Class Based QoS Report Pack

For the Windows®, HP-UX, Solaris, and Linux operating systems

Software Version: 1.31

HP Performance Insight 5.41

User Guide

November 2009

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This guide's title page contains the following identifying information:

- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

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Contents

1 Overview

HP Performance Insight 5.41 (PI 5.41) collects data from many sources, performs in-depth trend analysis, maintains performance baselines, and provides users with convenient, web-based reporting. Following is a partial list of product features:

- Distributed architecture
- Easy to scale (supports data collection from thousands of agents)
- CODA/PA agent support
- Multi-company security model
- Data warehousing
- Near Real Time reporting
- Forecasting
- Extensive aggregation (by hour, day, week, month; by location, by customer)
- Thresholding and alerting
- Easy identification of bottlenecks
- Easy assessment of capacity trends
- Accurate and timely documentation for management
- Integration with NNM
- Integration with OVO/OM

The reporting solutions created for PI 5.41 cover many areas of business technology optimization, including traffic profiling for networks, specifically, IP QoS Reporting and Class-Based QoS Reporting. For a complete list of reporting solutions organized by technology, see Appendix A, PI Report Packs.

Class Based QoS Reporting

The Class Based QoS reporting solution provides comprehensive summarization and reporting features that let you view the effect of QoS policies on network traffic. The Class Based QoS Report Pack displays reports that provide a comprehensive picture of what is happening on the network. Network service providers and their customers can use the Report Pack to monitor the usage characteristics of network services with a view to service capacity planning and network/service optimization.

The Class Based QoS Report Pack installs on PI 5.41. The Class Based QoS Datapipe runs on the PI 5.41 server.

The Datapipe collects data using SNMP and networking devices that support the Class Based QoS configuration. The Report Pack aggregates and reports on the data.

Data Collection for Class-Based QoS Reporting

The Datapipe collects QoS statistics from the Cisco Class Based QoS MIB (Management Information Base) and populates the Class Based QoS rate tables once every 15 minutes. It collects QoS policy configuration data for all routers once a day.

Quality of Service (QoS) lets you dedicate bandwidth to particular types of traffic but does not tell you how much traffic of each service class is traversing the network, nor does it provide the hourly and daily information needed to design efficient QoS schemes. To find out how much traffic of each service class is traversing the network, and when the traffic is taking place, it is necessary to poll byte and packet counters in the Cisco Class Based QoS MIB and process the collected data. The MIB stores traffic policy data and performance statistics. QoS policies define the flow of traffic.

Customer, location, node, and interface information for QoS data is imported via the Common Property Tables property import/forms and the Interface Reporting property import/form.

The Datapipe provides the following data collection functionality:

- Discovers nodes that support the Class Based QoS MIB. The MIB contains a number of useful metrics for various QoS policies, including:
  - Inventory
    - Parent and child classes applied on the various interfaces of the Class Based QoS-enabled devices and the direction information.
  - Class statistics
    - Pre-policy packets, bytes, and bit rate
    - Dropped packets, bytes, and bit rate
    - Packets dropped due to no buffers
  - Policing statistics
    - Conformed packets, bytes, and bit rate
    - Exceeded packets, bytes, and bit rate
    - Violated packets, bytes, and bit rate

- Queuing statistics
  - Current queue depth
  - Maximum queue depth
  - Discard bytes and packets
- Traffic shaping statistics
  - Delayed bytes and packets
  - Dropped bytes and packets
  - Current queue size
- Random Early Detect (RED) statistics
  - Random dropped bytes and packets
  - Tail dropped bytes and packets
  - Transmitted bytes and packets
  - ECN marked bytes and packets
  - Mean queue size

- Recognizes and responds to re-indexing of QoS objects in the Class Based QoS MIB tables.
- Maps data from the rate tables to the Class Based QoS Report Pack base tables.
- Collects QoS statistics according to the QoS policy configuration of the routers.
- Recognizes and responds to interface re-indexing discovered by the Interface Reporting Datapipe and the ifEntry Discovery Datapipe.
- Collects QoS policy configuration data within 15 minutes after a re-indexing event or a configuration change is discovered on a router. This happens only on routers that are re-indexed or reconfigured.
- Collects statistics for routers that need policy configuration updates to minimize gaps in the data due to re-indexing or policy configuration changes. Collections are based on the previous policy configuration. Statistics for new QoS objects are collected when the new policy configuration is known.
- Updates the configuration/information for classes and policies in the Report Pack for all nodes requiring a configuration update prior to transferring data.
- Transfers data to the Report Pack only for nodes with complete policy configuration data. After a re-index or configuration change, trend sums are suspended until the policy configuration is updated.

Class Based QoS Report Pack

The Report Pack issues processing directives to PI 5.41, and displays reports that show the distribution of traffic on a per-precedence basis. With this information, you can monitor the usage characteristics of provided network services, plan service capacity, and optimize your network services.

The Report Pack populates the Class Based QoS daily tables every day as defined in the processing schedule. The Class Based QoS monthly tables are updated every day with the current month-to-date data. The Class Based QoS forecast tables are populated every day using a 42-day baseline period.

Class-Based QoS contains four folders and a total of 17 reports. See below for details.

Folder	Report
Admin	QoS Polling Overview
Drilldown	Bit Rate History Dropped Bit Rate History Inventory Packet Rate History Percent Packet Drop History Queuing History Traffic Forecast Utilization History
Summary	Policing Summary by Class Queuing Summary by Class RED Summary by Class RED Summary by Class/Precedence Summary by Class Traffic Shaping Summary by Class
Top N	Queuing Top N Utilization Top N

Reports show data by interface, traffic direction, and class. Additional reports may show data aggregated by device and for all devices. Reports show hourly, daily, and monthly data.

For details on deploying the reports, see Accessing Deployed Reports on page 21. To see example reports, see Sample Reports on page 25.

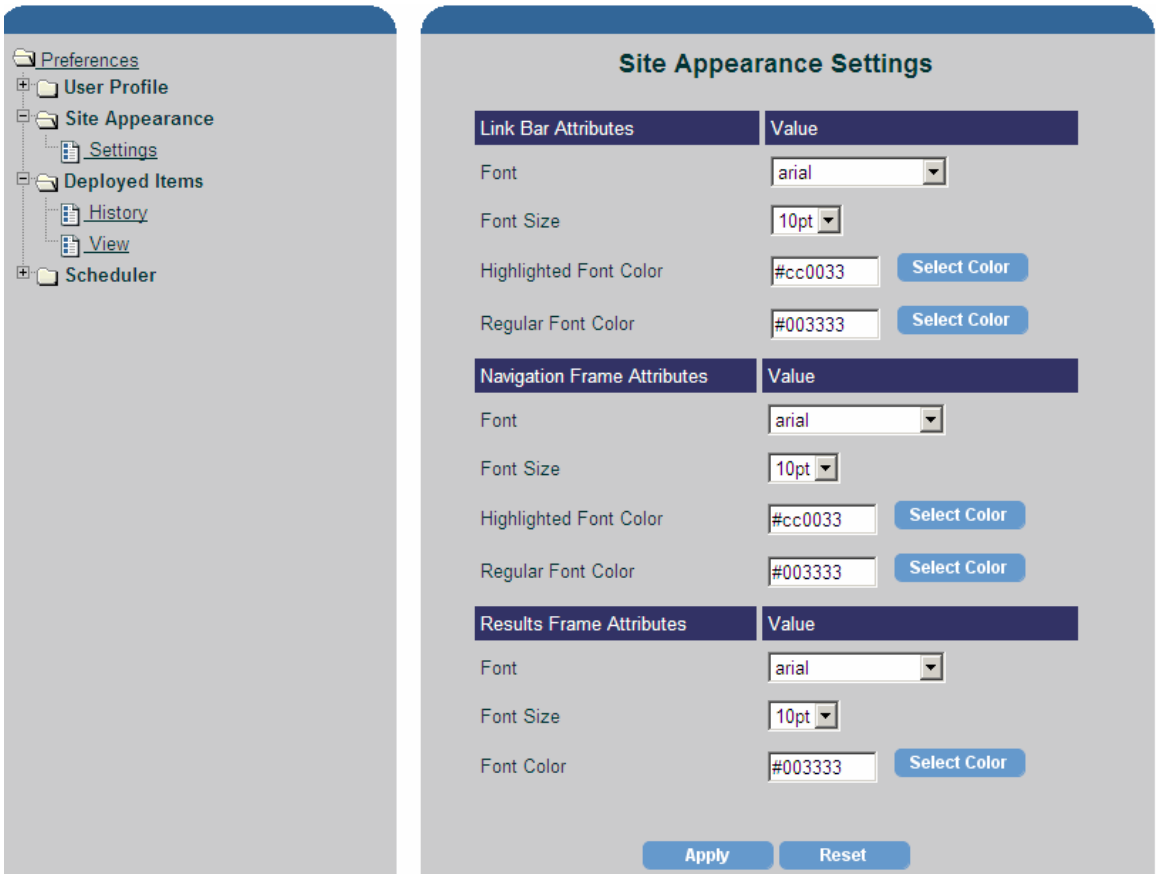
Customizing the Appearance of Reports

The Report Pack provides Common Property Table forms that enable provisioning additional (optional) information, such as node locations and end customers. The Report Pack uses this provisioning data to present more detailed information concerning the endpoints of the network flows.

The Report Pack inherits property data, including name of node, name of interface, location of node, and customer, from the Interface Reporting Report Pack. Any property changes made for Interface Reporting using the Common Property Tables automatically appear in Class Based QoS Report Pack reports.

