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Junos Space Documentation and Release Notes

For a list of related Junos Space documentation, see

http://www.juniper.net/techpubs/en_US/junos-space1.3/information-products/index-junos-space.html




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If the information in the latest release notes differs from the information in the documentation, follow the *Junos Space Release Notes*.

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at <http://www.juniper.net/techpubs/>.

Documentation Conventions

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at <http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: <http://www.juniper.net/customers/support/>
- Search for known bugs: <http://www2.juniper.net/kb/>
- Find product documentation: <http://www.juniper.net/techpubs/>
- Find solutions and answer questions using our Knowledge Base: <http://kb.juniper.net/>
- Download the latest versions of software and review release notes: <http://www.juniper.net/customers/csc/software/>
- Search technical bulletins for relevant hardware and software notifications: <https://www.juniper.net/alerts/>

- Join and participate in the Juniper Networks Community Forum:
<http://www.juniper.net/company/communities/>
- Open a case online in the CSC Case Management tool: <http://www.juniper.net/cm/>

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: <https://tools.juniper.net/SerialNumberEntitlementSearch/>

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at <http://www.juniper.net/cm/> .
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see <http://www.juniper.net/support/requesting-support.html> .

PART 1

Overview

- Overview of Junos Space Layer 2 Service Provisioning on page 3

CHAPTER 1

Overview of Junos Space Layer 2 Service Provisioning

- Junos Space Layer 2 Services Overview on page 3
- Provisioning Process Overview on page 12
- Service Attributes Overview on page 15
- Service Order States and Service States Overview on page 23

Junos Space Layer 2 Services Overview

Junos Space Network Activate software enables you to provision the following types of services:

- Point-to-point services across networks that use LDP for signaling in the network core. These services use directed pseudowire virtual circuits across the network to establish point-to-point virtual private networks (VPNs). The provisioner must specify the addresses of the ingress and egress routers of the virtual circuits.
- Multipoint services across networks that use BGP signaling in the network core. These VPLS services use route targets and route distinguishers to establish service connectivity. The Network Activate software supports multipoint-to-multipoint (full mesh) services and point-to-multipoint (hub and spoke) services.

For details about Juniper Networks Layer 2 technologies, see the *JUNOS Software VPNs Configuration Guide*.

Point-to-point services and multipoint services support the following interface types:

- port-to-port—All traffic is transported across the network.
- 802.1Q (dot1q)—Supports 802.1Q VLAN-tagged network traffic in a point-to-point or multipoint Ethernet service. Network traffic is constrained using VLAN IDs.
- Q-in-Q—Supports double tagged traffic in a point-to-point or multipoint Ethernet service.

Table 2 on page 4 provides a guide to selecting the appropriate type of layer 2 service for a specific customer need.

Table 2: Selecting a Layer 2 Service

Customer Requirement	Provision This Service
Send all VLAN traffic from one site to other sites in the service.	Layer 2 VPN port-to-port service OR Layer 2 VPN Q-in-Q to Q-in-Q service for all traffic
Send traffic associated with one specific VLAN from one site to other sites in the service.	Layer 2 VPN 802.1Q-to-802.1Q service
Send traffic associated with a range of VLANs from one site to other sites in the service.	Layer 2 VPN Q-in-Q to Q-in-Q service for a range of VLANs

Juniper Networks refers to this kind of connection as a *Layer 2 circuit*. For details about Layer 2 circuits, see the *Junos Software VPNs Configuration Guide*.

The Network Activate software enables you to provision a range of services from the following service families for your enterprise customers:

- Layer 2 Point-to-Point Ethernet Services with LDP Signaling on page 4
- VPLS Services on page 8

Layer 2 Point-to-Point Ethernet Services with LDP Signaling

Point-to-point services provide transport and encapsulation of Layer 2 Ethernet circuits between two endpoints. To provision a point-to-point LDP service, the provisioner must select the network provider-edge (N-PE) routers that will be the service endpoints and configure the user-network interfaces (UNIs) at those endpoints. The Junos Space software automates the end-to-end provisioning of the pseudowire by establishing a virtual circuit between the N-PE routers using a unique virtual circuit ID (VC ID).

The IETF refers to these connections in *RFC 4905, Encapsulation Methods for Transport of Layer 2 Frames over MPLS Networks as emulated virtual circuits*, and in *RFC 4447, Pseudowire Setup and Maintenance Using the Label Distribution Protocol (LDP) as pseudowire emulation* (see *IETF RFC 4447*).

The Metro Ethernet Forum (MEF) refers to these connections as *E-Line services*. See *Metro Ethernet Services – A Technical Overview* by Ralph Santitoro.

The Junos Space software enables you to provision the following point-to-point service options for your enterprise customers:

- Port-to-Port Service on page 5
- Single VLAN Service Using 802.1Q Interfaces on page 5
- All Traffic Service Using Q-in-Q Interface on page 6
- Range of VLANs Service with Q-in-Q Interfaces on page 6

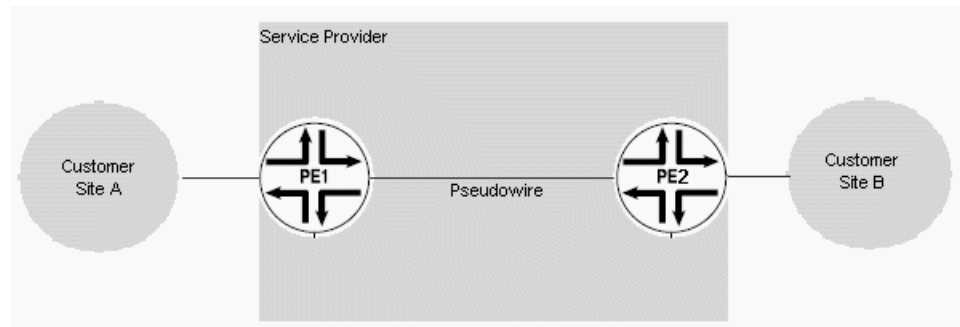
Port-to-Port Service

A port-to-port service transports all traffic on a port on a provider edge (N-PE) router across the network to a port of another N-PE router. enterprise customers need to purchase only a single physical port for all their traffic. However, a single port might cost more than the bandwidth for a single VLAN or selected range of VLANs.

The service provider needs no knowledge of the enterprise customer's VLAN structure, because all the customer's traffic is transported.

Figure 1 on page 5 shows an example in which a port-to-port connection transports all VLAN traffic for an enterprise customer from customer site A to customer site B across the network.

Figure 1: Point-to-Point LDP port-to-port Connection Transports all Traffic

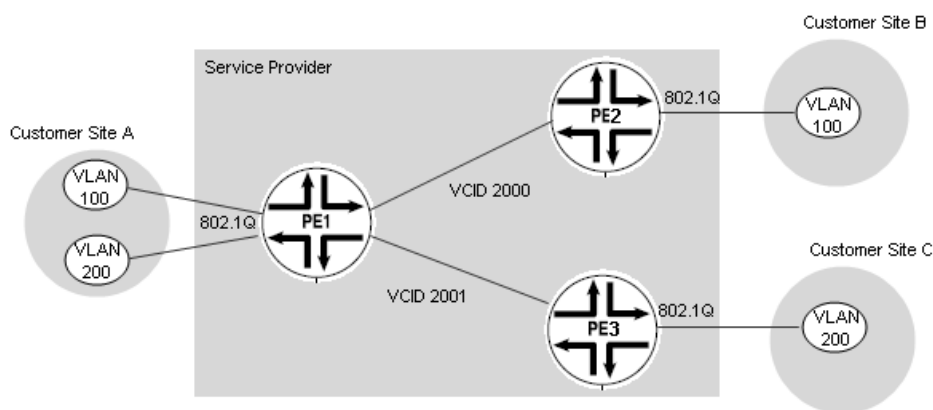


Single VLAN Service Using 802.1Q Interfaces

802.1Q services transport VLAN traffic from one site to another across the network. The selected payload is a single VLAN, so the enterprise customer needs to purchase only the bandwidth necessary to transport that VLAN. To implement this type of service, the service provider must exchange VLAN information with the enterprise customer.

Consider the example shown in Figure 2 on page 6. VLAN 100 might be used for payroll and spans sites A and B. VLAN 200 is used by engineering and spans sites A and C. Payroll and engineering are securely separated by provisioning separate point-to-point connections for each VLAN, each on a separate VCID. Service multiplexing at customer site A allows multiple virtual circuits to share the same port yet provide secure connections to separate sites.

Figure 2: Point-to-Point Ethernet Services with 802.1Q Interfaces



All Traffic Service Using Q-in-Q Interface

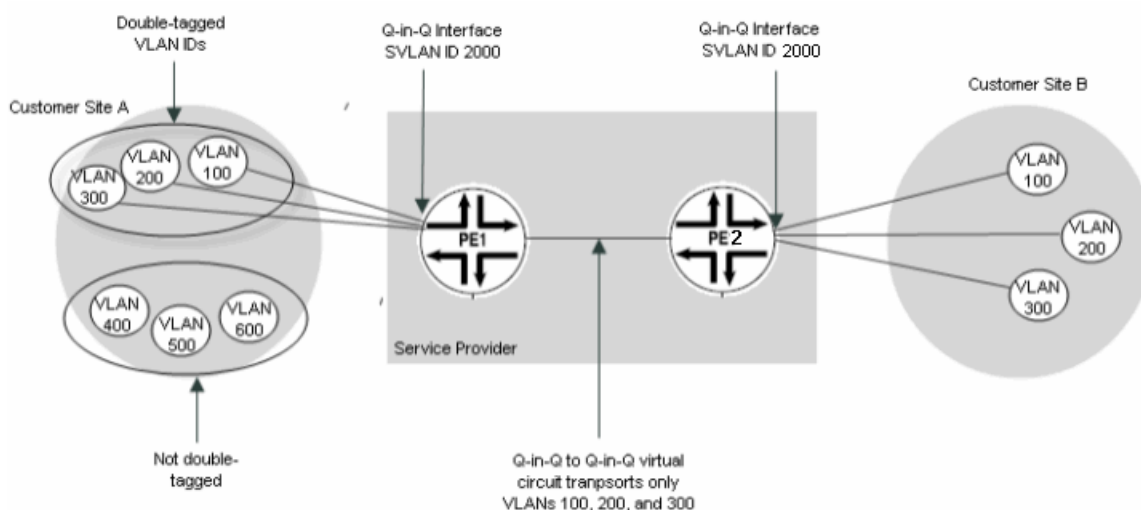
This type of point-to-point Ethernet (LDP) service uses Q-in-Q interfaces and transports all customer traffic from one site to another across the network. The Q-in-Q interface adds a service provider tag to the frame, which isolates the enterprise customer's VLAN tags. The service provider does not need knowledge of the customer's VLAN structure because all traffic is transported to the destination site.

Range of VLANs Service with Q-in-Q Interfaces

This type of point-to-point Ethernet (LDP) service uses QinQ interfaces and carries a range of VLANs across the network. The service provider must establish with the enterprise customer which VLANs are to be transported. The service provider allocates a service provider VLAN ID as a second tag to the selected VLAN ID range, which isolates the traffic on selected VLANs from other traffic.

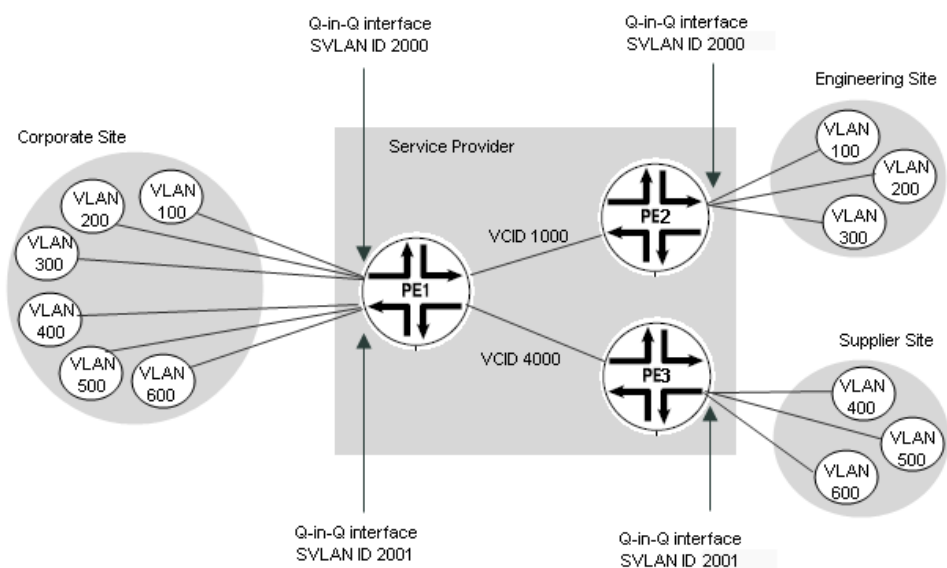
Figure 3 on page 7 shows an example in which an enterprise customer has 6 VLANs with VLAN IDs 100, 200, 300, 400, 500, and 600. The service is provisioned to carry only VLANs 100, 200, and 300 by tagging them with the service provider VLAN ID of 2000. VLANs 400, 500, and 600 do not cross the network.

Figure 3: Point-to-Point Ethernet Service with Q-in-Q Interfaces for Range of VLANs.



You can use separate service VLAN IDs to segregate traffic into secure groups of VLAN IDs. For example, VLANs 100, 200, and 300 might all be part of an enterprise's engineering organization, while VLANs 400, 500, and 600 might exchange information with suppliers. In this example, VLANs 100, 200, and 300 can be double-tagged with service VLAN ID 2000 and get transported only to the remote engineering site, while VLANs 400, 500, and 600 might be tagged with the service VLAN ID of 2001 and get transported only to the supplier's site along a separate pseudowire, as shown in Figure 4 on page 7.

