MPLS VPN Report Pack

Software Version 3.20

HP Performance Insight

User Guide

October 2007

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Contents

1 Overview

This chapter covers the following topics:

OVPI and SLA Monitoring for Label-Switched VPNs

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

Label-Switched Paths in a VPN

An internet service provider can create virtual private networks (VPNs) for its customers. Each VPN shares a common backbone that connects all the sites belonging to a customer. Each VPN contains backbone routers, provider edge routers, and customer edge routers. If the service provider implements Multi-Protocol Label Switching (MPLS), the provider edge routers communicate with each other using label-switched paths.

Each provider edge router maintains a virtual routing and forwarding table, or VRF. The purpose of the VRF is to point traffic toward the correct customer edge router. The provider edge router receives routing updates from customer edge routers and distributes routing updates to other provider edge routers. The interfaces on a provider edge router can be MPLS-enabled or they can function as VPN endpoints. When an interface is MPLS-enabled, it faces the common backbone. When an interface functions as a VPN endpoint, it belongs to a VRF and faces the customer.

The MPLS VPN Report Pack

The reports in the MPLS VPN package monitor the status of large-scale enterprise VPNs running over MPLS-enabled networks. The basic reporting component is the device-level logical interface, as presented by the ifTable in MIB-II. The MPLS VPN Report Pack collects data from the ifTable and automates the following chores:

- Finding VRFs that are generating errors
- Finding VRFs that are not functioning
- Ranking VPNs according to utilization
- Grouping multiple VPN-associated interfaces into single entities
- Applying SLA metrics, such as utilization or discard ratios, to VPNs and individual VRFs
- Discovering VPN network configurations and relationships
- Calculating statistics for label usage and failed label lookups

Dependencies

The MPLS VPN Report Pack builds on the capabilities of the Interface Reporting Report Pack. The following packages are prerequisites:

- Interface Discovery Datapipe — discovers MIB-II interfaces and tracks them for re-indexing events
- Interface Reporting ifEntry Datapipe — polls devices for MIB-II data
- Common Property Tables — maintains a single set of customer, location, and device tables shared by multiple report packs
- Threshold and Event Generation Module — generates SNMP traps based on service level metrics and sends traps to the network management system

Enhancements in Version 3.20

Version 3.20 includes a new feature, a new upgrade package, and defect fixes.

New Feature in Version 3.20

- Copy Policy Enhancement

New Upgrade Package

- UPGRADE_MPLS_VPN_to_32

Defect Fixes

- TBD
- TBD
- TBD

Folders and Reports

If you view reports using the web interface, you will see the following report folders:

- Admin
- Devices
- Interfaces
- VPNs
- VRFs

See below for a brief description of the reports in each folder.

Admin Folder

Report	Description
MPLS Inventory	A list of all MPLS enabled interfaces with MPLS specific configuration data.
VPN Inventory	Select a VPN to see component VRFs. Select a VRF to display a list of all associated interfaces.
VPN SLA Configuration	Displays VPNs and their component VRFs, with the current SLA settings for each.

Devices Folder

Report	Description
Recent MPLS Activity	A current view of all devices with MPLS enabled interfaces. Provides details for label count, label lookup, and fragment count.
Recent VPN Activity	Historical analysis of configured interfaces, configured and active VRF counts, interface exception counts (by utilization, error and discard ratio) and route counts.
Recent VPN Route Activity	Historical route change activity across devices that support VRFs.

Interfaces Folder.

Report	Description
MPLS Availability and Response Time	Availability (based on ifOperStatus) and SNMP response time (for management traffic) for MPLS-enabled interfaces.
MPLS Unreachable Interfaces	MPLS-enabled interfaces that have not responded to poll requests within the previous 35 minutes, but have responded at some time during the previous 6 hours.
Near Real Time MPLS	Displays configuration data accompanied by exception counts, utilization, discards and errors.
NRT MPLS Snapshot	Same as Near Real Time MPLS, but with an interface pre-selection window to accommodate selective displays of data.
Near Real Time VPN	Displays configuration data accompanied by exception counts, utilization, discards and errors.
NRT VPN Snapshot	Same as Near Real Time VPN, but with an interface pre-selection window to accommodate selective displays of data.
VPN Availability and Response Time	Availability (based on ifOperStatus) and SNMP response time (for management traffic) for VPN-associated interfaces.
VPN Grade of Service	VPN-associated interfaces with their exception counts, presented in a GOS type report showing hours with and without exceptions.
VPN Interface Exception Hot Spots	VPN configuration data accompanied by interface exception counts, utilization, discards and errors.

Report	Description
VPN Top Ten Volume	A list of the top and bottom ten VPN-associated interfaces based on transferred volume. Provides many configuration details.
VPN Unreachable Interfaces	VPN-associated interfaces that have not responded to poll requests within the previous 35 minutes, but have responded at some point during the previous 6 hours.

VPNs Folder

Route Activity	Lets you examine hourly and daily route activity for a VPN as a whole, and also on a per-VRF basis.
Top 10/Bottom 10 — Interface Availability	The top and bottom ten VPNs on the network in terms of component interface availability.
Top 10/Bottom 10 — Volume	The top and bottom ten VPNs on the network in terms of volume. Only ifOutOctets are counted in order to avoid double-counting each packet.
Traffic	Historical traffic counts for a VPN as a whole. Includes exception counts across all interfaces in the VPN and links to the VRF traffic graphs.
VPN Exception Hot Spots	A historical report focusing on yesterday's problems. Includes details for exception counts across all VPN-associated interfaces, route counts across all VRFs within the VPN, and traffic statistics.
VPN Executive Summary	A monthly summary for each VPN; includes number of routes, total volume transferred, interface exceptions, security violations, and operational seconds.
Recent Utilization	Utilization, traffic, and exception details for VRFs and their component interfaces during the most recent complete polled hour.

VRFs Folder

Current OperStatus	The operational status of each VRF on the network, arranged so that *Down* and *Unknown* VRFs appear first in the list for ease of trouble shooting.
Historical Utilization	Traffic, utilization, and exception history for each component interface of the VRF on a daily basis.
Recent OperStatus	Operational status changes for each VRF over the previous 24 hours, including active and associated interface counts, as well as configuration changes.

Options for Customizing Reports

You can customize the contents of MPLS VPN reports by applying group filters, by adding property data, by modifying property data, by applying constraints, and by changing view options for tables and graphs. For details about view options for tables and graphs, see Appendix C, Editing Tables and Graphs.

Group Filters

Group filters allow service providers (or any organization interested in sharing reports with customers) to produce customer-specific reports. Creating customer-specific reports involves the following tasks:

- Importing customers and locations using Common Property Tables
- Creating a group account for all of the users affiliated with each customer or group
- Creating a group filter for each group account

For more information about group filters, refer to the *OVPI Administration Guide*.

Applying Constraints

You apply constraints by editing parameters. Editing a parameter filters out the data you are not interested in seeing. For example, if you edit the Customer Name parameter, data for every customer except the customer you typed in the Customer Name field drops from the report. You can apply multiple constraints at once. The reports in MPLS VPN 3.0 support the following parameters:

- VPN Name
- SLA Name
- VRF Name
- Device
- Interface
- Protocol
- Customer Name
- Customer ID
- Location
- MinutesSincePoll
- Full or Half

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

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

Adding and Modifying Property Data

The reports in MPLS VPN 3.0 accommodate custom property information for:

- Devices
- Interfaces
- VPNs
- VRFs

If you used Common Property Tables to assign custom attributes to devices, the reports in MPLS VPN 3.0 will inherit those attributes automatically. To update device-level property data, use the change forms that come with Common Property Tables.

If you assigned customer and location attributes to the interfaces monitored by Interface Reporting, the reports in MPLS VPN 3.0 will inherit those attributes automatically. To update interface-level property data, you can import a file that contains your updates, or you can use the change forms that come with Interface Reporting.

Property data for VPNs is not inherited. The following attributes can be assigned to a VPN:

- Customer
- Location
- SLA settings

Property data for VRFs is not inherited. The following attributes can be assigned to a VRF:

- Customer
- SLA settings

Sources for Additional Information

This user guide contains samples of some of the reports in MPLS VPN 3.20. The demo package that comes with MPLS VPN 3.20 contains a sample of every report in the package. If you have access to the demo package and you want to know what fully-populated reports look like, install the demo package. Like real reports, demo reports are interactive. Unlike real reports, demo reports are static.

For information regarding the latest enhancements to MPLS VPN 3.0 and any known issues affecting this package, refer to the *MPLS VPN Report Pack Release Notes*. You may also be interested in the following documents:

- *Juniper MPLS VPN Datapipe Release Notes*
- *MPLS VPN Datapipe Release Notes*
- *Interface Reporting Report Pack User Guide*
- *Interface Discovery Datapipe User Guide*

➤ Includes information about the frequency of collections, specific SNMP MIBs, and specific SNMP OIDs.

- *Interface Reporting ifEntry Datapipe User Guide*

➤ Includes information about the frequency of collections, specific SNMP MIBs, and specific SNMP OIDs.

- *Thresholds Module User Guide*
- *NNM/OVPI Integration User Guide*
- *OVPI Report Packs, Release Notes, October 2007*

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

http://ovweb.external.hp.com/lpe/doc_serv/

The user guides for OVPI are listed under **Performance Insight**. The user guides for report packs and datapipes are listed under **Performance Insight Reporting Solutions**.

The manuals listed under **Performance Insight Reporting Solutions** indicate the month and year of publication. If a manual is revised and reposted, the date of publication will change. Since we post revised manuals on a regular basis, you should compare the date on your PDF to the date of the PDF on the web and download the web edition if it is newer.

2 Package Installation

This chapter covers the following topics:

Guidelines for a Smooth Install

An OVPI reporting solution has at least two ingredients, a report pack and a datapipe. Some OVPI reporting solutions come with multiple datapipes. When you install a datapipe, you configure OVPI to collect a specific type of performance data at a specific interval. When you install the report pack, you configure OVPI to summarize and aggregate the performance data collected by the datapipe.

The report pack CD contains report packs, datapipes, and shared packages. When you insert the CD in the CD_ROM drive and launch the package extraction program, the install script copies every package from the CD to the Packages directory on your system. After the extract finishes, the install script prompts you to launch OVPI and start Package Manager. Before using Package Manager, review the following guidelines.

Software Prerequisites

The following software must be installed before installing MPLS VPN:

- OVPI 5.30
- All service packs available for the version of OVPI (5.30) you are running
- Common Property Tables 3.70
- Interface Reporting 5.30

Interface Reporting requires two datapipes:

- Interface Discovery Datapipe 2.50
- Interface Reporting ifEntry Datapipe 2.50

If you are upgrading Interface Reporting, you may need to remove earlier versions of those datapipes, specifically:

- Interface Discovery Datapipe 1.1 / 2.0 / 2.1 / 2.2 / 2.3 / 2.4
- Interface Reporting ifEntry Datapipe 1.1 / 2.0 / 2.1 / 2.2 / 2.3 / 2.4

For details about upgrading Interface Reporting, refer to the *Interface Reporting Report Pack User Guide*.

Common Property Tables

MPLS VPN requires Common Property Tables. If you are not currently running any version of Common Property Tables, Package Manager will select and install Common Property Tables for you, automatically.

If you are running Common Property Tables 3.60 or earlier, upgrade to version 3.70 by installing the upgrade package. When you install the upgrade package, do not install anything else. Install the upgrade package and *only* the upgrade package. If you need help with the upgrade, or if you want to know more about how this package operates, refer to the *Common Property Tables User Guide*.

MPLS_VPN_Threshold

If NNM and OVPI are integrated, you should install the optional thresholds sub-package, MPLS_VPN_Threshold. Installing the thresholds sub-package enables a set of customized performance thresholds and configures OVPI to send thresholds traps to NNM. Threshold traps sent to NNM display as alarms in the NNM alarm browser.

You have the following options for setting thresholds:

- Set thresholds for rate data only
- Set thresholds for rate data and aggregated data
- Set thresholds for aggregated data only

The option you want determines where you need to install the thresholds sub-package. If you want to set thresholds for rate data only, then you must install the thresholds sub-package on satellite servers only. If you want to set thresholds for rate data and aggregated data (daily data, or a forecast), then you must install the thresholds sub-package on the central server as well as on each satellite server.

If you install MPLS_VPN_Threshold, Package Manager will install a prerequisite package, the Thresholds Module, for you. You may already have the Thresholds Module installed. Upgrade to Thresholds Module 5.1.

Distributed Environments

Package installation in a distributed environment is more complicated than package installation on a standalone system. If you are planning to install MPLS VPN in a distributed environment, the central server, every satellite server, and every remote poller must be running OVPI 5.30 and all available service packs for OVPI 5.30. Here is a high-level overview of the installation procedure for a distributed environment:

1 Disable trendcopy on the central server.

2. Install MPLS VPN (along with any prerequisite packages that are not already installed) on the central server; deploy reports.
3. Install MPLS VPN (along with any prerequisite packages that are not already installed) and the MPLS VPN Datapipe on each satellite server; if you do not want local reporting, do not deploy reports.
4. Re-enable trendcopy on the central server.
5. Reconfigure your central and satellite servers. For details, see Chapter 3, Setting Up a Distributed System.

Preliminary Tasks

There are two preliminary tasks that may or may not apply to your situation. The first task pertains to remote pollers and the need to save configuration data related to polling policies and polling groups. The second task pertains to custom table views.

Datapipes and Remote Pollers

When you uninstall an existing datapipe, the following information is lost:

- Single polling policy for a remote poller
- Cloned polling policies for multiple remote pollers
- Customized polling groups

To prevent this information from being lost, you can export existing polling policy configurations and customized polling groups by using the following commands:

- collection_manager
- group_manager

Exporting Polling Policy Configurations

If your environment contains polling policies for remote pollers, use the collection_manager command to export existing policy configurations to a file.

UNIX: As user trendadm, run the following command:

```
cd $DPIPE_HOME

./bin/collection_manager -export -file /tmp/savePollingPolicy.lst
```

Windows: As Administrator, launch a command window. Navigate to the OVPI install directory and execute the following command:

```
bin\collection_manager -export -file \temp\savePollingPolicy.lst
```

Exporting Polling Group Configurations

If your environment contains customized polling groups, use the group_manager command to export groups to individual .xml files.

UNIX: As user trendadm, execute the following command:

```
cd $DPIPE_HOME

./bin/group_manager -export_all -outfile /tmp/savePollingGroups
```

Windows: As Administrator, launch a command window, then navigate to the OVPI install directory and execute the following command:

```
bin\group_manager -export_all -outfile \temp\savePollingGroups
```

Custom Table Views

If you created custom views for data or property tables, the views you created may interfere with the report pack upgrade process, causing the upgrade to fail. Whether or not your views interfere with the upgrade depends on how you created them. If you created them using SQL, the upgrade will succeed but your views will not be available once the upgrade is complete. If you created them using Datapipe Manager, the upgrade is likely to fail. To prevent the upgrade from failing, follow this sequence of events:

- Delete your custom views.
- Upgrade the report pack.
- Recreate your custom views.

