

# Class Based QoS Report Pack

Software Version: 1.1

HP OpenView Performance Insight

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## User Guide

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# 1 Overview

This chapter covers the following topics:

- [OPVI and Class Based QoS](#) on page 7
- [Class Based QoS Report Types](#) on page 13
- [Package Version History](#) on page 15
- [Sources for Additional Information](#) on page 15

## OPVI and Class Based QoS

HP OpenView Performance Insight (OVPI) 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

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 (Management Information Base) and process the collected data. The MIB uses policies and traffic classes to define and control traffic flows.

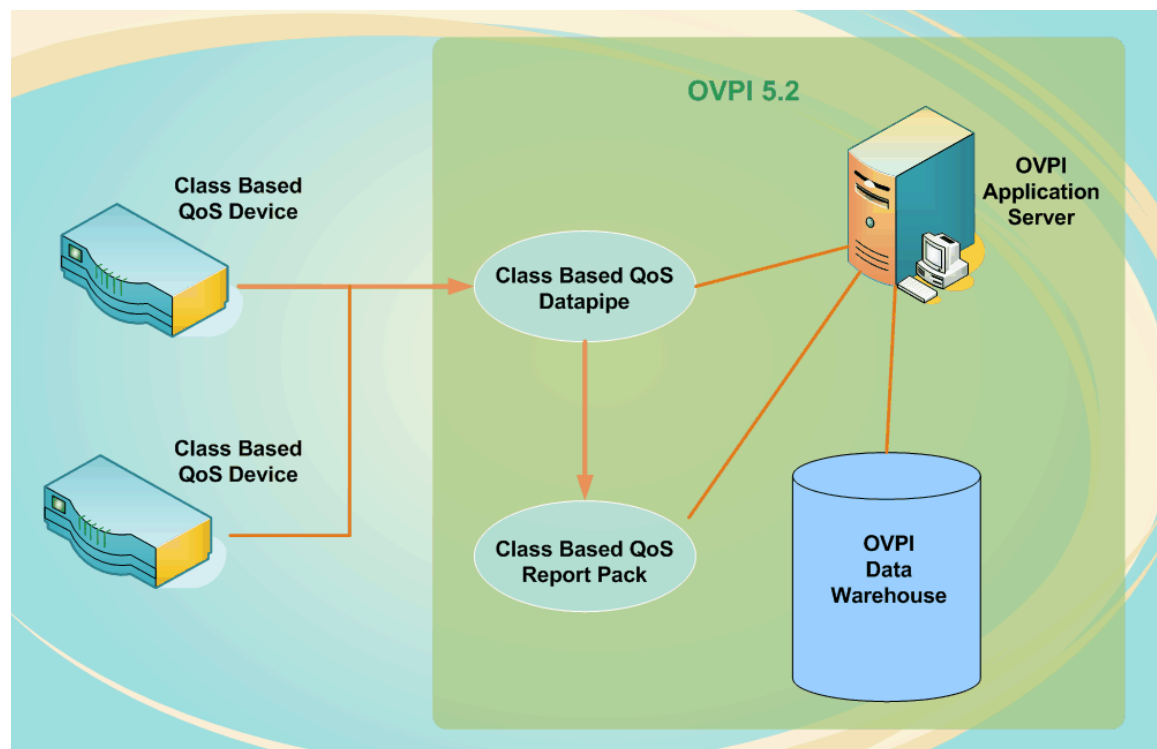
## Class Based QoS Reporting

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 Report Pack displays reports for various metrics, providing 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 can be deployed in standalone and in distributed environments.

## Data Collection

As the following graphic shows, the Class Based QoS reporting solution runs on an OVPI server that collects data using SNMP and networking devices that support the Class Based QoS configuration. The OVPI server can be on a single server or on multiple servers.



