Nways Manager

Element Manager User's Guide

Version 2.1

GA27-4221-03

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Note

Before using this information and the product it supports, be sure to read the general information under “Appendix. Notices” on page 33.

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About This Book

This manual provides information on using the Element Manager component of Nways™ Manager Version 2.1, including the Java™-based Management Applications and the Java Performance Monitor.

Who Should Read This Book

This manual is intended for the person responsible for using Nways Manager Version 2.1 for managing devices in a network.

How to Use This Book

This manual contains the following sections:

Chapter 1. Introduction describes the components of Nways Manager Version 2.1 and identifies the hardware and software requirements for using Element Manager.

Chapter 2. Element Management-Managing Devices describes the device management functions of Nways Manager Version 2.1, including information on using Java Management Applications to manage devices in a network.

Chapter 3. Element Management-Performance Monitoring describes the performance monitoring functions of Nways Manager Version 2.1, including using the Java Performance Manager to track network performance.

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Chapter 1. Introduction

This chapter provides a brief description of Element Manager, lists the IBM hardware components that it supports, and lists the hardware and software requirements for using Element Manager.

The Element Manager package performs the following tasks:

- Device Management
- Network Performance Monitoring
- Deployment Management

For the latest technical information, including prerequisites and supported Web browsers, go to the Nways Management Web page:

`http://www.networking.ibm.com/netmgt`

Device Management

Nways Manager Element Manager offers management support for IBM networking hardware by using ***Java Management Applications*** (JMAs). These Java-based management tools allow you to configure, reset, and monitor your networking hardware, as well as gather performance data such as real-time and historical performance statistics.

The JMAs use realistic, color-coded views of your network devices to indicate device status, and Nways Manager provides a complete set of messages, traps, and event notifications for devices on the network.

For more information on using JMAs to manage network devices, see “Java-based Management Application Window Operation” on page 6.

Virtual private network (VPN) capability is also included with Element Manager. For more information regarding the features of VPN, see *VPN Manager User's Guide*.

For a list of supported devices, see “Supported Hardware” on page 2, or visit our Web site at:

`http://www.networking.ibm.com/netmgt`

Network Performance Monitoring

Nways Manager Element Manager offers network performance monitoring using the ***Java Performance Manager*** (JPM). When you use the JPM, you can:

- **Select and monitor specific MIB objects or collections of MIB objects.** Creating collections of MIB objects allows you to create complex expressions that provide a better representation of performance information.
- **Specify objects or collections of objects to monitor.** Including setting thresholds and specifying actions to be taken when thresholds are exceeded.

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- **Display gathered data graphically.** You can create pie charts, line graphs, and bar charts, and store the information to generate reports.

Gathering performance information allows you to determine baseline performance, helping you to tune and proactively manage your network.

With the option of storing your data in a Java Database Connectivity (JDBC)-compliant database, the JPM can also perform historical and trend analysis of network performance.

For information on using the JPM, see “Using the JPM” on page 29.

Demonstration Version

If you are installing a demonstration version of this product, you will be installing a fully functional version of the product. **The product will become INOPERATIVE after a fixed period of time after you install it.** This period is 60 days.

You can order and install a non-demonstration version of the product at any time before or after the demonstration version has expired.

Supported Hardware

This list shows the IBM hardware supported by Nways Manager Element Manager.

- IBM Ethernet and Token-Ring Adapters
- MSS Client UFC in:
  - IBM 8270 Nways LAN Switch
  - IBM 8272 LAN Switch Modules
- IBM Network Utility
- MSS Domain Client UFC in:
  - IBM 8270 Nways LAN Switch
  - IBM 8272 Nways Token Ring LAN Switch model 216
  - IBM 8271 and 8272 2- and 3-slot LAN Switch Modules
- IBM 2210 Nways Multiprotocol Router
- IBM 2212 Access Utility
- IBM 2216 Multiaccess Connector
- IBM 8210 Nways Multiprotocol Switched Services (MSS) Server
- IBM 8224 Ethernet Stackable Hub
- IBM 8225 Fast Ethernet Stackable Hub
- IBM 8229 Bridge
- IBM 8235 Dial-In Access to LAN Servers
- IBM 8230 Token Ring Network Controlled Access Unit
- IBM 8237 Stackable Ethernet Hub
- IBM 8238 Token Ring Stackable Hub
- IBM 8239 Token Ring Stackable Hub

- IBM 8245 Nways 10/100 Ethernet Stackable Hub
- IBM 8250 Multiprotocol Intelligent Hub
- IBM 8260 Nways Multiprotocol Switching Hub
- IBM 8265 Nways ATM Switch
- IBM 8270 Nways LAN Switch Family
- IBM 8271 Nways Ethernet LAN Switch, models E12, E24, F12, F24, 108, 212, 412, 216, 524, 612, 624, and 712
- IBM 8272 Nways Token-Ring LAN Switch
- IBM 8273 Nways Ethernet RouteSwitch
- IBM 8274 LAN RouteSwitch[1]
- IBM 8275 Nways Ethernet LAN Switch
- IBM 8276 Nways Ethernet RoutePort[1]
- IBM 8277 Nways Ethernet RouteSwitch[1]
- IBM 8281 Nways ATM LAN Bridge
- IBM 8282 Nways ATM Workgroup Concentrator
- IBM 8285 Nways ATM Workgroup Switch
- IBM 8371 Multilayer Ethernet Switch
- Generic Java-based management for any SNMP-enabled device in your network.

Note: For the most up-to-date information on hardware supported by Nways Manager Element Manager, see our Web site at:

`http://www.networking.ibm.com/netmgt`

Performance management of these devices uses Java-enabled Distributed Intelligent Agents (DIAs). These agents enable you to offload the polling of information from the manager workstation, freeing up the processor on the manager, and to place the polling close to the devices being polled, freeing up bandwidth across WAN links. These agents can be configured to notify Element Manager when exceptions (for example, threshold exceeded) occur. The agents can be run on workstations in the network that are running a Java virtual machine.

One Registered Agent Access is provided with Nways Manager Version 2.1 free of charge. You will need to purchase a Registered Agent Access for each additional DIA that will be accessed by Nways Manager Version 2.1. Additional Registered Agent Accesses are available in quantities of 1 (part number: 04L6306), 5 (part number: 04L6307), and 10 (part number: 04L6308). You can buy additional registered agent accesses by contacting your IBM representative, an IBM Business Partner, or the IBM North America Sales Centers at 1-800-IBM-CALL, Reference: SE001.

Performance management of these devices also requires a Java Database Connectivity (JDBC)-compliant database to store the performance information. The Enterprise Edition of the IBM DB2 Universal Database® Version 5.0, which is JDBC-compliant, is

1. Requires Xylan's RouteVision Version 3.5 for Windows NT, and Version 3.3 for AIX, HP-UX, and Sun Solaris.

provided with Nways Manager Version 2.1 on a separate CD-ROM. **You may use this DB2 only in association with your licensed use of the Nways Manager Element Manager.**

JDBC-Compliant Database

A Java database connectivity (JDBC)-compliant database is required to use with the Java-based performance management component. The Enterprise Edition of IBM DB2 Universal Database Version 5.0, which is JDBC-compliant, is provided with Nways Element Manager on a separate CD-ROM. You may use this DB2® only in association with your licensed use of the Nways Manager Version 2.1.