Upgrading to Version 3.1

Perform the following tasks to upgrade to version 3.1:

- Task 1: Stop OVPI Timer and extract packages from the report pack CD
- Task 2: Upgrade to Common Property Tables 3.70
- Task 3: Upgrade to Interface Reporting 5.30
- Task 4: Install the UPGRADE_MPLS_VPN_to_32 upgrade package
- Task 5: Remove MPLS VPN Datapipe 3.2 and Juniper MPLS VPN Datapipe 1.1
- Task 6: Install MPLS VPN Datapipe 3.3 and Juniper MPLS VPN Datapipe 1.2
- Task 7: Restart OVPI Timer

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

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

   On Windows, do the following:

   a. Select **Control Panel > Administrative Tools > Services**.

   b. Select OVPI Timer from the list of services.

   c. From the Action menu, select **Stop**.

   On UNIX, as root, do one of the following:

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

   Sun: **`sh /etc/init.d/ovpi_timer stop`**
3. Insert the report pack CD in the CD-ROM drive. On Windows, a Main Menu opens automatically; on UNIX, mount the CD if the CD does not mount automatically, navigate to the top level directory on the CD, and run the **`./setup`** command.

4 Type **1** in the choice field and press **Enter**. The install script displays a percentage complete bar. When the copy is complete, the install script starts Package Manager. The Package Manager welcome window opens.

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

- Docs
- MPLS_VPN.ap
- MPLS_VPN_Demo.ap
- MPLS_VPN_Thresholds.ap
- UPGRADE_MPLS_VPN_to_32.ap

Task 2: Upgrade to Common Property Tables 3.70

Follow these rules:

- Do not install any other package with the Common Property Tables upgrade package; install the Common Property Tables upgrade package and *only* the Common Property Tables upgrade package.
- When prompted to accept or disable the option to Deploy Reports, accept the default. If you do not deploy reports, you will not deploy the change forms that come with Common Property Tables.
- 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: Upgrade to Interface Reporting 5.30

1 If you have not already upgraded to IR 5.30, install the UPGRADE_Interface_Reporting_to_53 package.

2 Upgrade the Interface Reporting datapipes.

a If you have one of the following versions of datapipes installed, you must remove this version of the datapipe and install the new datapipe (version 2.4):

— Interface Discovery Datapipe 1.1 / 2.0 / 2.1 / 2.2 / 2.3 / 2.4

— Interface Reporting ifEntry Datapipe 1.1 / 2.0 / 2.1 / 2.2 / 2.3 / 2.4

b If you have the following version of a datapipe installed, you must upgrade to the new version of the datapipe (version 2.5):

— Interface Discovery Datapipe 2.4

— Interface Reporting ifEntry Datapipe 2.4

Refer to the *Interface Reporting Report Pack User Guide* for more information about the upgrade procedure.

When the new datapipes are installed, click **Done** to return to the Management Console.

Task 4: Install the UPGRADE_MPLS_VPN_to_32 upgrade package

1 Start Package Manager. The Package Manager welcome window opens.

2 Click **Next**. The Package Location window opens.

3 Click **Install**.

4. Click **Next**. The Report Deployment window opens. Accept the defaults for Deploy Reports, Application Server, and Port. Type your user name and password for the OVPI Application Server.
5. Click **Next**. The Package Selection window opens.
6. Click the check box next to the following package: *UPGRADE_MPLS_VPN_to_32*
7. Click **Next.** The Type Discovery window opens. Disable the default.
8. Click **Next.** The Selection Summary window opens
9. Click **Install.** The Installation Progress window opens and the install begins. When the install finishes, a package install complete message appears.
10. Click **Done**.

Task 5: Remove MPLS VPN Datapipe 3.2 and Juniper MPLS VPN Datapipe 1.1

The MPLS_VPN Datapipes cannot be upgraded. You must remove MPLS_VPN Datapipe 3.2 and Juniper MPLS_VPN Datapipe 1.1 (if installed), then install MPLS_VPN Datapipe 3.3 and Juniper MPLS_VPN Datapipe 1.2. Start Package Manager and follow the on-screen instructions for package removal. When Package Manager tells you that removal is complete, click **Done** to return to the Management Console.

Task 6: Install MPLS VPN Datapipe 3.3 and Juniper MPLS VPN Datapipe 1.2

1. Start Package Manager. The Package Manager welcome window opens.
2. Click **Next.** The Package Location window opens.
3. Click **Install**.
4. Click **Next.** The Report Deployment window opens; disable the default for Deploy Reports.
5. Click **Next.** The Package Selection window opens.
6. Click the check box next to the following package:

   MPLS VPN Datapipe 3.2

   Juniper MPLS VPN Datapipe 1.2 (optional)
7. Click **Next.** The Type Discovery window opens.
8. Click **Next**. The Selection Summary window opens.
9. Click **Install**. The Installation Progress window opens and the install begins. When the install finishes, the package installation complete message appears.
10. Click **Done**.

Task 7: Restart OVPI Timer

On Windows, do the following:

1. Select **Control Panel > Administrative Tools > Services**.
2. Select OVPI Timer from the list of services.
3. From the Action menu, select **Start**.

On 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`**

Post-Upgrade Steps

Reconfigure any polling policies and customized group definitions that need to be restored. Do not re-import the configurations you exported. Since the old datapipe may be incompatible with the new datapipe you just installed, re-importing the configurations you exported could lead to data corruption. In addition, if you removed any custom table views before upgrading the report pack, you can recreate those custom table views now.

Installing MPLS VPN for the First Time

Follow these steps to install MPLS VPN on a stand-alone system:

- Stop OVPI Timer and extract packages from the report pack CD
- If necessary, upgrade to Common Property Tables 3.70
- Install MPLS VPN and restart OVPI Timer

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

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

   On Windows, do the following:

   a. Select **Control Panel > Administrative Tools > Services**

   b. Select OVPI Timer from the list of services.

   c. From the Action menu, select **Stop**

   On UNIX, as root, do one of the following:

   — HP-UX: **`sh /sbin/init.d/ovpi_timer stop`**

   — Sun: **`sh /etc/init.d/ovpi_timer stop`**
3. Insert the report pack CD in the CD-ROM drive.

   Windows: The Main Menu automatically displays.

   UNIX:

   a. Mount the CD (if the CD does not mount automatically).

   b. Navigate to the top level directory on the CD.

   c. Run **`./setup`**
4. Type **`1`** in the choice field and press **Enter**. The install script displays a percentage complete bar. When the copy is complete, the install script starts Package Manager. The Package Manager welcome window opens.

Once extraction to the Packages directory is complete, you can navigate to that directory to see the results. Under the MPLS VPN report pack you will see the following folders:

- MPLS_VPN.ap
- MPLS_VPN_Demo.ap
- MPLS_VPN_Thresholds.ap

- UPGRADE_MPLS_VPN_to_32.ap

Ignore the upgrade package. Installing the demo package is optional. You may install the demo package by itself, with no other packages, or you may install the demo package along with everything else.

Task 2: If necessary, upgrade to Common Property Tables 3.70

MPLS VPN requires Common Property Tables 3.70. If you are not running any version of Common Property Tables, skip this step. If you are running version 3.60 or earlier, install the upgrade package. When Package Manager indicates that the upgrade is complete, click **Done** to return to the Management Console.

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

Task 3: Install MPLS VPN and restart OVPI Timer

1. Start Package Manager. The Package Manager welcome window opens.
2. Click **Next**. The Package Location window opens.
3. Click **Install**.
4. Click **Next**. The Report Deployment window opens. Accept the default for Deploy Reports; type your username and password for the OVPI Application Server.
5. Click **Next**. The Package Selection window opens.
6. Click the check box next to the following packages:
   - *MPLS_VPN*
   - *MPLS_VPN_Threshold*
   - *MPLS_VPN_Datapipe 3.3*
   - *Juniper_MPLS_VPN_Datapipe 1.20*
   - *Interface_Reporting_ifEntry_Datapipe_2.50* (if not already marked as installed)
   - *IFEntry_Discovery_Datapipe_2.50* (if not already marked as installed)
   - *Interface_Reporting_5.30* (if not already marked as installed)
   - *MPLS_VPN_Demo* (optional)
7. Click **Next**. The Type Discovery window opens. Accept the default and click **Next**. The Selection Summary window opens.
8. Click **Install**. The Installation Progress window opens. When installation is complete, a package installation complete message appears.
9. Click **Done** to return to the Management Console.
10. Restart OVPI Timer.

    On Windows, do the following:

    a. Select **Control Panel > Administrative Tools > Services**

    b. Select OVPI Timer from the list of services.

    c. From the Action menu, select **Start**

    On 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`**

Post-Installation Steps

After you install the report pack, do the following:

1. Verify correct installation by calling the MPLS_VPN_Check_Status.sql script from the command line. If the script detects an unusual configuration, it will log warning messages.

   To run this script, type the following command from one of these directories:

   — For Oracle: `OVPI/packages/MPLS_VPN/MPLS_VPN.ap/Oracle`

   — For Sybase: `OVPI/packages/MPLS_VPN/MPLS_VPN.ap/Sybase`

   `ovpi_run_sql -sqlscript MPLS_VPN_Check_Status.sql`

   Running this script does not guarantee that the report pack was properly configured.

2. Launch Polling Policy Manager and make sure that the list of nodes includes your MPLS VPN nodes.
3. In approximately 1 hour, check that polling started as expected. Examine the Configuration and Logging Report (Admin folder, Interface Reporting). Messages from MPLS_VPN procedures will have MPLS or VPN in their name. You should see creation messages for devices, interfaces, VRFs, and VPNs.
4. Provision managed elements that are not automatically provisioned. For details, see Appendix B, Manual Provisioning.

Accessing Deployed Reports

When you installed the MPLS VPN Report Pack, you enabled the Deploy Reports option. As a result, the reports in this package (as well as any change forms that come with the reports) were deployed to the OVPI Application Server. Once reports reside on the OVPI Application Server, you have two ways to view them:

- OVPI client applications
- Web browser

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

For more information about the clients, refer to the *OVPI 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 *OVPI Administration Guide*.

New Objects and a New View

Any item that appears in a report accompanied by performance data or property information is an object. Devices, customers, and locations are objects, and all three of these object categories belong to OVPI's default object model. When you select an object in the object model, the right side of the Object/Property Management window refreshes, showing:

- A list of forms under **General Tasks**

- A list of forms under **Object Specific Tasks**
- A list of reports under **Object Specific Reports**

The object tree changes each time you install a new report pack. Installing Interface Reporting adds interfaces as objects under devices. In addition to adding new objects, some report packs add an entirely new class of objects or services. When this happens, the report pack provides a new view. To open the new view, select **View > Change View.**

The MPLS VPN Report Pack provides a new view tailored to VPNs and their VRFs. The new view is called **Mpls Vpn**. The object tree hierarchy for this view is as follows:

Mpls Vpn > Device > Vpn Vrf > Interface Type > Interface

Lower levels of the object tree inherit property information assigned to the upper levels. For example, setting a customer against an MPLS VPN will apply this customer to every interface in that VPN that does not already have the customer attribute set to a different value.

Uninstalling MPLS VPN

Follow these steps to uninstall the MPLS VPN and any dependent datapipe:

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

   On Windows, do the following:

   a. Select **Control Panel > Administrative Tools > Services**

   b. Select OVPI Timer from the list of services.

   c. From the Action menu, select **Stop**.

   On UNIX, as root, do one of the following:

   — HP-UX: **`sh /sbin/init.d/ovpi_timer stop`**

   — Sun: **`sh /etc/init.d/ovpi_timer stop`**
3. Open the Management Console and start Package Manager. The Package Manager welcome window opens.
4. Click **Next**. The Package Location window opens.
5. Click **Uninstall.**
6. Click **Next**. The Report Undeployment window opens. Keep the defaults.
7. Click **Next**. The Package Selection window opens. Click the check box next to:
   - *MPLS_VPN*
   - *MPLS_VPN_Datapipe*
   - *Juniper_MPLS_VPN_Datapipe*
   - *MPLS_VPN_Demo* (if installed)
8. Click **Next**. The Selection Summary window opens.
9. Click **Uninstall**. The Progress window opens. When removal is complete, a package removal complete message appears.
10. Click **Done**.

11 Restart OVPI Timer.

On Windows, do the following:

a Select **Control Panel > Administrative Tools > Services**

b Select OVPI Timer from the list of services.

c From the Action menu, select **Start**

On 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`**

3 Setting Up a 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.

Several report packs in the October 2007 release include a copy policy enhancement based on a copy policy import file. This file contains a list of data tables. When you install a report pack that has this file, the core product will generate copy policies automatically. As a result, you do not need to use the Managment Console to create copy policies. Instead, your only task related to copy policies is to verify that the copy policies you need already exist.

Because you are likely to have multiple satellite servers, we designed the hourly process files to be satellite-server friendly. This means that most of the time, most of the defaults are correct. But some defaults will be incorrect, or less than optimal, and to improve performance, you should change them. These manual edits, as well as the other steps listed above, are spelled out in detail below.

Configuring the Central Server

To configure the central server, perform the following tasks:

- Task 1: Register the satellite server by setting the database role
- Task 2: If you are not copying rate data to the central server, enable LIR
- Task 3: If you are enabling LIR, Add LIR mappings
- Task 4: Verify that you have the copy policies you want
- Task 5: Modify the `MPLS_Hourly_Process.pro` file

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: If you are not copying rate data from the satellite servers, 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: If you enable LIR, 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 **MPLS VPN** 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 Mapping** 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 that you have all of the copy policies you want.

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:

- SHVpnVrf
- SHVpnDeviceStats
- SHMplsInterfacePerf
- SHVPNIR

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 MPLS_Hourly_Process.pro file

The `MPLS_Hourly_Process.pro` file is found in the *`{DPIPE_HOME}`*`/scripts/` directory where *`{DPIPE_HOME}`* is the directory in which OVPI is installed.

Make the following change to this file:

- Find and comment out the following lines:

```
begin:Property_Import wait
end:Property_Import
begin:MPLS_1 wait
end:MPLS_1
```

Configuring a Satellite Server

Follow these steps to configure each satellite server.

1 Modify the `trendtimer.sched` file.

The `trendtimer.sched` file is found in the *{DPIPE_HOME}*`/lib/` directory where *{DPIPE_HOME}* is the directory in which OVPI is installed.

Make the following change:

- Find and change the following line (modify the daily processing time):

```
1:00+30 - - {DPIPE_HOME}/bin/trend_proc -f
{DPIPE_HOME}/scripts/MPLS_Hourly_Process.pro
```

to

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

2 Modify the `MPLS_Hourly_Process.pro` file.

The `MPLS_Hourly_Process.pro` file is found in the *{DPIPE_HOME}*`/scripts/` directory where *{DPIPE_HOME}* is the directory in which OVPI is installed.

Make the following changes:

- Find and uncomment the following lines:

```
#begin: MPLS_2 wait

# {DPIPE_HOME}/bin/perl {DPIPE_HOME}/scripts/IR_Performance.pl -p
  "Sat_1_MPLS_Copy" -t hour -v  start

# {DPIPE_HOME}/bin/trendcopy -t SHVpnVrf

# {DPIPE_HOME}/bin/trendcopy -t SHVpnDeviceStats

# {DPIPE_HOME}/bin/trendcopy -t SHMplsInterfacePerf

# {DPIPE_HOME}/bin/trendcopy -t SHVPNIR

# {DPIPE_HOME}/bin/perl {DPIPE_HOME}/scripts/IR_Performance.pl -p
  "Sat_1_MPLS_Copy" -t hour -v  stop

#end: MPLS_2
```

- Find and comment out the following lines:

```
begin:MPLS_3 wait

end:MPLS_3
```

3 Modify the `MPLS_DMF_Process.pro` file.

The `MPLS_DMF_Process.pro` file is found in the *{DPIPE_HOME}*`/scripts/` directory where *{DPIPE_HOME}* is the directory in which OVPI is installed.

