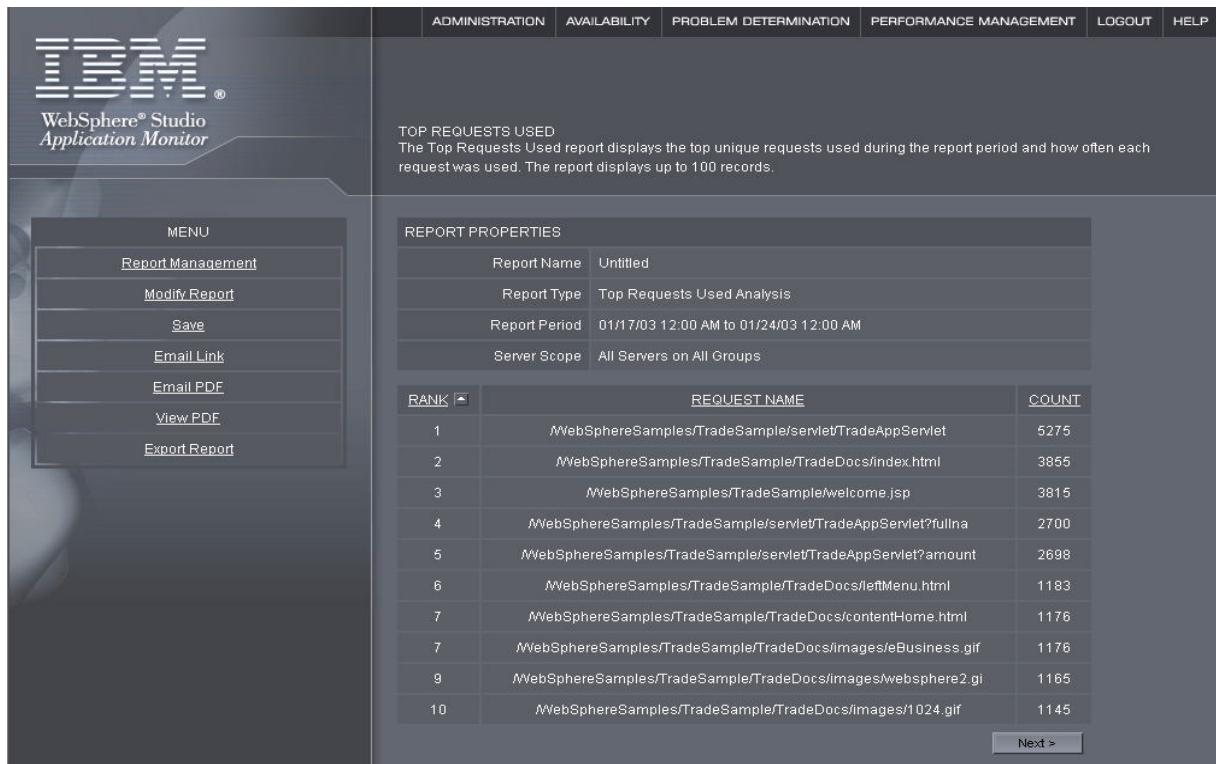


FIGURE 9. Report and Date Range Selection

6. Select a Top Report type from the drop-down menu.
7. Set the Start Date, End Date, Start Time, and End Time. If applicable, set the Advanced Filtering to extract the data of a specific time period. For detailed instructions, see step 2 of **Understanding the Date Range Settings**.
8. Click **Finish** to view the report.

The Top Report opens.

**FIGURE 10.** Top Report

Viewing the Reports

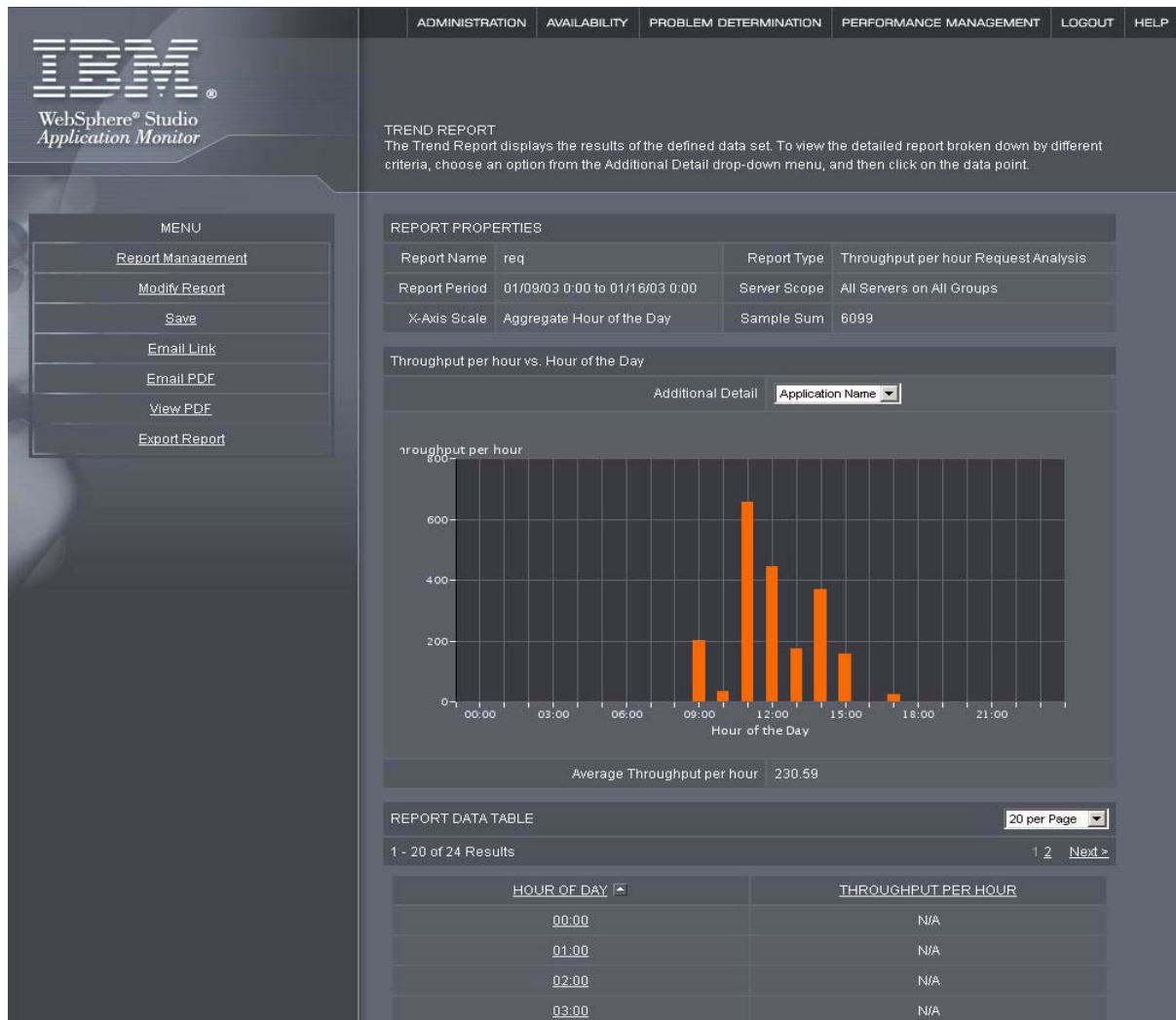
After defining a report other than a Top Report, there are six different reports that display various levels of detail: Trend Report, Decomposition Report, Method Report, Request Report, SQL Report, and Trace Report. The reports that you have access to will vary depending on the criteria you select while creating your report. For example, on the Server And Report Type Selection page, depending on the Report Type you select, the following reports are available:

- **Request Analysis** - displays Trend, Decomposition, Request Detail, and Trace reports.

- **Memory Analysis** - displays Trend, Decomposition, and Method Detail reports.
- **SQL Analysis** - displays Trend, Decomposition, and SQL Detail reports.
- **Server Availability Analysis** - displays the Trend report.
- **System Resource Analysis** - displays Trend and Decomposition reports.

To view the reports:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. Click the report name to run a report.
The Trend Report opens first.

**FIGURE 11.** Trend Report

Note: Use the left navigation to return to the Report Management page, modify a report, save a report, email a link or PDF, or view a PDF.

3. Select an option from the Additional Details drop-down box to decompose the Trend Report.

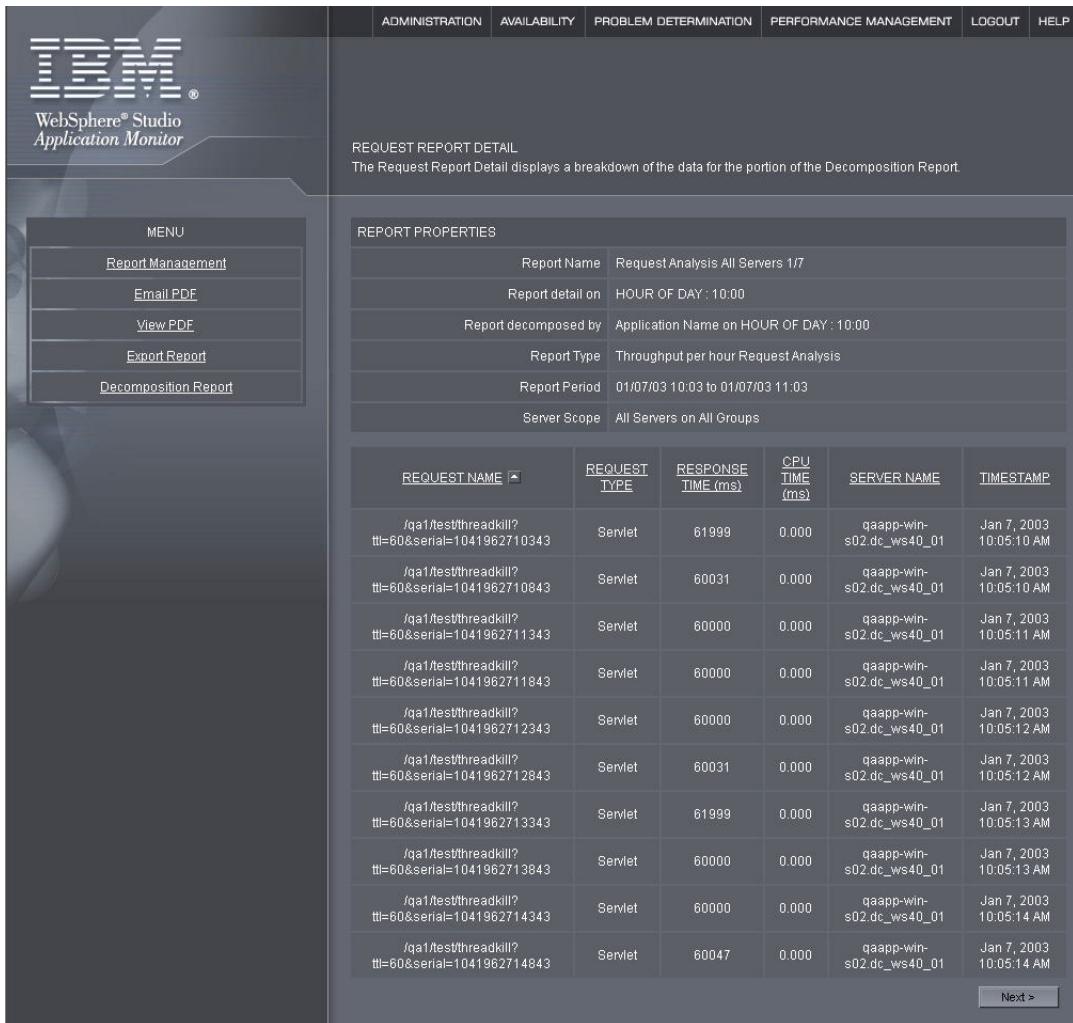
Viewing the Reports

4. Click the bar displayed in the graph or a data point to view more details.
The Decomposition Report opens.



FIGURE 12. Decomposition Report

5. Click on a section of the chart or a data point to view more details.
 The Request Report Detail page opens.



The screenshot shows the 'REQUEST REPORT DETAIL' page of the WebSphere Studio Application Monitor. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The left sidebar contains a 'MENU' with options: Report Management (selected), Email PDF, View PDF, Export Report, and Decomposition Report. The main content area displays 'REPORT PROPERTIES' with the following details:

Report Name	Request Analysis All Servers 1/7
Report detail on	HOUR OF DAY : 10:00
Report decomposed by	Application Name on HOUR OF DAY : 10:00
Report Type	Throughput per hour Request Analysis
Report Period	01/07/03 10:03 to 01/07/03 11:03
Server Scope	All Servers on All Groups

Below this is a table titled 'REQUEST NAME ▾' showing a list of requests with their properties:

REQUEST NAME ▾	REQUEST TYPE	RESPONSE TIME (ms)	CPU TIME (ms)	SERVER NAME	TIMESTAMP
/qa1/test/threadkill?ttl=60&serial=1041962710343	Servlet	61999	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:10 AM
/qa1/test/threadkill?ttl=60&serial=1041962710843	Servlet	60031	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:10 AM
/qa1/test/threadkill?ttl=60&serial=1041962711343	Servlet	60000	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:11 AM
/qa1/test/threadkill?ttl=60&serial=1041962711843	Servlet	60000	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:11 AM
/qa1/test/threadkill?ttl=60&serial=1041962712343	Servlet	60000	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:12 AM
/qa1/test/threadkill?ttl=60&serial=1041962712843	Servlet	60031	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:12 AM
/qa1/test/threadkill?ttl=60&serial=1041962713343	Servlet	61999	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:13 AM
/qa1/test/threadkill?ttl=60&serial=1041962713843	Servlet	60000	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:13 AM
/qa1/test/threadkill?ttl=60&serial=1041962714343	Servlet	60000	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:14 AM
/qa1/test/threadkill?ttl=60&serial=1041962714843	Servlet	60047	0.000	qaapp-wins02_dc_ws40_01	Jan 7, 2003 10:05:14 AM

A 'Next >' button is located at the bottom right of the table.