You can change the appearance of the reports, including fonts and graph styles, using the Web Access Server.

Figure 1 Site Appearance Settings



For detailed instructions, see the *HP Performance Insight 5.41 Administration Guide*.

Product Version History

Version	Release Date	Features/Enhancements
1.10	June 2007	Initial release
1.10	October 2007	
1.30	February 2009	*new upgrade package:* • Class_Based_QoS_Upgrade_to_13 *new version of datapipe:* • Class_Based_QoS_Datapipe_Upgrade_to_12 *defect fix:* • QXCR1000818651 - No data in CB QoS reports • QXCR1000873210 - A customer's name is visible in the Class Based QOS report pack
1.31	November 2009	*new upgrade package:* • Class_Based_QoS_Upgrade_to_131 *defect fix:* • QCCR1B39239: CBQoS reports do not show Voice and Video Traffic information

Sources for Additional Information

The following documents provide additional information:

- *HP Performance Insight 5.41 Administration Guide*
- *Common Property Tables User Guide*
- *Interface Reporting Report Pack User Guide*
- *Interface Reporting ifEntry Datapipe User Guide*

These documents can be found either on the product DVD or you can download the latest version from the URL shown in Documentation Updates on page 3.

Select **Support** → **Product Manuals** to reach the HP Software Product Manuals page. The user guides are listed under Performance Insight.

Every manual on the Product Manuals Search page indicates the month and year. If a manual is revised and reposted, the date will change. Revised manuals are posted on a regular basis, so check the date on your PDF against the date on the PDF on the web and use the web version if it is newer.

2 Package Installation

Guidelines for Installation

The Report Pack CD has the latest report packs and datapipes. When you insert the CD in the CD-ROM drive and launch the package extraction program, the install script on the CD extracts every package from the CD and copies the results to the Packages directory on your system. When the extract finishes, the install script prompts you to launch PI 5.41 and start Package Manager. Before using Package Manager, review the following guidelines.

Prerequisites for Installation

The Class Based QoS Report Pack has a combination of core product requirements and package level requirements. The core product requirements are:

- PI 5.41
- All service packs available for PI 5.41

The package level prerequisites are:

- Common Property Tables 3.91
- Interface Reporting Report Pack 5.52

Upgrading Common Property Tables

If you are running an earlier version of Common Property Tables, you must upgrade that package to version 3.91 (see Upgrade to Common Property Tables 3.91 on page 16).

For more information about installing and using Common Property Tables, refer to the *Common Property Tables User Guide*.

Distributed Environments

If you are running Class Based QoS on a distributed system across multiple servers, the central server, every satellite server, and every remote poller must be running the same version of Performance Insight and all available service packs for that version of HP Performance Insight. When you install the Class Based QoS on the central server, deploy reports. When you are done installing packages, you must configure each server by following the steps under Configuring the Report Pack and Datapipe on page 33.

Installing Class Based QoS

Task 1: Extract Packages from the Report Pack CD

1. Log in to the system. On Windows systems, log on with Administrator privileges. 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`**

   Solaris: **`sh /etc/init.d/ovpi_timer stop`**
3. Insert the Report Pack CD.

   Windows: A Main Menu displays automatically.

   UNIX: Mount the CD, navigate to the top-level directory for the CD drive, and run the ./setup command.
4. Select PI 5.41 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:

   — Class_Based_QoS

   — Class_Based_QoS_Datapipe

Task 2: Upgrade to Common Property Tables 3.91

1. Do not install any other package with the Common Property Tables upgrade package; install the CPT upgrade package and only the CPT upgrade package.
2. When prompted to accept or disable the option to Deploy Reports, accept the default. If you do not deploy reports, you will not deploy the change forms that come with Common Property Tables.
3. When the install finishes, click **Done** to return to the Management Console.

If you need more help with this task, refer to the *Common Property Tables User Guide*.

Task 3: Install the Report Pack and the Datapipe

1. If Package Manager is not running, select Package Manager from the Management Console.
2. Click **Next**. The Package Location window opens.
3. Click the Install radio button.
4. Approve the default installation directory or use the browse feature to select a different directory if necessary.
5. Click **Next**. The Report Deployment window opens.
6. Accept the default settings for Deploy Reports.

   Also accept the defaults for the application server name and port.

7 Type the same username and password as you used on the Management Console.

8 Click **Next**. The Package Selection window opens.

9 Select the check box next to the following package names:

— Class_Based_QoS 1.31

— Class_Based_QoS_Datapipe 1.21

10 Click **Next**. The Type Discovery window opens.

You can run Type Discovery at this point.

11 The Selection Summary window opens. Verify that the contents of this window are correct.

12 Click **Install** to begin the installation process. The Installation Progress window opens and the install process begins. When the install process is complete, a success install complete message appears.

13 Click **Done**.

14 Restart OVPI Timer.

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

UNIX: As root, do one of the following:

HP-UX: `sh /sbin/init.d/ovpi_timer start`

Solaris: `sh /etc/init.d/ovpi_timer start`

Installing the demo package is optional. You can install the Class Based QoS demo package by itself, or you can install the demo package along with the Report Pack.

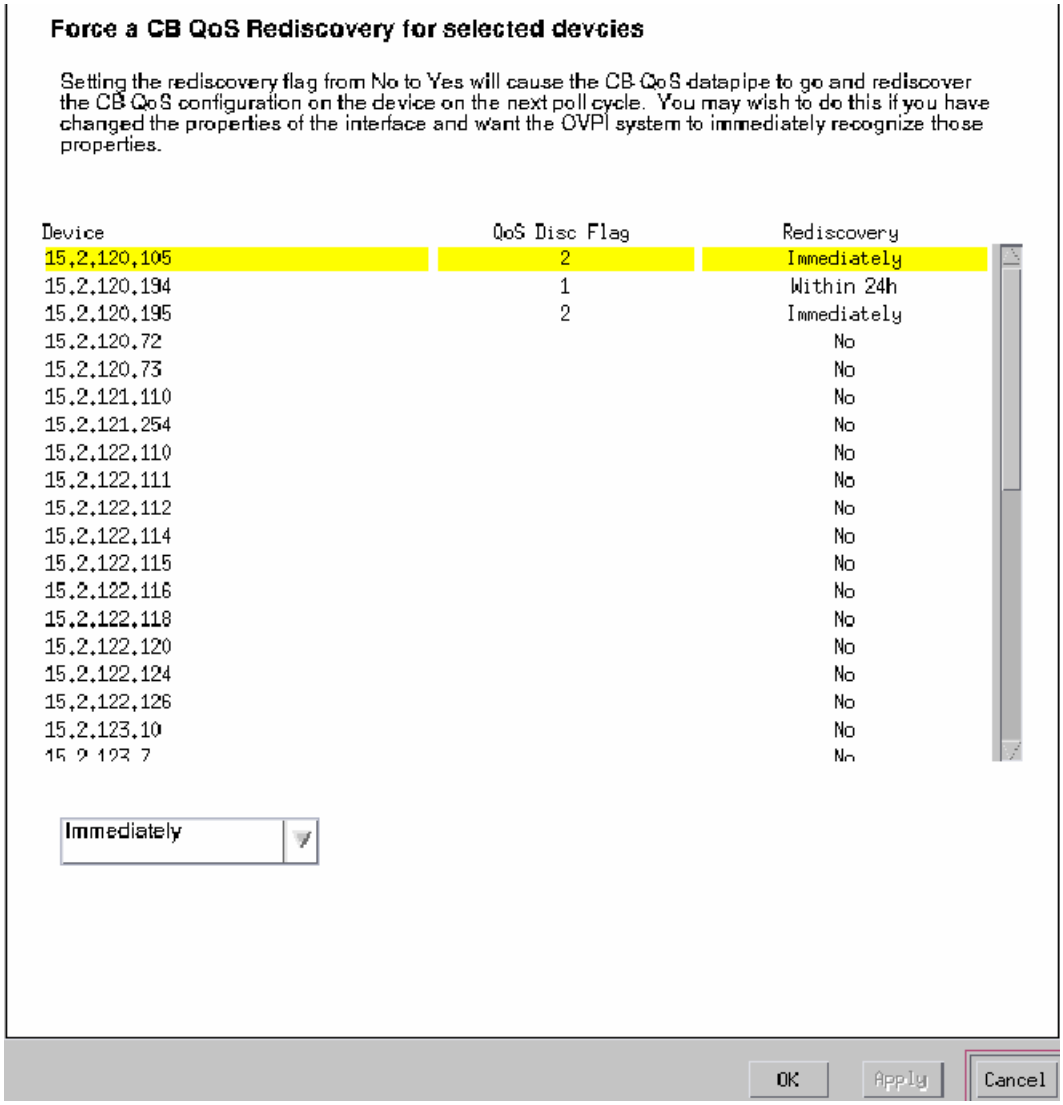
Configuring Class Based QoS

The Datapipe lets you select the period when the configuration information will be collected. It lets you limit the collection of Class Based QoS data to specified interfaces. And it lets you select the period when the Class Based QoS running statistics will be collected.

There are two forms for configuring the Datapipe. The forms are available through the Admin Console. Go to **Objects** > **Object/Property Management**.

