



# CHAPTER 1

## Cisco PVM Overview

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This chapter provides information for getting started with the Cisco Performance Visibility Manager (Cisco PVM), a centralized network analysis application used to view, manage, and troubleshoot network traffic. This chapter contains the following sections:

- [Cisco PVM Overview, page 1-1](#)
- [Before Using Cisco PVM, page 1-2](#)
- [User Access to Cisco PVM Functions, page 1-3](#)
- [Logging in to Cisco PVM, page 1-4](#)
- [Navigating the Dashboard, page 1-6](#)
- [Understanding Data Views, page 1-13](#)
- [Monitoring and Reporting Functions, page 1-16](#)
- [Enhancing Filter Operations, page 1-20](#)
- [Displaying the Cisco PVM Version Number, page 1-20](#)
- [Closing the Dashboard, page 1-21](#)

## Cisco PVM Overview

Cisco PVM is a centralized network management tool that enhances the Network Analysis Module (NAM) for Cisco Catalyst 6500 Series switches, 7600 Series routers, and Branch series routers by providing visibility into the network that aids troubleshooting and QoS management. Cisco PVM is designed to:

- Give end users visibility into their networks and applications.
- Collect, aggregate, and correlate data from multiple NAMs and network devices.
- Provide critical performance information through a graphical user interface (GUI) for troubleshooting, traffic analysis, monitoring, and capacity planning.
- View alarms showing deviations from an established baseline of network and application traffic flows.
- Collect application response time (ART) data from several NAMs and correlate the data to provide end-to-end response time information for applications.
- Monitor the network continuously to identify network performance problems so that they can be resolved before end users are affected.

- Provide a consistent and complete assessment of performance with comprehensive, pre-configured reports.

Cisco PVM is a highly scalable and distributable real-time data collection, correlation, and aggregation engine providing a centralized and integrated end-to-end (E2E) network view. It adds value to the Cisco NAM Traffic Analyzer, as well as other applicable Cisco performance and traffic management product suites.

## Before Using Cisco PVM

Before accessing the Cisco PVM Dashboard for the first time, verify that the following third-party software applications are installed on the client machine:

- Internet browser—Microsoft Internet Explorer 6.0 or greater.
- Report viewer—Adobe Reader 6.01 to 6.04. The reader is available free of charge at:  
[http://www.adobe.com/products/acrobat/readstep2\\_allversions.html](http://www.adobe.com/products/acrobat/readstep2_allversions.html)

The reader software is required to read and print documentation included with the Cisco PVM dashboard, such as reports and guides.

This section contains the following topics:

- [Database Archiving, page 1-2](#)
- [Client System Requirements, page 1-2](#)

## Database Archiving

You can set up Cisco PVM to archive configuration tables for either the online analytical processing (OLAP) or online transaction processing (OLTP) databases. To use this command-line utility, see [Appendix C, “Database Archiving.”](#)

## Client System Requirements

Access to the Cisco PVM dashboard requires Internet Explorer running on these operating systems:

- Red Hat Enterprise Linux Version 4 (inclusive)  
You can find more information about RHELv4 and download software at the following URL:  
<http://www.redhat.com/rhel/details/features/>
- Red Hat Enterprise Linux Version 3 (with Update 8 or higher)  
You can find more information about RHELv3 and download software at the following URL:  
<http://www.redhat.com/rhel/details/enterpriselinex3/>
- Microsoft Windows 2000 or XP.

The complete minimum software and hardware requirements for client machines (to view the GUI) appear in [Table 1-1](#).

**Table 1-1** Minimum Client System Requirements

Client Machine Component	Minimum Requirement
Disk Storage	4.0 GB
Processor	Pentium 4
System Memory	256 MB
Operating System	Microsoft Windows 2000 or XP
Display Settings: Resolution	1024 x 768
Display Settings: Color Palette	True Color
Browser	Microsoft Internet Explorer 6.0 (with Java, JavaScript, and cookies enabled)  <b>Note</b> Recommended: 6.0 SP2 for XP users, or 6.0 SP1 with all available updates for Windows 2000 users.
Report Viewer	Adobe Reader 6.01 and higher

**Caution**

If you are running Windows 2000, you must ensure that you have all of the latest updates from Microsoft for both the OS *and* for Internet Explorer. You must have IE Service Pack 1 and all of its updates installed on the client workstation for optimal Cisco PVM performance. Ensure that IE is running the necessary functions by clicking **Tools > Internet Options > Advanced > Restore Defaults** after all updates to your system have been made.

## User Access to Cisco PVM Functions

Depending on whether you are a Cisco PVM Administrator or General User, you can access some or all system functions. Access permissions are set by the Cisco PVM Administrator. The Cisco PVM functions available to each user type are summarized in [Table 1-2](#).