Figure 4: Point-to-Point Ethernet Service with Q-in-Q Interfaces for Range of VLANs on Separate Service Provider VLANs



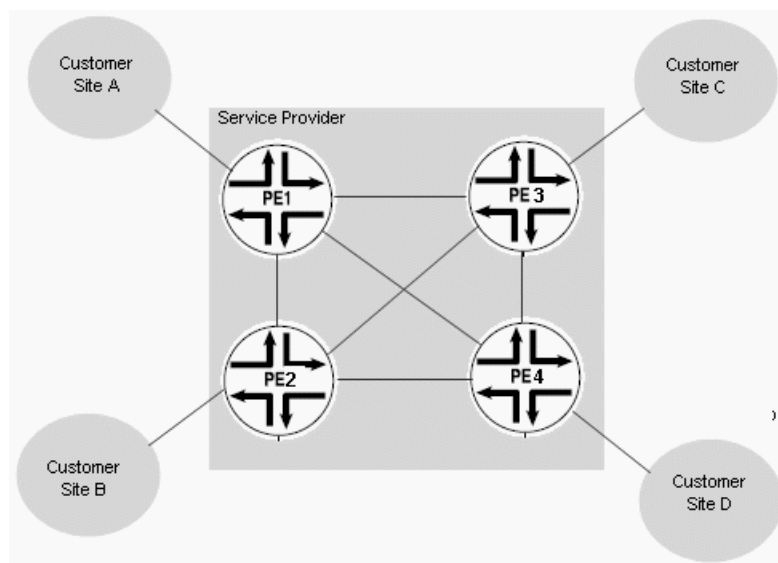
VPLS Services

The Network Activate software supports Virtual Private LAN Services (VPLS) which in turn provides multipoint-to-multipoint services and point-to-multipoint services.

The Metro Ethernet Forum (MEF) refers to these connections as *E-LAN services*. See *Metro Ethernet Services – A Technical Overview* by Ralph Santitiro.

Figure 5 on page 8 shows an example of a multipoint service connecting four customer sites.

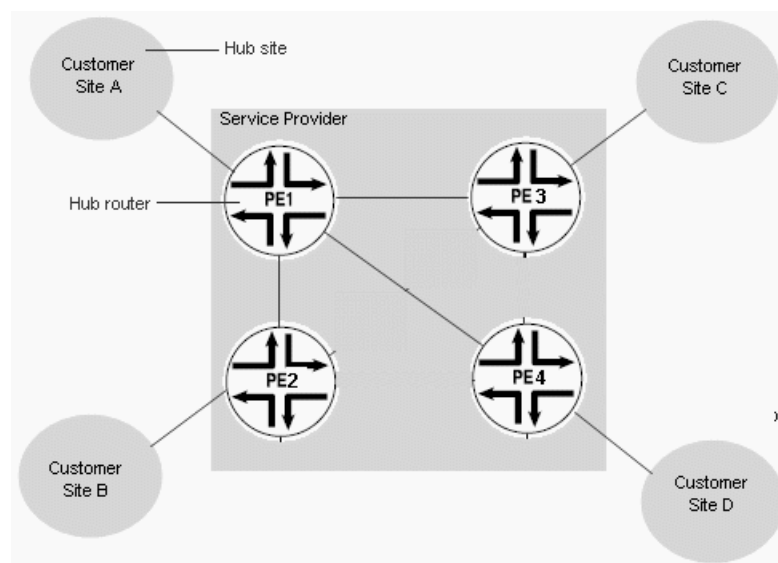
Figure 5: Multipoint-to-Multipoint VPLS Service—Full Mesh



This full mesh design enables direct communication among all PE routers in the service. This topology is efficient for services in which all sites need to communicate with all other sites.

Figure 6 on page 9 shows a point-to-multipoint service with a single hub. The service provides connectivity between the hub router (PE1) and each of the spokes (PE2, PE3, and PE4), but no connectivity exists among the spokes.

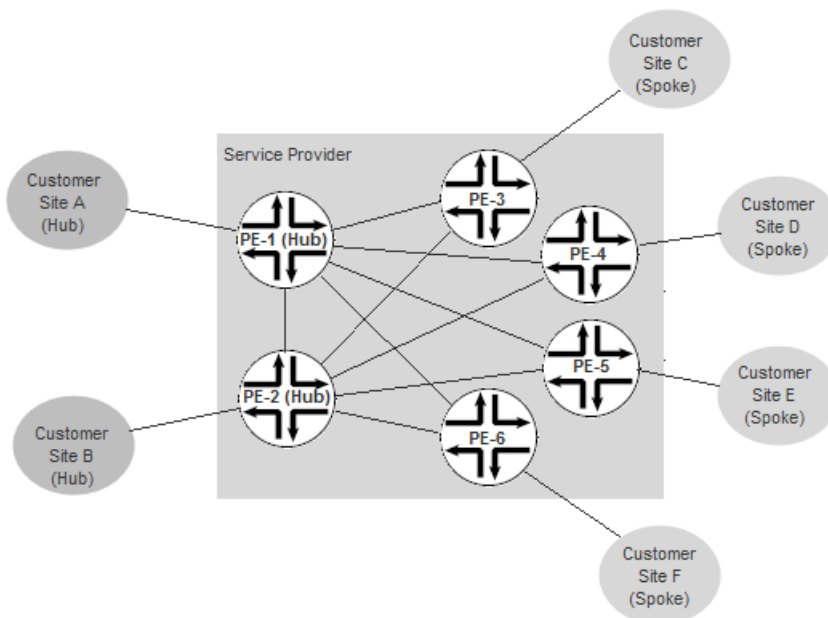
Figure 6: Point-to-Multipoint VPLS Service with Single Hub



This kind of topology is effective for services in which one site needs to communicate with all other sites, but communication among spokes is not required. For example, the hub site might house corporate headquarters, while each of the spoke sites is a region.

Figure 7 on page 9 shows a point-to-multipoint service with two hubs. In this case, all spokes connect to both hubs.

Figure 7: Point-to-Multipoint VPLS Service with Multiple Hubs



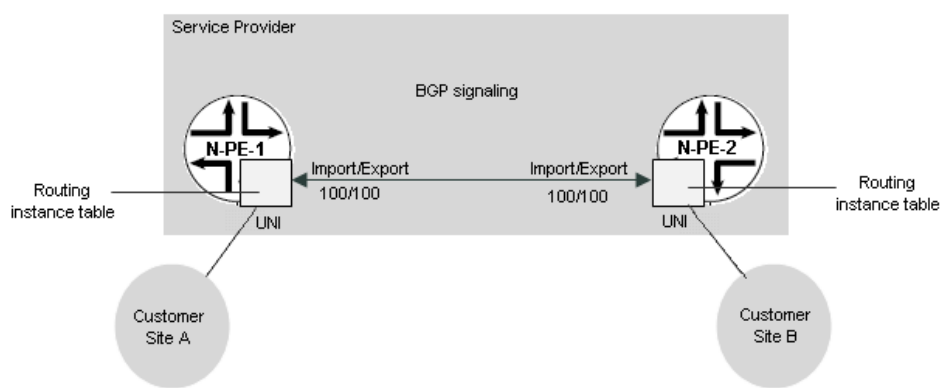
Typical use for dual hub routers is to provide redundancy in case of failure. For example, a data center might be duplicated at customer sites A and B, requiring access to both sites from each spoke for effective redundancy.

For all VPLS topologies, route targets and route distinguishers designate the multipoint connectivity among the participating endpoints.

Service Autodiscovery

The Junos software in the devices uses autodiscovery to establish connectivity among the N-PE routers quickly and efficiently. Figure 8 on page 10 shows an example.

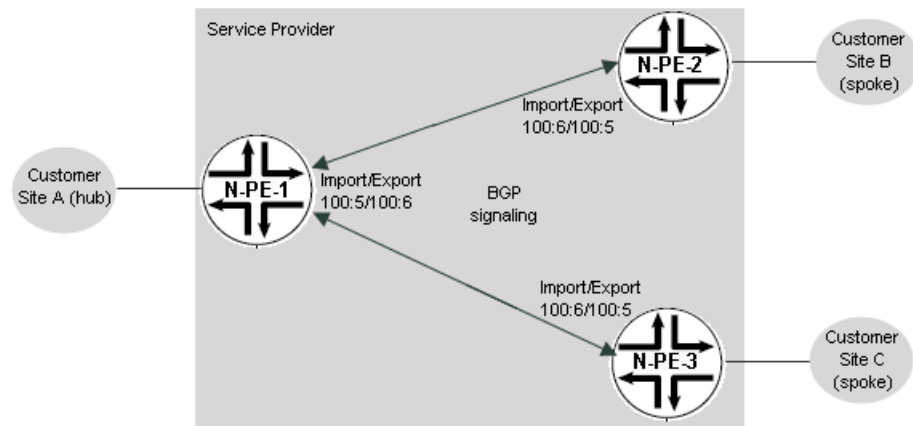
Figure 8: Autodiscovery of Service Connectivity



In this example, device N-PE-1 is the first to be added to the service. It exports route target 100 and imports route target 100. When N-PE-2 is added to the service, it also exports and imports route target 100. The Junos software on the device automatically makes the association and creates the connectivity path between the two devices. Similarly, when you add a third device to the service, so long as it exports/imports the same route targets as the N-PE devices in the existing service, the new device is added to the service and connectivity with both existing N-PE devices is established automatically.

For a point-to-multipoint service, route target/route distinguisher pairs have different values for import and export. These values for import and export are the same for all spokes, but reversed for the hub, thereby enabling communication between each spoke and the hub, but not among spokes. Figure 9 on page 11 shows an example. In this case, device N-PE-1 (the hub router) exports route target:route distinguisher pair 100:6 and imports 100:5. Each spoke imports 100:6 and exports 100:5 enabling communication with the hub, but not with each other.

Figure 9: Autodiscovery in a Point-to-Multipoint Service



VPLS and Normalization

Similar to point-to-point Ethernet services, the UNIs of VPLS services can be port-to-port, 802.1Q, or Q-in-Q. The type of VLAN mapping—or normalization—is specified in the service definition. VLAN normalization applies only to MX Series devices.

Normalization supports automatic mapping of VLANs. Normalization performs operations on VLAN tags to achieve the desired translation. The Network Activate software supports two forms of VLAN normalization:

- **Normalize all**—The customer VLAN ID is preserved across the network. That is, the broadcast domain includes the interfaces that have the same VLAN ID across the VPLS service. For double-tagged packets (Q-in-Q interfaces), a “pop” operation at ingress strips the service VLAN ID from the packet. A corresponding “push” operation at egress inserts the service VLAN ID known at the local site. Hence, the service VLAN ID at egress does not have to match the service VLAN ID at ingress.

For single-tagged packets (802.1Q interfaces), “Normalize All” has no effect, because the packet has no service VLAN ID to pop or push.

- **Normalize none**—The customer VLAN ID is not preserved across the network. The broadcast domain includes all VLANs at any site provisioned in the service. For single-tagged packets (802.1Q interfaces), a “pop” operation at ingress removes the customer VLAN ID from the packet. A corresponding “push” operation at egress adds a local customer VLAN ID.

For double-tagged packets (Q-in-Q interfaces), both customer VLAN ID and service VLAN ID are popped from the packet at ingress and pushed at egress.

If normalization is not used, then all customer VLAN IDs and all service VLAN IDs must match to be part of the same broadcast domain.

Normalization works well with automatically assigned VLAN IDs, because the service provider does not need to specify the VLAN IDs that are popped and pushed. Without normalization, the service provider must specify explicitly the customer VLAN ID and the service VLAN ID.

- Related Topics**
- Service Attributes Overview on page 15
 - Provisioning Process Overview on page 12

Provisioning Process Overview

Provisioning is a multistep process that makes services available to customers.

The Getting Started panel in the Junos Space user interface provides the steps involved in provisioning a service, including not only the provisioning work itself (steps 4 through 9), but also the steps that are necessary before you can begin the provisioning process (steps 1 through 3). The following example shows the Service Provisioning assistant in the Getting Started panel:



Steps in the sequence are often performed by users with different levels of privilege. The Junos Space software provides predefined administrator roles that provide the necessary privilege for each step in the sequence:

- The Device Manager role allows an administrator to discover devices (step 1).
- The Service Manager role allows an administrator to perform device prestaging actions including discovering and assigning device roles (steps 2 and 3).

- The Service Designer roles allows an administrator to create and publish a service definition (step 4).
- The Service Activator (less privileged) role allows an administrator to perform provisioning tasks including creating and managing customers, service orders, and services (steps 5 through 9).

For details about predefined administrator roles, see Predefined Administrator Roles in the *Junos Space Network Application Platform User Guide*.

Network Operator Tasks—Provisioning Prerequisites

Network operators are usually responsible for performing the prerequisite tasks before the following service designer or service provisioner can perform their tasks:

- Discovering devices.
- Launching role discovery.
- Assigning N-PE roles.

Discovering devices is the process for bringing your network devices under Junos Space management. Network operators who are assigned the Device Manager role can perform this task. See Device Discovery Overview in the *Junos Space Network Application Platform User Guide* for more information about discovering devices.

Launching role discovery and assigning N-PE roles are collectively known as prestaging tasks. Prestaging finds the N-PE devices among those already under Junos Space management and assigns appropriate MPLS N-PE roles to these devices and user-to-network interface (UNI) roles to their interfaces. Once these roles are established, the devices are ready for provisioning. Users who are assigned the Service Manager role can perform device role discovery and role assignment. See “Prestaging Devices Overview” on page 27 for more information about prestaging devices.

Service Designer Tasks

The service designer is responsible for the service definitions that the service provisioner will use as the basis for creating a service order.