FIGURE 13. Request Report Detail

Viewing the Reports

If you selected Request Analysis as the Report Type, to access the Trace Report:

1. Click on the Request Name to view the Trace Report.
2. The Trace Report page opens.

The screenshot shows the WebSphere Studio Application Monitor interface with the 'TRACE REPORT' selected. The left sidebar has a menu with options like 'Report Management', 'Email PDF', 'View PDF', 'Export Report', and 'Detail Report'. The main content area displays 'REPORT PROPERTIES' with fields for Report Name (Untitled), Request Trace on (WebSphereSamples/TradeSample/servlet/TradeAppServlet?amount), Report detail on (HOUR OF DAY : 15:00), Report decomposed by (Application Name on HOUR OF DAY : 15:00), Report Period (01/17/03 12:00 AM to 01/24/03 12:00 AM), and Server Scope (All Servers on All Groups). Below this is the 'METHOD TRACE' section, which is a table showing four trace entries. The columns are Depth, Event, Target, Date/Time, Elapsed Time (ms), CPU Time (ms), Δ Elapsed Time (ms), and Δ CPU Time (ms). The data is as follows:

Depth	Event	Target	Date/Time	Elapsed Time (ms)	CPU Time (ms)	Δ Elapsed Time (ms)	Δ CPU Time (ms)
0	Servlet Entry	WebSphereSamples/TradeSample/servlet/TradeAppServlet?amount	Jan 21, 2003 3:07:36 PM	0	0.000	0	0.000 ms
1	Method Entry	trade_client/TradeAppServlet doGet	Jan 21, 2003 3:07:36 PM	1	0.000	1	0.000 ms
2	Method Entry	trade_client/TradeAppServlet performTask	Jan 21, 2003 3:07:36 PM	1	0.000	0	0.000 ms
3	Method Entry	trade_client/TradeConfig getPage	Jan 21, 2003 3:07:36 PM	6	10.000	5	10.000 ms

FIGURE 14. Trace Report

Note: These instructions apply to all the report types available. However, remember that the reports available depend on the Report Type selected. Top Reports have no additional detail.

Running a Report

Return to the Performance Analysis & Reporting Management page to run a saved report and retrieve the current data. Additionally, you can save a report, email a link or PDF of a report, or create a PDF of your report for a colleague or for your own future reference. If you email a link, remember that the recipient must be a WSAM user with the appropriate rights to view the servers where the report runs.

To run a Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. All previously defined and saved reports display on the Performance Analysis & Reporting Management page.
3. Click the report name to run a report.

Note: The report opens displaying data based on the Metric selected on the Report Filtering Options page. The type of report and metric selected display in the page heading, for example, Trend Report – Throughput per Second Request Analysis.

Modifying a Report

After creating a report, you can modify the parameters of the report to suit your changing needs. Change the settings in the Server And Report Type Selection page, the Report Filtering Options page, the Date Range Settings page, and the Report Comparison page. Using this method, you can reuse, duplicate, and modify old reports for different application servers.

To modify a report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.

The screenshot shows the 'Performance Analysis and Reporting Management' page. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and 'WebSphere® Studio Application Monitor' are displayed. A 'MENU' dropdown is open, showing 'Define Report'. The main content area has a heading 'REPORTS' and a table listing various reports. The table columns are: Report Name, Group/Server, Report Type, Date Created, Owner, Modify, and Delete. The reports listed are:

Report Name	Group/Server	Report Type	Date Created	Owner	Modify	Delete
Carl's First Report (Isn't that CUTE?)	All Groups	Request Analysis	01/06/2003	admin	Modify	Delete
Contrast	All Groups	Request Analysis	01/07/2003	admin	Modify	Delete
FridayChumpy2atnoon	Linux WebSphere5	Request Analysis	01/14/2003	admin	Modify	Delete
last 3 hours	All Groups	Request Analysis	01/07/2003	admin	Modify	Delete
null	All Groups	Request Analysis	01/08/2003	admin	Modify	Delete
req	All Groups	Request Analysis	01/16/2003	admin	Modify	Delete
Request Analysis All Servers	All Groups	Request Analysis	12/20/2002	admin	Modify	Delete
Request Analysis All Servers 1/16	All Groups	Request Analysis	01/16/2003	admin	Modify	Delete
Request Analysis All Servers 1/7	All Groups	Request Analysis	01/07/2003	admin	Modify	Delete
Request Analysis Inx WL6, 25/min for 4 mins	Linux WebLogic6	Request Analysis	01/07/2003	admin	Modify	Delete
Request Analysis qaapp-aix- s01.myserver 11AM	AIX WebLogic 6	Request Analysis	01/09/2003	admin	Modify	Delete
Request Analysis Sarah	AIX WebSphere4	Request Analysis	01/08/2003	admin	Modify	Delete
Response Time	All Groups	Request Analysis	01/14/2003	admin	Modify	Delete
Server Availability	All Groups	Server Availability Analysis	01/08/2003	admin	Modify	Delete

The Cyanea logo is visible in the top right corner.

FIGURE 15. Performance Analysis & Reporting Management

2. Click **Modify** next to the report you want to modify.
The Server And Report Type Selection page opens.
3. Change the Group, Server, or Report Type selection, and click **Next**.
The Report Filtering Options page displays different options based on the Report Type you select.

Note: While you are choosing a server by navigating through the groups, it should be noted that the final group name does not affect the data to be extracted for the preparation of the report. The group name is immaterial to the selection process when the system gathers data. The report will compile all records that are generated by the chosen server regardless of which group it belongs to.

4. Select the filtering options for your report to examine and limit the type of records to include in the report.
5. Click **Next** to continue creating the report.
The Date Range Settings page opens.
6. Set the parameters to restrict the data returned in your report. For detailed instructions, see **Understanding the Date Range Settings**.
7. Click **View Report** to view the report. If you want to get a second data set, click **Next** to open the Report Comparison page.
The Report Comparison page opens.
8. Select a report comparison type and view the comparison report by clicking **View Report**.
The Trend Report opens.

Modifying a Top Report

After creating a Top Report, you can modify its parameters to suit your changing needs. Change the settings in the Server And Report Type Selection page, and the Report and Date Range Selection page. Using this method, you can reuse, duplicate and modify old reports for different application servers.

To modify a Top Report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. Click **Modify** next to the Top Report you want to change.
The Server And Report Type Selection page opens.

3. Change the Group, Server, or Report Type selection, and click **Next**.

Note: While you are choosing a server by navigating through the groups, it should be noted that the final group name does not affect the data to be extracted for the preparation of the report. The group name is immaterial to the selection process when data is gathered. The report will compile all records that are generated by the chosen server regardless which group it belongs to.

4. Click **Next** to modify the report type, date range, and the filtering options.
The Report and Date Range Selection page opens.
5. Select a Top Report type from the drop-down menu.
6. Set the Start Date, End Date, Start Time, and End Time. If applicable, set the Advanced Filtering to extract the data of a specific time period. For detailed instructions, see step 2 of **Understanding the Date Range Settings**.
7. Click **Finish** to create the report.
The Top Report opens.

Deleting a Report

Manage your reports by keeping them up-to-date. Delete existing reports from the system that are no longer in use.

To delete a report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis & Reporting Management page opens.
2. Click **X** or **Delete** next to the report you want to remove.
3. At the confirmation box, click **OK** to delete the report.
The Performance Analysis & Reporting Management page displays without the deleted report.

Emailing a Report

For your convenience, you can email a PDF or a link of a report to one or a group of WSAM users.

To email a report:

1. From the top navigation, click **Performance Management > Performance Analysis & Reporting**.
The Performance Analysis and Reporting Management page opens.
2. Click an existing report name to run a report.
The selected report opens.

Emailing a Report

The screenshot shows the WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there's a sidebar with a menu titled 'MENU' containing options like Report Management, Modify Report, Save, Email Link, Email PDF, View PDF, and Export Report. The main content area displays a report titled 'TOP CPU-INTENSIVE METHODS'. The report header states: 'The Top CPU-Intensive Methods report displays the top unique methods that, during the report period, took the most cumulative CPU time and the sum total CPU time. The report displays up to 100 records.' Below the header is a 'REPORT PROPERTIES' section with the following details:

Report Name	Top CPU Intensive Methods All Servers
Report Type	Top CPU Intensive Methods Analysis
Report Period	01/30/03 2:05 AM to 02/06/03 2:05 AM
Server Scope	All Servers on All Groups

Below the properties is a table showing the top 10 CPU-intensive methods:

RANK	METHOD NAME	TOTAL_CPU_TIME (ms)
1	com/qa/test/servlets/TestStackTrace doGet	193089.090
2	com/qa/test/servlets/TestStackTrace.processRequest	193089.039
3	com/qa/test/servlets/TestStackTrace.doMethodTwo	111286.430
4	com/qa/test/servlets/TestStackTrace.doMethodOne	108239.021
5	com/qa/test/servlets/TestStackTrace.doMethodThree	104032.397
6	com/qa/test/servlets/TestThreadKill doGet	20234.953
7	com/qa/test/servlets/TestThreadKill.processRequest	20234.948
8	COM/goober/servlet/LeakyServlet doGet	20066.667
9	COM/goober/servlet/ChumpyServlet doGet	5637.657
10	com/qa/test/servlets/TestEJBAccess doGet	1102.169

A 'Next >' button is located at the bottom right of the table.

FIGURE 16. The selected report

3. On the left navigation, click **Email Link**, **Email PDF** or **View PDF**. This emails a link to the report, a PDF of the report, or displays a PDF.
4. On the Email page, enter the email address of the recipient.

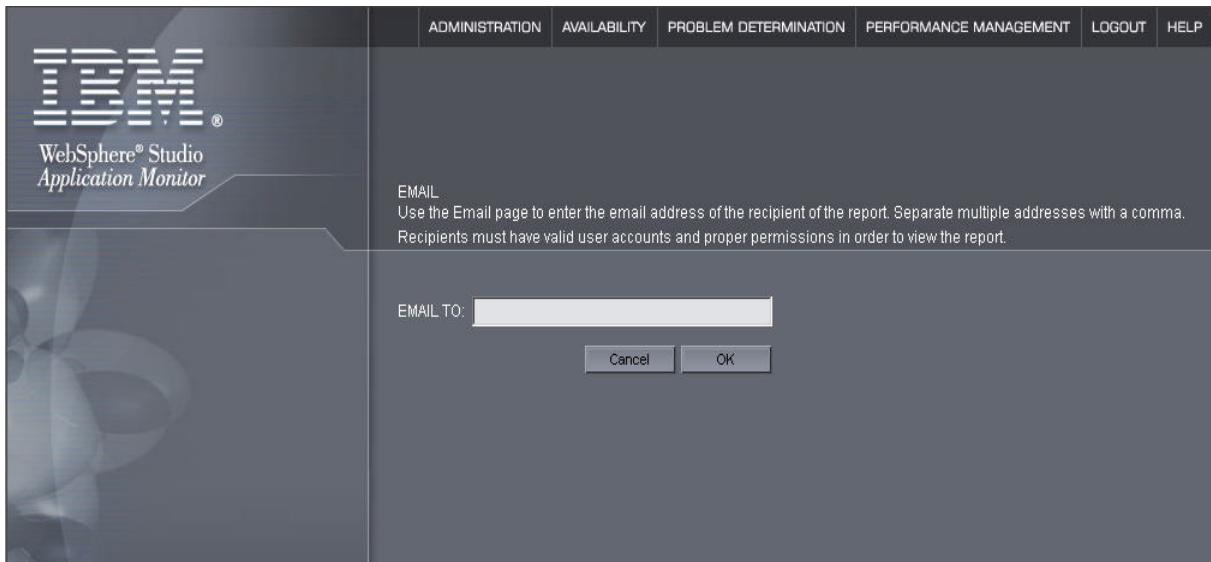


FIGURE 17. Email page

5. Click **OK** to email the report.

Usage Notes: When you email a link, the recipient must be a WSAM user with the appropriate rights to view the servers in the report. When sending email to a group of recipients, a semicolon ";" should be placed between each email address.

You can only email a Top Report or a Trend Report. Email recipients will be able to navigate to all detail levels from the Trend Reports.

Understanding the Date Range Settings

The Date Range Settings page contains three main sections — **Date Range**, **Advanced Filtering (optional)**, and **Graphing Option**.

To set the Date Range Settings:

1. From the Date Range section, click to select a preset date range or enter a custom start date and end date for extracting only the data for the time period specified.
2. To extract the data of a specific time period, define your custom data set in the Advanced Filtering section:
 - Uncheck the hours of the day when you do not want data to display. For example, to select only data occurring between 9:00am and 5:00pm, uncheck 00:00-08:00 hours and 18:00-23:00 hours.
 - Uncheck the days of the week when you do not want data to display. For example, to select only data occurring Monday through Friday, uncheck Saturday and Sunday.
 - Uncheck the days of the month when you do not want data to display.
 - Uncheck the months of the year when you do not want data to display.

Note: By default, the Advanced Filtering section automatically selects all the options.

3. Select any of the following in the Graphing Option for analyzing certain patterns in the data based on time characteristics, or compiling large amounts of data over a long period and plotting all the points:
 - Time series in hour
 - Time series in day
 - Time series in week
 - Time series in month
 - Aggregate minute of the hour
 - Aggregate hour of the day
 - Aggregate day of the week
 - Aggregate month of the year

Note: This section is inapplicable for defining a Top Report.

WSAM records all key events performed by the user and the system, such as, creating an account, canceling a thread, logging into the system, and so on, into a central audit trail. Specifically, the system creates a record in the audit log that includes the User Name, Date/Time and any action performed, such as, login and logout; clicking Save to create, modify, delete, or change the status of an account; clicking Save to create, modify, or delete a group; changes made to a thread, i.e., Cancel Request, Cancel Thread; or saving a change to the thread status or thread priority.

Accessing the User Audit Trails

The User Audit Trails is a text file that contains a record of user activity.

To open the User Audit Trails:

1. Depending on your platform, go to the **/opt/cyaneaone/logs** directory on the server hosting WSAM.

2. In a text editor appropriate to your platform, open the **cyaneaone_audit.log** file. See the sample file below.

Note: The /tmp directory and cyaneaone_audit.log are configurable WSAM defaults. If, during installation, you change the defaults these instructions will not apply.

audit.log

```
2002-02-23 14:43:50,470 [audit] - htang logged in
2002-03-13 15:20:15,791 [audit] - htang modified thread 350009416 priority 4 ->5
2002-03-13 17:17:42,077 [audit] - htang session timed out
```

TABLE 1. Sample from User Audit Trails Log

From the application server perspective, there are 3 major types of requests: JSP, Servlet, and remote EJB calls. These calls are either coming from a Web server, or an application server other than itself.