### Class Based QoS Datapipe

The Datapipe provides the following data collection functionality:

- Discovers nodes that support the Cisco 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 CBQoS-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
- Populates the Class Based QoS base table.
- Collects QoS statistics every 15 minutes by default.
- Collects only the QoS statistics that are appropriate based on the QoS configuration of the router.
- Recognizes and responds to interface re-indexing discovered by the Interface Reporting Datapipe and the IFEntry Discovery Datapipe.
- Recognizes and responds to re-indexing of QoS objects in the Class Based QoS MIB tables.
- Recognizes and responds to configuration changes (other than re-indexing) of QoS objects in the Class Based QoS MIB tables as part of the statistics collection.
- Collects QoS configuration data for all routers once per day to keep the configuration information fresh. However, you can also force the immediate collection of configuration data.
- Collects QoS configuration data within 15 minutes after a re-indexing event or a configuration change is discovered on a router. This happens only on the routers that were re-indexed or reconfigured.
- Collects QoS configuration data as appropriate for QoS objects configured on each router.
- Collects statistics for routers needing configuration updates to minimize gaps in the data due to re-indexing or configuration changes.

Collections are based on the previous configuration. Statistics for new QoS objects are not collected until the new configuration is known. If QoS objects are removed for the configuration, there may be errors in the trend log that the MIB table for the removed QoS object does not exist.

- Collects only statistics for QoS objects with configuration data less than two days old.
- 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 configuration data. After a re-index or configuration change, trend sums are suspended until the configuration is updated.

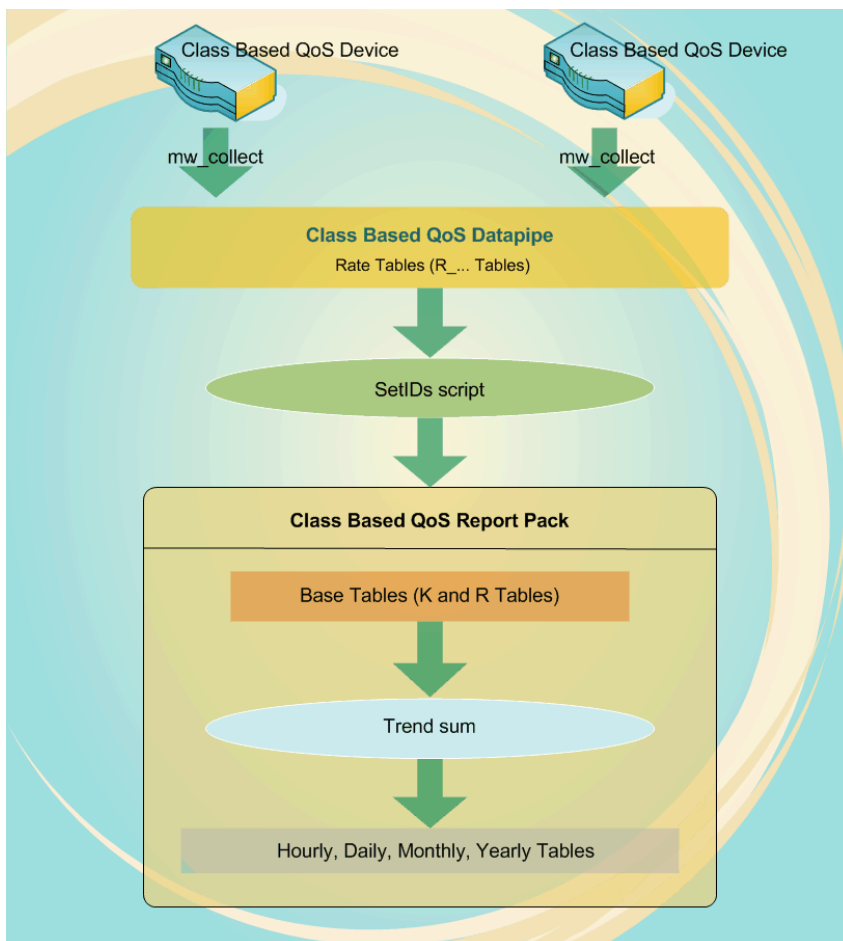
### Class Based QoS Report Pack

The Report Pack issues processing directives to OVPI, 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 also provides an open API for 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.

