

HP OpenView Performance Insight

Cisco IP Telephony Statistics Report Pack User Guide

Software Version: 3.0

Reporting and Network Solutions 7.0



November 2004

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Overview

This overview covers the following topics:

- [OVPI and Cisco Gateway Statistics](#)
- [Folders and Reports](#)
- [Integration with NNM](#)
- [Ways to Customize Reports](#)
- [Sources for Additional Information](#)

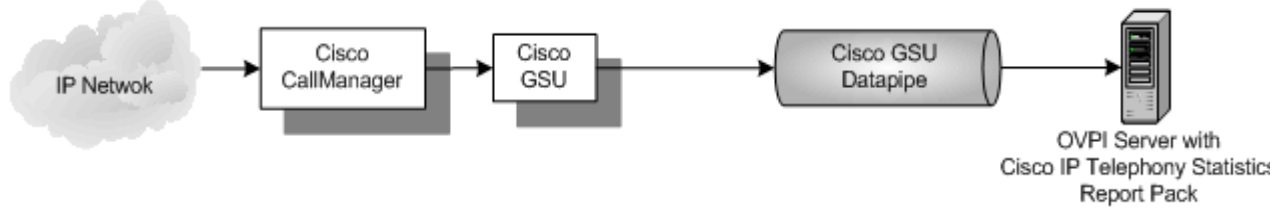
OVPI and Cisco Gateway Statistics

The Cisco IP Telephony Statistics Report Pack monitors Cisco CallManager resources. The reports in this package highlight resources that are underutilized and resources that are not in balance. Use the reports in this package to display performance information for:

- CAS channel usage
- PRI channel usage
- FXO port usage
- FXS port usage
- Total call volume handled by an instance of a CallManager
- Time spent in different states by channels of a given gateway

Cisco GSU (Gateway Statistics Utility) is a drop-in module for CiscoWorks IP Telephony Environment Monitor. Although Cisco GSU collects performance statistics for Media Gateway Control Protocol (MGCP) gateways and for Cisco IOS (H323) gateways, the current version of Cisco IP Telephony Statistics supports MGCP gateways only.

Output from the Cisco GSU is reformatted by a preprocessor. The preprocessor is part of the Cisco GSU Datapipe. After the preprocessor reformats output from the Cisco GSU, the Cisco GSU Datapipe imports the results into OVPI. The figure below shows a Cisco CallManager, a Cisco GSU, the Cisco GSU Datapipe, and an OVPI server running the Cisco IP Telephony Statistics Report Pack.



The following table outlines recent changes to the Cisco IP Telephony Report Pack.

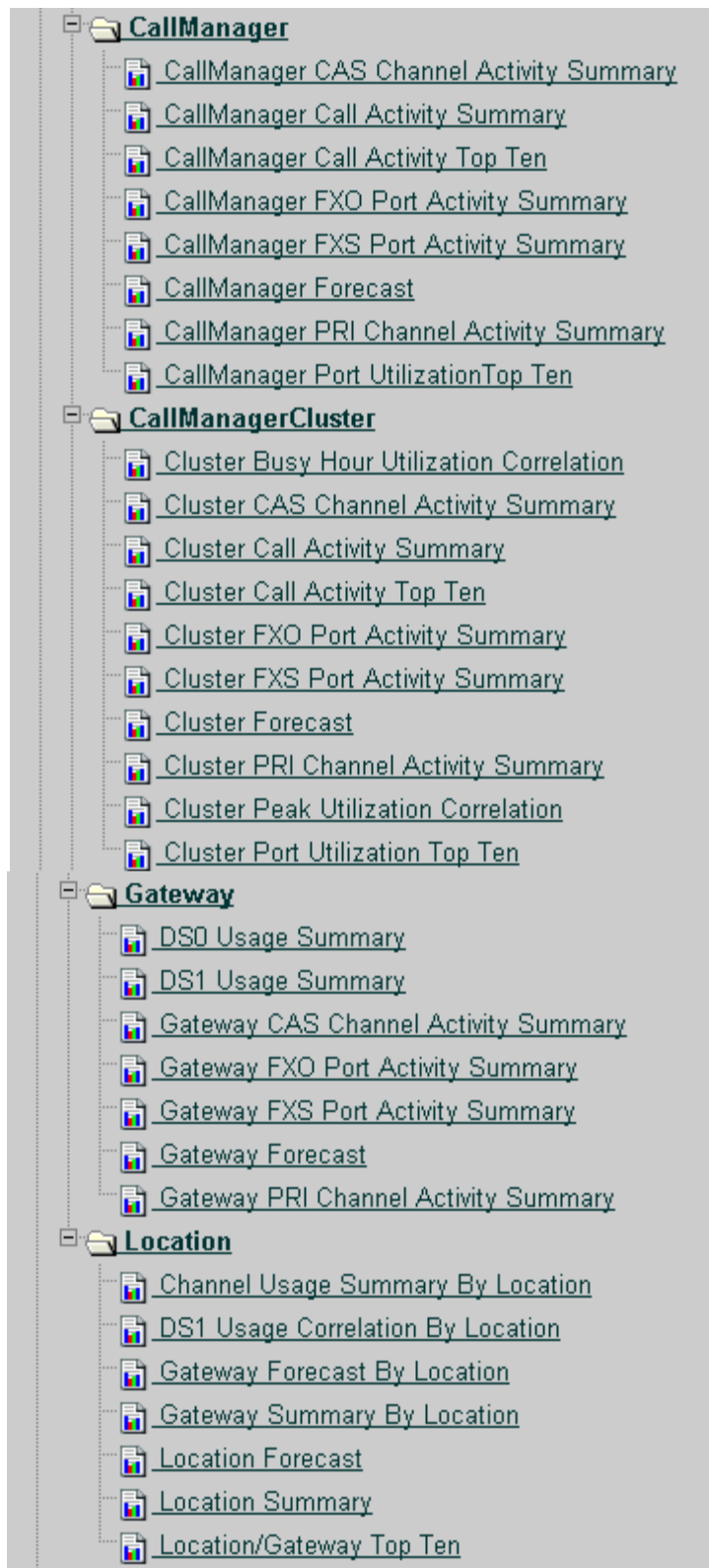
Version	RNS Version and Date	Features/Enhancements
1.0	RNS 3.0 - May 2003	32 reports Cisco GSU Datapipe 1.0
2.0	RNS 4.0 - October 2003	OVPI Object Manager support Cisco GSU Datapipe 2.0 <i>new change forms:</i> <ul style="list-style-type: none"> • Configure a New CallManager Cluster • Assign CallManagers to Clusters • Configure Gateway Thresholds • Configure CallManager Thresholds • Configure Channel/Port Thresholds
2.0	RNS 5.0 - April 2004	OVPI 5.0 support
3.0	RNS 6.0 - August 2004	Oracle support Cisco GSU Datapipe 3.0
3.0	RNS 7.0 - November 2004	No changes

Folders and Reports

If the Management Console, one of the OVPI clients, is installed on your system, you can access the reports in Cisco IP Telephony Statistics by navigating the object model. If you are accessing reports on the web, you will see the following folders:

- CallManager Cluster
- CallManager
- Gateway
- Location

As shown below, each folder contains a mix of summary reports, top ten reports, correlation reports, and forecast reports.



Top Ten reports perform a ranking function. They make it easy for you to locate heavily used CallManagers, CallManager Clusters, gateways, and locations based on yesterday's resource utilization levels.

Summary reports provide historical data for groups of devices organized by CallManager Cluster, CallManager, gateway, DS1 and other user-defined groups. Use these reports to find out whether recent excess traffic is a short-lived anomaly or a longer-term trend that may require corrective action.

Forecast reports show estimates for future port utilization. These reports highlight items that are trending toward over-utilization or under-utilization. Use these reports to find out which CallManager Clusters, CallManagers, gateways, and locations will be over-utilized or under-utilized in the near future.

Integration with NNM

If you use NNM as well as OVPI, you have the option of improving your problem diagnostic abilities by integrating OVPI and NNM. You integrate these systems by installing the NNM/Performance Insight Integration Module. See the *NNM/Performance Insight Integration Module 2.0 User Guide* for details.

If NNM and OVPI are integrated, you can access all of the reports in IP Telephony Statistics from the Report Launchpad window, a window you can access from multiple NNM interfaces, including NNM map (ovw), Home Base Dynamic Views, and the NNM alarm browser. In addition to launching OVPI reports from the Report Launchpad window, you can also use the NNM alarm browser to see threshold breaches detected by OVPI. If you want to implement this feature, you must install the optional thresholds sub-package that comes with IP Telephony Statistics. Installing this sub-package activates a set of default thresholds and configures OVPI to send threshold traps to NNM.

For a description of the defaults activated by the thresholds sub-package, and the change forms you can use to modify defaults, see [Chapter 5, Package Configuration](#).

Ways to Customize Reports

You can change the contents of a report by applying group filters, by applying constraints, and by selecting a different view option for individual tables and graphs. For details about view options for tables and graphs, see [Chapter 10, Editing Tables and Graphs](#).

Applying Group Filters

If you intend to share reports with external customers, you will need customer-specific reports. Creating customer-specific reports involves the following tasks:

- Importing customer names and device locations using Common Property Tables
- Creating a group account for all of the users affiliated with a particular customer
- Creating a group filter for the group account

For more information about creating filters for group accounts, refer to the *OpenView Performance Insight 5.0 Administration Guide*.

Applying Constraints

A constraint eliminates the data you are not interested in seeing. Applying a constraint is the same as editing a parameter. If you edit the Gateway parameter, data for all gateways except the gateway you typed in the Gateway field drops from the report. If you edit Gateway Location, data for all locations except the location you typed in the Gateway Location field drops from the report. You may apply multiple constraints at once. Cisco IP Telephony Statistics 3.0 supports the following parameters:

- CallManager Cluster Name
- CallManager Name
- Gateway Name
- Gateway Location

If you are using the Web Access Server to view reports from a web browser, edit parameters by clicking the edit parameters icon at the bottom right-hand corner of the report. When the Edit Parameters window opens, enter the constraint in the field and click **Submit**.

If you are using Report Viewer, select **Edit > Parameter Values** from the menu bar. When the Modify Parameter Values window opens, click the **Current Value** field. Type a new value and click **OK**.

Sources for Additional Information

This user guide contains samples of some of the reports in the package. The demo package that comes with Cisco IP Telephony Statistics contains a sample of every report in the package. If you have access to the demo package, and you want to know what fully-populated reports look like, install the demo package. Like real reports, demo reports are interactive. Unlike real reports, demo reports are static.

For details about the latest enhancements and any known problems, refer to the following document:

Cisco IP Telephony Statistics Report Pack 3.0 Release Statement

You may also be interested in the following documents:

- *Common Property Tables 3.5 User Guide*
- *IP Telephony Call Detail Report Pack 2.0 User Guide*
- *RNS 7.0 Release Notes, November 2004*

Manuals for the core product, OVPI, and manuals for the reporting solutions that run on the core product can be downloaded from the following site:

<http://www.hp.com/managementsoftware>

Select **Support > Product Manuals** to open the **Product Manual Search** page. Manuals for OVPI are listed under **Performance Insight**. Manuals for OVPI report packs and the value-add components for NNM are listed under **Reporting and Network Solutions**.

The manuals listed under **Reporting and Network Solutions** indicate the month and year of publication. If a user guide is revised and reposted, the date of publication will change even if the software version number does not change. Since we post updated user guides on a regular basis, you should search this site for updates before using an outdated manual.

The Upgrade Install

This chapter covers the following topics:

- Guidelines for a Smooth Upgrade
- Upgrading Version 2.0 to Version 3.0
- Package Removal

Guidelines for a Smooth Upgrade

When you insert the RNS 7.0 CD, launch the package extraction interface, and select OVPI report packs for installation, the install script extracts every OVPI package from the CD and copies the results to the Packages directory on your system. Once the extraction process finishes, the install script prompts you to launch Performance Insight and start Package Manager. Upgrading to Cisco IP Telephony 3.0 is an easy and straightforward task:

- Install the 2.0-to-3.0 upgrade package
- Remove Cisco GSU Datapipe 2.0
- Install Cisco GSU Datapipe 3.0

Before running Package Manager, review the following guidelines.

Prerequisites

Make sure the following software is already installed before upgrading to version 3.0:

- OVPI 5.0
- Any service pack available for OVPI 5.0
- Common Property Tables 3.0 or higher

Common Property Tables

If you are running version 2.2 of Common Property Tables, you must upgrade your current version to version 3.0 or higher. When you install the upgrade package (either 2.2-to-3.0 or 3.0-to-3.5), do not install anything else at the same time. Install the upgrade package for Common Property Tables and *only* the upgrade package for Common Property Tables.

Distributed Environments

If your system is distributed, every server must be running OVPI 5.0 and all the service packs currently available for OVPI 5.0. Following is an overview of the upgrade install for a distributed environment:

- 1 Disable trendcopy on the central server.
- 2 At the central server:
 - Install the upgrade package for Common Property Tables; deploy reports
 - Install the 3.0 upgrade package for Cisco IP Telephony Statistics; deploy reports
- 3 At each satellite server:
 - Install the upgrade package for Common Property Tables
 - Install the 3.0 upgrade package for Cisco IP Telephony Statistics.
 - Remove Cisco GSU Datapipe 2.0
 - Install Cisco GSU Datapipe 3.0
- 4 Re-enable trendcopy on the central server.

When you installed Cisco IP Telephony Statistics for the first time, you had to set up connections with satellite server databases, configure trendcopy pull commands, and switch off aggregations at each satellite servers. If you recently upgraded from OVPI 4.6 to OVPI 5.0, the following configuration changes, which were made shortly after Cisco IP Telephony Statistics 2.0 was installed, will have to be redone:

- Set up connections with satellite server databases (using the Add Database Wizard)
- Configure trendcopy pull commands

For details, see [Chapter 4, Distributed Systems](#).

Upgrading Version 2.0 to Version 3.0

Perform the following tasks to upgrade from version 2.0 to version 3.0:

- Task 1: Stop OVPI Timer and extract packages from the RNS 7.0 CD
- Task 2: Install the upgrade package for Common Property Tables
- Task 3: Install the upgrade package for Cisco IP Telephony Statistics
- Task 4: Remove Cisco GSU Datapipe 2.0
- Task 5: Install Cisco GSU Datapipe 3.0
- Task 6: Restart OVPI Timer

Task 1: Stop OVPI Timer and extract packages from the RNS CD

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**

UNIX: As root, type one of the following:

```
HP-UX: sh /sbin/ovpi_timer stop
```

```
Sun: sh /etc/init.d/ovpi_timer stop
```

- 3 Insert the RNS 7.0 CD. On Windows, a Main Menu displays automatically; on UNIX, mount the CD, navigate to the top-level directory for the CD drive, and type the setup command.
- 4 Select OVPI report packs by typing **1** in the choice field and pressing Enter. The install script displays a percentage complete bar. When extraction finishes, the install script starts Package Manager. The Package Manager welcome window opens.

If you navigate to the Packages directory on your system, you will see the following folders under the IP Telephony folder:

- Cisco_IP_Telephony_Statistics.ap
- Cisco_IP_Telephony_Statistics_Demo.ap
- Cisco_IP_Telephony_Statistics_Location.ap
- Cisco_IP_Telephony_Statistic_Thresholds.ap
- UPGRADE_Cisco_IP_Telephony_to_3.ap
- UPGRADE_Cisco_IP_Telephony_Statistics_Location_to_3.ap

You are about to install the two upgrade packages. Under Cisco GSU Datapipe, you will see the following folder:

- CiscoGSU_Datapipe.ap

Task 2: Upgrade to Common Property Tables 3.0 or higher

If you are running an earlier version of Common Property Tables, upgrade to Common Property Tables 3.0 or higher. If you are not running any version of Common Property Tables, skip this task. If you are upgrading, observe these rules:

- Do not install any other package with the upgrade package; install the Common Property Tables upgrade package and *only* the Common Property Tables upgrade package.
- When prompted to accept or disable the option to Deploy Reports, accept the default. If you disable the default, the forms that come with Common Property Tables will not be deployed.
- When the install finishes, click **Done** to return to the Management Console.

If you need help with the upgrade, refer to the *Common Property Tables 3.5 User Guide*.

Task 1: Upgrade Cisco IP Telephony Statistics

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**. Approve the default installation directory or select a different directory if necessary.
- 4 Click **Next**. The Report Deployment window opens; accept the default for Deploy Reports and enter your username and password for the OVPI Application Server.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to the following packages:

- *UPGRADE_Cisco_IP_Telephony_Statistics_to_3*
 - *UPGRADE_Cisco_IP_Telephony_Statistics_Location_to_3*
- 7 Click **Next**. The Type Discovery window opens. Disable the default and click **Next**. The Selection Summary window opens.
 - 8 Click **Install**. The Installation Progress window opens; when installation is complete, a package installation complete message appears.
 - 9 Click **Done** to return to the Management Console.

Task 2: Remove the Cisco GSU Datapipe 2.0

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Uninstall**.
- 4 Click **Next**. The Report Undeployment window opens.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to the following package:
 - *CiscoGSU_Datapipe 2.0*
- 7 Click **Next**. The Selection Summary window opens.
- 8 Click **Uninstall**. The Progress window opens. When the uninstall process is complete, a package removal complete message appears.
- 9 Click **Done**.

Task 3: Install the Cisco GSU Datapipe 3.0

- 1 Start Package Manager. The Welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**.
- 4 Click **Next**. The Report Deployment window opens. Disable the default for Deploy Reports and click **Next**. The Package Selection window opens.
- 5 Click the check box next to the following package:
 - *CiscoGSU_Datapipe 3.0*
- 6 Click **Next**. The Type Discovery window opens. Disable the default and click **Next**. The Selection Summary window opens.
- 7 Click **Install**. The Installation Progress window opens. When the installation finishes, a package installation complete message appears.
- 8 Click **Done**.

The New Install

This chapter covers the following topics:

- Guidelines for a smooth installation
- Prerequisites related to OVPI and Cisco
- Installing IP Telephony Statistics 3.0
- Accessing deployed reports; new objects in the object model
- Package removal

Guidelines for a Smooth Install

The reporting solutions that run on OVPI consist of two installable packages, a report pack and a datapipe, or sometimes a report pack and multiple datapipes. When you install a datapipe, you configure OVPI to collect a specific type of performance data at a specific polling interval. When you install a report pack, you configure OVPI to summarize and aggregate performance data in a specific way.

The RNS 7.0 CD includes a package installation script. When you insert the RNS 7.0 CD, launch the package extraction interface, and select OVPI report packs for installation, the install script extracts every OVPI report pack from the CD and copies the results to the Packages directory on your system. When the extraction process finishes, the install script prompts you to launch Performance Insight and start Package Manager. Review the following guidelines before running Package Manager.

