

CA Spectrum®

VPLS Manager

Release 9.4



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CA Technologies Product References

This document references the following CA Technologies products:

- CA Spectrum®
- CA Spectrum® VPLS Manager (VPLS Manager)
- CA Spectrum® MPLS VPN Manager (MPLS VPN Manager)
- CA Spectrum® Report Manager (Report Manager)

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Chapter 1: VPLS Manager

This guide provides concepts, processes, and procedures for installing and configuring VPLS Manager. This guide also describes how to discover and model the VPLS environment, and how to monitor the performance of the VFI and Sites.

This section contains the following topics:

[About VPLS Manager](#) (see page 7)

[Who Should Use VPLS Manager](#) (see page 8)

[MIBs and Devices Supported by VPLS Manager](#) (see page 8)

[System Requirements](#) (see page 8)

[How VPLS Manager Works](#) (see page 9)

About VPLS Manager

VPLS Manager is a CA Spectrum add-on application that provides management tools to service providers deploying VPLS technology in their environment. Service providers who offer Layer 2 MPLS VPN service to their customers can benefit from using VPLS Manager to monitor their environment. In combination with the MPLS VPN Manager application, VPLS Manager provides seamless management of both Layer 3 (BGP) and Layer 2 MPLS VPNs within the same navigation and viewing framework. The primary benefits of the product are the discovery, modeling, and monitoring of Layer 2 networks, services, and resources. As an integrated application of the CA Spectrum product family, VPLS Manager benefits from the CA Spectrum ability to manage the entire network.

Note: For more information about the MPLS VPN Manager application, see the *MPLS VPN Manager User Guide*.

Fault management is a key capability provided by VPLS Manager. VPLS Manager constantly monitors the resources used to provide VPLS to customers and intelligently computes the condition of the VPLS environment. For example, VPLS Manager monitors the devices, interfaces, configurations, and circuits with which the VPLS service is implemented. Monitoring is accomplished through polling and intelligent trap handling.

Another key capability is performance management of your VPLS environment. Performance management is accomplished by monitoring the traffic on VPLS-enabled interfaces and displaying them in real time.

VPLS Manager is designed to be a distributed SpectroSERVER (DSS) enabled application. This design provides the application significant scalability and capacity, supporting management of the largest networking environments.

Who Should Use VPLS Manager

VPLS Manager is designed for service providers who are running a VPLS core environment and must monitor their client network traffic for performance and accuracy within this network. VPLS Manager supports service provider environments that use Juniper equipment in their MPLS core and edge networks.

MIBs and Devices Supported by VPLS Manager

VPLS Manager manages Virtual Private LAN Service (VPLS) as described in the draft "RFC 4761 VPLS using BGP for Auto-Discovery and Signaling." These MIBs provide access to the configuration information for Layer 2 VPNs configured on PE router interfaces.

VPLS Manager supports the following tables in the Juniper Enterprise VPN MIB:

- Table of Configured VPNs (jnxVpnTable)
- Table of VPN Interfaces (jnxVpnIfTable)

VPLS Manager functionality is supported by Juniper on JunOS 6.1 or later.

System Requirements

VPLS Manager is an add-on application that works within CA Spectrum. In addition to a running SpectroSERVER installation, VPLS Manager requires the following:

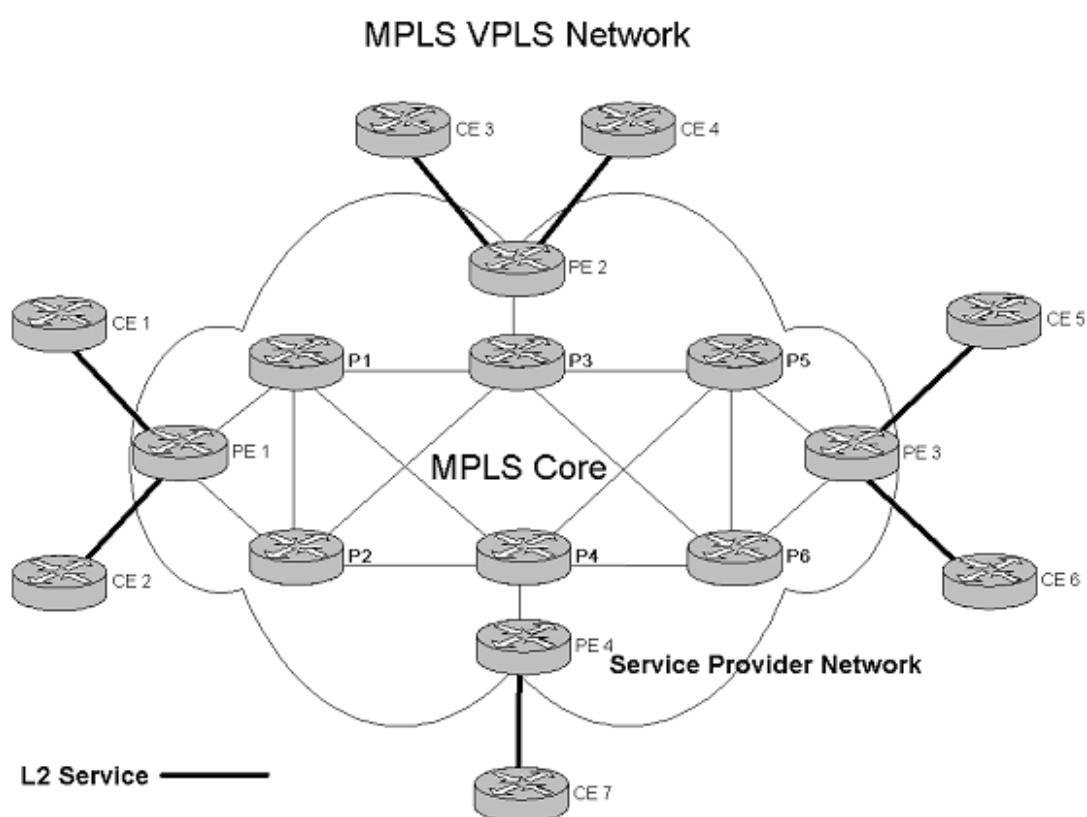
- SNMP access to all PE devices in the VPLS service
- Juniper VPN MIB implemented and populated on your MPLS hardware
- Management module for Juniper routers

Note: CA Spectrum comes with all required MIBs.

Note: The device models in this module have the necessary application models needed for discovery of your VPLS environment.