## Deploying the Class Based QoS Report Pack

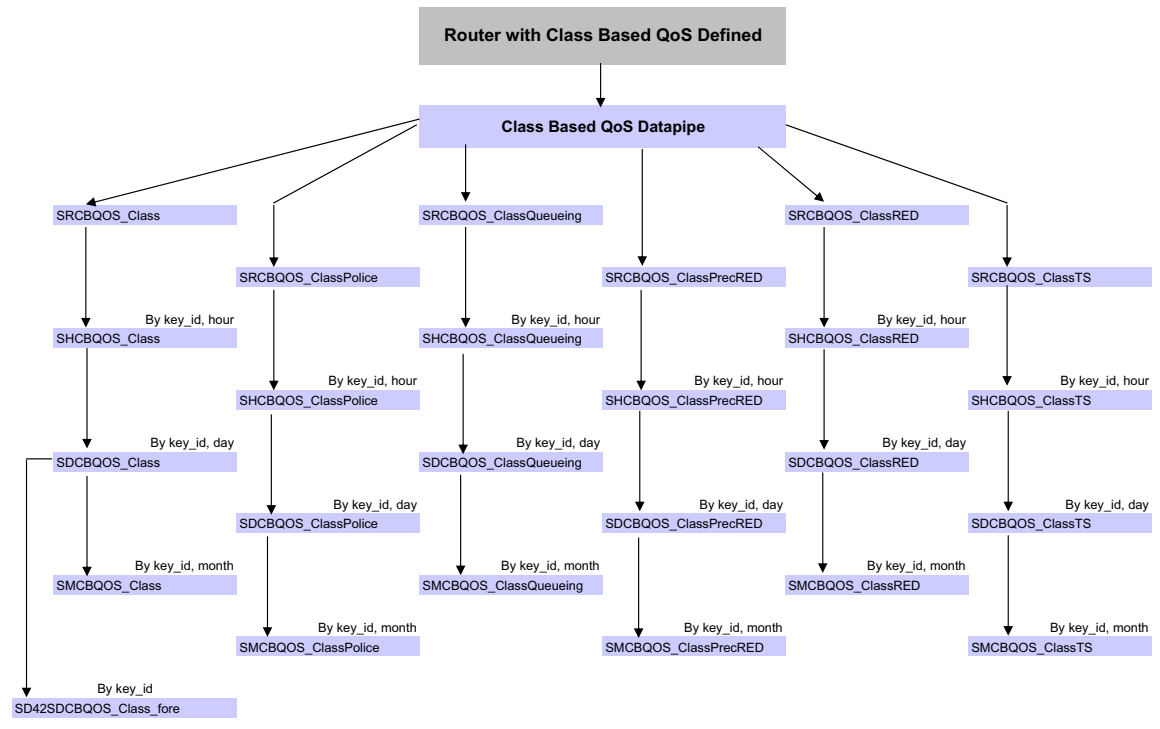
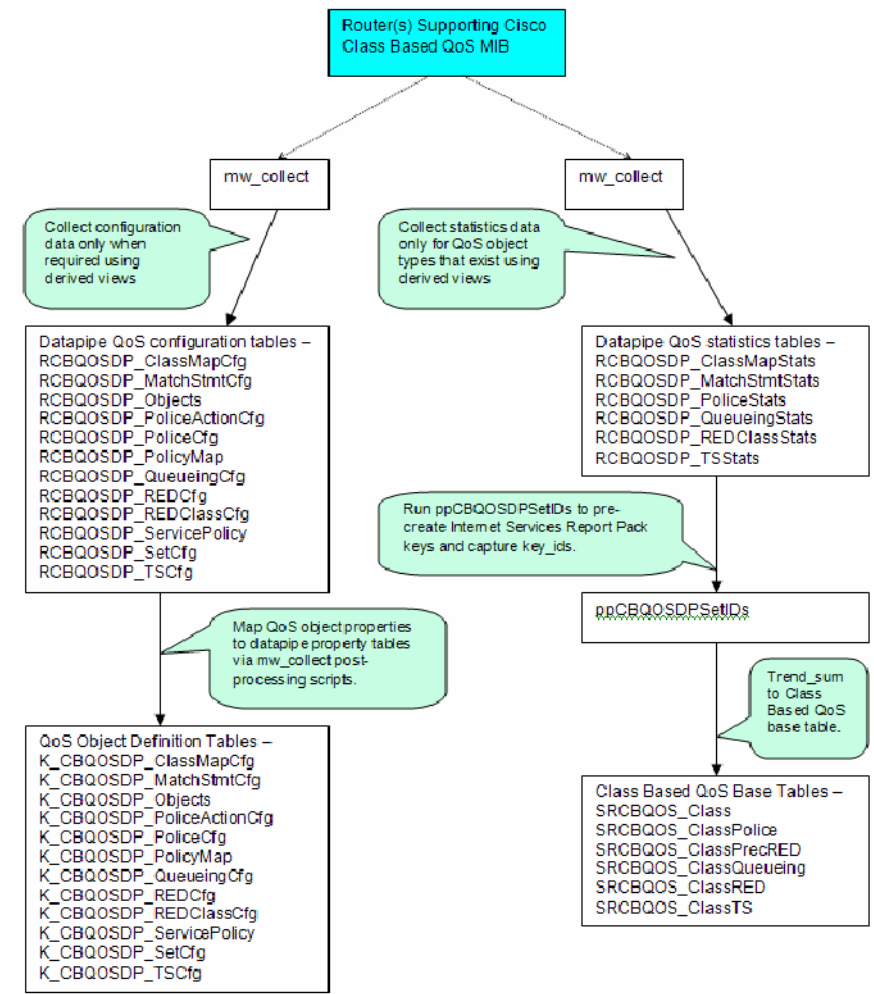
After installation and type discovery, the supported devices need to be configured for the Class Based QoS configuration collection interval (see [Configuring Class Based QoS](#) on page 21). The interfaces in those devices need to be identified for polling or not. Once this is done, the Class Based QoS configuration data is collected from the devices, and the data is displayed in the base tables of the Report Pack. The overview reports show the QoS collection overview.