Prerequisites

Cisco IP Telephony Statistics 3.0 has the following prerequisites:

- OVPI 5.0
- Any and all service packs available for OVPI 5.0
- A functioning CallManager environment (Cisco CallManager 3.3 or 4.0)
- MGCP gateways
- Cisco GSU 1.0 or Cisco GSU 2.0

The Cisco IP Telephony Statistics Report Pack shares property data with the IP Telephony Call Detail Report Pack. Sharing property data eliminates duplication and simplifies administration. However, since these report packs operate independently, installing both packages is not necessary.

Upgrading Common Property Tables

If Common Property Tables is already installed, you must upgrade to version 3.0 if you are not already running version 3.0. If you are running version 3.0, you have the option to upgrade to version 3.5. If you are not running any version of Common Property Tables, you have nothing to do, since Package Manager will install the latest version of Common Property Tables for you, automatically.

Do not install an upgrade package for Common Property Tables *and* other packages at the same time. Install the upgrade package for Common Property Tables and *only* the upgrade package for Common Property Tables. For more information about installing and using Common Property Tables, refer to the *Common Property Tables 3.5 User Guide*.

Distributed Environments

If you intend to run Cisco IP Telephony Statistics in a distributed environment, the installation procedure is more complicated. Here is an outline of the steps involved when installing Cisco IP Telephony Statistics in a distributed environment:

- 1 Verify that every server is running OVPI 5.0 and all available service packs.
- 2 Install Cisco IP Telephony Statistics on the central server:
 - a Disable trendcopy.
 - b If necessary, upgrade to Common Property Tables 3.0 or higher.
 - c Install Cisco IP Telephony Statistics 3.0; deploy reports
- 3 Install Cisco IP Telephony Statistics on each satellite server:
 - a Upgrade to Common Property Tables 3.0 or higher; deploy reports (forms)
 - b Install Cisco IP Telephony Statistics 3.0; deploy reports.
 - c Install the Cisco GSU Datapipe 3.0.
- 4 Re-enable trendcopy on the central server.

After the installation is complete, you must set up connections with satellite server databases, configure trendcopy pull commands, and switch off aggregations above the hourly level on the satellite servers. For details, see [Chapter 4, Distributed Systems](#).

Installing CiscoWorks

A functioning CallManager environment consists of CallManager systems and MGCP gateways.

CiscoWorks is available on *Cisco CD One, Fifth Edition for Windows*. Please refer to documentation published by Cisco for more information about installing, configuring, and troubleshooting CiscoWorks.

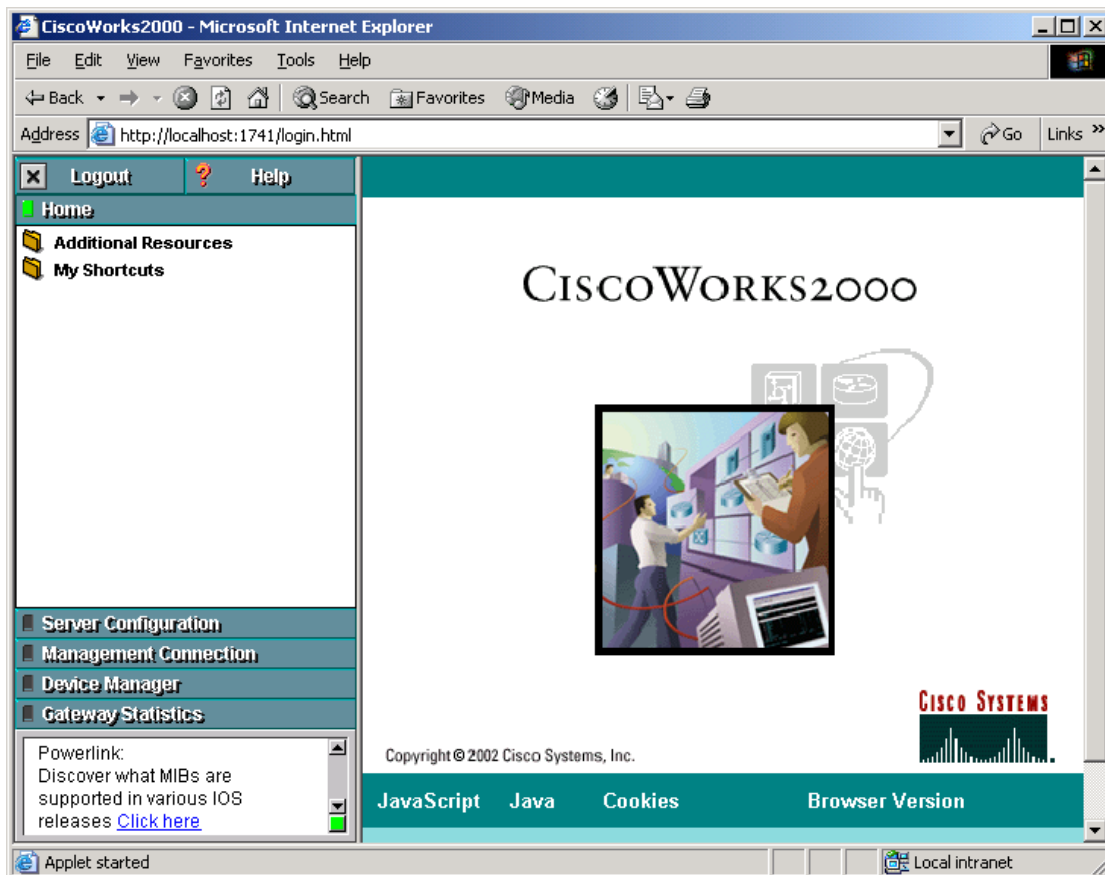
Follow these steps to install CiscoWorks:

- 1 Download Cisco GSU from the following URL:

<http://www.cisco.com/cgi-bin/tablebuild.pl/cw-gtwystat-util>

You need a Cisco CCO login to download Cisco GSU. If you do not have a login, contact your local Cisco representative.

- 2 Download both the Cisco GSU readme and the executable installation file.
- 3 Read the readme.
- 4 Run the GSU installation file. The CiscoWorks menu window opens.



Configuring Cisco GSU

To configure Cisco GSU, perform the following tasks:

- Task 1: Create a data collection file.
- Task 2: Import the data collection file.
- Task 3: Schedule data collection.

Task 1: Creating a Data Collection File

Create a comma-separated data collection file. Your file will include a list of the gateways you want to monitor. Use the following syntax rules:

Field	Description
Device Name	Required. The device name or IP address for the CCM system.
Device Capabilities	Required. The only valid value is “CCM”.
Device Family	Optional. Describes the CCM platform.
Software Version	Required. The version number of the CCM software. Valid values are “3.1” and “3.2”.
HTTP Server	Optional. The DNS name or IP address of the HTTP server in the CCM cluster. If this field is not specified, the address or the name of the CCM system is used.

Here is an example of an entry in your data collection file:

```
CCMSys1 , CCM , MCS , 3 . 1 ,
```

For more information, refer to online help.

Task 2: Importing the Data Collection File

Follow these steps to import the data collection file:

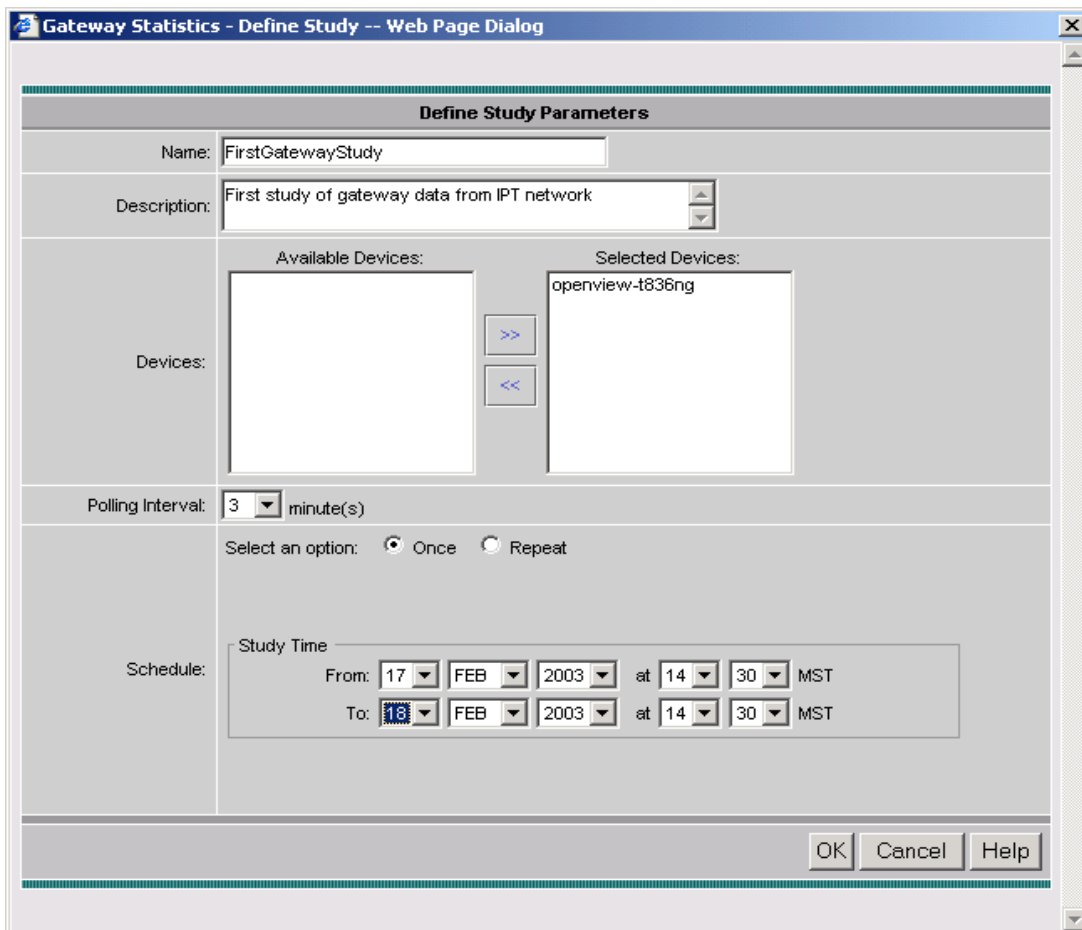
- 1 From the CiscoWorks menu, select **Gateway Statistics**.
- 2 From the Gateway Statistics menu, select **Device Management**.
- 3 From the Device Management menu, select **Device Import**. When you are prompted, enter the path and name of the data collection file you created.
- 4 Close the Device Import window.

Task 3: Scheduling Data Collection

Follow these steps to schedule data collection by defining study parameters:

- 1 From the CiscoWorks menu, select **Gateway Statistics**.

- 2 From the Gateway Statistics menu, select **Study Management**. The Define Study Parameters window opens.



- 3 Schedule data collection by accepting or modifying the defaults for polling interval and schedule.
- 4 Click **OK**.

Installing Cisco IP Telephony Statistics 3.0

This section covers the following tasks:

- Task 1: Stop OVPI Timer and extract packages from the RNS 7.0 CD
- Task 2: Upgrade to Common Property Tables 3.0 or higher
- Task 3: Remove Thresholds Module 4.0
- Task 4: Install these packages:
 - Cisco IP Telephony Statistics 3.0
 - Cisco IP Telephony Statistics Location
 - Cisco IP Telephony Statistics Thresholds (optional)
 - Cisco GSU Datapipe

- Task 5: Restart OVPI Timer

Task 1: Stop OVPI Timer and extract packages from the RNS CD

- 1 Log in to the system. On UNIX systems, log in as root.
- 2 Stop OVPI Timer and wait for processes to terminate.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**

UNIX: As root, type one of the following:

HP-UX: **sh /sbin/ovpi_timer stop**

Sun: **sh /etc/init.d/ovpi_timer stop**

- 3 Insert the RNS 7.0 CD. On Windows, a Main Menu displays automatically; on UNIX, mount the CD, navigate to the top-level directory for the CD drive, and type the setup command.
- 4 Select OVPI report packs by typing **1** in the choice field and pressing Enter. The install script displays a percentage complete bar. When extraction finishes, the install script starts Package Manager. The Package Manager welcome window opens.

If you navigate to the Packages directory on your system, you will see the following folders under the IP Telephony folder:

- Cisco_IP_Telephony_Statistics.ap
- Cisco_IP_Telephony_Statistics_Demo.ap
- Cisco_IP_Telephony_Statistics_Location.ap
- Cisco_IP_Telephony_Statistic_Thresholds.ap
- UPGRADE_Cisco_IP_Telephony_to_3.ap
- UPGRADE_Cisco_IP_Telephony_Location_to_3.ap

Ignore the upgrade packages. Installing the demo package is optional. You may install the demo package by itself, or you may install the demo package along with everything else.

Under Cisco GSU Datapipe, you will see the following folder:

- CiscoGSU_Datapipe.ap

Task 2: Upgrade to Common Property Tables 3.0 or higher

If you are running Common Property Tables 2.2 or earlier, upgrade to Common Property Tables 3.0 or higher. Observe these rules:

- Do not install other package at the same time; install the Common Property Tables upgrade package and *only* the Common Property Tables upgrade package.
- Accept the Deploy Reports option. If you disable the default, the forms that come with Common Property Tables will not be deployed to the OVPI Application Server.
- When Package Manager indicates that the upgrade is complete, click **Done** to return to the Management Console.

If you need help with the upgrade, refer to the *Common Property Tables 3.5 User Guide*.

Task 3: Remove any previous version of the Thresholds Module

There is no upgrade path for the Thresholds Module. The latest version is version 5.0. If you are running an earlier version of the Thresholds Module (most likely version 3.0 or possibly version 4.0) uninstall this package by starting Package Manager and following the on-screen directions for package removal. When the uninstall is complete, click **Done** to return to the Management Console.

Package Manager will install the newest version of the Thresholds Module for you, automatically, if and when you select for installation the thresholds sub-package that comes with Cisco IP Telephony Statistics. In Task 4, below, you are directed to install the thresholds sub-package. Install the thresholds sub-package and Package Manager will select and install Thresholds Module 5.0 for you.

Task 4: Install Cisco IP Telephony 3.0 and the Cisco GSU Datapipe

- 1 Start Package Manager. The Package Manager welcome window opens.
- 2 Click **Next**. The Package Location window opens.
- 3 Click **Install**. Approve the default installation directory or use the browse feature to select a different directory if necessary.
- 4 Click **Next**. The Report Deployment window opens. Accept the default for Deploy Reports; accept the default for application server name and port. Type your username and password for the OVPI Application Server.
- 5 Click **Next**. The Package Selection window opens.
- 6 Click the check box next to the following package:
 - *Cisco IP Telephony Statistics 3.0*
 - *Cisco IP Telephony Statistics Location*
 - *Cisco IP Telephony Statistics Thresholds*
 - *Cisco IP Telephony Statistics Demo* [optional]
 - *Cisco GSU Datapipe 3.0*
- 7 Click **Next**. The Type Discovery window opens. To run Type Discovery immediately after package installation, accept the default.
- 8 Click **Next**. The Selection Summary window opens.
- 9 Click **Install**. The Installation Progress window opens and the install process begins. When the install finishes, a package install complete message appears.
- 10 Click **Done** to return to the Management Console.
- 11 Restart OVPI Timer.

Windows: Select **Settings > Control Panel > Administrative Tools > Services**

UNIX: As root, type one of the following:

HP-UX: **sh /sbin/ovpi_timer start**

Sun: **sh /etc/init.d/ovpi_timer start**

- 12 Click **Next**. The Type Discovery window opens.

- 13 Type Discovery is not required for Cisco IP Telephony Statistics and CiscoGSU_Datapipe. If no other packages are to be installed at the same time, clear the Discover check box and click **Next**. The Selection Summary window opens.
- 14 Click **Install**. The Installation Progress window opens; when installation is complete, the following message appears: Report Package: Completed.
- 15 Click **Done**.

Task 5: Restart OVPI Timer.

Windows: Do the following:

- a From the Control Panel, select **Administrative Tools > Services**
- b Select OVPI Timer from the list of services.
- c From the Action menu, select **Start**.

UNIX: As root, do one of the following:

- HP-UX: **sh /sbin/ovpi_timer start**
- Sun: **sh /etc/init.d/ovpi_timer start**

Accessing Deployed Reports

When you installed this package, you enabled the Deploy Reports option. As a result, the reports (as well as any change forms that come with the reports) were deployed to the OVPI Application Server. Once reports reside on the OVPI Application Server, you can view reports using a web browser or one of the OVPI client applications.

If the client components are installed on your system, you have access to Report Viewer, Report Builder, and the Management Console. If the client components are not installed on your system, using a web browser is the only way you can view reports.

For more information about the client components, refer to the *Performance Insight Installation Guide*. For more information about the Management Console, including how to use the Object/Property Management view to launch reports specific to a selected object, refer to the *Performance Insight Administration Guide*.

New Objects for the Object Model

An object is any item that has performance data or property information associated with it. Devices, customers, and locations are object categories that belong to OVPI's default object model. When you select an object in the object model, you refresh the right side of the Object/Property Management window. Under **General Tasks**, you will see a list of forms, under **Object Specific Tasks**, you will see a list of forms, and under **Object Specific Reports**, you will see a list of reports.

The object tree changes each time you install a new report pack. Installing the Cisco IP Telephony Statistics package adds the following object categories to the object model:

- Cluster
- CallManager
- Gateway

- DS1
- Port/Channel

Package Removal

If you remove a report pack, the associated tables and all the data in those tables are deleted. If you want to preserve the data in those tables, archive the data before removing the report pack.

Follow these steps to uninstall Cisco IP Telephony Statistics:

- 1 Log on to the system. On UNIX systems, log on as root.
- 2 Stop OVPI Timer and wait for processes to stop running.

Windows: Do the following:

 - a From the Control Panel, select **Administrative Tools** → **Services**
 - b Select OVPI Timer from the list of services.
 - c From the Action menu, select **Stop**.

UNIX: As root, do one of the following:

 - HP-UX: **sh /sbin/ovpi_timer stop**
 - Sun: **sh /etc/init.d/ovpi_timer stop**
- 3 Start Package Manager. The Package Manager welcome window opens.
- 4 Click **Next**. The Package Location window opens.
- 5 Click **Uninstall**.
- 6 Click **Next**. The Report Undeployment window opens. Accept the default for Undeploy Reports; also accept the defaults for application server name and port. Type your username and password for the OVPI Application Server.
- 7 Click **Next**. The Package Selection window opens.
- 8 Click the check box next to the following packages:
 - *Cisco IP Telephony Statistics*
 - *Cisco IP Telephony Statistics_Location*
 - *CiscoGSU_Datapipe*
 - *Cisco IP Telephony Statistics_Thresholds* (if installed)
 - *Cisco IP Telephony Statistics_Demo* (if installed)
- 9 Click **Next**. The Selection Summary window opens.
- 10 Click **Uninstall**. The Progress window opens. When the uninstall process is complete, a removal complete message appears.
- 11 Click **Done**.
- 12 Restart OVPI Timer.

Windows: Do the following:

- a From the Control Panel, select **Administrative Tools** → **Services**

- b** Select OVPI Timer from the list of services.
- c** From the Action menu, select **Start**.

