Class Based QoS Report Pack

Software Version: 1.1

HP OpenView Performance Insight

User Guide

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1 Overview

This chapter covers the following topics:

- HP Performance Insight on page 7
- Class Based QoS Reporting on page 7
- Package Version History on page 14
- Sources for Additional Information on page 14

HP Performance Insight

Performance Insight is a performance management application that 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:

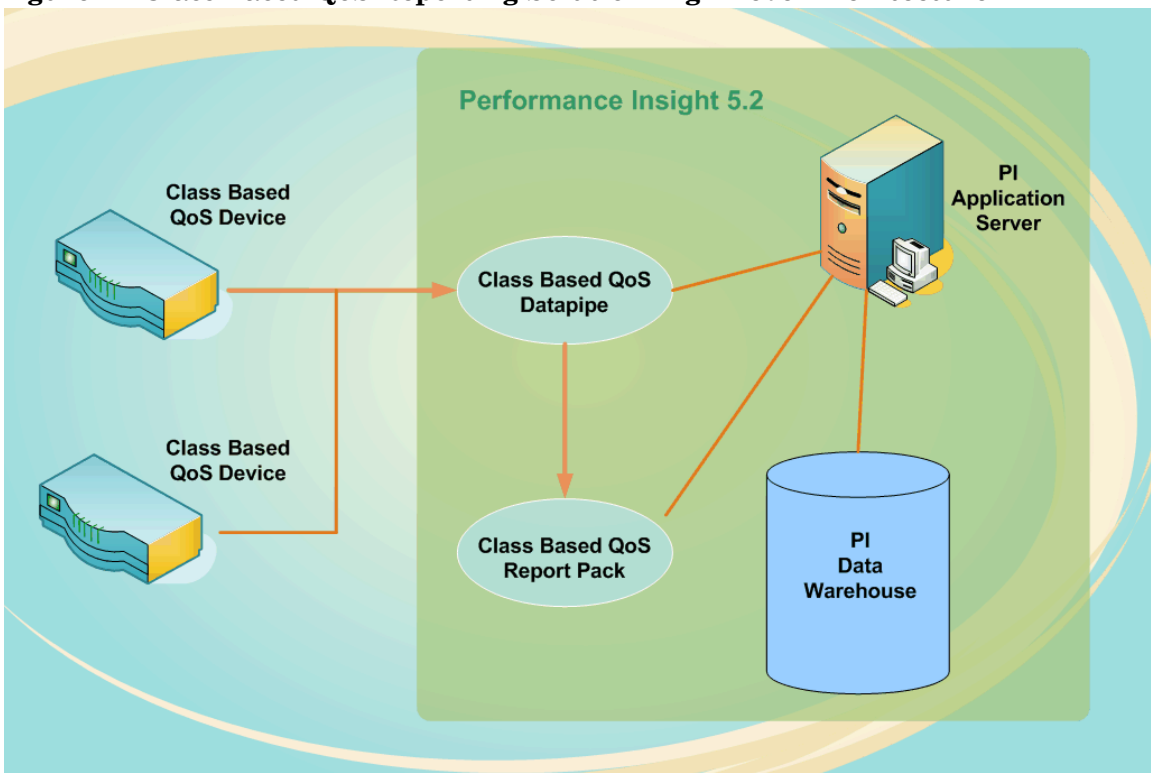
- Distributed architecture
- Easy to scale (supports data collection from thousands of agents)
- CODA/OVPA agent support
- Multi-company security model
- Data warehousing
- Near Real Time reporting
- Forecasting
- Extensive aggregation (by day, week, month; by location, by customer)
- Thresholding and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

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.

Figure 1 Class Based QoS Reporting Solution High-Level Architecture

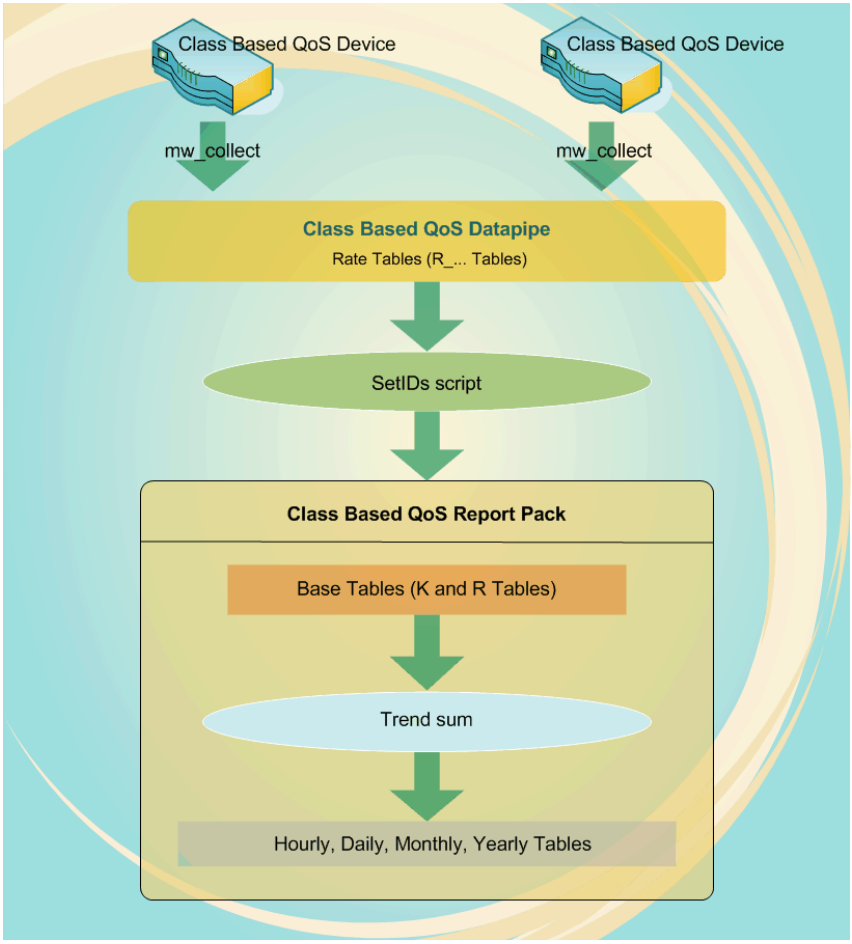


The Class Based QoS Report Pack installs on Performance Insight. The Class Based QoS Datapipe runs on the Performance Insight server.