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/forms. For more information, see the *Common Property Tables User Guide*.

- The Datapipe populates the Class Based QoS base tables once every 15 minutes.
- The Report Pack populates the Class Based QoS daily tables every day as defined in the processing schedule.
- The Report Pack populates/updates the Class Based QoS monthly tables every day with the current month containing month-to-date data.
- The Report Pack populates the Class Based QoS forecast tables every day using a 42-day baseline period.

The following graphics illustrate the process flow for the Datapipe.



# Class Based QoS Report Types

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
  - Traffing 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 23. To see example reports, see [Sample Reports from the Demo Package](#) on page 27.

## Customizing the Appearance of Reports

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

The screenshot displays the HP OpenView Performance Insight Administration interface. At the top left is the HP logo and the word 'invent'. A navigation bar at the top right contains links for Home, Catalog, Preferences, Administration, Schedule, and Help. The main content area is titled 'HP OpenView Performance Insight' and is divided into two panels. The left panel is a sidebar with a tree view containing folders for Preferences, User Profile, Site Appearance, Deployed Items, and Scheduler. Under Site Appearance, there are sub-items for Settings, History, and View. The right panel is titled 'Site Appearance Settings' and contains three sections: Link Bar Attributes, Navigation Frame Attributes, and Results Frame Attributes. Each section has a table with 'Attribute' and 'Value' columns. The 'Link Bar Attributes' section includes Font (arial), Font Size (10pt), Highlighted Font Color (#cc0033), and Regular Font Color (#003333). The 'Navigation Frame Attributes' section includes Font (arial), Font Size (10pt), Highlighted Font Color (#cc0033), and Regular Font Color (#003333). The 'Results Frame Attributes' section includes Font (arial), Font Size (10pt), and Font Color (#003333). Each color field has a 'Select Color' button. At the bottom of the right panel are 'Apply' and 'Reset' buttons.