How VPLS Manager Works

As a service provider, your goal is to use your MPLS VPLS core network to transport data packets from one part of your customer's network to another. For example, your MPLS network may transfer data packets from your customer's New York office to their London office. In this situation, your customer cannot model and monitor their network traffic through your MPLS VPLS network, and you, as a service provider, typically cannot model and monitor the client networks in New York or London. The following diagram shows that in this scenario the only interface between the customer network and your MPLS VPLS network is the relationship between their Customer Edge (CE) routers and your Provider Edge (PE) routers:

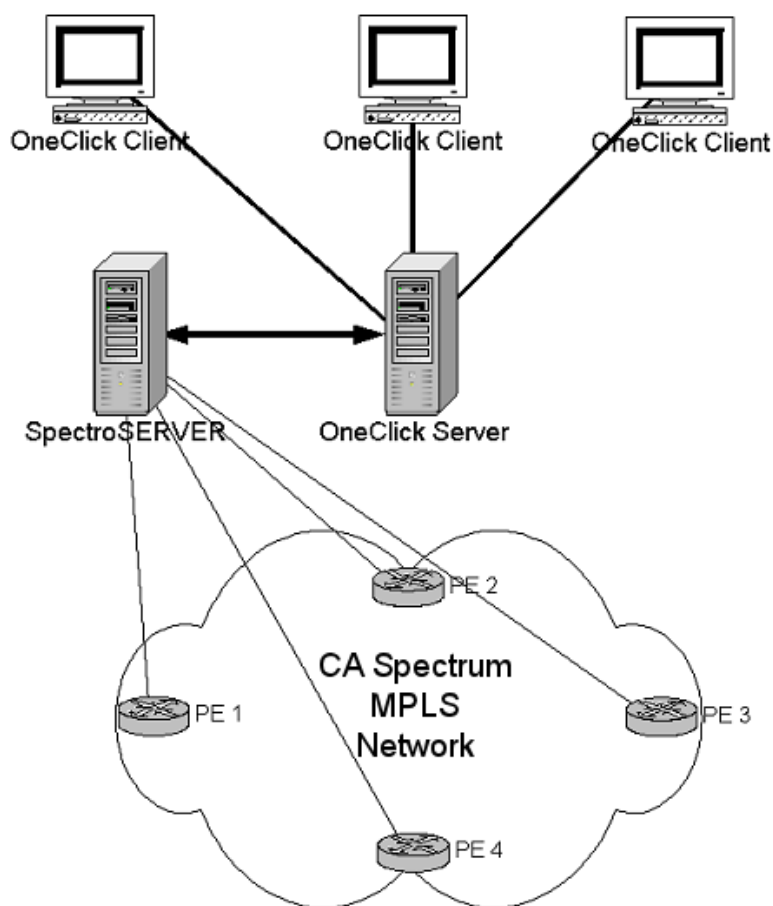


As shown by the architectural diagram, the major components of this environment are the following entities:

- Provider's core MPLS network (P routers)
- Provider's edge routers (PE routers)
- Customer edge routers (CE routers)

VPLS Manager focuses on the information provided by the PE routers and does not utilize nor provide any information on what exists in the MPLS core. As shown in the following deployment diagram, the management of the customer edge equipment is not part of VPLS Manager:

VPLS Management Architecture



As shown in the diagrams above, VPLS Manager monitors your MPLS VPLS network environment as follows:

1. The PE routers use Layer 2 services to gather information from the CE routers, including the discovery of configuration and performance information from the supported MIBs. In addition, traps are supported where they are available.
2. The SpectroSERVER communicates with your PE routers when executing Discovery, modeling, polling, and fault management operations. All database operations with respect to modeling are handled by the SpectroSERVER.
3. The OneClick server periodically polls the SpectroSERVER database for management information, then displays this information in the OneClick clients.

Chapter 2: Getting Started

This section describes how to install and configure VPLS Manager. This section also explains how to discover and model your VPLS environment.

This section contains the following topics:

[Install VPLS Manager](#) (see page 13)

[Accessing VPLS Manager](#) (see page 14)

[Discovery and Modeling](#) (see page 14)

Install VPLS Manager

VPLS Manager is included in your CA Spectrum extraction key. When you install CA Spectrum, the VPLS Manager components are automatically installed and available for use. For best results, you can adjust the configuration settings appropriately after installation is complete.

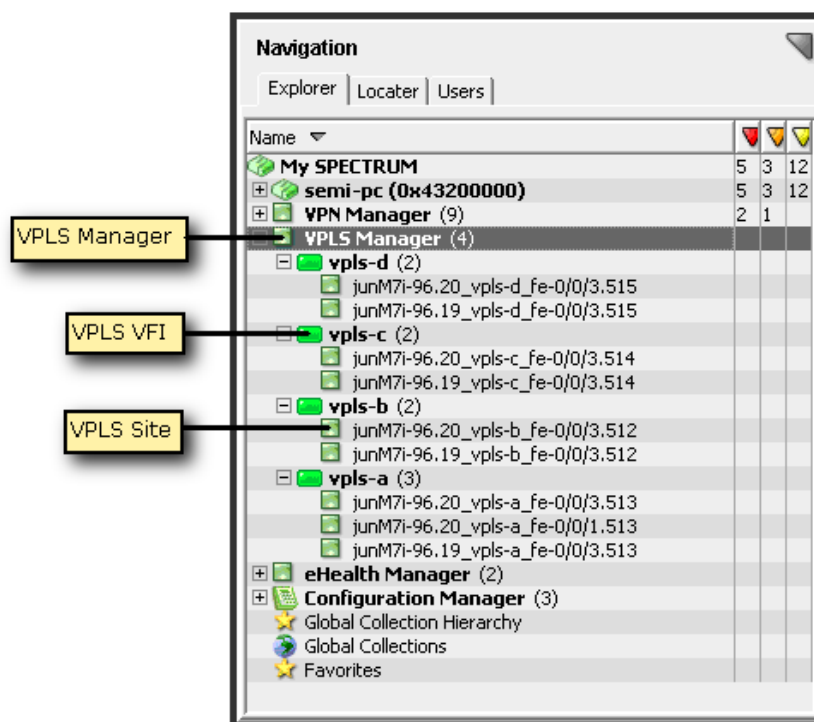
To install VPLS Manager properly, the administrator must install CA Spectrum.

For existing CA Spectrum installations, perform an in-place installation to help ensure the VPLS Manager components are installed. In a fault tolerant environment, VPLS Manager must be installed on each SpectroSERVER to be fault tolerant.

Note: Perform this procedure on all SpectroSERVERs in a distributed environment for which you want to use VPLS Manager. For specific installation instructions, see the *Installation Guide*.

Accessing VPLS Manager

You can access VPLS Manager from the Explorer tab of the Navigation panel. Expanding the VPLS Manager node displays all VFIs managed by the VPN Manager. Expanding each VFI displays the VPLS sites contained in the VPLS environment. The following is an example of the VPLS Manager hierarchy in the Navigation panel.



The Contents panel displays the Alarm list for the modeled element that you have selected in the Navigation panel. The Component Detail panel displays the Alarm details for the Alarm selected in the Alarm list shown in the Contents panel. If the Alarm list is empty, the Component Detail panel displays the Information view for the modeled element selected in the Navigation panel.

Discovery and Modeling

Before you can use VPLS Manager to manage your VPLS network, you must run VPLS Discovery. VPLS Discovery discovers each VFI and VPLS Site currently configured on devices modeled in CA Spectrum. Before running VPLS Discovery, you can configure the VPLS Discovery options to achieve the best results for your environment.

Discovery Prerequisites

For VPLS Discovery to complete successfully, devices must meet the following prerequisites:

- VPLS devices must support the correct MPLS-VPLS MIBs.
- CA Spectrum discovers and models the physical network infrastructure via Discovery, manual modeling, or the Modeling Gateway. Before using the VPLS Discovery functionality, you must first model the physical components of your network in CA Spectrum using one of these methods.