Note

If you use IBM DB2 Universal Database V5.0, you will need to use version 5.2 or higher for this installation. If you received a version 5.0 DB2 database with Nways Manager Element Manager, FixPak 10 will upgrade a version 5.0 database to the necessary 5.2 version. You may also wish to install a later FixPak, if available..

In the United States and Canada, telephone 1-800-237-5511 to request the DB2 APAR . Outside the United States and Canada, contact your country support representative. You can also download the FixPaks from our Web site at:

`http://www.software.ibm.com/data/db2/db2tech/version5.html`

Chapter 2. Element Management-Managing Devices

Nways Manager Version 2.1 allows you to manage devices using Java-based Management Applications (JMAs). JMAs provide device-specific management functions and operations, such as support to enable and disable device ports or to update device microcode. Nways Manager Version 2.1 includes a variety of JMAs for IBM networking hardware products. These are listed on page 2.

For the most up-to-date information on hardware supported by Nways Manager Element Manager, see our Web site at:

`http://www.networking.ibm.com/netmgt`

In addition to the device-specific management applications, Nways Manager Version 2.1 includes RMON Management Integration.

Starting Nways Element Manager for AIX and HP-UX

The first time you start an application, be sure to log in as a root user. To start the Element Manager applications that you have installed, enter the command:

`/opt/OV/bin/ovw`

The Network Node Manager root map is displayed, from which you can open Nways Manager applications.

- **To open a Java Device view**:
  1. Select a device by clicking on an icon in Topology Map.
  2. Select *Tools... -> IBM Nways Manager -> Java: Open Java Device View* or select *Tools... -> IBM Nways Manager Java: Open IBM 8260 Switching Module Series*
- **To open Deployment Manager (only runs with AIX):**
  1. Access the NetView menu.
  2. Select *Tools... -> IBM Nways Java... -> Open Deployment Manager*.
- **To open VPN Manager:**
  1. Access the platform menu.
  2. Select *Tools... -> IBM Nways Manager... -> Open VPN View*.

Starting Nways Element Manager for Windows NT

The first time you start an application, be sure to log in as an administrative user. To start the Element Manager applications that you have installed, enter the command:

`\opt\OV\bin\ovw`

The Tivoli NetView IT Director's Edition for Windows NT or HP OpenView Network Node Manager on Windows NT map is displayed, from which you can open Nways Manager applications.

- **To open a Java Device view**:
  1. Select a device by clicking on an icon in Topology Map.

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2. Select *Tools... -> IBM Nways Manager Java: Open Java Device View* or select *Tools... -> IBM Nways Manager Java: Open IBM 8260 Switching Module Series*

- **To open Deployment Manager:**
  1. Access the platform menu.
  2. Select *Tools... -> IBM Nways Java... -> Open Deployment Manager*.
- **To open VPN Manager:**
  1. Access the platform menu.
  2. Select *Tools... -> IBM Nways Manager... -> Open VPN View*.

Java-based Management Application Window Operation

The Java-based Management application interface has four areas:

- A **navigation tree** at the left, which is a hierarchical structure that shows the status of the managed device and all the items associated with the managed device. This includes hardware items, such as ports, and information items that do not have status, such as configuration information.
- A **device view**, or picture of the managed device. This device view shows the real-time status of relevant items on the device, such as the ports.
- An **information panel** in the middle or lower-middle of the interface window. This information panel displays data about the selected item, such as configuration information or components that contributed to the particular status, and enables you to change settings or other configuration information.
- A **message line**, at the bottom of the window, that keeps you informed of progress and conditions in the JMA itself. The message line displays icons to alert you to changes in the status or configuration of the device.
- An IP Changeover icon may appear at the bottom of the display. This icon appears only when the JMA lost contact with the device at its primary IP address. Since it was unable to communicate via the primary address, it established a new session and is now communicating with the device via a secondary IP address.

  Note: This does not apply to Telnet equipment, which will not use a secondary IP address.

Items shown on the device graphic are the same as many items in the navigation tree, and show the same status conditions. Selecting an item on the device graphic produces the same information panel as selecting the item from the navigation tree.

If the JMA is unable to determine the device type during startup, the device view is empty, and only the navigation tree is displayed.

The Java-based Management Application Window also allows you to change the layout of the window and the colors used in the display. See the online help for information on how to do this.

The Navigation Tree

The navigation tree is a hierarchical structure that enables you to view the range of management information about the managed device. This includes the status of the device and its components, the configuration options, and the fault options.

Icons

The navigation tree uses several icons to represent monitored resources:

Folder A higher level resource that represents one or more dependent items. The folder at the top of the tree, for example, usually represents the device itself. Other folders at subsequent levels might represent configuration information or fault information.

Within each folder are items that make up part of the overall folder of information. The status indicated for a folder is calculated from the statuses of immediate dependent items. Click on the plus (+) next to a folder to see and take action on the items within the folder.

Ball A dependent resource, such as a port on the device, that has a status associated with it.

Page A dependent resource that consists of information only, such as configuration information. This resource may or may not allow user changes, depending on the item, the device being managed, and the access rights of the user. This resource has no status associated with it.

Colors

The status of a resource is indicated by the following colors:

Green Normal. The object is in a normal operational state.

Yellow Marginal. The operation of the object is impaired but the object is still functional.

Red Critical. The object is not functioning.

Light Blue Unknown. The object status cannot be determined. The statuses of the object's dependent items may be all light blue or some combination of light blue, wheat, and light grey.

Light Grey The object has been administratively disabled.

Wheat Unmanaged. Status information is not currently being collected on the object or is not being collected on the object's dependent items. For many dependent items you can specify whether or not to collect status.

Setting Status Collection On or Off

To conserve resources and reduce processing time, you can turn off the collection of status information for some items.

Status collection can be turned on or off only for objects that are in MIB tables. To view or change the status collection setting, click on the dependent object in the navigation tree to display the object's status information window.

If status collection can be set, the leftmost column in the table is reserved for that purpose. A checkmark in the leftmost column of a row indicates that status collection is on for that object. Turn checkmarks on or off by clicking in the leftmost column of a row.

When some rows are checked and others are not, the status reported reflects only the checked rows.

For MIB tables with status, a popup menu is provided with the displayed tables. This popup menu can be accessed in two ways:

- Click on the table header in the MIB table
- Right mouse click in either the Status or Critical column.

This menu allows you to turn status collection on or off, mark or unmark critical resources, and search through Monitored or Critical resources in the MIB table.

Critical Resource Monitoring

Critical Resource Monitoring enables the user to select one or more resources for which status is maintained as a critical resource. When status collection is turned on for a critical resource, a status of *either* Marginal or Critical is displayed as Critical (red) on the Navigation tree. The navigation tree also shows all parent objects (Ball and Folder Icons) in Critical status.

A critical resource can be Marked or Unmarked by clicking on its row. A checkmark in the column indicates the resource is marked as critical.

Note: Status monitoring must also be enabled (a checkmark in the Status column) in order to calculate status for the resource.

The popup menu in the Navigation tree can be used to select resources on a per panel basis for those resources not in the MIB table. This method is only enabled for resources with a Ball icon on the Navigation tree, but not included in a MIB table.

Navigating

Expand folders by clicking the plus (+) next to the icon to display dependent items.

Collapse folders by clicking the minus (−) next to the icon to hide dependent items.