Link Bar Attributes	Value
Font	arial
Font Size	10pt
Highlighted Font Color	#cc0033 <a href="#">Select Color</a>
Regular Font Color	#003333 <a href="#">Select Color</a>

Navigation Frame Attributes	Value
Font	arial
Font Size	10pt
Highlighted Font Color	#cc0033 <a href="#">Select Color</a>
Regular Font Color	#003333 <a href="#">Select Color</a>

Results Frame Attributes	Value
Font	arial
Font Size	10pt
Font Color	#003333 <a href="#">Select Color</a>

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

## Package Version History

Version	Release Date	Features/Enhancements
1.1	June 2007	Initial release

## Sources for Additional Information

The following documents provide additional information:

- *HP OpenView Performance Insight 5.2 Administration Guide*
- *Common Property Tables 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 for OVPI 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 17
- [Installing Class Based QoS](#) on page 19
- [Accessing Deployed Reports](#) on page 23
- [Package Removal](#) on page 24
- [Troubleshooting](#) on page 25

### 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 OVPI 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:

- OVPI 5.2
- All service packs available for the version of OVPI (5.2) you are running

The package level prerequisites are:

- Common Property Tables 3.6
- Interface Reporting Report Pack 5.2

#### 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 19).

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 OVPI and all available service packs for that version of OVPI. 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 35.

# 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`  
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 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:
  - 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 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`

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 when the Class Based QoS device configuration changes.

**Force a CB QoS Rediscovery for selected devcies**

Setting the rediscovery flag from No to Yes will cause the CB-QoS datapipe to go and rediscover the CB-QoS configuration on the device on the next poll cycle. You may wish to do this if you have changed the properties of the interface and want the OVPL system to immediately recognize those properties.


Device	QoS Disc Flag	Rediscovery
15.2.120.105	2	Immediately
15.2.120.194	1	Within 24h
15.2.120.195	2	Immediately
15.2.120.72		No
15.2.120.73		No
15.2.121.110		No
15.2.121.254		No
15.2.122.110		No
15.2.122.111		No
15.2.122.112		No
15.2.122.114		No
15.2.122.115		No
15.2.122.116		No
15.2.122.118		No
15.2.122.120		No
15.2.122.124		No
15.2.122.126		No
15.2.123.10		No
15.2.123.7		No

Immediately

OK Apply Cancel

## 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 changes and close the form.

**Select Device**

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**

---

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	F
FastEthernet0/1	2	6	1	07 Nov 2006 / 02:32	0	1	F
Null0	3	1	1	07 Nov 2006 / 02:32	0	0	F

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

- OVPI client applications
- Web browser

The screenshot shows the HP OpenView Performance Insight web interface. The left-hand pane, titled 'Catalog', shows a tree view of report categories. The 'Class Based QoS' category is selected and highlighted with a red circle. The right-hand pane, titled 'Deployed Items', shows a table of reports for this category. The table has columns for Name, Description, Location, and Undeploy. The reports listed are:

Name	Description	Location	Undeploy
Admin		/system/Class_Based_QoS/	<input type="checkbox"/>
DrillDown		/system/Class_Based_QoS/	<input type="checkbox"/>
Summary		/system/Class_Based_QoS/	<input type="checkbox"/>
Bit Rate History		/system/Class_Based_QoS/	<input type="checkbox"/>
Dropped Bit Rate History		/system/Class_Based_QoS/	<input type="checkbox"/>
Inventory		/system/Class_Based_QoS/	<input type="checkbox"/>
Packet Rate History Report		/system/Class_Based_QoS/	<input type="checkbox"/>
Percent Packet Drop History		/system/Class_Based_QoS/	<input type="checkbox"/>
Queueing History		/system/Class_Based_QoS/	<input type="checkbox"/>
Queueing Top N		/system/Class_Based_QoS/	<input type="checkbox"/>
Traffic Forecast		/system/Class_Based_QoS/	<input type="checkbox"/>
Utilization History		/system/Class_Based_QoS/	<input type="checkbox"/>
Utilization Top N		/system/Class_Based_QoS/	<input type="checkbox"/>

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 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 OVPI 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 OVPI 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 OVPI 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>