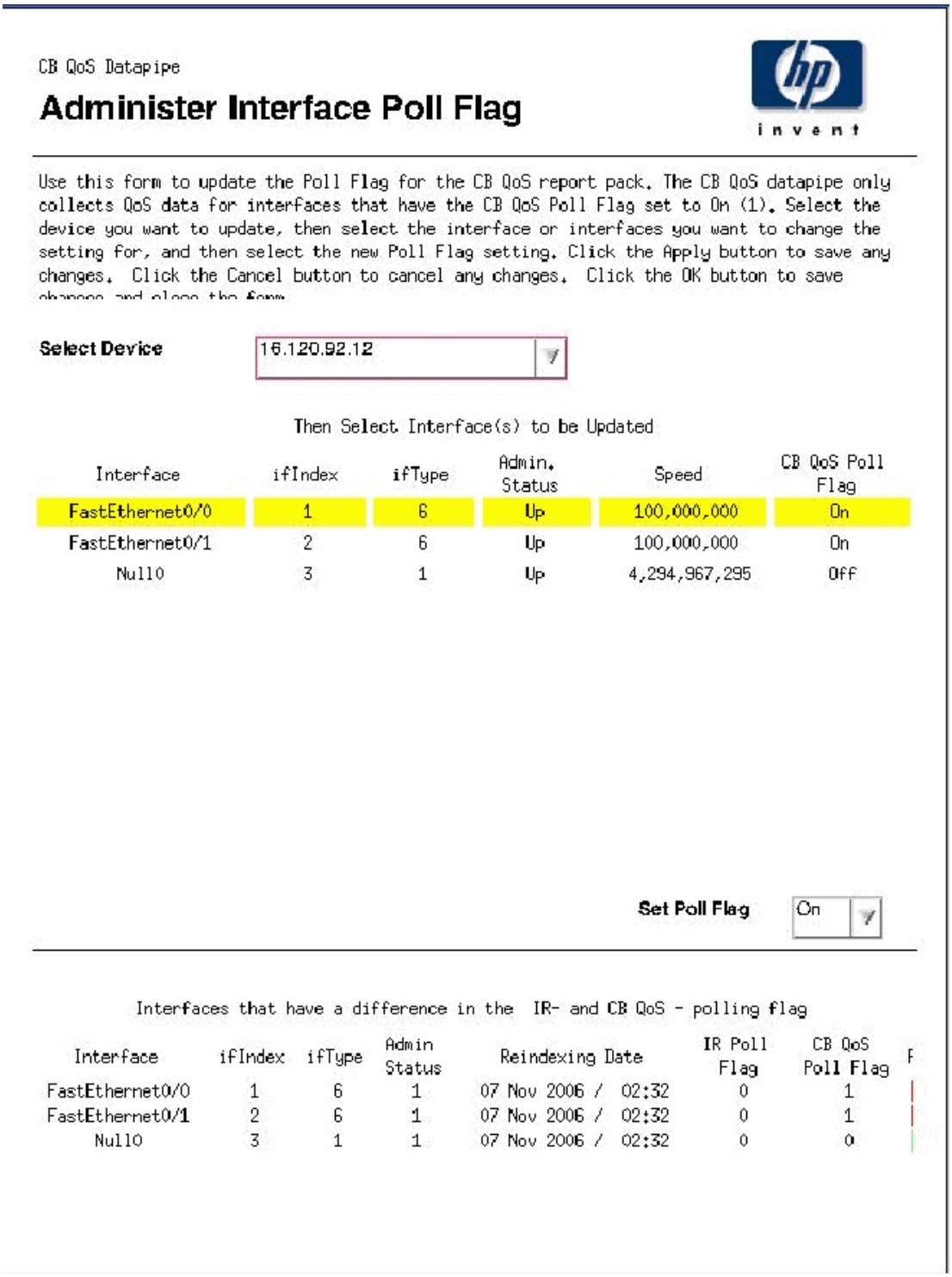
Force CB QoS Rediscovery Form

This form lets you determine when re-polling will take place once the Class Based QoS device configuration changes.



Administer Poll Flag for CB QoS Interfaces Form

This form lets you decide whether the interface on the supported devices can be polled or not.



CB QoS Datapipe

Administer Interface Poll Flag

Use this form to update the Poll Flag for the CB QoS report pack. The CB QoS datapipe only collects QoS data for interfaces that have the CB QoS Poll Flag set to On (1). Select the device you want to update, then select the interface or interfaces you want to change the setting for, and then select the new Poll Flag setting. Click the Apply button to save any changes. Click the Cancel button to cancel any changes. Click the OK button to save

Select Device 16.120.92.12

Then Select Interface(s) to be Updated

Interface	ifIndex	ifType	Admin. Status	Speed	CB QoS Poll Flag
FastEthernet0/0	1	6	Up	100,000,000	On
FastEthernet0/1	2	6	Up	100,000,000	On
Null0	3	1	Up	4,294,967,295	Off

Set Poll Flag On

Interfaces that have a difference in the IR- and CB QoS - polling flag

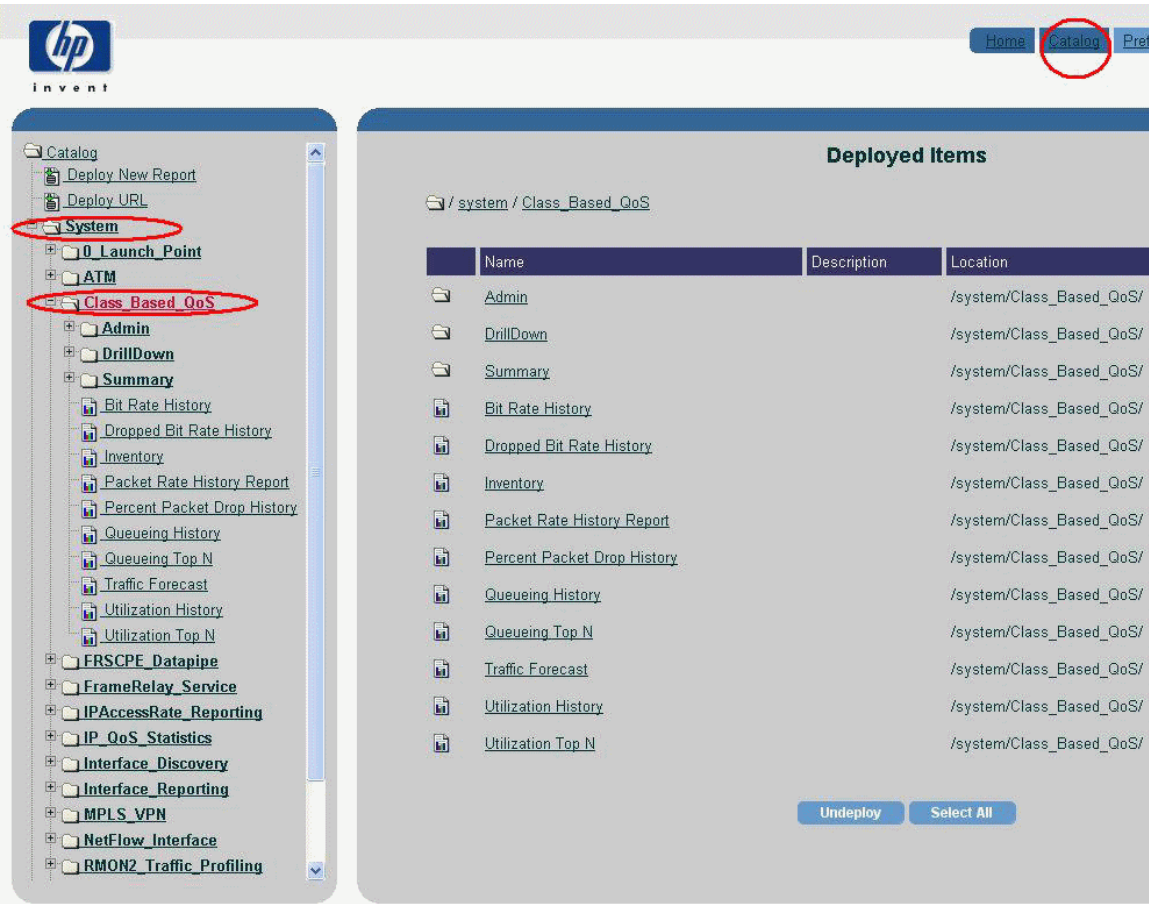
Interface	ifIndex	ifType	Admin Status	Reindexing Date	IR Poll Flag	CB QoS Poll Flag	F
FastEthernet0/0	1	6	1	07 Nov 2006 / 02:32	0	1	
FastEthernet0/1	2	6	1	07 Nov 2006 / 02:32	0	1	
Null0	3	1	1	07 Nov 2006 / 02:32	0	0	

Once the configuration collection interval and polled interfaces are selected, Class Based QoS configuration data is collected from the devices. The data is available in the base tables of the Report Pack. The overview report shows the QoS collection overview.

Accessing Deployed Reports

When you install Class Based QoS, the Deploy Reports option is enabled. As a result, the reports in this package (as well as any forms associated with the package) are deployed to the PI 5.41 Application Server. Once reports reside on the Application Server, they can be viewed in two ways:

- PI 5.41 client applications
- Web browser



If the client applications are installed on the user's system, the user has access to Report Viewer, Report Builder, and the Management Console. If the client applications are not installed on the user's system, using a web browser to view reports is the only way the user can view reports.

For more information about the clients, refer to the *HP Performance Insight Installation Guide*. For details about the Management Console, including how to use the Object/Property Management view to launch reports specific to a selected object, refer to the *HP Performance Insight 5.41 Administration Guide*.

Uninstalling the Package

Follow these steps to uninstall Class Based QoS. Removing the Report Pack automatically removes the Datapipe.