UNIX: As root, do one of the following:

- HP-UX: **sh /sbin/ovpi_timer start**
- Sun: **sh /etc/init.d/ovpi_timer start**



Removing Cisco IP Telephony Statistics automatically removes the Cisco GSU Datapipe even if you did not select the datapipe for removal.

Distributed Systems

If you intend to run Cisco IP Telephony Statistics as a distributed system across multiple servers, and you followed the installation guidelines in the installation chapter, your central server is running the report pack and each of your satellite servers is running the report pack and the Cisco GSU Datapipe. You are now ready to perform these tasks:

- Configure the central server
- Configure each satellite server
- Verify that all system clocks are synchronized

Configuring the Central Serve

Perform these tasks to configure the central server:

- Set up connections with satellite server databases
- Configure trendcopy pull commands

Task 1: Set up connections with satellite server databases.

- 1 Start the Management Console.
- 2 Click the **Systems** icon on the lower left. The **System/Network Administration** pane opens.
- 3 Right-click the **Databases** folder. When prompted, select **Add OVPI Database**. The Add Database Wizard opens.
- 4 Click **Next**.
- 5 Type the hostname and port number for the database you want to add; click **Next**.
- 6 Review the Summary. Repeat Steps 4 and 5 for each additional database.
- 7 Click **Finish** when you are done.


Task 2: Configure trendcopy pull commands from the central server to each satellite server.

- 1 Open the following file:
`$DPIPE_HOME/scripts/Cisco_IP_Telephony_Statistics_Daily.pro`
- 2 Modify block0 as follows:
 - a Remove “#” before each line in block0, including the begin and end lines.

- b** Replace *SATELLITE_SERVER_1_DATABASE* with the satellite server name.
- c** Replace *THIS_MACHINE_DATABASE* with the central server name.
- 3** If there is more than one satellite server, create a copy of block0 for each satellite server and repeat step 2 for each block.
- 4** Save and close:
`$DPIPE_HOME/scripts/Cisco_IP_Telephony_Statistics_Daily.pro`

Configuring a Satellite Server

Switch off daily aggregations. Follow these steps:

-  If the satellite server is performing local reporting, or if the *Cisco_IP_Telephony_Statistics_Location* module is installed, do not switch off daily aggregations.

- 1** Locate the `$DPIPE_HOME/lib/trendtimer.sched` file.
- 2** Comment out the lines referencing *Cisco_IP_Telephony_Statistics_Daily.pro*.

System Clocks

Make sure that the system clock on each satellite server is synchronized with the system clock on the central server.

Package Configuration

This chapter covers the following topics:

- Specifying the Source Data Directory
- CallManager Clusters
- Resource Thresholds and Associated Change Forms

Specifying the Source Data Directory

Before the Cisco GSU Datapipe can begin to collect data, it needs to know where the source data files are located. According to the default, the raw data files from Cisco Gateway Statistics Utility should be located on the server that is running the Cisco GSU Datapipe. If the raw data files are located on a remote server, the Cisco GSU Datapipe can be configured to use FTP to retrieve those files.

The default directory for the location of the raw data files is:

```
${DPIPE_HOME}/data/ImportData/CiscoGSU_Datapipe
```

The Cisco GSU Datapipe includes a preprocessor. The purpose of the preprocessor is to filter the raw data and put the raw data into a format that can be manipulated by the Cisco GSU Datapipe. The preprocessor (a perl script, `CiscoGSU_PP.pl`) produces the following output:

- `CManager.dat`
- `Gateway.dat`
- `Channel.dat`

The preprocessor stores these files in the source data directory. The Cisco GSU Datapipe reads the output from the preprocessor and imports the data into the OVPI database using the `CiscoGSU_Collection.pro` file and the following specialized configuration TEEL files:

- `CiscoGSU_Cmanager.teel`
- `CiscoGSU_gateway.teel`
- `CiscoGSU_channel.teel`

Before package installation, the TEEL files are located in:

```
{DPIPE_HOME}/packages/CiscoGSU_Datapipe/CiscoGSU_Datapipe.ap
```

After installation, the TEEL files are located in:

```
{DPIPE_HOME}/packages/CiscoGSU_Datapipe/CiscoGSU_Datapipe.ap  
{DPIPE_HOME}/lib
```



If you make changes to TEEL files after installation, make the same changes in both directories.

Changing the Source Directory Path

If raw GSU data files are located on a remote system, you must modify a line in a file. Follow these steps:

- 1 Open the {DPIPE_HOME}/scripts/CiscoGSU_Collection.pro file
- 2 Locate this line:

```
{DPIPE_HOME}/bin/perl {DPIPE_HOME}/bin/CiscoGSU_PP.pl
```

- 3 Add this to the end of the line:

```
-f 1 -m <Remote_Host_Name> -u <Username> -p <Password> -r <Remote_directory>
```

If the data source directory is not the same as the default directory described in the preceding section, make the following changes:

- 1 Navigate to the appropriate directory (see the discussion above regarding which directories are involved).
- 2 Open the CiscoGSU_Collection.pro file.
- 3 Locate the following line:

```
{DPIPE_HOME}/bin/perl {DPIPE_HOME}/bin/CiscoGSU_PP.pl
```

- 4 Add this to the end of the line:

```
-l <new directory path>
```

- 5 Open the following files:

```
— CiscoGSU_Cmanager.teel  
— CiscoGSU_gateway.teel  
— CiscoGSU_channel.teel
```

- 6 Locate the line beginning with **Sourcefile =**
- 7 Change the path, replacing the existing path with the complete path name to the new directory; begin the new path name just after the equals sign (=). The source directory specified would normally be the directory created to receive the output from the Cisco Gateway Statistics Utility.



Leave the filename as specified in the original SourceFile.

Changing Source Disposition

TEEL files are also used to specify what to do with a data file once the data has been imported. The default behavior for the Cisco GSU Datapipe is to delete the preprocessed files. Because raw data files are archived, there is no need to archive data output by the preprocessor.

CallManager Clusters

Although the Cisco IP Telephony Statistics package operates without importing custom property information, none of the cluster nor location-oriented reports provide meaningful data (for example, all CallManagers would be combined into one group called “Location Unassigned”).

The Cisco IP Telephony Statistics Report Pack allows the user to place the devices (CallManagers and gateways) into logical groups:

- Groups of CallManagers (based on cluster or other criteria)
- Groups of gateways (based on geographic location or user-defined criteria)

The grouping of these objects is enabled by creating a cluster name and assigning CallManagers or gateways to the cluster. For example, if the CallManagers *s1ccm1* and *s1ccm2* are assigned to a cluster named *cluster1* and similarly if the CallManagers *s2ccm1* and *s2ccm2* are assigned a cluster named *cluster2*, the report pack aggregates the data belonging to these four CallManagers into two groups (*cluster1* and *cluster2*).

To get cluster information into reports, configure a CallManager cluster. You see clusters in reports immediately after OVPI processes your updated import file.

Configuring a CallManager Cluster

To configure a CallManager cluster, do the following:

- 1 Create a cluster name:
 - a Launch the Management Console.
 - b Click **Objects**. The Object/Property Management window opens.

- c Select **File > New > Create a new CallManager Cluster**. The Configure A New CallManager Cluster form opens.

This form allows a new CallManager Cluster to be created. Enter the name of the new cluster; the description is optional. Click the OK button to create the cluster and close the window. Click the Apply button to create the cluster and leave the window open to create additional clusters. Click the Cancel button to cancel.

Currently Configured Clusters	
Cluster Name	Description
default	
Cluster1	Cluster1

Add a New Cluster

Cluster Name:

Description:

OK Apply Cancel

- d Enter a name for the cluster and a brief description.
 - e Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.
- 2 Assign CallManagers or gateways to the cluster:
- a From the Object/Property Management window, select **View > Change View > Location**.
 - b Select a location.
 - c Highlight the Location Unassigned folder.

- d Double-click **Assign CallManagers to Clusters** under **Object Specific Tasks**. The form opens.

Cisco IP Telephony

Assign CallManagers to Clusters

This form allows to assign a CallManager to a cluster. Select a CallManager from the CallManager selection list and then choose the cluster from the drop down list below. Click the OK button to update the cluster information and close the window. Click the Apply button to update the cluster assignment and leave the window open to assign other CallManagers to clusters. Click the Cancel button to cancel.

CallManager List

CallManager Name	Cluster Name
Cluster1_CCM1	Cluster1

Cluster Name:

OK Apply Cancel

- e Highlight a CallManager name in the CallManager List and select the cluster name to which it is assigned.
- f Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

Resource Thresholds and Associated Change Forms

Cisco_IP_Telephony_Statistics_Thresholds imposes nine default thresholds for resource utilization monitoring. When performance reaches one of these default thresholds, the thresholds sub-package sends a trap to the Network Node Manager (NNM). The following table describes the condition behind each threshold and the severity of the alarm.

Threshold	Default	Condition	Severity
PRIOverUtilization	95%	95% of PRI channels or more were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
PRIUnderUtilization	5%	5% of PRI channels or less were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
CASOverUtilization	95%	95% of CAS channels or more were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
CASUnderUtilization	5%	5% of CAS channels or less were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
FXOOverUtilization	95%	95% of FXO ports or more were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
FXOUnderUtilization	5%	5% of FXO ports or less were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
FXSOverUtilization	95%	95% of FXS ports or more were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
FXSUnderUtilization	5%	5% of FXS ports or less were occupied for each monitored device (CallManager or Gateway) during the previous day.	Warning
DeadChan	N/A	A channel was in OutofService status all the time during the previous day.	Warning

Modifying Gateway and CallManager Thresholds

Threshold values can be modified, using forms, for a gateway or CallManager. To modify a threshold value, do the following:

- 1 Launch the Management Console.

- 2 Click **Objects**. The Object/Property Management window opens.
- 3 Select **View > Change View > Cluster**.
- 4 Select a gateway or cluster.
- 5 Under **Object Specific Tasks**, double-click **Configure Gateway Thresholds** or **Configure CallManager Thresholds**. The form opens. Both forms are similar and the Configure Gateway Thresholds form is shown below.

Cisco IP Telephony

Configure Gateway Thresholds

This form allows to configure the threshold values for the gateways. Enter/modify the threshold values. Click the OK button to save the values and close the window. Click the Apply button to update the values in the database and leave the window open for further modifications. Click the Cancel button to cancel.

PRI Channel Max. Util	95.00
PRI Channel Min. Util	5.00
CAS Channel Max. Util	95.00
CAS Channel Min. Util	5.00
FXO Port Max. Util	95.00
FXO Port Min. Util	5.00
FXS Port Max. Util	95.00
FXS Port Min. Util	5.00

OK Apply Cancel

- 6 Modify the threshold.
- 7 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

Modifying Channel/Port Thresholds

The channel/port threshold value (DeadChan) can be modified:

- 1 Start Report Builder.
On a Windows system, select **Programs > HP OpenView > Performance Insight > Builder**.

On a UNIX system, cd to `$OVPI_HOME/bin` and type `./builder`.

2 From Report Builder, select **File > Open**.

3 Open the following file:

```
%OVPI_HOME%\forms\deploy\admin\Cisco_IPT_Admin_Forms\  
Cisco_IPT_Statistics_Forms\ChannelPortThreshConfig.frep
```

The Configure Channel/Port Thresholds form opens.

Cisco IP Telephony

Configure Channel/Port Thresholds

This form allows to configure the threshold values for the Channels/Ports for all IP Telephony devices. Enter/modify the threshold values. Click the OK button to save the values and close the window. Click the Apply button to update the values in the database and leave the window open for further modifications. Click the Cancel button to cancel.

Channel/Port

Max. Out of Service Channels:

OK Apply Cancel

4 Modify the threshold.

5 Click **Apply** to save changes, **OK** to save changes and close the form, or **Cancel** to close the form without saving changes.

Top Ten Reports

Cisco IP Telephony Statistics includes five Top Ten reports:

- 2 CallManager reports (active calls and port utilization)
- 2 cluster reports (call activity and port utilization)
- 1 location/gateway report

Each Top Ten report contains two tables, one for utilization and one for rate of increase. The utilization table on the left looks at data for yesterday. The rate of increase table on the right looks at baseline data, which includes data for yesterday. Top Ten reports refresh once daily.

The cluster reports aggregate statistics for multiple CallManagers. The CallManager reports provide statistics for individual CallManagers. The location report aggregates statistics for groups of devices at each location. Top Ten reports display the *baseline average* and the *rate of increase*. The baseline average is calculated by averaging all the busy hours reported over the baseline period. The rate of increase is calculated by dividing the 30-day forecast value by the baseline average.

The following table describes the ranking available from each report.

Report	Ranking
CallManager Active Calls	<ul style="list-style-type: none"> • Highest average active calls • Rate of increase in active calls
CallManager Port Utilization	<ul style="list-style-type: none"> • Highest port utilization rate • Highest rate of increase in port utilization
Cluster Call Activity	<ul style="list-style-type: none"> • Highest average active calls • Rate of increase in active calls
Cluster Port Utilization	<ul style="list-style-type: none"> • Highest port utilization rate • Highest rate of increase in port utilization
Location/Gateway	<ul style="list-style-type: none"> • Highest percentage of active ports by location • Rate of increase in port utilization by location • Highest percentage of port utilization by gateway • Highest rate of increase in port utilization by gateway

Cisco IP Telephony Statistics



Call Manager Active Calls Top Ten

The Call Manager Active Calls Top Ten Report provides lists of Call Managers which had the most active calls during the previous day. Call Managers are also listed by the projected increase rate.

Most Active Calls

Mon Apr 21 12:00 AM

	Call Manager	Average Active Calls
1	s2ccm2	28
2	s1ccm2	12
3	s1ccm1	12
4	s2ccm1	12

Active Calls Increase

Mon Apr 21 12:00 AM

	Call Manager	Baseline	+ 30 / 60 / 90 Days
1	s2ccm1	12	12 / 12 / 12
2	s1ccm1	12	12 / 12 / 12
3	s1ccm2	12	12 / 12 / 12
4	s2ccm2	27	27 / 27 / 26

Cisco IP Telephony Statistics



Call Manager Port Utilization Top Ten

The Call Manager Port Utilization Top Ten Report provides lists of Call Managers which had the highest port utilization percentage during the previous day. Call Managers are also listed by the projected increase rate.

Highest Port Utilization

Tue, Oct 26 12:00 AM



	Call Manager	Total Active Ports Rate (%)	Total Ports
1	s1ccm2	59.0	283
2	s1ccm1	55.5	283

Utilization Increase

Tue, Oct 26 12:00 AM



	Call Manager	Baseline (%)	+ 30/ 60/ 90 Days
1	s1ccm1	56.6	57.5 / 58. / 58.6
2	s1ccm2	57.0	56.6 / 56.4 / 56.2

Cisco IP Telephony Statistics



Cluster Call Activity Top Ten

The Cluster Call Activity Top Ten Report provides lists of CallManager clusters which had the most active calls during the previous day. CallManager clusters are also listed by the projected increase rate.

Most Active Calls

Wed, Oct 20 12:00 AM

	CallManager Cluster	Average Active Calls
1	default	241

Active Calls Increase

Wed, Oct 20 12:00 AM

	CallManager Cluster	Baseline	+ 30/60/90 Days
1	default	244	243 / 243 / 242

Cisco IP Telephony Statistics



Cluster Port Utilization Top Ten

The Cluster Port Utilization Top Ten Report provides lists of CallManager clusters which had the highest port utilization rate during the previous day. CallManager clusters are also listed by the projected increase rate.

Highest Port Utilization

Wed, Oct 20 12:00 AM

	CallManager Cluster	Total Active Ports Rate (%)	Total Ports
1	default	54.1	566

Utilization Increase

Wed, Oct 20 12:00 AM

	CallManager Cluster	Baseline (%)	+ 30/60/90 Days
1	default	55.1	54.8 / 54.6 / 54.5

Cisco IP Telephony Statistics



Location/Gateway Top Ten

The Location/Gateway Top Ten Report provides a list Locations or Gateways which had the highest port utilization rate during the previous day. Locations or Gateways are also listed by the projected increase rate of utilization.

Highest Port Utilization Locations

Wed, Oct 20 12:00 AM

	Location	Total Active Ports Rate (%)	Total Ports
1	Reston	56.2	130
2	Cupertino	56.1	153

Utilization Increase by Location

Wed, Oct 20 12:00 AM

	Location	Baseline (%)	+ 30/60/90 Days
1	Cupertino	56.1	56.1 / 56.1 / 56.1
2	Reston	56.5	56.4 / 56.4 / 56.3

Highest Port Utilization Gateways

Wed, Oct 20 12:00 AM

	Gateway	Location	Total Active Ports Rate (%)	Total Ports
1	s1c1c4k-3	Cupertino	58.5	56
2	s1c1cat4k-1	Cupertino	58.5	41
3	s1c2c4k-2	Reston	57.6	70
4	s1c23600-2	Reston	56.9	26
5	s1c1c4k-4	Cupertino	56.6	56
6	s1c2c4k-1	Reston	54.3	34

Utilization Increase by Gateway

Wed, Oct 20 12:00 AM

	Gateway	Location	Baseline (%)	+ 30/60/90 Days
1	s1c1c4k-3	Cupertino	58.2	58.3 / 58.3 / 58.4
2	s1c1c4k-4	Cupertino	57.8	57.5 / 57.3 / 57.
3	s1c1cat4k-1	Cupertino	57.7	57.9 / 58. / 58.2
4	s1c23600-2	Reston	56.8	56.8 / 56.8 / 56.9
5	s1c2c4k-1	Reston	56.2	55.7 / 55.3 / 55.
6	s1c2c4k-2	Reston	59.8	59.2 / 58.8 / 58.4

Summary Reports

Summary reports add depth to Top Ten Reports. They aggregate data for a particular element type and plot metrics on an hourly, daily, and monthly basis. Hourly graphs show anomalies and time-of-day usage patterns; daily and monthly graphs reveal trends derived from hourly data. Use summary reports to find out whether the performance you see in a Top Ten report reflects a temporary condition or an on-going trend.

CallManager Cluster Selection Table: Sorts clusters by busy hour call activity, from highest to lowest. This table reports events for yesterday. Selecting a cluster updates the PRI Channel Activity graph to reflect the activity for the selected cluster.

PRI Channel Activity Graph: If the average or busy hour levels for PRI channel activity in the hourly graph seem unusual, compare the hourly graph to the daily graph. The daily graph gives you a feel for what was normal for the last few weeks. If the hourly graph diverges significantly from the daily graph, yesterday's levels were not typical. The daily tab includes busy hour. If conditions are normal, busy hour and average utilization will not converge.

CallManager Cluster Selection Table: Sorts clusters by busy hour calls, from highest to lowest. Use this table to see which clusters require further investigation and which type or types of metrics need more attention. This table reports events for yesterday. Select a cluster to view call activity by CallManager in the CallManager Selection table.

CallManager Selection Table: Sorts CallManagers by call activity for the selected cluster, from highest to lowest. This table reports events for yesterday.