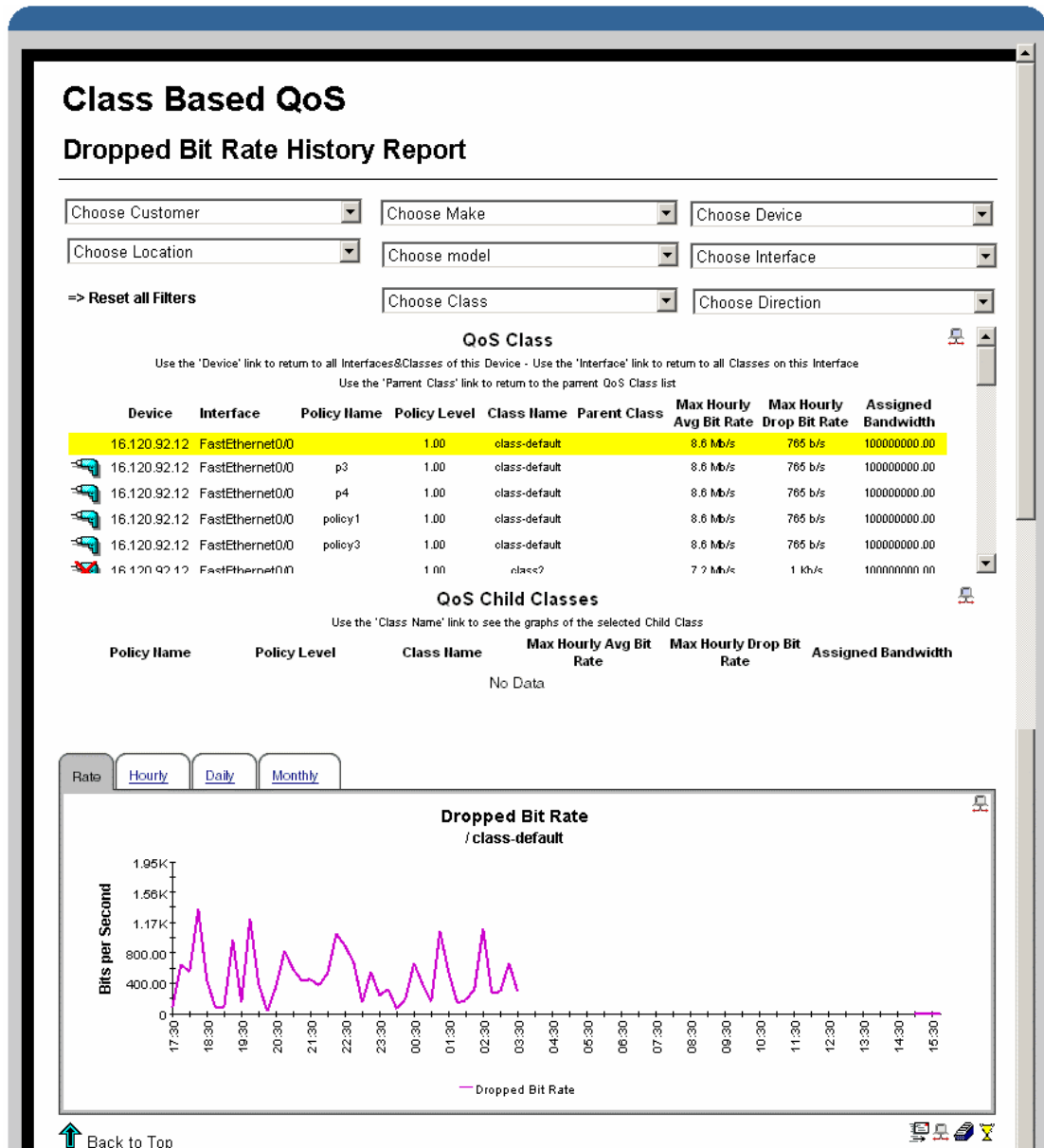


# 3 Sample Reports from the Demo Package

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

### Class Based QoS

#### Queuing 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

[Back to Top](#)

## Utilization History Report for the QoS Classes in a Device

### 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 parent 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	class?		7.7 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