Note: For instructions about using these mechanisms to model your network, see the *Modeling and Managing Your IT Infrastructure Administrator Guide* and the *Modeling Gateway Toolkit Guide*.

- The devices must have MPLS-VPLS properly configured.

Configure VPLS Manager for Discovery

Before you run VPLS Discovery, you can configure the VPLS Discovery options. Making these selections helps ensure that CA Spectrum finds and manages only the VPLS devices you want to monitor.

To configure VPLS Manager for VPLS Discovery

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Click the Information tab in the Contents panel.
3. Expand the Configuration, VPLS Discovery subview and make your selections from the following configuration options:

Enable Dynamic Discovery

Determines whether to start the VPLS Discovery automatically when a new PE router is modeled. Starting VPLS Discovery automatically helps to keep the VPLS information current when new devices are added to the network.

Note: As the VPLS Manager application is running, VPLS sites may be created or destroyed when certain traps are received.

Default: No

VFI Name Filter Type

Determines if the VFI names in the 'Global VFI Name Filter' field are included or excluded from modeling. This feature can save unnecessary resources by limiting the number of VPLS sites that require monitoring. Options include the following:

- Exclusive
- Inclusive

Global VFI Name Filter

Lists the VFI names to be included or excluded from modeling. This field is used together with the 'VFI Name Filter Type' field.

VPLS Discovery options are configured.

More information:

[Run VPLS Discovery](#) (see page 17)

[Filter VPLS Discovery Results](#) (see page 18)

Discover and Model Your VPLS Environment

To view and monitor your VPLS environment in CA Spectrum, you must model your VPLS devices. Running VPLS Discovery is the most comprehensive method of modeling your VPLS environment, but it also requires the greatest amount of system resources. To accommodate your modeling needs, you can choose from the following options when discovering and modeling the VPLS devices in your environment:

- [Run a full VPLS Discovery](#) (see page 17)
- [Run VPLS Discovery on selected models only](#) (see page 17)
- [How to Update the New VPLS VFI Interface](#) (see page 18)
- [Filter the full VPLS Discovery results](#) (see page 18)
- [Configure CA Spectrum modeling to include VPLS Discovery](#) (see page 19)

Run VPLS Discovery

To discover and model your entire VPLS environment, you can run a VPLS Discovery. Before you run an on-demand VPLS Discovery, be sure that you meet the prerequisites and that you configured your VPLS Discovery options.

Follow these steps:

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Click the Information tab in the Contents panel.
3. Expand the Configuration, VPLS Discovery subview.
4. Click Run in the Discovery Status field.

A dialog opens to request the landscapes on which you want to run VPLS Discovery.

5. Select the landscapes and click OK.

VPLS Discovery runs. When complete, the VPLS Discovery Status field lists the status. Also, a tooltip on this field lists the number of discovered VPLS devices (single SpectroSERVER) or servers (distributed SpectroSERVER).

More information:

[Discovery Prerequisites](#) (see page 15)

[Configure VPLS Manager for Discovery](#) (see page 15)

Run VPLS Discovery on Selected Models

In the available OneClick views for VPLS Manager, you can select a set of models and run VPLS Discovery for those models only. This ability can help you minimize the CA Spectrum resources required when troubleshooting or verifying changes to the status of only specific devices.

To run VPLS Discovery on selected models

1. Select the models in OneClick.
2. Click Tools, Utilities, Network Services Discoveries, VPLS Discovery.

The VPLS Discovery process is initiated for the selected models only. You can check the status in the Configuration, VPLS Discovery subview.

How to Update the New VPLS VFI Interface

When a new VPLS enabled device is added in your VPLS environment, you model it in your OneClick landscape. If you run the VPLS discovery, the new device is created as a child of the configured VPLS VFI under the VPLS Manager in the Navigation pane. But the new interface is not updated in the Interfaces tab in the Component Detail pane for the new device under the VPN VFI. You must manually update the new interface.

Follow these steps:

1. In the Navigation pane, select VPLS Manager.
2. In the Contents pane, select List.
A list of all the VPLS VFIs is displayed.
3. Delete the configured VPLS VFI.
4. In the Component Detail pane, select Information and run the VPLS Discovery.
The VPLS VFI model that was deleted is created with the same number of child devices.
5. Select Interfaces, and verify that the new interface is added.

The new interface is updated for the configured VPN VFI.

Filter VPLS Discovery Results

If you do not want to monitor all VFIs, you can apply a filter that includes or excludes selected VFIs from discovery and modeling. This feature can help save resources by reducing the number of VFIs CA Spectrum polls.

To filter VPLS Discovery results

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).
The main details page for VPLS Manager opens in the Contents panel.
2. Click the Information tab in the Contents panel.
3. Expand the Configuration, VPLS Discovery subview.
VPLS Discovery options display.
4. Click Set in the VFI Name Filter Type field and select one of the following options:
 - Exclusive
 - Inclusive

5. Click Add in the Global VFI Name Filter field.

The Add dialog opens, prompting you to enter the VFI name.

6. Enter the VFI name and click OK.

The VFI name is added to the Global VFI Name Filter list. Depending on the VFI Name Filter Type you select, VPLS Discovery is filtered to include or exclude the listed VFIs.

More information:

[Configure VPLS Manager for Discovery](#) (see page 15)

Configure CA Spectrum Modeling to Include VPLS Discovery

CA Spectrum lets you configure modeling to include network services discoveries, such as VPLS Discovery. As a part of modeling configuration, you can specify which network service discoveries to run with the CA Spectrum modeling process.

Note: For more information, see the *Modeling and Managing Your IT Infrastructure Administrator Guide*.

Chapter 3: Viewing VPLS Manager Data

This section describes where to find VPLS Manager data in CA Spectrum, the model types, and additional options for viewing the available data. The content in this section is intended for all VPLS Manager users.

This section contains the following topics:

[Navigation](#) (see page 21)

[Topology](#) (see page 22)

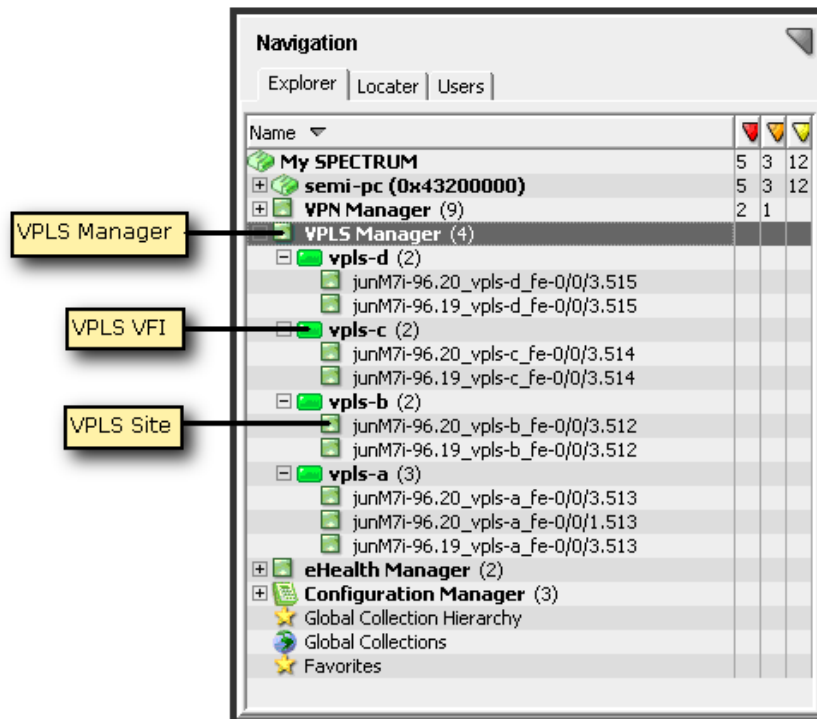
[VPLS Manager Model Types](#) (see page 23)