Make the following change:

- Find and comment out the following lines:

```
begin:MPLS_1 wait

end:MPLS_1
```

System Clocks

Make sure that the system clock on each satellite server is synchronized with the system clock on the central server. Synchronization is extremely important when linked processes are executing in exact sequences across independent machines.

4 Change Forms

Change forms make it easy to update properties. Use change forms to:

- Create SLA configuration details
- Change SLA configuration details
- Change the name of the customer assigned to a VPN
- Change the name of the SLA assigned to a VPN
- Assign a new name to a VPN
- Update the SLA settings assigned to a VRF

You are free to import property data in batch-mode by using a file. The batch-mode method is more efficient if you have a lot changes to make or if you are working with an automated import mechanism configured from another application. For details about creating property import files, see Appendix B, Manual Provisioning.

Create SLA Configuration Details

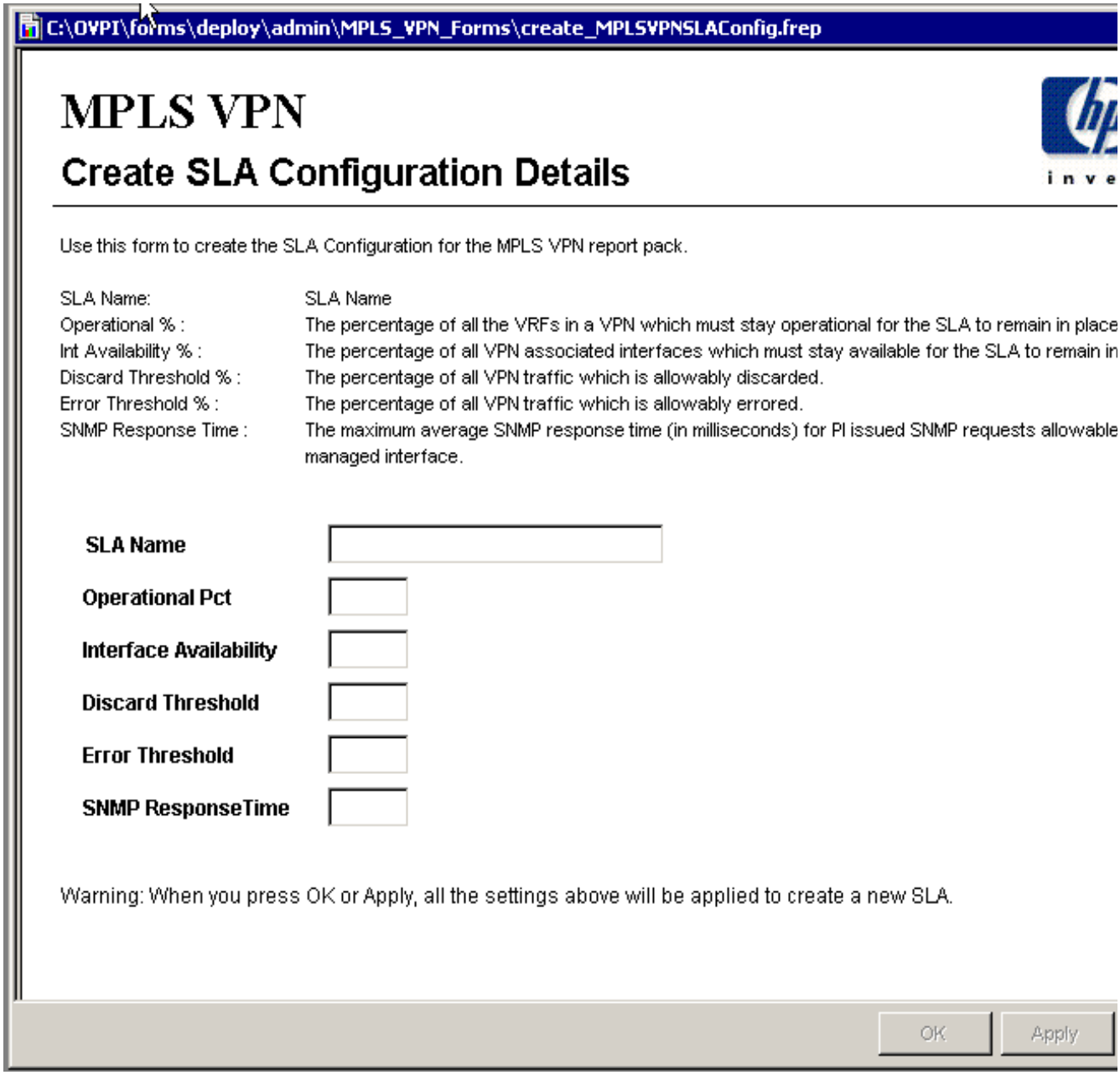
With the MPLS VPN Report Pack, the user can configure thresholds for metrics such as the operational percentage of the VPN, the overall interface availability, and the error percentage of traffic traversing the VPN. If you want to combine these metrics into a single Service Level Agreement (SLA), you have the option of applying the SLA to the entire VPN or to individual VRFs.

Follow these steps to open the form and create MPLS VPN SLA configurations:

1 In the Management Console, click the **Objects** icon.

2 Select **File > New.**

3 Select **Create MPLS VPN SLA** and click **Create**. The form opens.



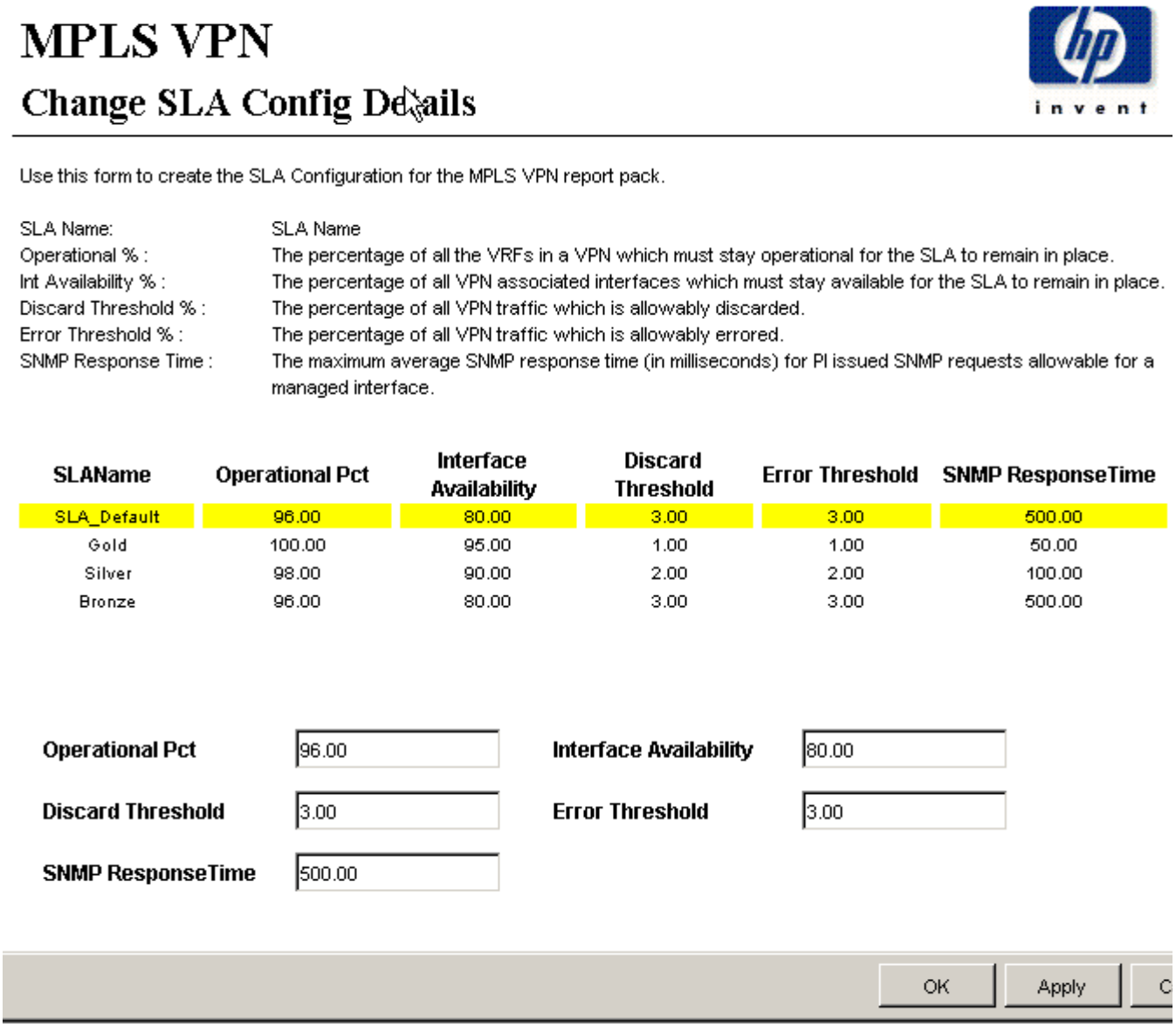
4 Create details about the SLA by adding data to each field.

5 Click **Apply**, then click **OK** to save the changes and close the form.

Change SLA Configuration Details

SLA details do not relate to a managed object directly; they are applied to a managed object. For this reason the Change SLA Configuration Details form always appears in the General Tasks window when any object is selected. Follow these steps to open the form and change SLA Configuration details:

1. In the Management Console, click the **Objects** icon.
2. Select any object in the model.
3. Under General Tasks, double-click **Change SLA Config**.



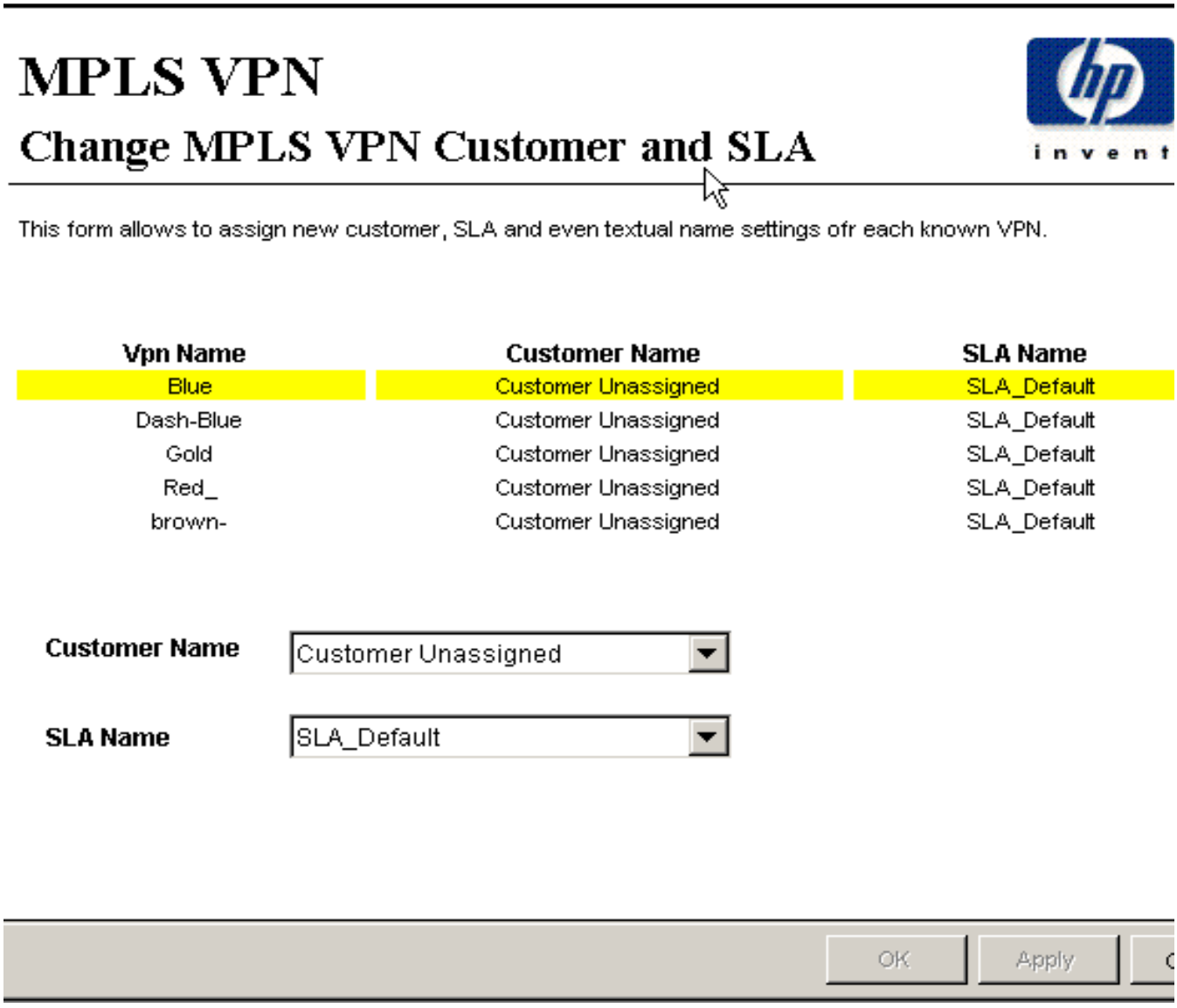
4. Select an existing SLA that you want to change.
5. Modify the values in the editable boxes below.
6. Click **Apply** to save changes, then click **OK** to save the changes and close the form.

Change MPLS VPN Customer and SLA

This change form allows you to modify the customer and SLA assigned to a VPN. Before using this form, you must create customer entries. Create customer entries by using the batch-mode property import that comes with Common Property Tables or the “create new” forms that come with Common Property Tables.

SLAs are created by using the batch-mode property import that comes with the MPLS VPN Report Pack or by using the Create SLA Configuration Details form. Follow these steps to open the form and update the assigned customer and SLA name:

1. In the Management Console, click the **Objects** icon.
2. Select **View** > **Change View**.
3. Select **Mpls Vpn** model from the list.
4. Navigate to the MPLS VPN and select a VPN you want to update.
5. In the list of Object Specific Tasks, double-click **Update VPN Customer and SLA**.



6 Select the VPN you want to change.

7 Change the customer name or the SLA name using the drop-down selection boxes.

8 Click **Apply**, then click **OK** to save the changes and close the form.

Change a VPN Name

Every time a group of VRFs is discovered, a meaningful name is assigned to the group. Name assignment take place according to these rules:

- If the VRF group matches a group stored in the database and a non-default name is already available, continue to use that name. A discovered VRF group matches a stored VRF group when it appears that one or more VRFs exist in both sets.
- If the VRF group has a default name, examine the individual VRF names for each VRF in the group:
  - If each VRF in the list has the same name AND that name IS NOT in use already as a VPN name, assign that text string as the VPN name of this VRF group.
  - If each VRF in the list has the same name AND that name IS in use already as a VPN name, assign that text string as the VPN name and append the VPN Internal ID number to the end of the string, separated by an underscore (_).
- Examine each VRF name in the VRF group. If the first characters of each name match, use the maximum number of initial matching characters as the VPN name, provided that the length of this subset is greater than 3 characters and this name is not in use already.