**Pre-Policy Bandwidth Utilization**  
/ class-default

Average Utilization

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# Sample Summary Reports

## Policing Summary by Class Report



# Traffic Shaping Summary by Class Report

## Class Based QoS

### Traffic Shaping Summary by Class



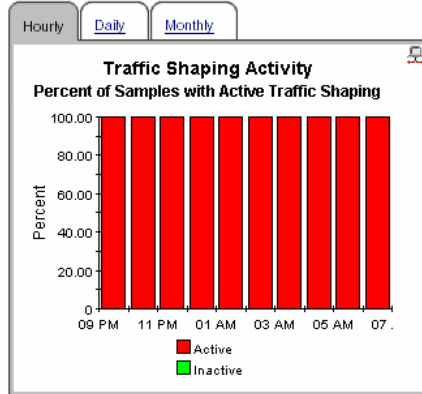
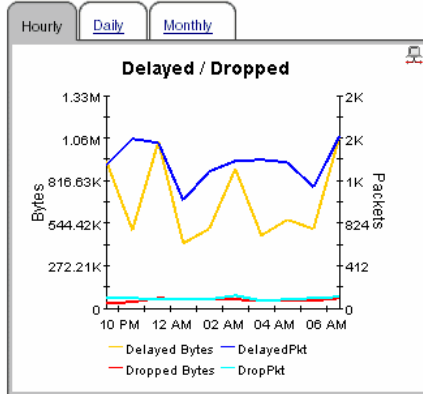
The Traffic Shaping Summary by Class Report

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



# 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)
18.120.92.11	FastEthernet0/1	In		1.00	classPrec23	4960792.00	44.33	0.12
18.120.92.11	FastEthernet0/1	In	p3	1.00	classPrec23	4960792.00	44.33	0.12
18.120.92.11	FastEthernet0/1	In	policy3	1.00	classPrec23	4960792.00	44.33	0.12
18.120.92.11	FastEthernet0/1	In	p4	1.00	classPrec23	4960792.00	44.33	0.12
18.120.92.11	FastEthernet0/1	In	policy1	1.00	classPrec23	4960792.00	44.33	0.12
18.120.92.11	FastEthernet0/1	Out		3.00	class4	4647130.00	7.72	0.04
18.120.92.11	FastEthernet0/1	Out	p4	3.00	class4	4647130.00	7.72	0.04
18.120.92.11	FastEthernet0/1	Out	policy3	3.00	class4	4647130.00	7.72	0.04
18.120.92.11	FastEthernet0/1	Out	policy1	3.00	class4	4647130.00	7.72	0.04
18.120.92.11	FastEthernet0/1	Out	p3	3.00	class4	4647130.00	7.72	0.04
18.120.92.11	FastEthernet0/1	Out		1.00	class3	4033836.00	12.66	0.12
18.120.92.11	FastEthernet0/1	Out	policy3	1.00	class3	4033836.00	12.66	0.12
18.120.92.11	FastEthernet0/1	Out	policy1	1.00	class3	4033836.00	12.66	0.12
18.120.92.11	FastEthernet0/1	Out	p4	1.00	class3	4033836.00	12.66	0.12
18.120.92.11	FastEthernet0/1	Out	p3	1.00	class3	4033836.00	12.66	0.12
18.120.92.11	FastEthernet0/0	In		1.00	class-default	3528099.00	6.75	0.02
18.120.92.11	FastEthernet0/0	In	p3	1.00	class-default	3528099.00	6.75	0.02
18.120.92.11	FastEthernet0/0	In	p4	1.00	class-default	3528099.00	6.75	0.02
18.120.92.11	FastEthernet0/0	In	policy1	1.00	class-default	3528099.00	6.75	0.02

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## Utilization Top N Report

### 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	classPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In	p3	1.00	classPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In	policy3	1.00	classPrec23	0.00	0.00
16.120.92.11	FastEthernet0/1	In		1.00	class-default	0.00	0.00
16.120.92.11	FastEthernet0/1	Out		1.00	class-default	0.00	0.00

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# 4 Configuring Distributed Systems

This chapter covers the following topics:

- [Configuring the Central Server](#) on page 35
- [Configuring Satellite Servers](#) on page 37
- [System Clocks](#) on page 37

If you are running OVPI 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 OVPI 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 OVPI 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 OVPI 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 OVPI 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 OVPI 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 OVPI 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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