[Spotlighting VFIs](#) (see page 25)

[VPLS Manager Searches](#) (see page 25)

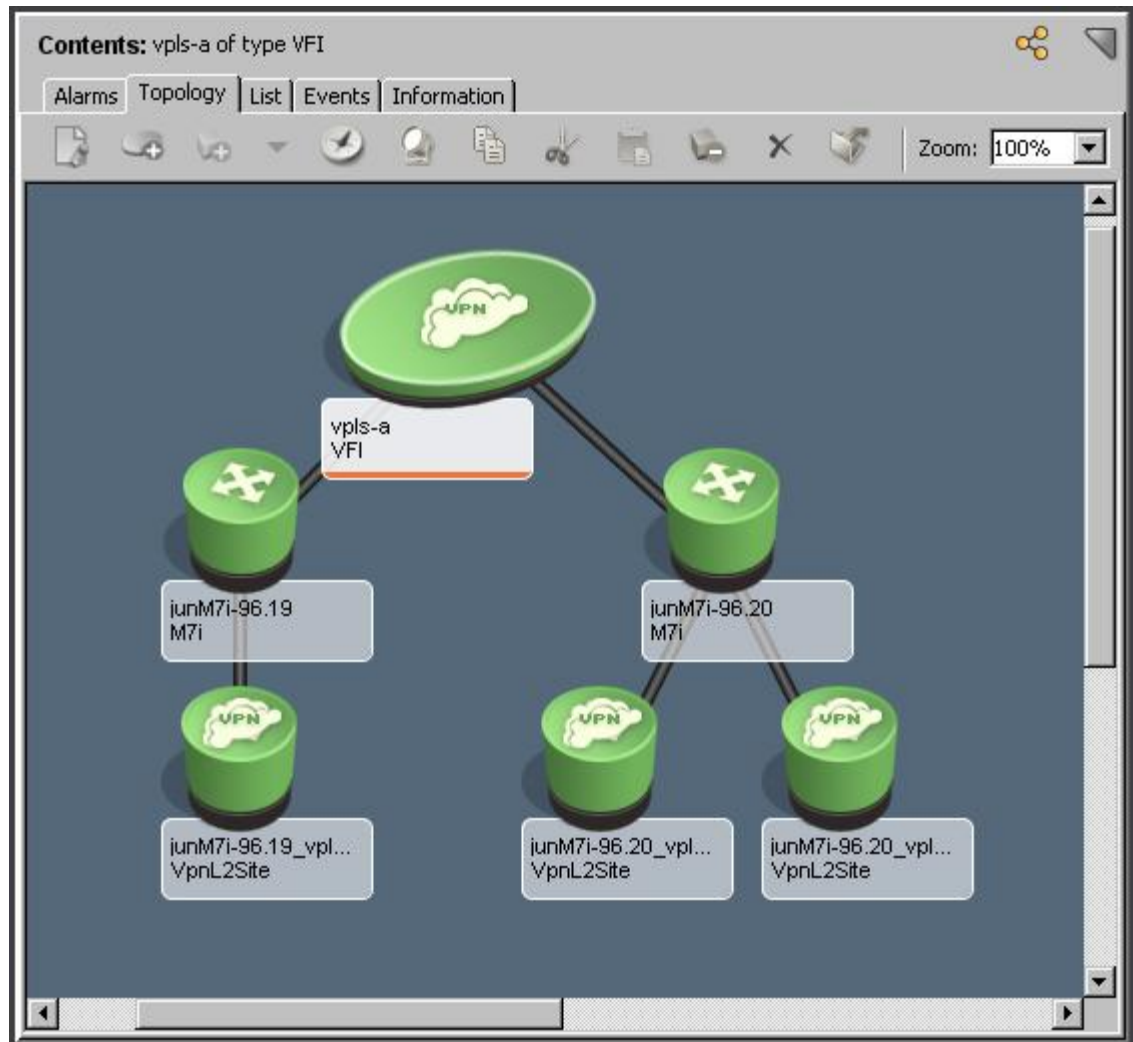
Navigation

OneClick is the main tool for interacting with VPLS Manager models. Using OneClick, you can configure the application, as well as view and search model information. All VPLS Manager navigation is contained within the VPLS Manager hierarchy in the Navigation panel, as shown in the following example:



Topology

VPLS Manager contains a topology view that shows how your VPLS entities are connected to other devices in your network environment. For example, the following topology view shows a VPLS environment with the VFI model (vpls-a) connected to two PE routers (junM7i-96.19 and junM7i-96.20). Then, these PE routers are connected to the VFI Site models, as shown:



VPLS Manager Model Types

During VPLS Discovery, several CA Spectrum models are created to represent different aspects of the MPLS/BGP VPN MIB in VPLS Manager. CA Spectrum uses these models to build your VPLS environment topology and reflect the current status of each entity in that environment.

The VPLS Manager topology includes the following model types:

VPLS Manager

Represents the VPLS Manager application. By default, CA Spectrum creates this model when the application is installed with CA Spectrum. This model cannot be destroyed. This application model must be present for VPLS Discovery to successfully discover MPLS-VPLS information.

Model Type: VplsManager

VFI

Represents each unique VPLS VFI. A *Virtual Forwarding Instance (VFI)* is a logical collection of VPLS Sites that are part of the same virtual packet forwarding instance. These VPLS Sites share a common Layer 2 forwarding database, much the same way that Layer 3 devices may share a common routing table. The Model Class attribute for the VFI model is set to Transport Service.

Model Type: VFI

VPLS Site

Represents each unique VPLS Site modeled during VPLS Discovery. A *VPLS Site* represents the service delivered to a customer over an interface in your VPLS environment. CA Spectrum creates a VPLS Site model on the same SpectroSERVER on which its associated PE router is modeled. The Model Class attribute for the VPLS Site model is set to Transport Service. VPLS Manager assumes that each VPLS Site is connected to a given PE by a single interface. By default, CA Spectrum does not create VpnL2Site models for loopback and tunnel interfaces.