**Table 1-2** User Access to Cisco PVM GUI Functions by User Type

Cisco PVM GUI Function	Administrator	General User
<b>Setup</b>		
NAMs, Switches, Routers: add, edit, delete, view, enable, and disable	<b>x</b>	
Thresholds: add, edit, delete, view, enable, and disable	<b>x</b>	
Data Source Groups: add, edit, delete, and view	<b>x</b>	
System Preferences: view and edit	<b>x</b>	
<b>Monitor</b>		
Run and view near real-time and real-time monitoring charts for single and aggregated NAM data	<b>x</b>	<b>x</b>

**Table 1-2** User Access to Cisco PVM GUI Functions by User Type (continued)

Cisco PVM GUI Function	Administrator	General User
<b>Reports</b>		
Run, view, and schedule historical reports for single and aggregated NAM data	<b>x</b>	<b>x</b>
<b>ART</b>		
Add, edit, delete, and view ART Groups	<b>x</b>	
Run ART reports	<b>x</b>	<b>x</b>
<b>Alerts</b>		
View Threshold-crossing alarms	<b>x</b>	
View system events	<b>x</b>	
<b>Admin</b>		
View security events	<b>x</b>	
Add, edit, delete, and view user accounts	<b>x</b>	
Change other users' passwords	<b>x</b>	
Change own password	<b>x</b>	<b>x</b>

## Logging in to Cisco PVM

The login ID and password that you receive from your system administrator determines whether you are a user with administrator or general access permissions. If you are unable to log in to the system, check with the Cisco PVM administrator for the correct login information.



### Note

If the system has been set up to invoke Lightweight Directory Access Protocol (LDAP) user authentication, login IDs and passwords are not assigned through Cisco PVM user management. Check with your system or network administrator for login information.

**Step 1** Open a browser window.



### Note

Verify that you have enabled Java, JavaScript, and cookies.

**Step 2** In the address bar, enter the URL for Cisco PVM in the format **https://<hostname>:8443**.



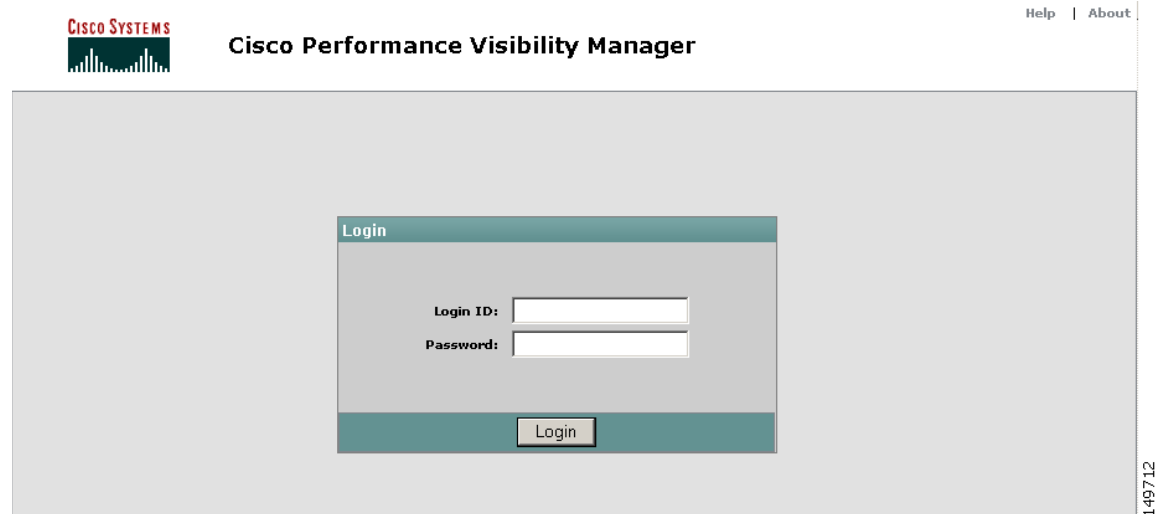
### Note

To run Cisco PVM in HTTP mode, see the [“Enabling Non-Secure Access to the PVM GUI” section on page 1-5](#)

**Step 3** Click **OK** or **Yes** at any prompts indicating that you are entering a secure server requiring a valid certificate.

The Cisco PVM login window appears, as shown in [Figure 1-1](#).

Figure 1-1 Cisco PVM Login Window

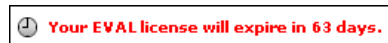


**Step 4** Enter your Login ID and password.

**Step 5** Click **Login** or press **Enter**.

Cisco PVM automatically opens the Overview display under the Monitor tab. If you are running Cisco PVM in Evaluation mode, you will see a message at the top of the window stating when the license expires, as shown in Figure 1-2.

Figure 1-2 Cisco PVM Evaluation Mode

**Note**

For information on obtaining and installing the license file, see the *Cisco Performance Visibility Manager Installation Guide*.

## Enabling Non-Secure Access to the PVM GUI

To run Cisco PVM in HTTP mode instead of the default HTTPS, complete the following steps:

**Step 1** Configure JBoss HTTP-Invoker:

- Edit file

\$JBOSS\_HOME\server\default\deploy\http-invoker.sar\META-INF\jboss-service.xml and update each mbean *InvokerURLPrefix* and *InvokerURLSuffix* to use the proper protocol and port number (they occur four times). Following are examples using HTTP and port 8080:

```
<attribute name="InvokerURLPrefix">http://</attribute>
```

```
<attribute name="InvokerURLSuffix">:8080/...</attribute>
```