Double-click on the folder itself to display an information panel about the dependent item statuses that make up the folder status.

Double-click on a ball to display a detailed information panel about the selected item. Some of these information panels enable you to make configuration changes; others are display-only.

Some icons in the Navigation tree correspond to “hot spots” in the device view. To view status information for those resources, double-click on each resource’s icon in the Navigation tree or on the hot spot in the device view.

Web-Based Network Management

The Web-based network management extensions provide access to the Element Manager Java-based management functions from Web browsers anywhere in your enterprise. When Nways Manager Element Manager is installed and configured for Web-based management, not only can you use Java-based management from the Nways Manager Element Manager workstation but you can access the Java-based functions from Web browser clients running on any platform from anywhere in your enterprise.

A couple of important points to remember:

- The Web-based network management functions are provided by these components:
  - Nways Manager Element Manager
  - Web server
  - Web browser client
- The Nways Manager Element Manager creates HTML pages on demand, and provides these pages and the Java code for Web-based management applets.

Things You Can Do

You can organize the Web pages into any structure that suits your needs. The following are examples of how you might integrate the pages into your own server structure.

- Identify all the critical managed devices, such as routers and servers, and their Web pages. Create a new Web page that includes URL links to these devices. You can create Web pages that provide other kinds of groupings of the Element Manager pages, such as by building/floor or operator responsibility.
- Save frequently accessed Web pages as bookmarks on your Web browser. If you have a database that contains useful information about the managed nodes, you can create an HTML criteria.

What Must Be Running

For Web-based network management, these things must be running:

- Your Web server
- The JMAintegrator, which is started in the opt/ovbin/ovstatus file.

Your Web Server

Almost any Web server will work with the Element Manager. Note that your Web server does ***not*** need Java support. The Web server accesses the Nways Manager Element Manager Java code only as data. The cgilaunder.exe file must be configured as an executable file.

Settings for AIX and HP-UX

All Web Servers must be configured to communicate with the client on port 80, which is the default port in most Servers. The following sections define the required settings for some common Web Servers.

Apache Web Server: Add the following lines, in this order, to the file /Server_root/conf/srm.conf:

```
Alias /nways      "/usr/CML/JMA/java/websvr"
Alias /cgi/code   "/usr/CML/JMA/java/websvr/code"
ScriptAlias /cgi  "/usr/CML/JMA/java/websvr"
```

Where *Server_root* is the directory in which Apache Websvr is installed, and *usr* is the directory where the Nways product is installed.

Netscape Web Server:

1. Go to the server main page to verify that the server is on.
2. Select the **Programs** menu from the menu bar.
3. Select **CGI File Type**.
4. Select **Yes** to activate CGI as a file type.
5. Select **Content Management** from the menu bar.
6. Select **Additional Document Directories**, and add the follwing lines:

   ```
   URL prefix: nways
   Map To Directory: /usr/CML/JMA/java/websvr

   URL prefix: cgi
   Map To Directory: /usr/CML/JMA/java/websvr
   ```

Domino Web Server:

1. Go to `http://Machine/Frntpage.html`, where *Machine* is the directory in which you installed the Domino Web Server.
2. Select **Configuration and Administration Forms**, which will take you to `http://Machine/admin-bin/Cfgin/initial`.
3. Select **Request Routing**, which will take you to `http://Machine /admin-bin/Cfgin/mpfrule`.
4. Add the following lines in this order:

   ```
   Action     Request Template      Replacement File Path
   ------     ----------------      ---------------------
   Pass       /nways/*           /usr/CML/JMA/java/websvr/*
   Exec       /cgi/CgiLauncher*  /usr/CML/JMA/java/websvr/CgiLauncher*
   Pass       /cgi/*             /usr/CML/JMA/java/websvr/*
   ```

Settings for Windows NT

All Web Servers must be configured to communicate with the client on port 80, which is the default port in most Servers. The following sections define the required settings for some common Web Servers.

Apache Web Server: Add the following lines, in this order, to the file \Server_root\conf\srm.conf:

```
Alias \nways      "\Nways\java\websvr"
Alias \cgi\code   "\Nways\java\websvr\code"
ScriptAlias \cgi  "\Nways\java\websvr"
```

Where *Server_root* is the directory in which Apache Websvr is installed, and *Nways* is the directory where the Nways product is installed.

Netscape Web Server:

1. Go to the server main page to verify that the server is on.
2. Select the **Programs** menu from the menu bar.
3. Select **CGI File Type**.
4. Select **Yes** to activate CGI as a file type.
5. Select **Content Management** from the menu bar.
6. Select **Additional Document Directories**, and add the follwing lines:

```
URL prefix: nways
Map To Directory: \Nways\java\websvr

URL prefix: cgi
Map To Directory: \Nways\java\websvr
```

Domino Web Server:

1. Go to `http://Machine/Frntpage.html`, where *Machine* is the directory in which you installed the Domino Web Server.
2. Select **Configuration and Administration Forms**, which will take you to `http://Machine/admin-bin/Cfgin/initial`.
3. Select **Request Routing**, which will take you to `http://Machine /admin-bin/Cfgin/mpfrule`.
4. Add the following lines in this order:

```
Action     Request Template      Replacement File Path
------     ----------------      ---------------------
Pass       \nways\*           \Nways\java\websvr\*
Exec       \cgi\CgiLauncher*  \Nways\java\websvr\CgiLauncher*
Pass       \cgi\*             \Nways\java\websvr\*
```

Your Web Browser

This section provides details for configuring Web browsers to use the Element Manager. A few important points:

- Any Web browser that meets the requirements defined below should be able to access the Element Manager Web-based features.
- After the Element Manager has been installed on the management workstation, you need to copy the files named ClientClasses.jar, CommonClasses.jar, mlsoft.jar, to any Web browser client machine that will be using the remote management functions of Element Manager. This will dramatically improve the performance of the JMA clients,

because their Java code will be loaded from the local system instead of having to be downloaded from your Web server. After copying those files, modify the classpath to access those files.

Browser Requirements

For a Web browser to be compatible with the Element Manager, it must have Java support at the appropriate level. The required level of Java is JDK 1.1.5 or later. The Java support will come with your browser, so you should not have to obtain and install Java separately.

Note: If you are using Microsoft Internet Explorer Version 4.x or 5.x, then you need to update the Java Virtual Machine and RMI Patch available by selecting other options at:

`http://www.microsoft.com/windows/ie/download/default.asp`

Examples

Locating JMA help information

There are four ways to get help information for a JMA:

- Select **Help** from the JMA toolbar
- Double-click the **?** icon located in the JMA Device View
- Click the **Help** button located in the JMA Information Panel.

You can also get information on the latest upgrades to Nways Manager Element Manager by visiting our Web site at:

`http://www.networking.ibm.com/netmgt`

Chapter 3. Element Management-Performance Monitoring

The Java Performance Manager (JPM) component of Nways Manager Element Manager allows you to store, display, and analyze the values of counter and gauge MIB variables on devices being managed by a Java-based Management Application. The JMA can be specifically created for a particular device, or it can be the generic JMA that can manage standard MIBs on any SNMP agent.

Overpolling

Polling a large number of MIB objects from a device in a relatively short period of time, or polling a large number of MIB objects for a sustained time may result in overpolling of the device and cause agent degradation. If a device agent's operation appears degraded, then reduce the number of objects being polled, increase the polling interval, or stop polling for the device. This will indicate if the condition is a result of overpolling.