Model Type: VpnL2Site

VPLS Site Model Names

CA Spectrum generates unique names for VPLS Site models during VPLS Discovery. The naming convention is as follows:

RouterName_VFI_IfName

To help ensure the name is unique, the naming convention is based on the following three parts:

- *RouterName*—The PE router associated with the VPLS Site
- *VFI*—The associated VFI
- *IfName*—The IfName of the interface to which the VPLS Site is connected

View Associated VPLS Sites

For an individual VFI model, you can view a list of associated VPLS Sites. Using the list, you can quickly see the condition of related VPLS Sites that can affect the performance of the selected VFI.

To view a list of associated VPLS Sites

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Select the VFI model

Details about the selected model display in the Contents panel.

3. Click the Information tab.

4. Expand the Associated Sites subview.

A table lists all of the VPLS Site models associated with the selected VFI model.

View Associated PE Routers

For an individual VFI or VPLS Site model, you can view a list of associated PE routers. Using the list, you can quickly see the condition of all related routers that can affect the performance of the selected model.

To view a list of associated PE routers

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Select the VFI or VPLS Site model.

Details about the selected model display in the Contents panel.

3. Click the Information tab.
4. Expand the Associated Edge Routers subview.

A table lists all of the PE routers associated with the model selected in step 2.

Spotlighting VFIs

The spotlighting feature in OneClick lets you isolate and visualize model relationships within your network that are not readily visible from the Topology view. For example, the Topology view does not visually distinguish VFIs and VPLS Sites, making it more difficult to picture these relationships within the context of your network. With spotlighting, these model relationships are accentuated, showing you where they appear in the network topology.

Using the spotlighting feature, you can select a VFI to view in the Topology view. Viewing VFI information from this view can help you more easily understand which devices are related to the selected VFI. From this view, you can also see if any alarming devices are impacting the performance of the VFI.

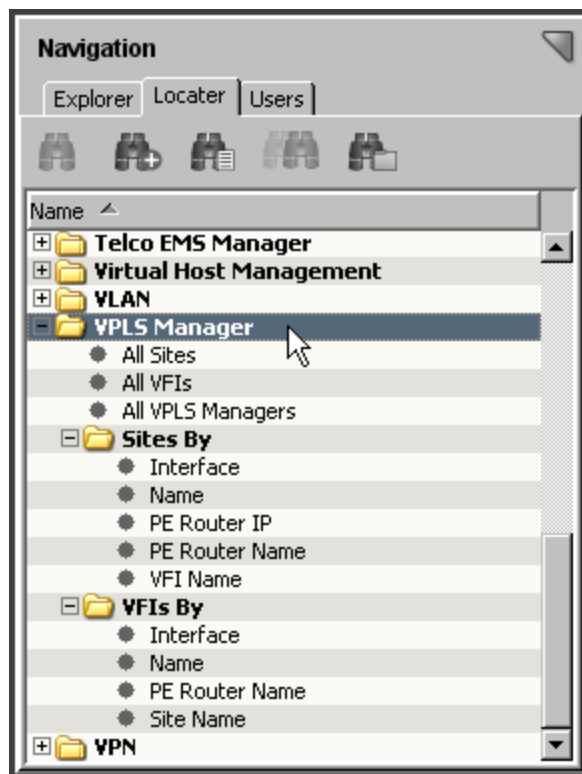
Note: For more information about how to use spotlighting, see the *Operator Guide*.

VPLS Manager Searches

Using the search feature can help you find details about your VPLS environment that help you monitor the performance. Searches can locate specific components of your MPLS-VPLS core, such as locating VPLS Sites by PE router IP or all VFIs within a specific landscape. These types of searches can help you investigate information related to a specific customer, because you can use details associated with your customer SLAs in your searches, such as specific device or site name.

VPLS searches support cross-server device modeling. You can specify one or more, or all SpectroSERVERs to search for a particular VPLS Manager model, sets of VFIs, or VPLS Sites that are managed by a specific SpectroSERVER. You can use the search results to access a number of views that present management, performance, and configuration information.

The search options are grouped under the VPLS Manager folder, as shown:



For example, if you know the IP address or name of a specific PE router, you can search for all VPLS Sites that use it. Using the list of VPLS Sites affected by the router can be useful when performing scheduled maintenance. You can change your VPLS Sites to use a different router, or be sure to place the VPLS Site model in maintenance mode to avoid unnecessary alarms in CA Spectrum. Also, you can give prior notice to any customers affected by those VPLS Sites.

Note: For more information about Locator searches, see the *Operator Guide*.

Chapter 4: Configuring VPLS Manager

This section describes how to configure VPLS Manager options. These are tasks that are typically performed by the VPLS Manager administrator.

This section contains the following topics:

[VPLS Manager Model Configuration](#) (see page 27)

[VFI Model Configuration](#) (see page 29)

[Distributed SpectroSERVER Configuration](#) (see page 32)

VPLS Manager Model Configuration

After VPLS Discovery, you must configure VPLS Manager so that it manages your VPLS environment appropriately. The VPLS Manager application offers configuration options for VPLS Manager models, the individual VFI models, and for VPLS Site models. In addition to the typical configuration options for CA Spectrum models, the VPLS Manager model lets you specify parameters for all of the VFIs managed by the selected VPLS Manager model. Using these configuration options, you can optimize how CA Spectrum monitors your VPLS environment. Configuration options include the following:

- Port polling
- Traps for creating and deleting models

Note: By default, both options are enabled.

Configure Port Polling

Along with traps, the polling mechanism is used to determine the health of the resources that make up your VPLS environment. Although enabled by default, you can disable polling to reduce network traffic. However, disabling polling causes the loss of significant functionality in VPLS Manager. Port polling must be enabled to update the condition of VPN Site models.

Note: Only an administrator performs this task.

To configure port polling in your VPLS environment

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Click the Information tab in the Contents panel.

3. Expand the Configuration, Management Configuration subview.
VPLS Manager configuration options display.
4. Click the 'set' link in the Enable Port Polling field.
The value for the selected option becomes editable.
5. Select the desired value for the field and click Save.
VPLS Manager is configured to poll devices in your VPLS environment according to your selection.

More information:

[View Real-Time Performance Data](#) (see page 40)

Configure Traps to Create and Delete Models (VPLS)

If your VPLS devices are properly configured to send traps to the SpectroSERVER host, you can use this trap data to create or delete VFI and VPLS Site models automatically. Traps sent from the devices in your VPLS environment can help ensure that devices in your VPLS environment are not unmanaged. Likewise, traps can also help to keep the information in CA Spectrum accurate by eliminating VPLS devices that no longer exist.

Some environments do not support the use of traps, and you can choose to disable them. However, we recommend that you enable traps when possible, because traps (along with polling) provide the best response to network faults and outages.

Note: Only an administrator performs this task.

To configure traps to create and delete VPLS device models automatically

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).
The main details page for VPLS Manager opens in the Contents panel.
2. Click the Information tab in the Contents panel.
3. Expand the Configuration, Management Configuration subview.
VPLS Manager configuration options display.

4. Click the 'set' link in the following fields, as needed:

Create on Trap

Creates a new VFI or VPLS Site when the mplsVrflfUp or jnxVpnIfUp trap is received and the device model already exists.