Gateway Selection Table and DS1 Selection Table: Displays data aggregated at various levels in the hierarchy. Similar to the CallManager Cluster and CallManager selection tables. The DS1 selection table is the lowest level in the hierarchy. Selecting a DS1 updates the Channel States graph with metrics for that DS1.

Channel States Graph: Displays the percentage of time spent in various states by the channels that belong to the selected DS1. Displays data at hourly, daily and monthly levels; if the hourly graph diverges significantly from the daily graph, yesterday was not typical.

See below for samples of the following reports:

- CallManager Call Activity Summary
- Cluster PRI Channel Activity Summary
- Gateway Summary by Location
- DS0 Usage Summary
- DS1 Usage Summary

Cisco IP Telephony Statistics



CallManager Call Activity Summary

The CallManager Call Activity Summary Report presents call activity metrics aggregated over all gateways for a given CallManager. This report can be used to view call distribution patterns across the CallManager installations.

CallManager Cluster Selection Table



Wed, Oct 20, 2004

CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
default	241	330	177	144	79	8	4	84	46

CallManager Selection Table

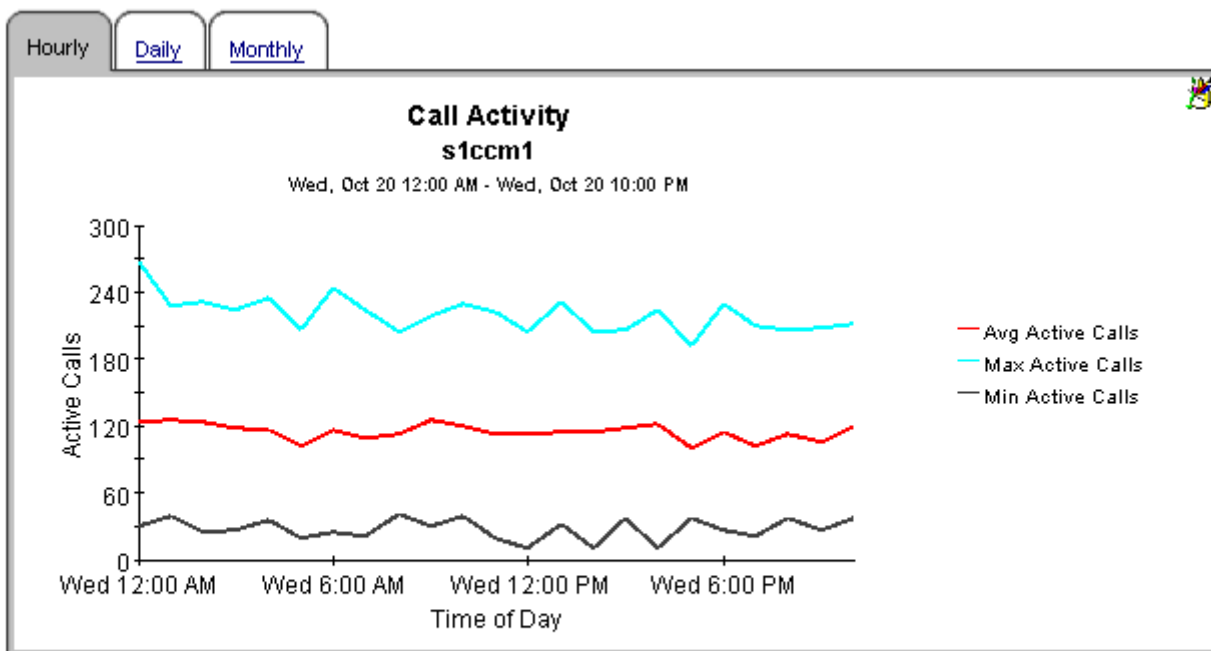
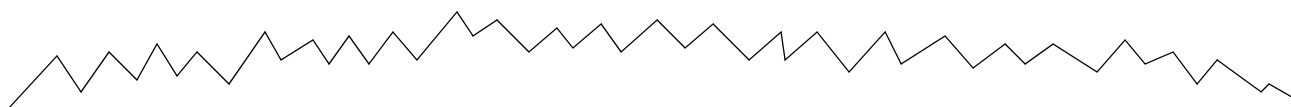



default

Wed, Oct 20, 2004

CallManager Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
s1com1	126	165	96	72	43	4	2	42	24
s1com2	123	165	93	72	39	4	2	42	24





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Cisco IP Telephony Statistics



Cluster PRI Channel Activity Summary

The Cluster PRI Channel Activity Summary Report presents PRI Channel Activity metrics aggregated for all CallManager(s) for a given cluster. This report can be used to view historical trunk utilization metrics and to identify call distribution patterns across the CallManager clusters.

CallManager Cluster Selection Table

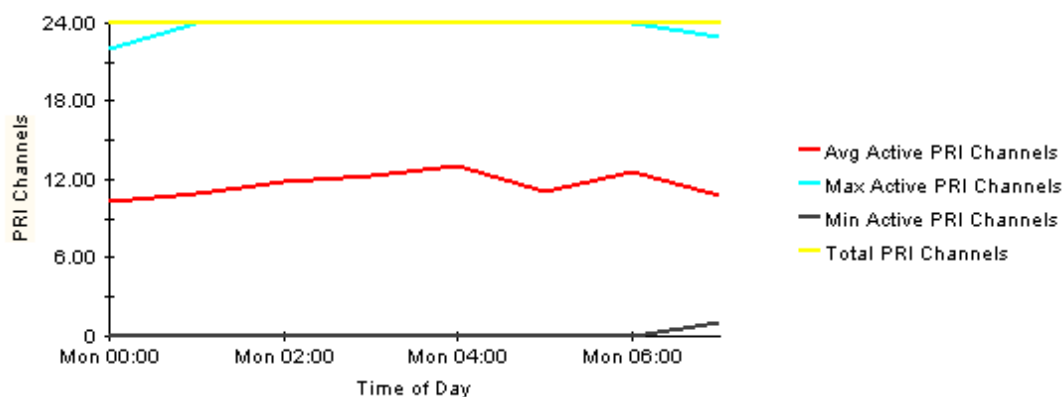
Mon Apr 21 2003

CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
West Coast Cluster1	24	0	0	0	0	12	7	36	21
East Coast Cluster1	38	24	14	24	14	6	4	36	19

Hourly | Daily | Monthly

PRI Channel Activity East Coast Cluster1

Mon Apr 21 12:00 AM - Mon Apr 21 07:00 AM



Cisco IP Telephony Statistics



Gateway Summary By Location

The Gateway Summary By Location Report presents gateway Statistics metrics aggregated over all ports/channels at a given location. This report can be used to drill down to individual gateways at a location in order to view historical port Statistics metrics for the selected gateway.

Location Selection Table

Wed, Oct 20, 2004

Location Name	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS	
All Locations	165	90	72	38	4	2	42	22	
Cupertino	79	45	48	27	2	1	24	13	
Reston	86	48	24	14	2	1	18	10	

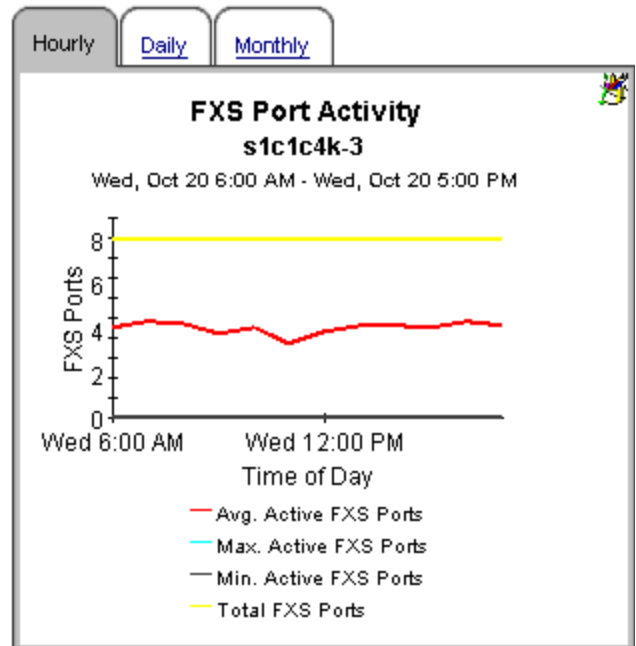
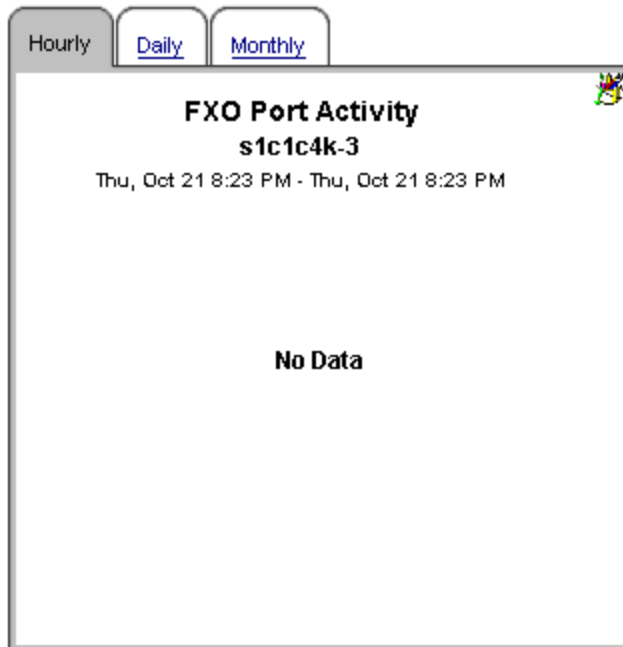
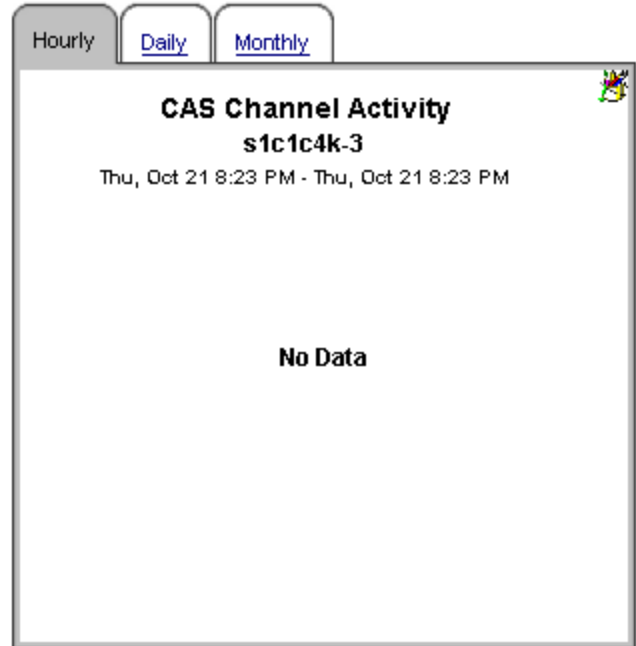
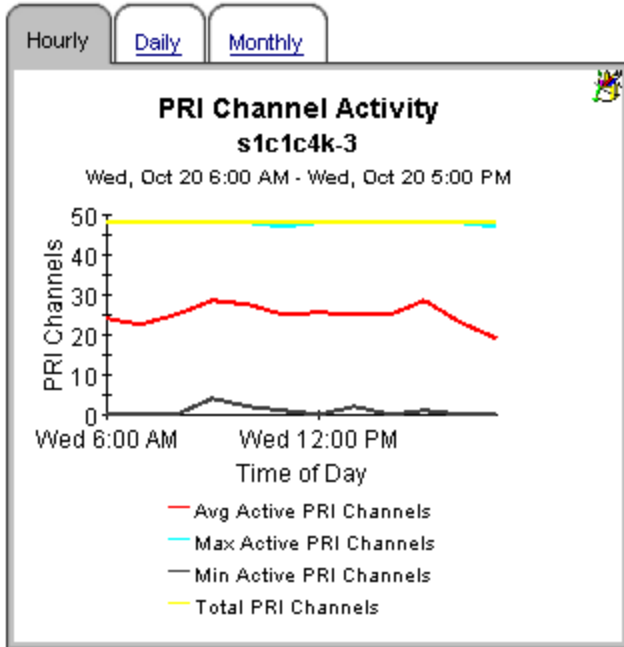
Gateway Selection Table

All Locations

Wed, Oct 20, 2004

Gateway Name	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS	
s1c1c4k-3	48	28	0	0	0	0	8	4	
s1c1c4k-4	0	0	48	27	0	0	8	5	
s1c1cat4k-1	31	18	0	0	2	1	8	5	
s1c23600-2	0	0	24	14	2	1	0	0	
s1c2c4k-1	24	13	0	0	0	0	10	5	





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Cisco IP Telephony Statistics



DS0 Usage Summary

The DS0 Usage Summary Report presents the usage metrics for a given channel. This can be used to identify heavily utilized channels of a gateway and also to identify any dramatic changes in the usage patterns of a channel (for example a sudden increase in "out of service" state).

CallManager Cluster Selection Table



Wed, Oct 20, 2004

CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
default	241	330	177	144	79	8	4	84	46

CallManager Selection Table



default

Wed, Oct 20, 2004

CallManager Name	Avg Active Calls	Total PRI Channels	Avg. Active PRI Channels	Total CAS Channels	Avg. Active CAS Channels	Total FXO Ports	Avg. Active FXO Ports	Total FXS Ports	Avg Active FXS Ports
s10cm1	115	165	83	72	36	4	2	42	21
s10cm2	113	165	80	72	36	4	2	42	21



Gateway Selection Table

s1ccm1

Wed, Oct 20, 2004

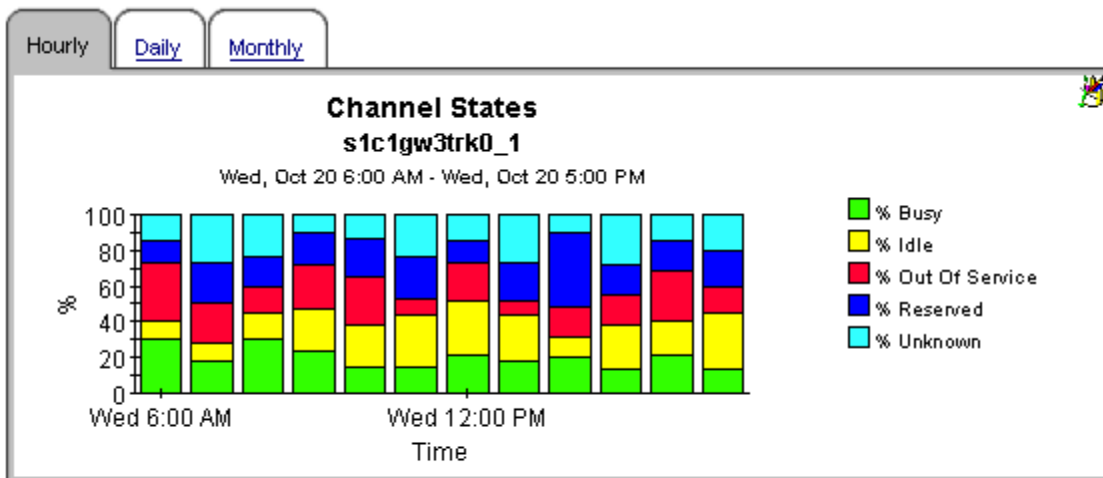
Gateway Name	Total PRI Channels	Avg. Active PRI Channels	Avg. Active CAS Channels	Total CAS Channels	Total FXO Ports	Avg. Active FXO Ports	Total FXS Ports	Avg Active FXS Ports
s1c1c4k-3	48	25	0	0	0	0	8	4
s1c1c4k-4	0	0	23	48	0	0	8	4
s1c1cat4k-1	31	16	0	0	2	1	8	4

Channel Selection Table

s1c1c4k-3

Wed, Oct 20, 2004

Channel	% Busy State	% Idle State	% Out Of Service State	% Reserved State	% Unknown State
s1c1gw3trk0_1	20	21	20	20	19
s1c1gw3trk0_10	18	21	22	18	20
s1c1gw3trk0_11	18	18	18	25	20
s1c1gw3trk0_12	19	20	24	17	20
s1c1gw3trk0_13	20	21	19	20	20
s1c1gw3trk0_14	20	22	17	19	22



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Cisco IP Telephony Statistics



DS1 Usage Summary

The DS1 Usage Summary Report presents the usage metrics for a given DS1. This can be used to view the channel utilization at the DS1 level and also to identify any dramatic changes in the usage patterns of a given DS1 (for example a sudden increase in "out of service" state).

CallManager Cluster Selection Table

Mon Apr 21 2003

CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
West Coast Cluster1	24	0	0	0	0	12	7	36	21
East Coast Cluster1	38	24	14	24	14	6	4	36	19

CallManager Selection Table

West Coast Cluster1

Mon Apr 21 2003

CallManager Name	Avg Active Calls	Total PRI Channels	Avg. Active PRI Channels	Total CAS Channels	Avg. Active CAS Channels	Total FXO Ports	Avg. Active FXO Ports	Total FXS Ports	Avg Active FXS Ports
s1ccm1	11	0	0	0	0	6	3	18	9
s1ccm2	11	0	0	0	0	6	3	18	9

Gateway Selection Table

s1ccm1

Mon Apr 21 2003

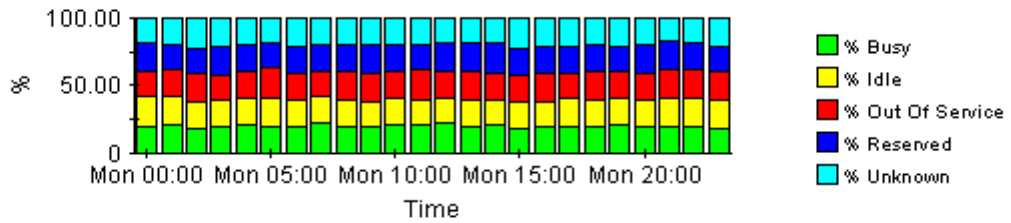
Gateway Name	Total PRI Channels	Avg. Active PRI Channels	Total CAS Channels	Avg. Active CAS Channels	Total FXO Ports	Avg. Active FXO Ports	Total FXS Ports	Avg Active FXS Ports
s1c1gw1	24	12	0	0	0	0	10	5
s1c1gw2	31	16	0	0	0	0	8	4

Hourly | Daily | Monthly

Channel States

s1c1gw1trk0

Mon Apr 21 12:00 AM - Mon Apr 21 11:00 PM



Forecast Reports

Forecast reports alert you to conditions where port over-utilization or port under-utilization is developing. All forecast reports contain a selection table followed by graphs. Graphs provide more detail about the item highlighted in the selection table.

The selection table performs a ranking function, allowing you to see which elements are seeing the highest rates of increase based on data in the rolling baseline. The selection table sorts items from highest rate of increase to lowest rate of increase. In addition to baseline values, the selection table includes projections for:

- F30
- F60
- F90

Each graph has three tabs:

Standard. Compares the baseline to F30, F60, and F90 values.