1. Log in to the system. On UNIX systems, log in as root.
2. Stop OVPI Timer and wait for processes to terminate.
3. Start Package Manager. The Package Manager welcome window opens.
4. Click **Next**. The Package Location window opens.
5. Click the Uninstall radio button.
6. Click **Next**. The Report Undeployment window opens.
7. If reports were deployed to the PI 5.41 Application Server, accept the defaults for Undeploy Reports, Application Server Name, and Port. Otherwise, clear the check box and skip to step 9.
8. Type your username and password for the PI 5.41 Application Server.
9. Click **Next**. The Package Selection window opens.
10. Click the check box next to the following packages:

    Class Based QoS Report Pack 1.31

    Class Based QoS Report Pack Demo 1.00
11. Click **OK**.
12. Click **Next**. The Selection Summary window opens.
13. Click **Uninstall**. The Progress window opens and the removal process begins. When the uninstall process is complete, a package removal complete message appears.
14. Click **Done** to return to the Management Console.
15. Restart OVPI Timer.

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

    UNIX: As root, type the following:

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

    Solaris: **`sh /etc/init.d/ovpi_timer start`**

The Class Based QoS Report Pack can be uninstalled independent of any other report pack.

Troubleshooting

Problem Statement

Reports do not show data.

Solution

- Verify that data collection is successful.
  - — Check whether the configuration collection interval has been configured correctly
  - — Check whether the interfaces on the supported devices have been selected for the polling
- Check for errors in map procedure.
  - — Check the “trend.log” for error messages
- Make sure that Trendtimer is running.
- Open the View Troubleshooting external link

```
http://support.openview.hp.com/troubleshooting.jsp
```

Problem Statement

Drilldown reports do not show voice and video traffic forecast information.

Solution

Update the configuration for the VoiceTraffic class in Cisco Class Based QoS MIB device configuration file using the following guidelines:

```
USA-PPY-BUS-RT-01.
policy-map Voice_Policy
class VoiceTraffic
priority percent 75
class class-default
fair-queue
random-detect

class-map match-all VoiceTraffic
match access-group name Voice

ip access-list extended Voice
remark Voice Traffic
permit tcp any any eq 1719
permit udp any any eq 1719
permit udp any any eq 1720
permit tcp any any eq 1720
permit udp any any range 2048 3028
```

3 Sample Reports

This chapter contains samples of the following reports:

- Dropped Bit Rate History
- Queueing History
- Utilization History
- Policing Summary by Class
- Traffic Shaping Summary by Class
- Queuing Top N
- Utilization Top N

Class Based QoS

Dropped Bit Rate History Report

Choose Customer | Choose Make | Choose Device

Choose Location | Choose model | Choose Interface

=> Reset all Filters | Choose Class | Choose Direction

QoS Class

Use the 'Device' link to return to all Interfaces&Classes of this Device - Use the 'Interface' link to return to all Classes on this Interface

Use the 'Parrent Class' link to return to the parrent QoS Class list

Device	Interface	Policy Name	Policy Level	Class Name	Parent Class	Max Hourly Avg Bit Rate	Max Hourly Drop Bit Rate	Assigned Bandwidth
16.120.92.12	FastEthernet0/0		1.00	class-default		8.6 Mb/s	765 b/s	100000000.00
16.120.92.12	FastEthernet0/0	p3	1.00	class-default		8.6 Mb/s	765 b/s	100000000.00
16.120.92.12	FastEthernet0/0	p4	1.00	class-default		8.6 Mb/s	765 b/s	100000000.00
16.120.92.12	FastEthernet0/0	policy1	1.00	class-default		8.6 Mb/s	765 b/s	100000000.00
16.120.92.12	FastEthernet0/0	policy3	1.00	class-default		8.6 Mb/s	765 b/s	100000000.00
16.120.92.12	FastEthernet0/0		1.00	class2		7.2 Mb/s	1 Kb/s	100000000.00

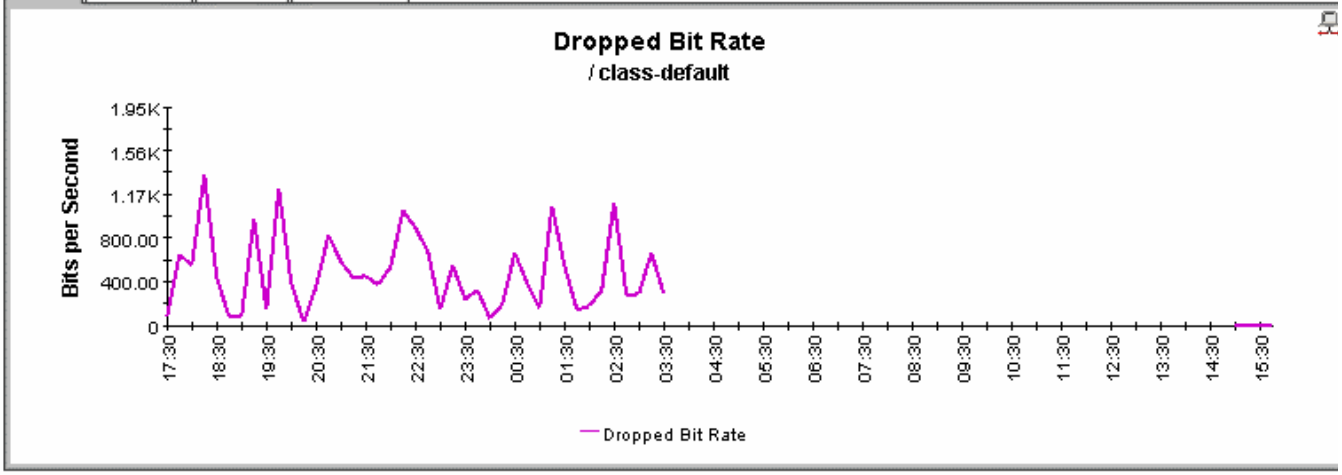
QoS Child Classes

Use the 'Class Name' link to see the graphs of the selected Child Class

Policy Name	Policy Level	Class Name	Max Hourly Avg Bit Rate	Max Hourly Drop Bit Rate	Assigned Bandwidth

No Data

Rate | Hourly | Daily | Monthly



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Class Based QoS

Queueing History Report

Choose Customer | Choose Make | Choose Device

Choose Location | Choose model | Choose Interface

=> **Reset all Filters** | Choose Class | Choose Direction

QoS Class

Device	Interface	Policy Name	Policy Level	Class Name	Parent Class	Max. Hourly Queue Depth	Discarded Bytes	Discarded Packets	Assigned Bandwidth	Priority Queue	empty
16.120.92.11	FastEthernet0/0		1.00	clasPrec23		3790103.50	1169284	4581	100000000.00	N	
16.120.92.11	FastEthernet0/0	p3	1.00	clasPrec23		3790103.50	1169284	4581	100000000.00	N	
16.120.92.11	FastEthernet0/0	p4	1.00	clasPrec23		3790103.50	1169284	4581	100000000.00	N	
16.120.92.11	FastEthernet0/0	policy3	1.00	clasPrec23		3790103.50	1169284	4581	100000000.00	N	
16.120.92.11	FastEthernet0/0	policy1	1.00	clasPrec23		3790103.50	1169284	4581	100000000.00	N	
16.120.92.11	FastEthernet0/0		1.00	class-default		4089766.00	1143914	4678	100000000.00	N	

QoS Child Classes

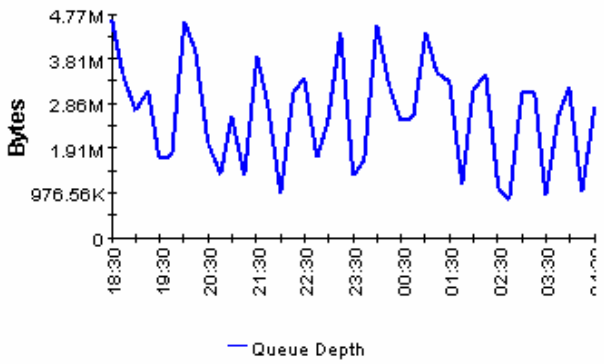
Policy Name	Policy Level	Class Name	Max. Hourly Queue Depth	Discarded Bytes	Discarded Packets	Assigned Bandwidth	Priority Queue

No Data

Rate | Hourly | Daily | Monthly

Queue Depth

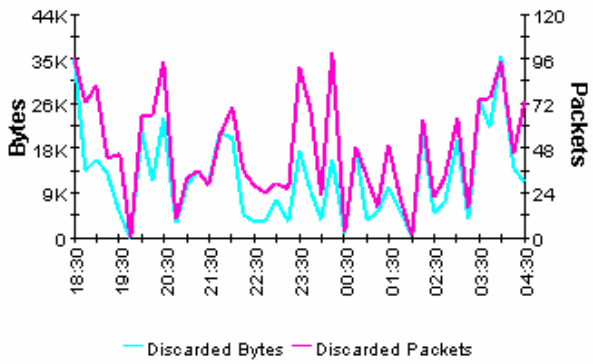
Queue Depth at Time of Poll



Rate | Hourly | Daily | Monthly

Discards

Total Since Previous Poll



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Class Based QoS

Utilization History Report

Choose Customer | Choose Make | Choose Device

Choose Location | Choose model | Choose Interface

=> Reset all Filters | Choose Class | Choose Direction

QoS Class

Use the 'Device' link to return to all Interfaces&Classes of this Device - Use the 'Interface' link to return to all Classes on this Interface