A service definition specifies the attributes that are common among a group of service orders that have similar service requirements. For example, a service definition might specify a port-to-port service, whether the associated VCID should be assigned automatically from a predefined pool or specified by the user, and what range of bandwidths can be assigned in the service order. The service definition also defines which attributes of the service can be edited in the service order.

The Junos Space product provides several standard service definitions which support most needs. If the standard service definitions do not support your needs, then the service designer needs to create new, customized service definitions.

Users who are assigned the Service Designer role can create and manage service definitions.

Service Provisioner Tasks

Service provisioner tasks include the following:

- Creating the customer.
- Creating the service order.
- Deploying the service.
- Performing a configuration audit.
- Performing a functional audit.

A service order is an instance of the service definition that completes the definition for a specific customer's use. The service order always specifies the customer and the endpoints that link the customer sites through the MPLS network. For each endpoint, the service provisioner specifies the N-PE device and the UNI on that device that connects the customer site to the N-PE device. The service order can also specify any additional attributes that are configured in the service definition as editable in the service order. These attributes might include the VCID, MTU for the UNI, MTU for the connection across the network, VLAN-ID, and rate limiting bandwidth.

Deployment of a service order pushes a service to the network devices. Before deployment completes, a series of prevalidation checks takes place. If the prevalidation checks indicate that the service is valid, the deployment proceeds. If the prevalidation checks indicate an invalid service, the service provisioner must re-create the service order correctly before trying again to deploy it.

After the service is deployed, a functional audit establishes whether the service is up or down. If the functional audit reports that the service is up, the customer can begin using the service.

Once the service is active, the service provisioner can monitor the health of the service by running a functional audit or a configuration audit.

Users assigned the Service Activator role can perform these service provisioning tasks.

Related Topics

- Discovering Devices in the *Junos Space Network Application Platform User Guide*
- Discovering and Assigning All N-PE Devices on page 45
- Discovering and Assigning N-PE Devices with Exceptions on page 47
- Predefined Point-to-Point Ethernet Service Definitions on page 93
- Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
- Predefined Point-to-Multipoint Ethernet Service Definitions on page 140
- Creating a Point-to-Point Ethernet Service Definition on page 66
- Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73
- Creating a Point-to-Multipoint Ethernet Service Definition on page 81
- Unpublishing a Service Definition on page 91

- Adding a New Customer on page 160
- Creating a Point-to-Point Ethernet Service Order on page 163
- Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
- Creating a Point-to-Multipoint Ethernet Service Order on page 178
- Deploying a Service on page 188
- Validating a Service on page 195
- Predefined Administrator Roles in the *Junos Space Network Application Platform User Guide*

Service Attributes Overview

A service is defined by a set of attributes. Some attributes are common to all service instances created from one service definition, and are therefore set during service definition time. Other attributes are specific to a service instance and must be set in the service order. Some attributes can be set either in the service definition or in the service order; in such cases it is up to the service designer to determine when the attribute will be set.

The Network Activate user interface groups service attributes as follows:

- General attributes—General information about the service, such as whether the service is point-to-point, multipoint-to-multipoint (full mesh VPLS), or point-to-multipoint (hub and spoke VPLS), what signaling mechanism is used in the network core, and who the enterprise customer is who uses the service.
- Connectivity settings—Information about connectivity among customer sites through the network. For point-to-point Ethernet services in a network with LDP switching in the network core, these settings include the VC ID. For multipoint Ethernet (or VPLS) services these settings include the route target and route distinguisher.
- Advanced settings—Information about advanced connectivity among customer sites through the network. For multipoint Ethernet (or VPLS) services these settings include tunnel services, local switching, fast-reroute-priority, label block size, and connection type.
- UNI settings—Information about each customer site, including the N-PE device and interface the site uses to connect to the network, the encapsulation method used (physical and logical), MTU, customer VLAN ID and range, service VLAN ID, bandwidth limiting, and so on.

General Attributes

The following general attributes are defined for each service:

- Service Type on page 16
- Customer on page 16
- Enable QoS (Release Candidate Feature) on page 16

Service Type

The service type attribute combines the topology and core signaling technology in the same attribute.

The service type is the first attribute to be determined during service definition. It can combine the topology and core signaling technology in the same attribute and can have one of the following values:

- Point-to-point Ethernet (LDP)—Virtual circuit between two customer sites using LDP signaling in the network core.
- Multipoint-to-multipoint Ethernet (VPLS) —Virtual private LAN service (VPLS) among multiple customer sites using BGP signaling in the network core to provide full mesh connectivity.
- Point-to-multipoint Ethernet (VPLS) —Virtual private LAN service (VPLS) among multiple customer sites using BGP signaling in the network core to provide connectivity between a hub site and multiple spoke sites.

Customer

This attribute specifies the enterprise customer who will use the service instance. This attribute is always specified in the service order.

Enable QoS (Release Candidate Feature)

This attribute specifies whether QoS is enabled on the service to provide priority to certain traffic. This attribute is enabled in the service definition and defined in the service order.

Connectivity Settings

The following attributes are defined for the connectivity among UNI endpoints across the network:

- Virtual Circuit Identifier (VCID) (Point-to-Point Services Only) on page 16
- Route Targets and Route Distinguishers (Multipoint Services Only) on page 16
- Normalized VLAN (Multipoint Services Only) on page 17
- MAC Learning on page 17

Virtual Circuit Identifier (VCID) (Point-to-Point Services Only)

This unique identifier can be assigned automatically from a pool of VCIDs or can be manually specified. It uniquely identifies a point-to-point virtual circuit through the network and is provided for all switched point-to-point services.

Route Targets and Route Distinguishers (Multipoint Services Only)

Route targets and route distinguishers are always automatically generated by the Junos Space software for multipoint Ethernet (VPLS) services. Route targets and route distinguishers designate the multipoint connectivity among the participating endpoints of a multipoint service. They identify the members of the virtual LAN.

Normalized VLAN (Multipoint Services Only)

Similar to point-to-point Ethernet services, the UNIs of VPLS services can be port-to-port, 802.1Q, or Q-in-Q. The type of VLAN mapping—or normalization—is specified in the service definition. VLAN normalization applies only to MX Series devices.

Normalization supports automatic mapping of VLANs and performs operations on VLAN tags to achieve the desired translation. The Network Activate software supports two forms of VLAN normalization:

- **Normalize all**—The customer VLAN ID is preserved across the network. That is, the broadcast domain includes the interfaces that have the same VLAN ID across the VPLS service. For double-tagged packets (Q-in-Q interfaces), a “pop” operation at ingress strips the service VLAN ID from the packet. A corresponding “push” operation at egress inserts the service VLAN ID known at the local site. Hence, the service VLAN ID at egress does not have to match the service VLAN ID at ingress.

For single-tagged packets (802.1Q interfaces), “Normalize All” has no effect, because the packet has no service VLAN ID to pop or push.

- **Normalize none**—The customer VLAN ID is not preserved across the network. The broadcast domain includes all VLANs at any site provisioned in the service. For single-tagged packets (802.1Q interfaces), a “pop” operation at ingress removes the customer VLAN ID from the packet. A corresponding “push” operation at egress adds a local customer VLAN ID.

For double-tagged packets (Q-in-Q interfaces), both customer VLAN ID and service VLAN ID are popped from the packet at ingress and pushed at egress.

If normalization is not used, then all customer VLAN IDs and all service VLAN IDs must match to be part of the same broadcast domain. Services with dedicated port interfaces cannot use normalization.

Normalization works well with automatically assigned VLAN IDs, because the service provider does not need to specify the VLAN IDs that are popped and pushed. Without normalization, the service provider must specify explicitly the customer VLAN ID and the service VLAN ID.

MAC Learning

You can enable MAC learning for a virtual switch, for a bridge domain, for a specific logical interface in a bridge domain, or for a set of bridge domains associated with a Layer 2 trunk port. MAC learning is enabled by default.

When MAC learning is enabled, you can configure the following settings:

Interface MAC Limit

Specify the maximum number of media access control (MAC) addresses that can be learned by the VPLS routing instance. You can configure the same limit for all interfaces configured for a routing instance. You can also configure a limit for a specific interface. The default is 1024 addresses. The range is 16 through 65,536 MAC addresses. This option is supported for MX-series routers only.

MAC Table Size

Modify the size of the MAC address table for the bridge domain, a set of bridge domains associated with a trunk port, or a virtual switch. The default is 5120 MAC addresses.

MAC Statistics

Enable MAC accounting either for a specific bridge domain, or for a set of bridge domains associated with a Layer 2 trunk port. MAC statistics is disabled by default. This option is supported for MX-series routers only.

Advanced Settings (MultiPoint Services Only)

The following attributes are defined for advanced connectivity among UNI endpoints across the network:

- Tunnel Services on page 18
- Local Switching on page 18
- Fast-Reroute-Priority on page 18
- Label Block Size on page 18
- Connectivity Type on page 19

Tunnel Services

You can enable tunnel services to specify that traffic for particular VPLS routing instances be forwarded to specific virtual tunnel (VT) interfaces, allowing you to load-balance VPLS traffic among all the available VT interfaces on the router.

Tunnel services are disabled by default.

Local Switching

In local switching mode, you can terminate multiple Layer 2 circuit pseudowires at a single VPLS mesh group.

Local switching is disabled by default.



NOTE: In a point-to-multipoint topology, you must enable local switching on the hub router and disable local switching on the spokes.

Fast-Reroute-Priority

Specify the fast reroute priority for a VPLS routing instance. You can configure high, medium, or low fast reroute priority to prioritize specific VPLS routing instances for faster convergence and traffic restoration. Because the router repairs next hops for high-priority VPLS routing instances first, the traffic traversing a VPLS routing instance configured with high fast reroute priority is restored faster than the traffic for VPLS routing instances configured with medium or low fast reroute priority. The default setting is LOW.

Label Block Size

VPLS MPLS packets have a two-label stack. The outer label is used for normal MPLS forwarding in the service provider's network. If BGP is used to establish VPLS, the inner label is allocated by a PE router as part of a label block. One inner label is needed for

each remote VPLS site. Four sizes are supported. We recommend using the default size of 8, unless the network design requires a different size for optimal label usage, to allow the router to support a larger number of VPLS instances.

If you allocate a large number of small label blocks to increase efficiency, you also increase the number of routes in the VPLS domain. This has an impact on the control plane overhead.

Changing the configured label block size causes all existing pseudowires to be deleted. For example, if you configure the label block size to be 4 and then change the size to 8, all existing label blocks of size 4 are deleted, which means that all existing pseudowires are deleted. The new label block of size 8 is created, and new pseudowires are established.

Four label block sizes are supported: 2, 4, 8, and 16. Consider the following scenarios:

- 2—Allocate the label blocks in increments of 2. For a VPLS domain that has only two sites with no future expansion plans.
- 4—Allocate the label blocks in increments of 4.
- 8 (default)—Allocate the label blocks in increments of 8.
- 16—Allocate the label blocks in increments of 16. A label block size of 16 enables you to minimize the number of routes in the VPLS domain. Use this setting only if the number of routes is the most important concern.

Connectivity Type

You can configure the VPLS routing instance to take down or maintain its VPLS connections depending on the status of the interfaces configured for the VPLS routing instance. By default, the VPLS connection is taken down whenever a customer-facing interface configured for the VPLS routing instance fails. This behavior is explicitly configured by specifying the `ce` option. You can alternatively specify the `irb` option to ensure that the VPLS connection remain up so long as an Integrated Routing and Bridging (IRB) interface is configured for the VPLS routing instance.

UNI Settings

The following attributes are defined for the service endpoints or customer sites that are connected by the service:

- Ethernet Options on page 20
- N-PE Device on page 20
- Interface on page 20
- MTU on page 20
- Traffic Type on page 20
- Customer VLAN ID on page 21
- Service VLAN ID and VLAN ID Range on page 21
- Physical Encapsulation on page 21
- Logical Encapsulation on page 22
- Rate Limiting and Bandwidth on page 23

Ethernet Options

This attribute identifies the interface type at the endpoint by defining the level packet tagging for the UNI. It can have the following values:

- port-port

Transfers all data from the UNI to the other end of the LSP trunk.

- dot1q

An 802.1Q interface that tags each packet with a VLAN ID, thus allowing a specific VLAN to traverse the network.

- qinq

A Q-in-Q interface that double tags each frame. The inner tag is added by the service provider. The service provider can use this inner tag to differentiate among services. For example, you can configure VLANs for a customer's intranet with a different inner tag from VLANs used for working with providers or partners.

N-PE Device

Specifies the provider-edge device that connects the customer site to the network.



NOTE: The Network Activate application does not support provisioning services for J Series devices.

Interface

Specifies the physical interface on the N-PE device that connects the customer site or CE device to the N-PE device.

MTU

The MTU represents the largest frame size in bytes that passes through the UNI. MTU is configurable.



NOTE: This value is distinct from the MTU assigned to the connectivity in the network core.

Traffic Type

This attribute places restrictions on the traffic that can be transported across the network by the associated service. It can have the following values:

- Transport single VLAN

Restricts the associated service to transporting just one VLAN across the network. This option can be used only with 802.1Q interface types.

- Transport VLAN range

Allows the associated service to transport a range of VLANs across the network. This option can be used only with Q-in-Q interface types.

- Transport all traffic

Allows the associated service to transport all traffic across the network. This option can be used with Q-in-Q interface types only.

The traffic type attribute is not applicable to port-to-port services. Port-to-port services always transport all traffic.

Customer VLAN ID

Specifies a VLAN ID that is attached to each packet to permit VLANs to be shared across the network.

This attribute can be used only with 802.1Q and Q-in-Q interface types.

Service VLAN ID and VLAN ID Range

The service VLAN ID (SVLAN ID) specifies a second level of tagging to segregate groups of VLANs.