Default: Yes

Delete on Trap

Deletes an existing VFI or VPLS Site model when the mplsVrflfDown or jnxVpnIfDown is received and the device no longer exists in CA Spectrum.

Default: Yes

The value for the selected option becomes editable.

5. Select the desired value for the field and click Save.

The traps are configured to create or delete devices in your VPLS environment according to your selection.

VFI Model Configuration

After VPLS Discovery, you must configure VPLS Manager so that it manages your VPLS environment appropriately. The VPLS Manager application offers configuration options for VPLS Manager models, the individual VFI models, and for VPLS Site models. In addition to the typical configuration options for CA Spectrum models, the VFI model lets you specify parameters for the selected VFI and the VPLS Sites it manages. Using these configuration options, you can optimize how CA Spectrum monitors your VPLS environment. Configuration options include the following:

- Impact thresholds
- Alarms for VFIs or VPLS Sites

Set Impact Thresholds

The path of network traffic across your VPLS environment depends on which VPLS Sites are available for use. Network traffic can move most efficiently when all VPLS Sites for a VFI are available to your customers. Therefore, monitoring the performance of your VFIs can help ensure you provide your customers the correct level of service. To monitor the performance, you can set impact thresholds that trigger alarms when a percentage of the VPLS Sites for a VFI are no longer available.

To set impact thresholds for your VFIs

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Select a VFI in the Navigation panel.

Details for the selected VFI display in the Contents panel.

3. Click the Information tab in the Contents panel.

4. Expand the Configuration Information subview.

VFI configuration options display.

5. Click the 'set' link in the following fields, as needed:

Critical Threshold %

Specifies the percentage of down (unreachable) VPLS Sites that cause CA Spectrum to generate a critical alarm for the model.

Default: 15

Limits: 0-100

Note: A value of zero causes CA Spectrum to always generate a critical alarm when any VPLS Site becomes unreachable.

Major Threshold %

Specifies the percentage of down (unreachable) VPLS Sites that cause CA Spectrum to generate a major alarm for the model.

Default: 10

Limits: 0-100

Note: A value of zero causes CA Spectrum to always generate a major alarm when any VPLS Site becomes unreachable.

Minor Threshold %

Specifies the percentage of down (unreachable) VPLS Sites that cause CA Spectrum to generate a minor alarm for the model.

Default: 5

Limits: 0-100

Note: A value of zero causes CA Spectrum to always generate a minor alarm when any VPLS Site becomes unreachable.

The value for the selected option becomes editable.

6. Enter the desired value for the field and click Save.

The impact thresholds are configured to generate alarms when the threshold values for the selected VFI are breached.

Enable or Disable Alarms

To alert you to problems within your VPLS environment, CA Spectrum can generate alarms for VFIs or VPLS Sites. For example, an event is triggered when contact is lost to one of these models. When alarms are enabled, CA Spectrum generates a corresponding alarm. Although both alarm types are enabled by default, you can disable these alarms for non-critical devices to reduce the number of unnecessary alarms.

To enable or disable alarms

1. [Open VPLS Manager in the Navigation panel](#) (see page 14).

The main details page for VPLS Manager opens in the Contents panel.

2. Select a VFI in the Navigation panel.

Details for the selected VFI display in the Contents panel.

3. Click the Information tab in the Contents panel.

4. Expand the Configuration Information subview.

VFI configuration options display.

5. Click the 'set' link in the following fields, as needed:

Enable VFI Alarms

Determines whether CA Spectrum generates a VFI alarm when the condition of the VFI model changes. When this option is enabled and traps are properly configured, a contact lost event triggers an alarm that is asserted against the VFI model. When this option is disabled, a contact lost event causes the VFI model to turn red, but no alarm is created.

Default: Yes

Enable Site Alarms

Determines whether CA Spectrum generates a VPLS Site alarm when the condition of a VPLS Site managed by the selected VFI changes to critical. When this option is enabled, CA Spectrum generates an alarm. However, CA Spectrum does not generate an alarm when this option is disabled.

Default: Yes

The value for the selected option becomes editable.

6. Select the desired value for the field.

The alarms for the selected VFI model are configured according to your selection.

Distributed SpectroSERVER Configuration

In a DSS environment (see definition on page 43), you can model your PE routers from any SpectroSERVER. CA Spectrum creates an L2Site model on the same SpectroSERVER on which its associated PE router is modeled. However, CA Spectrum creates all VFI models on the main location server (MLS (see definition on page 43)). All of the discovered VFIs appear in the VPLS Manager area of the OneClick console. The local SpectroSERVERs must have a connection to the MLS to support this distributed configuration.

Important! To create a distributed VPLS Manager environment, all VFI models must reside on the SpectroSERVER that is on the MLS. When you change the MLS, the VFI and VpnL2Site models become invalid and are deleted by each SpectroSERVER in the DSS environment. To change the MLS properly, see the procedure for designating a new MLS. For more information, see the *Distributed SpectroSERVER Administrator Guide*.

Distributed SpectroSERVER Considerations

Review the following considerations before configuring a Distributed SpectroSERVER:

- When the same PE router is modeled on multiple landscapes, multiple site models are created. The site models have the same name (unless the device models are named differently) but reside on different landscapes. If an outage occurs, you can see multiple similar alarms because multiple sites are experiencing an outage.
- If you do not want to receive alarms on one set of the site models, use proxy models. Otherwise, CA Spectrum raises alarms on each site model.
- If you model the same device in multiple landscapes, name the device differently. Using different device names lets you easily differentiate the similar alarms in multiple landscapes.

Applying Global Configurations

In a DSS environment (see definition on page 43), you can apply configuration settings globally using the VPLS Manager model on the MLS (see definition on page 43). By default, the configuration options you set on the main VPLS Manager model are applied to the VPLS Managers on remote SpectroSERVERs. Setting a configuration option globally provides an efficient method for setting your preferences across all SpectroSERVERs.

If needed, you can override a global configuration on a remote VPLS Manager. For example, if you have a lab environment that is managed by a separate SpectroSERVER, you can turn off VFI alarms generated by the devices managed on that SpectroSERVER. Turning these off helps eliminate unnecessary alarms.

Note: Use caution when making overrides. Whenever possible, update the model information on the MLS as a best practice and use local overrides for any changes required on a specific SpectroSERVER.

Override a Global Configuration

By default, the configuration options you set on the main VPLS Manager model are applied to the VPLS Managers on remote SpectroSERVERs in a DSS environment. However, you can override these settings on a remote VPLS Manager. For example, if you have a lab environment that is managed by a separate SpectroSERVER, you can eliminate unnecessary alarms by turning off VFI alarms generated by the devices managed on that SpectroSERVER.

Follow these steps:

1. [Search for the VPLS Manager you want to configure](#) (see page 25).

The VPLS Manager model appears in your search results in the Contents panel.

2. Select the VPLS Manager model.
3. Click the Information tab in the Component Details panel.
4. Expand the Configuration, Management Configuration subview.
5. Click the 'set' link for the configuration option to override.

The Local Override Panel displays. The Global value reflects the value set on the MLS VPLS Manager model.