We call this request, generally expressed in the form of a string, the Original Request String (ORS) in the following discussion.

While a unique ORS can normally be used to represent a specific application function such as log in, check out, and log out, very often this may not be the case. Different application designs may choose to use different programming techniques to represent the actual function to be invoked, while still maintaining a simple, uniform ORS throughout a series of interactions. In this case, using problem determination functions like WSAM and Server Activity Display will not be as effective since different applications may appear to be the same.

In addition, when performing workload characterization and understanding resource consumption, an analyst may sometimes find that it is neither possible nor effective to break down consumption simply by ORS, especially if there are too many of them. Aggre-

gation of consumptions based on classification of ORS is more desirable.

The Request Mapper functionality is designed to resolve this type of problem. When an application server receives a request (ORS), the Request Mapper will allow the ORS to be rewritten into two other strings before it is passed on to WSAM:

- Request Name
- Application Name

Request Name

The Request Name allows the user to assign alternate request identifiers that are more meaningful and appropriate to the chosen programming model of the application.

The Request Name is provided because the Request String is just one way of identifying requests. There is data that is within the request that is not represented by the Request String. Furthermore, requests can be rather cryptic, so mapping them to something more immediately recognizable or understandable is useful.

For example, a Web request can be mapped by:

- URI: **/account/login**
- Servlet Class Name: **com.cyanea.web.AccountServlet**
- Struts Class Name: <http://www.cyanea.com/account/execute/login.do> -->
com.cyanea.web.account.LoginAction
- Custom Naming Scheme: **account.login**

When the installed Request Mapper is invoked, data is passed into this plug-in class to assist the custom code developer to make a decision. This includes the Request Object and the Session Object in the case of a URL based request.

Application Name

The Application Name allows the user to assign request identifiers that classify their requests into different applications. It is a means to aggregate different ORS into an application label.

The Application Name provides the user with the ability to analyze their historical data from an application perspective.

For example, requests can be mapped to different names such as the following:

- Account Management
- Web Trading
- Order Management

Default Request Mapping Behavior

If no request mapper is used, the Application Monitor will map the incoming ORS onto a Request Name and an Application Name using the following rule:

Request Name = ORS without the host name

Application Name = URI of ORS

Active Request Search is conducted on the Request Name and Server Activity Display uses Request Name for the display. Performance Analysis & Reporting performs decomposition by Application Name.

Sample Request Mapper

Request Mapper is highly sensitive to performance since it is frequently invoked. A poor-performing Request Mapper can have an adverse effect on the overall **performance of the application server in terms of Servlet response time as well as CPU costs.**

For compilation, follow the standard Java compilation procedure.

For deployment, ensure the new class file exists on the classpath and restart the application server. A system property called **cyanea.requestmapper** should be set to the implementing class. For example,

.. -Dcyanea.requestmapper=com.cyanea.mapper.RequestMapperExample

Java docs and an example follow:

Package com.cyanea.mapper

Interface Summary

[MappedRequest](#)

Interface used for providing the WSAM system with a Distinguishable Request String (DRS) and a Collapsible Request String (CRS) about a particular Servlet request.

[RequestMapper](#)

WSAM recognizes JSP and Servlet requests on an application server.

TABLE 1. Interface Summary

Interface Mapped Request

public interface MappedRequest

Interface used for providing the WSAM system with a DRS and a CRS about a particular servlet request.

Method Summary

<code>java.lang.String</code>	<u>getCRS()</u>
<code>java.lang.String</code>	<u>getDRS()</u>

TABLE 2. Method Summary

Interface Request Mapper

public interface RequestMapper

WSAM recognizes JSP and servlet requests on an application server. These requests are normally identified throughout the WSAM system using the URI of the request. In some situations, such as when a Struts design paradigm is used, a particular URI will be used to handle different types of business requests.

WSAM provides this interface as a mechanism for modifying WSAM's default behavior of using the URI to describe the request. An implementation of this interface can be installed by registering the classname with the Java executable as a system property.

To install, specify the system property "**cyanea.requestmapper**" with the implementing class as the value.

For example: -

Dcyanea.requestmapper=com.cyanea.mapper.RequestMapperExample

Method Summary	
<u>MappedRequest</u>	<u>mapRequest</u> (java.lang.String servletClassName, javax.servlet.http.HttpServletRequest request) This stateless method should translate a servlet classname and a URL into a MappedRequest object.

TABLE 3. Method Summary

mapRequest

```
public MappedRequest mapRequest(java.lang.String servletClassName,  
                          javax.servlet.http.HttpServletRequest request)
```

This stateless method should translate a servlet classname and a URL into a MappedRequest object. Any RequestMapper class should attempt to execute this method as quickly as possible, due to the fact that it lies directly in the path of the application server thread execution.

- **Parameters:**

ServletClassName - the name of the ServletClass handling this request

request - the HttpServletRequest object for this request

- **Returns:**

an instance of MappedRequest indicating the DRS and CRS to be used by the WSAM system

Request Mapper Example (1):

```
/*
 * $RCSfile: MappedRequestExample.java,v $
 * Copyright (c) 2002 Cyanea Systems Corp.
 * All rights Reserved.
 */

package com.cyanea.mapper;

public class MappedRequestExample implements MappedRequest {
    private String CRS;
    private String DRS;

    /** Creates a new instance of MappedRequestExample */
    public MappedRequestExample(String myCRS, String myDRS) {
        CRS = myCRS;
        DRS = myDRS;
    }

    public String getCRS() {
        return CRS;
    }

    public String getDRS() {
        return DRS;
    }
}
```

Request Mapper Example (2):

```
/*
 * $RCSfile: RequestMapperExample.java,v $
 * Copyright (c) 2002 Cyanea Systems Corp.
```

```
* All rights Reserved.  
*/  
  
package com.cyanea.mapper;  
  
import javax.servlet.http.HttpServletRequest;  
  
public class RequestMapperExample implements RequestMapper {  
    /** static MappedRequest instance for welcome page requests */  
    private static final MappedRequest welcomeRequest;  
    /** static MappedRequest instance for quote page requests */  
    private static final MappedRequest quoteRequest;  
    /** static MappedRequest instance for buy page requests */  
    private static final MappedRequest buyRequest;  
    /** static MappedRequest instance for sell page requests */  
    private static final MappedRequest sellRequest;  
    /** static MappedRequest instance for portfolio page requests */  
    private static final MappedRequest portfolioRequest;  
    /** static MappedRequest instance for account page requests */  
    private static final MappedRequest accountRequest;  
    /** static MappedRequest instance for update page requests */  
    private static final MappedRequest updateRequest;  
  
    /**  
     * Static class variables are used to avoid continuous object  
     * creation  
     * of redundant information on a per-client-request basis. An  
     * unsynchronized, read-only HashMap can also be used for  
     * looking up  
     * MappedRequest instances to gain a performance increase.  
    */
```

```
**/


    static {
        welcomeRequest = new MappedRequestExample("Welcome
Page", "welcome");
        quoteRequest = new MappedRequestExample("quote", "quote");
        buyRequest = new MappedRequestExample("trade", "buy");
        sellRequest = new MappedRequestExample("trade", "sell");
        portfolioRequest = new
        MappedRequestExample("overview", "portfolio");
        accountRequest = new MappedRequestExample("account", "account");
        updateRequest = new
        MappedRequestExample("account", "updateAccount");
    }

    /**
     * Creates a new instance of RequestMapperExample */
    public RequestMapperExample() {
    }

    /**
     * This example checks the HttpServletRequest object for the GET
     or POST
     * parameter "map". If the parameter "map" is not found,
     "action" is
     * used. This "action" string, is then used to look up the
     corresponding
     * MappedRequest object. If no MappedRequest object is found, a
     new
     * object is created and returned. This should be avoided, as
     it can be
     * an expensive operation.
     */
    public MappedRequest mapRequest(String servletClassName,
                                    HttpServletRequest request) {
        String action = request.getParameter("map");
```

```
if ( action == null) {
    action = request.getParameter("action");
    if ( action == null )
        return welcomeRequest;
}
/* A HashMap lookup could also be performed here instead of
iterating
 * a list of string comparisons.  If a list of strings
comparison are
 * used, it is desirable list the most common action first.
*/
if ( "quote".equals(action) )
    return quoteRequest;
else if ( "buy".equals(action) )
    return buyRequest;
else if( "sell".equals(action) )
    return sellRequest;
else if( "portfolio".equals(action) )
    return portfolioRequest;
else if( "account".equals(action) )
    return accountRequest;
else if( "updateAccount".equals(action) )
    return updateRequest;
else
    return new MappedRequestExample(action,action);
}
}
```

This chapter illustrates how to use WSAM in a hypothetical troubleshooting situation. We describe three scenarios at a financial institution with an online trading application.

Scenario 1 *Database Connection Pool*

A financial institution receives calls from customers reporting slow trading transactions.

INVESTIGATE:

From the Application Overview page, the volume throughput under the Trading Group slows down which means the application servers are slow in processing the client requests.

Scenario 1 Database Connection Pool

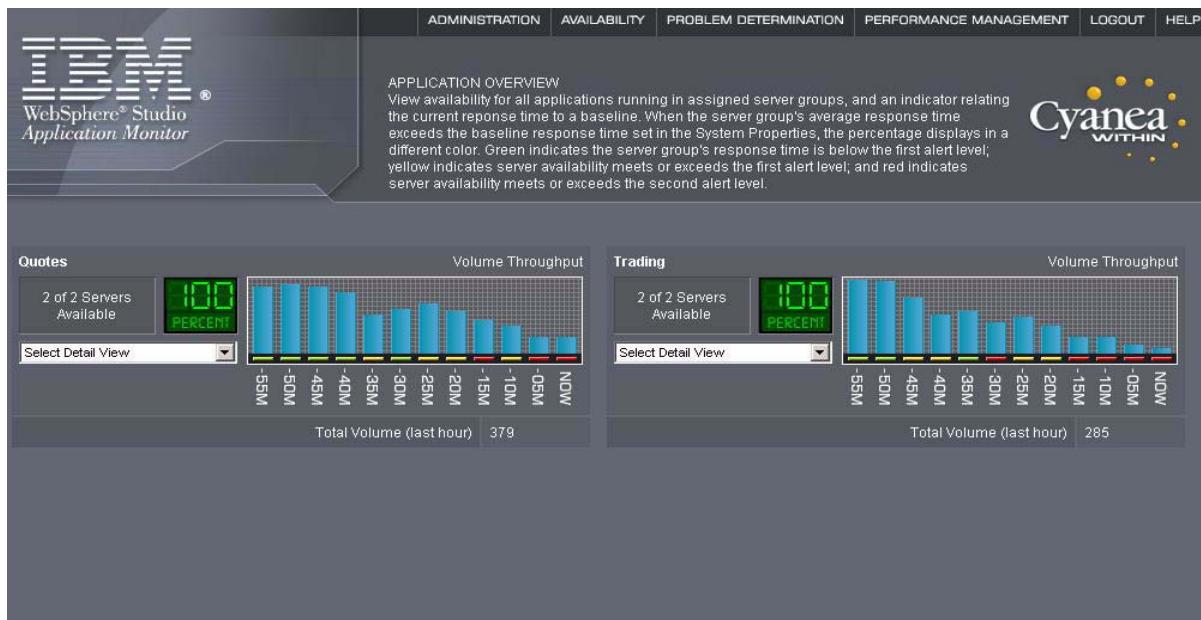
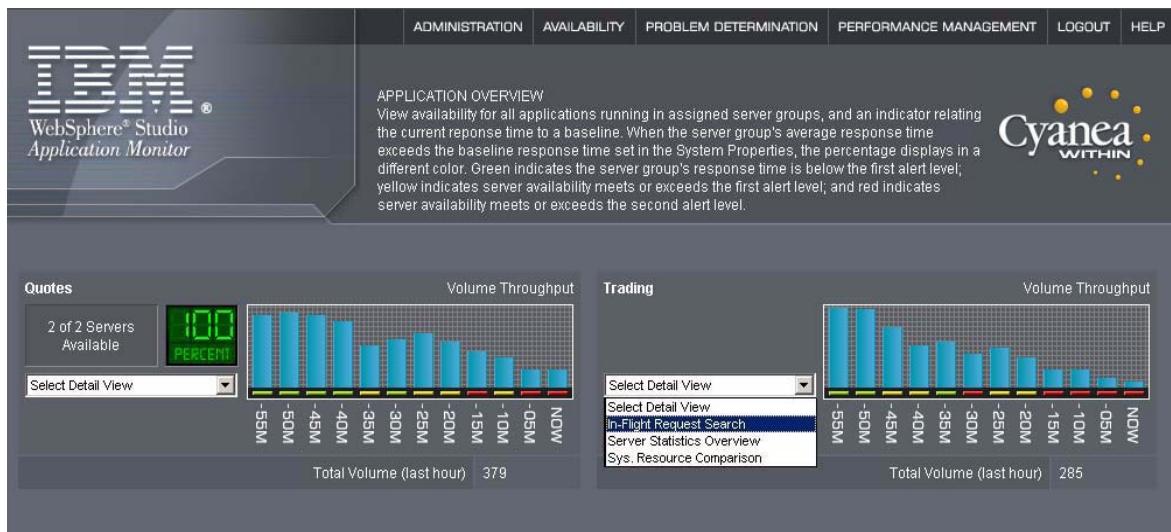


FIGURE 1. Application Overview

1. Under the Trading Group, click to select the In-Flight Request Search from the drop-down menu.

**FIGURE 2.** In-Flight Request Search selection

2. The In-Flight Request Search page opens. It shows all the client requests that are being processed by the servers. Click **OK** in the Search Request box to search for a particular client request by typing part of the URL string (Client Request name).