**Step 2** Configure JBoss Web server (Tomcat):

- a. Stop PVM.
  - b. Edit the file:  
\$JBOSS\_HOME/server/default/deploy/jbossweb-tomcat41.sar/META-INF/jboss-service.xml to enable non-secure access to PVM GUI via port 8080
  - c. Comment out (by enclosing between '<!--' and '-->' strings) the corresponding connector section. After commenting, the section should appear as follows:
 

```
<!-- SSL/TLS Connector configuration using the SSL domain
keystore<ConnectorclassName="org.apache.coyote.tomcat4.CoyoteConnector"address="{jboss.bind.address}"port =
"8443"minProcessors="5"maxProcessors="50"enableLookups="true"acceptCount="10"debug
="0"connectionTimeout="50000"scheme="https"secure="true"><FactoryclassName="org.apache.coyote.tomcat4.CoyoteServerSocketFactory"keystoreFile="{jboss.server.home.dir}/conf
/ssl.keystore"keystorePass="changeit"protocol="TLS"/></Connector-->
```
  - d. Uncomment the corresponding connector section. After un-commenting, the section should appear as follows:
 

```
<!-- A HTTP/1.1 Connector on port 8080 --><Connector
className="org.apache.coyote.tomcat4.CoyoteConnector"address="{jboss.bind.address}"
port="8080" minProcessors="5" maxProcessors="50" enableLookups="true"
acceptCount="10" debug="0" connectionTimeout="5000" useURValidationHack="false"/>
```
  - e. Start PVM.
- 

## Navigating the Dashboard

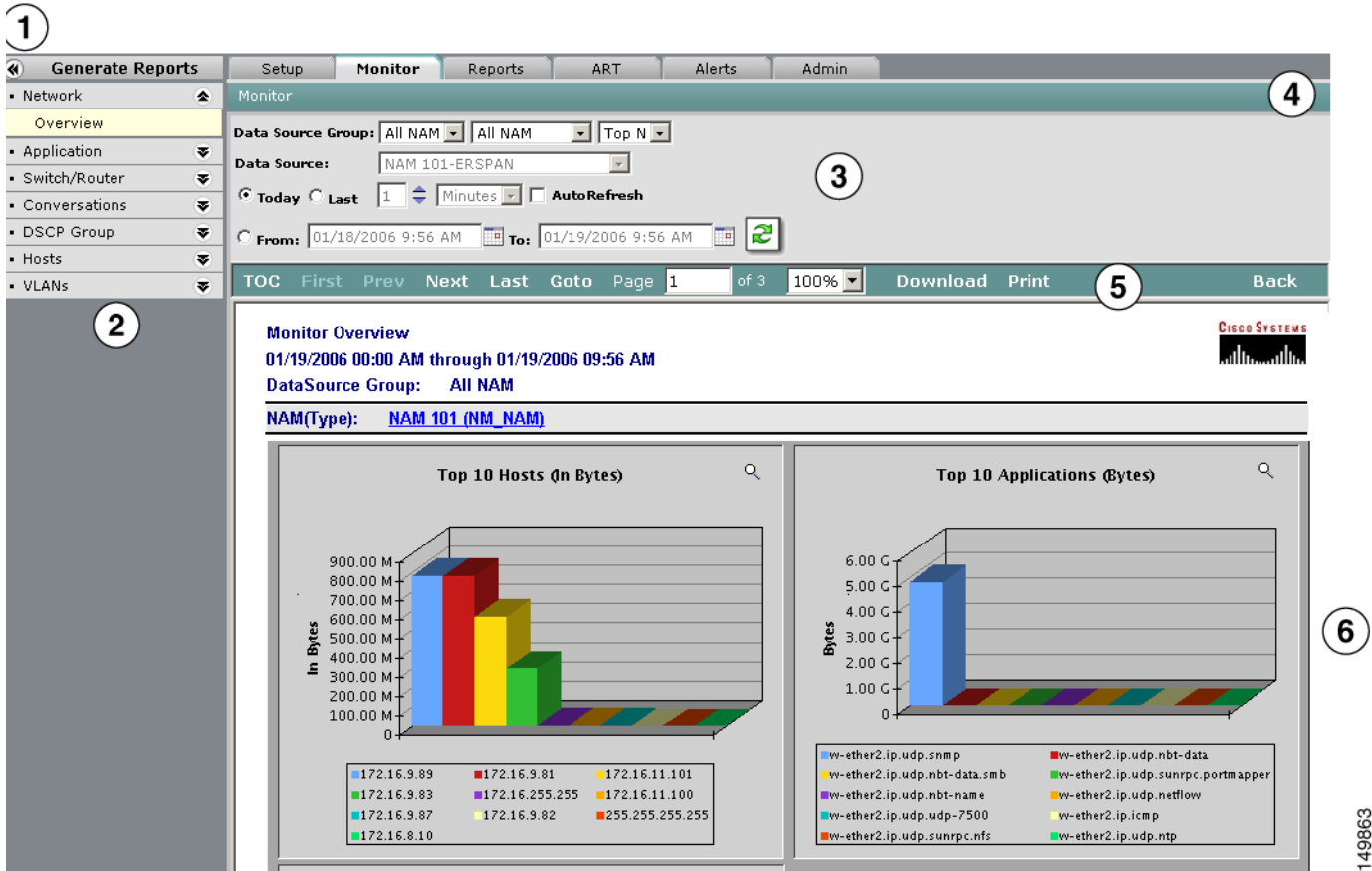
This section contains a general overview of the navigational features including navigational tabs, links, and submenu items available in the dashboard window. It contains the following topics:

- [Dashboard View, page 1-6](#)
- [System Navigation Links, page 1-9](#)
- [Navigation Tabs, page 1-9](#)

## Dashboard View

When Cisco PVM opens, the Monitor tab automatically displays a network Overview report. The report displays the system tabs and report result pane only, leaving menu items and report parameters hidden. You can expand the menu and report parameters pane to view other reports or change variables, as shown in [Figure 1-3](#)

Figure 1-3 Cisco PVM Dashboard—Monitor Overview Report Default



149863

1	Generate Reports Menu Expand/Collapse Icon	2	Report Suite Menu Items with Expansion Icons
3	Report Parameters Pane—Monitor Tab	4	Parameters Pane Expand/Collapse Icon Location
5	Report Page Header	6	Report Display Pane





### Expand/Collapse Icons

Whenever you run a report, the Cisco PVM GUI shows only the report display pane and hides all other GUI functions except the tabs. In the Monitor, Reports, and ART Reports windows, you can expand or collapse the Generate Reports menu, individual report suites, and the report parameters panes using the various icons shown in Table 1-3.

Table 1-3 Expand/Collapse Icons

Action	Icon
Expand Reports Menu	
Collapse Reports Menu	

**Table 1-3** Expand/Collapse Icons (continued)

Action	Icon
Expand Report Suite	
Collapse Report Suite	
Expand parameters pane	
Collapse parameters pane	

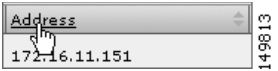
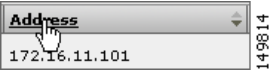
## Sorting Lists

The dashboard view for tabs such as Setup, ART, Alerts, and Admin displays lists of groups or other elements, menu items, an area for filtering the list, and action buttons for adding devices, viewing alerts, and setting up data groups or other system parameters. Some users will not see all tabs or all functions, as described in [Table 1-2 on page 1-3](#).

You can click the name of a column header in any Cisco PVM table to sort the list in ascending or descending order. The appearance of the column header changes depending on the order in which the column has been sorted.

[Table 1-4](#) explains how to use column sorting in Cisco PVM tables.

**Table 1-4** Sorting Columns in Cisco PVM Screens

To sort the column as...	Click the header..	Column Header Appearance
Ascending	Once	
Descending	Twice	

## Pagination Links

In windows displaying tabular lists of more than 12 items (such as Alerts), Cisco PVM displays a set of pagination links above the upper right corner of the table. These links allow you to navigate backwards and forwards through the entire list of items.

- **First/Prev**—Navigates to the window before the current or to the first window in the entire list (these links are inactive on the first window of the list).
- **[Number]**—Navigates to the specific window of the list.

- **Next/Last**—Navigates to the window after the current window or to the last window in the entire list (these links are inactive on the last window of the list).

A summary statement above the upper left corner of the table displays the location of the current display in the entire list, such as, “22 items found, displaying 1 to 12.”

## System Navigation Links

Table 1-5 summarizes the system navigation links found on each window of the Cisco PVM GUI.

**Table 1-5** System Navigation Links

Link	Description
Logout	Logs you out of Cisco PVM and returns to the Login window.
Help	Launches Cisco PVM online help in a new browser window.  <b>Note</b> Help for General Users only is displayed at the login window. After you log in as an Administrator, the help link opens the Administrator help topics.
About	Displays the version of the Cisco PVM software including the build number.

## Navigation Tabs

Cisco PVM provides the following easy-to-use navigation tabs directing you to functional areas. The following sections display figures depicting the location of Cisco PVM navigation tabs and the menu items that appear beneath each tab.



### Note

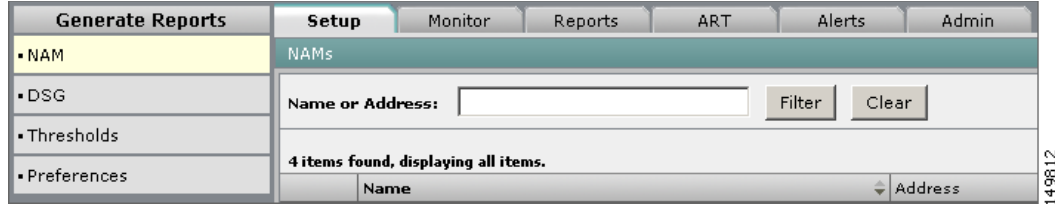
Detailed information, including specific procedures for each tab, is found in the remaining chapters of this guide.

## Setup

Setup allows users to:

- View, add, edit, delete, and import NAMs and supporting switches and routers, as well as enable or disable data collection on individual NAMs.
- Define thresholds for monitoring in the Alert Viewer.
- Define data collection groups, called Data Source Groups, by NAM or switch/router data flows; the data source groups are then available for selection in the reporting and monitoring suites.
- Define system configuration preferences including default threshold severity levels, baseline duration and re-calibration periods, and the system-wide collection cycle.
- Access the NAM Traffic Analyzer for a selected NAM.