The VLAN range specifies a range of VLANs to be transported across the network by associating them with an SVLAN ID.

These options are configurable only for Q-in-Q interfaces.

Physical Encapsulation

Specifies the physical link-layer encapsulation type.

- flexible-ethernet-services—Offers the most flexibility, depending on the characteristics of the N-PE device and its line modules.

For Gigabit Ethernet IQ interfaces and Gigabit Ethernet PICs with small form-factor pluggable transceivers (SFPs) only, use flexible Ethernet services encapsulation when you want to configure multiple per-unit Ethernet encapsulations. This encapsulation type allows you to configure any combination of route, TCC, CCC, and VPLS encapsulations on a single physical port. Aggregated Ethernet bundles cannot use this encapsulation type. If you configure flexible Ethernet services encapsulation on the physical interface, VLAN IDs from 1 through 511 are no longer reserved for normal VLANs.

In the Junos Space Network Activate product, you can use this encapsulation type with 802.1Q interfaces and Q-in-Q interfaces in point-to-point Ethernet services and in multipoint Ethernet services.

- vlan-ccc—You can use Ethernet VLAN encapsulation on CCC interfaces. This option restricts the range of available VLAN IDs to 512 through 4094. 1 through 511 are reserved for internal use.

In the Junos Space Network Activate product, you can use this encapsulation type with 802.1Q interfaces and Q-in-Q interfaces in point-to-point services.

- extended-vlan-ccc—Use extended VLAN encapsulation on CCC interfaces with Gigabit Ethernet interfaces that must accept packets carrying 802.1Q values.

In the Junos Space Network Activate product, you can use this encapsulation type with 802.1Q interfaces and Q-in-Q interfaces in point-to-point services.

- **ethernet-vpls**—Use Ethernet VPLS encapsulation on Ethernet interfaces that have VPLS enabled and that must accept packets carrying standard TPID values.

In the Junos Space Network Activate product, this encapsulation is used only for dedicated port interface types in multipoint Ethernet services.

Logical Encapsulation

Specifies the logical link-layer encapsulation type. Logical encapsulation with 802.1Q interfaces allows you to route multiple services through the same physical interface.

- **vlan-ccc**—Use Ethernet virtual LAN (VLAN) encapsulation on CCC interfaces. When you use this encapsulation type, you can configure the family ccc only.
- **extended-vlan-ccc**—Use extended VLAN encapsulation on CCC interfaces with Gigabit Ethernet interfaces that must accept packets carrying 802.1Q values.
- **vlan-vpls**—Use VLAN VPLS encapsulation on Ethernet interfaces with VLAN tagging and VPLS enabled. Interfaces with VLAN VPLS encapsulation accept packets carrying standard Tag Protocol (TPID) values only.

Table 3 on page 22 defines the logical encapsulation types that are valid for each physical encapsulation type in a point-to-point Ethernet service.

Table 3: Physical and Logical Encapsulation Compatibilities in Point-to-Point Ethernet Services

Physical Encapsulation	Logical Encapsulation	Valid Interface Types
flexible-ethernet-services	vlan-ccc	802.1Q and Q-in-Q
vlan-ccc	vlan-ccc	802.1Q and Q-in-Q
extended-vlan-ccc	extended-vlan-ccc	802.1Q and Q-in-Q
ethernet-ccc	not applicable	dedicated port

Table 4 on page 22 defines the logical encapsulation types that are valid for each physical encapsulation type in multipoint Ethernet services:

Table 4: Physical and Logical Encapsulation Compatibilities in Multipoint Ethernet (VPLS) Services

Physical Encapsulation	Logical Encapsulation	Valid Interface Types
flexible-ethernet-services	vlan-vpls	802.1Q and Q-in-Q
ethernet-vpls	not applicable	dedicated port

Rate Limiting and Bandwidth

Rate limiting allows you to specify the maximum bandwidth permitted for a service.

The burst rate is automatically calculated as two times the MTU of the UNI.

Related Topics • Junos Space Layer 2 Services Overview on page 3

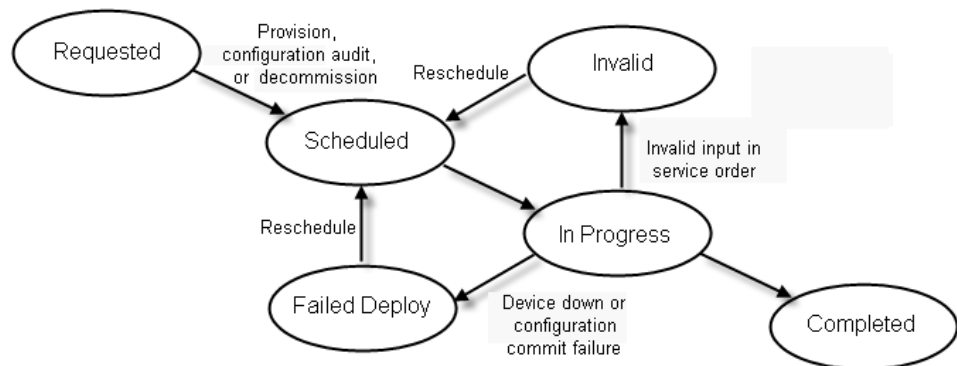
Service Order States and Service States Overview

Service provisioners create service orders which are requests to provision a service, validate a service, or decommission a service. The service order for provisioning a service defines all the service attributes.

Service Order States

Before a service order can affect a service, it must transition through several states as shown in Figure 10 on page 23.

Figure 10: Service Order States and State Transitions



When the service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment, the service order is in the Requested state.

After the service provisioner has scheduled the service order for deployment, the service order transitions to the Scheduled state. If the service provisioner schedules the service order for immediate deployment, then the service order will be in the Scheduled state only briefly. However, if the service provisioner has scheduled a later deployment, the service order could be in this state for several hours or days.

When a scheduled service order reaches its time for deployment, it transitions to the transitory In Progress state. From this state, the Junos Space software attempts to deploy the service. Successful deployment transitions the service order to the Completed state.

If the Junos Space software cannot deploy the service because of invalid information in the service order itself, the service order enters the Invalid state. The service provisioner must resolve the issues that cause the failure before re-creating the service order and rescheduling it for deployment.

If the device is down or the Junos Space software is unable to push the service configuration to the device, the service order transitions to the Failed Deploy state. A network operator might need to resolve the problem before the service provisioner reschedules the service order.

Service States

A service is created when a service order to provision a service reaches the Completed state.

If a service exists, it is in the Deployed state. If a new service fails to deploy, the service does not exist.

If an attempt to modify a service fails, the service enters the Fail Deploy state. When a service is in the Fail Deploy state, you can attempt to redeploy it, or you can delete it.

The service also has an audit state of Up or Down, depending on whether the service passed or failed functional audit.

- Related Topics**
- Viewing Multipoint Ethernet Service Orders as Graphics on page 222
 - Viewing Services on page 232
 - Deploying a Service on page 188
 - Validating a Service on page 195

PART 2

Prestaging Devices

- [Prestaging Devices Overview on page 27](#)
- [Device Configuration Prerequisites to Prestaging on page 33](#)
- [Prestaging Actions on page 39](#)
- [Monitoring Prestaging Activities on page 55](#)

CHAPTER 2

Prestaging Devices Overview

- [Prestaging Devices Overview on page 27](#)

Prestaging Devices Overview

In the Junos Space product, prestaging takes the devices already under Junos Space management and prepares them for service activation. The prestaging process discovers network provider edge (N-PE) devices in the Junos Space database and assigns roles to those devices and their interfaces. N-PE routers and user-to-network interfaces (UNIs) are basic building blocks required by provisioning.



NOTE: The Network Activate application does not support provisioning for J Series devices.

The Junos Space software makes it easy to complete all the prestaging activities you need for up to several hundred devices.

Prestaging uses the Network Activate software to automatically determine the role of a router based on rules that exist in the system. If a router is an N-PE router, the Junos Space software assigns it the N-PE role. The Junos Space software qualifies each interface on the N-PE router to be a serviceable UNI.

N-PE and UNI recommendations made automatically by the Network Activate software are appropriate for most situations. In some networks, however, you might need to make some exceptions. You might have recommended N-PE devices that you don't want to assign the N-PE role for provisioning. In addition, you might want to exclude some interfaces from qualification as UNIs.

To prestage devices while accepting all recommendations made by the Network Activate software, see “Discovering and Assigning All N-PE Devices” on page 45. To make exceptions to the Network Activate recommendations, see “Discovering and Assigning N-PE Devices with Exceptions” on page 47.

The following topics provide additional overview information about the prestaging process:

- [Prestaging Prerequisites on page 28](#)
- [Prestaging Process Overview on page 28](#)

- Prestaging Rules on page 29
- VLAN Pool Profiles on page 30

Prestaging Prerequisites

Before you can perform prestaging on your network devices, each device must meet specific configuration requirements, and must be brought under Junos Space management through device discovery.

The following configuration requirements must be met before beginning the provisioning process. Otherwise, service deployment will fail:

- MPLS must run on each N-PE device and on each P device.
- LDP signaling must be established between N-PE devices that will participate in the same point-to-point Ethernet (LDP) service.
- MPBGP must run on each N-PE device that will participate in a multipoint service.

Before you can prestage devices, you must perform device discovery to import all Juniper Networks devices on your network that the Junos Space software can manage. The Network Activate prestaging software works on devices that have already been discovered and imported into the Junos Space database, but have not yet been prestaged.

For details about bringing devices under Junos Space management, see *Discovering Devices* in the *Junos Space Network Application Platform User Guide*.

Related Topics • *Discovering Devices* in the *Junos Space Network Application Platform User Guide*

Prestaging Process Overview

After the Junos Space software has discovered the devices, you must perform a two or three stage process to prestage devices:

1. Discover roles. In this stage, the Junos Space software searches the database for N-PE devices that have not yet been assigned.
2. Examine the results of the role discovery and make any exceptions to the system recommendations (rare). Specifically, you might:
 - Exclude specified devices from N-PE role assignment.
You might need to do this for a device that you know is not a PE device. For example, Provider (P) devices that have loopback addresses will pass the rules for N-PE role assignment. For devices that you know are not PE devices, you can edit the configuration out-of-band, and then run role discovery again.
 - Select a different loopback address for a device.
 - Exclude interfaces from UNI assignment.
3. Confirm the assignments.

When you confirm device assignments, those devices are removed from the list of recommendations. If, initially, you exclude devices from assignment, you can return to the list of recommendations later and make further assignments.

When you add more devices to your network, you will need to discover those devices and run the role discovery operation again. Running role discovery again overwrites any devices remaining in the role discovery results list of recommended assignments, but has no effect on devices with confirmed assignments.

You make assignments and exceptions using two inventory pages:

- The Assign Roles screen is a device inventory of N-PE routers that the Network Activate software has discovered in its database that have not yet been assigned. You can perform the following operations from the Assign Roles screen:
 - Select multiple devices to assign roles—The most common and recommended prestaging workflow is to select all devices in the Assign Roles screen and assign them all. See “Discovering and Assigning All N-PE Devices” on page 45 for step-by-step instructions for assigning all Junos Space recommendations.
 - Select a single device to assign a role—You must select a single device to change the loopback address or the UNI assignments on that device. For step-by-step instructions on selecting a different loopback address, see “Changing the Loopback Address of an N-PE Device” on page 50.

You can also exclude a single device using this screen.
- Exclude specified devices from the N-PE role. See “Discovering and Assigning N-PE Devices with Exceptions” on page 47 for step-by-step instructions.
- The Manage Device UNIs screen is an inventory of UNI-qualified interfaces for a specific discovered device. You can view a separate Manage Device UNIs screen for each discovered N-PE device. You can perform the following operations from the Manage Device UNIs screen:
 - Exclude multiple interfaces from qualification as UNIs. For step-by-step instructions on excluding interfaces from the list of qualified UNIs, see “Excluding Interfaces from UNI Role Assignments” on page 51.
 - Exclude a single interface from the list qualified for UNI assignment. For step-by-step instructions on selecting a different VLAN Pool Profile, see Modifying the VLAN Pool Profile Used by a UNI.

Related Topics

- Viewing N-PE Devices on page 39
- Discovering and Assigning All N-PE Devices on page 45
- Discovering and Assigning N-PE Devices with Exceptions on page 47

Prestaging Rules

Prestaging rules are predefined. These rules contain criteria for classifying the MPLS role of each device, in addition to recommending which physical interfaces should be UNI

interfaces. For each recommended UNI interface, the system recommends its primary loopback address and its VLAN pool profile.

Correctly assigning MPLS roles to devices is critical for provisioning the correct MPLS behavior. Each MPLS role has a different behavior. For example, N-PE is the only role allowed to terminate MPLS sessions.

The rules used by the Junos Space software to determine the recommended role assignment are described for devices, UNIs, and VLAN pool profiles in the following sections:

- N-PE Device Classification Rules on page 30
- UNI Classification Rules on page 30
- VLAN Pool Profile Classification Rules on page 30

N-PE Device Classification Rules

The system recommends the N-PE role for devices that satisfy the following criteria:

- The comment field in the device configuration identifies the device as an N-PE device.
- The device role is set to N-PE unless EBGP is enabled for the device. Specifically, the device role is set to N-PE unless the device configuration has `configuration/protocols/bgp/group/type` set to `external`. If EBGP is enabled, the device role is set to P.
- The device is assigned a loopback address. A device that has no loopback address cannot function as an N-PE device.

UNI Classification Rules

Before an interface on an N-PE device can be provisioned as a UNI, it must satisfy the following criteria:

- The interface must be Gigabit Ethernet (ge) or 10 Gigabit Ethernet (xe) type.
- The interface must have no IP address defined.

VLAN Pool Profile Classification Rules

The Junos Space software assigns VLAN pool ranges to the UNIs, depending on the configured encapsulation.