About the Java Performance Manager

The Java Performance Manager is a set of functions designed to provide performance management for any Java-based Management Application. The JPM is not a stand-alone product, but rather a set of functions that are integrated with the JMA.

The JPM uses Distributed Intelligent Agents (DIA) and a Distributed Performance Manager (DPM). Any number of DIAs can be distributed in an IP network to provide performance monitoring on local devices. A DIA performs the following tasks:

- Connects to its DPM
- Accepts performance management instructions from the DPM
- Uses SNMP to query devices assigned to its domain
- Saves short term performance data, forwarding this data when necessary for permanent storage by the DPM
- Notifies DPM of any performance events

A DIA will reestablish its connection to its DPM after a program or network outage, allowing the DPM to restore the DIA's prior program state.

You can specify the variables to monitor, and create and customize performance reports that can be viewed with any Web browser.

Distributed Intelligent Agents

The Distributed Intelligent Agent is a Java program that performs SNMP polling for the Java Performance Manager. A DIA can run on any platform that supports version 1.1.6 of the Java run-time environment.

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One registered DIA is included with Element Manager. For information on purchasing additional Registered Agent Accesses, which are required for additional DIAs, please see page 3.

To install a DIA on a workstation other than the Nways Manager workstation, see the readme.txt (/usr/CML/JMA/dia for AIX and HP-UX) (\Nways\CML\JMA\dia for Windows NT). A DIA is automatically installed on the Nways Manager workstation. If you do not configure any other DIAs, the instance of the DIA on the Nways Manager workstation will poll all nodes managed by JMAs in Nways Manager. All DIAs are configured through the DpAdmin tool on the Nways Manager workstation. See the section, “JPM Server Configuration” on page 19, for more information on configuring DIAs.

In addition to polling, DIAs can perform thresholding operations on polled variables. You can explicitly configure JPM thresholds, or you can elect to have them set by JPM based on the mean and standard deviations of previously polled values. By default, the threshold for all objects polled by JPM is 3 standard deviations above the mean, calculated after 20 polling intervals and continuously updated as the mean and standard deviation change.

When the DIA detects that a configured threshold has been exceeded, it notifies the JPM server. If a JMA is running for the agent that caused the threshold to be exceeded, then a Performance bullet on the navigation tree of that JMA will change color to red. When the value returns below the threshold, the Performance bullet will return to green. These performance status changes are propagated up the navigation tree, causing higher branches in a tree to be red, yellow, or green, depending on the composite status. For more information on the connection between the Performance bullet on the navigation tree and JPM polling, see “JPM Server Configuration” on page 19.

Relational Database

JPM uses a Java Database Connectivity (JDBC)-compliant database to store the historical data that it captures.

IBM has successfully tested the JPM with DB/2 Universal Database.

DB2 Universal Database with AIX and HP-UX

To install and configure DB2 for use with JPM:

1. Log in as root and create a user account with the following properties:

   Name nwaysdb2

   Primary Group db2asgrp

   and at least 100 MB of free disk space.
2. Create a user account with the following properties:

   Name nwaysadm

   Primary Group db2asgrp

   to act as the owner of the Administration Server.

3. Modify the existing definition for db2asgrp to include root as a user in the group.
4. To begin the installation, mount the CD using the following command:

   mount /dev/*device_name* **/cdrom**

   where *device_name* is the name of your CD-ROM drive.
5. Change directory to the mount point:

   cd /cdrom
6. Run the installation program:

   db2setup
7. To install DB2, select **Install...**, and install using the UDB Enterprise Edition option.
8. After the installation is completed, select **Create...** to create a database instance.
9. From the Create menu, select **Create a DB2 Instance**, and create an instance user with the following properties:

   user name nwaysdb2

   group db2asgrp
10. When you are prompted to create another user, known as a “fence” user, create a user with the same information as the instance user. You can ignore DB2’s warning, as Nways Manager does not use the fence user.
11. Create an administration server by selecting **Create...** and selecting **Create the Administration Server**.
12. Create an administration user with the following properties:

    user name nwaysadm

    group db2asgrp
13. Select **Close** to exit the db2setup process.
14. Ensure that nwaysdb2 is the owner of the file /home/nwaysdb2/.profile by entering the following command:

    chown nwaysdb2:db2asgrp /home/nwaysdb2/.profile
15. Add the following line to the end of the file /home/nwaysdb2/.profile:

    ```
    . sqllib/db2profile
    ```
16. Ensure that nwaysadm is the owner of the file /home/nwaysadm/.profile by entering the following command:

    chown nwaysadm:db2asgrp /home/nwaysadm/.profile
17. Add the following line to the end of the file /home/nwaysadm/.profile:

    ```
    . sqllib/db2profile
    ```
18. Add the following lines to the end of both /etc/profile and /opt/OV/bin/ovSetDBEnv: If you are using CDE (Common Desktop Environment) you should add these lines to .dtprofile in the root directory and in the home directory of any user that will run Nways Manager applications.

    ```
    export DB2DIR=/opt/IBMdb2/V5.0
    export DB2INSTANCE=nwaysdb2
    export SHLIB_PATH=/home/nwaysdb2/sqllib/lib
    export PATH=$PATH:/home/nwaysdb2/sqllib/bin:/home/nwaysdb2/sqllib/adm:/home/nwaysdb2/
    ```

19. Log in as nwaysdb2 and execute the following command to automatically start the instance on reboot:

    db2set -i nwaysdb2 DB2AUTOSTART=YES

20. Edit the /etc/inittab file. Find the line used to start the DB2 services, which looks like:

    ```
    rcdb2:2:once:/etc/rc.db2 > /dev/console 2>&1 # Autostart DB2 Services
    ```

    The first field (″rcdb2″) in the line can only be 4 characters long. The second field (″2″) is the run level in which this entry is to be processed. A blank run level field means that the entry is valid for all run levels. To ensure that DB2 is started on reboot, change the line to the following:

    ```
    rcdb::once:/etc/rc.db2 > /dev/console 2>&1 # Autostart DB2 Services
    ```

21. Start the DB2 instance:

    db2start

22. Create the Nways Manager Performance Database using the following command:

    db2 CREATE DATABASE IBMNMPDB

23. Log in as root and create the directory /usr/CML/JMA/java/websvr/code if it does not already exist.

24. Unzip the DB2 JDBC drivers into the Nways Manager classpath by unzipping the file /opt/IBMdb2/V5.0/java/db2java.zip into the directory /usr/CML/JMA/java/websvr/code

    You can find information about unzip at:

    `http://www.cdrom.com/pub/infozip/UnZip.html.`

25. Reboot the machine for the changes to take effect.

26. Ensure that the Nways Manager daemons are running and then start the Nways Manager Performance Management Configuration application by selecting **IBM Nways Java -> Performance Configuration** from the NetView *Tools* menu, or by issuing the following command:

    /usr/CML/JMA/bin/dpadmin

    Note: When you run Performance Management Configuration, a graphical window is displayed. To use this window, you must have X-access to your console.

27. Select the Database tab. By default, the fields are set for a local connection to DB2.

28. Select **Start Collection** to create a connection to DB2. When the connection is established, the button will change to Stop Collection. You can then close the Performance Management Configuration window.