Scenario 1 Database Connection Pool

The screenshot shows the IBM WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and "WebSphere® Studio Application Monitor" are displayed. On the right, there's a "Cyanea WITHIN" logo. The main area is titled "IN-FLIGHT REQUEST SEARCH" with a sub-instruction: "In the Search Request box, type the name of the request for which you are searching. If you leave this box empty, all active requests will display." Below this, there's a "SEARCH CRITERIA" section with dropdown menus for "Group" (set to "Trading") and "Server" (set to "All Servers"), and a "Search Request" input field containing the placeholder text "Search Request". An "OK" button is located next to the search input field. Below this section is a "SEARCH RESULTS" table. The table has columns: Timestamp, Server Name, Client Request, Start Date/Time, Thread ID, and Total Resident Time (ms). The data in the table is as follows:

Timestamp	Mar 20, 2003 12:11:46 PM				
Server Name	Client Request	Start Date/Time	Thread ID	Total Resident Time (ms)	
demo-win-s02.Trade02.2112 (L3)	[Icon] /Trade/doTrade?ttl=20	Mar 20, 2003 12:11:31 PM	582150952	14458	
demo-win-s02.Trade02.2112 (L3)	[Icon] /Trade/doTrade?ttl=20	Mar 20, 2003 12:11:35 PM	625479672	10443	
demo-win-s02.Trade02.2112 (L3)	[Icon] /Trade/doTrade?ttl=20	Mar 20, 2003 12:11:41 PM	625484376	4458	

FIGURE 3. In-Flight Request Search

High Total Resident Time shows that the transactions are slow — the higher the time, the slower the process. Slowdowns are caused by facets common to the application, such as, the database.

However, before calling the database administrator, check the Database Connection Pool resources usage. Investigate whether there is a pattern related to the servers. Randomly click the Tools button on a few different servers to view the System Resources.

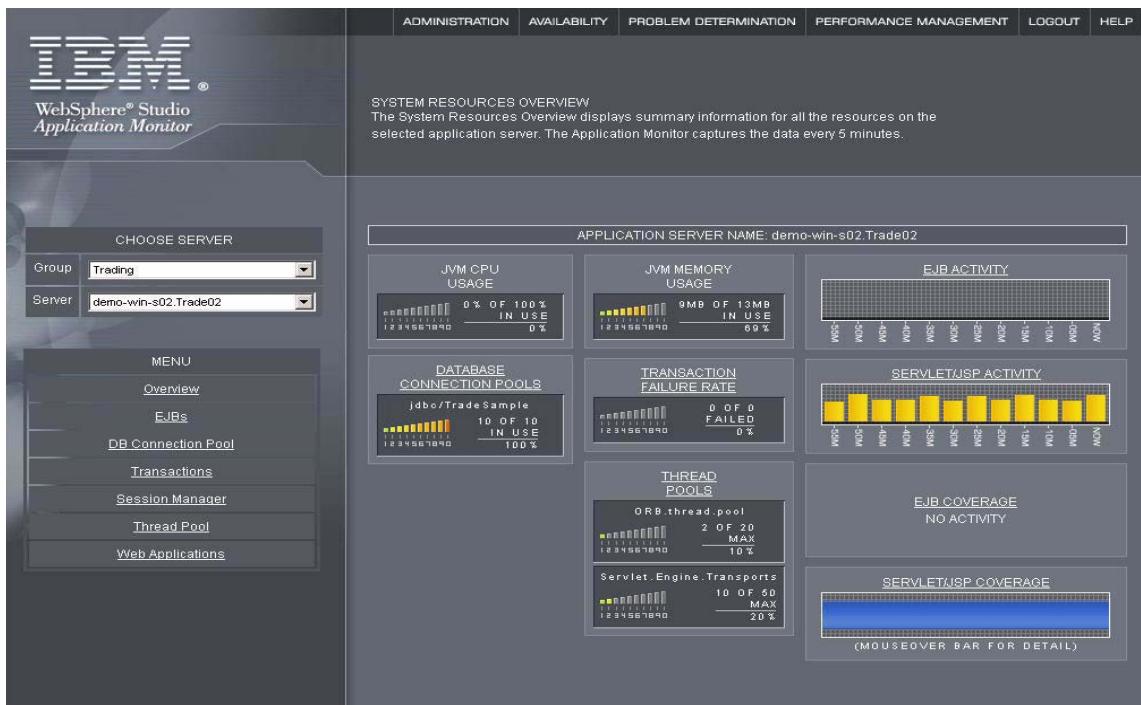


FIGURE 4. System Resources Overview

The Database Connection Pool graphics display very high usage. This could explain the slowdown. Trading requests are waiting for JDBC threads to execute SQL calls. Given the unusual volume of requests, and the fact that trading transactions are database intensive, the total delay could be up to minutes.

3. From the left navigation, click **DB Connection Pool**, to view more detailed information in the Database Connection Pools Summary page.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, there is a vertical menu with options: MENU, Overview, EJBs, DB Connection Pool (which is selected and highlighted in blue), Transactions, Session Manager, Thread Pool, and Web Applications. The main content area displays the "DATABASE CONNECTION POOLS SUMMARY". It includes a section for "SNAPSHOT INFO" showing the APPLICATION SERVER NAME as "demo-win-s02.Trade02" and the TIMESTAMP OF SNAPSHOT as "Oct 04, 2002 05:46:07 AM". Below this is a table titled "DATABASE CONNECTION POOLS SUMMARY" with the following data:

Connection Pool	Pool Size	Concurrent Waiters	Avg Wait Time (ms)	Faults	% Max
jdbc/TradeSample	10	4	23,494.279	0	100

FIGURE 5. Database Connection Pools Summary

The Database Connection Pools Summary shows that the connections have been in use 100% of the time since the application server started. Due to this heavy workload, the Database Connection Pool failed to process all the requests efficiently and caused a high number of concurrent waiters and average wait time (ms).

4. Click the DB Connection Pool name to view the Database Connection Pool Detail page.

The screenshot shows the IBM WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, a vertical menu lists: MENU, Overview (selected), EJBs, DB Connection Pool, Transactions, Session Manager, Thread Pool, and Web Applications. The main content area displays 'DATABASE CONNECTION POOL DETAIL' information. It shows the APPLICATION SERVER NAME: demo-win-s02.Trade02, RESOURCE: jdbc/TradeSample, and TIMESTAMP OF SNAPSHOT: Oct 04, 2002 05:46:47 AM. Below this, a table provides detailed statistics:

	# Creates:	14	# Destroys:	4
# Allocations:	6,942		# Returns:	6,932
Pool Size:	10		Concurrent Waiters:	4
Avg Wait Time (ms):	23,468.486		Faults:	0
% Used:	100		% Max:	100
PrepStmt Cache Discards:	0			

FIGURE 6. Database Connection Pool Detail

The Database Connection Pool Detail table displays that 90% of the Database Connection Pool is in use and needs tuning to cope with the high volume of throughput.

SOLUTION: Increase the Database Connection Pool size in Websphere. This is part of the standard WebSphere configuration.

Scenario 2 Looping Request

A financial institution receives calls from customers reporting problems placing trades.

INVESTIGATE:

On the Application Overview page, the volume throughput under the Trading Group is low which means the application servers are processing requests slowly.



FIGURE 7. Application Overview

1. Under the Trading Group, click to select In-Flight Request Search from the drop-down menu.



FIGURE 8. In-Flight Request Search selection

2. The In-Flight Request Search displays all the processing requests. Type a keyword of the URL string in the Search Request box to retrieve a particular client request.

Scenario 2 Looping Request

The screenshot shows the IBM WebSphere Studio Application Monitor interface. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and "WebSphere® Studio Application Monitor" are displayed. On the right, there's a "Cyanea WITHIN" logo with a yellow dotted graphic. The main area is titled "IN-FLIGHT REQUEST SEARCH" with a sub-instruction: "In the Search Request box, type the name of the request for which you are searching. If you leave this box empty, all active requests will display." Below this, there's a "SEARCH CRITERIA" section with dropdown menus for "Group" (set to "Trading") and "Server" (set to "All Servers"), and a "Search Request" input field with an "OK" button. Underneath is a "SEARCH RESULTS" section containing a table with three rows of data. The columns are labeled "Timestamp", "Server Name", "Client Request", "Start Date/Time", "Thread ID", and "Total Resident Time (ms)". The data is as follows:

Timestamp	Mar 20, 2003 12:11:46 PM				
Server Name	Client Request	Start Date/Time	Thread ID	Total Resident Time (ms)	
demo-win-s02.Trade02.2112 (L3)	[X]	/Trade/doTrade?ttl=20	Mar 20, 2003 12:11:31 PM	582150952	14458
demo-win-s02.Trade02.2112 (L3)	[X]	/Trade/doTrade?ttl=20	Mar 20, 2003 12:11:35 PM	625479672	10443
demo-win-s02.Trade02.2112 (L3)	[X]	/Trade/doTrade?ttl=20	Mar 20, 2003 12:11:41 PM	625484376	4458

FIGURE 9. In-Flight Request Search

The data shows that the trade transactions are not moving and total resident time is very high.

3. Click the Thread ID's link to view the Request Detail page.

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. The main content area is titled "THREAD DETAIL". A descriptive text states: "The Thread Detail page provides data for one thread only. Use the tools to trace a stack, method, or request and session object. If necessary, cancel a thread, cancel a request, or change the thread's priority or status." Below this is a "REQUEST PROPERTIES" table:

Snapshot Date	May 19, 2003	Application Server Name	dc_ws405_01
Snapshot Time	4:27:32 PM	Application Server IP Address	192.168.4.5
Platform CPU % Utilization	0.00%	Total Thread Count	1

Below the properties table is a "REQUEST DETAIL" section containing various parameters:

Thread ID	1166270892	Last Known CPU	0.000 ms
Client Request	/qa1/test/threadkill	Idle Time	50849 ms
Client Request Start Date	May 19, 2003	Thread Type	Servlet
Client Request Start Time	4:26:43 PM	Last Known Class Name	com/qa/test/services/TestThreadKill
Resident Time	50849 ms	Last Known Method	processRequest
Priority	5	Thread Status	Waiting
Change Priority	<input type="button" value="No Change"/>	Change Thread Status	<input type="button" value="No Change"/>

At the bottom of the detail section are "Cancel Request", "Cancel", and "Save" buttons.

FIGURE 10. Request Detail

The data shows high Resident Time, low Accumulated CPU, and high Idle Time. The thread status is Waiting Condition. In other words, the request may be caught in a loop.

4. From the left navigation, click **Method Trace**.

Scenario 2 Looping Request

The screenshot shows the WebSphere Studio Application Monitor interface. The top navigation bar includes links for Administration, Availability, Problem Determination, Performance Management, and Log. The left sidebar has a 'MENU' section with options: Select New Thread, Request Detail, Stack Trace, Method Trace, and Request/Session Object. The main content area is titled 'METHOD TRACE' and contains a brief description: 'The Method Trace page lists the method information for uncompleted requests. The trace includes entry and exit for methods in the thread as well as the entry and exit for any embedded methods.' Below this is a 'METHOD TRACE PROPERTIES' table with the following data:

Snapshot Date	May 20, 2003	Application Server Name	qaas
Snapshot Time	10:43:17 AM	Application Server IP Address	192.168.1.10
Platform CPU % Utilization	0.00%	Total Thread Count	3
Current Total Elapsed Time	97193 ms	Total Method Count	5
Current Total CPU Time	0.000 ms		

Below the properties is a 'METHOD TRACE' table showing the execution details. The columns are: Threshold Configuration, Nesting Level, Method Name, Date/Time, Elapsed Time (ms), CPU Time (ms), and Delta Elapsed Time (ms). The data shows five levels of nesting, with each level having a different nesting level and method name, indicating a loop.

Threshold Configuration	Nesting Level	Method Name	Date/Time	Elapsed Time (ms)	CPU Time (ms)	Delta Elapsed Time (ms)
5	0	Servlet Entry MethodTrace	May 20, 2003 10:41:41 AM	0	0.000	0
5	1	Method Entry com/qa/test/servlets/TestInFlight doGet	May 20, 2003 10:41:41 AM	0	0.000	0
5	2	Method Entry com/qa/test/servlets/TestInFlight processRequest	May 20, 2003 10:41:41 AM	0	0.000	0
5	3	Method Entry com/qa/test/servlets/TestInFlight doMethodOne	May 20, 2003 10:41:41 AM	1	0.000	1
5	4	Method Entry com/qa/test/servlets/TestInFlight doMethodTwo	May 20, 2003 10:42:41 AM	60006	0.000	**

FIGURE 11. Method Trace

The trace shows a repetitive pattern of method executions.

SOLUTION: The trading transaction is in an application loop. The loop may stop other transactions because of the serialized process required to obtain a unique trade confirmation number. The looping transaction request must be canceled to release the other trade transactions. On the left navigation, click **Request Detail**. Then, click **Cancel Request** to cancel the request.

Scenario 3 Database Server

The data center receives a call from customer support reporting various functions failing all over the website.

INVESTIGATE:

The Application Overview page shows all the servers are up and operating normally except for the incremental requests graph.



FIGURE 12. Application Overview

The Incremental requests numbers across the board go from high to flat, and then drop to low volume throughput.

- To check the availability of the servers, click to select Server Statistics Overview from the drop-down menu under the Trading Group.

Scenario 3 Database Server



FIGURE 13. Server Statistics Overview selection

2. The detail view displays all the servers in the selected application group. Other authorized servers display the summary view on the left side of the page. To add other groups to the detail page view, click the All Servers right arrow on the left navigation.

Name	Status	Platform	Volume	JVM CPU (ms)	Total Volume	JVM CPU %	Total CPU %	JVM Memory Usage (mb)	Group Name	IP
qaapp-aix-s01 qaapp-aix-s01 42788 (L3)	Available	AIX	0	0	0	0.00	1.75	30	El Groupito	192.168.1.10
qaapp-aix-s03 qaapp-aix-s03 37968 (L3)	Available	AIX	0	0	0	0.00	0.00	30	El Groupito	192.168.1.19
qaapp-lnx-s02 dc_ws405_01 22811 (L3)	Available	Linux	0	20	655	0.00	0.00	19	El Groupito	192.168.1.19
qaapp-sun-s01 dc_ws405_01 16266 (L3)	Available	Solaris	0	70	0	0.00	0.00	7	El Groupito	192.168.1.19
qasun qaapp-sun-s01 --	Unavailable	Solaris	0	0	0	0.00	0.00	0	El Groupito	192.168.1.19

■ Unavailable ■ Threshold Exceeded ■ Disabled Δ = 15 seconds

FIGURE 14. Server Statistics Overview

- Since CPU usage is low this means the server has adequate CPU to process request. The slowdown is not caused by lack of CPU. In addition, the percentage of total JVM CPU and JVM memory is also low, this means the problem is not caused by the lack of JVM CPU or JVM memory. The slowdown may be caused by application inefficiency or the thread's failure to process requests. Click the Tools button to view the Server Activity Display page.