Day of Week. Aggregates data by day, allowing you to see whether overall growth is generally the same throughout the week or significantly different one day to the next. Because this view factors “downdays” out of the calculation, you can see what forecasts are like when they are not skewed by abnormally low levels of utilization.

History. Displays the busy hour metrics that were used to calculate values for F30, F60, and F90.

See below for samples of the following reports:

- CallManager Forecast
- CallManager Cluster Forecast
- Gateway Forecast by CallManager
- Gateway Forecast by Location
- Location Forecast

Cisco IP Telephony Statistics



Call Manager Forecast

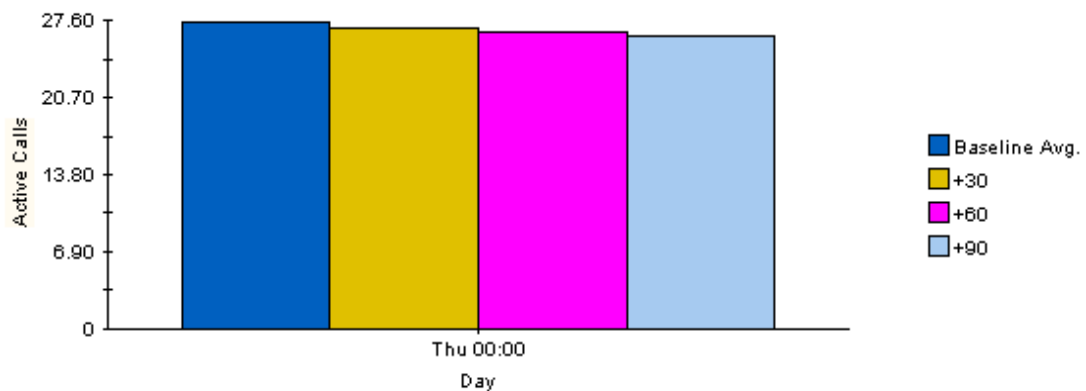
The Call Manager Forecast Report enables the user to quickly identify Call Managers with the greatest projected increase in call volume. The list of call managers are sorted by rate of increase in number of calls processed. Drill down charts present forecasted overall call volume metrics for the selected Call Manager.

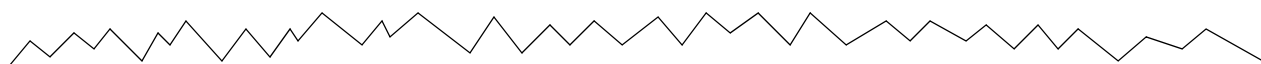
Call Manager Selection Table

Call Manager Name	Call Activity Baseline	Active Ports Baseline, %	F30 Active Ports Rate, %	F60 Active Ports Rate, %	F90 Active Ports Rate, %
s2ccm2	27	57.5	56.8	56.4	55.9
s2ccm1	12	57.8	58.3	58.6	59.0
s1ccm1	12	57.6	56.3	55.3	54.4
s1ccm2	12	57.7	55.9	54.6	53.3

Standard | Day of Week | History

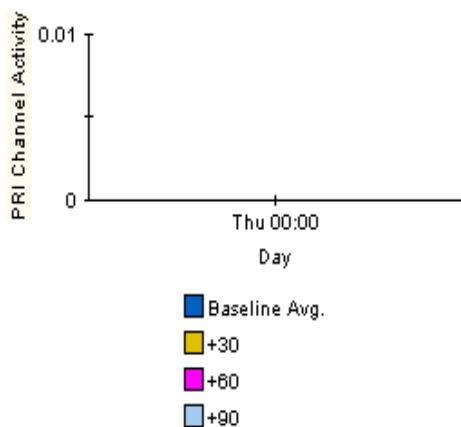
Call Activity Forecast s2ccm2





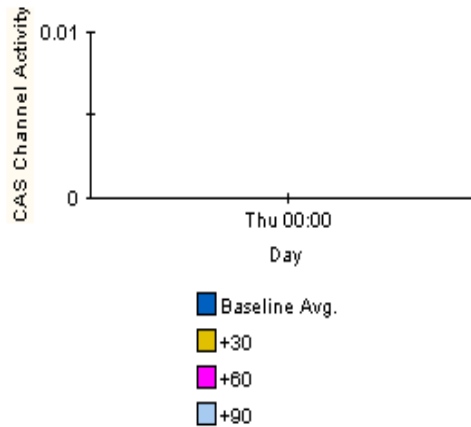
Standard | Day of Week | History

**PRI Channel Activity Forecast
s1ccm1**



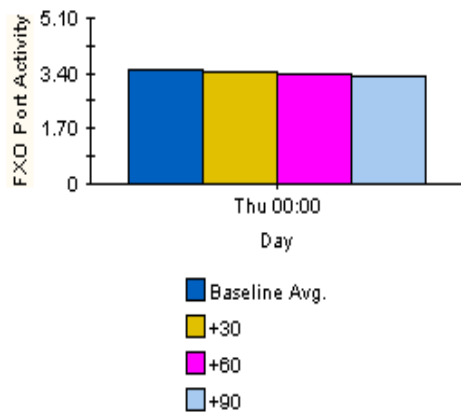
Standard | Day of Week | History

**CAS Channel Activity Forecast
s1ccm1**



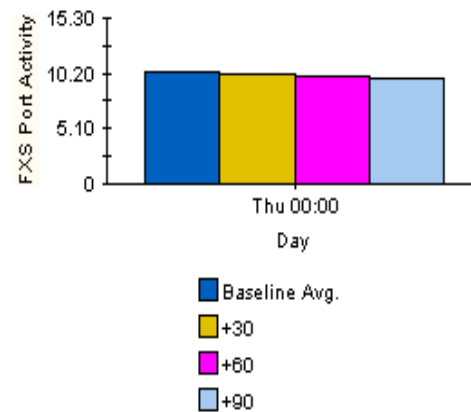
Standard | Day of Week | History

**FXO Port Activity Forecast
s1ccm1**



Standard | Day of Week | History

**FXS Port Activity Forecast
s1ccm1**



Cisco IP Telephony Statistics

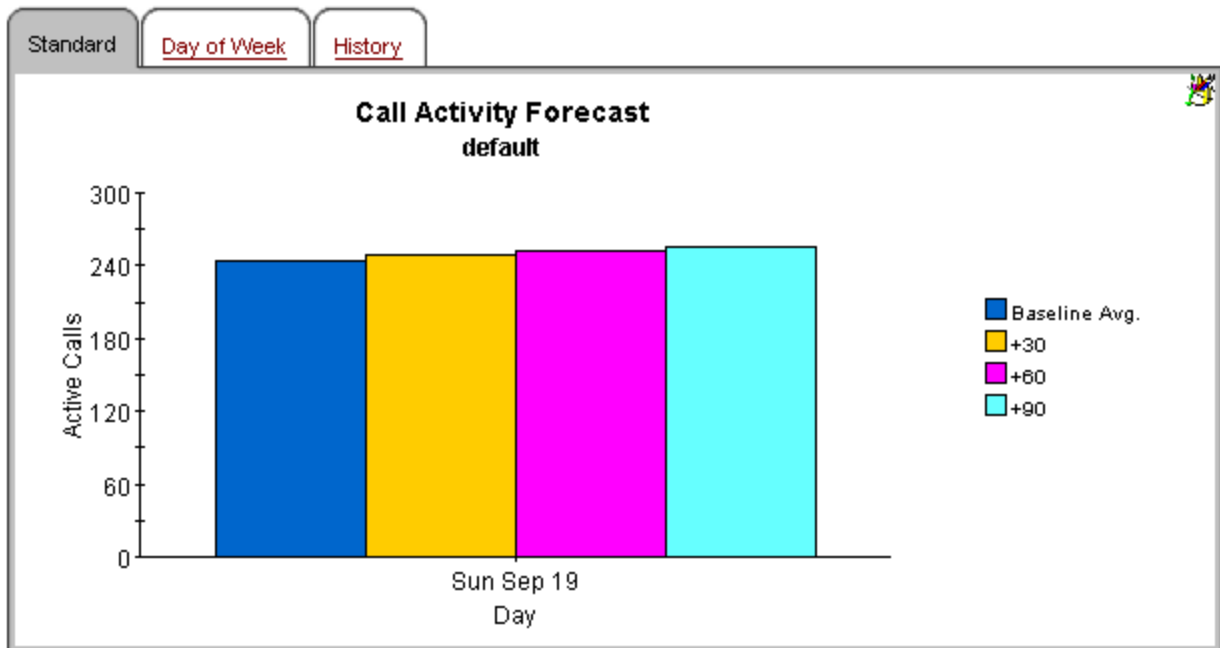


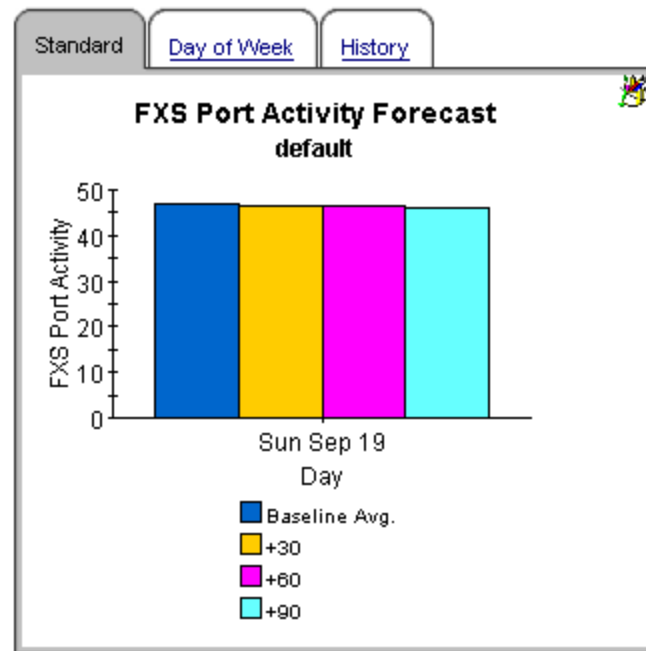
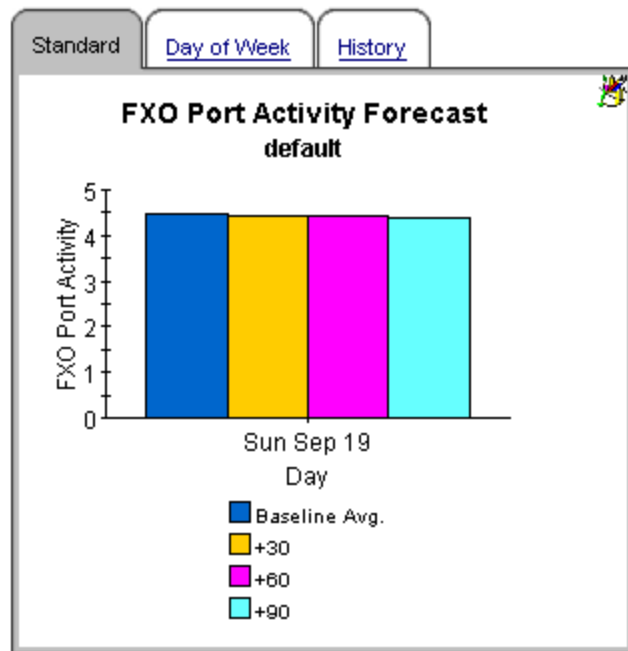
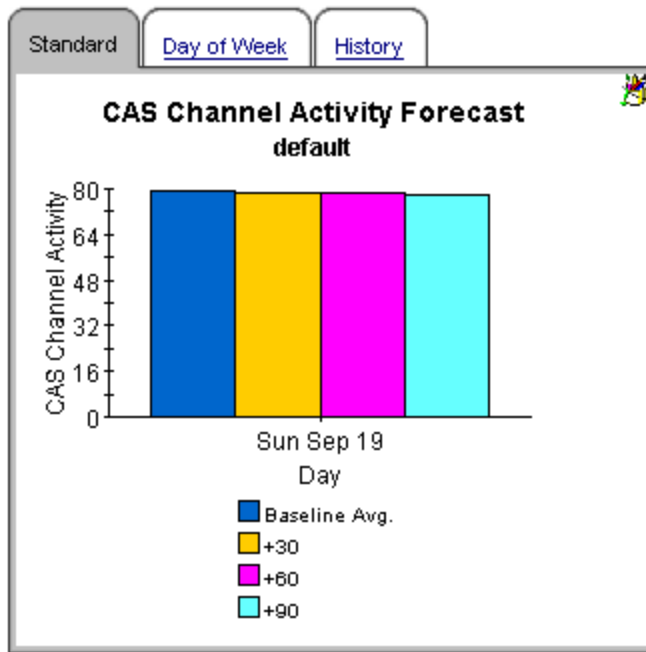
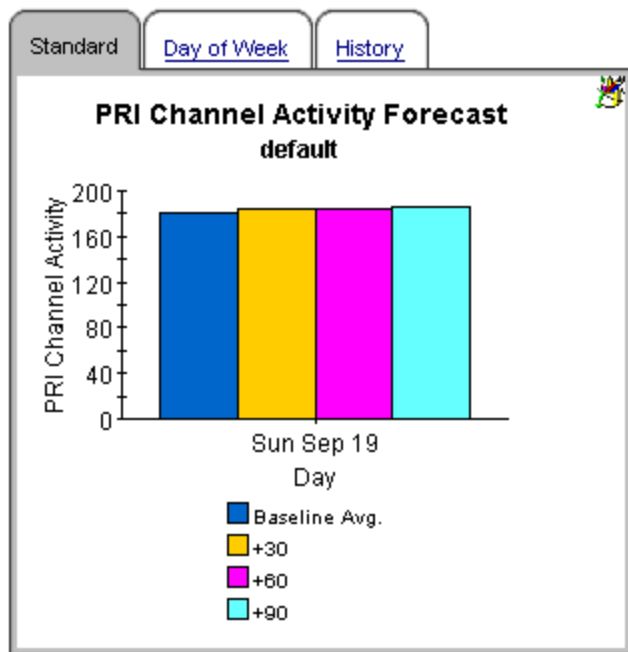
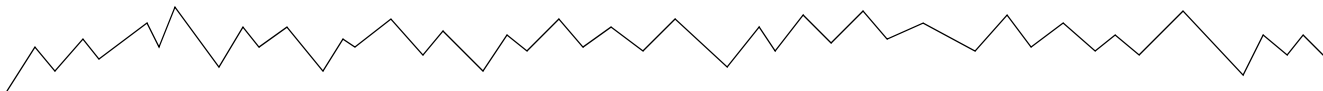
CallManager Cluster Forecast

The CallManager Cluster Forecast Report enables the user to quickly identify CallManager Clusters with the greatest projected increase in call volume. The list of call managers are sorted by rate of increase in number of calls processed. Drill down charts present forecasted overall call volume metrics for the selected Call Manager.

CallManager Cluster Selection Table

CallManager Cluster Name	Call Activity Baseline	Active Ports Baseline, %	F30 Active Ports Rate, %	F60 Active Ports Rate, %	F90 Active Ports Rate, %
default	245	55.1	55.4	55.5	55.6





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Cisco IP Telephony Statistics



Gateway Forecast by CallManager

The Gateway Forecast by Call Manager Report enables the user to quickly identify Gateways associated to a given Call Manager with the greatest projected increase in number of ports used. The list of gateways are sorted by rate of increase in number of ports used. Drill down charts present forecasted overall port occupancy metrics for the selected gateway.

CallManager Selection Table



Call Manager Name	Call Activity Baseline	Active Ports Baseline, %	F30 Active Ports Rate, %	F60 Active Ports Rate, %	F90 Active Ports Rate, %
s1ccm2	127	57.0	56.6	56.4	56.2
s1ccm1	124	56.6	57.5	58.0	58.6



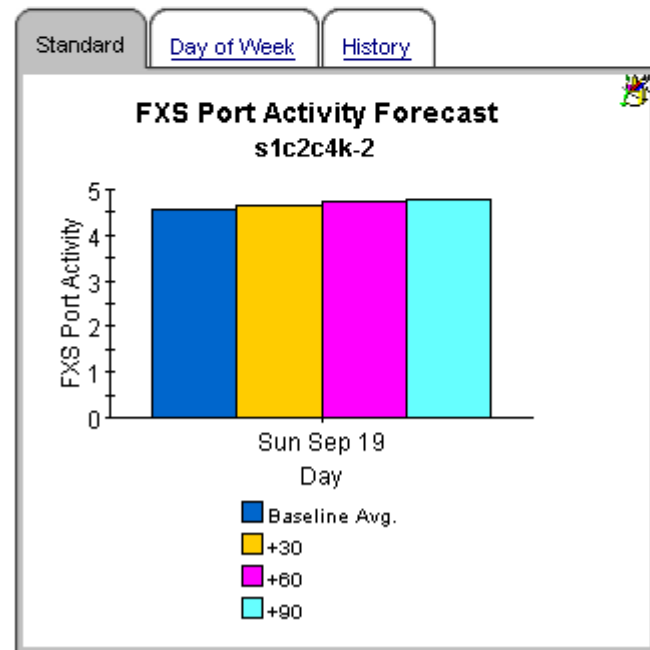
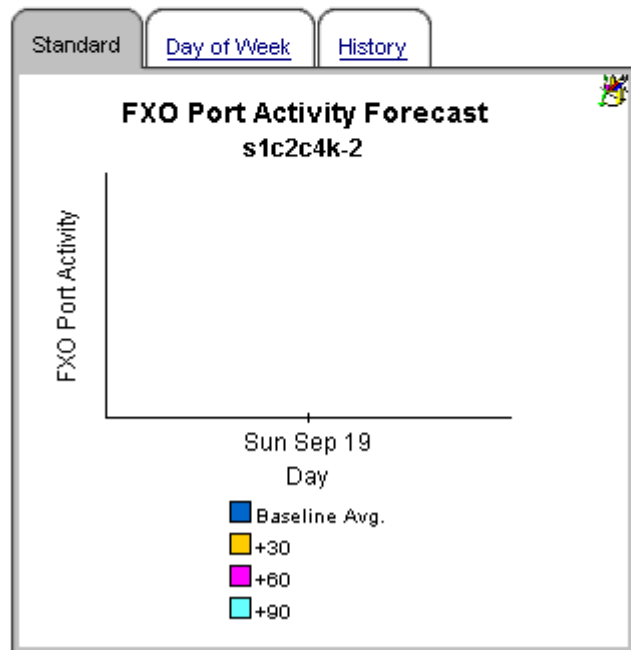
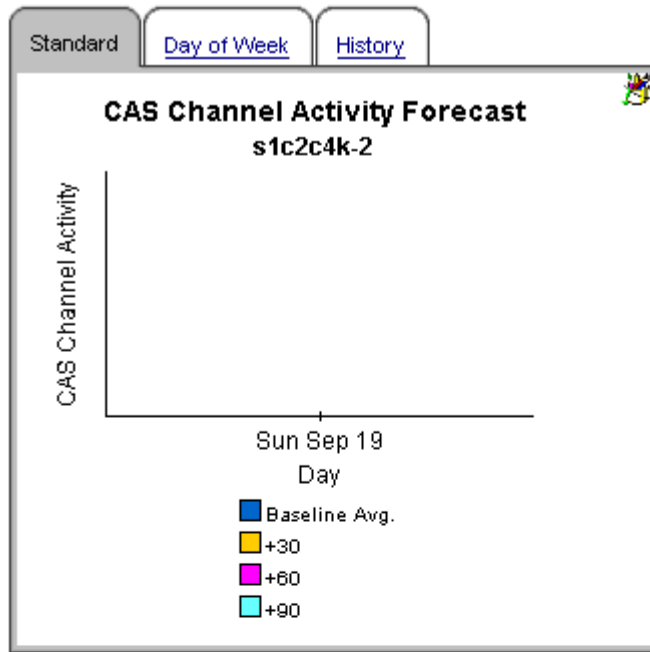
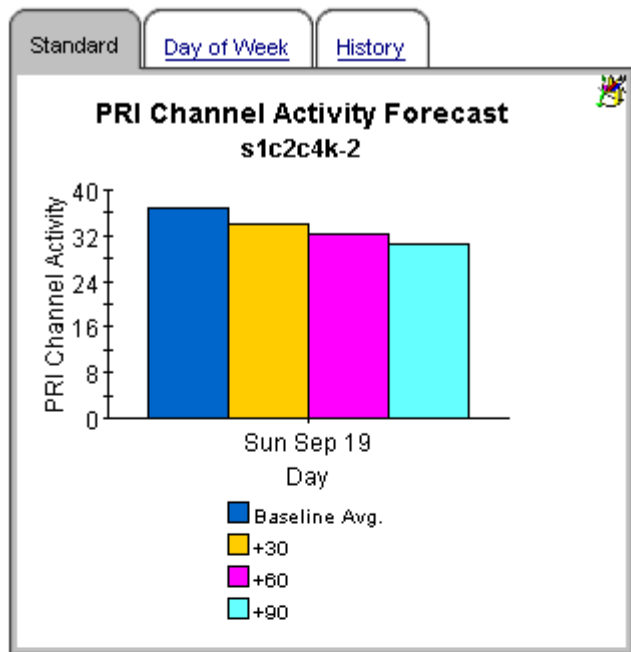
Gateway Selection Table



s1ccm2

Gateway Name	Active Ports Baseline %	F30 Active Ports Rate %	F60 Active Ports Rate %	F90 Active Ports Rate %
s1c2c4k-2	59.2	55.4	53.0	50.6
s1c23600-2	56.6	55.7	55.1	54.6
s1c2c4k-1	56.2	55.7	55.4	55.1





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Cisco IP Telephony Statistics



Gateway Forecast By Location

The Gateway Forecast By Location Report enables the user to quickly identify locations with the greatest projected increase in number of ports used. Drill down charts present forecasted overall port Statistics metrics for the selected gateway in a given location.