Related Topics Viewing Prestaging Rules on page 42

VLAN Pool Profiles

A VLAN pool profile specifies the ranges of valid VLAN IDs that are available for use on MX Series devices, on each physical interface. The maximum theoretical pool of VLAN IDs contains 4096 VLAN IDs—IDs 0 through 4095.

VLAN ID 0 and VLAN ID 4095 are never valid VLAN IDs.

The Network Activate system provides the following predefined VLAN pool profiles:

- **maximum-range**—Any VLAN ID pool created using the maximum-range profile allows any VLAN ID from 1 through 4094. This is the default VLAN profile.
- **vlan-ccc**—Any VLAN ID pool created using the vlan-ccc profile allows any VLAN IDs from 512 through 4094 available for use. VLAN IDs 1 through 511 are reserved for use by Juniper Networks.

For each physical interface that the Network Activate software recommends as a UNI, the system attempts to determine the best VLAN pool profile. For example, if a UNI has the vlan-ccc encapsulation setting, the rules recommend the vlan-ccc pool profile for that interface. When the correct VLAN pool profiles have been assigned to each UNI, The Network Activate software creates a VLAN ID pool for each UNI containing only the allowed VLAN IDs specified in the VLAN pool profile for that UNI.

If the device interface is already running encapsulation before being brought under Junos Space management, the Network Activate software will assign the appropriate VLAN range.

For details about encapsulation, see the *Junos Software VPNs Configuration Guide*.

Related Topics

- Viewing Prestaging Rules on page 42
- Discovering and Assigning All N-PE Devices on page 45
- Discovering and Assigning N-PE Devices with Exceptions on page 47

CHAPTER 3

Device Configuration Prerequisites to Prestaging

- Base Configuration for N-PE Device to be Used in Multipoint Service on page 33
- Base Configuration for N-PE Device to be Used in a Point-to-Point Ethernet (LDP) Service on page 34
- Base Configuration for a P Router on page 36

Base Configuration for N-PE Device to be Used in Multipoint Service

An N-PE device to be used in a multipoint service must have the following entities configured before you assign the N-PE role to the device:

- Gigabit Ethernet interfaces to the network core
- Loopback interface
- Routing options
- MPLS protocol
- BGP protocol
- ospf protocol
- ldp protocol

A sample configuration follows. The N-PE device in this example has just one interface to the network core. In a more complex network in which the N-PE device connects to more than one P device, you would need to configure multiple interfaces.

```
interfaces {
  ge-0/0/0 {
    unit 0 {
      family inet {
        address 10.1.22.2/30;
      }
      family mpls;
    }
  }
  lo0 {
    unit 0 {
```

```
        family inet {
            address 192.168.1.30/32;
        }
    }

}

routing-options {
    autonomous-system 65410;
}

protocols {
    mpls {
        interface ge-0/0/0.0;
        interface lo0.0;
    }
    bgp {
        group CA-Peer {
            type internal;
            local-address 192.168.1.30;
            family l2vpn {
                signaling;
            }
            neighbor 192.168.1.40;
            neighbor 192.168.1.10;
            neighbor 192.168.1.20;
            neighbor 192.168.1.50;
            neighbor 192.168.1.60;
        }
    }
    ospf {
        traffic-engineering;
        area 0.0.0.0 {
            interface lo0.0 {
                passive;
            }
            interface ge-0/0/0.0;
        }
    }
    ldp {
        interface ge-0/0/0.0;
        interface lo0.0;
    }
}
```

- Related Topics**
- Base Configuration for N-PE Device to be Used in a Point-to-Point Ethernet (LDP) Service on page 34
 - Base Configuration for a P Router on page 36

Base Configuration for N-PE Device to be Used in a Point-to-Point Ethernet (LDP) Service

An N-PE device to be used in a point-to-point service must have the following entities configured before you assign the N-PE role to the device:

- Gigabit Ethernet interfaces to the network core
- Loopback interface
- MPLS protocol

- ospf protocol
- ldp protocol

A sample configuration follows. The N-PE device in this example has just one interface to the network core. In a more complex network in which the N-PE device connects to more than one P device, you would need to configure multiple interfaces.

```

interfaces {
  ge-0/0/0 {
    unit 0 {
      family inet {
        address 10.1.18.2/30;
      }
      family mpls;
    }
  }
  lo0 {
    unit 0 {
      family inet {
        address 192.168.1.20/32;
      }
    }
  }
}
protocols {
  mpls {
    interface ge-0/0/0.0;
    interface lo0.0;
  }
  ospf {
    traffic-engineering;
    area 0.0.0.0 {
      interface lo0.0 {
        passive;
      }
      interface ge-0/0/0.0;
    }
  }
  ldp {
    interface ge-0/0/0.0;
    interface lo0.0;
  }
}

```



NOTE: If the N-PE router will also be used in multipoint services, do not use this base configuration. Instead, use the base configuration for multipoint services.

Related Topics

- Base Configuration for N-PE Device to be Used in Multipoint Service on page 33
- Base Configuration for a P Router on page 36

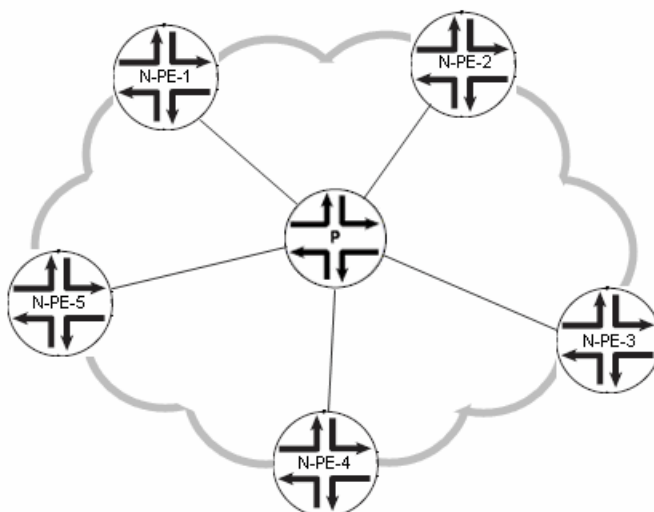
Base Configuration for a P Router

P routers in your MPLS network must have the following entities configured before these devices are prestaged:

- A Gigabit Ethernet interface to each router in the network
- Loopback interface
- MPLS protocol
- ospf protocol
- ldp protocol

Figure 11 on page 36 shows a simple network with one P router connecting five N-PE routers.

Figure 11: Connectivity in a Simple Network



The following example shows a P-router configuration for the simple network shown in Figure 11 on page 36.

```

interfaces {
    ge-0/0/2 {
        unit 0 {
            family inet {
                address 10.1.14.1/30;
            }
            family mpls;
        }
    }
    ge-0/0/3 {
        unit 0 {
            family inet {
                address 10.1.15.2/30;
            }
            family mpls;
        }
    }
}
  
```

```

}
ge-5/0/0 {
  unit 0 {
    family inet {
      address 10.1.17.1/30;
    }
    family mpls;
  }
}
ge-5/0/1 {
  unit 0 {
    family inet {
      address 10.1.18.1/30;
    }
    family mpls;
  }
}
lo0 {
  unit 0 {
    family inet {
      address 192.168.1.1/32;
    }
  }
}
}

protocols {
  mpls {
    interface ge-0/0/2.0;
    interface ge-0/0/3.0;
    interface ge-5/0/0.0;
    interface ge-5/0/1.0;
    interface lo0.0;
  }
  ospf {
    traffic-engineering;
    area 0.0.0.0 {
      interface ge-0/0/2.0;
      interface ge-0/0/3.0;
      interface ge-5/0/0.0;
      interface ge-5/0/1.0;
      interface lo0.0 {
        passive;
      }
    }
  }
  ldp {
    interface ge-0/0/2.0;
    interface ge-0/0/3.0;
    interface ge-5/0/0.0;
    interface ge-5/0/1.0;
  }
}

```

- Related Topics**
- Base Configuration for N-PE Device to be Used in Multipoint Service on page 33
 - Base Configuration for N-PE Device to be Used in a Point-to-Point Ethernet (LDP) Service on page 34

CHAPTER 4

Prestaging Actions

- Viewing N-PE Devices on page 39
- Viewing Prestaging Rules on page 42
- Discovering and Assigning All N-PE Devices on page 45
- Discovering and Assigning N-PE Devices with Exceptions on page 47
- Adding a UNI on page 52
- Unassigning N-PE Devices on page 53
- Deleting UNIs on page 53

Viewing N-PE Devices

You can view network devices that have been assigned the N-PE role using either a thumbnail display or a table.

The following topics provide procedures for viewing N-PE devices:

- Viewing N-PE Devices as Graphics on page 39
- Viewing N-PE Devices in a Table on page 41

Viewing N-PE Devices as Graphics

To view N-PE devices in a graphical form, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the Manage Device Roles screen header, select the graphical view icon.

Thumbnails of every device on the network assigned the N-PE role appear in the main display area.

4. To view summary information about a specific N-PE device, select the device thumbnail and drag the zoom slider to the rightmost position. The following device information appears in the main display area:
 - Name—The name assigned to the device
 - Role—The assigned MPLS role for the device (N-PE)

- Management address—The address to which the Junos Space fabric connects to the device
 - Loopback address
5. To view additional device details, including UNI information, click **Details** in the thumbnail for the device. The NPE Details window appears.

The detailed view provides the following information:

- Name—The name assigned to the device
- MPLS Role—The assigned MPLS role for the device (N-PE)
- Serial number—The serial number of the device
- OS version—The version of the Junos software on the device
- Platform—The device type and model, for example MX240
- Loopback address
- Connection status—up or down
- UNI Interfaces—All assigned UNIs on the device with the applied VLAN pool profile

An example follows:



Viewing N-PE Devices in a Table

To view N-PE devices in a table, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the Manage Device Roles screen header, select the table view icon.

A table of information about all N-PE devices on your network appears. For each device, the table presents the following information:

- Name—The name assigned to the device.
 - Management Address—The address to which the Junos Space fabric connects to the device.
 - Loopback Address
4. To view device details and UNI information, double-click the table row for the device. The device detail view appears in the main display area. The detailed view lists all UNIs discovered on the device with the applied VLAN pool profile and includes the following device information:

- Name—The name assigned to the device
- Role—The assigned MPLS role for the device (N-PE)
- Management address—The address to which the Junos Space fabric connects to the device
- Loopback address
- Connection status—up or down

- Related Topics**
- [Prestaging Devices Overview on page 27](#)
 - [Viewing Prestaging Statistics on page 55](#)
 - [Viewing Prestaging Rules on page 42](#)
 - [Adding a UNI on page 52](#)
 - [Unassigning N-PE Devices on page 53](#)
 - [Deleting UNIs on page 53](#)
 - [Discovering Devices in the *Junos Space Network Application Platform User Guide*](#)

Viewing Prestaging Rules

Prestaging rules contain criteria for classifying the MPLS role of each device and recommending which physical interfaces should be UNI interfaces. For each recommended UNI interface, the system recommends its primary loopback address.

These prestaging rules are predefined and cannot be configured. They are neither selectable nor configurable. However, you can modify the results of the rules before committing the recommended assignments to the database.

The following topics show how to view prestaging rules in either a graphical or a tabular view. You can view a summary of all prestaging rules, see a summary or view details of a specific prestaging rule.

- [Viewing Prestaging Rules as Graphics on page 42](#)
- [Viewing Prestaging Rules in a Table on page 44](#)

Viewing Prestaging Rules as Graphics







To view the prestaging rules as graphics, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace.
2. In the task ribbon, select the **Manage Device Roles** task.
3. In the task ribbon, select **Rules**.
The Prestaging Rules screen appears.
4. In the Prestaging Rules screen header, select the thumbnail view icon.

Thumbnails representing each of the prestaging rules appear.

Each thumbnail contains a decoration in the top left corner that identifies the type of check the rule performs and a unique name that identifies the specific rule. Table 5 on page 43 describes each prestaging rule.