Scenario 3 Database Server

The screenshot shows the 'Server Activity Display' page of the WebSphere Studio Application Monitor. At the top, there's a navigation bar with links for ADMINISTRATION, AVAILABILITY, PROBLEM DETERMINATION, PERFORMANCE MANAGEMENT, LOGOUT, and HELP. On the left, the IBM logo and 'WebSphere® Studio Application Monitor' are displayed. The main content area has several sections:

- SERVER SELECTION:** A dropdown menu for 'Group' set to 'El Groupito' and another for 'Server' set to 'qaapp-lnx-s02.dc_ws405_01.22811 (L3)'.
- SERVER INFO:** Displays a snapshot taken on May 19, 2003, at 4:13:58 PM. The application server name is 'dc_ws405_01'. Platform CPU % Utilization is 0.00%. Total Thread Count is 2.
- RECENT ACTIVITY (Last Minute):** Shows JVM CPU usage at 0.00%, JVM Heap Size at 18 MB, # of Requests at 1, Avg. Response Time at 1 ms, and # of Active Sessions at 0.
- THREADS:** A table showing thread details. The columns include Filter By, Thread Type (Any), Thread Status (Any), Refresh, Thread ID, Priority, Client Request, Client Request Start, Resident Time (ms), Last Known CPU (ms), Idle Time (ms), Thread Status, Last Known Class, and Last Known Method. Two threads are listed:
 - Thread ID 158657964, Priority 5, Client Request /qa1/test/threadkill, Started May 19, 2003 4:11:21 PM, Resident Time 159279 ms, Last Known CPU 0.000 ms, Idle Time 159279 ms, Status Waiting, Class com/qa/test/servlets/TestThreadKill, Method processRequest.
 - Thread ID 158051036, Priority 5, Client Request /qa1/test/stacktrace, Started May 19, 2003 4:13:50 PM, Resident Time 10484 ms, Last Known CPU 0.000 ms, Idle Time 10484 ms, Status Waiting, Class com/qa/test/servlets/TestStackTrace, Method doMethodOne.

FIGURE 15. Server Activity Display

The data displays high Resident Time (ms), Idle Time (ms) and the Thread Status is in a 'waiting condition'. This indicates that some requests are hanging in the application server.

4. To find more information on the thread, select the Thread ID's link to view the detail, and then select Method Trace.

METHOD TRACE
The Method Trace page lists the method information for uncompleted requests. The trace includes entry and exit for methods in the thread as well as the entry and exit for any embedded methods.

METHOD TRACE PROPERTIES			
Snapshot Date	May 20, 2003	Application Server Name	qa
Snapshot Time	10:43:17 AM	Application Server IP Address	192.168.1.100
Platform CPU % Utilization	0.00%	Total Thread Count	3
Current Total Elapsed Time	97193 ms	Total Method Count	5
Current Total CPU Time	0.000 ms		

METHOD TRACE						
Threshold Configuration		5	Δ Elapsed Time (ms)	5	Δ CPU Time (ms)	
Nesting Level		Method Name	Date/Time	Elapsed Time (ms)	CPU Time (ms)	
0	Servlet Entry	MethodTrace	May 20, 2003 10:41:41 AM	0	0.000	
1	Method Entry	com/qatest/servlets/TestInFlight.doGet	May 20, 2003 10:41:41 AM	0	0.000	
2	Method Entry	com/qatest/servlets/TestInFlight.processRequest	May 20, 2003 10:41:41 AM	0	0.000	
3	Method Entry	com/qatest/servlets/TestInFlight.doMethodOne	May 20, 2003 10:41:41 AM	1	0.000	
4	Method Entry	com/qatest/servlets/TestInFlight.doMethodTwo	May 20, 2003 10:42:41 AM	60006	0.000	

FIGURE 16. Method Trace

5. If you cannot find out the reason for the problem from the Method Trace page, you may want to view the Stack Trace page for more detailed information. The Stack Trace page displays a list of method calls starting with the method where the stack trace printed in Last in First Out order. For each method, the list includes the Class Name, Method Name, and (optionally) a line number. The last executed method displays the first in the Stack Trace.

ADMINISTRATION | **AVAILABILITY** | **PROBLEM DETERMINATION** | **PERFORMANCE MANAGEMENT** | **LOGOUT** | **HELP**

STACK TRACE
The Stack Trace page lists the JVM stack depth for the methods that have not completed execution. The trace provides the Class Name and Method Names for each level of the stack. The stack trace feature is not available if you are using a version of WebSphere earlier than 4.0.3.

STACK TRACE PROPERTIES

Snapshot Date	Jan 21, 2003	Application Server Name	dc_ws40_01
Snapshot Time	3:49:16 PM	Application Server IP Address	192.168.4.8
Platform CPU % Utilization	0.12%	Total Thread Count	1

STACK TRACE

Depth	Class	Method
0	java/lang/Thread	sleep
1	com/qat/test/servlets/TestStackTrace	doMethodThree
2	com/qat/test/servlets/TestStackTrace	processRequest
3	com/qat/test/servlets/TestStackTrace	doGet
4	javax/servlet/http/HttpServlet	service
5	javax/servlet/http/HttpServlet	service
6	com/lbm/servlet/engine/webapp/StrictServletContext	doService
7	com/lbm/servlet/engine/webapp/StrictLifecycleServlet	_service
8	com/lbm/servlet/engine/webapp/IdleServletState	service
9	com/lbm/servlet/engine/webapp/StrictLifecycleServlet	service
10	com/lbm/servlet/engine/webapp/ServletInstance	service
11	com/lbm/servlet/engine/webapp/ValidServletReferenceState	dispatch
12	com/lbm/servlet/engine/webapp/ServletInstanceStateReference	dispatch
13	com/lbm/servlet/engine/webapp/WebAppRequestDispatcher	handleWebAppDispatch
14	com/lbm/servlet/engine/webapp/WebAppRequestDispatcher	dispatch
15	com/lbm/servlet/engine/webapp/WebAppRequestDispatcher	forward
16	com/lbm/servlet/engine/srt/WebAppInvoker	doForward
17	com/lbm/servlet/engine/srt/WebAppInvoker	handleInvocationHook
18	com/lbm/servlet/engine/invocation/CachedInvocation	handleInvocation
19	com/lbm/servlet/engine/srp/ServletRequestProcessor	dispatchByURI
20	com/lbm/servlet/engine/selector/OSEListenerDispatcher	service
21	com/lbm/servlet/engine/http11/HtpConnection	handleRequest
22	com/lbm/ws/http/HttpConnection	readAndHandleRequest
23	com/lbm/ws/http/HttpConnection	run
24	com/lbm/ws/util/CachedThread	run

FIGURE 17. Stack Trace

6. The data shows the last outstanding method and indicates that all requests are hanging on SQL calls of various types in various methods. There seems to be a general database server problem causing all database transactions to hang.

SOLUTION: Contact the database administrator to fix the problem.

Accumulated CPU

The approximate CPU time utilized under a thread since the current request started.

Acknowledge Mode

The acknowledge mode as one of the following:
AUTO_ACKNOWLEDGE CLIENT_ACKNOWLEDGE
DUPS_OK_ACKNOWLEDGE NO_ACKNOWLEDGE

Action

The activity the system will take when a trap is met, currently log-to-file or email.

Activate Non Exist Sessions

The number of requests for a session that no longer exists.

Active

1. Determines if the consumer is active.
2. Determines whether the consumer has a message listener set up or a synchronous receive in progress.

-
-
- 3. Determines whether the subscription is being used by a durable subscriber.

Active Global Transactions

The number of concurrently active global transactions.

Active Local Transactions

The number of concurrently active local transactions.

Active methods

- 1. The average number of concurrently active methods, that is the number of methods called at the same time.
- 2. The average number of invocations being processed concurrently for all the methods.

Active Sessions

- 1. The number of concurrently active sessions.
- 2. The number of communication sessions active during the interval.
- 3. The current number of HTTP sessions actively referenced in the server at the end of the interval.

Active Threads

The number of concurrently active threads.

Additional Detail

- 1. A dynamically generated list based on the selections made by the user when creating the report.
- 2. A drop-down menu for viewing the detailed report broken down by different criteria in a Trend Report.

Admin Server

The name of the administration server that oversees the functions of the application servers.

Admin Server Host

The address on which the admin server is listening for connections.

Admin Server Listen Port

The port on which the admin server is listening for connections.

Affinity Breaks

The number of HTTP session affinities broken, not counting WAS intentional breaks of session affinity.

Alert Condition

The definition of when to perform the selected action.

AMC Name

The AMC Name of the bean activated by the container (only the rightmost 256 characters are recorded).

Application Server

The name of the application server monitored by the Data Collector.

Application Server IP Address

The IP address for the selected application server.

Application Server Name

1. The name of the selected application server.
2. The Sysplex node name concatenated with the server instance name.
3. The name of the server where the session is executing.

Application Server Start Time

The time that the application server started running.

Application Server Uptime

1. The amount of time that has passed since the application server started running.
2. The system highlights this number on the Server Statistics Overview page when the amount of time that has passed since the application server started running exceeds the threshold value.

Application Trap

A trap on data from a user's application, as opposed to application server data.

Archive Agent

Accepts the aggregated data from a publish server and performs fast data archiving into the database for reporting purposes.

Attempt to Activate Nonexistent Session

The number of requests for a session that no longer exists (presumably because the session timed out).

Authentication

Verifies the identity of a user who is logging into the Application Monitor with UNIX user names and passwords.

Authoritative Date/Time Stamp

The authoritative date/time when the data was frozen.

Authoritative Only

The file only exists on the authoritative server.

Authoritative Server

The operator selects this server from an application group to perform a comparison of installed binaries with up to 10 additional servers (the Comparison Servers).

Authoritative Size

The size of the file found on the authoritative server.

Average Active Usage

The running average usage of created connections that are active in the Connector Pool since the pool was last shrunk.

Average CPU Usage

The average percentage that the CPU is busy since the server was started.

Average Create Time

The average method response time for create in milliseconds.

Average Drain Size

The average number of objects discarded in each drain. It applies to entity and stateless beans.

Average Execution Time

The average amount of time in milliseconds all invocations of the servlet have executed since created.

Average Garbage Collection Duration

The average duration of a garbage collection call.

Average invalidation Time

The average time required to process the invalidation of HTTP sessions.

Average Method Response Time

The average response time, in milliseconds, on all methods of the remote interface for this bean.

Average Method Response Time for Create

The average time in milliseconds a bean create call takes including the time for the load.

Average Method Response Time for Remove

The average time in milliseconds a beanRemove call takes including the time at the database.

Average Pool Size

The average number of objects in the pool. It applies to entity and stateless beans.

Average Remove Time

The average method response time for remove in milliseconds.

Average Sessions Lifetime

The average lifetime of invalidated HTTP sessions.

Average Time between Garbage Collection Calls

The average time (in seconds) between two garbage collection calls.

Average Time Wait for Lock

The average time that a thread waits for a lock.

Average Use Time

The average time in milliseconds a connection is used by a request.

Average Wait Time

The average waiting time in milliseconds until a connection is granted.

Average Waiting Threads

The average number of threads concurrently waiting for a connection.

Baseline Definition

The baseline the application must fall below for an average response time for all servers in the group.

Baseline Indicator Settings

The percentage above the baseline that you determine to be slow or very slow. “Slow response” means the present response time is between 26% and 50% of the baseline; “very slow response” means the present response time exceeds 50% of the baseline. When the response time reaches Indicator 1, an orange indicator will display on the Application Overview page; a red indicator means the response time has exceeded Indicator 2 and the system is very unhealthy.

Baseline Response Time

This is the historical response time displayed on the Application Overview page in comparison to the current response time.

Baseline Response Time Sample Duration

The number of days included when the system collects and averages the Baseline Response Time.

Byte Received

The number of bytes transferred to the server from all attached clients.

Byte Sent

The number of bytes sent from the server to all attached clients.

Bytes Threshold Time

The amount of time in the threshold condition since the last reset.

Cache Discards

1. The number of session objects that have been forced out of the cache.
Applicable only for persistent sessions.
2. The total number of statements discarded because the statement cache is at its maximum size.

Cancel Request

A method for terminating application requests from the system that loop or abuse resources. Cancel Request will terminate the request by throwing a run-time exception, and all necessary clean-up will occur accordingly.

Capacitive Increment

The initial capacity configured for this Connector connection pool.

Change Priority

In case there is a need to raise or lower the priority of a thread, change it by selecting a priority number. Priority 1 is the lowest and priority 10 is the highest.

Change Thread Status

If there is a need to freeze the execution of a thread, suspend the thread to freeze it while investigating the problem further and the re-activate it when the problem is resolved.

Class

A collection of data and methods (operations) on the data which share a common structure and behavior.

Class Path

The pathname where the Class is stored.

Client ID

The client ID for the connection/ durable subscriber.

Client Request

The request by a client for a particular server resource. This resource is often a Web page or a Java application.

Client Request Start

The start date and time for the current request.

Community

A string that is part of the SNMP protocol.

Comparison Date/Time Stamp

The comparison date/time when the data was frozen.

Comparison Only

The file only exists on the Comparison Server.

Comparison Servers

The operator selects up to 10 servers to compare installed binaries to on the authoritative server.

Component ID

An ID assigned by the system for identification.

Concurrent Actives

The average level as a function of time of bean instances of the home that are in the ready state (active beans). A measure of server activity.

Concurrent Lives

1. The average number of concurrently live beans.
2. The average level as a function of time of bean objects that exist in the run time, whether active or pooled objects (the system instantiated but did not destroy). A measure of how many resources the home interface consumed.