6. Enter a value that is different from the global value, uncheck the 'Use global value' checkbox, and click Save.

Your changes are saved, and the new configuration settings override the global settings for the selected VPLS Manager model.

Note: When a local override is being used, the Management Configuration subview displays an asterisk appended to the non-global attribute value.

Chapter 5: Managing Models, Traps, and Alarms

This section describes the concepts and procedures for managing models, traps, and alarms generated for VPLS Manager devices.

This section contains the following topics:

[VPLS Manager Alarms](#) (see page 35)

[Trap Support](#) (see page 35)

[VPLS Site Model Deletion](#) (see page 36)

VPLS Manager Alarms

To alert you to problems within your monitored networks, CA Spectrum generates alarms. When monitoring your VPLS environment, your VPLS Manager models display an alarm state for the following conditions:

- Site Down
- VFI Condition (Initial, Good, Minor, Major, Critical)

Trap Support

The following table lists the Juniper traps supported by VPLS Manager. Receipt of either a jnxVpnIfUp trap or a jnxVpnIfDown trap typically results in a change of the VFI model condition. Events are created based on changes in condition.

Note: Each device must be configured to send SNMP traps to the CA Spectrum Virtual Network Machine (VNM).

Trap	Result of Receiving Trap
jnxVpnIfUp	If the VFI model already exists, a change in status is reported. Otherwise, a new VFI model is created.
jnxVpnIfDown	If both the VFI model and the VPLS Site on the device sending this trap exist, a change in status is reported. Otherwise, the VFI model is deleted.

Trap	Result of Receiving Trap
jnxVpnPwUp	If no other related outages are present, the status of the VPLS Site is upgraded to good.
jnxVpnPwDown	If the VPLS Site is no longer provisioned in the device, the VPLS Site is deleted.

VPLS Site Model Deletion

When you no longer need to monitor a VPLS Site, you can manually select the VPLS Site model and delete it. VPLS Site models are also deleted in the following situations:

- When you delete a VFI model, CA Spectrum automatically deletes all VPLS Site models associated with this VFI model.
- When you delete a PE router model, CA Spectrum deletes all of the associated VPLS Site models. When the last VPLS Site is deleted, CA Spectrum also deletes the VFI model associated with those VPLS Site models.
- If a PE router model sends a jnxVpnIfDown SNMP trap and the same VRF entry has been removed from the device's VRF Table, CA Spectrum deletes the VPLS Site model.

Chapter 6: Monitoring Status and Performance

This section explains the information you need to monitor the performance of your VPLS environment and check your adherence to customer SLAs using VPLS Manager. This section is intended for general VPLS Manager operators.

This section contains the following topics:

[Monitoring Performance and SLAs](#) (see page 37)
[Reports](#) (see page 41)

Monitoring Performance and SLAs

For an ISP, continuity of service is crucial for each customer, which is why client SLAs are often established. Although all service outages are not avoidable, the customer relies on the ISP to keep the outages to a minimum, adhering to the terms agreed upon in their SLA.

Monitoring a VPLS environment for adherence to customer SLAs can be difficult. VPLS Manager makes this task easier by monitoring the performance of the VPLS devices and providing a way to view the relationship of those devices to your PE routers. By knowing which customers are impacted by a specific VFI, you can monitor SLAs when monitoring VPLS environment performance in one of the following ways:

- **Analyze the condition of your VFIs**—Using fault monitoring, VPLS Manager continually updates you about the latest condition of your VPLS devices. These conditions can trigger traps and alarms. All alarms generated from the VPLS environment can provide insight into performance glitches.
- **Search for a customer's VFIs to monitor their health**—Using search, you can locate the VFIs or VPLS Sites used by a specific customer. After locating these device models, you can check their current condition or performance details to help ensure they meet your established SLA.
- **View real-time performance details**—For any VFI or VPLS Site model, you can view an on-demand performance report.
- **Run reports**—VPLS Manager provides various reports to help you monitor the health of your VPLS environment, such as event or availability reports.

Some of these monitoring tasks are proactive (such as searching for specific VFIs) and some are the result of an alarm triggered by a device in your VPLS environment.

Although SLA information is not maintained in VPLS Manager, you can use the information you have about your SLAs, such as the name of a VFI used by a client, to determine which customers are impacted by an alarm involving a VPLS device.

How the Condition of VPLS Devices is Calculated

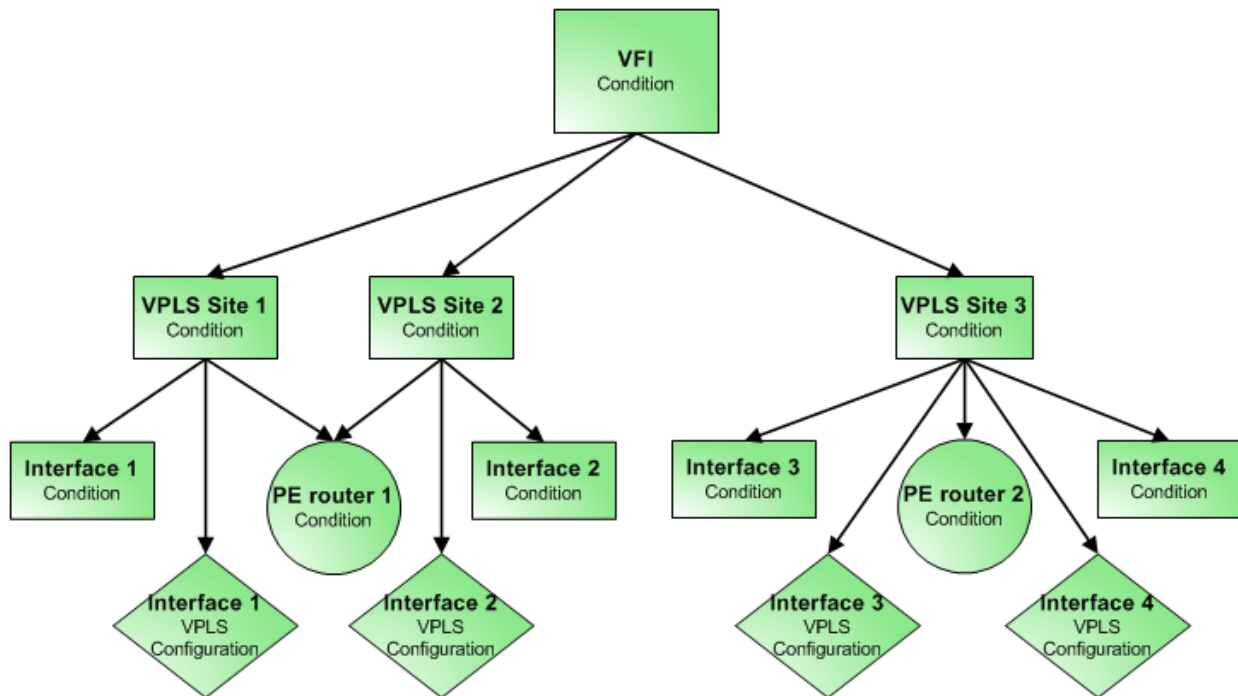
The overall condition of a VFI is of critical importance to providers of VPLS services. Knowing the condition of a VFI can help ensure that you meet your customer SLAs or determine when performance tuning in your VPLS environment is needed.