Location Selection Table



Location Name	Active Ports Baseline (%)	F30 Active Ports Rate (%)	F60 Active Ports Rate (%)	F90 Active Ports Rate (%)	
All Locations	54.0	54.1	54.1	54.1	
Cupertino	56.1	56.1	56.1	56.1	
Reston	56.5	56.4	56.4	56.3	

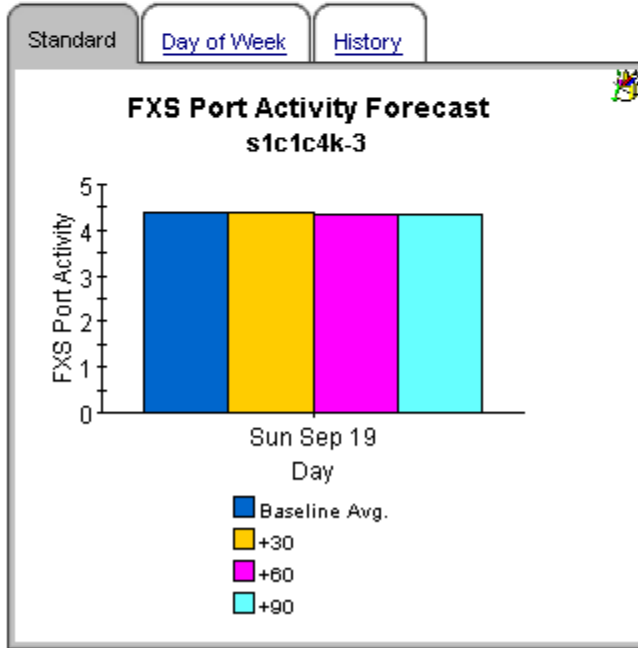
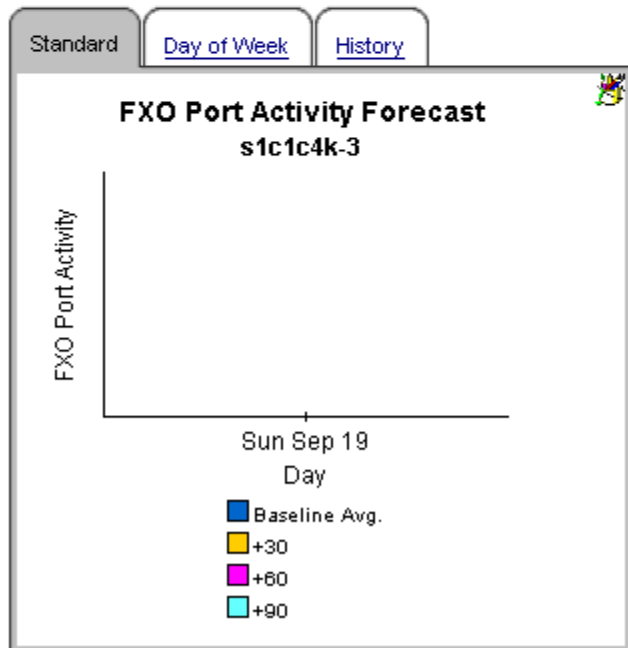
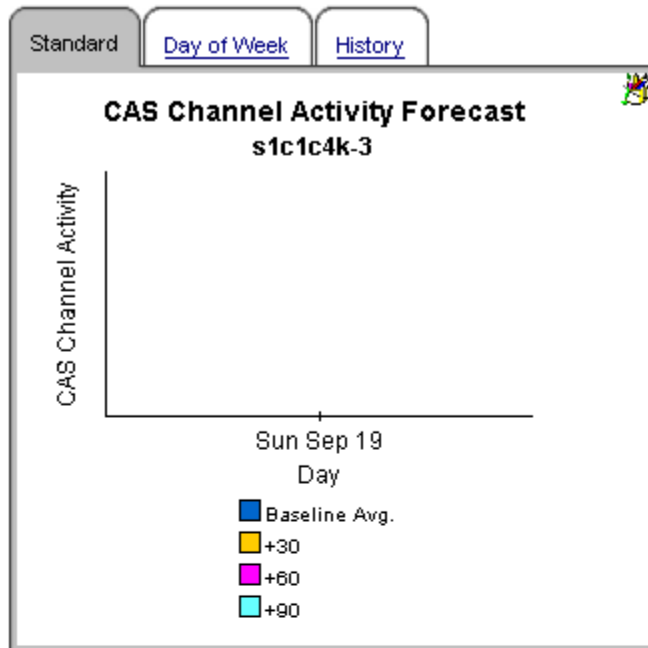
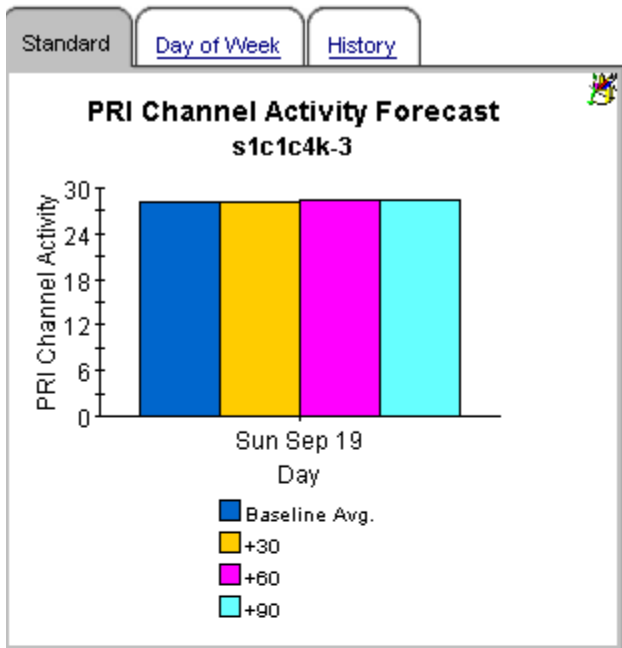
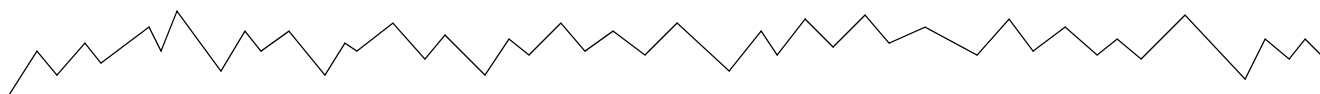
Gateway Selection Table



All Locations

Gateway	Active Ports Baseline (%)	F30 Active Ports Rate (%)	F60 Active Ports Rate (%)	F90 Active Ports Rate (%)	
s1c1c4k-3	58.2	58.3	58.3	58.4	
s1c1c4k-4	57.8	57.5	57.3	57.0	
s1c1cat4k-1	57.7	57.9	58.0	58.2	
s1c23600-2	56.8	56.8	56.8	56.9	
s1c2c4k-1	56.2	55.7	55.3	55.0	
s1c2c4k-2	59.8	59.2	58.8	58.4	





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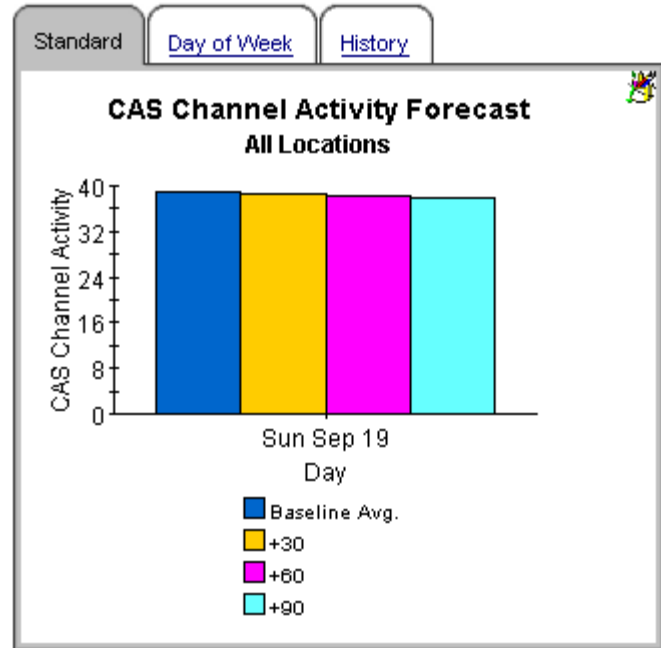
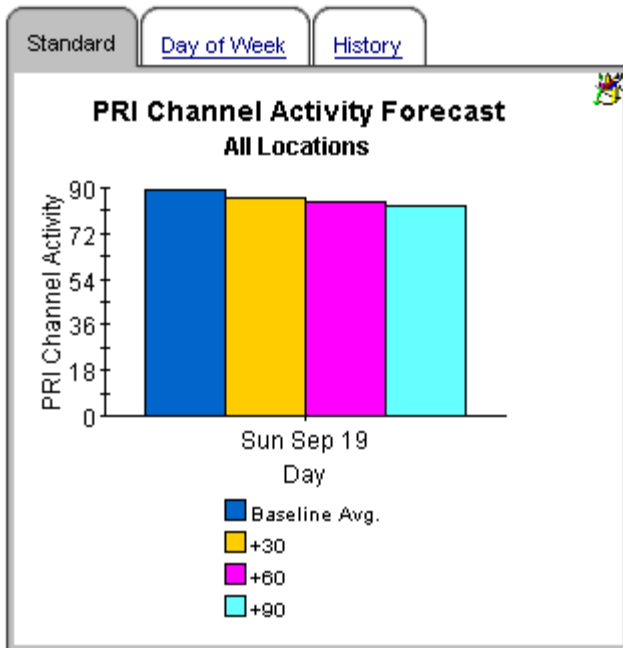


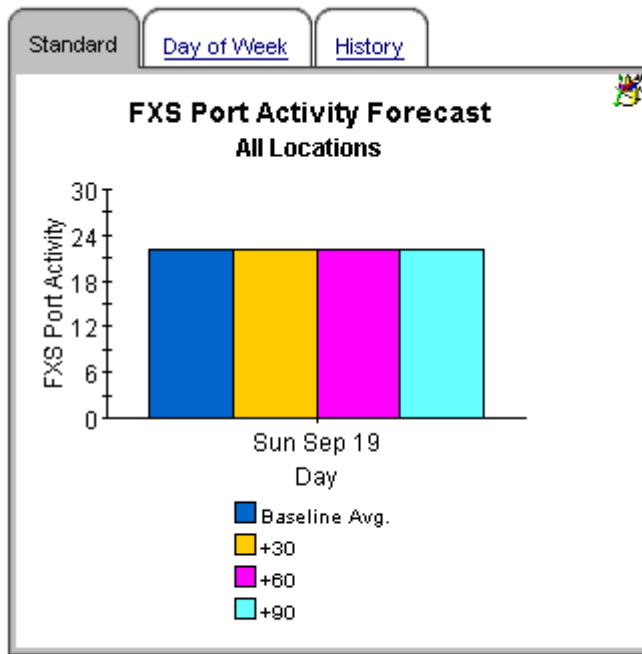
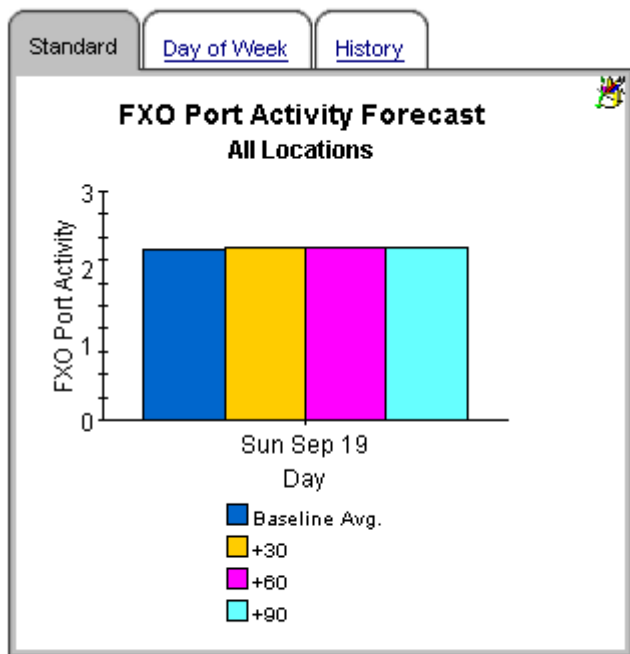
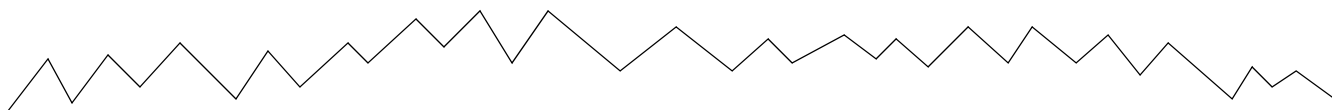
Location Forecast

The Location Forecast Report enables the user to quickly identify locations with the greatest projected increase in number of ports used. The list of locations are sorted by rate of increase in number of ports used. Drill down charts present forecasted overall port Statistics metrics for the selected location.

Location Selection Table

Location	Baseline (%)	+ 30/60/90 Days
All Locations	53.9	52.7 / 52.1 / 51.4
Cupertino	55.8	53.3 / 51.8 / 50.3
Reston	56.2	54.7 / 53.7 / 52.8





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Correlation Reports

Correlation Reports allow you to compare:

- Peak utilization for CallManagers within the same cluster
- Busy hour utilization for CallManager within the same cluster
- DS1 usage on a location-by-location basis

These reports will help you see where utilization is not balanced. See below for samples of the following reports:

- CallManager Cluster Peak Utilization Correlation
- CallManager Cluster Busy Hour Utilization Correlation
- DS1 Usage Correlation by Location

Cisco IP Telephony Statistics



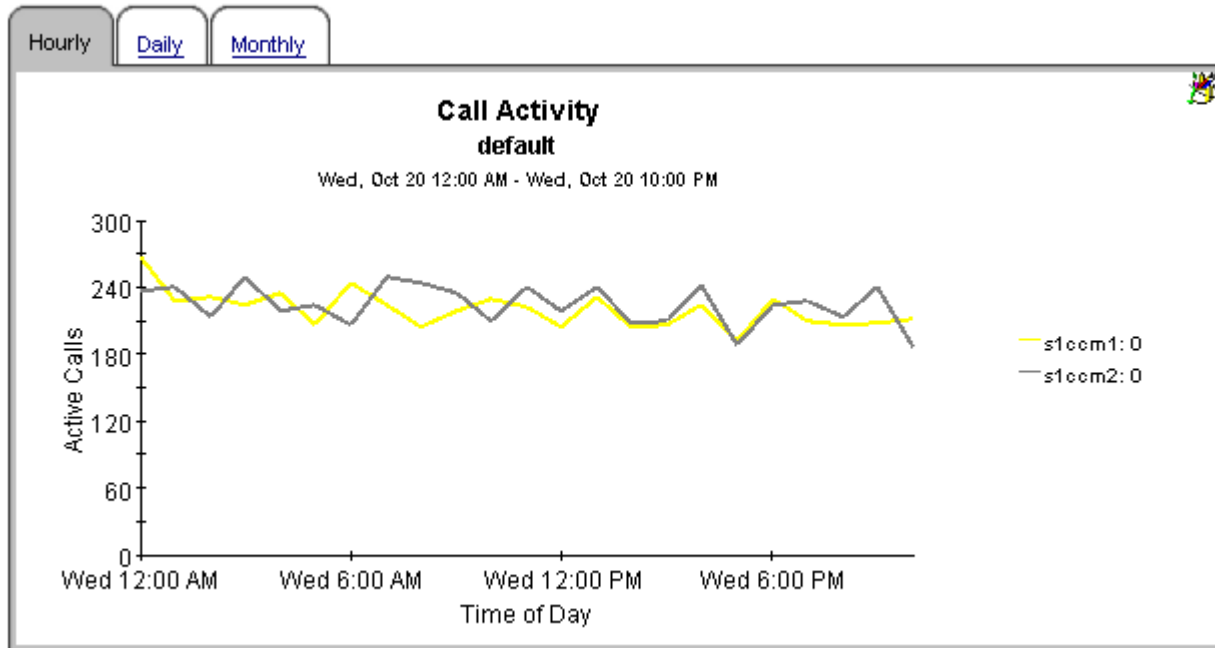
CallManager Cluster Peak Utilization Correlation