Concurrent Requests

1. The number of requests that are concurrently processed by the ORB.
2. The number of requests that are concurrently processed by servlets.

Concurrent Waiters

The average number of threads concurrently waiting for a connection.

Condition

The user-defined criteria that combines with the selected resource to set a trap.

Configuration Name

The name of the configuration you apply to the Data Collector.

Configuration Profile

This parameter provides the name of the Configuration Repository of the Kernel.

Connected Kernel

The IP address and port number for the Kernel.

Connection Delay Time (ms)

The average time (in milliseconds) necessary to get a connection from the database. This is how long it takes to get a physical connection from the database. It is calculated as summary time to connect divided by summary number of connections.

Connection factory

A connection factory is an object whose sole purpose is to create connection objects. When an application needs a connection, it asks the connection factory to "manufacture" a connection object.

Connection Factory Name

The configured ConnectionFactory Name for the Connection Factory using this Connector connection pool.

Connection Pool Faults

The number of faults (e.g. time-out) in the connection pool.

Connector Pool Name

1. The configured Logical Name for the Connection Factory using this Connector connection pool.
2. The name of the connection pool the SQL statement belongs to.
3. The name of the connection pool for the leaked connection.

Container Thread Pool

The current number of threads in the container.

Context Root

The context root (context path) for the Web application.

Contrast Options

A second data set used for the purpose of comparative analysis.

Cookies & Attributes

The name of the cookies associated with this session and the contents of the cookies.

Created Sessions

The number of sessions that were created.

CRS

Collapsible Request String.

Current Total CPU Time

The total CPU time spent so far by the current request.

Current Total Elapsed Time

The total time that has elapsed since the request began executing.

Data Collector

The Application Monitor software that runs on the application server and captures information regarding the internal workings of the application server.

Data Collector Controller

Controls the behavior of a Data Collector, including the monitoring level, filter list, and enable or disable status.

Data Collector Listen Port

The port that clients of the Data Collector use to communicate with the Data Collector.

Data Collector Uptime

The amount of time that has passed since the Data Collector started running.

Data Grouping

Aggregates a data set based on a selected time interval, i.e., month, date of the month, day of the week, and hour of the day.

Data Interval

The type of data provided; the distance between points on the X axis of the report.

Database Connection Pool

1. A group of database connections. A new request is assigned a free connection from the pool. Upon completion of the request, the system returns the connection to the pool.

-
-
- 2. The database connection pool on the selected Application Server has an indicator that displays the number of connections in use and the total number of connections in the pool.

Database Connection Pool Name

The name of the database connection pool.

Database Name

The name of the database that the connection is associated with.

Date Range

The start and end dates for the report.

Decomposition Report

This report provides a breakdown of the Trend Report by the criteria selected.

Default Data Collector Configuration

The set up configuration assigned to new Data Collectors to capture information regarding the applications running inside the application server.

Default Monitoring Level

The currently set default monitoring level for all servers connected to the Application Monitor. This is the case when configuring a server for the first time and bringing up the server under the management of the Application Monitor. The default monitoring level for the non z/OS platform is L2 (Problem Determination Mode). As for the z/OS platform, the default monitoring level is L1 (Production Mode).

Destination Name

The destination for the consumer.

Device Host Name

The name or address of the machine being sent SNMP messages.

Drains from Pool

The number of times the daemon found the pool was idle and attempted to clean it. It applies to entity and stateless beans.

DRS

Distinguishable Request String.

Durable

Determines whether the consumer is durable.

Durable Subscribers

With a Durable JMS Subscriber, messages are persisted by the JMS system when the subscriber is not available, normally in a database store. When the durable subscriber becomes available, the JMS server will provide them with the messages that the subscriber missed due to its unavailability.

EAR File

Enterprise Archive File. The number of Enterprise Archive files on the application server.

EJB

Enterprise Java Bean. Component architecture for the development and deployment of object-oriented, distributed, enterprise-level applications. Applications written using the EJB architecture are scalable, transactional, and secure.

EJB Activity

The amount of EJB calls made for the last hour with a 5 minute refresh rate.

EJB Coverage

1. The distribution of EJB invocations in the last hour, by EJB Home name.
2. The graphical representations of the most frequently accessed EJBs.

EJB Home

The name of the Enterprise Java Bean method.

EJB Name

The name of an EJB component.

EJB Role

The list of EJB Roles associated with the method separated by a semicolon ";" up to 256 characters.

EJB Type

The bean's type (CMP entity bean, BMP entity bean, stateless session bean, and stateful session bean).

EJB Volume

The number of times that EJB methods were invoked on the Application Server.

ejbActivate Invocations

The number of ejbActivate Invocations.

ejbLoad Invocations

The number of ejbLoad invocations.

Entity Bean

An enterprise bean that represents persistent data maintained in a database. An entity bean can manage its own persistence or it can delegate this function to its container.

Errors

The number of errors encountered during the Servlets execution.

Exclude (Classname)

A list of classes that will not be monitored unless they are part of the Exclude Override (Classname).

Exclude Override (Classname)

A subset of classes in the Exclude (Classname) that will be monitored.

Execution Time High

The amount of time in milliseconds the single longest invocation of the servlet has executed since created.

Execution Time Low

The amount of time in milliseconds the single shortest invocation of the servlet has executed since created.

Execution Time Total

The amount of time in milliseconds all invocations of the servlet have executed since creation.

Existing Sessions

The number of existing communication sessions at the end of the interval.

External Read Size

The size of session data read from persistent store. Applicable only for (serialized) persistent sessions.

External Read Time

The time (in milliseconds) taken in reading the session data from persistence store. For multi-row, the metrics are for the attribute; for single row, the metrics are for the whole session. Applicable only for persistence sessions. When using a JMS persistent store, if the user chooses not to serialize the data, the counter will not be available.

External Write Size

The size of session data written to persistent store. Applicable only for (serialized) persistent sessions.

External Write Time

The time (in milliseconds) taken in writing the session data from persistent store. Applicable only for (serialized) persistent sessions.

Failures to Reconnect

The number of cases when a connection pool attempted to refresh a connection to a database and failed. Failure may happen because of database unavailability or a broken connection to the database.

Faults

The number of faults (e.g. time-out) in the connection pool.

File Name Match

The file names only matched. They are unlikely to be the same.

File Name/Path/Size Match

The files with matched file name and path, and size, but not timestamp, are likely to be the same.

Finalized Sessions

The number of sessions that were finalized.

First Join Time

The first time the component joined with the Kernel.

Fixed Rate

The average response time per 5 minute increments from between the start date and end date will become the baseline against which your current response times on the Application Overview will be compared.

Fixed Response Time

The response time entered in this field will become the response time against which your current response times on the Application Overview will be compared.

Force GC

Force Garbage Collection. When this option is enabled, JVM will perform a garbage collection before taking a heap dump

Free Memory

1. The free memory in JVM runtime.
2. The snapshot of free KB of free memory.

Free Pool Size

The number of free connections in the pool.

Full Match

The file name and path, size, and file system timestamp are matched and are likely to be identical to each other.

Garbage Collection

Java automatically reclaims any memory that is longer needed for reuse through a process called Garbage Collection. An object is considered garbage when there are no longer references to it stored in variables, the fields of any objects, or the elements of an array.

Garbage Collection Delay

The amount of time the system should wait prior to taking the second heap snapshot

Gets Found

The number of times a retrieve found an object available in the pool. It applies to entity and stateless beans.

Gets from Pool

The number of calls retrieving an object from the pool. It applies to entity and stateless beans.

Global before Completion Duration

The average duration of before_completion for global transactions.

Global Commit Duration

The average duration of commit for global transactions.

Global Prepare Duration

The average duration of prepare for global transactions.

Global Transaction Duration

The average duration of global transactions.

Global Transactions

The number of global transactions run through and initiated by the server instance during the interval.

Global Transactions Begun

The number of global transactions begun on the server.

Global Transactions Committed

The number of global transactions committed.

Global Transactions Involved

The number of global transactions involved on the server.

Global Transactions Rolled Back

The number of global transactions rolled back.

Global Transactions Timeout

The number of global transactions timed out.

Group Name

1. The name of the group.
2. All servers that belong to the group will display on the Server Statistics Overview page.

Heap

A heap is an area of pre-reserved computer main storage (memory) that a program process can use to store data in some variable amount that won't be known until the program is running.

Heap Size

The amount of memory allocated to JVM

Idle Time

Idle time is time that the request has been idling plus any unaccounted CPU time not captured by the Application Monitor.

Initial Capacity

The initial capacity configured for the Connector Connection Pool.

Installed Binary

A file deployed to a server. In a server farm, it is important that all the files are the same version.

Instance Name

The name of the WebSphere server instance.

Interceptors

A callback code that is executed when an ORB request enters or exits the process space.

Interrupted

The system stopped the thread.

Interval Start/End

The snapshot start time and end time.

Invalidated Sessions

The number of sessions that were invalidated.

Invalidated via Time-Out

The number of sessions that are invalidated via timeout.

Invocations

The number of times the method was invoked during the interval.

IP Address

The IP address of the application server.

Invocations

The number of times the method was invoked during the interval.

Java Policy

The pathname where the Java Policy is stored.

JDBC Connection Pools

The number of JDBC connections available on the selected application server.

JDBC Driver Version

The version of the JDBC driver, in the format of concatenating the Driver class name with 'major: XX, minor: YY'.

JDBC Operation Timer and JDBC Operation Time

The amount of time in milliseconds spent executing in the JDBC driver.

JNDI Name

The configured JNDI Name for the Connection Factory using this Connector Connection Pool.

JSP

Java Servlet Page. A server-side technology, Java server pages are an extension to the Java servlet technology. JSPs have dynamic scripting capability that works in tandem with HTML code, separating the page logic from the static elements -- the actual design and display of the page.

JSP Coverage

The distribution of servlet/JSP requests in the last hour, by servlet/JSP name.

JVM

Java Virtual Machine. A self-contained operating environment that executes pre-compiled Java byte code.

JVM CPU Delta

1. The amount of CPU time that a JVM used since the last page refresh.
2. The system highlights this number on the Server Statistics Overview page when the JVM CPU Delta since the last refresh exceeds the threshold value.

JVM CPU Usage

The current CPU utilization of the JVM space itself.

JVM CPU%

1. The percentage of time that the JVM platform was using CPU.
2. The system highlights this number on the Server Statistics Overview page when the percent of JVM CPU usage exceeds the threshold value.

JVM Heap Size

The amount of heap that is available to the JVM code.

JVM ID

The JVMID of the server.

JVM Memory Usage

1. The amount of memory used, in MB, by the JVM of the selected application server.
2. The system highlights this number on the Server Statistics Overview page when the JVM memory usage exceeds the threshold value.

JVMPi

Java Virtual Machine Profiler Interface. A two-way function call interface between the Java Virtual Machine and an in-process profiler agent.

Kernel

A directory service dedicated to the Application Monitor that keeps track of which components have joined or left the network.

Kernel Code Base

The URL where the Application Monitor component downloads the Kernel binaries.

L1 (Production Mode)

This monitoring level provides Availability Management, System Resources, and basic request data. Use this level for servers with high volume transactions, stable operations, and simple transactions.

L2 (Problem Determination Mode)

This monitoring level provides Production level monitoring of advanced request data, including CPU information, and cancelling a request without SQL level data. The JVMPi is enabled on the corresponding JVMs making JVMPi function calls possible. Use this level for high volume transactions in an environment that is occasionally unstable with simple to complex transactions.

L3 (Tracing Mode)

This is the most powerful monitoring level. Therefore, only this level utilizes all the reporting elements available. For example, in the Tracing mode, the Server Activity Display shows additional data for the following columns: Accumulated CPU and Idle Time. In addition, on the Request Detail page, the Method Trace and Cancel Request functions are available. Use this level for servers that have been selected for diagnostics and detailed workload characterization.

Last Access Time

The last time a client sent a request associated with a session.

Last Contract Renewal Time

The most recent renewal time of the contract with the Kernel.

Last Known Class Name

The name of the last class being accessed by the current request.

Last Known Method

The name of the last method being accessed by the current request.

Library Path

The pathname where the Library is stored.

Listen Address

The address on which this server is listening for connections.

Listen Port

The port on which this server is listening for connections.

Listening Port

The port that clients of the Data Collector use to communicate with the Data Collector.

Live Sessions

The number of concurrently live sessions in cache.

Load Timestamp

The timestamp when servlet was loaded.

Local Active Sessions

The number of active local communication sessions attached and active within the server instance during the interval.

Local Before Completion Duration

The average duration of before_completion for global transactions.

Local Bytes Received

The number of bytes transferred to the server from all locally attached clients.

Local Bytes Sent

The number of bytes transferred from the server to all locally attached clients.

Local Commit Duration

The average duration of commit for local transactions.

Local Existing Sessions

The number of existing local communication sessions attached and active within the server instance during the interval.

Local Transaction Duration

The average duration of local transactions.

Local Transactions

The number of local transactions initiated by the server instance during the interval.

Local Transactions Begun

The number of local transactions begun on the server.

Local Transactions Committed

The number of local transactions committed.

Local Transactions Involved

The total number of global transactions involved at the server (begun and imported).

Local Transactions Rolled Back

The number of local transactions rolled back.

Local Transactions Timeout

The number of local transactions timed out.

Log File Name

The Log File used by the Resource Adapter for this Connector Connection Pool.

Logging Enabled

The Log File used by the Resource Adapter for this Connector Connection Pool.

Max Capacity

The maximum capacity configured for the Connector Connection Pool.

Max Inactive Interval

The maximum time interval, in seconds, that the servlet container will keep this session open between client accesses.

Maximum Active Sessions

The maximum number of active HTTP sessions during the interval.

Maximum Inactive Interval

The maximum time interval, in seconds, that the servlet container will keep this session open between client accesses.

Maximum Live Sessions

The maximum number of live HTTP sessions during the interval.

Maximum Method Records

The maximum number of method entry/exit records. The records will be overwritten when they reach this value. The default value is 10,000.

Maximum Response Time

The maximum response time measured in milliseconds.

MD5

A unique numeric signature that is different for each file when the contents of the file are different even if the creation date and the file names coincide.