If you decide to change a system-assigned VPN name, use the Change MPLS VPN Name form. Follow these steps to open the form:

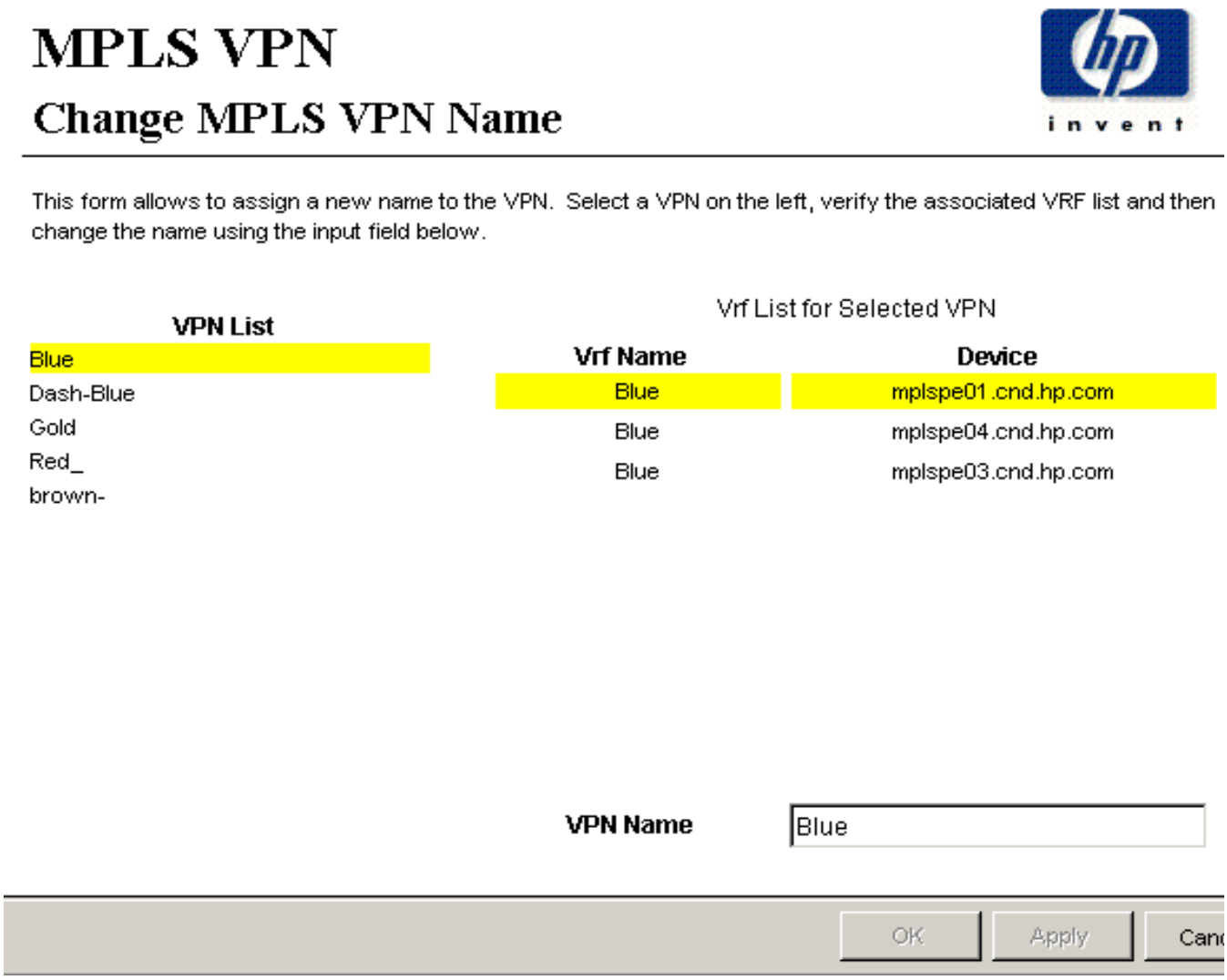
1 In the Management Console, click the **Objects** icon.

2 Select **View > Change View**.

3 Select **Mpls Vpn** model from the list.

4 Navigate to the MPLS VPN and select a VPN you want to update.

5 In the list of Object Specific Tasks, double-click **Change MPLS VPN Name**.



6 Select a VPN, then type the new VPN name in the editable box.

7 Click **Apply**, then click **OK** to save the changes and close the form.

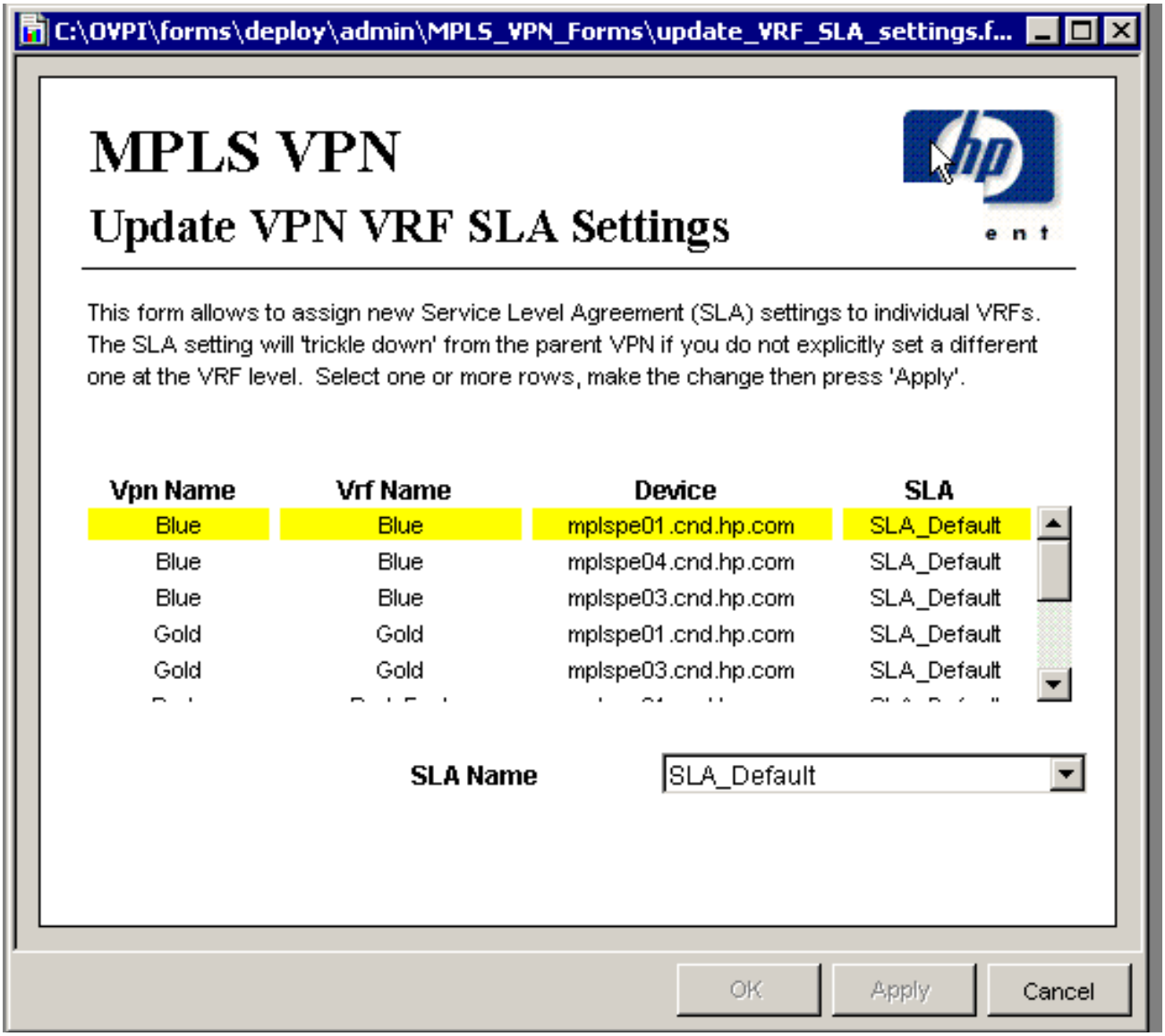
Update VPN VRF SLA Settings

SLAs must be created for the first time by using the property import file described in Appendix A or by using the Create SLA Configuration Details form. Follow these steps to open the update form and assign new SLA settings to the VRF:

1 In the Management Console, click the **Objects** icon.

2 Navigate to the device you want to update and select a specific VRF. (If you want to view all of the VRFs on a device, navigate to the device and select it.)

3 In the list of Object Specific Tasks, double-click **Update VPN VRF SLA Settings.**

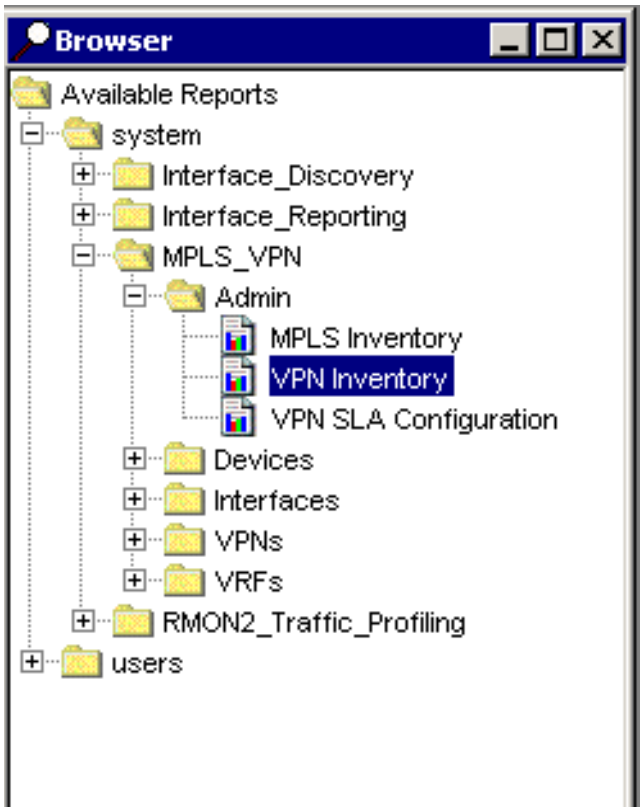


4 Assign a new SLA VPN VRF using the **SLA Name** drop-down selection list.

5 Click **Apply**, then click **OK** to save the changes and close the form.

5 VPN Inventory

The VPN Inventory report functions as a catalog of VPNs as reported by network devices. Use this report to find out which devices and interfaces are being used within a VPN and to see the VPN-specific configuration settings deployed at that time. This report does not contain graphs or analysis of historical performance.



The VPN Inventory report is inside the Admin folder. The other reports in this folder focus on customer- oriented inventory lists, MPLS-enabled interfaces, and VPN SLA settings.

Since the VPN Inventory report is updated once per poll cycle, you can go to this report to find the latest information. Newly discovered VPNs will be noted and representations created in the MPLS VPN Report Pack database tables.

The selection table on the left provides a list of every known VPN. If the VPN has been provisioned with a customer and an SLA setting, that information will show as well. Select a VPN to display a list of VRFs that make up the VPN. In the table on the right you will see the number of associated interfaces, the number of active interfaces, and the SLA setting for each VRF. Select a VRF to display the settings for that VRF and a list of interfaces associated with that VRF.

You can reduce the scope of this report by applying the following constraints:

- VPN
- Customer Name
- Customer ID

MPLS VPN Reporting

VPN Inventory

Select a VPN name on the left and see the component VRFs and the devices they exist on. Each VRF is accompan
detailed configuration information, displayed in the middle of the report, and a list of all associated interfaces for the

VPN List

Name	Customer	Customer Id	SLA
vpn1	Customer 1	1	Gold
vpn3	Customer 2	2	Silver
vpn4	Customer 3	3	Bronze
vpn5	Customer 4	4	Iron
vpn6	Customer 5	5	Tin
vpn7	Customer 6	6	Plastic

Component VRF/Devices

Ordered by Host Device

Location	Host Device	Assoc if.	Active if.
Location Unassigned	mimic1	2	2
Location Unassigned	mimic10	2	2
Location Unassigned	mimic11	2	2
Location Unassigned	mimic12	2	2
Location Unassigned	mimic13	2	2
Location Unassigned	mimic14	2	2
Location Unassigned	mimic15	2	2
Location Unassigned	mimic16	2	2
Location Unassigned	mimic17	2	2
Location Unassigned	mimic18	2	2
Location Unassigned	mimic19	2	2
Location Unassigned	mimic2	2	2
Location Unassigned	mimic20	2	2
Location Unassigned	mimic3	2	2
Location Unassigned	mimic4	2	2
Location Unassigned	mimic5	2	2
Location Unassigned	mimic6	2	2

Current VRF Settings at Last Poll - (mimic1: 0)

Description	OperStatus	# Routes	HighRouteThreshold	MidRouteThreshold	Ro
VPN 1 Description	Up	6	4,294,967,295	4,294,967,295	

Associated Interfaces for mimic1: 0

Interface	Full/Half	ifType	Admin Status	Protocol	Speed
5.0	F	1	Up	other	In: 1.0 Mb/s Out: 1.0 Mb/s

6 Route Activity

The VPN Route Activity Report is in the Devices folder. This report is designed for network operations staff responsible for monitoring route change activity.

This report includes a selection table, a route activity table, a VRF route activity table, and a VRF route activity graph. Tables and graphs are described below.

Table or Graph	**Function**
Selection table	• Every device that supports a VPN • Customer and location (attributes provisioned by the user) • Active VRFs and Connected Interfaces (attributes sourced from the network) • **Max Routes** = aggregate of the maximum routes for all VRFs on the device • **# Routes** = aggregate of actual routes for all VRFs on the device
Route activity table	• Configured VRFs (maximum # during the time period) • Active VRFs (maximum # during the time period) • Shows changes in number of routes • Allow you to compare routing changes to total volume placed on the backbone by this VRF
VRF route activity table	• Actual number of routes per VRF • Maximum number of routes allowed per VRF
VRF route activity graph	• Tracks maximum route count over time • Tracks minimum route count over time • Tracks average route count • **Hourly** = previous 50 hours • **Daily** = previous 50 days

MPLS VPN Reporting

Recent VPN Device Route Activity

Select a device from the list to see related VRF Route information. Angled brackets around any metric signify that it changed values during the most recently summarized hour - the value displayed is an average for the hour. An X to the left of a row signifies that no hourly data is available within the previous 2 hours. Note that Max Routes is an aggregate of the max allowable routes for each VRF on the device.