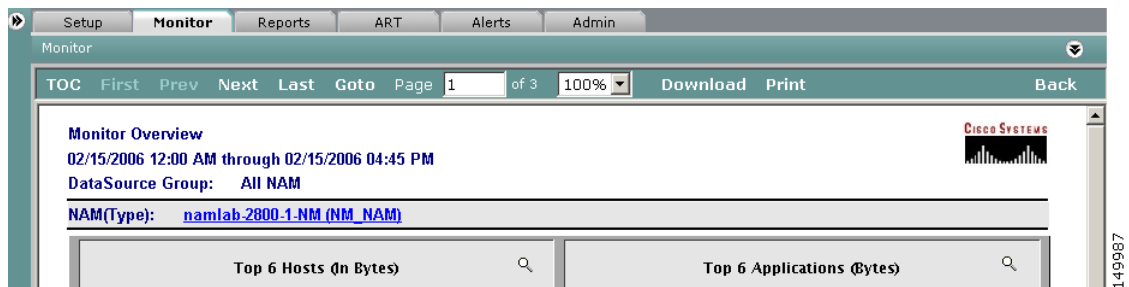
The Setup tab also provides access to the external NAM configuration web interface (see [Figure 1-4](#)).

**Figure 1-4 Setup Tab**

## Monitor

The Monitor tab allows you to monitor resources based on information from a single NAM or from multiple NAMs across the network, in near real time. This gives you the ability to monitor specific sections of the network or to access an All NAMs view that displays multiple NAMs across the network for quick comparisons.

When the Monitor tab displays, as well as every time you run a report, the Generate Reports menu area and the report parameters pane are collapsed. Click the Expand/Collapse icons on the upper left and right sides of the window to open the list of available reports and the parameters pane. Figure 1-5 shows the default Monitor display.

**Figure 1-5 Monitor Tab—Default Display**

- Real-time charts are linked to reports generated from the Monitor GUI, and provide a visual display of changes in data flows by data source and variable for a selected NAM or switch/router. These charts display true real-time information.
- Trending reports are linked to reports generated in the Monitor GUI, and provide a magnified view of raw data for analysis of abnormal or problematic traffic patterns.

## Reports

The Reports tab provides an extensive set of web-based reporting features that allow you to take a snapshot of activity for a specified reporting period. Reports are automatically archived and can be retrieved and printed in the report viewer.

When the Reports tab displays, the menu of available reports (Generate Reports) is expanded and defaults to the Applications report. Every time you run a report, however, the menu area collapses. Click the Expand/Collapse icon on the upper left of the window to show or hide the list of available reports. Figure 1-6 shows the default Reports tab display.

Figure 1-6 Reports Tab—Applications Parameters Pane Default

The screenshot displays the 'Reports' tab in the Cisco PVM interface. The left sidebar contains a tree view with 'Applications' selected. The main content area is titled 'Applications Report Period' and includes the following sections:

- Applications Report Period:** Includes radio buttons for 'Today', 'Current' (with a 'Week' dropdown), 'Previous' (with a '1' spinner and 'Days' dropdown), and 'Previous' (with a '1' spinner and 'Calendar' dropdown). It also has 'From' and 'To' date/time pickers set to 02/05/2006 4:23 PM.
- Report View:** Includes 'Data Source Group' with three dropdowns (All NAM, All NAM, NAM 151-ERSPAN) and a 'Report Type' dropdown set to 'Cumulative Rates'.
- Schedule:** Includes a 'Report Name' text field, radio buttons for 'Right Now', 'Once', and 'Recurring'. The 'Recurring' section has a 'Run The Report' dropdown set to 'Every Day', and fields for 'Time', 'Start', and 'Until' with '(Hh:Mm AM/PM)' format.

A 'Run' button is located at the bottom right of the main area. The number '149897' is visible in the bottom right corner of the screenshot.

- Real-time charts are linked to reports generated from the Reports GUI, and provide a visual display of data flows by data source and variable for a selected NAM or switch/router. These charts display true real-time information.
- Trend reports are linked to reports generated in the Reports GUI, and provide a magnified view of raw data for analysis of abnormal or problematic traffic patterns.

**Note**

For a summary of the differences between the Monitor and Reports tabs, see [Monitoring and Reporting Functions, page 1-16](#).

**ART**

The ART tab (see [Figure 1-7](#)) provides access to reports for Network Flight, Server Response, and Client-Server Response Times, as well as the Client Investigation Report. The reports under the ART tab allow specialized views of response time and other client/server data with links to protocol-specific information. Users can also set up ART Groups for aggregation of ART-specific data.

**Figure 1-7** ART Tab—Setup Default

ART Group Name	Description	Interval
<input type="checkbox"/> ART All NAM	ART All NAM	180

## Alerts

The Cisco PVM Alerts tab (Figure 1-8) displays service alerts. Cisco PVM polls data flows to detect user-defined thresholds that have been violated. Using the filter feature, you can display a list of threshold and system alerts occurring within a specific time period. You can select a start and end date during which the alerts occurred and specify the severity of the alert to display only those records meeting the specified criteria. Details of an alert management record can be viewed from the Alerts list. Additionally, you can stop or resume monitoring for specific alerts by enabling and disabling Thresholds under Setup.

**Figure 1-8** Alerts Tab

Severity	Date	Description	Log Type
59 items found, displaying 1 to 12.			