Use the 'Parent Class' link to return to the parrent QoS Class list

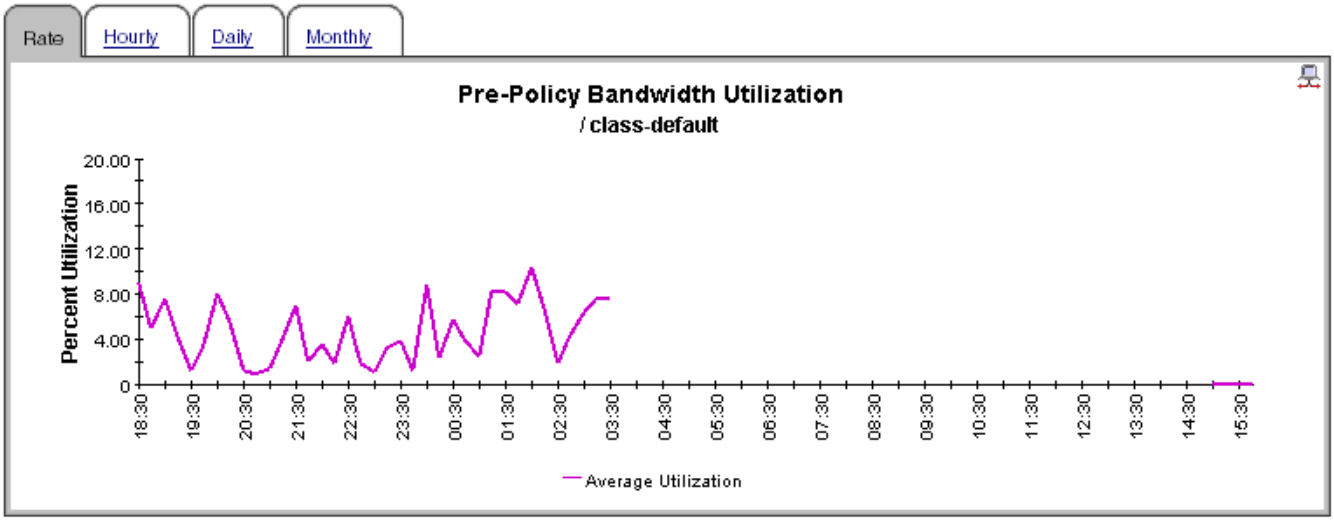
Device	Interface	Policy Name	Policy Level	Class Name	Parent Class	Max Hourly Avg Bit Rate	Assigned Bandwidth
16.120.92.12	FastEthernet0/0		1.00	class-default		8.6 Mb/s	100000000.00
16.120.92.12	FastEthernet0/0	p3	1.00	class-default		8.6 Mb/s	100000000.00
16.120.92.12	FastEthernet0/0	p4	1.00	class-default		8.6 Mb/s	100000000.00
16.120.92.12	FastEthernet0/0	policy1	1.00	class-default		8.6 Mb/s	100000000.00
16.120.92.12	FastEthernet0/0	policy3	1.00	class-default		8.6 Mb/s	100000000.00
16.120.92.12	FastEthernet0/0		1.00	class2		7.2 Mb/s	100000000.00

QoS Child Classes

Use the 'Class Name' link to see the graphs of the selected Child Class

Policy Name	Policy Level	Class Name	Max Hourly Avg Bit Rate	Assigned Bandwidth
No Data				

Rate | Hourly | Daily | Monthly



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Class Based QoS

Policing Summary by Class

The Policing Summary by Class Report

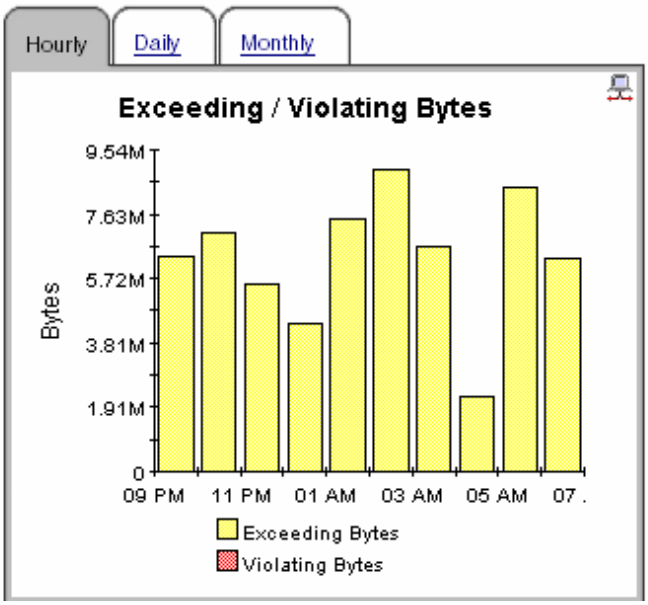
Router	Interface	Direction
16.120.92.11	FastEthernet0/0	In
16.120.92.11	FastEthernet0/1	In
16.120.92.11	FastEthernet0/1	Out
16.120.92.12	FastEthernet0/0	Out

QoS Class

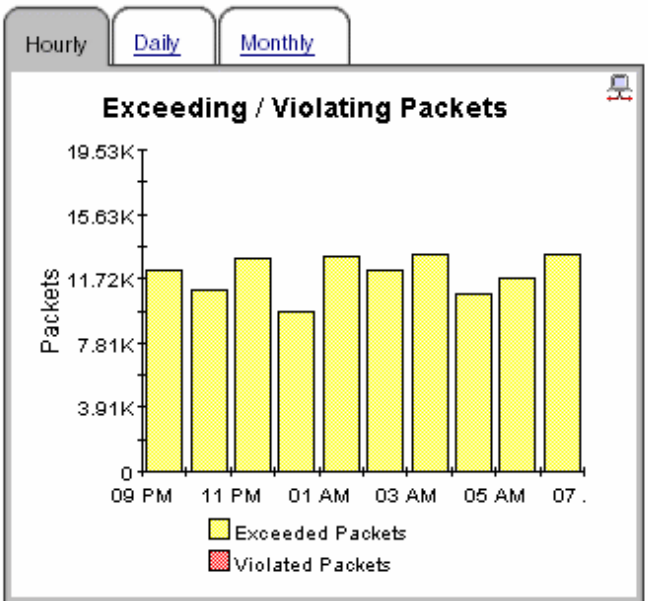
16.120.92.11 / FastEthernet0/0 / In

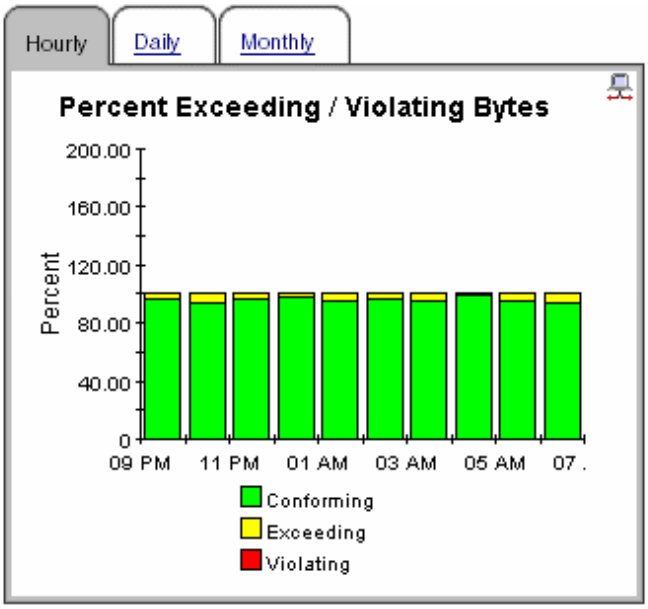
Class Name	Conforming Bytes	Exceeding Bytes	Violating Bytes
classPrec23	4146722464	151406920	0
classPrec23	4146722464	151406920	0
classPrec23	4146722464	151406920	0
classPrec23	4146722464	151406920	0
classPrec23	4146722464	151406920	0

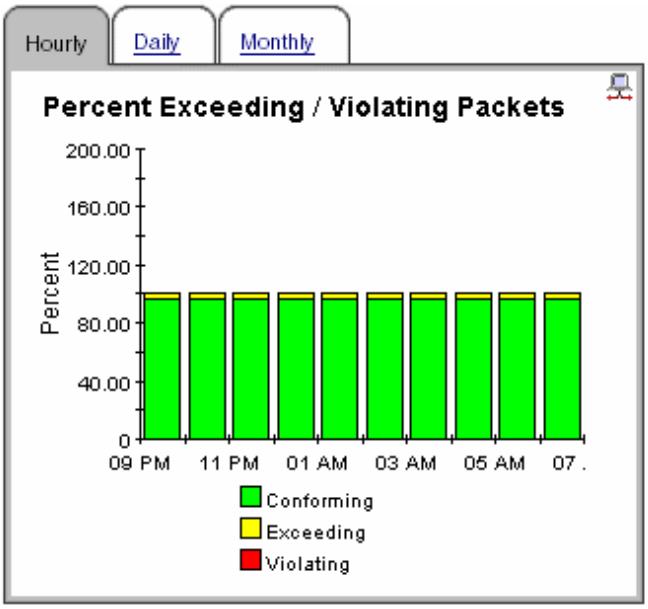
Hourly | Daily | Monthly



Hourly | Daily | Monthly




Hourly
Daily
Monthly
Percent Exceeding / Violating Bytes
200.00
160.00
120.00
80.00
40.00
0
Percent
09 PM
11 PM
01 AM
03 AM
05 AM
07 .
Conforming
Exceeding
Violating


Hourly
Daily
Monthly
Percent Exceeding / Violating Packets
200.00
160.00
120.00
80.00
40.00
0
Percent
09 PM
11 PM
01 AM
03 AM
05 AM
07 .
Conforming
Exceeding
Violating