Database Maintenance

When first installed, JPM does not use a database. A limited amount of historical data is stored in memory, and this data is lost when new data is received. To start storing information in the database, you must specify the database location and drivers using the DpAdmin tool. For information on how to do this, see “JPM Server Configuration” on page 19.

You must ensure that you have adequate free space on the database file system before starting database storage with JPM. The amount of space needed is highly dependent on the number of agents being polled and the polling interval. As a starting point, polling 20 agents with the default 20 minute polling interval, a 250 MB file system could be filled up in three to four weeks of continuous polling. It is recommended that you monitor the amount of storage consumed by the JPM database for several weeks after starting use of the database, and develop a database maintenance plan based on your observations.

To purge old data from your database, run the JPM Database Maintenence application by selecting **IBM Nways Java -> Database Maintenance** from the NetView *Tools* menu, or by issuing the following command:

```
/usr/CML/JMA/bin/dbmaint.sh
```

Using the JPM Database Maintenance program, you can specify a time period for which you want to retain data, and then choose to:

- Delete old data

  or
- Compress old data by mathematically combining a number of data points into a single point

DB2 Database for Windows NT

Important

If you chose not to have DB2 started automatically when the machine is started, then you will have to issue the `db2start` command from the MS-DOS command prompt before creating a database.

After making sure that the JDBC drivers are installed and DB2 is started, follow these steps to create a database:

1. Select **Start** -> **Programs** -> **MS-DOS prompt**.
2. Change the directory to *nways**bin*.
3. Run the command `db2cmd CreateDatabase.bat -create`.

   By default, a database will be created on the same disk that DB2 was installed. It is advised that this disk partition have at least 60 to 100 MB of free disk space. If you intend to store historical statistics for more than 20 devices over a period several weeks or longer, then you will need approximately 1 GB or more of available disk space.
4. Depending on your platform:
   - Start NetView by selecting **Start** -> **Programs** -> **NetView** -> **NetView Console**.
   - Start OpenView by selecting **Start** -> **Programs** -> **OpenView** -> **Network Node Manager**.
5. Select **Tools** -> **IBM Nways Java** -> **Performance Configuration**.
6. Click on the *Database* tab.

If you are using HP OpenView Network Node Manager on Windows NT Version 5.01,

then you may be asked to enter your username and password. If so, enter the administrative password that you created at the beginning of this process.

7. Click **Start Collection**.

Potential Problems Connecting to a JDBC-enabled Database: If you encounter problems connecting to the JDBC-enabled database from Nways Manager, try the following solutions.

Message: **Could not find JDBC driver classes. Closing connection.**

Action: Install or reinstall the JDBC drivers.

- For DB2, unzip the JDBC drivers (found in Sqllib\java\db2java.zip where *Sqllib* is the default directory into which DB2 was installed) into *nways*\java\websvr\code, where *nways* is the directory into which Nways Manager was installed. You may have to retrieve an unzip program from the Internet to perform this task.
- For other databases, refer to the documentation for those databases. The JDBC drivers must exist in the Nways classpath (*nways*\java\websvr\code, where *nways* is the directory into which Nways Manager was installed) to allow connection to the database.

Message: **JDBC connect error. Check database URL and make sure your username and password are correct. Closing connection.**

Action:

- Check to make sure your database system and JDBC drivers are JDBC-compliant. The database must support ANSI-92 SQL.
- Check the JDBC URL and make sure it is the one that the database manufacturer suggests you use. This can usually be found in the database documentation under a section dealing with running Java applications. If you are using a third-party driver, then the URL and driver name should be included with that driver. the default URL is given for the DB2 running locally.
- Make sure you have created a database called IBMNMPDB.
  - If you are not using DB2, read your database documentation on how to do this.
  - If you are using DB2, change to the directory *nways*\bin, where *nways* is the directory into which Nways Manager was installed, and run the command: `db2cmd CreateDatabase.bat -create`
- Make sure that the disk on which you have created the database has at least 60 to 100MB of space. The exact amount of space required depends on how much historical information will be stored
- The following databases and JDBC drivers are known to be incompatible with Nways Manager and are not recommended:
  - Microsoft Access, JDBC-ODBC Bridge.

Clearing out the DB2 Database: After a period of use, it may be necessary to clear out the DB2 database. To clean out the database, change to the directory *nways*\bin, where *nways* is the directory into which Nways Manager was installed, and run the command: `db2cmd CreateDatabase.bat -create`

JPM Server Configuration

You can customize the MIB objects that are presented to the JMA when a Performance bullet is selected from the JMA navigation tree. Element Manager makes default selections that provide basic information about the interfaces, protocols, and system elements in the navigation tree. Some MIB counters and gauges that might be of use in some network management situations are not polled as part of the default configuration. You can use the DpAdmin tool to customize what data is displayed under a Performance bullet in the JMA navigation tree.

This section explains the JPM data concepts and offers tips for using the DpAdmin tool to modify the default JPM customization.

JPM Data Structures

JPM organizes MIB objects into these groups:

Performance Objects:
MIB objects or mathematical combinations of MIB objects (such as interface utilization).

Graphs:
one or more performance objects to be shown on the same graph. To make graphs more meaningful, all performance objects on the same graph should have the same units, but JPM does not distinguish by type when grouping objects for graphs.

Views: one or more graphs, displayed on the same notebook page by JPM.

Templates:
all the notebook pages that are grouped under a single Performance bullet in the JMA navigation tree.

The default configurations of these objects are stored in text files found in the directory *install_dir*/java/properties/startup.

Important

It is often useful to customize two aspects of JPM performance that affect all these default objects by modifying these text files prior to beginning JPM polling.

The most commonly modified properties are:

- The polling interval used by the DIAs for polling all performance objects. The default is 20 minutes.
- The time period covered on a graph when viewing performance data in a JMA. The default is 4 hours.

To modify the polling interval, use the following procedure:

1. Make a backup copy of all files in the directory *install_dir*/java/properties/startup where *install_dir* is the directory where Element Manager is installed.
2. Edit the file pollobj.def in the startup directory.

3. Replace every instance in the file of the string `I 1200` with the string `I n` where *n* is the number of seconds in the new polling interval.
4. Reload the configuration following the instructions in “Loading the Configuration”.

Later, you can change the polling interval for individual polling objects using the DpAdmin tool. Remember that the total load placed on DIAs by polling and the volume of SNMP traffic generated in your network is increased by a smaller polling interval.

To modify the view length, use the following procedure:

1. Make a backup copy of all files in the directory *install_dir*/java/properties/startup where *install_dir* is the directory where Element Manager is installed.
2. Edit the file view.def in the startup directory.
3. Replace every instance in the file of the string `R 4,2` with the string `R n,x` where *n* is the number of time units in the new view length, and *x* is the unit identifier. Unit identifiers are:
   - 1 for minutes
   - 2 for hours
   - 3 for days
   - 4 for weeks
4. Reload the configuration following the instructions in “Loading the Configuration”.