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

Figure 2 Data Collection Process

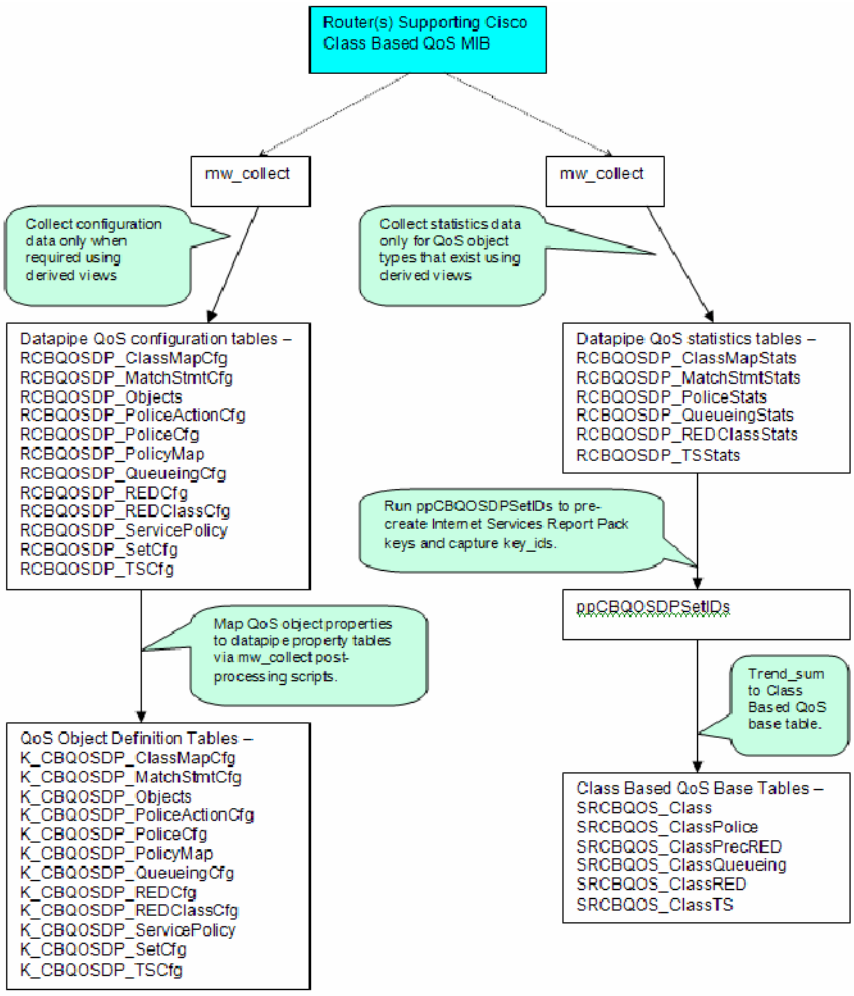


The Datapipe collects QoS statistics from the Cisco Class Based QoS MIB (Management Information Base) and populates the Class Based QoS rate tables once every 15 minutes. It collects QoS policy configuration data for all routers once a day.

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.

Figure 3 Datapipe Process Flow



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 Performance Insight, 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.

The Report Pack provides the following types of reports:

- 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
- TopN:
  - 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 from the Demo Package on page 25.