Devices Supporting VPNs
Sorted by Current Number of Routes

	Device	Cust Id	Customer	Cnfgd Vrfs	Active Vrfs	Cnctd Int	Max Routes	# Routes
	192.168.0.3	8	Backbone	< 6 >	< 5 >	< 6 >		92

System Contact	System Name	System Location	System Descr

Hourly | Daily

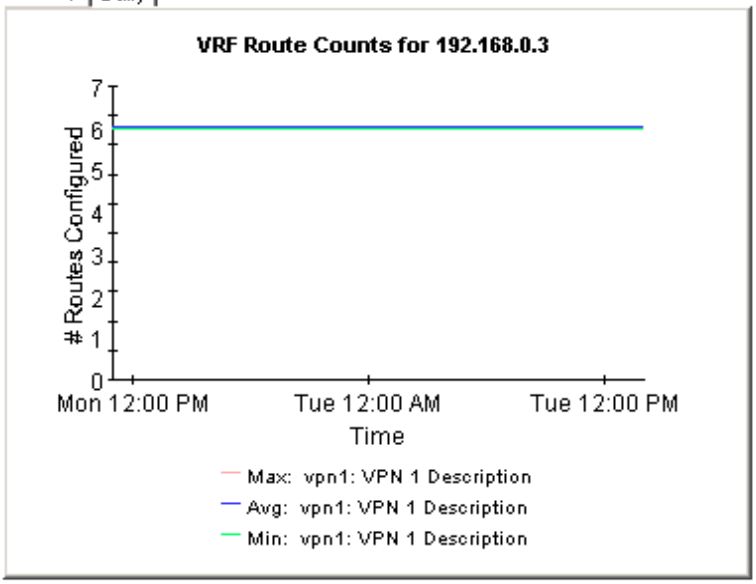
Hourly Route Activity for 192.168.0.3

Time Period	Max VRF Routes	# Routes	Volume Out	Cnfgd Vrfs	Active Vrfs
Tue Sep 17 02:00 PM		92	0 bytes	6	5
Tue Sep 17 01:00 PM		92	0 bytes	5	5
Tue Sep 17 12:00 PM		92	0 bytes	5	5
Tue Sep 17 11:00 AM		92	0 bytes	5	5
Tue Sep 17 10:00 AM		92	0 bytes	5	5
Mon Sep 16 08:00 PM		92	0 bytes	5	5
Mon Sep 16 07:00 PM		92	0 bytes	5	5
Mon Sep 16 06:00 PM		92	0 bytes	5	5
Mon Sep 16 05:00 PM		92	0 bytes	5	5
Mon Sep 16 04:00 PM		92	0 bytes	5	5

VRF Route Activity

Vrf Name	# Routes	Max Allowable
vpn1	6	
vpn3	86	
vpn4	0	
vpn5	0	
vpn6	0	
vpn7	0	

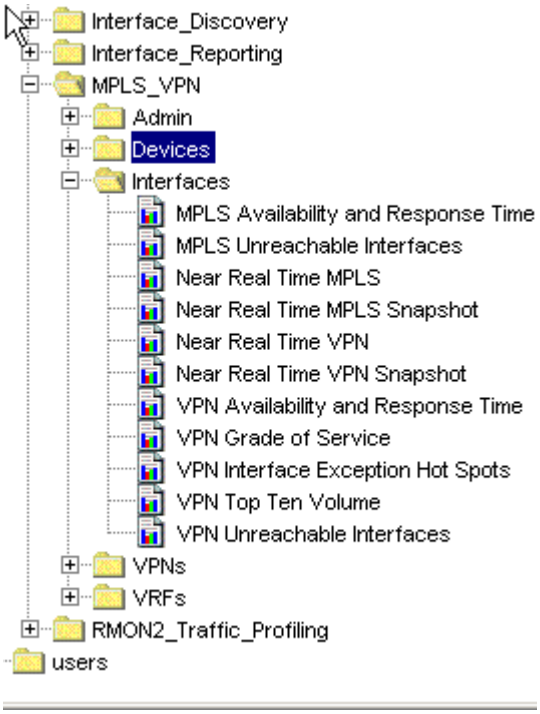
Hourly | Daily



7 Unreachable VPN Interfaces

The reports in the Interfaces folder focus on MPLS-enabled and VPN-associated interfaces. While similar to the interface-specific reports in the Interface Reporting Report Pack, these reports offer additional MPLS or VPN related attributes on a per-interface basis.

The MPLS Unreachable Interfaces report contains a list of interfaces that have not been polled within the previous 35 minutes. Use this report to troubleshoot faulty devices and network connections.



You can reduce the scope of this report by applying the following constraints:

- Device: device name or IP address
- Interface: unique identifier for the interface
- Protocol: name of protocol (enumeration of ifType)
- Customer: name of customer associated with the interface. An interface will inherit the customer details of the parent device if none are explicitly specified.
- Location: name of the location associated with the interface. An interface will inherit the location details of the parent device if none are explicitly specified.
- Full or Half: duplex configuration of the interface - full duplex (2) or half duplex (1).
- MinutesSincePoll: number of minutes since the beginning of the last completed poll cycle.

By default, the system will poll on a 15 minute cycle. The default value for *MinutesSincePoll* is 35 minutes. This value for the default accommodates interfaces that missed one poll cycle. If you increase the value for *MinutesSincePoll*, only the interfaces that have been out of reach for the duration you indicate will display in the report.

MPLS VPN Reporting

Unreachable MPLS Enabled Interfaces

The Unreachable MPLS Associated Interfaces report lists the time since the last successful poll for interfaces for which data had been received recently but not within the previous 35 minutes. To change the limit from 35 minutes simply change the run time parameter value.

MPLS Enabled Interfaces

Previously Active Interfaces Which may now be Unreachable

Device	Interface	ifAdminStatus	location_name	F/H	Protocol	Speed	Min. Since Poll
12.168.0.3	Ethernet1/2	Up	Location Unassigned	F	other	In: 1.0 Mb/s Out: 1.0 Mb/s	22
12.168.0.3	Ethernet1/3	Up	Location Unassigned	F	other	In: 10.0 Mb/s Out: 10.0 Mb/s	22

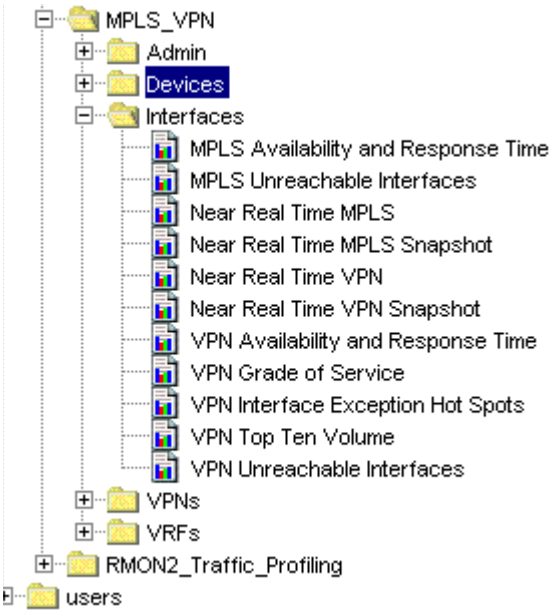
8 VPN Interface Exception Hot Spots

The VPN Interface Exception Hot Spots lets you spot interfaces with high exception counts. The report provides a list of all the VPN-associated interfaces that breached one or more of the following thresholds:

- Threshold for percent of packets discarded
- Threshold for percent of packets with errors
- Threshold for excessive utilization

The selection table shows data from yesterday and ranks interfaces by number of exceptions, highest to lowest. The graphs below the selection table allow you to investigate discards, errors, and utilization in much more details. Selecting an interface populates the following graphs:

- Hourly exception count
- Daily exception count
- Monthly exception count
- Utilization (throughout yesterday)
- Errors (throughout yesterday)
- Discards (throughout yesterday)
- Utilization (inbound/outbound/both)
- Errors (inbound/outbound/both)
- Discards (inbound/outbound/both)



You can reduce the scope of this report by applying the following constraints:

- Device - The device name or IP address
- Interface - The unique identifier for the interface
- Protocol - The protocol name (enumeration of ifType)
- Customer - The customer name associated with the interface.
- Location - The location name associated with the interface.
- Full or Half - The duplex configuration of the interface - full duplex (2) or half duplex (1).

MPLS VPN Reporting

VPN Interface Exception Hot Spots

This report has one entry for each monitored VPN associated interface on the network which experienced threshold exceptions yesterday. An exception occurs when inbound or outbound utilization, % discard rate or % error rate exceeds the threshold set for that interface. F/H = Full or Half Duplex. U = Utilization, D = Discards, E = Error.

VPN Associated Interfaces with Exceptions Yesterday

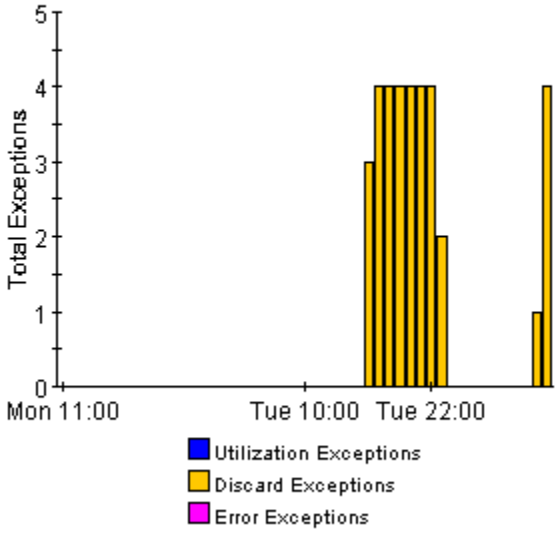
Sorted by Exception Count

Device	Interface	TextVrfName	Customer	F/H	Speed	Total Exceptions	Thresholds %
192.168.0.3	Ethernet1/3	vpn4	Customer 4	F	In: 10.0 Mb/s Out: 10.0 Mb/s	In:0 Out:29	U:90 D:1 E:1
192.168.0.3	Ethernet1/1	vpn3	Customer 3	F	In: 1.0 Mb/s Out: 1.0 Mb/s	In:11 Out:0	U:90 D:1 E:1
192.168.0.3	Ethernet1/2	vpn1	Customer 1	F	In: 1.0 Mb/s Out: 1.0 Mb/s	In:2 Out:0	U:90 D:1 E:1

Interface Details	Edge Type	Protocol	Group	Location	Country
Ethernet1/3	Provider	other	Unknown Group	Belfast, NI	Unknown Country

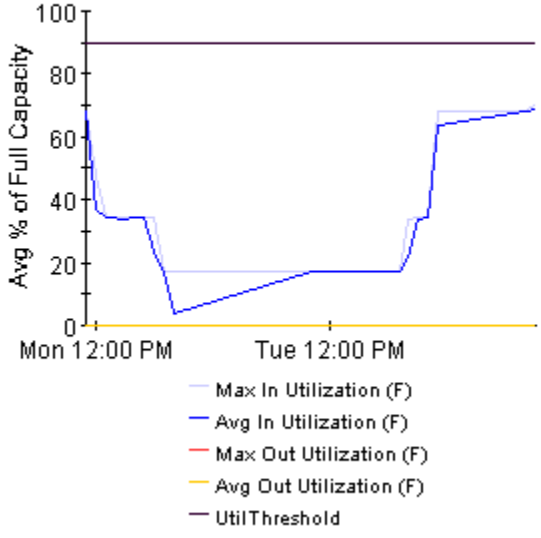
Hourly | Daily | Monthly

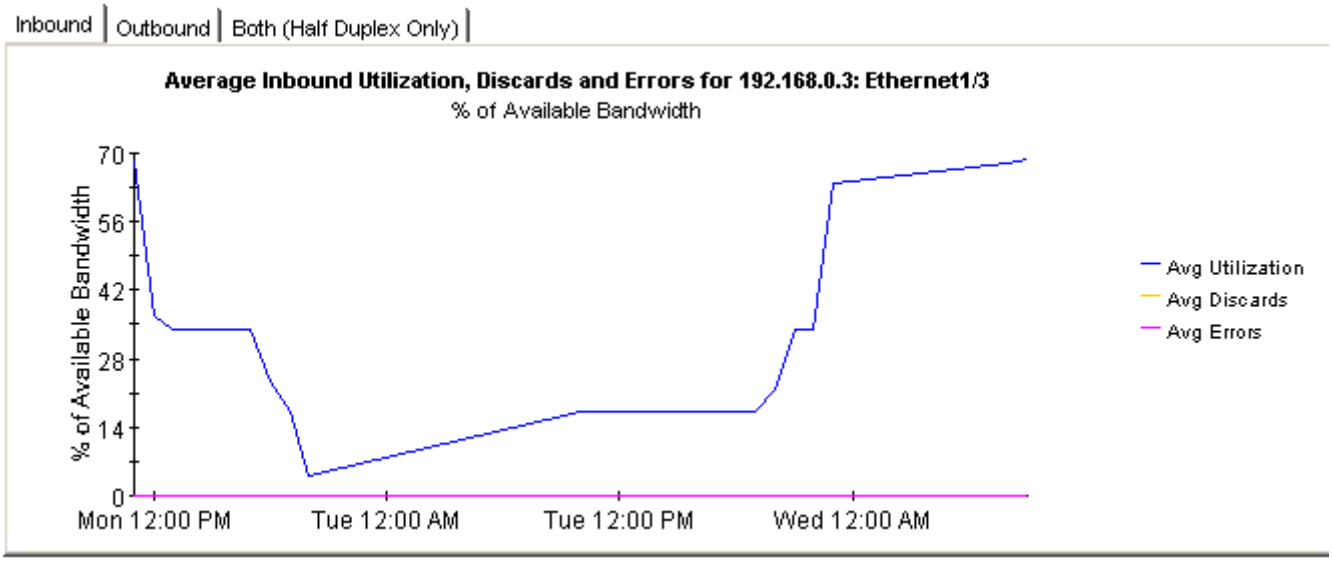
Exception Counts for 192.168.0.3: Ethernet1/3



Utilization | Discards | Errors

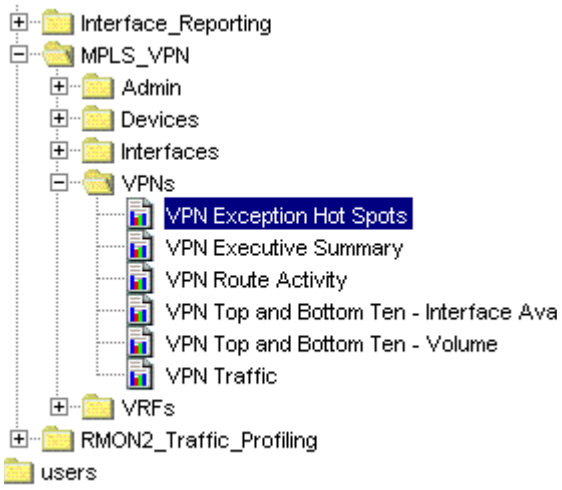
Utilization for 192.168.0.3: Ethernet1/3




Inbound
Outbound
Both (Half Duplex Only)
Average Inbound Utilization, Discards and Errors for 192.168.0.3: Ethernet1/3
% of Available Bandwidth
% of Available Bandwidth
70
56
42
28
14
0
Mon 12:00 PM
Tue 12:00 AM
Tue 12:00 PM
Wed 12:00 AM
Avg Utilization
Avg Discards
Avg Errors

9 VPN Traffic Volume

The reports in the VPNs folder focus on the entire VPN. All VRFs with the same VPN name are considered part of a single VPN, and it is their *aggregated* statistics that are presented here. Since all data in each report is aggregated data, the reports in this folder may be more suitable for managers than staff responsible for network operations.