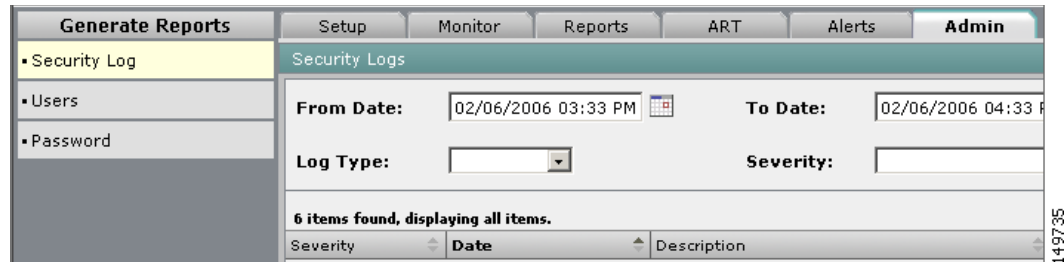
### Note

Alerts are displayed in continuous mode, so an alert related to the same source will continue to appear until the set threshold value is no longer violated. You can therefore see an alert from the same source appear at progressively lower severity levels until it clears. Threshold values are assigned under the Setup tab.

## Admin

The Admin tab (see Figure 1-9) allows you to view security events and change passwords, as well as add, edit, view, and delete user accounts.

Figure 1-9 Admin Tab



## Understanding Data Views

The Cisco PVM Monitor function displays near real-time traffic data views for applications, hosts, conversations, switches/routers, VLANs, and response times. You can view network resources based on these types and drill down to access details about a particular resource. The GUI allows you to select key traffic views based on NAM aggregation data types.

This section contains the following topics:

You select which data to view on generated reports using the drop-down selection menu available in the parameters pane at the top of the Monitor window. You can select a Data Source Group (DSG) and one of the following types of data views:

- **Data Source**—displays data for a specific data source available in the selected DSG.
- **All NAM**—displays data for all NAMs in the DSG.
- **Aggregated**—displays collated data from multiple NAMs and data sources across the network.

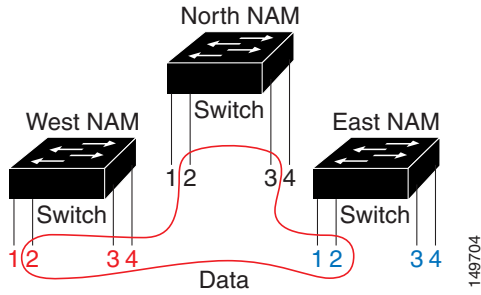
To supply traffic information to the Monitor and Reports functions, Cisco PVM uses the Data Source Group, a logical collection of raw data sources that users can customize into groups for NAMs, switches, and routers. Cisco PVM uses DSGs for those system functions that require calculating statistics over multiple data sources, such as Thresholds and reports.

When you set up a DSG, you can view all existing data sources by NAM or supporting device, and you can specify only those sources you want to include in the group. You can therefore combine similar data sources from multiple NAMs or supporting devices into a single DSG.

The following figures show a DSG example and the possible data views that can be generated in reports. The red line in [Figure 1-10](#) shows the numbered data sources selected from specific NAMs that define the DSG:

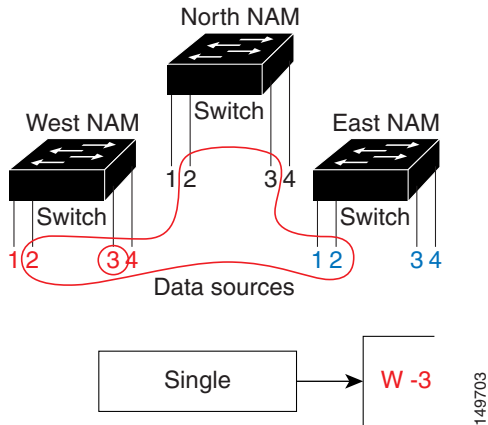
- Sources 2, 3, and 4 from the West NAM
- Sources 2 and 3 from the North NAM and
- Sources 1 and 2 from the East NAM.

**Figure 1-10 Schematic of a Data Source Group**



The following three figures depict which data sources from the DSG are selected for each of the available data views. The red circle in [Figure 1-11](#) indicates that data source 3 only has been selected from the DSG as the source to use to generate the report.

**Figure 1-11 Single Data Source View**



The red ovals in [Figure 1-12](#) show that data sources from all NAMs in the DSG have been chosen as the source to generate the report.