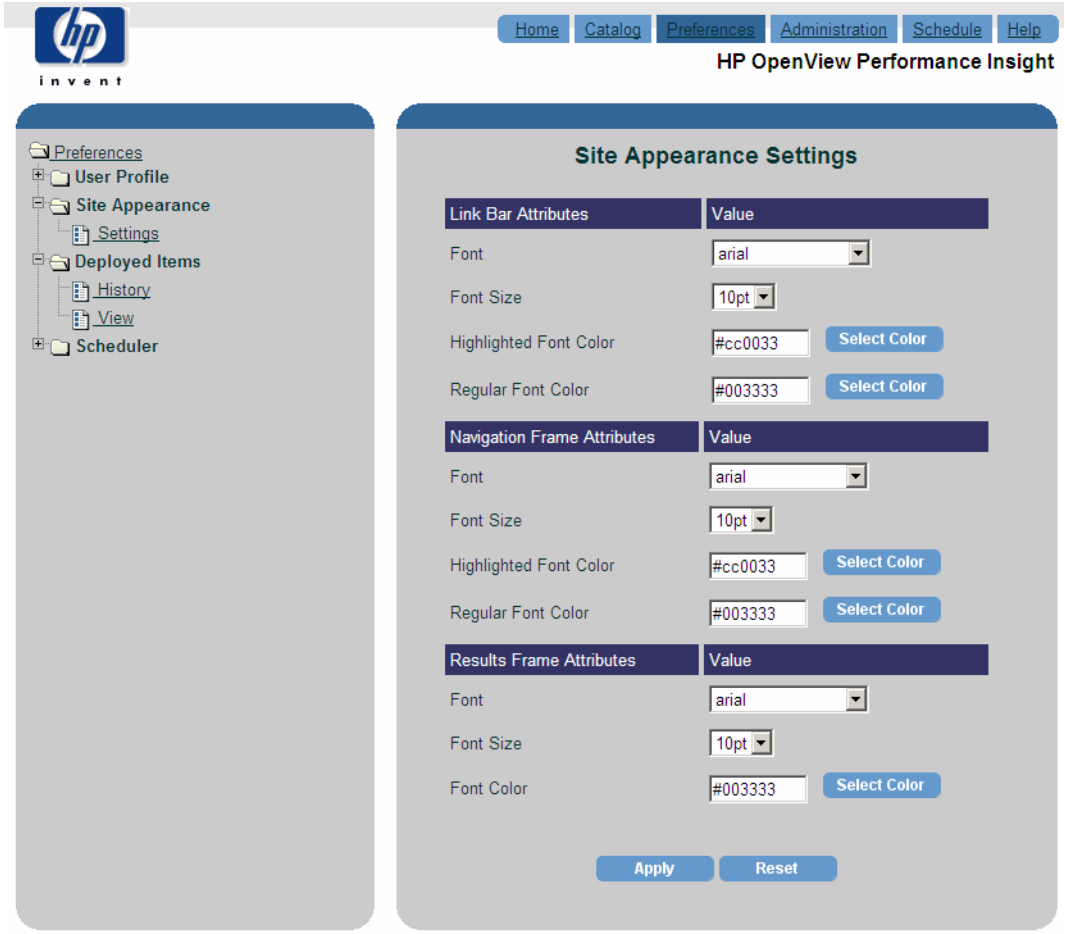
Customizing the Appearance of Reports

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 4 Site Appearance Settings



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

Package Version History

Version	Release Date	Features/Enhancements
1.1	June 2007	Initial release
1.1	October 2007	

Sources for Additional Information

The following documents provide additional information:

- *HP Performance Insight 5.3 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

This chapter covers the following topics:

- Guidelines for a Smooth Install on page 15
- Installing Class Based QoS on page 17
- Accessing Deployed Reports on page 21
- Package Removal on page 22
- Troubleshooting on page 23

Guidelines for a Smooth Install

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 Performance Insight 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:

- Performance Insight 5.2 or later
- All service packs available for the version of Performance Insight you are running

The package level prerequisites are:

- Common Property Tables 3.6
- Interface Reporting Report Pack 5.3

Upgrading Common Property Tables

If you are running an earlier version of Common Property Tables, you must upgrade that package to version 3.6 or higher (see Upgrade to Common Property Tables 3.6 on page 17).

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 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 Distributed Systems 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 PI 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 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 Performance Insight 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 3.6

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 1.1

— Class_Based_QoS_Datapipe 1.1

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 PI 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`**

Sun: **`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.

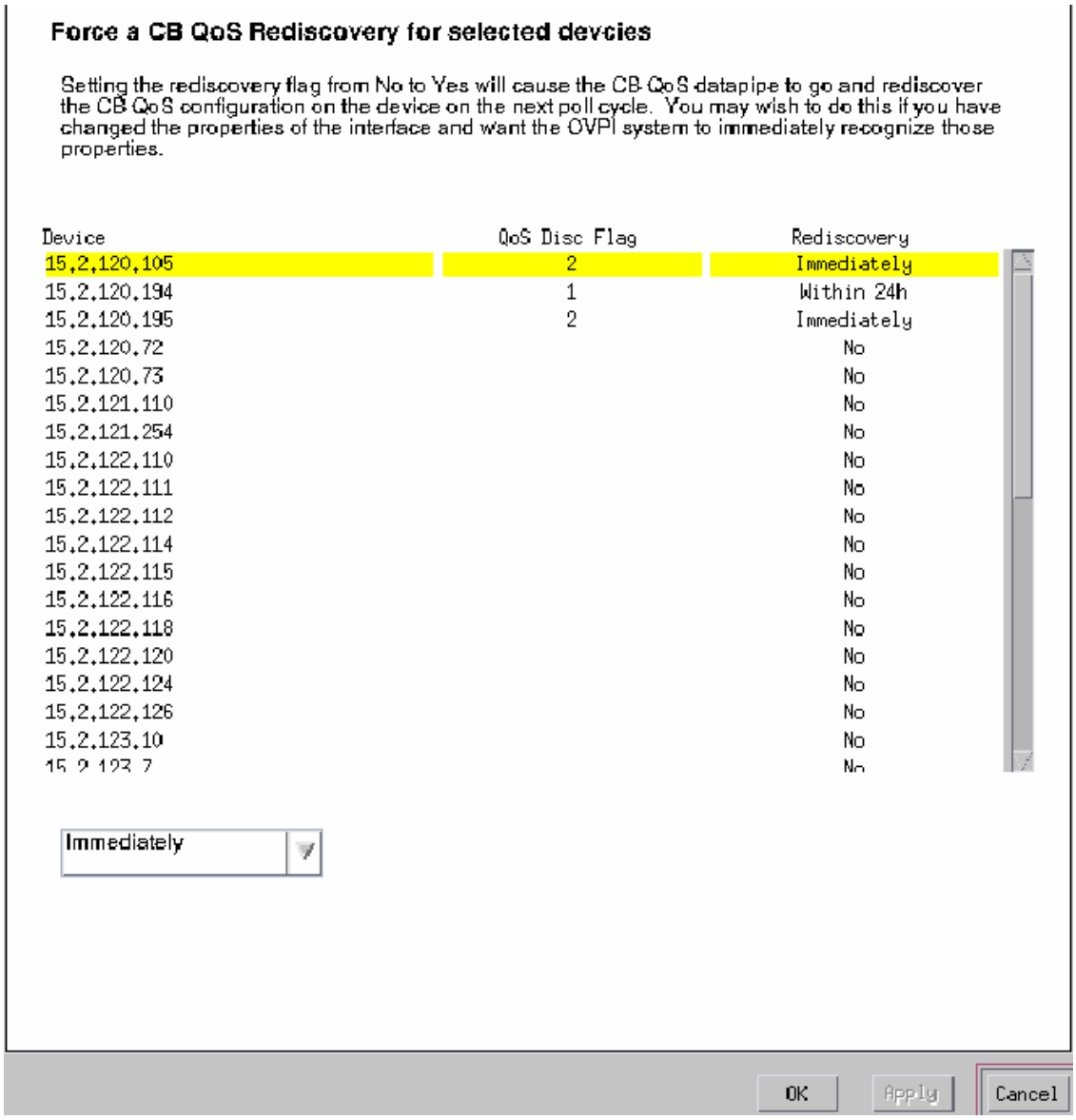
Configuring Class Based QoS

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**.