Loading the Configuration

To load a new default configuration, follow these steps:

1. Exit Element Manager and stop the JMAintegrator daemon using the following command:

   ```
   /opt/OV/bin/ovstop JMAintegrator
   ```

2. Remove the directory *install_dir*/java/properties/config and all its subdirectories, where *install_dir* is the directory where Element Manager is installed.
3. Restart Element Manager and restart the JMAintegrator daemon using the following command:

   ```
   /opt/OV/bin/ovstart JMAintegrator
   ```

Using the DpAdmin Tool

After you have loaded the default JPM configuration, you can use the DpAdmin tool to modify the JPM configuration. You can launch the DpAdmin tool in two ways:

- From any JMA, select the **Performance Management Configuration** option under the **System** and **General** branches of the navigation tree. Although you are running DpAdmin from a single JMA, any changes you make will affect all JMAs that use the object definitions you modify.
- From the OpenView *Tools: IBM Nways Java* menu, select:
  - **Performance Configuration** for DIA, database, and reporting customization
  - **JPM Template Customization** for JPM customization

The tabs on the DpAdmin notebook allow you to configure a wide variety of behavior associated with JPM. The tabs are:

DIA Monitor
Use this page to configure and monitor Distributed Intelligent Agents (DIAs). The first page displayed shows a graphic representation of the DIAs that are currently configured. Double-clicking a DIA will show status for that DIA. Double-clicking a DIA while holding the CTRL key allows you to configure nodes for that DIA, or to create a configuration for a new DIA.

Polling Configuration
Use this page to specify which devices you want JPM to poll. You may specify a list of device types (sysOIDs) that you want JPM to poll. You may also specify a list of additional IP addresses that you want JPM to poll, as well as a list of IP addresses that you do not want JPM to poll (even if their device types are included on the list to be polled).

With previous releases of Element Manager, JPM automatically started polling a device when a JMA was launched for that device and continued polling until you instructed JPM to stop polling. In Element Manager Version 2.1, JPM temporarily polls devices while a JMA is open, but permanently polls only those devices and device types that you specify on this page.

Database Configuration
Use this page to specify what relational database JPM should use. The default values of the JDBC Driver and Database URL fields are correct for DB/2. For other databases, use the information supplied by the database manufacturer, using IBMNMPDB for the database name. Remember that you must manually create a database named IBMNMPDB, because the JDBC API will not allow Nways Manager to create it for you.

Template
Use this page to add views to a template. When you add views, you must also add all performance objects contained in those views in order to begin polling those performance objects. Templates are the highest level of the JPM data structure, and have a one-to-one correspondence to Performance bullets, which are endpoints in the JMA navigation tree. You cannot create additional templates, so all JPM views must fit in the navigation tree at one of the existing points. The template names use a dotted notation, the last segment of which is the same as the folder on the navigation tree under which the Performance bullet appears.

Performance Object
Use this page to create or modify the performance objects that are polled by the JPM. Select **Help** on this page for detailed information about what the fields on this page mean. To define new performance objects, you must know the Object Identifier (OID) for any MIB objects that the performance object is based on.

View Use this page to create or modify views. You can combine any graphs that exist to create views. Existing graphs are displayed in the list box on the left of the page.

Graph Use this page to create or modify graphs. You can combine any performance objects that exist to create graphs. Existing performance objects are displayed in the list box on the left of the page.

Schedule
Use this page to define periods of time for which different thresholding criteria are used. This schedule only applies to performance objects that use JPMs auto-thresholding mechanism. Select **Help** on this page for detailed information on how to create a polling schedule.

Options
Use this page to modify reporting options. Report options define a ***weekday*** to the JPM report programs. For more information, see “Reports” on page 26.

Using the Performance Analyzer Application

The Performance Analyzer application can be used to retrieve performance data from the JPM database, construct graphs, and create reports. There are three ways to start the Performance Analyzer application:

- Select the Performance Analyzer option from the Tools folder on the JMA navigation tree.
- View the file *nways*/java/websvr/analyzer.html in a Java-enabled browser. This starts the applet.
- Select **Tools -> IBM Nways -> Performance Analyzer** from the OpenView menu

The Performance Analyzer application gets all of its statistical data from the Nways Manager Performance Database. By default, this is IBMNMPDB. To use the Performance Analyzer application, you must configure Nways Manager to store its performance data to a database.

Navigating

The Managed Devices branch of the navigation tree contains an icon for each device in the Nways Manager Performance Database. If the Performance Analyzer was launched from a Java-based Management Application, you will see only that device under the Managed Devices tree.

Under each managed device, you will see a magnifying glass icon representing a performance object. A performance object is an SNMP MIB variable or expression that Nways Manager is polling for that device.

Under each performance object, you will see each instance that was discovered for this device. Single-instance (scalar) performance objects will only have a single instance (″0″) while multi-instance (tabular) performance objects can have several.

The Analysis Reports branch of the navigation tree contains an icon for each user-created report.

Creating a Graph

To create a graph, you must initialize the graph, set the time range, add elements, and modify the attributes of the graph or graph elements.

The Clear button is used to clear all elements from the graph and to reset the graph times to the range indicated by the Time Range control. Notice that the graph will not accept new Time Range values until it is cleared.

The Time Range control gives you the ability to manage the amount of time (from the current time into the past) that you want your graph to cover. Graphs with larger-than-needed time frames can be slow to retrieve data from the database and the graph can become cluttered, so be sure to choose the smallest time range that meets your needs.

Now that your graph is initialized, you can begin to add graph elements to it. A graph element can be added by double-clicking on a performance object instance or by selecting one or more instances and clicking the Edit button. The selected instances will be added to the graph with the instance details displayed in the legend below the graph.

You can modify the attributes of a graph or of a graph element. You can modify graph attributes by double-clicking on the top row of the legend below the graph. You can modify graph element attributes by double-clicking on the desired element in the legend.

Manipulating a Graph

You can manipulate a graph by:

- Zooming in on a section of the graph by holding the left mouse button down and dragging a selection box around the desired part of the graph.
- Translating the graph around an axis by holding down the Shift key and the left mouse key and dragging the mouse in the direction you want the graph to move.
- Exploding a point on the graph by holding down the Ctrl key and selecting a graph point with the left mouse button. A graph dialog will appear with the values for all of the graph elements at that specific point in time.

  You can toggle between a pie and bar chart view of the data. The same zooming, translating, and resetting options are available, but now an explode operation will display the value of the selected element.
- Resetting the graph to the default view by pressing the *R* key. The reset key will only work if the graph has the focus.

Saving a Report

After creating a graph, you can save your changes to a report. Clicking **Save** will bring up the *Save Analysis* dialog. Enter a unique name (up to 18 characters with no spaces) and click **Yes** to store the graph in the performance database as a report. A new report icon will be created under the Analysis Reports branch of the navigation tree.

Launching a Report

You can launch a report that you have created by selecting a Time Range and then double-clicking on a report icon (or selecting one or more reports and clicking the Launch button). If you want to make changes to a report, simply select the report and click **Edit** to load the report as a graph. Make your changes to the graph and click **Save** to store the graph as a report.

Using the Real-Time Poller/Grapher Application

The Real-Time Poller/Grapher application allows you to view a real-time graph of performance data. The data is polled more often than ordinary JPM polling, but the collected data is not stored in a database. Data for multiple MIB objects and from multiple devices may be combined on a single graph.

To start the Real-Time Poller/Grapher application, select **Tools -> IBM Nways -> Real-Time Poller/Grapher** from the OpenView menu.

Navigating

When it is first launched, the Real-Time Poller/Grapher asks for the IP address of a device to poll, a community name, and initial polling interval. The Poller/Grapher navigation tree displays all Performance Objects that are available, even though some of them may not be supported by the initial device. Expanding the navigation tree for a Performance Object shows the instances of that object on the device.