The VPN Traffic Volume report ranks VPNS by traffic volume. If you select a VPN, you can see statistics for hourly traffic volume and daily traffic volume, and you can also inspect traffic volume on a per-VRF basis. At the VRF level, you can see how the traffic volume has changed on an hourly and daily basis.

The **VRF Oper%** column in the selection table shows the average operational percentage of all the component VRFs within the VPN. A VRF is considered operational if one or more of the interfaces associated with it are operationally up. This is regardless of the total number of interfaces associated with it.

The selection table also shows the number of utilization, discard, and error exceptions generated at the interface level, in response to thresholds configured at the interface level. The exception count in this table is an aggregate figure representing all the interfaces associated with the VPN.

You can reduce the scope of this report by applying the following constraints:

- Device - device name or IP address.
- Customer_Name - customer name associated with the VPN.

  All interfaces associated with a VPN will inherit the customer details of the parent, if it not explicitly specified as something else.

- Cust_ID - numeric identifier for this customer.
- VPN - textual name for this VPN.

MPLS VPN Reporting

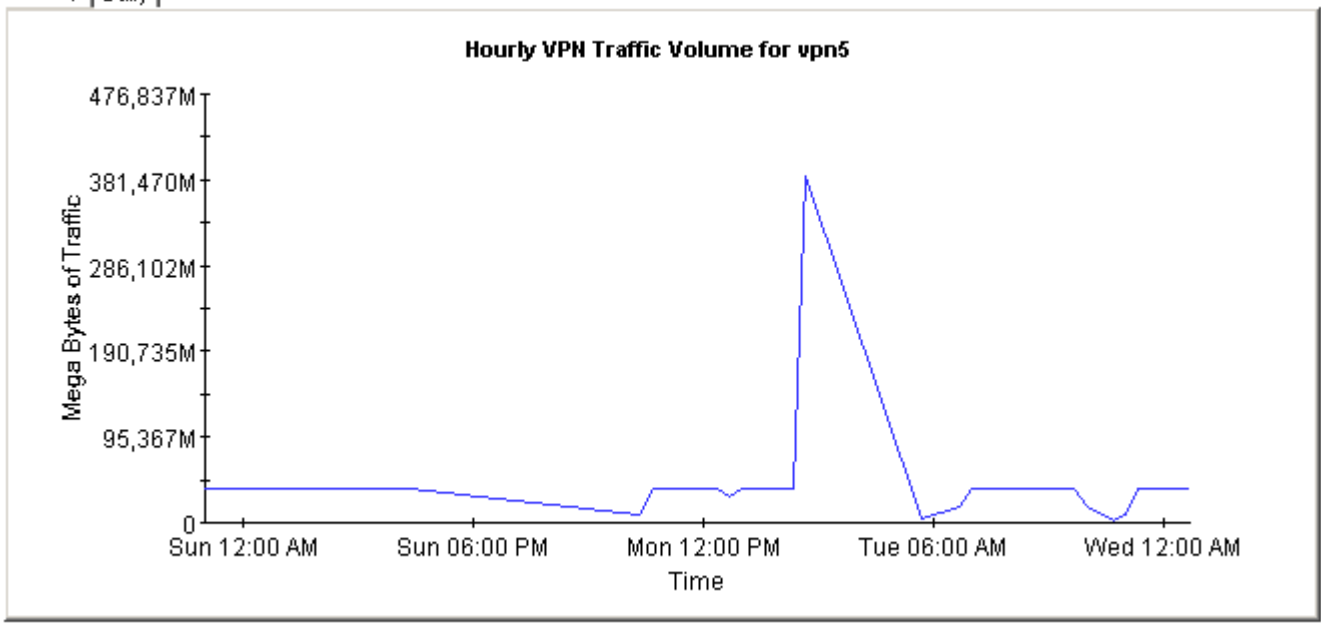
VPN Traffic Volume

This report displays total traffic counts across a VPN. Only outgoing traffic from PE side devices are included in the VPN total. VRF Oper % represents the combined percentage availability for yesterday for all VRFs associated with the VPN. Exception counts are separated into Utilization, Discard and Error groups.

VPNs With Traffic Yesterday

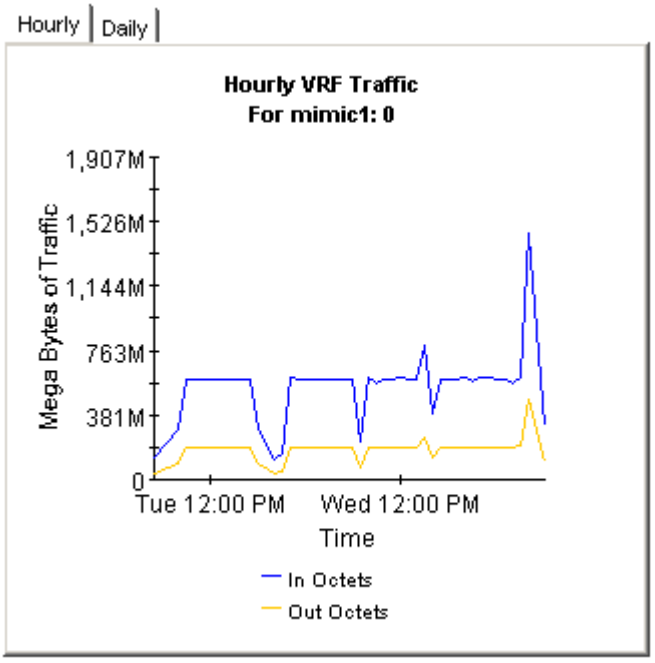
Vpn Name	Customer	Associated Int	Active if.	VRF Oper %	Volume	Exceptions
vpn5	Customer Unassigned	199	199	0.000	814.2 GB	U:0 D: E:
vpn1	Customer Unassigned	398	398	100.000	485.5 GB	U:9256 D:35342 E:0
vpn4	Customer Unassigned	199	0	100.000	294.2 GB	U:9256 D:17671 E:0
vpn6	Customer Unassigned	199	199	100.000	294.2 GB	U:0 D: E:
vpn7	Customer Unassigned	398	199	100.000	220.7 GB	U:0 D: E:
vpn3	Customer Unassigned	1,990	1,393	0.000	2.9 GB	U:17671 D:0 E:0

Hourly | Daily



VRF Volume

Device	Description	In	Out
mimic1	VPN 5 Description	13.1 GB	4.2 GB
mimic2	VPN 5 Description	13.1 GB	4.2 GB
mimic3	VPN 5 Description	13.1 GB	4.2 GB
mimic4	VPN 5 Description	13.1 GB	4.2 GB
mimic5	VPN 5 Description	13.1 GB	4.2 GB
mimic6	VPN 5 Description	13.1 GB	4.2 GB
mimic7	VPN 5 Description	13.1 GB	4.2 GB
mimic8	VPN 5 Description	13.1 GB	4.2 GB
mimic9	VPN 5 Description	13.1 GB	4.2 GB
mimic10	VPN 5 Description	13.1 GB	4.2 GB
mimic11	VPN 5 Description	13.1 GB	4.2 GB
mimic12	VPN 5 Description	13.1 GB	4.2 GB
mimic13	VPN 5 Description	13.1 GB	4.2 GB
mimic14	VPN 5 Description	13.1 GB	4.2 GB
mimic15	VPN 5 Description	13.1 GB	4.2 GB
mimic16	VPN 5 Description	13.1 GB	4.2 GB
mimic17	VPN 5 Description	13.1 GB	4.2 GB
mimic18	VPN 5 Description	13.1 GB	4.2 GB



10 Current VRF Operational Status

The Current VRF Operational Status report displays the operational status of all known VRFs. Each metric is updated after every poll cycle. A VRF is considered operational if one or more of the interfaces associated with it is currently operationally up.

The Current OperStatus report is one of four reports in the VRFs folder. The reports in this folder focus on individual VRFs. A VRF is an instance of a VPN on a device. All VRFs with the same VPN name are considered part of a single VPN. Due to the real time nature of this report, it is suitable for use by network operations staff.

You can reduce the scope of this report by applying the following constraints:

- Device - device name or IP address.
- VPN Name - textual name for this VPN.
- SLA Name - textual Service Level Agreement name for this VRF.

MPLS VPN Reporting

Current VRF Operational Status

This report presents the operational status of each VRF at the time of the last successful poll. The VRF OperStatus is based on the mplsVpnVrfOperationalStatus MIB variable. A VRF is 'up' (1) when at least one interface associated with the VRF has an ifOperStatus of 'up' (1). A VRF is 'Down' (2) if there are no interfaces associated with it, or none of the associated interfaces have an ifOperStatus of 'up' (1). The report does not include those VPN VRFs which are currently unreachable but may be operationally down.

Current VRF Operational Status
As of Last Poll Cycle

Host Device	Name	Description	OperStatus	Active if.	SLA Name
Internet_Device	atime	Unknown	Down	0	SLA_Default
192.168.0.3	vpn5	VPN 5 Description	Down	1	SLA_Default
mimic1	vpn5	VPN 5 Description	Down	1	SLA_Default
mimic2	vpn5	VPN 5 Description	Down	1	SLA_Default
mimic3	vpn5	VPN 5 Description	Down	1	SLA_Default
192.168.0.3	vpn3	VPN 3 Description	Unknown: 0	7	SLA_Default
mimic1	vpn3	VPN 3 Description	Unknown: 0	7	SLA_Default
mimic2	vpn3	VPN 3 Description	Unknown: 0	7	SLA_Default
mimic3	vpn3	VPN 3 Description	Unknown: 0	7	SLA_Default
192.168.0.3	vpn1	VPN 1 Description	Up	2	SLA_Default
mimic1	vpn1	VPN 1 Description	Up	2	SLA_Default
mimic2	vpn1	VPN 1 Description	Up	2	SLA_Default
mimic3	vpn1	VPN 1 Description	Up	2	SLA_Default
192.168.0.3	vpn4	VPN 4 Description	Up	0	SLA_Default
mimic1	vpn4	VPN 4 Description	Up	0	SLA_Default
mimic2	vpn4	VPN 4 Description	Up	0	SLA_Default
mimic3	vpn4	VPN 4 Description	Up	0	SLA_Default
192.168.0.3	vpn6	VPN 6 Description	Up	1	SLA_Default
mimic1	vpn6	VPN 6 Description	Up	1	SLA_Default
mimic2	vpn6	VPN 6 Description	Up	1	SLA_Default
mimic3	vpn6	VPN 6 Description	Up	1	SLA_Default
192.168.0.3	vpn7	VPN 7 Description	Up	1	SLA_Default
mimic1	vpn7	VPN 7 Description	Up	1	SLA_Default
mimic2	vpn7	VPN 7 Description	Up	1	SLA_Default
mimic3	vpn7	VPN 7 Description	Up	1	SLA_Default

A Version History

Version	Release Date	Features/Enhancements
1.0	May 2003	27 reports Directed-instance polling support Interface re-indexing support MPLS VPN Datapipe 1.0
2.0	October 2003	*new features:* • OVPI Object Manager support • MPLS VPN Datapipe 2.0 *new forms:* • Create SLA Config Details • Change SLA Config Details • Change MPLS VPN Name • Change MPLS VPN Customer & SLA • Update VPN & VRF SLA Settings
3.0	April 2004	*new features:* • OVPI 5.0 support • Oracle support • MPLS VPN Datapipe 3.0
3.0	August 2004	Upgrade package (to_3.0)
3.0	November 2004	*new datapipe:* • Juniper MPLS VPN Datapipe 1.0 *new version of existing datapipe:* • MPLS VPN Datapipe 3.1
3.0	May 2006	*datapipe defect fixes:* • Juniper MPLS VPN Datapipe 1.1 — QXCR1000293259 • MPLS VPN Datapipe 3.2 — QXCR1000308165 — QXCR1000290932

Version	Release Date	Features/Enhancements
3.10	April 2007	*new features:* • Location Independent Reporting (LIR) • Copy Policies • Top level table of NRT reports no longer shows rate data • Object delete *new versions of existing datapipes:* • Juniper MPLS VPN Datapipe 1.2 • MPLS VPN Datapipe 3.3 *new upgrade package:* • UPGRADE_MPLS_VPN_to_31 *defect fixes:* • QXCR1000353578 • QXCR1000385632
3.20	October 2007	*new feature:* • Copy Policy Enhancement *new upgrade package:* • UPGRADE_MPLS_VPN_to_32 *defect fixe:* • QXCR1000441897: MPLS_VPN: length of dsi_table_key column is too small to accomodate VRF+IF NAME.

B Manual Provisioning

This appendix covers the following topics:

- Managed elements and their associated properties
- Provisioning interfaces
- Provisioning devices
- Provisioning VRFs
- Provisioning VPNs
- Provisioning SLAs

Elements and Properties

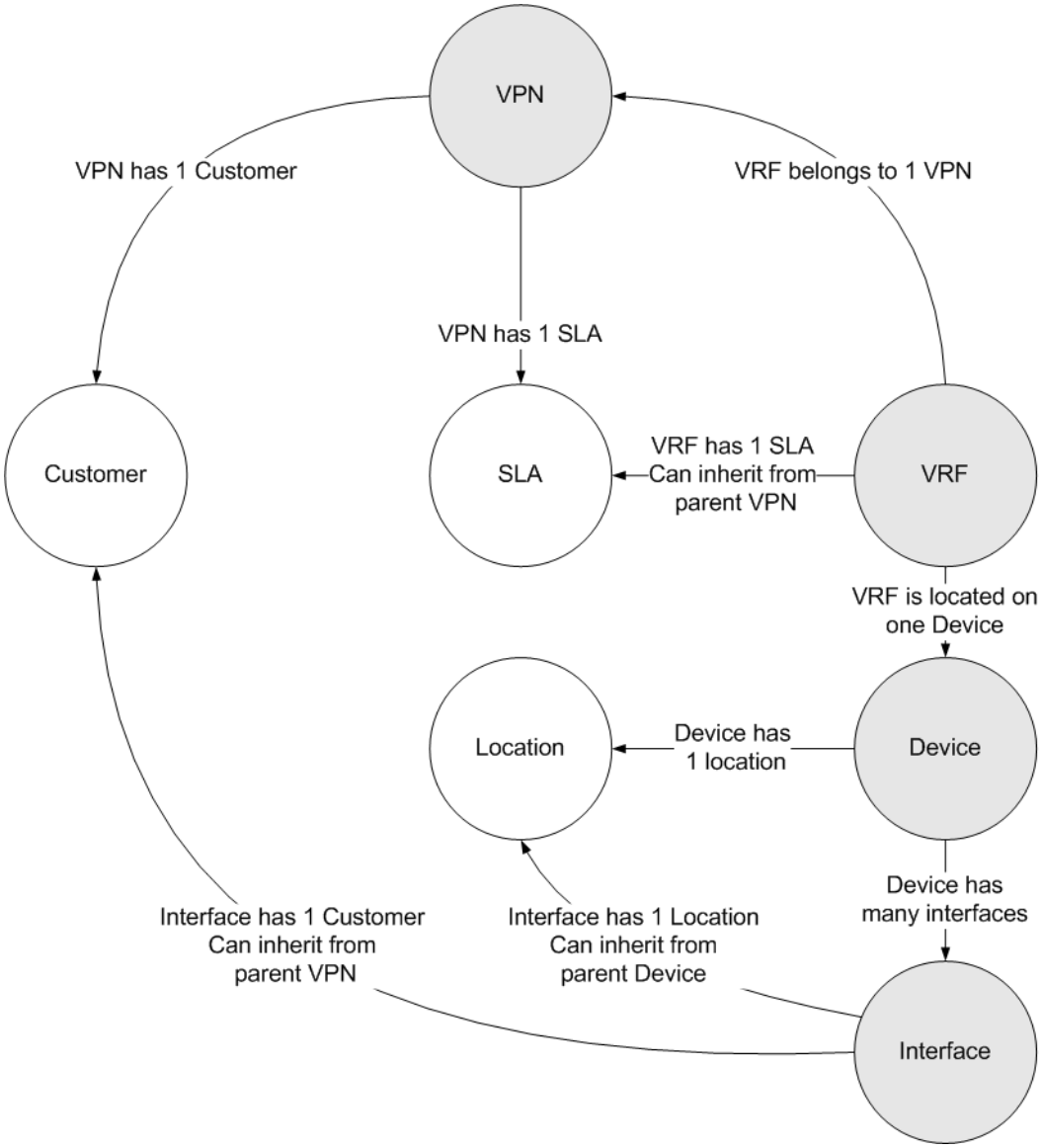
The MPLS VPN Report Pack represents the network as a collection of managed elements. The managed elements are:

- VPN
- VRF
- SLA
- Interface (MPLS-enabled or VPN-associated)
- Device

The following table shows the properties associated with each managed element.