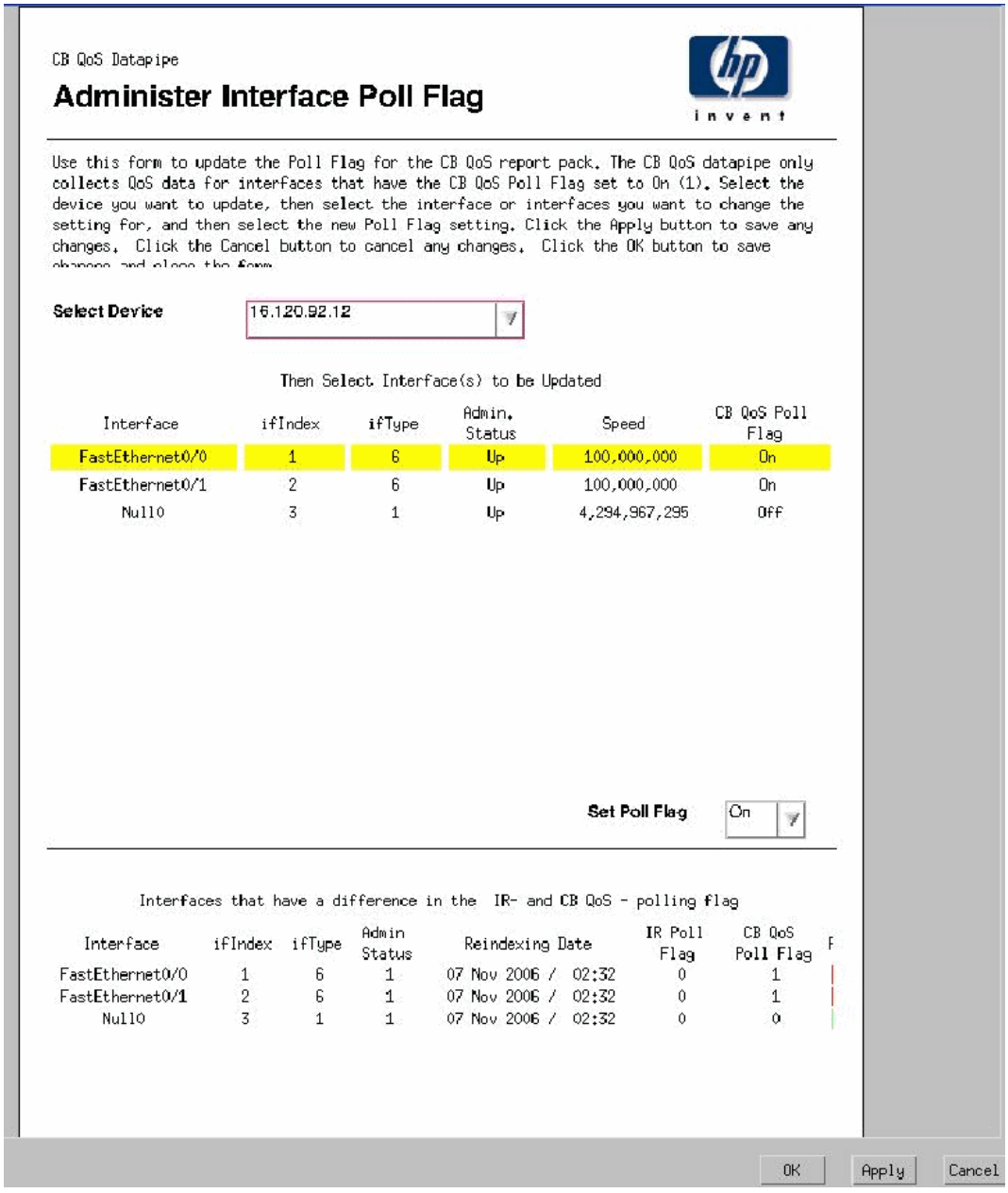
Force CB QoS Rediscovery Form

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.