Class Based QoS

Traffic Shaping Summary by Class

The Traffic Shaping Summary by Class Report

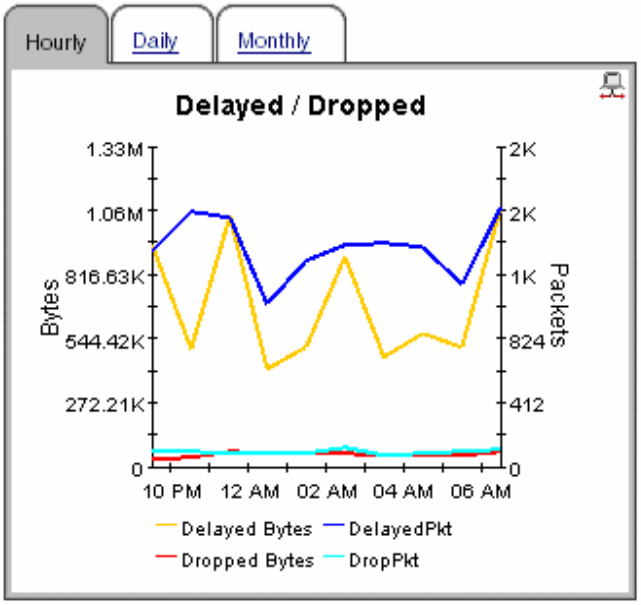
Router	Interface	Direction
16.120.92.11	FastEthernet0/0	In
16.120.92.11	FastEthernet0/1	In
16.120.92.11	FastEthernet0/1	Out
16.120.92.12	FastEthernet0/0	Out

QoS Class

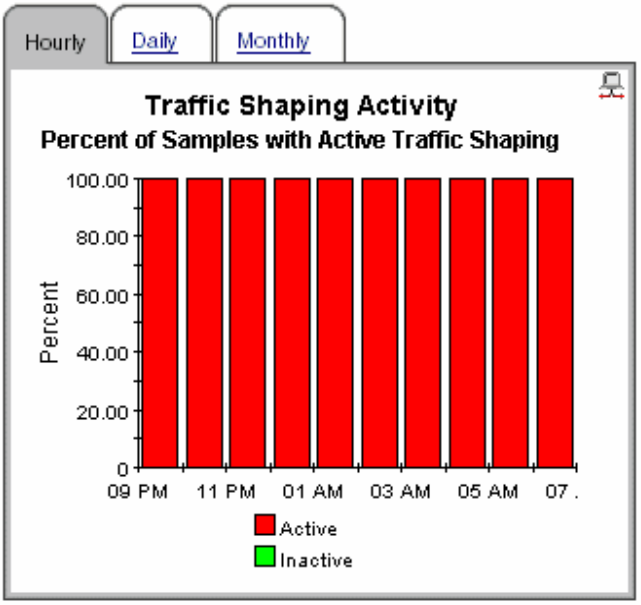
16.120.92.11 / FastEthernet0/0 / In

Class Name	Bytes Delayed	Packets Delayed	Bytes Dropped	Packets Dropped	Percent Active
clasPrec23	16085694.00	33053.00	1337503.00	2416.00	100.00
clasPrec23	16085694.00	33053.00	1337503.00	2416.00	100.00
clasPrec23	16085694.00	33053.00	1337503.00	2416.00	100.00
clasPrec23	16085694.00	33053.00	1337503.00	2416.00	100.00

Hourly | Daily | Monthly



Hourly | Daily | Monthly



Class Based QoS

Queuing Top N Report

Choose Class

Rate | Hourly | Daily | Monthly

Classes with Greatest Queue Depth

Based on the most recent poll

Device	Interface	Direction	Policy Name	Policy Level	Class	Queue Depth (Bytes)	Byte Disc. Rate (Bps)	Packet Disc. Rate (pps)
16.120.92.11	FastEthernet0/1	In		1.00	classPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	p3	1.00	classPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	policy3	1.00	classPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	p4	1.00	classPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	policy1	1.00	classPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	Out		3.00	class4	4647130.00	7.72	0.04
16.120.92.11	FastEthernet0/1	Out	p4	3.00	class4	4647130.00	7.72	0.04
16.120.92.11	FastEthernet0/1	Out	policy3	3.00	class4	4647130.00	7.72	0.04
16.120.92.11	FastEthernet0/1	Out	policy1	3.00	class4	4647130.00	7.72	0.04
16.120.92.11	FastEthernet0/1	Out	p3	3.00	class4	4647130.00	7.72	0.04
16.120.92.11	FastEthernet0/1	Out		1.00	class3	4033836.00	12.66	0.12
16.120.92.11	FastEthernet0/1	Out	policy3	1.00	class3	4033836.00	12.66	0.12
16.120.92.11	FastEthernet0/1	Out	policy1	1.00	class3	4033836.00	12.66	0.12
16.120.92.11	FastEthernet0/1	Out	p4	1.00	class3	4033836.00	12.66	0.12
16.120.92.11	FastEthernet0/1	Out	p3	1.00	class3	4033836.00	12.66	0.12
16.120.92.11	FastEthernet0/0	In		1.00	class-default	3528099.00	6.75	0.02
16.120.92.11	FastEthernet0/0	In	p3	1.00	class-default	3528099.00	6.75	0.02
16.120.92.11	FastEthernet0/0	In	p4	1.00	class-default	3528099.00	6.75	0.02
16.120.92.11	FastEthernet0/0	In	policy1	1.00	class-default	3528099.00	6.75	0.02

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Class Based QoS

Utilization Top N Report

Choose Class

Rate | Hourly | Daily | Monthly | 30 Day Forecast | 60 Day Forecast | 90 Day Forecast

Classes with Highest Utilization

Based on the most recent poll

Device	Interface	Direction	Policy Name	Policy Level	Class	Utilization (%)	Discard (%)
16.120.92.11	FastEthernet0/0	In		1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/0	In	p3	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/0	In	p4	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/0	In	policy1	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/0	In	policy3	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out		1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out	policy3	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out	policy1	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out	p4	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out	p3	1.00	class-default	0.00	0.00
16.120.92.12	FastEthernet0/0	Out		1.00	class-default	0.00	0.00
16.120.92.12	FastEthernet0/0	Out	p3	1.00	class-default	0.00	0.00
16.120.92.12	FastEthernet0/0	Out	p4	1.00	class-default	0.00	0.00
16.120.92.12	FastEthernet0/0	Out	policy1	1.00	class-default	0.00	0.00
16.120.92.12	FastEthernet0/0	Out	policy3	1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/0	In		1.00	clasPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In	p3	1.00	clasPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In	policy3	1.00	clasPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In		1.00	class-default	0.00	0.00

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4 Configuring the Report Pack and Datapipe

Configuring the Report Pack for Distributed System

These are the steps to follow when setting up a distributed system:

- Decide whether or not you want local reporting
- Install the right set of packages on each server (a central server that is not polling will not need datapipes; the satellite servers will need datapipes)
- Verify that the system clocks in your environment are synchronized
- Register your satellite servers
- If you are not copying rate data to the central server, enable LIR on the central server
- If you enable LIR, add LIR mapping with the time type set to rate
- Verify that you have all the copy policies you need
- Configure the central server (manual edits to trendtimer.sched and .pro files)
- Configure each satellite server (manual edits to trendtimer.sched and .pro files)

If you want to set up a distributed system, you can implement local reporting or you can implement centralized reporting. If you want local reporting, you need to deploy reports when you install the report pack on each satellite server, and you need to allow summarizations to run on each satellite server. If you do not want local reporting, then you do not need to deploy reports when you install a report pack on a satellite server and you can disable the scripts that run summarizations on each satellite server.

Before Location Independent Reporting (LIR) was available, our recommendation to anyone setting up a distributed system was to deploy reports on satellite servers, keep rate data on satellite servers, copy hourly data to the central server, and disable summarizations above the hourly level on satellite servers. The advantage to this approach was that it kept a large volume of rate data off the network and it decreased the processing load on the central server. The disadvantage is that the central server could not display a Near Real Time (NRT) report. The only NRT report was a local NRT report, on a satellite server. LIR overcomes this disadvantage. If you enable LIR, you can open an NRT report on the central server and drill-down on table selections. The selections you make cause the central server to query a satellite server for locally aggregated data. Of course, if you would rather copy rate data to the central server, you can. If you do that, then enabling LIR is not necessary.

Configuring the Central Server

To configure the central server, perform the following tasks:

Task 1: Register the satellite server by setting the database role

1. Start the Management Console (log on with Administrator privileges).
2. Click the Systems icon in the navigation pane.
3. Navigate to the HP Performance Insight Databases folder and select the database system.
4. Click Database Properties.
5. From the Database Role list, select the Satellite Server role.
6. Enter any information necessary to configure the Satellite Server role.

To add a new database reference, you can use the Add Database Reference Wizard in the System and Network Administration application.