Figure 1-12 All NAM View

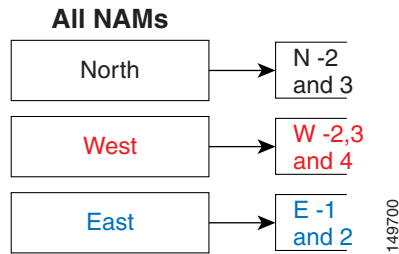
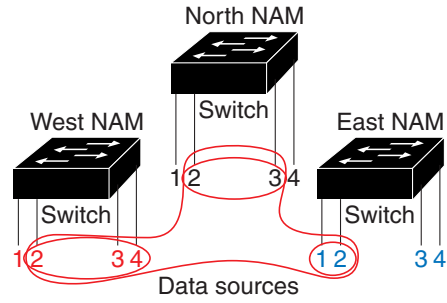
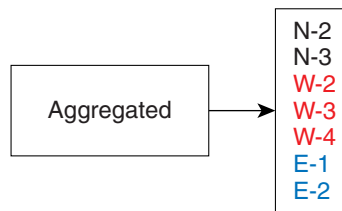
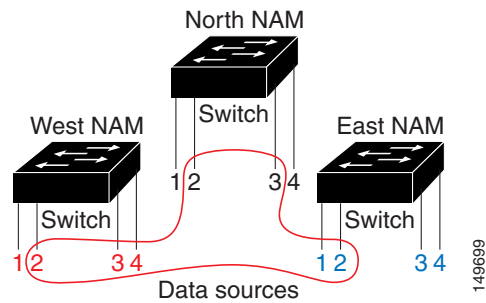


Figure 1-13 shows that the entire DSG has been chosen as the data source for generating the aggregated (collated) data view.

Figure 1-13 Aggregated View



# Monitoring and Reporting Functions

The Monitor and Reports tabs present many of the same report suites and can display data from the same sets of sources. This section contains the following topics:

- [Monitor and Reports Comparison, page 1-16](#)
- [Reports Navigation, page 1-16](#)
- [Dynamic Data Displays, page 1-19](#)

## Monitor and Reports Comparison

The generated reports under both tabs also appear with similar layouts and drill-down capabilities. However, the purpose of the Monitor function is to provide a dynamic view of current network activity, including an auto-refresh function that regenerates the report based on a user-specified time interval. The Reports function allows you to schedule current and historical snapshots of network performance for business and network management reporting purposes, including an archive function that stores each report generated. [Table 1-6](#) displays the key differences between the two functions.

**Table 1-6** *Monitoring and Reporting Comparison*

Function	Monitoring	Reporting
General Purpose	Real-time monitoring of data sources	Historical reporting
Available data ranges (report scope)	<ul style="list-style-type: none"> <li>• Today</li> <li>• Last minute or hour</li> <li>• Date range</li> </ul>	<ul style="list-style-type: none"> <li>• Today</li> <li>• Current week, month, year</li> <li>• Previous day, week, month, year</li> <li>• Previous calendar day, week, month, year</li> <li>• Date range</li> </ul>
Overview display	Y	N
Reports Run Automatically <sup>1</sup>	Y	N
Display Auto-Refresh	Y	N
Real-Time Charts link	Y	Y
Trending Reports link	Y	Y
Scheduling	N	Y
Archiving	N	Y

1. When you click on a report name, the report generates based on the last set of selected parameters.

## Reports Navigation

Whenever you run a report, you will see a Progress Indicator ([Figure 1-14](#)) that shows the system is calculating report values based on the parameters you have chosen and is in the process of displaying the report view.

**Figure 1-14 Report Progress Indicator**

## Report Types

After you have selected the Data Source Group and data type you want to view, select a Report Type for generating the report:

- **Current Rates**—Displays the statistics collected over the selected time period.
- **Cumulative Rates**—Displays the statistics collected for the selected report element since the collection was created or within the selected time period.
- **TopN**—Displays the data collected for the TopN selected report elements, such as Hosts, VLANs, or Hosts, over the selected time period. The value of N is configured by selecting **Setup > Preferences**.

## Available Data Views for Individual Reports

Table 1-7 shows the report types available for reports available under both the Monitor and Reports tab. The reports support each data view:

- Data Source
- All NAM
- Aggregated

**Table 1-7 Available Report Types**

Report	Tab	Report Type(s) Available
Overview	Monitor only	TopN only
Host Details	Reports only	<ul style="list-style-type: none"> <li>• Cumulative Rates</li> <li>• Current Rates</li> </ul>
Application Details	Reports only	<ul style="list-style-type: none"> <li>• Cumulative Rates</li> <li>• Current Rates</li> </ul>
All other reports	Monitor and Reports	All



### Note

Because switch and router data sources do not support the same set of statistics, data cannot be aggregated for Data Source Groups containing both switches and routers. Therefore, Data Source Groups containing both switch and router data sources do not support the Aggregated view for monitoring and reporting.

## Navigation Links

After you have run a report, navigating through generated reports is accomplished using the navigation links available in every report header (see [Figure 1-15](#)).

**Figure 1-15** Report Header



**TOC**—(Table of Contents) Displays a list of NAMs used to generate the current report, as assigned in the selected Data Source Group. For example, if the report was generated using a data from four different NAMs, the TOC pane displays the name of each NAM as a link to a separate page in the report. Clicking TOC once opens the list in a pane to the left of the report; clicking TOC again closes the left pane.

**First**—Navigates to the first window of a multi-window report.

**Prev**—Navigates to the previous window of a multi-window report.

**Next**—Navigates to the next window of a multi-window report.

**Last**—Navigates to the last window of a multi-window report.

**Goto Window \_\_\_ of N**—Navigates to a specific report window number when you enter the number and clicks Goto.

**Size drop-down box**—Displays zoom drop-down options (25% to 400%).

**Download**—Enables downloading and saving of reports in various formats.

**Print**—Enables printing of reports from the Acrobat Reader report viewer.

**Back**—Returns to the original report to which the current display is linked.

## Column Sorting in Tabular Reports

Column header names in Cisco PVM reports contain sorting arrows that display a new window with data sorted in either ascending or descending order, as shown in [Figure 1-16](#).