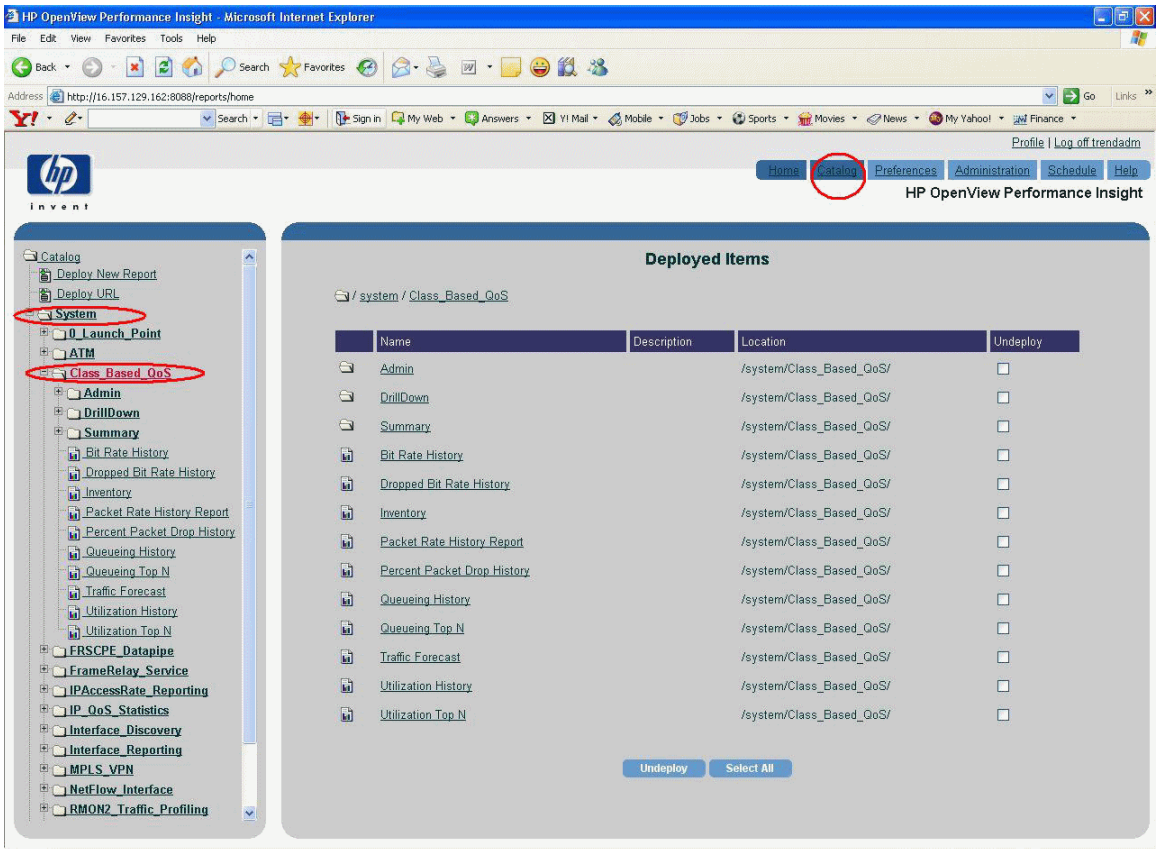


Once the configuration collection interval and polled interfaces are selected, Class Based QoS configuration data is collected from the devices. The data is available in the base tables of the Report Pack. The overview report shows the QoS collection overview.

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 Performance Insight Application Server. Once reports reside on the Application Server, they can be viewed in two ways:

- Performance Insight 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 OpenView 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 OpenView Performance Insight Administration Guide*.

Package Removal

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 PI 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 Performance Insight 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 Performance Insight 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 1.1

    Class Based QoS Report Pack Demo 1.0
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 PI Timer.

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

    UNIX: As root, type the following:

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

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

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

Troubleshooting

Perform the following steps to debug the problem in case reports do not show data.

- 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

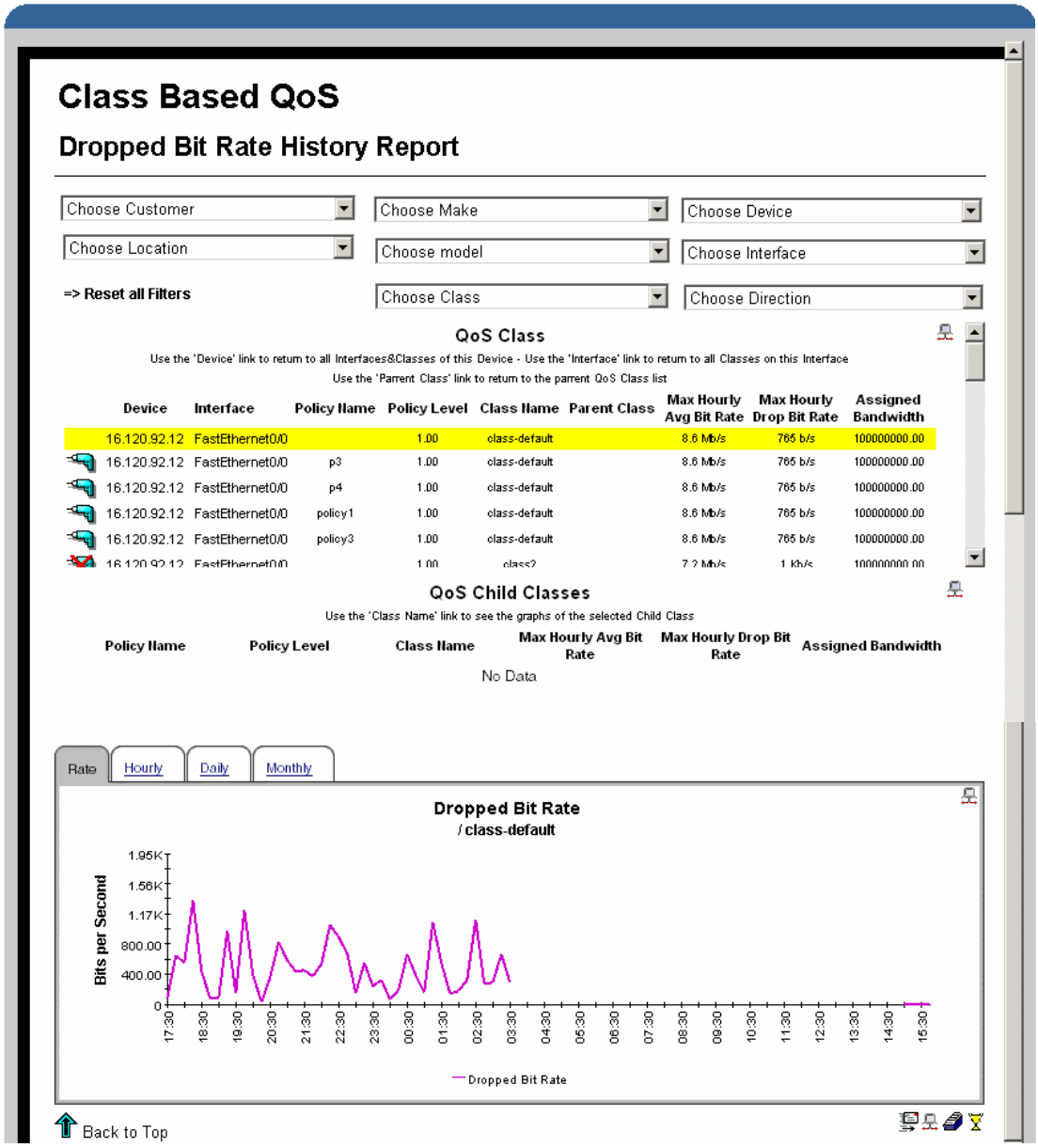
  `http://support.openview.hp.com/troubleshooting.jsp`