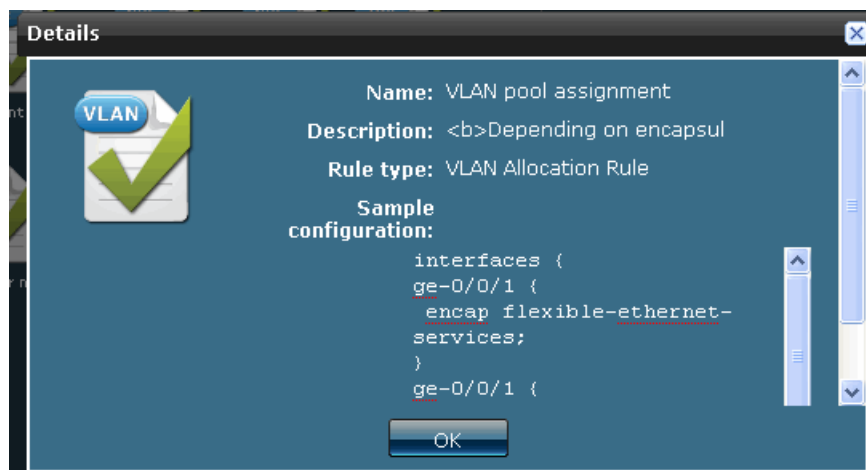
Table 5: Prestaging Rules

Name	Rule Type	Explanation
Comment match		Checks whether the Comment field in the device configuration explicitly identifies the device as a PE device. The Comment field must contain "PE" if the device is to be assigned the PE MPLS role.
Loopback check		Checks whether the loopback IP address is set in the device configuration. A loopback address must be set if the device is to be assigned the PE MPLS role.
BGP type		Checks whether EBGp is enabled for the device. Specifically, the rule checks whether the device configuration has configuration/protocols/bgp/group/type set to "external." EBGP must not be enabled if the device is to be assigned the PE MPLS role. Devices with EBGp set are instead assigned the P role.
Filter for Ethernet ports		Checks for Gigabit Ethernet (ge) or 10 Gigabit Ethernet (xe) interfaces.
Filter for non IP ports		Excludes interfaces with IP addresses from UNI assignment.
Vlan pool assignment		Depending on configured encapsulation, correct VLAN pool ranges are assigned to the UNIs: <ul style="list-style-type: none"> vlan-ccc—512 through 4094 flexible-ethernet-services—1 through 4094 flexible-vlan-services—1 through 4094 extended-vlan-ccc—1 through 4094

- To view summary information about a specific prestaging rule, drag the zoom slider to the rightmost position. The following summary information appears in the main display area:

- The name of the rule

- The rule type; that is, whether it is an NPE rule, a UNI rule, or a VLAN allocation rule
 - A brief description of the rule
6. To view additional details about a rule, click **Details** for the selected rule. The additional information includes a sample configuration that satisfies the rule:



Viewing Prestaging Rules in a Table

To view prestaging rules in a tabular format, follow these steps:

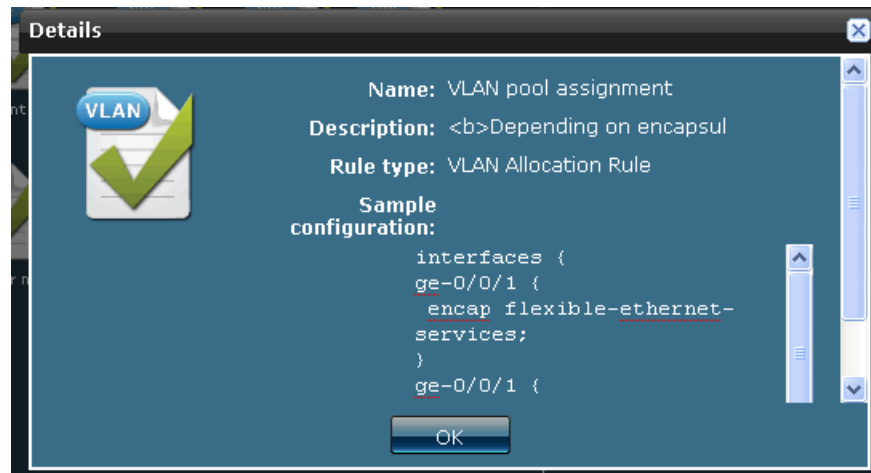
1. In the Network Activate task ribbon, select the **Prestage Devices** workspace.
2. In the task ribbon, select the **Manage Device Roles** task.
3. In the task ribbon, select **Rules**.

The Prestaging Rules screen appears.

4. In the Prestaging Rules screen header, select the table view icon.

A table appears listing all the prestaging rules along with a brief description of each rule. See Table 5 on page 43 for details.

5. To view details about the rule, including a sample configuration, double-click the table row. An example output follows:



- Related Topics**
- [Prestaging Devices Overview on page 27](#)
 - [Viewing N-PE Devices on page 39](#)
 - [Discovering and Assigning All N-PE Devices on page 45](#)
 - [Discovering and Assigning N-PE Devices with Exceptions on page 47](#)

Discovering and Assigning All N-PE Devices

Prestaging all Network Activate assignment recommendations is a powerful yet simple way to prepare your devices for provisioning. This procedure provides the prestaging steps that accept all system recommendations. To prestage devices and make exceptions to the system recommendations, see “Discovering and Assigning N-PE Devices with Exceptions” on page 47.

Before discovering and assigning N-PE devices, you must have already have run device discovery. See *Discovering Devices in the Junos Space Network Application Platform User Guide*.

Prestaging has two parts:

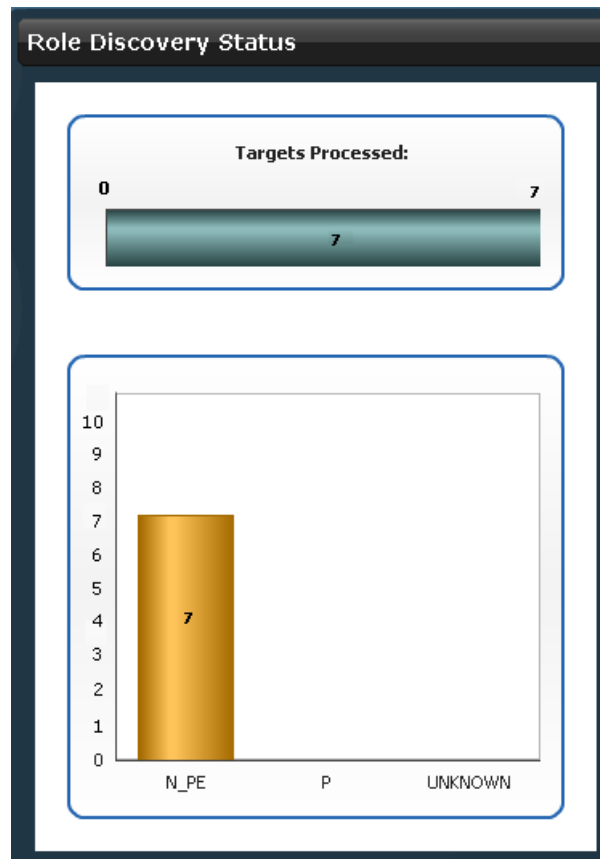
1. [Discovering Device Roles on page 45](#)
2. [Assigning Device Roles on page 47](#)

Discovering Device Roles

To discover the roles of devices found during element discovery, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Discover Roles** task icon.

The Role Discovery Status window shows the discovery of unassigned devices found in the database, as shown in the following example:



The graph portion of this example shows how many of the unassigned devices the prestaging rules determined could be assigned the N-PE role and how many could be assigned the P role. The UNKNOWN bar indicates devices that had no MPLS role assigned but for which the Network Activate software was unable to recommend a role.

4. To view the devices for which the Network Activate software recommends the PE role, click on the N_PE bar.

The Assign Roles screen appears.

The question mark on each icon indicates that the device role has not yet been assigned.

Device role discovery is now complete. To assign device and interface roles, follow the steps in the next section, "Assigning Device Roles" on page 47.

Assigning Device Roles

If you need to exclude devices from role assignment, or you need to exclude interfaces from the list of interfaces that can be used as UNIs, use the procedures documented in “Discovering and Assigning N-PE Devices with Exceptions” on page 47.

To assign all discovered roles and interfaces, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select **Manage Device Roles**.
3. The Manage Device Roles screen appears and shows all devices with roles currently assigned.
4. In the task ribbon, select the **Assign Roles** task icon.
5. In the Assign Roles screen, click **Multiple** in the quick view pane and select all devices.
6. Open the Actions drawer and select **Assign NPE Role**.
7. In the confirmation screen, click **Assign**.
8. To view the assignment status, in the Job Details screen, click the job ID of the assignment job.

The Manage Jobs screen shows the progress and status of the role assignment job. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

While the job is ongoing, you cannot make additional assignments from the Assign Roles screen. The Assign NPE Role action is dimmed to indicate you cannot select it.

Related Topics

- Prestaging Devices Overview on page 27
- Discovering and Assigning N-PE Devices with Exceptions on page 47
- Unassigning N-PE Devices on page 53
- Deleting UNIs on page 53
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
- Viewing Prestaging Rules on page 42
- Discovering Devices in the *Junos Space Network Application Platform User Guide*

Discovering and Assigning N-PE Devices with Exceptions

Preparing network devices for service activation is usually a simple process which directs the Network Activate software to prepare your devices automatically. When you prestage devices, the Network Activate software scans the database for devices that have already been discovered but have no MPLS role assigned, and recommends a role for each device it finds, based on the device configuration data and a set of predefined rules. You can then display those devices and their recommended settings for:

- MPLS role for the device (PE only)
- Loopback interface
- UNI interfaces

The Network Activate software allows you to exclude specific recommended devices from being assigned the N-PE role and to exclude interfaces from use as UNIs during service provisioning. You can also change the loopback address of a PE device.

For step-by-step instructions on how to prepare devices for network activation using all the recommendations for N-PE role assignment and UNI assignment that the Network Activate software makes, see “Discovering and Assigning All N-PE Devices” on page 45. These topics describe how to prestage devices with exceptions:

1. Discovering Device Roles on page 48
2. Excluding Devices from N-PE Role Assignment on page 50
3. Changing the Loopback Address of an N-PE Device on page 50
4. Excluding Interfaces from UNI Role Assignments on page 51
5. Committing Your Prestaging Choices on page 51

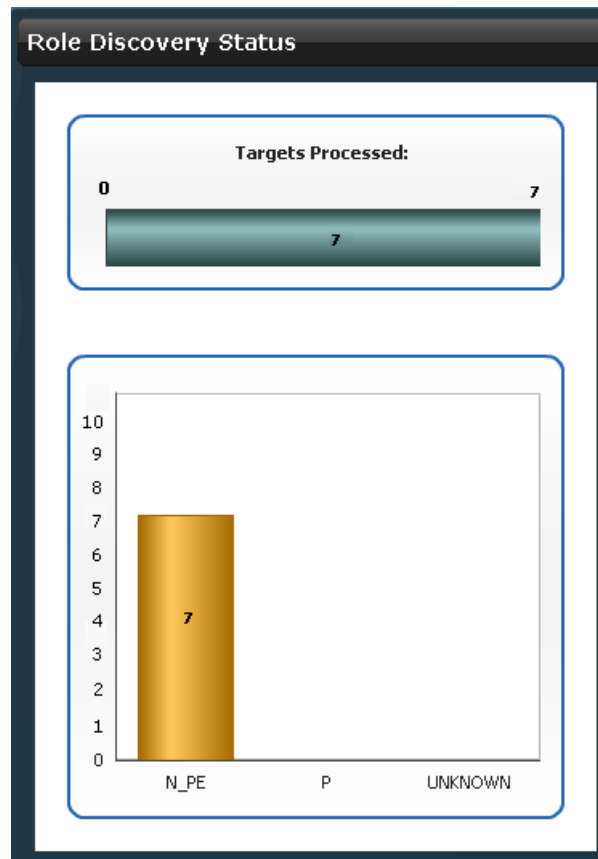
Discovering Device Roles

Before discovering device roles, you must run device discovery. See *Discovering Devices* in the *Junos Space Network Application Platform User Guide*.

To discover unassigned PE devices, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Discover Roles** task icon.

The Role Discovery Status window shows the discovery of unassigned devices found in the database, as shown in the following example:



NOTE: If this is not the first time you have run the discover roles operation, this action overwrites any recommendations remaining from the previous discover roles operation. Devices with confirmed roles are not affected.

The Targets Processed box contains a progress bar, which when finished, shows how many unassigned devices the Network Activate software found in its database.

The graph portion of this example shows how many of the unassigned devices the prestaging rules determined could be assigned the N-PE role and how many could be assigned the P role. The UNKNOWN bar indicates devices that had no MPLS role assigned but for which the Network Activate software was unable to recommend a role.

4. To view the devices for which the Network Activate software recommends the PE role, click on the N_PE bar.

The Assign Roles screen appears.

The question mark on each icon indicates that the device role has not yet been assigned.

5. Choose your next step:

- To exclude a device, see “Excluding Devices from N-PE Role Assignment” on page 50.
- To change the loopback address for specific devices, see “Changing the Loopback Address of an N-PE Device” on page 50.
- To exclude some UNIs for specific devices, see “Excluding Interfaces from UNI Role Assignments” on page 51.

Excluding Devices from N-PE Role Assignment

The rules-driven process that the Network Activate software uses to discover device roles recommends the correct roles in most cases. To exclude a device from N-PE role assignment, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Assign Roles** task icon.

The results of the most recent role discovery operation appear.

4. In the Assign Roles screen, select the N-PE device that you want to exclude from role assignment. To exclude several N-PE devices, use the multiple selection capability.
5. Open the Actions drawer and select **Exclude from NPE Role**.

The Assign Roles screen refreshes. The excluded devices are no longer visible.

Changing the Loopback Address of an N-PE Device

The Network Activate software allows you to change the loopback address of an N-PE device to that of a different loopback unit.



NOTE: Although Junos software allows you to assign multiple loopback addresses to the same loopback unit, the Junos Space software recognizes only the first address assigned to the loopback unit. Therefore, when you change the loopback address of an N-PE device, it must be to that of a different loopback unit.

To change the loopback address of an N-PE device, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Assign Roles** task icon.

The results of the most recent role discovery operation appear, including any changes you have subsequently made to your prestaging data.

Repeat steps 4 through 7 for each device for which you want to change the loopback address.

4. In the Assign Roles screen, select the device for which you want to change the loopback address.
5. Open the Actions drawer and select **Modify Loopback Address**.
6. In the Modify Loopback Address window, select the loopback address you want to use.
7. Click **Modify**.

The new loopback address appears.

Excluding Interfaces from UNI Role Assignments

To exclude interfaces from the list of interfaces that the prestaging rules determined were suitable for use as UNIs, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Assign Roles** task icon.

The results of the most recent role discovery operation appear, including any changes you have subsequently made to your prestaging data.

Repeat steps 4 through 9 for each device for which you want to exclude some recommended UNI selections:

4. In the Assign Roles screen, select the device for which you want to manage UNIs.
5. Open the Actions drawer and select **Manage Device UNIs**.

The Manage Device UNIs screen shows all the device interfaces for the selected device and indicates those that the Network Activate software recommends for use as UNIs.

6. In the Manage Device UNIs screen, select the UNI you want to exclude.

To exclude more than one UNI, use the multiple selection capability.