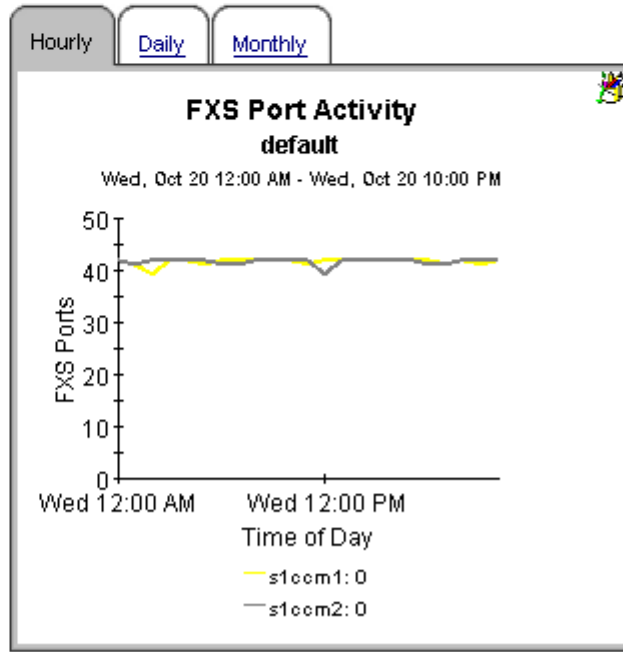
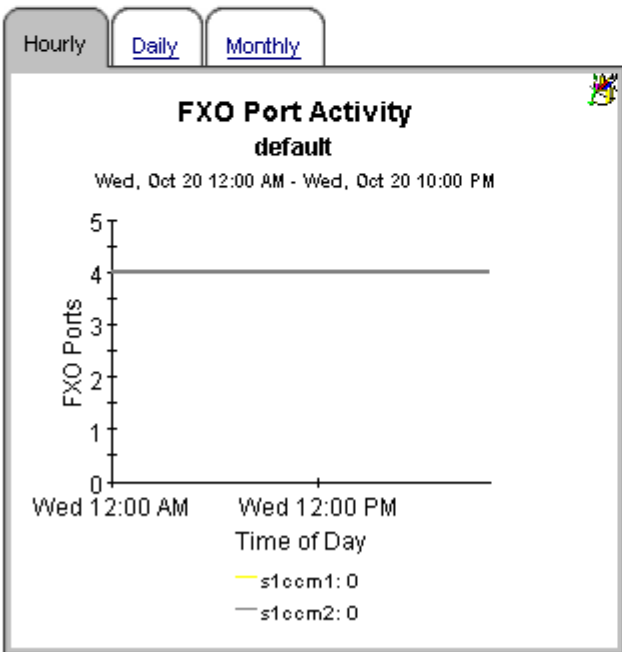
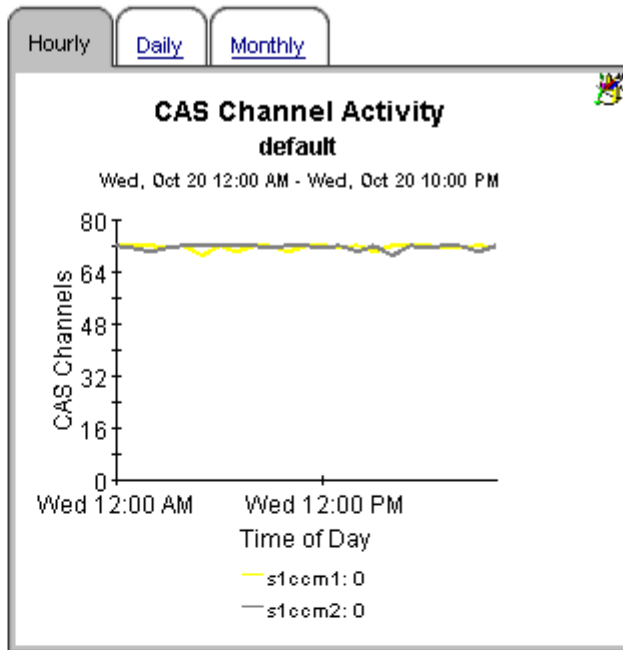
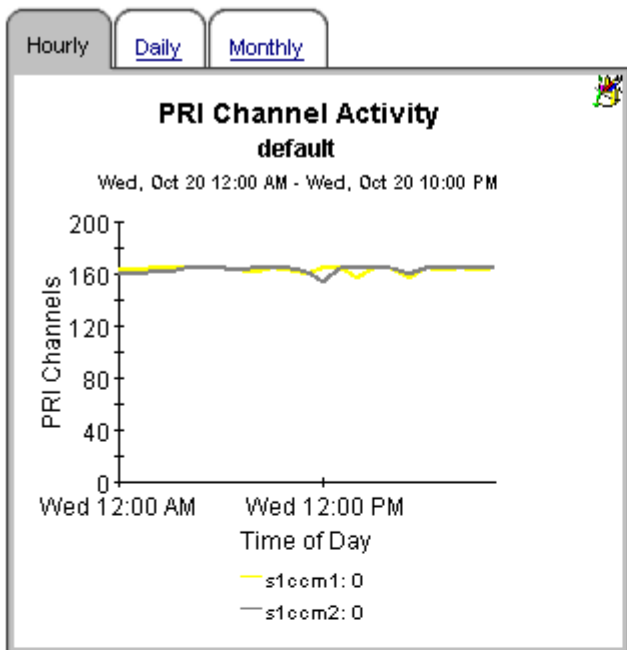
This report presents the peak utilization metrics for all the CallManagers that belong to a particular cluster. This would help in identifying imbalanced utilization of resources across the CallManagers in a given cluster.

CallManager Cluster Selection Table

Wed, Oct 20, 2004

CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
default	241	330	177	144	79	8	4	84	46





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Cisco IP Telephony Statistics

CallManager Cluster Busy Hour Utilization Correlation



This report presents the busy hour utilization metrics for all the CallManagers that belong to a particular cluster. This would help in identifying imbalanced utilization of resources across the CallManagers in a given cluster.

CallManager Cluster Selection Table

Mon Apr 21 2003

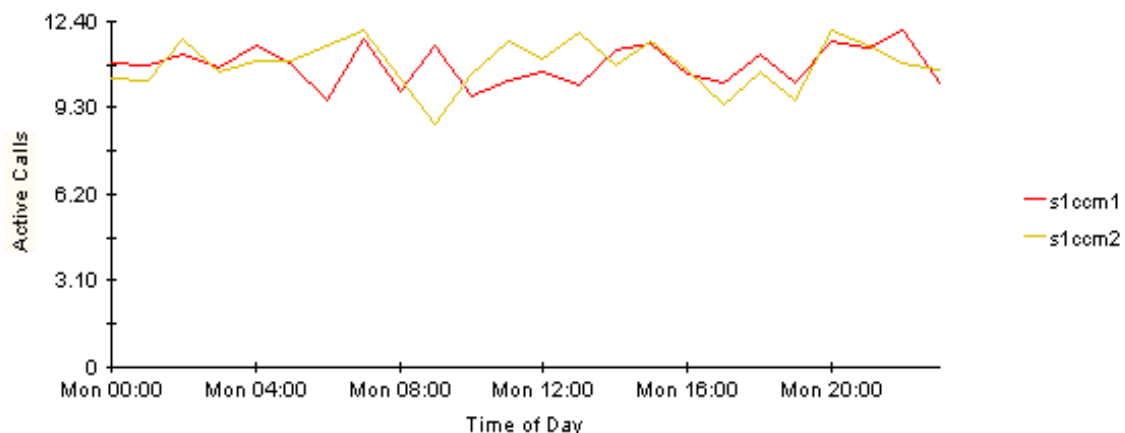
CallManager Cluster Name	Busy Hour Calls	Total PRI Channels	Busy Hour Active PRI	Total CAS Channels	Busy Hour Active CAS	Total FXO Ports	Busy Hour Active FXO	Total FXS Ports	Busy Hour Active FXS
West Coast Cluster1	24	0	0	0	0	12	7	36	21
East Coast Cluster1	38	24	14	24	14	6	4	36	19

Hourly | Daily | Monthly

Call Activity

West Coast Cluster1

Mon Apr 21 12:00 AM - Mon Apr 21 11:00 PM



Cisco IP Telephony Statistics



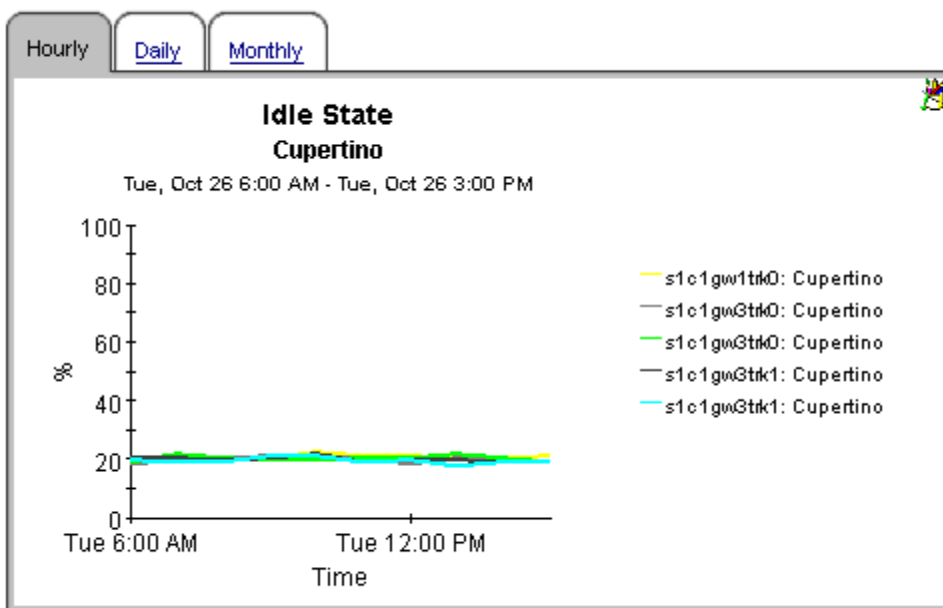
DS1 Usage Correlation By Location

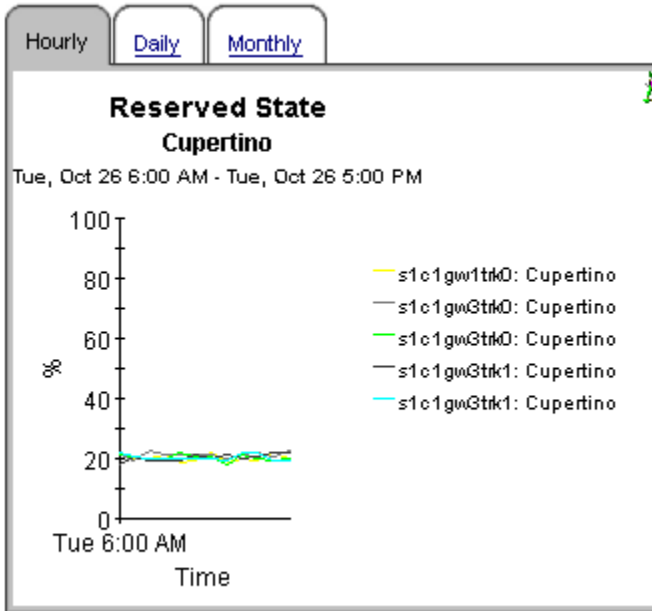
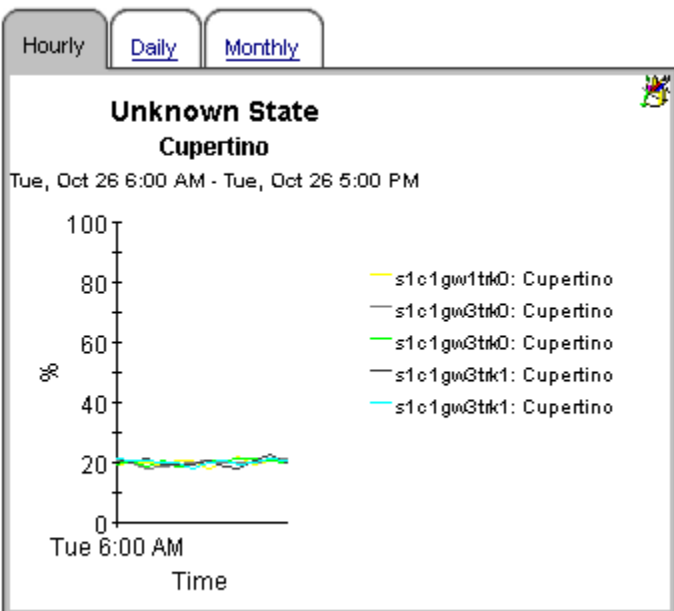
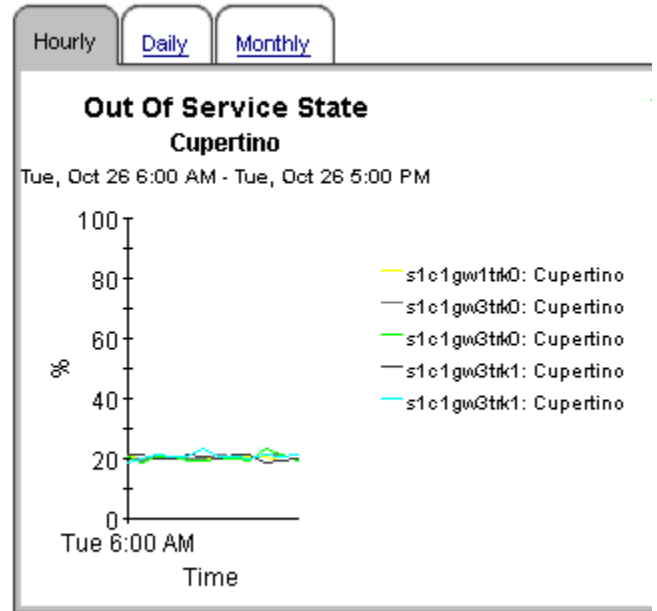
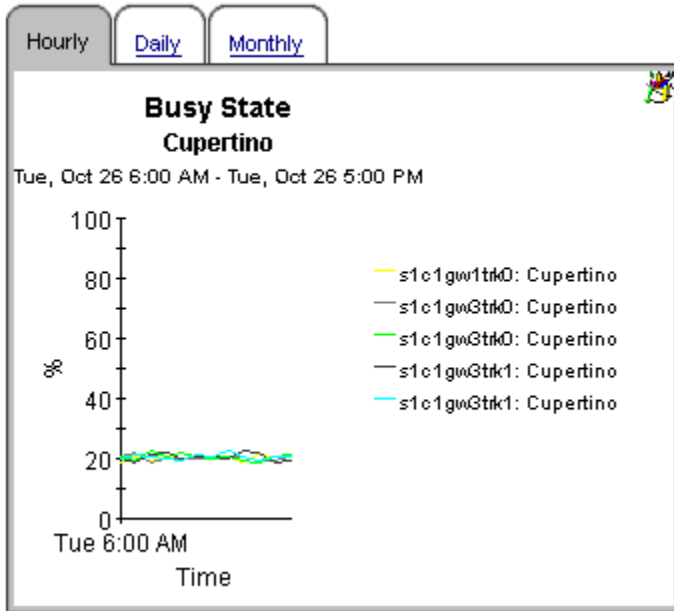
The DS1 Usage Correlation By Location Report presents the usage metrics for the individual DS1(s) that belong to a given location. This can be used to identify imbalanced usage of the T1/E1 lines.

Location Selection Table

Tue, Oct 26, 2004

Location	% Busy State	% Idle State	% Out Of Service State	% Reserved State	% Unknown State
Cupertino	20	20	20	20	20
Reston	20	20	20	20	20






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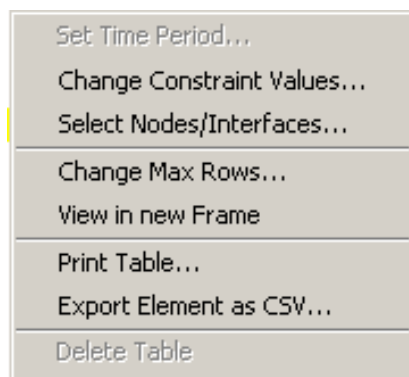
Editing Tables and Graphs

Any table or graph can be viewed in several ways. While the default view is usually adequate, you can easily change to a different view. If you are using Report Viewer, right-click the object to display a list of view options. If you are using the Web Access Server, follow these steps:

- 1 Click **Preferences** on the links bar.
- 2 Expand **Reports** in the navigation frame.
- 3 Click **Viewing**.
- 4 Select the **Allow element editing** box.
- 5 Click **Apply**.
- 6 Click  (the edit icon) next to the table or graph.

View Options for Tables

Right-clicking a table, or selecting the edit table icon if you are using the Web Access Server, opens a list of table view options.



Select **Set Time Period** to alter the relative time period (relative to now) or set an absolute time period. The Set Time Period window opens.

You may shorten the period of time covered by the table from, for example, 42 days to 30 days or to 7 days. If you are interested in a specific period of time that starts in the past and stops *before* yesterday, click **Use Absolute Time** and select a Start Time and an End Time.

Select **Change Constraint Values** to loosen or tighten a constraint, thereby raising or lowering the number of elements that conform to the constraint. The Change Constraint Values window opens. To loosen a constraint, set the value lower; to tighten a constraint, set the value higher.

The **Select Nodes/Interfaces** allows you to change the scope of the table by limiting the table to specific nodes, specific interfaces, or a specific group of nodes or interfaces. The Select Node Selection Type window opens.

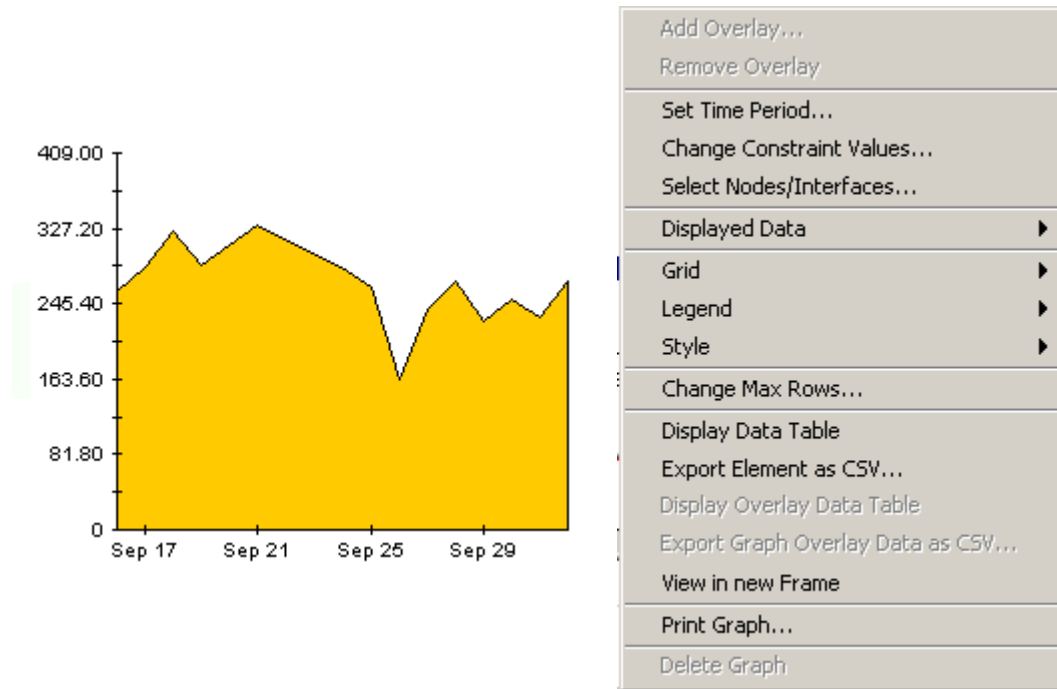
Change Max Rows increases or decreases the number of rows in a table. The default is 50. If you expand the default, the table may take more time to open. If you are trending a large network, using the default ensures that the table opens as quickly as possible.