Task 2: Enable LIR

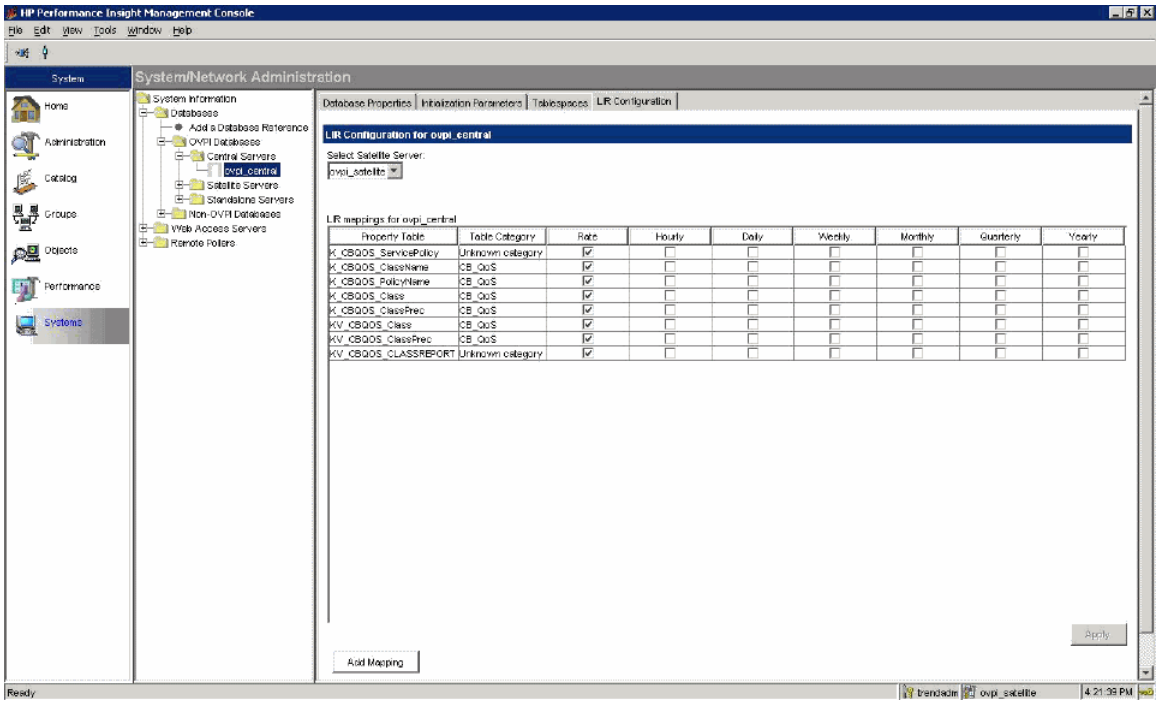
1. Start the Management Console (log on with Administrator privileges).
2. Click the **Systems** icon in the navigation pane.
3. Navigate to the HP Performance Insight Databases folder and select the central server.
4. Click **LIR Configuration**.
5. Select the **LIR enabled** check box.

Task 3: Add LIR mappings

1. Start the Management Console (log on with Administrator privileges).
2. Click the **Systems** icon in the navigation pane.
3. Navigate to the HP Performance Insight Databases folder and select the central server.
4. Click **LIR Configuration**.
5. Click **Add Mapping**.
6. Select a satellite server to which you need to add a mapping from the Select Satellite Server list.
7. Select the Category data table option.
8. Select **Class Based QoS** from the drop-down list.
9. Select the rate data type.
10. Click **Add to List**.
11. Ensure that the LIR mapping has not missed mapping any of the following tables. Also, ensure that the following tables are of rate data type:
    - K_CBQOS_ServicePolicy
    - K_CBQOS_ClassName
    - K_CBQOS_PolicyName
    - K_CBQOS_Class
    - K_CBQOS_ClassPrec

- KV_CBQOS_Class
- KV_CBQOS_ClassPrec
- KV_CBQOS_CLASSREPORT

The following figure depicts this:



12 If you want to add additional LIR mappings, click **Add to list** and repeat step 6 through step 12.

13 Click **OK**.

14 Click **Apply**.

A copy policy is automatically generated for the hourly data and for each LIR mapping that you add. The data type selected when adding an LIR mapping (in step 9 above) determines the type of data copied that is defined in the generated copy policy (the type of data copied that is defined in the generated copy policy is for one greater than the data type selected in the LIR mapping). For example, if you select an hourly data type, a daily data copy policy is generated.

Task 4: Verify the automatically generated copy policies

Verify that a copy policy has been generated for the following tables and that the copy type is set correctly (to Property and Data):

1 Start the Management Console (log on with Administrator privileges).

2 Click the **Copy Policy** icon in the navigation pane to start the Copy Policy Manager.

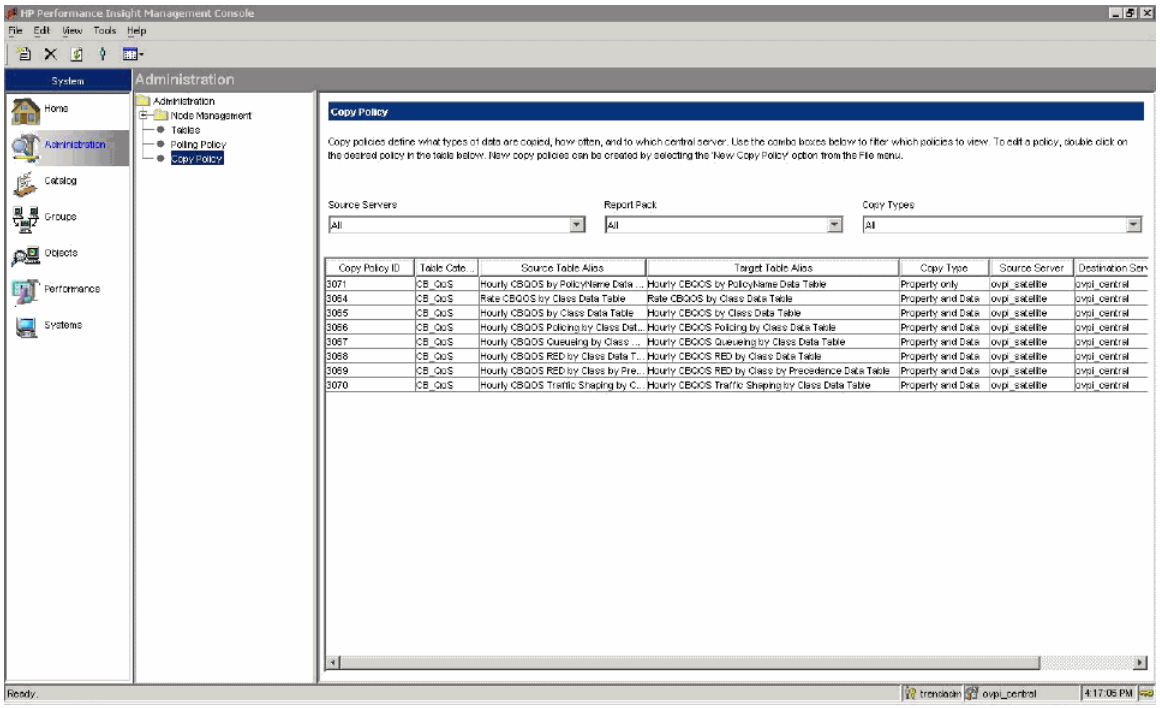
3 Find the following tables and ensure that the table types are as mentioned in the following table.

Table 1 LIR Mapping Table Types

Table Name	Table Type
SRCBQOS_Class	Property and Data
SHCBQOS_Class	Property and Data
SHCBQOS_ClassPolice	Property and Data
SHCBQOS_ClassPolice	Property and Data
SHCBQOS_ClassQueueing	Property and Data
SHCBQOS_ClassRED	Property and Data
SHCBQOS_ClassPrecRED	Property and Data
SHCBQOS_ClassTS	Property and Data
SHCBQOS_PolicyName	Property

If a copy policy has not been generated for a table, do the following:

4 Click the **New Copy Policy** icon or select **File > New Copy Policy** from the Copy Policy Manager. The Copy Policy Wizard opens.



5 Click **Next**. The Satellite Server and Copy Policy Selection Page opens.

6 Select a satellite server from the pull down list. This is the satellite server from which data is copied to the central server.

7 Select **Single Table** and select the table from the pull down list.

8 Click **Next**. The Copy Type Selection Page opens.

9 Select **Property and Data**.

10 Click **Next**. The Summary page opens.

11 Verify the information in the summary window. If the information is not correct, you can modify it by clicking **Back**.

12 Click **Finish**.

13 Repeat step 4 - step 12 for all missing tables.

If the copy type is not set to Property and Data, do the following:

1 Double-click the copy policy.

2 Select the **Property and Data** copy type.

3 Click **OK**.

Task 5: Modify the trendtimer.sched file

You can find the `trendtimer.sched` file in the {DPIPE_HOME}/lib/ directory. In this instance, {DPIPE_HOME} is the directory in which HP Performance Insight is installed.

Change this file by finding and commenting out the following line:

```
1:00+15 - - {DPIPE_HOME}/bin/trend_proc -f
{DPIPE_HOME}/scripts/CB_QOS_Hourly.pro
```

Configuring Satellite Servers

Follow these steps to configure each satellite server.

1 Modify the {DPIPE_HOME}/lib/trendtimer.sched file (where {DPIPE_HOME} is the directory in which HP Performance Insight is installed). Do the following:

- Find and comment out the following line (to switch off interface aggregations above the hourly level):

  ```
  24:00+3:00 - - {DPIPE_HOME}/bin/trend_proc -f
  {DPIPE_HOME}/scripts/CB_QOS_Daily.pro
  ```

- Modify the *.pro trendtimer entry in the {DPIPE_HOME}/lib/trendtimer.sched file. By default, this process starts at 30 minutes after the hour. To make sure the satellite server completes hourly summarizations before the central server begins hourly summarizations, change the start time from 1:00+30 to 1:00+15.

2 Modify the *.pro file (found in the {DPIPE_HOME}/scripts/directory. In this instance, {DPIPE_HOME} is the directory in which HP Performance Insight is installed):

3 Configure polling policies for the Class Based QoS Datapipe, making sure that each Interface is polled by one satellite server only.