7. Open the Actions drawer and select **Exclude from UNI Role**.
8. Open the Actions drawer and select **Return to Assign Roles** to return to the Assign Roles screen.

Committing Your Prestaging Choices

This procedure provides instructions for assigning the N-PE role to selected devices and committing all device prestaging information to the database.

Before performing these steps, you must complete the following tasks:

- Discover devices that have not yet been assigned an MPLS role.
- Exclude from the list of discovered devices those devices that you do not want to assign the N-PE role to.
- On each device, exclude the interfaces you do not want used as UNIs.

To commit your prestaging choices to the database, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the task ribbon, select the **Assign Roles** task icon.
4. Examine the list of devices to be sure these are the devices you want to assign the N-PE role.
5. Select all devices.
6. Click **Assign NPE Role**.
7. In the confirmation screen, click **Assign**.
8. To view the assignment status, in the Job Details screen, click the job ID of the assignment job.

The Manage Jobs screen shows the progress and status of the role assignment job. See *Viewing Scheduled Jobs in the Junos Space Network Application Platform User Guide* for details.

While the job is ongoing, you cannot make additional assignments from the Assign Roles screen. The Assign NPE Role action is dimmed to indicate you cannot select it.

- Related Topics**
- [Prestaging Devices Overview on page 27](#)
 - [Discovering and Assigning All N-PE Devices on page 45](#)
 - [Unassigning N-PE Devices on page 53](#)
 - [Adding a UNI on page 52](#)
 - [Deleting UNIs on page 53](#)
 - [Viewing Scheduled Jobs in the Junos Space Network Application Platform User Guide](#)
 - [Viewing Prestaging Rules on page 42](#)
 - [Viewing N-PE Devices on page 39](#)
 - [Discovering Devices in the Junos Space Network Application Platform User Guide](#)

Adding a UNI

To add a UNI to the list of UNIs that can be assigned to a service on a specific device, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the Manage Device Roles screen, select the device on which you want to add an interface to the list of potential UNIs.
4. Open the Actions drawer and select **Add Device UNIs**.

5. The Assign Device UNIs screen appears, displaying all interfaces on the device that have not been assigned.

Interfaces that the prestaging rules identified as having UNI capability have the UNI symbol in the upper left corner of the thumbnail.

6. Select the interface you want to make available for assignment as a UNI. To select multiple interfaces, use the multiple selection feature.
7. Open the Actions drawer and select **Assign UNI**.
8. In the Assign UNI role window, click **Confirm** to assign the UNI.

- Related Topics**
- Viewing N-PE Devices on page 39
 - Deleting UNIs on page 53

Unassigning N-PE Devices

To unassign an N-PE device so that it can no longer be assigned to a service, follow these steps:



NOTE: Before you can unassign an N-PE device, it must not be assigned to any deployed service.

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the Manage Device roles screen, select the N-PE device you want to unassign.
4. Open the Actions drawer and select **Unassign NPE Role**.



NOTE: If services are deployed on this device, the Unassign NPE Role action will be dimmed and not selectable.

5. The Manage Device Roles screen refreshes and shows the selected device removed.

- Related Topics**
- Viewing N-PE Devices on page 39
 - Discovering and Assigning All N-PE Devices on page 45
 - Discovering and Assigning N-PE Devices with Exceptions on page 47

Deleting UNIs

After performing the initial assignment of N-PE devices and UNIs, you can still exclude additional interfaces from the list of UNIs so long as those UNIs are not assigned to services.

To remove an interface from consideration as a UNI, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
2. In the task ribbon, select the **Manage Device Roles** task icon.
3. In the Manage Device Roles screen, select the device you want to work on.
4. Open the Actions drawer and select **Manage Device UNIs**.

The Manage Device UNIs screen appears. It shows all the interfaces that have been assigned the UNI role.

5. Select the interface you no longer want to have the UNI role. To unassign multiple interfaces, use the multiple selection feature.
6. Open the Actions drawer and select **Delete UNI**.
7. In the Exclude from UNI Role confirmation window, click **Exclude**.

- Related Topics**
- Viewing N-PE Devices on page 39
 - Adding a UNI on page 52

CHAPTER 5

Monitoring Prestaging Activities

- Monitoring Device Roles on page 55

Monitoring Device Roles

- Viewing Prestaging Statistics on page 55

Viewing Prestaging Statistics

The landing page for the Prestage Devices workspace contains charts and graphs that provide information about available capacity on discovered N-PE devices. You can determine which devices have UNIs available, or which devices have plenty of available capacity for routing services.

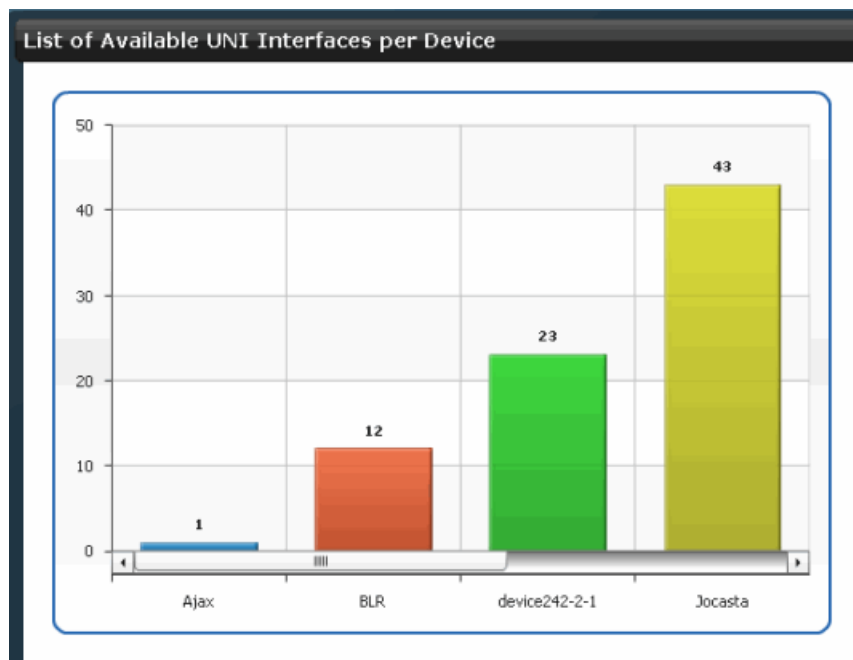
The following topics describe viewing statistics in the Prestage Devices workspace landing page:

- Viewing Available UNIs on N-PE Devices on page 55
- Viewing Services on N-PE Devices on page 56

Viewing Available UNIs on N-PE Devices

To view the number of available UNIs on each device allocated an N-PE role, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.
The Junos Space software displays the chart named List of Available UNI Interfaces per Device. An example follows:



Each vertical bar represents an N-PE device. The number of UNIs is shown on the Y axis. If more than four devices on your network have been assigned the N-PE role, drag the slider across the bottom of the graph to view all devices.

2. To list the UNIs configured on a specific N-PE device:
 - a. Click on the bar that represents the device.
 - b. In the Manage Device Roles screen, double-click the device.

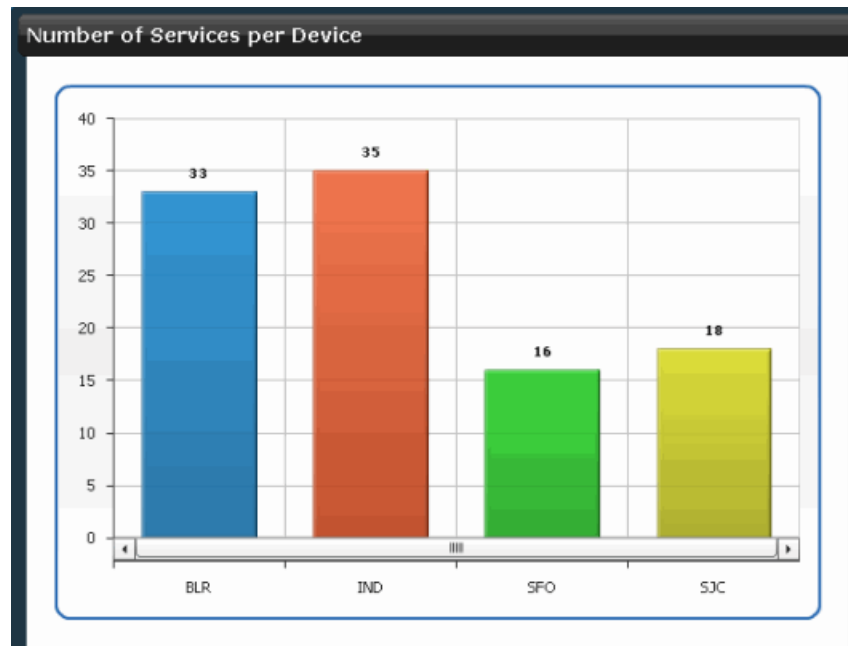
The Manage Device Roles screen shows only the data for the selected device.

Viewing Services on N-PE Devices

To view the number of services provisioned on each N-PE device in your network, follow these steps:

1. In the Network Activate task ribbon, select the **Prestage Devices** workspace icon.

The Junos Space software displays the chart named Number of Services per Device. An example follows:



- Each vertical bar represents an N-PE device. The number of services provisioned on each device is shown on the Y axis. If more than four devices on your network have been assigned the N-PE role, drag the slider across the bottom of the graph to view all devices.
- To find out more information about the services provisioned on a specific device, click on the bar that represents the device.

The Manage Services page displays only those services provisioned on that device.

- Related Topics**
- [Prestaging Devices Overview](#) on page 27
 - [Viewing Services](#) on page 232
 - [Viewing Managed Devices](#)

PART 3

Creating and Managing Layer 2 Service Definitions

- Managing Service Definitions on page 61
- Predefined Service Definitions on page 93
- Monitoring Service Definitions on page 153

CHAPTER 6

Managing Service Definitions

- Viewing Service Definitions on page 61
- Creating a Point-to-Point Ethernet Service Definition on page 66
- Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73
- Creating a Point-to-Multipoint Ethernet Service Definition on page 81
- Publishing a Customized Service Definition on page 90
- Unpublishing a Service Definition on page 91
- Deleting a Customized Service Definition on page 91

Viewing Service Definitions

The following topics show how to view service definitions in either a graphical or a tabular view. You can view all service definitions, use filters to limit the view, see a “quick view,” or view full details of a specific service definition.

- Viewing Service Definitions as Graphics on page 61
- Viewing Service Definitions in Tables on page 64

Viewing Service Definitions as Graphics

To view the service definitions on your network in a graphical form, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. To display the service definition inventory as graphics, in the filter bar, select the thumbnail view icon.

Thumbnails for the service definitions appear in the main display area.

A sample thumbnail follows, with its components identified. The top portion of the thumbnail identifies the service topology and includes a decoration that indicates whether the service definition is published. The lower portion of the thumbnail indicates the endpoint interface type and traffic type and includes a decoration that indicates whether the service definition is one of the standard service definitions provided with the Network Activate software, or if it is customized.

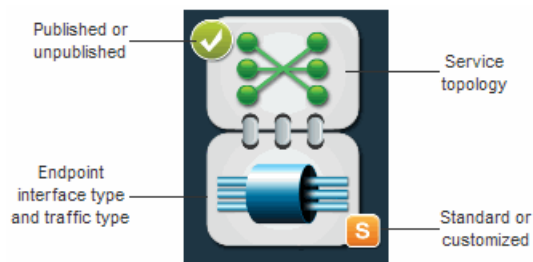


Table 6 on page 62 explains each of the service definition thumbnail symbols and decorations.

Table 6: Service Definition Symbols and Decorations

Symbol/Decoration	Name	Description
	Point-to-point	This service definition is for point-to-point Ethernet services.
	Multipoint-to-multipoint	This service definition is for multipoint-to-multipoint (full mesh) Ethernet services.
	Point-to-multipoint	This service definition is for point-to-multipoint (hub and spoke) Ethernet services.
	Single VLAN	Transports a single VLAN between 802.1Q interfaces
	Range of VLANs	Transports a range of VLANs between Q-in-Q interfaces
	All traffic	Transports all traffic between Q-in-Q interfaces
	Port-to-port	Transports all traffic on a port to other sites in the service
	Standard	The service definition is prepackaged and cannot be modified.
	Customized	The service definition is customized.
	Published	The service definition is published and is available for creating service orders. Standard service definitions are always published. Customized service definitions can be published or not.
	Unpublished	The customized service definition has not yet been published.

4. Use the search facility to restrict the display by partial name.
5. To view summary information for a specific service definition, drag the zoom slider to the rightmost position. Summary information about the service appears in the main display area. Table 7 on page 63 explains the fields in this summary view.

Table 7: Summary Information for Service Definitions

Field	Meaning
Name	The unique name assigned to the service definition.
Service type	One of the following: <ul style="list-style-type: none"> Point-to-point Ethernet (LDP) VPLS (MultiPoint-MultiPoint) VPLS (Point-MultiPoint)
State	One of the following values: <ul style="list-style-type: none"> Published—The service definition is available for use by service provisioners. Unpublished—The service definition is not yet available for use by service provisioners.
Traffic type	One of: <ul style="list-style-type: none"> Transport all traffic—All the customers VLAN traffic is transported across the network. Transport all traffic (port based)—All traffic on dedicated ports. Transport single vlan—Only one specified VLAN is transported across the network. Transport vlan range—A specified range of VLANs is transported across the network.
Description	A brief description of the service definition.

6. To view details of a specific service definition, click **Details** in the summary information view for the service definition.