**Figure 1-16** Sorting Arrows



## Downloading Reports

Reports can be downloaded and saved in Portable Document Format (PDF), Microsoft Excel, and Rich Text Format files. To download reports, complete the following steps:

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**Step 1** Click **Download** in the report header.

The download window opens.

**Step 2** Select the file format you want to use to view or save the report.




---

**Note** Follow the on-screen tips for helpful information regarding which data format to choose.

---

**Step 3** Select the desired range of pages to be exported in the Window Range section.

**Step 4** Click **Save Report**.

The File Download window opens. Clicking **Open** in the Windows File Download window opens the file in an application according to the file type you chose to download.

**Step 5** Click **Save** in the File Download window.

The Save As File window opens.

**Step 6** Save the file:

- a. Browse to the location where you want to save the file.
- b. Enter the appropriate file name in the **File name** field.
- c. Choose the file type from the **Save as type** drop-down list.
- d. Click **Save**.

The data is exported to the selected format and saved in the selected location.

**Step 7** Close the Cisco PVM Download window by clicking **Close**.

---

## Printing Reports

The print function available in the report opens the current report using Acrobat Reader launched in a new window, then opens the dialog for printing the report as a PDF document. To print reports, complete the following steps:

---

**Step 1** Click **Print** in the report header. The report opens a new window, and the Acrobat Print window opens immediately following.

**Step 2** Set any necessary printing options in the Print window, as you normally would, and click **OK**. The report prints in PDF format.

**Step 3** Close the Acrobat Reader window by clicking the close button in the upper right corner.

---

## Dynamic Data Displays

This section explains the two ways that Cisco PVM displays dynamic data:

- Real-Time Charts—display pop-up windows that show data refreshed in real-time.
- Trend Reports—display raw data with a trend line from selected report time periods for a magnified view of report data.

## Real-Time Charts

Cisco PVM displays access to real-time data through links available in report displays. Monitoring reports that are displayed in tabular format contain a link in each table row that opens a Real-Time Chart pop-up window for the corresponding report element (such as host or protocol). Clicking the link opens a new window to monitor the details for the selected report element graphed in real time. Once opened, the chart continually refreshes to give a running view of changes in real-time traffic over the network.

**Note**

Real-Time Chart drill-down capability is available for all tabular reports displaying either the Data Source or All NAMs views.

For more information about Real-Time Chart functionality, see [Real-Time Charts](#), page 3-14.

## Trend Reports

Cisco PVM enables you to analyze problematic areas of the network by providing access to raw data displayed with a normalizing trend line directly from aggregated data views. Reports displaying aggregated data in tabular format contain a link in each table row that opens a Trend Report for the corresponding report element (such as VLAN ID). Clicking the link in the report display opens the Trend Report for the selected row. The report displays raw data for the selected network component (such as protocol, host, or interface) with a superimposed line showing the data trend over time, offering a magnified view of the data flow for analysis of abnormal or problematic patterns.

For more information about Trend Report functionality, see [Trend Reports](#), page 3-18.

## Enhancing Filter Operations

When filtering lists in Cisco PVM display panes, the percent symbol (%) or the asterisk (\*) can be used as a wildcard character to broaden the search, but it is not required. It can be typed both before and after a variable (such as a parameter or an IP address), or it can be typed by itself to list all items available for a particular field. Leaving a field blank will return all results for that field, as constrained by other filter parameters. Filter operations in Cisco PVM are not case-sensitive.

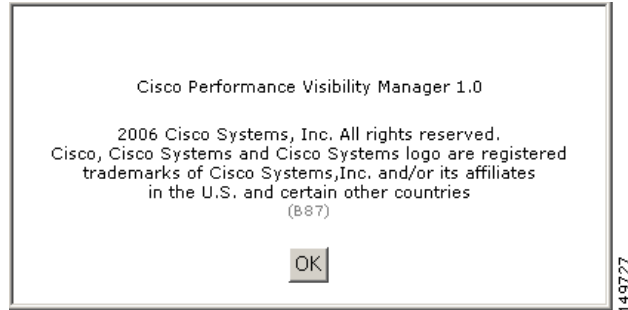
The use of a wildcard character is not required in Cisco PVM, but you can use either the percent character (%) or the asterisk (\*) as wild cards if desired. For example, to find the user “Virginia” in a list of users, you could enter any of the following strings as search criteria:

- virg
- irg
- virg%
- i\*g

Leaving the field blank will return a list of all users. If you want to return to the original, unfiltered list, click **Clear**, then click **Filter**.

## Displaying the Cisco PVM Version Number

If you need to contact Cisco Technical Support, please have the Cisco PVM version number ready. To obtain the version number, select the **About** link in the upper right portion of the Cisco PVM Dashboard. To close the About box, click **OK**. The About box (see [Figure 1-17](#)) opens as a pop-up window; the version number appears at the end of the first line of text and the current build number appears in the last line of text.

**Figure 1-17 About Box**

## Closing the Dashboard

To close the dashboard:

- select the **Logout** link on the upper right portion of the window or
- close the browser window.