System Clocks

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

Configuring the Datapipe for Multiple Pollers

The Class Based QoS Datapipe requires additional configuration for use with multiple pollers. The standard installation configures 21 groups and 20 polling policies for a single poller. For use with multiple pollers, additional sets of groups and polling policies must be configured for each additional poller.

The datapipe package includes additional group and collection policy files for two pollers. If you need to configure the datapipe for more than two pollers against a single database, follow these steps to generate additional sets of group files and policies:

1. Log in as the PI Administrator (trendadm).
2. Navigate to `Class_Based_QoS_Datapipe\Class_Based_QoS_Datapipe.ap\Multi_Pollers\` in the Package directory.
3. Run the following command:

   `trend_proc -f create_cbqos_groups_multi_pollers.pro`
4. Run the following command (this is a single command and must be typed in the same line):

   `collection_manager -import -file CBQOS_Collection_Policies_multi_pollers.txt`
5. Start Polling Policy Manager and select **Edit** → **Datapipe Installations...**.
6. Click **Create...** to create new pollers.
7. Add the hostname and (optionally) the IP address of each poller and click **OK**.
8. When all pollers have been added, click **Close** to exit the Edit Datapipe Installations window.
9. Click **All** in the left panel to display all polling policies.
10. Delete the original *_Collection, *_ Immediate and *_C15 policies (those without a _poller1 or _poller2 at the end of the name).
11. Modify the new *_Collection_poller1 policies by double-clicking the policy.

    Change the **Polling Assigned** to setting to be the hostname of poller1.
12. Modify the new *_Collection_poller2 policies by double-clicking the policy.

    Change the **Polling Assigned** to setting to be the hostname of poller2.

    At this point, the policies should look similar to those in the following table.

Policy Name	Table Name	Group Name to Collect From	Poll From
QoS_ServicePolicy_ Immediate_poller1	XCBQOSDP_ServicePolicy	CBQoS_ImmediateConfig-poller1	Hostname of poller1
QoS_ServicePolicy_ Collection_poller1	XCBQOSDP_ServicePolicy	CLASS_BASED_QOS-poller1	Hostname of poller1
QoS_Objects_ Immediate_poller1	XCBQOSDP_Objects	CBQoS_ImmediateConfig-poller1	Hostname of poller1
QoS_Objects_ Collection_poller1	XCBQOSDP_Objects	CLASS_BASED_QOS-poller1	Hostname of poller1

Policy Name	Table Name	Group Name to Collect From	Poll From
QoS_PolicyMap_ Collection_poller1	XCBQOSDP_PolicyMap	CBQOS_ConfigALL-poller1	Hostname of poller1
QoS_QueueingCFG_ Collection_poller1	XCBQOSDP_QueueingCfg	CBQOS_ConfigQueue-poller1	Hostname of poller1
QoS_PoliceCFG_ Collection_poller1	XCBQOSDP_PoliceCfg	CBQOS_ConfigPolice-poller1	Hostname of poller1
QoS_PoliceActCFG_ Collection_poller1	XCBQOSDP_PoliceActionCfg	CBQOS_ConfigPolice-poller1	Hostname of poller1
QoS_MatchStmtCFG_ Collection_poller1	XCBQOSDP_MatchStmtCfg	CBQOS_ConfigMatch-poller1	Hostname of poller1
QoS_ClassMapCFG_ Collection_poller1	XCBQOSDP_ClassMapCfg	CBQOS_ConfigALL-poller1	Hostname of poller1
QoS_SetCFG_ Collection_poller1	XCBQOSDP_SetCfg	CBQOS_ConfigSet-poller1	Hostname of poller1
QoS_TrafShapeCFG_ Collection_poller1	XCBQOSDP_TSCfg	CBQOS_ConfigTS-poller1	Hostname of poller1
QoS_REDCFG_ Collection_poller1	XCBQOSDP_REDCfg	CBQOS_ConfigRED-poller1	Hostname of poller1
QoS_REDClassCFG_ Collection_poller1	XCBQOSDP_REDClassCfg	CBQOS_ConfigRED-poller1	Hostname of poller1
QoS_ClassMapStats_ C15_poller1	XCBQOSDP_ClassMapStats	CBQoSDP_Objects2ClassMap-poller1	Hostname of poller1
QoS_QueueingStats_ C15_poller1	XCBQOSDP_QueueingStats	CBQoSDP_Objects4Queue-poller1	Hostname of poller1
QoS_MatchStats_ C15_poller1	XCBQOSDP_MatchStmtStats	CBQoSDP_Objects3MatchStmt-poller1	Hostname of poller1
QoS_PoliceStats_ C15_poller1	XCBQOSDP_PoliceStats	CBQoSDP_Objects7Police-poller1	Hostname of poller1
QoS_TrafShapeStats_ C15_poller1	XCBQOSDP_TSStats	CBQoSDP_Objects6TS-poller1	Hostname of poller1
QoS_REDClassStats_ C15_poller1	XCBQOSDP_REDClassStats	CBQoSDP_REDObjects5RED-poller1	Hostname of poller1
QoS_ServicePolicy_ Immediate_poller2	XCBQOSDP_ServicePolicy	CBQoS_ImmediateConfig-poller2	Hostname of poller2
QoS_ServicePolicy_ Collection_poller2	XCBQOSDP_ServicePolicy	CLASS_BASED_QOS-poller2	Hostname of poller2
QoS_Objects_ Immediate_poller2	XCBQOSDP_Objects	CBQoS_ImmediateConfig-poller2	Hostname of poller2

Policy Name	Table Name	Group Name to Collect From	Poll From
QoS_Objects_ Collection_poller2	XCBQOSDP_Objects	CLASS_BASED_QOS-poller2	Hostname of poller2
QoS_PolicyMap_ Collection_poller2	XCBQOSDP_PolicyMap	CBQOS_ConfigALL-poller2	Hostname of poller2
QoS_QueueingCFG_ Collection_poller2	XCBQOSDP_QueueingCfg	CBQOS_ConfigQueue-poller2	Hostname of poller2
QoS_PoliceCFG_ Collection_poller2	XCBQOSDP_PoliceCfg	CBQOS_ConfigPolice-poller2	Hostname of poller2
QoS_PoliceActCFG_ Collection_poller2	XCBQOSDP_PoliceActionCfg	CBQOS_ConfigPolice-poller2	Hostname of poller2
QoS_MatchStmtCFG_ Collection_poller2	XCBQOSDP_MatchStmtCfg	CBQOS_ConfigMatch-poller2	Hostname of poller2
QoS_ClassMapCFG_ Collection_poller2	XCBQOSDP_ClassMapCfg	CBQOS_ConfigALL-poller2	Hostname of poller2
QoS_SetCFG_ Collection_poller2	XCBQOSDP_SetCfg	CBQOS_ConfigSet-poller2	Hostname of poller2
QoS_TrafShapeCFG_ Collection_poller2	XCBQOSDP_TSCfg	CBQOS_ConfigTS-poller2	Hostname of poller2
QoS_REDCFG_ Collection_poller2	XCBQOSDP_REDCfg	CBQOS_ConfigRED-poller2	Hostname of poller2
QoS_REDClassCFG_ Collection_poller2	XCBQOSDP_REDClassCfg	CBQOS_ConfigRED-poller2	Hostname of poller2
QoS_ClassMapStats_ C15_poller2	XCBQOSDP_ClassMapStats	CBQoSDP_Objects2ClassMap-poller2	Hostname of poller2
QoS_QueueingStats_ C15_poller2	XCBQOSDP_QueueingStats	CBQoSDP_Objects4Queue-poller2	Hostname of poller2
QoS_MatchStats_ C15_poller2	XCBQOSDP_MatchStmtStats	CBQoSDP_Objects3MatchStmt-poller2	Hostname of poller2
QoS_PoliceStats_ C15_poller2	XCBQOSDP_PoliceStats	CBQoSDP_Objects7Police-poller2	Hostname of poller2
QoS_TrafShapeStats_ C15_poller2	XCBQOSDP_TSStats	CBQoSDP_Objects6TS-poller2	Hostname of poller2
QoS_REDClassStats_ C15_poller2	XCBQOSDP_REDClassStats	CBQoSDP_REDObjects5RED-poller2	Hostname of poller2

13 Select **Edit** → **Polling Groups...** → **All Nodes in Same View** in the upper pane, then select poller1 in the lower pane. Assign nodes to be collected by poller1 to the poller1 view.

14 Select **Edit** → **Polling Groups...** → **All Nodes in Same View** in the upper pane, then select poller2 in the lower pane. Assign nodes to be collected by poller2 to the poller2 view.

A PI Report Packs

Business Technology	Reporting Solution
Application	Application Report Pack: • WebLogic SPI • WebSphere SPI
Database	Database SPI Report Pack
HP Business Process Insight	BPI Report Pack
HP Internet Services	Internet Services Report Pack
HP Network Node Manager	NNM Event & Availability Report Pack
HP Operations	OVO Report Pack
IP Telephony	• Cisco IP Telephony Call Detail • Cisco IP Telephony Gateway Statistics
MPLS VPN	MPLS VPN Report Pack
Networking	Infrastructure Usage • Interface Reporting • Device Resource Report Pack LAN/WAN Edge • Frame Relay (SNMP only) • ATM (SNMP only) WAN Core • Frame Relay (multiple switch vendors) • ATM (multiple switch vendors) Traffic Profiling • RMON II • NetFlow Interface • NetFlow Global View • IP QoS Report Pack • Class-Based QoS

Business Technology	Reporting Solution
Networking (continued)	Quality Assurance • Cisco Ping Report Pack • Service Assurance • IP Access Rate
System Resources	• System Resource Report Pack

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