Managed Element	**Associated Properties**
VPN	Customer Customer ID SLA
VRF	SLA
SLA	Operational% Interface availability Discard threshold
Interface	See *Interface Reporting Report Pack 4.6 User Guide*
Device	See *Common Property Tables 3.5 User Guide*

The following diagram shows the relationship between managed elements and their associated properties.



When an attribute can be sourced from the network, or inherited from an existing report pack, OVPI will provision the managed element automatically. When the attribute cannot be provisioned automatically, it must be provisioned manually. Managed elements introduced by the MPLS VPN Report Pack must be provisioned manually.

There are two ways to manually provision a managed element:

- Use one of the change forms that comes with the MPLS VPN Report Pack
- Create a property file and import the contents

If you choose to provision a managed element using a property import file, you have to create the property import file and store the file where OVPI expects to find it. There are several ways to create a property file:

- Create it yourself from scratch using a spreadsheet application
- Export the contents of the file from you own provisioning database

- Export existing property data from OVPI

Since exporting existing property data from OVPI produces a file with the proper format, we recommend using the third approach. If you create your own file, the sequence of attributes in your file must be correct and columns must be separated by tabs.

Provisioning Interfaces

Interfaces are fundamental to the MPLS VPN Report Pack. Provisioning interfaces is handled through the Interface Reporting Report Pack. As explained in the user guide for Interface Reporting, you may import many attributes, including customer and location, on a per-interface basis.

Keep these guidelines in mind when provisioning interfaces:

- Unless you are concerned that the network will misrepresent certain interface metrics, such as ifSpeed, importing custom attributes on a per-interface basis is not necessary.
- If the device has customer and location assigned to it, the interfaces on this device will inherit customer and location from the device. You may change these attributes later.
- Information indicating whether an interface is MPLS-enabled or VPN-associated is sourced from the network; these attributes cannot be manually provisioned.
- When provisioning a VPN, which has associated VRFs which in turn have associated interfaces, each interface will inherit the customer assigned to the VPN.

Provisioning Devices

Each interface in the network is physically attached to a device. The device can be referenced by name or by IP address. Since each VRF exists only on a single device, there is a relationship between VRF properties and device properties.

Property data for devices is created and maintained using the import/export utility that comes with Common Property Tables. For more information about assigning property information to devices, refer to the *Common Property Tables 3.5 User Guide*.

Provisioning VRFs

Every VRF has a relationship with:

- The VPN to which it belongs
- The device on which it exists
- The SLA setting to which it should adhere

Since the relationship with the VPN and the relationship with the device are maintained using data sourced from the network, there is no need to create or modify these custom attributes. The SLA setting, however, is configurable by the user.

SLA values can be associated with a VRF in one of two ways:

- The parent VPN is assigned an SLA setting, in which case all related VRFs will be allocated the same SLA.
- The user explicitly imports a specific SLA for one or more VRFs.

If the parent VPN is assigned an SLA setting, then all related VRFs will be allocated the same SLA. Follow these steps to import a specific SLA for one or more VRFs:

- Create a property file
- Name the file VRF_Property.dat
- Call the import mechanism for VRFs

The following table describes the format of the file.

Attribute	Type	Default	Comments
VPN Name	char_string,64	required field	The textual name of the VPN to which the VRF belongs.
Device Name	char_string,64	required field	The unique reference for this device, either IP address or host name.
VRF Name	char_string,64	required field	The name of the VRF to which other property values have to be updated.
SLA Name	char_string,64	required field	The unique reference for the SLA associated with the VRF.

File Import and Export

There are two ways to import the file:

- Navigate to OVPI/data/PropertyData/MPLS_VPN and type:

  trend_proc -f VRF_importdata.pro

- Execute the perl script by the same name in the same directory.

There are two ways to export the file from OVPI:

- Navigate to OVPI/data/PropertyData/MPLS_VPN and type:

  trend_proc -f VRF_exportdata.pro

- Execute the perl script by the same name in the same directory.

After your file is imported, OVPI will store the file in this directory:

OVPI/data/PropertyData/Archive

Notes

1. Reference to an SLA that does not yet exist will create a new SLA with defaulted values. To avoid this situation, you should create any required SLAs, with correct threshold values, ahead of time using the SLA import/export procedure.
2. Importing the VRF property file logs messages to the Configuration and Logging Report. This report is located in the Admin folder of Interface Reporting.

Provisioning VPNs

Every VPN has an external relationship with:

- The customer to which it belongs
- The SLA configuration to which it should adhere

VPN names will always be created using network sourced values, however in this case the customer and SLA settings will be defaulted. Follow these steps to assign a customer and/or SLA to a VPN, or provision new, not yet monitored VPNs:

- Create a property import file
- Name the file VPN_Property.dat
- Call the import mechanism for VPNs

The following table describes the format of the file.

Attribute	Type	Default	Comments
VPN Name	char_string,64	required field	The textual name of the VPN to which the VRF belongs.
Customer ID	integer	-2	The unique reference for the customer associated with this VPN.
Customer Name	char_string,64	“customer unassigned”	The textual name for the customer associated with this VPN.
SLA Name	char_string,64	required field	The unique reference for the SLA associated with the VRF.

File Import and Export

There are two ways to import the file:

- Navigate to `OVPI/data/PropertyData/MPLS_VPN` and type:

  trend_proc -f VPN_importdata.pro

- Execute the perl script by the same name in the same directory.

There are two ways to export the file from OVPI:

- Navigate to `OVPI/data/PropertyData/MPLS_VPN` and type:

  trend_proc -f VPN_exportdata.pro

- Execute the perl script by the same name in the same directory.

After your file is imported, OVPI will store the file in this directory:

OVPI/data/PropertyData/Archive

Notes

1 Although the customer attribute is stored and managed by Common Property Tables, references to a customer ID or customer name in this file are handled as follows:

- If the customer ID matches an existing customer ID, then the reference will be honoured and the customer name supplied in the file will be ignored.
- If the customer ID does not match any customer ID in the customer tables, then a new customer with the basic properties of name and ID will be created.

2 If a new customer is created, other customer properties will be defaulted. Although this approach to creating new customers is valid, we recommend that you create customer entries ahead of time, using the import utility that comes with Common Property Tables.

3 Reference to an SLA that does not exist yet will create a new SLA with defaulted values. To avoid this situation, create any required SLAs, with correct threshold values, ahead of time using the SLA import/export procedure.

4 Importing the VPN property file logs messages to the Configuration and Logging Report. This report is located in the Admin folder of Interface Reporting.

Provisioning SLAs

Each Service Level Agreement (SLA) has a name and five associated properties:

- Operational percentage
- Interface availability
- Discard threshold
- Error threshold
- SNMP response time

All VPNs and VRFs will be created with an SLA setting of *SLA_Default* until you modify it to your own preferences. To create a new SLA you can:

- Reference a new SLA name in the VPN or VRF import file
- Import a set of SLAs using the SLA import procedure

If you reference a non-existing SLA in another import file, then a new SLA will be created with the specified name but with defaulted column values. Follow these steps to modify an existing SLA, or create a new SLA, using the import procedure:

- Create a property import file.
- Name the file: `SLAConfig_Property.dat`
- Call the import mechanism for SLAs.

The following table describes the format of the file.

Attribute	**Type**	**Default**	**Comments**
SLA Name	char_string,64	required field	The textual name of the SLA.
Operational%	integer	99	The percentage of time that, combined and averaged over the time period, the VRFs of the VPN must be operational.

Attribute	Type	Default	Comments
Interface Availability	integer	99	The percentage of time that, combined and averaged over the time period, the interfaces of the VPN or VRF must be available.
Discard Threshold	integer	1	The maximum percentage of traffic, when averaged over the time period, that may be discarded.
Error Threshold	integer	1	The maximum percentage of packets, when averaged over the time period, that may be errored.
SNMP Response Time	integer	200	The maximum SNMP response time allowed across all interfaces.

File Import and Export

There are two ways to import the file:

- Navigate to `OVPI/data/PropertyData/MPLS_VPN` and type:

  trend_proc -f SLAConfig_mportdata.pro

- Execute the perl script by the same name in the same directory.

There are two ways to export the file from OVPI:

- Navigate to `OVPI/data/PropertyData/MPLS_VPN` and type:

  trend_proc -f SLAConfig_exportdata.pro

- Execute the perl script by the same name in the same directory.

After your file is imported, OVPI will store the file in this directory:

OVPI/data/PropertyData/Archive

Notes

1 Importing the SLA property file logs messages to the Configuration and Logging Report. This report is located in the Admin folder of Interface Reporting.

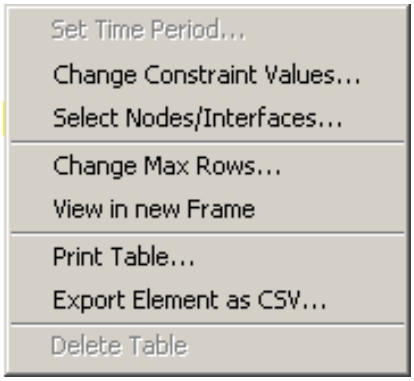
C Editing Tables and Graphs

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

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

View Options for Tables

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



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

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

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

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

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

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

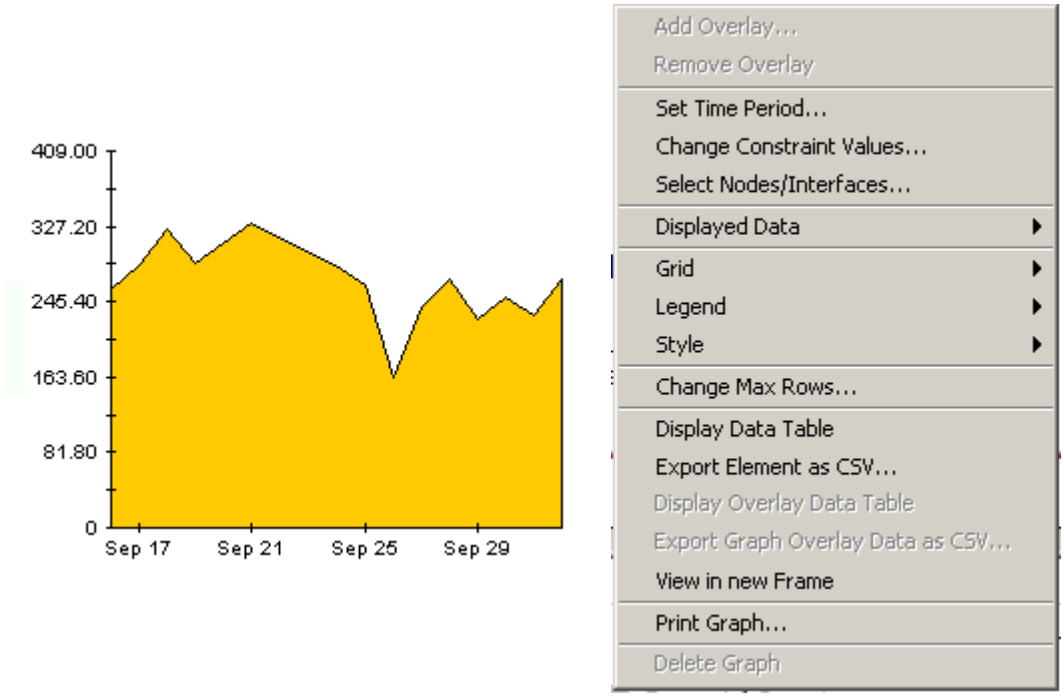
Table Viewer

Polled IP QoS Statistics Data - Input
Over Previous 6 Hours

Direction	IpPrecedence	Switched Bytes	Switched Pkts	Time Period
Input	0	105,688	675	Tue Oct 29 07:00 AM
Input	1	0	0	Tue Oct 29 07:00 AM
Input	2	0	0	Tue Oct 29 07:00 AM
Input	3	0	0	Tue Oct 29 07:00 AM
Input	4	0	0	Tue Oct 29 07:00 AM
Input	5	0	0	Tue Oct 29 07:00 AM
Input	6	600	5	Tue Oct 29 07:00 AM
Input	7	0	0	Tue Oct 29 07:00 AM
Input	0	98,334	638	Tue Oct 29 06:45 AM
Input	1	0	0	Tue Oct 29 06:45 AM
Input	2	0	0	Tue Oct 29 06:45 AM
Input	3	0	0	Tue Oct 29 06:45 AM
Input	4	0	0	Tue Oct 29 06:45 AM

View Options for Graphs

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

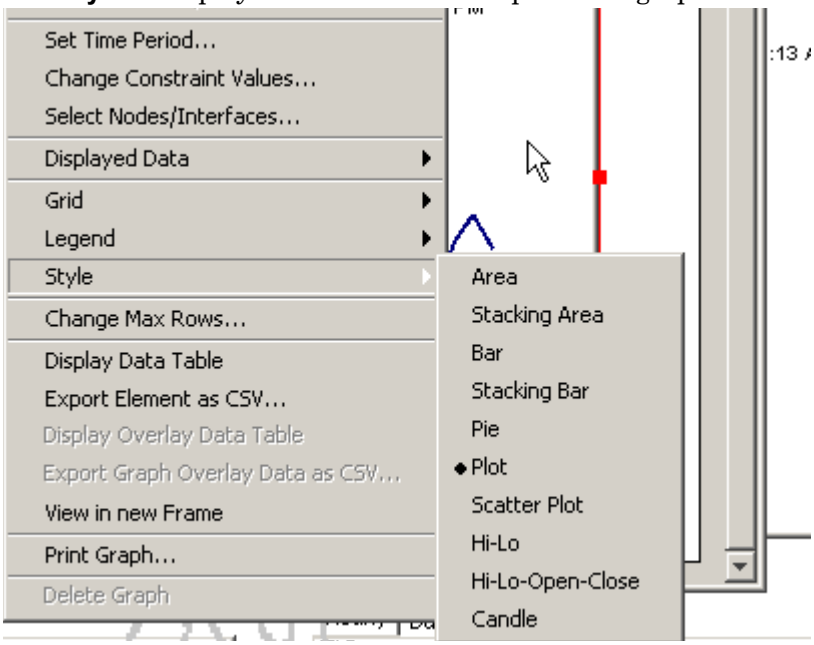


The following table provides details about each option.