3 Sample Reports from the Demo Package

The following reports are located in the demo package. They illustrate the types of reports that can be available to you. To see these reports on the demo package, click the **Catalog** tab and then click **System** > **Demo**.

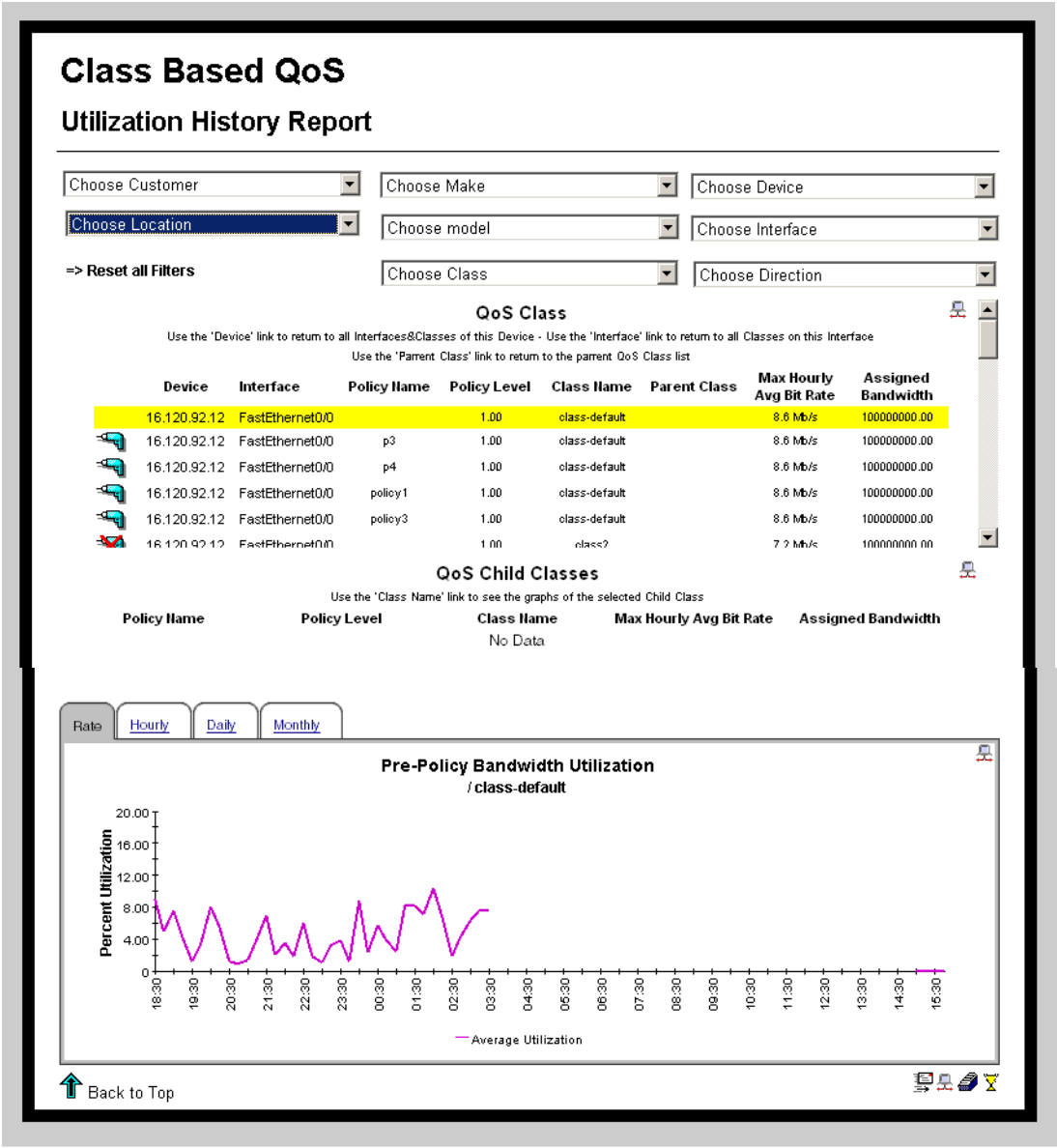
Sample DrillDown Reports

Dropped Bit Rate History Report for the QoS Classes in a Device



Queuing History Report for the QoS Classes in a Device

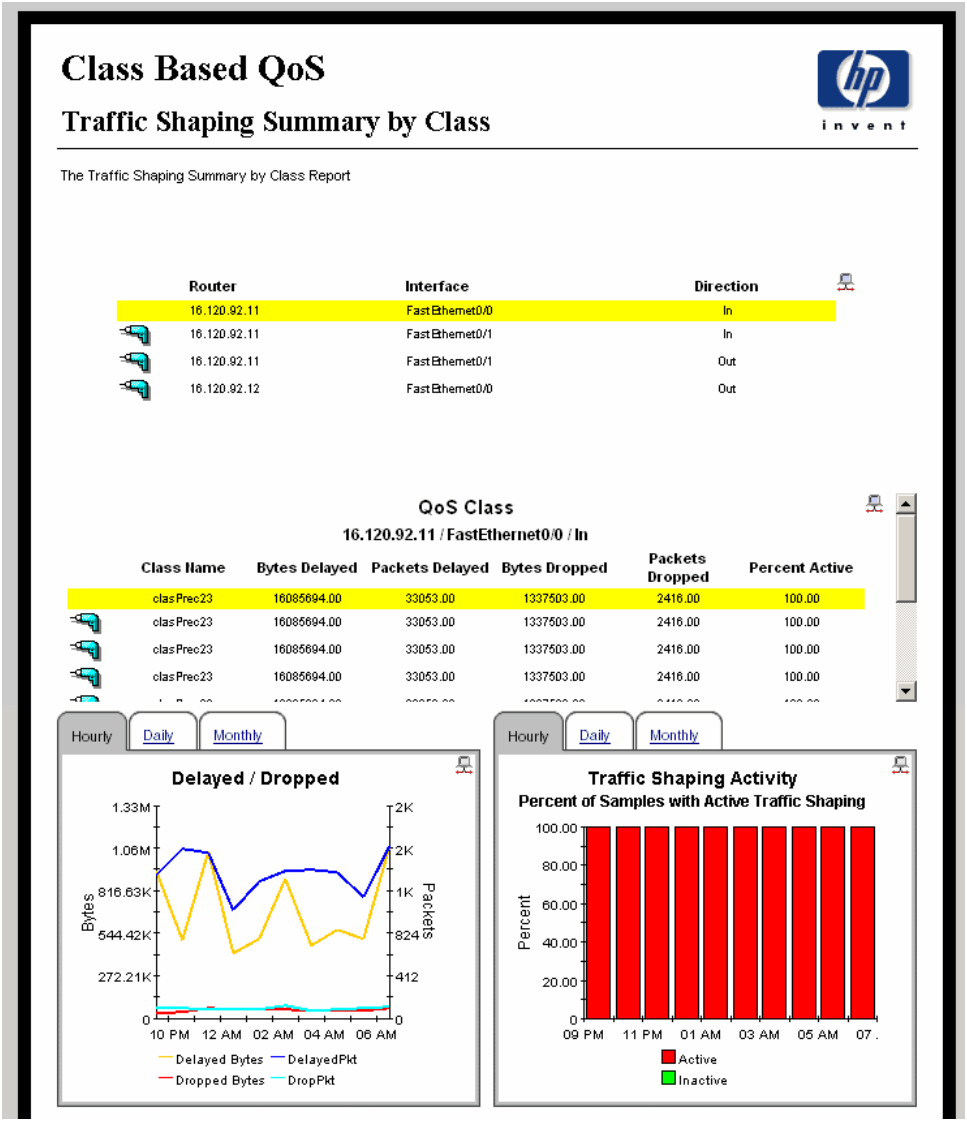
Utilization History Report for the QoS Classes in a Device