Memory Leak

A memory leak is the gradual loss of available computer memory when a program (an application or part of the operating system) repeatedly fails to return memory that it has obtained for temporary use. As a result, the available memory for that application or that part of the operating system becomes exhausted and the program can no longer function. For a program that is frequently opened or called or that runs continuously, even a very small memory leak can eventually cause the program or the system to terminate. A memory leak is the result of a program bug.

Memory Leak Candidate

Java classes and objects that are likely to be causing a memory leak.

Memory Leak Confirmation

The Memory Leak Confirmation Report helps you detect memory leaks in your system. Try various comparison metrics until you determine the cause of the leak. If there is over 24 hours of data available, your report will show the last 48 hours. Otherwise, your report will display the last 60 minutes of data.

Memory Usage

The amount of memory being used by the JVM process.

Message Back Out Count

The number of backed out messages that failed to be delivered to the bean's onMessage method. It applies to Message Driven beans.

Message Count

The number of messages delivered to the bean's onMessage method. It applies to Message Driven beans.

Messages Threshold Time

The amount of time in the threshold condition since the last reset.

Method

1. A function defined in a class. A class can contain data and methods. Methods are operations that are performed on the data.
2. The type of HTTP request with valid values of Get or Post.
3. The number of associated methods.

Method Signature

1. Methods may have the same name but accept different arguments. An example of a uniquely "callable" method would be classname+method-name+methodsignature.
2. The name of the method including its signature (only the leftmost 512 characters are recorded).

Method Trace

A Method Trace is essentially the path of execution for a request. The trace includes entry and exit for methods in the thread as well as the entry and exit for any embedded methods.

Method Trace Data

Each Method Trace contains the entry and exit records including the Method Name, Date, Time, Elapsed Time, and CPU Time. Each indent indicates a different nesting level.

Metric

1. The item you want to measure: Throughput per Second, Throughput per Minute, Throughput per Hour, Response Time, or CPU Time.
2. The item you want to measure: Pool Size, Concurrent Waiters, Average Wait Time, Faults, Percentage Pool Usage, Physical Connections, Connection Handles, JVM Free Memory, and JVM Memory Used.

Minimum Active Sessions

The minimum number of active HTTP sessions during the interval.

Minimum Life Sessions

The minimum number of live HTTP sessions during the interval.

Minimum Response Time

The minimum response time in milliseconds.

MIPS

Million Instructions per Second. This is an estimated computation to give an indication of the platform CPU power. This computation is based on an empirical formula derived from the SRM (System Resources Manager) service units/second factor.

MOD

Monitoring on Demand.

Monitoring Level

In the Application Monitor, the user has the ability to select between three levels of monitoring for a server or set of servers: L1 (Production mode), L2 (Problem Determination mode), and L3 (Tracing mode.)

Name

A concatenated string.

1. For non z/OS platform: the name of the WebSphere Node; the name of the Application Server; the process ID in decimal of the server; the current monitoring level.
2. For z/OS platform: the name of the Sysplex Node; the name of the Application Instance; the address Space ID in decimal of the server region; the current monitoring level.

No Local

The noLocal Boolean for the durable subscriber.

No Room for New Session

The number of times that a request for a new session can not be handled because it would exceed the maximum session count.

Number of Activates

The number of times beans were activated (applies to Entity and stateful session beans).

Number of Activations

The number of beans made active.

Number of Active Connections

The current total active connections.

Number of Active Connections High

The peak number of active connections in this Connector Pool since the pool was instantiated.

Number of Active Servers

The current total number of alive servers in this cluster.

Number of Active Transactions

The number of active transactions on the server.

Number of Allocates

The total number of connections allocated.

Number of Beans in Use

The number of beans currently in use during the session (active or ready state).

Number of Bytes Current

1. The current number of bytes stored in the destination.
2. The current number of bytes stored on the JMS server.
3. The current number of bytes received by the durable subscriber.

Number of Bytes High

The peak number of bytes stored in the destination/JMS server since the last reset.

Number of Bytes Pending

1. The number of bytes pending (uncommitted and unacknowledged) by the consumer/durable subscriber/producer.
2. The number of bytes pending (uncommitted and unacknowledged) stored on the JMS server or in the destination.
3. The number of bytes pending (uncommitted or unacknowledged) for the session.

Number of Bytes Received

1. The number of bytes received by the consumer or the session since the last reset.
2. The number of bytes received on the JMS server since the last reset.
3. The number of bytes received in the destination since the last reset.

Number of Bytes Sent

The number of bytes sent by the producer or the session since the last reset.

Number of Cache Accesses

The number of times the cache has been accessed.

Number of Cache Hits

The number of times a bean is looked up and successfully found in the cache.

Number of Cached Beans

The number of beans currently cached.

Number of Connection Consumers Current

The current number of connection consumers for the session pool.

Number of Connection Consumers High

The peak number of simultaneous connection consumers for the session pool.

Number of Connection Consumers Total

The total number of connection consumers made by the session pool since the last reset.

Number of Connections Created Total

The total number of Connector connections created in this Connector Pool since the pool was instantiated.

Number of Connections Destroyed Total

The total number of Connector connections destroyed in this Connector Pool since the pool was instantiated.

Number of Connections Matched Total

The total number of times a request for a Connector connections was satisfied via the use of an existing created connection since the pool was instantiated.

Number of Connections Rejected Total

The total number of rejected requests for a Connector connections in this Connector Pool since the pool was instantiated.

Number of Connections Total

The total number of JDBC connections in the JDBCConnectionPoolRuntimeMBean since the pool was instantiated.

Number of Consumers Current

1. The current number of consumers accessing the destination.
2. The current number of consumers for the session.

Number of Consumers High

1. The peak number of consumers accessing the destination since the last reset.
2. The peak number of consumers for the session since the last reset.

Number of Consumers Total

1. The total number of consumers accessing the destination since the last reset.
2. The total number of consumers instantiated by the session since the last reset.

Number of Creates

1. The number of times beans were created.
2. The total number of connections created.
3. The number of create calls.

Number of Destinations Current

The current number of destinations for the JMS server.

Number of Destinations High

The peak number of destinations on the JMS server since the last reset.

Number of Destinations Total

The number of destinations instantiated on the JMS server since the last reset.

Number of Destroys

1. The number of times bean objects were freed.
2. The total number of connections destroyed.

Number of Errors

The total number of errors in the servlet/JSP.

Number of Foreign Fragments Dropped

The number of fragments that originated in foreign domains/cluster that use the same multicast address.

Number of Fragments Received

The total number of multicast messages received on this server from the cluster.

Number of Fragments Sent

The total number of multicast fragments sent from this server into the cluster.

Number of Free Connections Current

The current total free connections.

Number of Free Connections High

The peak number of free connections in this Connector Pool since the pool was instantiated.

Number of Garbage Collection Calls

The number of garbage collection calls.

Number of Idle Beans

The number of idle beans in the pool that are available for use.

Number of instantiations

The number of times the system creates the bean objects.

Number of Invalid Login Attempts Total

The cumulative number of invalid logins attempted on the server.

Number of Invalid Login Users High

The peak number of users with outstanding invalid login attempts for the server.

Number of Invocation Total

The total number of servlet invocations.

Number of Leaked Connections

A connection that was checked out from the connection pool but was not returned to the pool by calling close.

Number of loaded servlets

The number of servlets that were loaded.

Number of Loads

The number of times the system loaded bean data.

Number of Lock Entries

The number of entries that are currently locked.

Number of Lock Managers Accesses

The number of times the Lock Manager is accessed. It applies to the beans that have exclusive locking specified.

Number of Locked Users Current

The number of currently locked users on the server.

Number of Login Attempts While Locked Total

The cumulative number of invalid logins attempted on this server while the user was locked.

Number of Managed Connections

The number of ManagedConnection objects in use for a particular EIS product name.

Number of Managed Connections Allocated

The total number of connections allocated.

Number of Managed Connections Created

The total number of connections created.

Number of Managed Connections Destroyed

The total number of connections destroyed.

Number of Managed Connections Freed

The total number of connections freed.

Number of Messages Current

1. The current number of messages in the destination.
2. The number of messages still available by the durable subscriber.
3. The current number of messages stored on the JMS server.

Number of Messages High

The peak number of messages in the destination since the last reset.

Number of Messages Pending

1. The number of messages pending (uncommitted and unacknowledged) by the consumer/durable subscriber/producer. Pending messages are over and above the current number of messages. A pending message is one that has either been sent in a transaction and not committed, or that has been received and committed or acknowledged.
2. The number of messages pending stored on the JMS server.

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- 3. The number of messages pending for the session.

Number of Messages Received

The number of messages received by the consumer/ the session or received on the destination since the last reset.

Number of Messages Sent

The number of messages sent by the producer/ session since the last reset.

Number of Multicast Messages Lost

The total number of in-coming multicast messages that were lost according to the server.

Number of Objects Allocated

The number of objects allocated.

Number of Objects Freed

The number of objects freed.

Number of Objects Moved

The number of objects moved.

Number of Open Sessions Current

The current total number of open sessions in the component.

Number of Open Sessions High

The peak number of the total number of open sessions in the server.

Number of Open Sockets Current

The current number of sockets registered for socket mixing on the server.

Number of Open Sockets Total

The total number of registrations for socket mixing on the sever.

Number of Optimization

The total number of global transactions converted to single phase for optimization.

Number of Passivates

1. The number of times beans were passivated (applies to Entity and stateful session beans).
2. The number of times the system passivated (removed from memory) a bean instance.

Number of Passivations

The number of beans made passive.

Number of Pending Requests Current

The number of waiting requests in the queue.

Number of Pending Requests Oldest Time

The time that the longest waiting request was placed in the queue.

Number of Persistence Loads

The number of times bean data was loaded from persistent storage. This applies to entity beans.

Number of Persistence Stores

The number of times bean data was stored in persistent storage. It applies to entity beans.

Number of Primary

The number of objects that the local server hosts as primaries.

Number of Ready Beans or Concurrent Actives

The number of bean instances in ready state or method-ready state.

Number of Reload Total

The total number of servlets that were reloaded.

Number of Reloads

The number of servlets that were reloaded.

Number of Removes

1. The number of times beans were removed.
2. The number of remove calls.

Number of Resend Requests

The number of state-delta messages that had to be resent because a receiving server in the cluster missed a message.

Number of Restarts

The total number of restarts for this server since the cluster was last activated.

Number of Returns

The total number of connections freed.

Number of Second Active Transactions

The total number of seconds for all committed transactions.

Number of Serviced Requests Total Time

The number of requests which have been processed by the queue.

Number of Session Pools Current

The current number of session pools instantiated on the JMS server.

Number of Session Pools High

The peak number of session pools instantiated on the JMS server since the last reset.

Number of Session Pools Total

The number of session pools instantiated on the JMS server since the last reset.

Number of Sessions Current

The current number of sessions for the connection.

Number of Sessions High

The peak number of sessions for the connection since the last reset.

Number of Sessions Opened Total

The total number of open sessions in this web application component.

Number of Sessions Total

The number of sessions on the connection since the last reset.

Number of Stores

The number of times the system wrote bean data to the database.

Number of Threads Dead

The number of threads that died.

Number of Threads Started

The number of threads started.

Number of Time-outs Total

The total number of transactions that have timed out.

Number of Total Connections

The total number of JDBC connections in the JDBCConnectionPoolRuntimeM-Bean since the pool was instantiated.

Number of Transactions

The total number of transactions processed. This total includes all committed, rolled back and heuristic transaction completions.

Number of Transactions Abandoned

The number of transaction that were abandoned.

Number of Transactions Committed Total

The total number of committed transactions.

Number of Transactions Heuristic

The number of transactions that completed with a heuristic status.

Number of Transactions Rolled Back App

The number of transactions that were rolled back due to an application error.

Number of Transactions Rolled Back Resource

The number of transactions that were rolled back due to a resource error.

Number of Transactions Rolled Back System

The number of transactions that were rolled back due to an internal system error.

Number of Transactions Rolled Back Total

The total number of transactions rolled back.

Number of Transactions Timed Out Total

The number of transactions that were rolled back due to a timeout expiration.

Number of Unlocked Users Total

The number of times we have unlocked a user on the server.

Number of User Lockout Total

The cumulative number of user lockouts done on the server.

Number of Waiters Total

The number of times a thread requested and had to wait for a bean from the pool.

Number of Waits for Lock

The number of times that a thread waits for a lock.

Number Waiting for Connections

The current total number waiting for a connection.

Number Waiting for Connections High

The peak number of waiters for a connection in the JDBCConnectionPoolRuntimeMBean. The count starts at zero each time the JDBCConnectionPoolRuntimeMBean is instantiated.

Object

An instance of a class.

ORB

Object Request Brokers. An Object Request Broker (ORB) manages the interaction between clients and servers, using the Internet InterORB Protocol (IIOP). It enables clients to make requests and receive responses from servers in a network-distributed environment.

ORS

Original Request String.

Override Monitoring Level

The monitoring level selected overrides the default monitoring level until the next schedule occurs.

Per Method Concurrent Requests

The number of concurrent calls to invoke the same method.

Percent CPU Usage

The average percentage busy for the CPU since the last query.

Percent Maxed

1. The average percent of the time that all connections are in use.
2. The average percent of the time that all threads are in use.

Percent of Total Number

The number of the Java objects belonging to the same Java class and the total number of Java objects in the heap.

Percent Time Max in Use

1. The average percent of the time that all connections are in use.
2. The percentage of time that the maximum configured threads are in use. If this value is consistently in the double-digits, then the Web container could be a bottleneck and the maximum number of threads available to the Web Container should be increased. See WebSphere documentation.

Percent Used

The average percent of the pool that is in use.

Plan Name

The DB2 plan name used by this connection.

Platform

The application server product name.

Platform CPU Delta

1. The amount of CPU time that the operating system used since the last refresh. (This feature does not apply to z/OS Platform)
2. The system highlights this number on the Server Statistics Overview page when the amount of CPU time that the operating system used since the last page refresh exceeds the threshold value.

Platform CPU% Utilization

The percent of the total CPU being utilized by the server platform.

PMI Polling Frequency

1. Performance Monitoring Infrastructure Polling Frequency.
2. The number of times the system resources request information from the PMI in seconds.