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

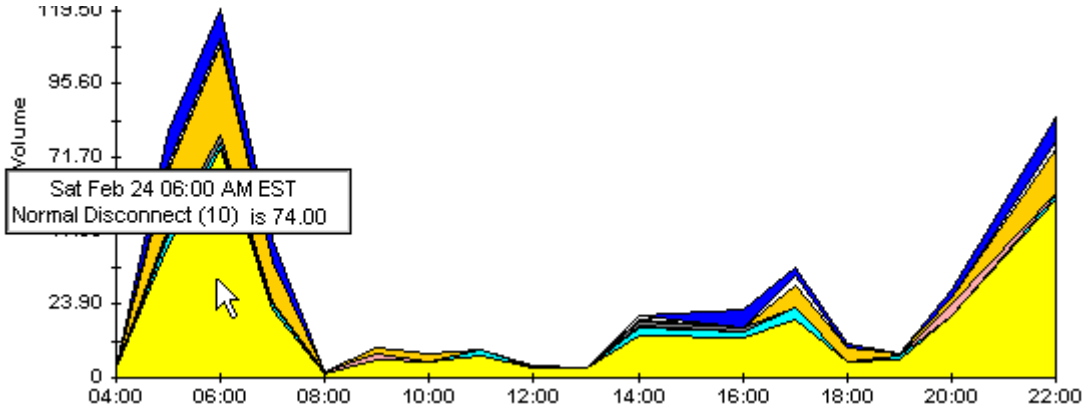
Style Options

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



Style > Area

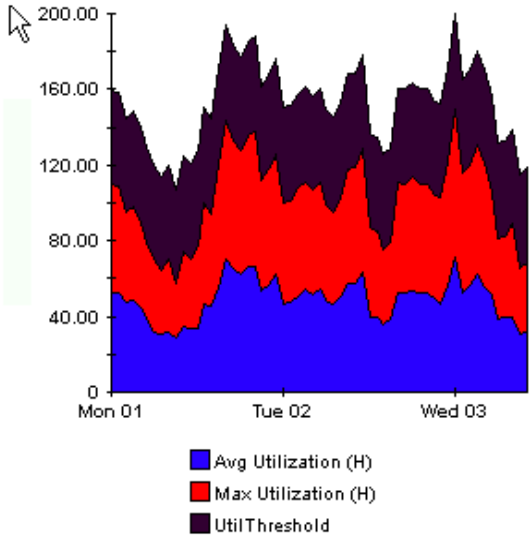
The plot or bar chart changes to an area graph. While relative values and total values are easy to view in this format, absolute values for smaller data types may be hard to see. Click anywhere within a band of color to display the exact value for that location



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

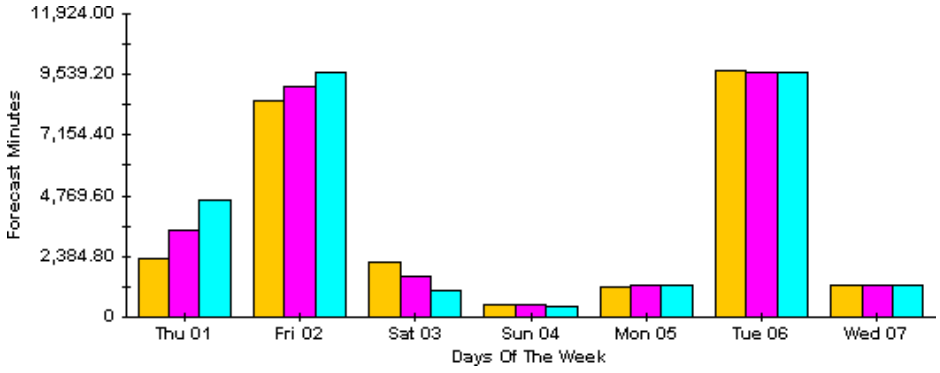
Style > Stacking Area

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



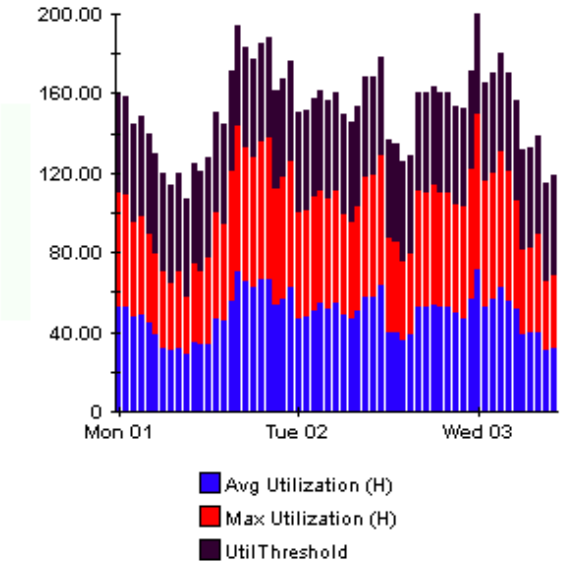
Style > Bar

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



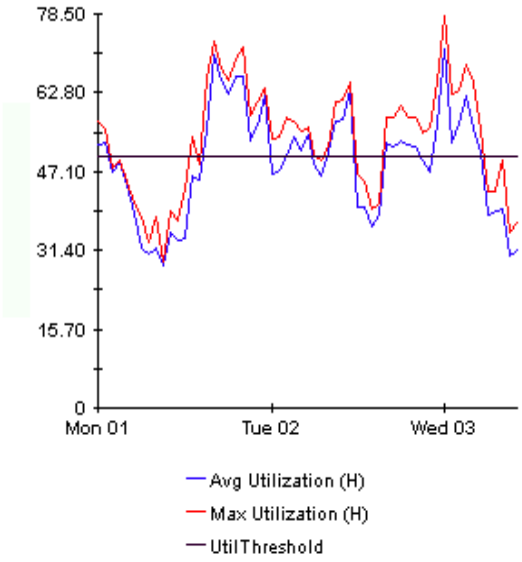
Style > Stacking Bar

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



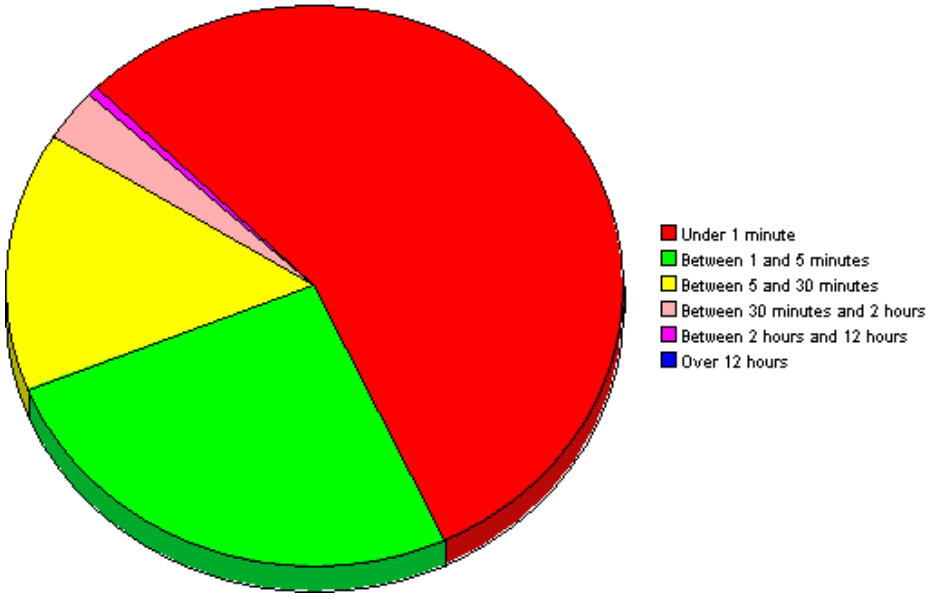
Style > Plot

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



Style > Pie

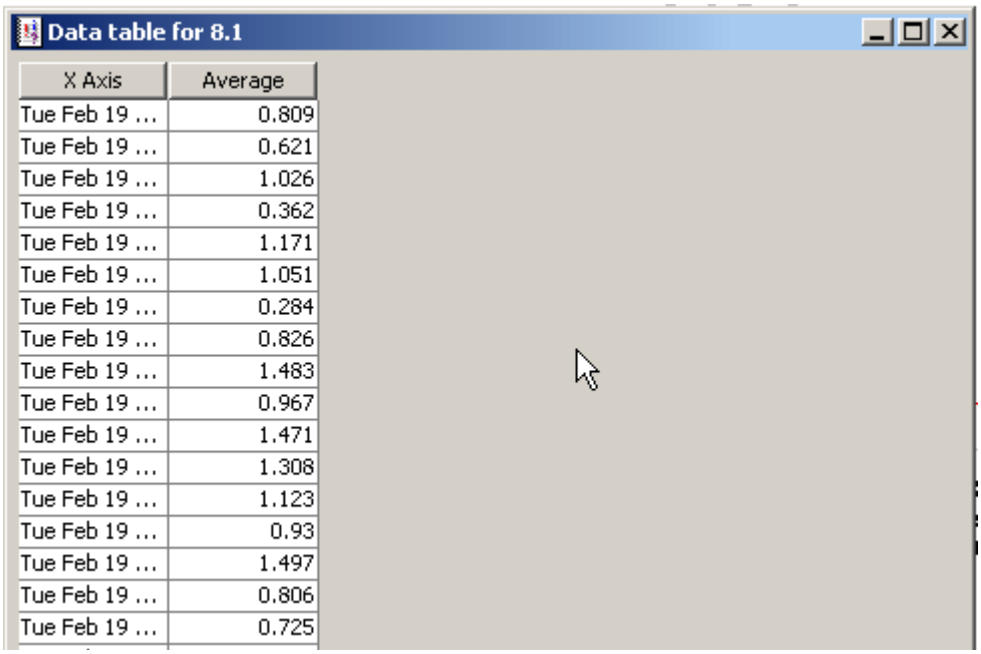
An area graph becomes a pie chart. Bands in an area graph convert to slices of a pie and the pie constitutes a 24-hour period. This view is helpful when a small number of data values are represented and you are looking at data for one day.



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

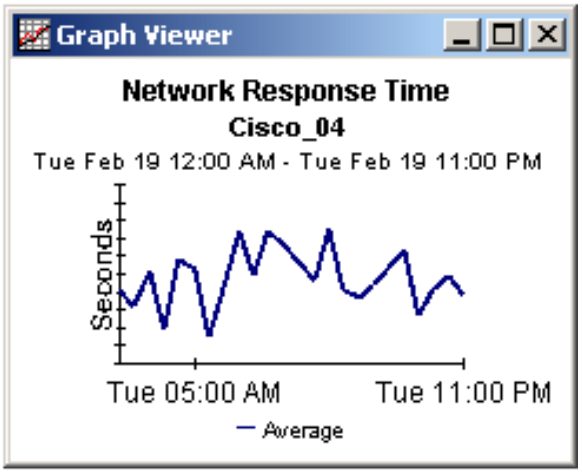
Display Data Table

This option changes a graph into a spreadsheet.



View in New Frame

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



Glossary

active interfaces

The number of interfaces associated with a VRF with an ifOperStatus of ‘Up’.

associated interfaces

The number of interfaces associated with a VRF irrespective of ifOperStatus.

availability

The percentage of time an interface, or group of related interfaces, has been operational. Identifies outages as reported through the sysUpTime variable, the ifLastChange and ifOperStatus variables. Calculated by combining device sysUpTime with interface ifOperStatus and interface ifLastChange.

customer

A textual name representing an external customer. It can be associated with Interfaces or VPNs and must be imported using the supplied provisioning tools.

customer ID

A numerical identifier that is uniquely associated with a customer name.

device

Any SNMP manageable device.

discard rate

The percentage of packets discarded by the interface. Data about discards is sampled during each poll cycle (by default this is four times an hour); based on those samples, OVPI calculates an average and a maximum discard rate.

discard threshold

The point at which an acceptable percentage of discarded traffic becomes an abnormal percentage and possibly impacts the user experience. If the interface is full duplex, the same threshold value is applied to both in and out packets separately.

error rate

The percentage of packets with errors as reported by the interface. Data about errors is sampled during each poll cycle (by default this is four times an hour); based on those samples, OVPI calculates an average and a maximum error rate.

error threshold

The point at which an acceptable percentage of errored traffic becomes an abnormal percentage and possibly impacts the user experience. If the interface is full duplex, the same threshold value is applied to both in and out packets separately.

exceptions

The number of times a threshold has been broken for the selected object. For an interface, thresholds apply to Utilization, Errors and Discards. For aggregated groups of interfaces such as a VRF, the exception count refers to the total number of exceptions across all component interfaces.

interface

An entry in the SNMP ifTable for of the Device. Can represent a physical or logical interface.

location

A textual name representing a location. It can be associated with Interfaces or devices and must be imported using the supplied provisioning tools.

location ID

A numerical identifier that is uniquely associated with a Location name.

MPLS

Multi Protocol Label Switching protocol

response time

Delay within the network management structure, specifically, delay between the poller and the target device. If the delay is being caused by the device, then this value may point to device resource issues.

routes

Indicates the number of routes associated with a VRF or device.

security violations

The number of illegally received labels on this VPN/VRF.

SLA

Service Level Agreement. The report package allows you to configure several metrics which can govern an SLA. These include the percentage of time the VPN components were operational and the SNMP response time to VPN components.

threshold

The line between normal and abnormal performance. When this line is crossed, an exception is recorded. Every threshold has a default value that is easily changed to reflect individual needs. Thresholds are used extensively in this package for Utilization, Discard and Error ratios at the interface level and across the VRF or VPN.

utilization

The total number of octets traversing the interface as a percentage of the total *possible* number of octets, using the ifSpeed property. If an interface is full duplex, utilization is calculated and displayed separately in each direction. Groups of interfaces have their utilization calculated by taking the total traffic on all administratively up interfaces in the group and dividing that by the total possible bandwidth for those interfaces. Utilization for a group of interfaces is more meaningful when all the interfaces in the group use the same protocol.

utilization threshold

The point at which the number of octets traversing the interface is considered detrimental to the service level required by network users. In the case of full duplex interfaces, the same threshold value is applied to both in and out packets separately.

VPN

Virtual private network.

VRF

VPN route forwarding. A VRF represents an instance of a VPN supported by one or more PE routers. The collection of matching VRFs from all network devices compose the actual VPN.

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