View in new Frame opens the table in a Table Viewer window, shown below. If necessary, make the data in the table more legible by resizing the window.

Table Viewer					
Polled IP QoS Statistics Data - Input Over Previous 6 Hours					
Direction	IpPrecedence	Switched Bytes	Switched Pkts	Time Period	
Input	0	105,688	675	Tue Oct 29 07:00 AM	
Input	1	0	0	Tue Oct 29 07:00 AM	
Input	2	0	0	Tue Oct 29 07:00 AM	
Input	3	0	0	Tue Oct 29 07:00 AM	
Input	4	0	0	Tue Oct 29 07:00 AM	
Input	5	0	0	Tue Oct 29 07:00 AM	
Input	6	600	5	Tue Oct 29 07:00 AM	
Input	7	0	0	Tue Oct 29 07:00 AM	
Input	0	98,334	638	Tue Oct 29 06:45 AM	
Input	1	0	0	Tue Oct 29 06:45 AM	
Input	2	0	0	Tue Oct 29 06:45 AM	
Input	3	0	0	Tue Oct 29 06:45 AM	
Input	4	0	0	Tue Oct 29 06:45 AM	
Input	5	0	0	Tue Oct 29 06:45 AM	
Input	6	0	0	Tue Oct 29 06:45 AM	
Input	7	0	0	Tue Oct 29 06:45 AM	
Input	0	97,539	648	Tue Oct 29 06:30 AM	
Input	1	0	0	Tue Oct 29 06:30 AM	
Input	2	0	0	Tue Oct 29 06:30 AM	
Input	3	0	0	Tue Oct 29 06:30 AM	
Input	4	0	0	Tue Oct 29 06:30 AM	
Input	5	0	0	Tue Oct 29 06:30 AM	
Input	6	120	1	Tue Oct 29 06:30 AM	
Input	7	0	0	Tue Oct 29 06:30 AM	
Input	0	90,744	564	Tue Oct 29 06:15 AM	
Input	1	0	0	Tue Oct 29 06:15 AM	
Input	2	0	0	Tue Oct 29 06:15 AM	
Input	3	0	0	Tue Oct 29 06:15 AM	
Input	4	0	0	Tue Oct 29 06:15 AM	
Input	5	0	0	Tue Oct 29 06:15 AM	
Input	6	0	0	Tue Oct 29 06:15 AM	
Input	7	0	0	Tue Oct 29 06:15 AM	
Input	0	103,775	656	Tue Oct 29 06:00 AM	
Input	1	0	0	Tue Oct 29 06:00 AM	
Input	2	0	0	Tue Oct 29 06:00 AM	
Input	3	0	0	Tue Oct 29 06:00 AM	
Input	4	0	0	Tue Oct 29 06:00 AM	

View Options for Graphs

Right-clicking a graph, or clicking the edit graph icon if you are using the Web Access Server, opens the following list of view options.



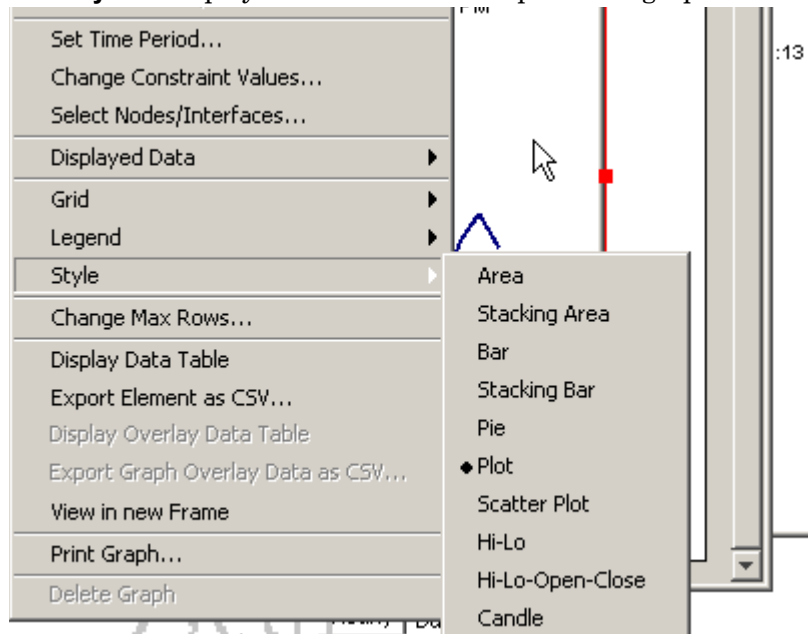
The following table provides details about each option.

Option	Function
Set Time Period	Same as the table option shown above.
Change Constraint Values	Same as the table option shown above.
Select Nodes/Interfaces	Same as the table option shown above.
Displayed Data	For every point on a graph display data in a spreadsheet.
Grid	Add these to the graph: X axis grid lines Y axis grid lines X and Y axis grid lines
Legend	Delete or reposition the legend.
Style	See the illustrations below.
Change Max Rows...	Same as the table option shown above.
Display Data Table	See below.

Option	Function
Export Element as CSV...	Same as the table option shown above.
View in New Frame	Opens graph in a Graph Viewer window.
Print Graph	Same as the table option shown above.

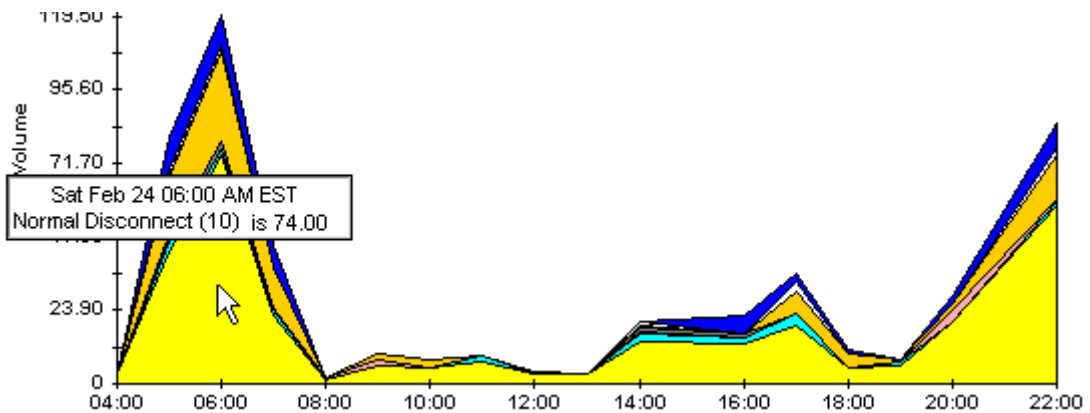
Style Options

Select **Style** to display a list of seven view options for graphs.



Style > Area

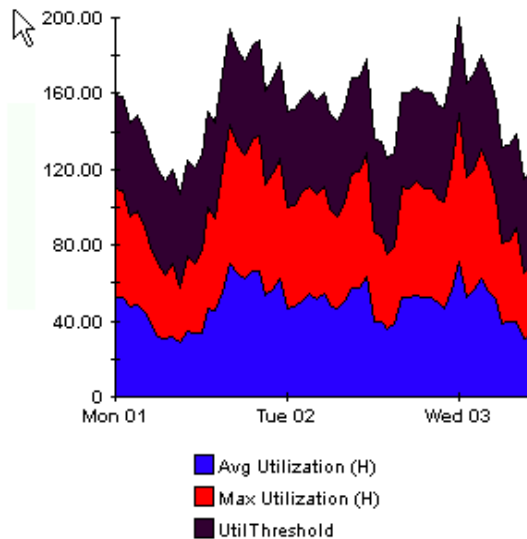
The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location



To shorten the time span of a graph, press SHIFT+ALT and use the left mouse button to highlight the time span you want to focus on. Release the mouse button to display the selected time span.

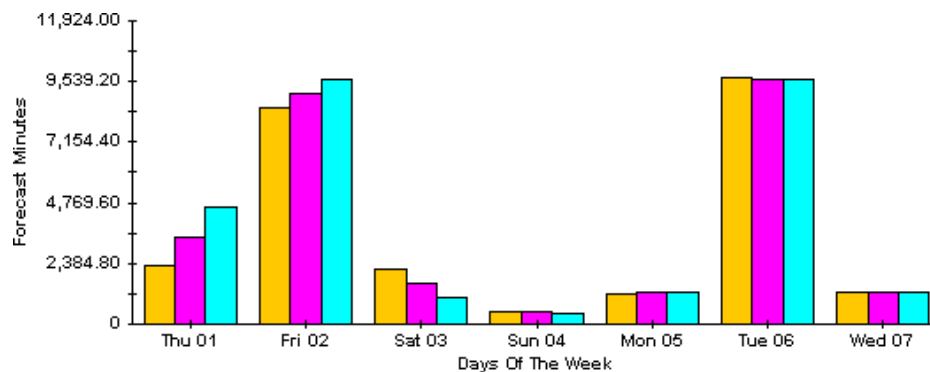
Style > Stacking Area

The area or plot graph changes to a stacking area graph. This view is suitable for displaying a small number of variables.



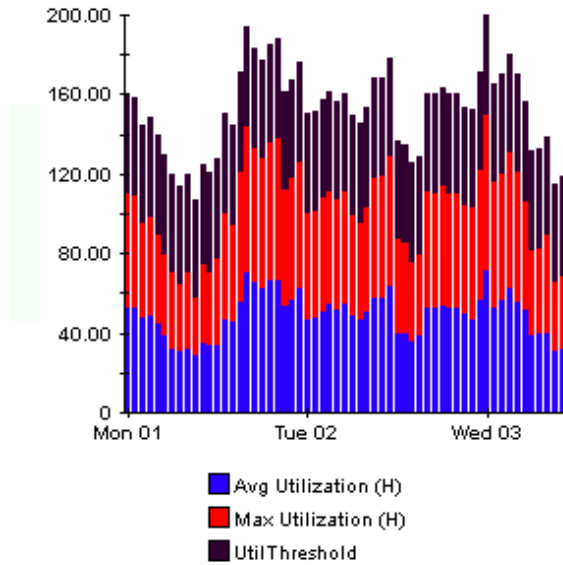
Style > Bar

The graph changes to a bar chart. This view is suitable for displaying relatively equal values for a small number of variables. There are three variables in the graph below.



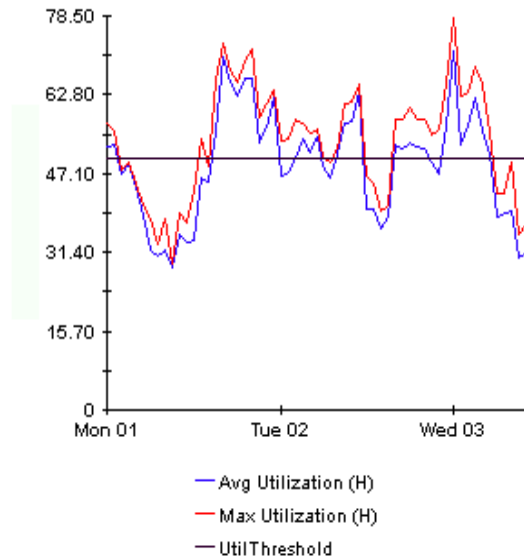
Style > Stacking Bar

The plot or area graph changes to a stacking bar chart. If you increase the width of the frame, the time scale becomes hourly. If you increase the height of the frame, the call volume shows in units of ten.



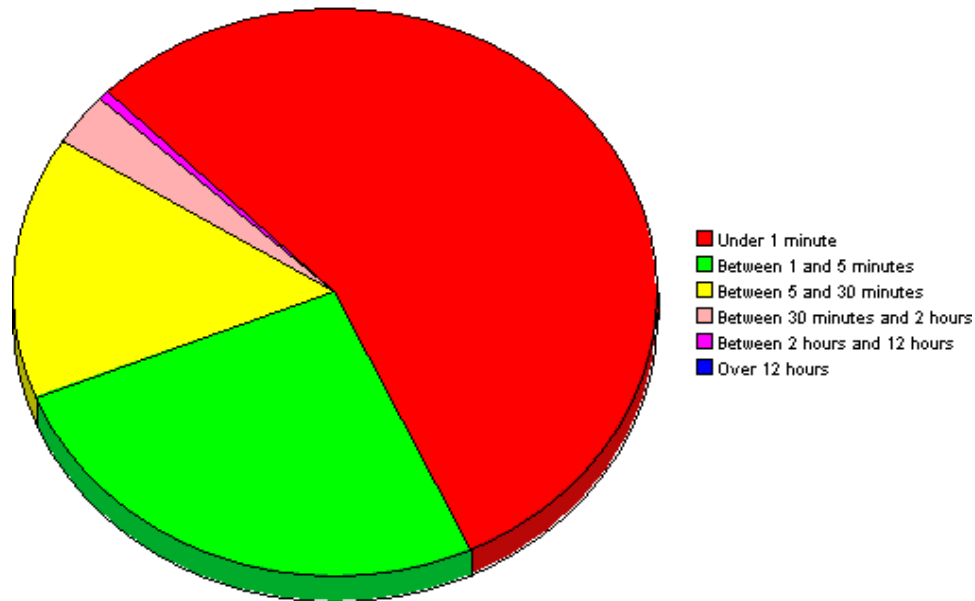
Style > Plot

Bands of color in an area graph change to lines. If you adjust the frame width, you can make the data points align with hour; if you adjust the frame height, you can turn call volume into whole numbers.



Style > Pie

An area graph becomes a pie chart. Bands in an area graph convert to slices of a pie and the pie constitutes a 24-hour period. This view is helpful when a small number of data values are represented and you are looking at data for one day.



If you are looking at data for more than one day, you will see multiple pie graphs, one for each day.

Display Data Table

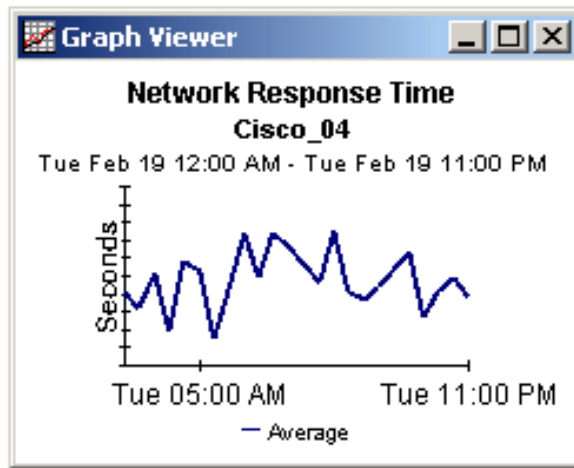
This option changes a graph into a spreadsheet.

A screenshot of a software window titled "Data table for 8.1" showing a spreadsheet with two columns: "X Axis" and "Average". The "X Axis" column contains 16 entries of "Tue Feb 19 ..." and the "Average" column contains numerical values ranging from 0.284 to 1.497.

X Axis	Average
Tue Feb 19 ...	0.809
Tue Feb 19 ...	0.621
Tue Feb 19 ...	1.026
Tue Feb 19 ...	0.362
Tue Feb 19 ...	1.171
Tue Feb 19 ...	1.051
Tue Feb 19 ...	0.284
Tue Feb 19 ...	0.826
Tue Feb 19 ...	1.483
Tue Feb 19 ...	0.967
Tue Feb 19 ...	1.471
Tue Feb 19 ...	1.308
Tue Feb 19 ...	1.123
Tue Feb 19 ...	0.93
Tue Feb 19 ...	1.497
Tue Feb 19 ...	0.806
Tue Feb 19 ...	0.725

View in New Frame

The graph opens in a Graph Viewer window. Improve legibility by resizing the window.



active ports rate

A measure of the percentage of total active channels/ports divided by the total channels/ports.

baseline average

The average of all samples during the baseline period. The baseline period is a rolling period comprising the previous 91 days

busy hour

Busy hour is the maximum hourly average for the day. This value is the basis for calculating future performance. Unlike the average for the day, this value does not smooth out daily peaks and valleys. In addition, unlike the daily maximum, or peak, and the daily minimum, this value represents a relatively persistent phenomenon, not a momentary condition. Since busy hour is an average, actual utilization could have been well above the average for a portion of that particular hour, as well as well below the average for a portion of that particular hour.

Cisco IP Telephony Statistics calculates a busy hour for the following metrics:

- Number of calls
- Active PRI channels
- Active CAS channels
- Active FXO ports
- Active FXS ports

CallManager

A Cisco AVVID IP Telephony service whose primary function is the control and routing of calls from voice-enabled IP device.

CAS

Channel Associated Signaling. A scheme for transmission of call signaling information that relies on interleaving the call signaling within the media information that the interface transmits.

channel name

The concatenation of DS1Name and Channel Index.

daily

Performance over the preceding 30 days for the following metrics:

- PRI channel activity
- CAS channel activity
- FXO port activity
- FXS port activity

The most recent day in this view is yesterday.

day of week

A forecast, derived from baseline data, that correlates growth rate to each day of the week.

F30, F60, F90

The level where utilization is expected to be 30, 60, and 90 days from now. Calculated by applying linear regression to busy-hour levels over the baseline period.

FXO

Foreign Exchange Office. A VoIP gateway providing analog access to central office's line termination.

FXS

Foreign Exchange Station. A VoIP gateway providing analog to a Plain Old Telephone Service (POTS) station.

gateway

A device that provides real-time, two-way communications between the packet-based network and other stations on a switched network.

growth rate

Also known as rate of increase. F30 utilization divided by average busy-hour utilization.

hourly

A view of yesterday's performance for the following metrics:

- PRI channel activity
- CAS channel activity
- FXO port activity
- FXS port activity

location

The place where gateways are located. Value imported by the Common Property Tables provisioning process. If not provisioned, field reads *unassigned*.

PRI

Primary Rate Interface. An ISDN interface containing 24 or 32 channels for the communication of media and signaling information.

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