To begin polling:

1. Double-click the left mouse button on an instance value, or select the instance and click on the **Add** button. The Performance Object is now added to the list of objects to be polled.
2. Select the Performance Object.
3. Click on **Start** to begin polling.

A graph appears in the upper-right portion of the window. The graph is updated each time a new data point is received.

Note: It may take two polling intervals for the first point to appear on the graph, since the value for many Performance Objects can only be calculated by comparing two consecutive data points.

You can add another device to the navigation tree by pressing the **Add Host** button. All Performance Objects currently being polled will continue to be polled. This allows you to compare values of two or more devices on the same graph.

To stop polling any Performance Object, select it in the list of polled objects and press the **Stop** button.

Managing TN3270E Response Times

If the Performance Analyzer application detects that a Managed Device contains Performance Objects related to TN3270E response time monitoring, specific grouping for TN3270E will be created in the navigation tree. This section describes the specific functions available for TN3270E response time monitoring.

Navigating

TN3270E groups are represented by a mainframe/terminal icon. Under each TN3270E group are the clients that belong to the group. A client is identified by an IpAddress:Port label. If the response time monitoring is aggregated for all clients in the group, a single aggregate client will appear under the group.

Creating a Graph

Selecting a TN3270E client and clicking the Edit button will load the TN3270E Response Time Monitor graph. This graph contains five elements corresponding to the five response time “buckets” defined for this TN3270E client. The buckets separate all TN3270E transactions into response time ranges. The TN3270E Response Time Monitor graph shows the number of transactions that fell into each range.

Once the graph is loaded, you can make changes and save your changes just like any other graph.

Double-clicking on a TN3270E client (or selecting one or more clients and hitting the Launch button) will launch the TN3270E Response Time Monitor report.

Managing Routers

If the Performance Analyzer application detects that a Managed Device contains Performance Objects related to routers (CPU, memory, and buffers), an entry for Routing will be created in the navigation tree. This section describes the specific functions available for managing routers.

Creating a Graph

Selecting a Routing icon and clicking **Edit** will load the Router Utilization graph. This graph contains the CPU, Memory, and Buffer Utilization for this router.

Once the graph is loaded, you can make changes and save your changes just like any other graph.

Launching a Report

Double-clicking on a Routing icon (or selecting the icon and clicking the **Launch** button) will launch the Router Utilization report.

Managing Frame Relay Circuits

If the Performance Analyzer application detects that a Managed Device contains Performance Objects related to frame-relay circuits (utilization, traffic, and congestion), entries for each frame-relay interface will be created in the navigation tree. This section describes the specific functions available for managing frame-relay circuits.

Navigating

Frame relay interfaces are represented by a wire/connector icon. Under each frame relay interface are the circuits that are defined to that interface. A circuit is identified with its DLCI number as its label For each circuit, icons for Traffic, Utilization, and Congestion are defined.

Creating a Graph

Selecting either Traffic, Utilization, or Congestion and clicking **Edit** will load the appropriate frame-relay graph.

Once the graph is loaded, you can make changes and save your changes just like any other graph.

Launching a Report

Double-clicking either *Traffic*, *Utilization*, or *Congestion* (or selecting any combination and clicking the **Launch** button) will launch the Frame Relay Circuit report.

Reports

Java Performance Manager's reporting capability provides access to the historical data that is stored in the JPM database without having to navigate through the JMA. It provides this access through Java applets that are imbedded in HTML pages made available through a server on the Nways Manager workstation. There is one type of report that provides graphic displays of stored historical data, and two types that provide text-based displays.

To simplify Web access to the reports, a Report Catalog HTML page that provides links to all reports is automatically created and updated by JPM. The page name is:

install_dir/java/websvr/reports/ReportCatalog.html

where *install_dir* is the directory where Element Manager is installed.

Chart Report Creation

The simplest way to create a report is to click on **Add View to Report** button when viewing a graph in a JMA. When the report creation dialog is displayed, type in the name for the report you want to create (JPM automatically adds .html to create a filename), and select a timespan for the report. You can create a report that covers the number of hours, days, weeks, or months that you specify.

To create a simple report that displays the information in a graph, use the default values for the *Report Type* field and *Save as Applet* checkbox, and leave the *Prompt for Additional Hostnames* box unchecked.

Performing these steps will create an HTML file with APPLET tags and parameters. The JPM Chart applet communicates with the JPM server to retrieve the historical data identified by the parameters and displays the data in a chart. A report created with default parameters through the **Add View To Report** button will display information only from the agent that the JMA is open for, and for all instances of tabular MIB variables. "Report Parameters" describes how to create reports that have different parameters.

Report Parameters

You can create reports that display selected rows of tabular MIB data (such as interfaces), or that combine historical data from multiple agents on a single graph. This section describes how to code parameters in HTML files to create these variations of reports.

To modify the reports created by JPM, use any text editor, or select **Edit Reports** from the JPM graph displayed when you select a Performance bullet from the JMA navigation tree.

To create a report that has a single instance of a tabular MIB variable for a single agent, specify a value for the instance parameter that is created by default in the report file. The value for an instance parameter has the format:

```
MIB_variable_name=value
```

For example, to create a report that shows the Interface Utilization for interface number three, first use JPM to create a report that shows Interface Utilization for all interfaces, then modify the parameters as shown:

```
<param NAME=number_of_nodes VALUE=1>
<param NAME=host_name_1 VALUE="10.10.3.100">
<param NAME=view_name VALUE="Interface Utilization">
<param NAME=instance VALUE="ifIndex = 3">
```

Some tables require two MIB variables to identify a particular row in the table. For example, to create a report that shows the Frame Relay Traffic for circuit 17 on interface 4, modify the instance parameter as shown:

```
<param NAME=number_of_nodes VALUE=1>
<param NAME=host_name_1 VALUE="10.10.3.100">
<param NAME=view_name VALUE="Frame Relay Traffic">
<param NAME=instance VALUE="ifIndex = 4, frCircuit = 17">
```

To create a report that shows more than one instance (but not all instances) of a tabular MIB variable for a single agent, create a host_name and instance_parameter pair for each instance you want to view. In this case, you must set the number_of_nodes parameter to the number of instances you want to see on the graph:

```
<param NAME=number_of_nodes VALUE=2>
<param NAME=host_name_1 VALUE="10.10.3.100">
<param NAME=view_name VALUE="Interface Utilization">
<param NAME=instance_1 VALUE="ifIndex = 4">
<param NAME=host_name_2 VALUE="10.10.3.100">
<param NAME=instance_2 VALUE="ifIndex = 5">
```

To create a report that shows instance of MIB variables from more than one agent, create a host_name and instance_parameter pair for each agent you want to see. Also, change the number_of_nodes parameter to the number of host/instance pairs you create. For example:

```
<param NAME=number_of_nodes VALUE=3>
<param NAME=host_name_1 VALUE="10.10.3.101">
<param NAME=view_name VALUE="Interface Utilization">
<param NAME=instance_1 VALUE="ifIndex = 4">
<param NAME=host_name_2 VALUE="10.10.3.102">
<param NAME=instance_2 VALUE="ifIndex = 5">
<param NAME=host_name_3 VALUE="10.10.4.101">
<param NAME=instance_3 VALUE="ifIndex = 9">
```

The ARCHIVE Tag

JPM will create reports that contain an ARCHIVE parameter on the APPLET tag. This parameter tells your Web browser to load Java class files from the archive specified, in this case ReportClasses.jar.