Pool Max Capacity

The maximum capacity of the servlet for single thread model servlets.

Pool Size

1. The average pool size.

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- 2. The average number of threads in the pool.

Pool State

The pool state as one of "Active" or "Suspended".

Port Number

The port number of the machine being sent SNMP messages.

Prepared Stmt Cache Discard Count

The total number of statements discarded because the statement cache is at its maximum size.

Priority

A number assigned to the JVM thread.

Processing Time

The time (in milliseconds) it takes a registered portable interceptor to run.

Publish Server

Accepts data from a Data Collector and aggregates it based on different needs.

Recycle Total

The total number of Connector connections that have been recycled in this Connector Pool since the pool was instantiated.

Reentrant

The bean's reentrance policy (reentrant or not reentrant within transaction).

Reference Lookup Time

The amount of time (in milliseconds) taken to lookup an object reference before method dispatch can be carried out.

Registered EJBs

The number of registered EJBs on the application server.

Registered Servlets

The number of registered servlets on the application server.

Remote Active Sessions

The number of active remote communication sessions attached and active within the server instance during the interval.

Remote Bytes Received

The number of bytes transferred to the server from all remotely attached clients.

Remote Bytes Sent

The number of bytes transferred from the server to all remotely attached clients.

Remote Existing Sessions

The number of existing remote communication sessions at the end of the interval.

Remote Host

The host name of the client initiating the request.

Remote IP

The IP address of the client initiating the request.

Request

Request by a client for a particular server resource. This resource is often a Web page or a Java application.

Request Name

1. The name of the request submitted to the server.
2. Allows the user to assign alternate request identifiers that are more meaningful and appropriate to the chosen programming model of the application.

Request Object

The J2EE server converts an HTTP request to an HTTP request object and delivers it to the Web component identified by the request URL. The Web component fills in an HTTP response object, which the server converts to an HTTP response and sends to the client.

Request Object Attributes

The attributes bound to the request object.

Request Sampling Rate

The percentage of requests stored in the database for reporting and analysis.

Request Type

The type of request either EJB, JSP, or servlet.

Request URL

The URL associated with this request.

Requests

The total number of times the servlet or JSP was requested during the interval.

Resident Time

The time a request has been active and served up to now.

Resource

1. The resource selected for trapping, i.e., Occurrence, CPU time, Resident time, Wait time, SQL Resident time, HTTP request parameters, or SQL statements.
2. The full name of the EJB.
3. The full name of the servlet or JSP on the application server.

Resource Adapter Link Ref

The Resource Adapter Link Reference for cases where this Connection Factory refers to an existing Resource Adapter deployment.

Response Time (ms)

The response time (in milliseconds) a servlet request is finished.

Returns Discarded

The number of times the returning object was discarded because the pool was full. This applies to entity and stateless beans.

Returns to Pool

The number of calls returning an object to the pool. This applies to entity and stateless beans.

RMI

Remote Method Invocation. A standard from Sun for distributed objects written in Java. RMI is a remote procedure call (RPC), which allows Java objects (software components) stored in the network to be run remotely.

Role

The administrator assigns a role to each user. The system default roles are Administrator, Operator, and User. The administrator can create custom roles to suit the needs of their specific environment.

Rolling Date

The number you place in this field will represent the days over which the average response will be calculated for the baseline. The response time on the Application Overview page will be compared to this baseline.

Run-time Environment

The specifics regarding the set up and installation of a server. The Application Monitor provides details for three environments: System, Java, and application server.

Run-time Exception

The exception generated by an application during the normal operation of the Java Virtual Machine.

Runnable

The thread is active or executing.

SAD

Server Activity Display. Tracks transactions and requests and provides detailed thread data for an application server at a specific point in time.

Sample End Time

The time that the last sample arrived.

Sample Start Time

The time that the system receives the first sample.

Sample Sum

The total number of samples collected for the report period.

Sampling Frequency

The percentage of requests stored in the database for reporting and analysis.

Schedule

A time defined by the user when the system switches to a new monitoring level.

Secondary Distribution Names

The names of the remote servers (e.g. myserver) of which the local server is hosting secondary objects. The name is appended with a number to indicate the number of secondaries hosted on behalf of that server.

Security Information

The pathname where the Security Policy file is stored.

Selector

1. The selector associated with this consumer.
2. The selector for the durable subscriber.

Serializable Session Object Size

The average size of session objects at session level including only serializable attributes in the cache.

Server Activity Display (SAD)

Tracks transactions and requests and provides detailed thread data for an application server at a specific point in time.

Server Name

1. The name of the server where the system captured the data.
2. The combination of the admin server name and the Application Server name and the process ID, or in the case of z/OS platform, the name of the Sysplex node, the Application Server name, and the address space ID of the server region.

Server Names

The names of the servers in the cluster.

Server Region Name

The name of the Server Region which belongs to the server instance.

Server Resource Trap

A trap on system resource activity, as opposed to a user's application behavior.

Server Scope

The server(s) on which the report is being generated.

Server Session Usage

The percentage of ServerSession pool in use. This applies to Message Driven beans.

Servlet

A Java application that runs in a Web server or application server and provides server-side processing, typically to access a database or perform e-commerce processing. Servlets provide a Java-based component-based, platform-independent method for building Web-based applications. It is a Java-based replacement for CGI scripts, Active Server Pages (ASPs) and proprietary plug-ins written in C and C++ for specific Web servers (ISAPI, NSAPI).

Servlet Name

The name of the servlet or JSP on the application server.

Servlet Volume

The number of times that servlet requests were sent to the application server.

Servlet/JSP Activity

The amount of servlet/JSP calls made for the last hour with a 5 minute refresh rate.

Servlet/JSP Coverage

The graphical representation of the most frequently accessed servlet/JSPs.

Session Attributes

The attributes bound to the session object.

Session Create Time

The time the server created the session.

Session Created

The number of HTTP sessions created.

Session ID

The ID associated with an HTTP session object.

Session Invalidate Time

The average time from when a session is invalidated until it is finished.

Session Lifetime

The average session life time.

Session Object

The session object is used to share information for one user across multiple pages while visiting a Web site. In other words, a session object is a way of retaining state for a normally stateless HTTP Web site. The J2EE container creates the session object when a client makes a request to the server. When the same client makes another request, the server finds the session object associated with that client and uses it.

Session Invalidated

The number of HTTP sessions invalidated.

Shrink Count Down Time

The amount of time left (in minutes) until an attempt to shrink the pool will be made.

Shrink Period Minutes

The Shrink Period (in minutes) of this Connector connection pool.

Shrinking Enabled

The shrinking of the Connector connection pool is enabled.

Size Percent of Total Size

The total size of the Java objects belonging to the same Java class as the heap size.

Snapshot Date

The date when the currently displayed data was frozen.

Snapshot Time

The time when the currently displayed data was frozen.

SNMP

Simple Network Management Protocol. A set of protocols for managing complex networks.

Source Info

An informative string about the component's source.

SQL Call

The SQL operation performed on the Table.

SQL Statement

The SQL statement that is currently processed by the connection.

SSL Listen Address

Secured Socket Layer. The address on which the server is listening for connections.

SSL Listening Port

Secured Socket Layer. The secure port the application server uses to listen for requests.

SR

System Resources. It displays the summary for all the system resources usage information with a 5 minute refresh rate.

SRC

System Resources Comparison. A feature to compare all the servers in a group by a selected resource. Using this comparison, users can take servers off-line that are under utilized and add servers to a group that are maximizing the server's capacity.

Stack Trace

Displays a list of method calls starting with the method where the Stack Trace printed in a Last in First Out order. For each method, the printout includes the class name, method name, and (optionally) a line number.

Start Date/Time

An ID assigned to a thread. The ID cannot be modified.

State

The state of the messaging bridge.

Stateful Session Bean

A session bean with a conversational state.

Stateless Session Bean

A session bean with no conversational state. All instances of a stateless session bean are identical.

Status

1. A string representation of the transaction's status.
2. The component's status.

Subscription Name

The subscription name for the durable subscriber.

Suspended

A user paused the thread and can re-active it when ready.

System Paging Rate

A paging file is a space on a hard disk used as the virtual memory extension of a computer's real memory (RAM). Having a paging file allows a computer's operating system to pretend that it has more RAM than it actually does. The least recently used files in RAM can be swapped out to the hard disk until they are needed later so that new files can be loaded into RAM. In larger operating systems, the units that are moved are called pages and the swapping process is called paging. Paging rate is referring to the rate of the swapping process in kilobytes per second.

System Resources (SR)

It displays the summary for all the system resources usage information with a 5 minute refresh rate.

System Resources Comparison (SRC)

A feature to compare all the servers in a group by a selected resource. Using this comparison, users can take servers off-line that are under utilized and add servers to a group that are maximizing the server's capacity.

System Resources Polling Frequency

Set how often the system resources requests information from your application server. The default setting is 60 seconds.

Table Name

The name of the table affected by the SQL call.

Target Type

Maps to the metric for a trap, e.g., DB Pool Size or CPU Time.

Thread

A thread allows multiple streams of execution concurrently and independently in the same program. A thread is a thread of control.

Thread Create

The total number of threads created.

Thread Destroy

The total number of threads destroyed.

Thread ID

ID assigned to a thread by the Application Monitor when the thread is created. The ID cannot be modified.

Thread Pool

A pool of threads available for servicing client requests. The J2EE application server pre-creates a collection of threads. This collection is the pool. As new requests arrive to the server, it assigns a request to a free thread. When the request completes, the thread is returned to the pool.

Thread Stack

A list of methods currently being executed in a thread. In a thread, method A invokes method B that invokes method C, the stack is A->B->C. When C finishes, it becomes A->B.

Thread Status

Suspend status denotes that an operator suspended a thread, while Active status denotes an executing thread. To return a thread to active status, select Resume.

Thread Type

The different types include, JSP, EJB, or Servlet.

Thread's Priority

The priority of the thread when processing requests.

Threshold

The threshold monitors the action or behavior of the server activity. The system will alert the user when the server exceeds the threshold.

Time Since Last Activated

The time difference in milliseconds of the previous and current access time stamps. This does not include sessions timed out.

Top CPU Intensive Methods Report

This report displays the top unique methods that, during the report period, took the most cumulative CPU time and the sum total CPU time. It displays up to 100 records.

Top CPU Intensive Requests Report

This report displays top unique requests that, during the report period, took the most cumulative CPU time and the sum total CPU time. It displays up to 100 records.

Top Method Used Report

This report displays the top unique methods used during the report period and how often each request was used. It displays up to 100 records.

Top Request Used Report

This report displays the top unique requests used during the report period and how often each request was used. It displays up to 100 records.

Top Slowest Methods Report

This report displays the top unique methods that took the longest time to complete and the average completion time. It displays up to 100 records.

Top Slowest Requests Report

This report displays the top unique requests that took the longest time to complete and the average completion time. It displays up to 100 records.

Top SQL Intensive Methods Report

This report displays the top unique methods that made the highest sum total of SQL calls during the report period. It displays up to 100 records.

Top SQL Intensive Requests Report

This report displays the top unique requests that made the highest sum total of SQL calls during the report period. It displays up to 100 records.

Top SQL Used Report

This report displays the top five SQL call types that were most often called, as well as the number of calls during the report period.

Top Tables Used Report

This report displays the tables that were called most often. It also displays the number of times each table was called during the report period. It displays up to 100 records.

Total CPU%

1. The percentage of time that the entire platform was using CPU.

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- 2. The system highlights this number on the Server Statistics Overview page when the percent of the entire platform CPU usage exceeds the threshold value.

Total Memory

The total memory in JVM runtime.

Total Method Calls

- 1. The number of calls to the bean's remote methods.
- 2. The total number of methods being processed. A measure of server activity.

Total Method Count

The total number of methods being processed by the selected request.

Total Requests

- 1. The total number of requests sent to the ORB.
- 2. The total number of requests a servlet processed.
- 3. The total number of times the Servlet or JSP services made a request during the interval.

Total Resident Time

The total amount of time, in milliseconds, since the start of the request.

Total Sessions

The total number of HTTP sessions tracked by the server at the interval. This includes both active and inactive sessions.

Total SQL Used

The top five SQL call types that were most often called and the number of calls.

Total Thread Count

The total number of active requests being serviced by the selected application server.

Total Volume

- 1. The number of completed requests.

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- 2. The system highlights this number on the Server Statistics Overview page when the total number of completed requests exceeds the threshold value.

Transaction Failure Rate

The percentage of transactions handled by the application server that are not successfully completed.

Transaction Policy

The bean method's transaction policy: TX_NOT_SUPPORTED; TX_BEAN_MANAGED;TX_REQUIRED; TX_SUPPORTS; TX_REQUIRES_NEW; TX_MANDATORY; TX_NEVER.

Transaction Server Name

- 1. The name of the Sysplex.
- 2. The name of the WebSphere Server.

Transaction Supported

The transaction support level for the Resource Adapter for this Connector connection pool.

Transaction Volume

The number of times that transactions were executed on the application server.

Trap

A set of conditions, thresholds, and criterion set by the user, when the system meets the settings, an action occurs.

Trap Condition

The user-defined criteria that combine with a selected resource to set a trap.

Trap Type

A way of categorizing two different types of metrics for the application or server resource trap.

Trend Report

This report displays the results of the defined data set. To view the detailed report broken down by different criteria, choose an option from the Additional Detail drop-down menu, and then click on the data points.

Unique Request

All the instances of a specific request string.

Uptime

The amount of time in seconds the JVM has been running.

Used Memory

The used memory in JVM runtime.

User Name

The database user name that is used for creating the connection.

Volume Delta

1. The number of completed requests since the screen refreshed.
2. The system highlights this number on the Server Statistics Overview page when the number of completed requests since the last refresh exceeds the threshold value.

Wait Seconds High Count

The number of seconds the longest waiter for a connection waited.

Waiting Condition

The thread is waiting on a condition variable.

Waiting Monitor

The thread is waiting on a monitor.

Web Container

Handles requests for servlets, JSP files, and other types of server-side include coding. The Web container creates servlet instances, loads and unloads servlets, creates and manages requests and response objects, and performs other tasks for managing servlets effectively.

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