Sample Summary Reports

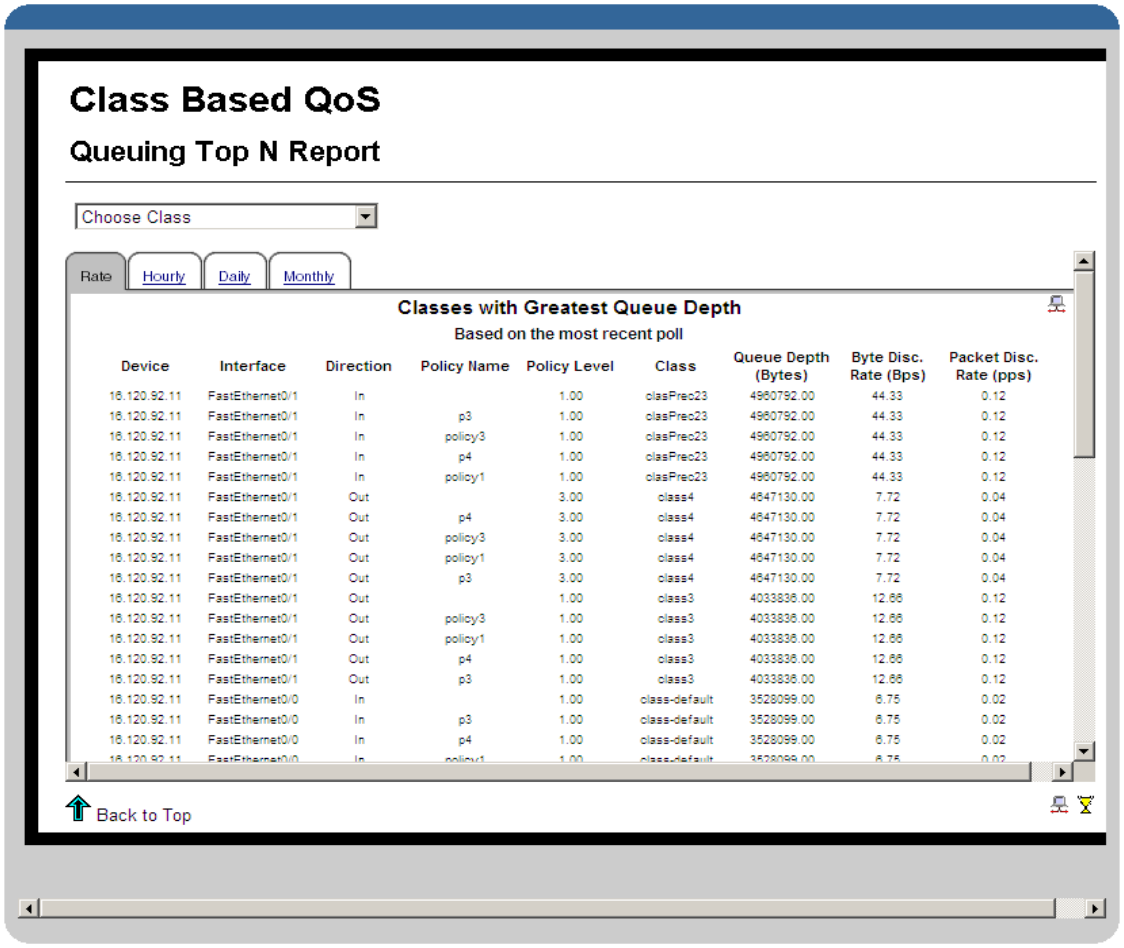
Policing Summary by Class Report

Traffic Shaping Summary by Class Report



Sample TopN Reports

Queuing Top N Report



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	clasPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	p3	1.00	clasPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	policy3	1.00	clasPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	p4	1.00	clasPrec23	4960792.00	44.33	0.12
16.120.92.11	FastEthernet0/1	In	policy1	1.00	clasPrec23	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

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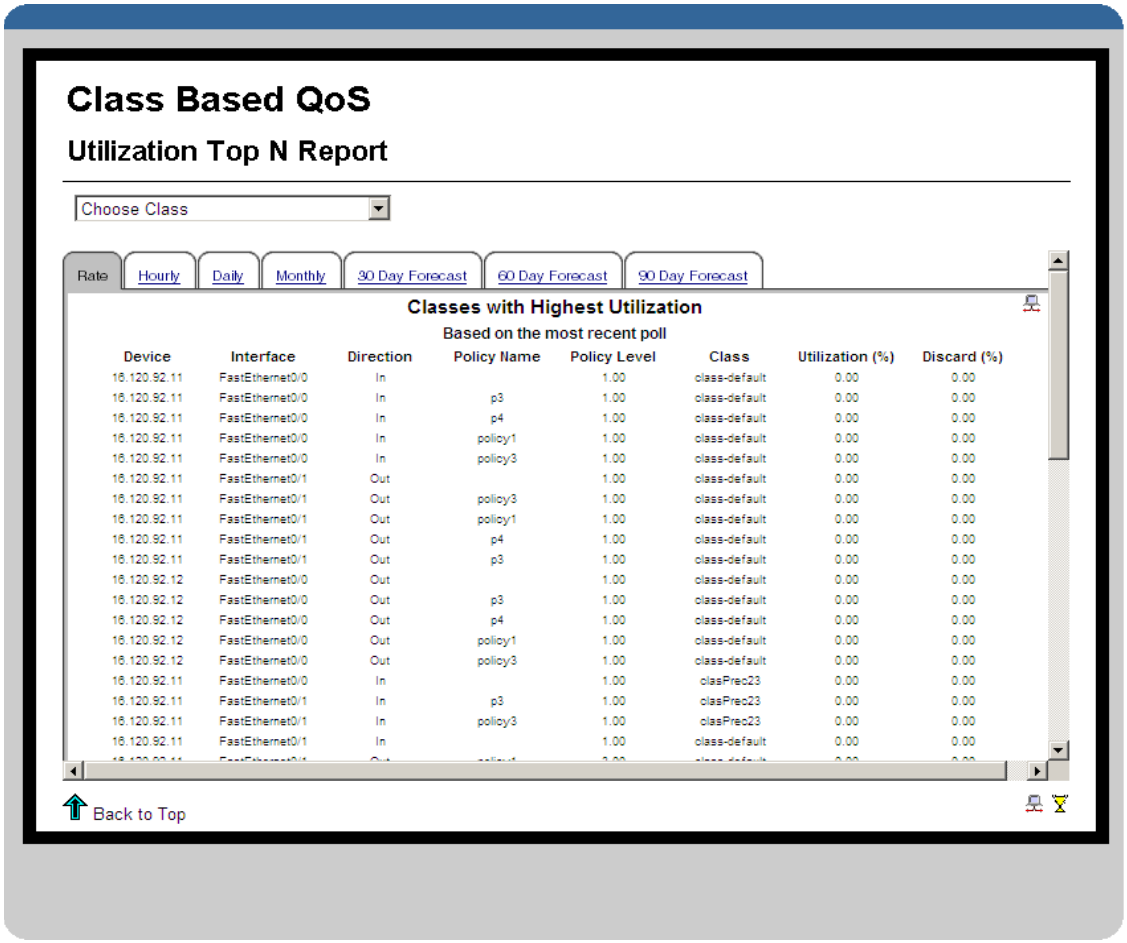
Utilization Top N Report



4 Configuring Distributed Systems

This chapter covers the following topics:

- Configuring the Central Server on page 33
- Configuring Satellite Servers on page 35
- System Clocks on page 35

If you are running Performance Insight as a distributed system, you installed Class Based QoS on the central server and on each satellite server. You also installed the Class Based QoS Datapipe on each server that polls. When you finish installing packages, you have to configure the servers in your system.

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 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 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 Performance Insight Databases folder and select the central server.

4 Click LIR Configuration.

5 Click Add Mapping.

6 From the Select Satellite Server list, select a satellite server to which to add a mapping.

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 If you want to add additional LIR mappings, click Add to list and repeat step 6 through step 10.

12 Click OK.

13 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 verify the copy type is set to Property and Data for each table:

- SHIPStatData
- SHIPStatInterfaceData

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

1 Click the New Copy Policy icon or select File > New Copy Policy from the Copy Policy Manager. The Copy Policy Wizard displays.

2 Click Next. The Satellite Server and Copy Policy Selection Page displays.

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

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

5 Click Next. The Copy Type Selection Page displays.

6 Select Property and Data.

7 Click Next. The Summary page displays.

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

9 Click Finish.

10 Repeat step 4 - step 9 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

The trendtimer.sched file is found in the {DPIPE_HOME}/lib/ directory. In this instance, {DPIPE_HOME} is the directory in which 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 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 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.

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