To improve performance when viewing reports remotely using a Web browser, leave the ReportClasses.jar file in the *install_dir*/java/websvr/code directory, where *install_dir* is the directory where Element Manager is installed, and allow the browser to download the file across the network.

Creating Text Reports

There are two types of text-based reports that can be created by selecting **Add View to Report** from the JMA chart screen, a Single Node Analysis report, and a Multiple Node Analysis Report.

The Single Node Analysis report presents a statistical analysis of all performance objects associated with the selected View. The mean, standard deviation, and recorded high and low values are displayed in a table.

The Multiple Node Analysis report presents a statistical analysis of a single performance object across one or more agents. The mean, standard deviation, and recorded high and low values are displayed in a table.

To create a text report, select **Add View to Report** while viewing a performance graph in a JMA that contains the performance objects you want to analyze. Choose a name for the report, and change the Report Type field to either Single Node Analysis or Multiple Node Analysis.

Viewing Reports

You can view reports with a Web browser that supports version 1.1 of the Java Development Kit (JDK). Some popular browsers and the levels that support JDK 1.1 are:

- Microsoft Internet Explorer, version 4.0 or higher
- Netscape Communicator, version 4.04 or higher
- Sun's HotJava browser, which can be downloaded from:

  `http://java.sun.com/products/hotjava/`

When viewing a report, the time period that the report displays is governed by the parameters you selected when the report was created, shown in the time_range and time_length parameters in the HTML file. The starting period for the time range is dependent on the units specified by the time_range parameter. For a unit of HOURS, the time range starts at the beginning of an hour. For a unit of DAYS, the time range starts at the beginning of a day (12:00 midnight). For a unit of WEEKS, the time range starts at the beginning of a week (Sunday by default, but you can change this under the Report Options tab of the DpAdmin tool).

When viewing a report, you can change the time span the report covers by selecting **New Time Range**. You can specify a range as a certain number of hours, days, weeks, or months, or you can give an exact starting and ending time.

Accessing the JPM

To access the Java Performance Manager, expand the Java-based Management application navigation tree until you reach the balls labeled *Performance* in the folders.

Click on a Performance ball to see the performance information for that item. For more information on using the navigation tree, see “Java-based Management Application Window Operation” on page 6.

Using the JPM

Use the JPM to perform the following actions for the resource associated with the Performance ball:

- View status events for the resource
- View performance graphs for the resource, grouped into “Views”
- Create or modify performance reports, which can be viewed with a Java-enabled Web browser.

The JPM Window

The JPM window gives performance information for the selected resource. It is presented in a notebook-style format.

The tabs at the top of the window correspond to views configured for particular resources. For example, if the resource is an interface, the default views would be Interface Utilization, Interface Packet Quality, and Interface Packet Breakdown. Views present information about the selected resource in graphs created according to preselected criteria.

Examples

This section contains some examples of how to perform common tasks using JPM.

Using JPM to see IP performance information for a Cisco router

1. Open the JMA for the router.
2. From the navigation tree, select:

```
Configuration
   Communication
      Protocols
         TCP/IP
            IP
```

3. Select the performance ball under the IP branch.
4. Select the tab labeled *IP Traffic*

Monitoring memory and CPU utilization for an IBM 2216 Nways Multiaccess Connector

To monitor memory utilization:

1. Open the JMA for the 2216
2. Expand the navigation tree down the path:

```
Configuration
   System
      Environment
         Memory
```

3. Select the Performance ball under the Memory branch of the tree.
4. Select the tab labeled *Heap Memory Utilization* to view Heap Memory, or the tab labeled *Memory Buffer Utilization* to view memory buffers.

To monitor processor utilization:

1. Open the JMA for the 2216.
2. Expand the navigation tree down the path:

```
Configuration
   System
      Device
         Processor
```

3. Select the performance ball under the Processor branch of the tree.
4. Select the tab labeled *CPU Utilization*.

Creating a custom report using JPM

This example shows the steps to create a custom report showing CPU and memory utilization for several IBM 2216 Multiaccess Connectors.

1. Follow the instructions above to view the graph for Heap Memory Utilization for a single 2216.
2. Click **Add View to Report**.
3. Type a filename in the Name field, for example 2216_memory.
4. Choose the time range for which you want a report.
5. Click **Add**.
6. View the graph for Memory Utilization.
7. Click **Add View to Report**.
8. Select the file you just created, in this case 2216_memory, and select the time range for which you want a report.
9. Repeat steps 6-8 of this sequence for the CPU Utilization graph. When you have finished, you will have an HTML file containing the graphs you have selected, showing data for the 2216 whose JMA you were viewing.
10. Edit the HTML file by selecting **Edit Reports** from the performance graph of any JMA and selecting your report.
11. The HMTL file contains three sets of applet tags and parameters. For each set of applet tags, modify the line beginning:

    ```
    <param NAME=instance...>
    ```

    to:

    ```
    <param NAME=instance_1...>
    ```

12. For each 2216 unit's statistics you want to monitor, add two parameters as follows:

```
<param NAME=host_name_n VALUE="z.z.z.z">
<param NAME=instance_n VALUE="">
```

Replacing *n* in the example with the ascending integer values starting with 2 (using the same value for both parameters), and replacing *z.z.z.z* with the IP address of the 2216 you want to monitor. Do this for each set of applet tags.

13. Modify the line that begins:

    ```
    <param NAME=number_of_nodes...>
    ```

    so that the value is the same as the number of host-name/instance pairs you have created.

14. When creating reports for MIB objects that are not part of a table, such as CPU Utilization and memory utilization on the 2216, you do not need to specify a value for *instance_parameters*. You must, however, have an *instance_parameter* for each *host_name_parameter* that you specify.

    When creating reports for variables that are part of a table, such as variables in the MIB2 interface table, you can see all entries in the table by leaving the *instance_parameter* variables without values. To see only specific entries in the table, you must specify a value for the *instance_parameter* by giving the index variable name and the desired value. For example:

    ```
    <param NAME=instance_1 VALUE="ifIndex=5">
    ```

15. Save the modifications to the HTML file.
16. View the report by following the instructions in “Viewing Reports” on page 28.

Incorporating a report into a Lotus® Freelance Graphics® presentation

1. View the graph you want to incorporate into your presentation by using the navigation tree to reach the Performance ball corresponding to the graph.
2. Select the tab for the graph and click **Add View to Report**.
3. Specify an HTML filename and select the **Save as Image** checkbox.
4. Click **Add**. This will save your report as a gif file located in the directory Nways_Manager/java/websvr/reports/images, with the same name as the graph.
5. You can now import this image into a Freelance Graphics presentation, or any other application that supports the gif format.

Appendix. Notices

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On all operating systems, HP OpenView may log **Agent In Distress** messages when polling devices with particular response characteristics (such as the IBM 8281 Nways ATM LAN Bridge). This message indicates that the HP OpenView was unable to complete the polling of the device due to the responses to queries for a set of MIB objects. The response characteristics for these devices for this set of queries causes a set of HP OpenView timeouts and ″spinning.″ If this occurs, it is generally not an indication of device failure.

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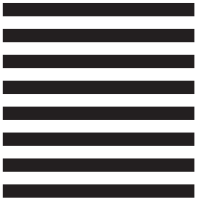

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