CA Spectrum constantly monitors the status of the resources used to provide the VPLS service. The goal of VPLS Manager is to determine the health of the VPLS service by understanding its relationship to physical and logical network entities. VPLS Manager calculates VFI condition based on analysis of the VFI's aggregate VPLS Site conditions.

The process for calculating VFI condition is as follows:

1. The PE routers, interfaces, and interface VPLS configurations are polled at a user-defined interval.
2. When one of these monitored resources experiences an outage, this condition is reflected in the health of the VPLS Site model. Specifically, VPLS Site condition is computed, based on these factors:
 - Contact status of the PE router
 - Condition of the VPLS-enabled interface (IPLS)
 - Configuration of the VPLS-enabled interface
 - Value of mplsVpnVrfOperStatus
 - Value of ifOperStatus for the physical interface
 - Receipt of a jnxVpnIfUp, jnxVpnPwUp, jnxVpnIfDown, or jnxVpnPwDown trap
3. The status of all VPLS Sites is then rolled up into the health of the VFI.

The following diagram demonstrates how condition is calculated for VPLS Sites and rolled up to the VFI models:



For example, CA Spectrum calculates the condition of VPLS Site 1 as a combination of the Interface 1 condition, PE router 1 condition, and the VPLS configuration of Interface 1. For VPLS Site 3, the condition is affected by two interfaces Interface 3 and Interface 4. Therefore, the condition of VPLS Site 3 is a combination of the PE router 2 condition and the condition and VPLS configuration of the two interfaces.

The condition of the VFI model is determined by the condition of all of the L2VpnSites contained in the VFI. The following list explains how each condition of a VFI is determined:

Initial

No L2VpnSites are modeled or all VPLS Site models are “Initial.” The percentage of VPLS Sites that are “Initial” is greater than the Minor threshold.

Maintenance

All the L2VpnSite models are in maintenance mode.

Minor

The percentage of L2VpnSites down (Site Rollup condition) is greater than the Minor threshold and less than the Major threshold.

Major

The percentage of L2VpnSites down is greater than the Major threshold and less than the Critical threshold.

Critical

The percentage of L2VpnSites down is greater than the Critical threshold.

Good

The percentage of L2VpnSites down is less than the Minor threshold.

You can set threshold values for each VFI model that control whether the VPLS Manager model generates VFI condition alarms.

More information:

[Configure Port Polling](#) (see page 27)

[View Real-Time Performance Data](#) (see page 40)

View Real-Time Performance Data

To measure the performance of your VPLS environment, you must analyze the devices and interfaces used by the VFIs. Their status helps to determine the overall health of your VPLS environment and to decide if you must make changes to improve the performance. Real-time performance monitoring is accomplished by on-demand polling of VPLS-enabled interfaces. The following interface statistics are polled:

- Bytes In Rate
- Bytes Out Rate

To view real-time performance data for a VPLS device

1. [Search for the VPLS device you want to monitor](#) (see page 25).
The VPLS device model appears in your search results in the Contents panel.
2. Select the VPLS device model.
Details about the selected model appear in the Component Details panel.
3. Click the Performance tab in the Component Details panel.
4. Select one of the following on-demand reports from the drop-down field:
 - Total Traffic
 - Component Traffic In
 - Component Traffic Out

Note: Performance data for a selected VFI is an aggregation of the performance data of the component VPLS Sites in a VFI.

Performance data for the selected report is displayed in the real-time graph. Although CA Spectrum does not store this data, the graph is updated every 10 seconds to reflect the current performance information.

More information:

[How the Condition of VPLS Devices is Calculated](#) (see page 38)

Reports

Reports provide information that helps you and your customers make informed decisions about your IT assets. Viewing a report lets you analyze specific areas of your VPLS environment to determine if changes are necessary to improve performance.

VPLS Manager uses Report Manager to generate reports. Using Report Manager you can create the following types of reports:

- Asset reports
- Availability reports

Note: For more information about report options and procedures to generate these reports using Report Manager, see the *Report Manager User Guide*.

Asset Reports

Asset reports generate information about the inventory of assets in the IT infrastructure, including information about VPLS environment assets. Asset reports can help you determine the health of your VPLS environment by focusing on the status of a model's condition over time.

The asset reports available for VPLS Manager include the following:

- **Site Health History**—A tabular report showing the status of a single VPLS Site during a specified time period
- **Site Health Percentage**—A pie chart for a single VPLS Site showing all statuses reported and the percentage of time spent in each status during a specified time period
- **VFI Health History**—A tabular report showing the condition of a single VFI during a specified time period
- **VFI Health Summary**—A pie chart for a single VFI showing all conditions reported and the percentage of time spent in each condition during a specified time period

Availability Reports

Availability reports provide historical information about up time and down time for assets in the IT infrastructure. Availability reports can help you determine the health of your VPLS environment by highlighting which VFIs and VPLS Sites performed the best and worst over time.

Important! The availability reports cannot function properly when duplicate site or VFI names are modeled in CA Spectrum. To help ensure these reports work correctly, be sure you provide unique names for all site and VFI models.

The availability reports available for VPLS Manager include the following:

- **Top N Most Available Sites**—A tabular report of best performing VPLS Sites in respect to up-time accumulated during a specified time period
- **Top N Least Available Sites**—A tabular report of the worst performing VPLS Sites in respect to up-time accumulated during a specified time period
- **Top N Most Available VFIs**—A tabular report of the best performing VFIs in respect to up-time accumulated during a specified time period
- **Top N Least Available VFIs**—A tabular report of the worst performing VFIs in respect to up-time accumulated during a specified time period

Glossary

distributed SpectroSERVER (DSS) environment

A *distributed SpectroSERVER (DSS) environment* consists of more than one SpectroSERVER. This environment enables management of a large-scale infrastructure. The SpectroSERVERs in this environment can be located within a single physical location or in multiple physical locations.

main location server (MLS)

The *main location server (MLS)* is the primary SpectroSERVER used to coordinate the information and events from all other SpectroSERVERs connected in a DSS environment.

Provider Edge (PE)

Provider Edge (PE) typically refers to the customer-facing router that is managed by the ISP. These routers interface with the customer network to carry network traffic from one customer server to another within the same LAN.

Service Level Agreement (SLA)

A *Service Level Agreement (SLA)* is typically a contractual agreement between a business and its subscribers guaranteeing a specified level of service, such as 99.9 percent availability. An SLA sometimes contains a penalty clause for noncompliance.

Virtual Forwarding Instance (VFI)

A *Virtual Forwarding Instance (VFI)* is a logical collection of VPLS Sites that are part of the same virtual packet forwarding instance. These VPLS Sites share a common Layer 2 forwarding database, much the same way that Layer 3 devices may share a common routing table.

Virtual Private LAN Service (VPLS)

Virtual Private LAN Service (VPLS) is a way to provide Ethernet-based multi-point to multi-point communication over IP/MPLS networks.

VPLS Site

A *VPLS Site* represents the service delivered to a customer over an interface in your VPLS environment.

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