The Network Activate software displays a detailed view of the service definition. The following example shows a point-to-point Ethernet service definition:

Service Definition Details

General

Name: ELine-PortBased
 Type: Point-to-Point Ethernet (LDP)
 Comments: P2P-Martini for J/M/MX, Port based, rate limit 10M

Connectivity Settings

VC ID selection: Auto pick ☒ Editable in service order
 Default MTU (Bytes): 1522 ☒ Editable in service order
 MTU range: 1522-9192

UNI Settings

Ethernet option: port-port
 Traffic type: N/A
 VLAN ID selection: N/A ☐ Editable in service order
 Physical IF encapsulation: ethernet-ccc
 Logical IF encapsulation: N/A
☐ Protect UNI interface
 Default MTU (Bytes): 1522 ☐ Editable in service order
 MTU range: 1522-9192
 Rate limiting: Enabled
 Default Bandwidth (Mbps): 10 ☒ Editable in service order
 Bandwidth range: 10-100
 Increment (Mbps): 10

For information about the meaning of each attribute, see “Service Attributes Overview” on page 15.

Viewing Service Definitions in Tables

To view the service definitions on your network in a tabular form, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. To display the service definition inventory in tabular form, in the filter bar, select the table view icon.

A table of service definitions appears in the main display area of the screen.

Table 8 on page 64 explains the information presented in the table.

Table 8: Service Definition Table Fields

Column	Meaning
Name	The unique name assigned to the service definition.

Table 8: Service Definition Table Fields (*continued*)

Column	Meaning
State	One of the following values: <ul style="list-style-type: none"> Published—The service definition is available for use by service provisioners. Unpublished—The service definition is not yet available for use by service provisioners.
Service Type	One of the following: <ul style="list-style-type: none"> Point-to-point Ethernet (LDP) VPLS (MultiPoint-to-MultiPoint) VPLS (Point-to-MultiPoint)
Created By	The screen name of the user who created the service definition.

- To restrict the display of service definitions, enter a search criterion of one or more characters in the Search bar and press Enter. All service definition names that match the search criterion appear in the main display area.
- To view details about a service definition, double-click the service definition icon in the table.

The Network Activate software displays a detailed view of the service definition. The following example shows a point-to-point Ethernet service definition:

Service Definition Details

General

Name: ELine-PortBased
 Type: Point-to-Point Ethernet (LDP)
 Comments: P2P-Martini for J/M/MX, Port based, rate limit 10M

Connectivity Settings

VC ID selection: Auto pick ☒ Editable in service order
 Default MTU (Bytes): 1522 ☒ Editable in service order
 MTU range: 1522-9192

UNI Settings

Ethernet option: port-port
 Traffic type: N/A
 VLAN ID selection: N/A ☐ Editable in service order
 Physical IF encapsulation: ethernet-ccc
 Logical IF encapsulation: N/A
☐ Protect UNI interface
 Default MTU (Bytes): 1522 ☐ Editable in service order
 MTU range: 1522-9192
 Rate limiting: Enabled
 Default Bandwidth (Mbps): 10 ☒ Editable in service order
 Bandwidth range: 10-100
 Increment (Mbps): 10

For information about the meaning of each attribute, see “Service Attributes Overview” on page 15.

- Related Topics**
- Creating a Point-to-Point Ethernet Service Definition on page 66
 - Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73
 - Creating a Point-to-Multipoint Ethernet Service Definition on page 81
 - Predefined Point-to-Point Ethernet Service Definitions on page 93
 - Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
 - Predefined Point-to-Multipoint Ethernet Service Definitions on page 140

Creating a Point-to-Point Ethernet Service Definition

This procedure provides the steps to create a definition for a point-to-point VPN service. The standard service definitions that came with your initial software installation are designed to be appropriate for most requirements. You can also create a customized service definition—for example, to set different bandwidth limits on the service than those offered in the standard service definitions.

Once the new service definition is complete and published, network operators or service provisioners can use the completed service definition as a base for creating and then activating point-to-point VPN services on the network.

The screens appear in the order stated. You can, however, perform these steps in any order by accessing them through the task list in the right panel. If the panel is not visible, click the snap tool on the right side of the main display area.

To create a point-to-point service definition, follow these procedures:

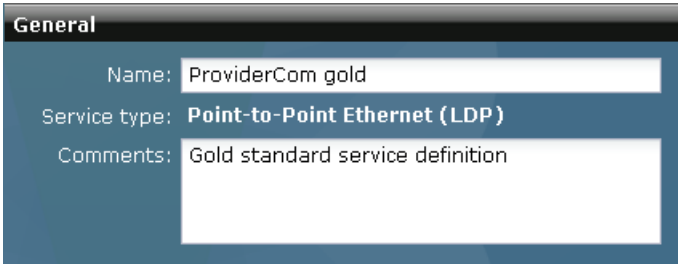
1. Specifying General Information on page 67
2. Specifying Connectivity Information on page 67
3. Specifying UNI Settings on page 68

Specifying General Information

To specify the general information for a point-to-point Ethernet (LDP) service definition, follow these steps:

1. In the task ribbon, select the **Service Design** workspace icon.
2. In the Network Activate task ribbon, select the **Manage Service Definitions** task icon.
3. In the task ribbon, select the **Create P2P Service Definition** task icon.

The first Create Service Definition screen appears, as shown in the following example:



General

Name:

Service type: **Point-to-Point Ethernet (LDP)**

Comments:

4. In the Name field, enter a name for the service definition.
5. In the Comments field, enter a brief description or other comment that you want to appear in the Service Definition table. (Optional)
6. Click **Next** to save the General step information. The Connectivity step appears.

Specifying Connectivity Information

In the Connectivity step, specify the attributes that define the connectivity between remote sites across the service provider network. An example screen follows:



Connectivity Settings

VC ID selection:

Default MTU (Bytes):

MTU range (Bytes):

☐ Editable in service order

☐ Editable in service order

To specify connectivity between sites across the network, follow these steps:

1. In the VC ID selection field, specify how the VC ID will be chosen during service order creation:

- To allow the service provisioner to enter the VC ID, choose **Select manually**.
- To cause the Junos Space software to assign a VC ID automatically from the VC ID pool, select **Auto pick**.

To allow the service provisioner to override the setting in the VC ID field, select **Editable in service order**.

2. In the Default MTU field, specify the MTU across the service provider network.

To allow the service provisioner to override the MTU setting, select **Editable in service order**. In the MTU range field, enter the highest and lowest MTU that the service provisioner can enter.

3. Click **Next** to save the connectivity settings. The UNI Settings step appears.

Specifying UNI Settings

In the UNI Settings step, provide the UNI service attributes for this service definition. The attributes you set depend on whether you are setting attributes for a port, an 802.1Q interface, or a Q-in-Q interface.

- Specifying UNI Settings for Port-to-Port Services on page 68
- Specifying UNI Settings for Services with 802.1Q Interface Types on page 69
- Specifying UNI Settings for Services with Q-in-Q Interface Types on page 71

Specifying UNI Settings for Port-to-Port Services

To set UNI attributes for a port:

1. In the Ethernet option field, select **port-port**. The screen shows options specific to port-to-port circuits, as shown in the following example:

The screenshot shows the 'UNI Settings' configuration page with the following sections and values:

- Traffic Treatment**
 - Ethernet option: **port-port**
 - Customer traffic type: **N/A**
 - VLAN ID selection: **Auto pick** (with an 'Editable in service order' checkbox)
- Interface Settings**
 - Physical IF encapsulation: **ethernet-ccc**
 - Logical IF encapsulation: **N/A**
- MTU Settings**
 - Default MTU (Bytes): **1522** (with an 'Editable in service order' checkbox)
 - MTU range (Bytes): **1522** to **9192**
- Bandwidth Settings**
 - ☒ **Enable rate limiting**
 - Default bandwidth (Mbps): **10** (with an 'Editable in service order' checkbox)
 - Bandwidth range (Mbps): **10** to **50**
 - Increment (Mbps): **10**

2. In the Customer traffic type field, select **N/A**. For port-to-port services, all traffic is always transported.

The VLAN ID cannot be selected. In port-to-port services, all traffic and all VLANs on one port are transported to the other port.

3. In the Physical IF encapsulation field, select **ethernet-ccc**, which is the only valid physical interface encapsulation method for port-to-port services.

The Logical IF encapsulation field cannot be selected because it is not relevant to port-to-port services.

4. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order**. In the MTU range field, enter the highest and lowest value for MTU that the service provisioner can enter.

5. To enable a service provisioner to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

6. Click **Finish** to save the UNI settings.

The service definition is complete.

Specifying UNI Settings for Services with 802.1Q Interface Types

To set UNI attributes for 802.1Q interfaces:

1. In the Ethernet option field, select **dot1q**. The screen shows options specific to 802.1Q interfaces, as shown in the following example:

UNI Settings

Traffic Treatment

Ethernet option: **dot1q**

Customer traffic type: **Transport single vlan**

VLAN ID selection: **Auto pick** ☐ Editable in service order

Interface Settings

Physical IF encapsulation: **flexible-ethernet-service**

Logical IF encapsulation: **vlan-ccc**

MTU Settings

Default MTU (Bytes): **1522** ☒ Editable in service order

MTU range (Bytes): **1522** **9192**

Bandwidth Settings

☒ Enable rate limiting

Default bandwidth (Mbps): **10** ☒ Editable in service order

Bandwidth range (Mbps): **10** **100**

Increment (Mbps): **10**

2. In the Customer Traffic type field, select **Transport single vlan** to transport the traffic for specific VLANs across the network. Transport single VLAN is the only option for 802.1Q interfaces.

The service provisioner will be prompted for the VLAN-ID when creating a service order based on this service definition.

3. In the VLAN ID field, specify how the VLAN ID will be determined:
 - To allow the service provider to specify the VLAN ID, choose **Select manually**.
 - To cause the VLAN ID to be selected automatically from the VLAN ID pool, select **Auto pick**.

To enable the service provisioner to override this setting in a service order, select **Editable in service order**.

4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. We recommend you select **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical IF encapsulation field. If you selected the recommended physical encapsulation mode of flexible-ethernet-service, then your only option is to select **vlan-ccc** for the logical encapsulation method.
6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order** and, in the MTU range fields, enter the lowest and highest values for MTU that the service provisioner is allowed to enter.

7. To enable a service to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

8. Click **Finish** to save the UNI settings.

The service definition is complete.

Specifying UNI Settings for Services with Q-in-Q Interface Types

To set UNI attributes for Q-in-Q interfaces:

1. In the Ethernet option field, select **qinq**. The screen expands to include options specific to Q-in-Q interfaces, as shown in the following example:

The screenshot shows the 'UNI Settings' configuration page with the following sections and values:

- Traffic Treatment**
 - Ethernet option: **qinq**
 - Customer traffic type: **Transport vlan range**
 - VLAN ID selection: **Select manually**
 - ☐ Editable in service order
- Interface Settings**
 - Physical IF encapsulation: **flexible-ethernet-service**
 - Logical IF encapsulation: **vlan-ccc**
- MTU Settings**
 - Default MTU (Bytes): **1522**
 - ☒ Editable in service order
 - MTU range (Bytes): **1522** to **9192**
- Bandwidth Settings**
 - ☒ Enable rate limiting
 - Default bandwidth (Mbps): **10**
 - ☒ Editable in service order
 - Bandwidth range (Mbps): **10** to **100**
 - Increment (Mbps): **10**

2. In the Customer traffic type field:
 - Select **Transport all traffic** if you want to transport the traffic from all VLANs across the network.
 - Select **Transport vlan range** if you want to limit the traffic across the network to a specific range of VLANs.

If you select this option, the service provisioner will be prompted for the VLAN-ID range when creating a service order based on this service definition.
3. In the VLAN ID selection field, specify how the service provider VLAN ID will be set during service order creation:
 - To cause the provisioning software to automatically select the service provider VLAN ID from the VLAN ID pool, select **Auto pick**.
 - To allow the service provisioner to specify the service provider VLAN ID, choose **Select manually**.

To enable the service provisioner to override this setting, select **Editable in service order**.
4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. We recommend you choose **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical IF encapsulation field. If you selected the recommended physical encapsulation mode of flexible-ethernet-services, then your only option is to select **vlan-ccc** for the logical encapsulation method.
6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order** and, in the MTU range fields, enter the lowest and highest values for MTU that the service provisioner can enter.
7. To enable a service to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

 - In the Bandwidth range (Mbps) field, enter the lowest and highest values that the service provisioner can enter.
 - In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.
8. Click **Finish** to complete the service definition.

Related Topics • Publishing a Customized Service Definition on page 90

- [Predefined Point-to-Point Ethernet Service Definitions on page 93](#)
- [Viewing Service Definitions on page 61](#)
- [Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73](#)
- [Creating a Point-to-Multipoint Ethernet Service Definition on page 81](#)

Creating a Multipoint-to-Multipoint Ethernet Service Definition

This procedure provides the steps to create a definition for a multipoint-to-multipoint Ethernet service.

The standard service definitions that came with your initial software installation are designed to be appropriate for most requirements. You can also create a customized service definition—for example, to set different bandwidth limits on the service than those offered in the standard service definitions.

When the new service definition is complete and published, network operators or service provisioners can use the completed service definition as a base for creating and then activating multipoint-to-multipoint Ethernet services on the network.

The screens appear in the order stated. You can, however, perform these steps in any order by accessing them through the task list in the right panel. If the panel is not visible, click the snap tool on the right side of the main display area.

To create a multipoint-to-multipoint Ethernet service definition, follow these procedures:

1. [Specifying General Information on page 73](#)
2. [Specifying Connectivity and Security Information on page 74](#)
3. [Specifying UNI Settings on page 75](#)
4. [Specifying Advanced Settings on page 79](#)

Specifying General Information

To specify the general information for a multipoint-to-multipoint service definition, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. In the task ribbon, select the **Create VPLS Service Definition** task icon.

The first Create Service Definition screen appears. A sample screen follows:

General

Name:

Service type:

Comments:

☒ Enable QoS

4. In the Name field, enter a name for the service definition.
5. In the Service type field, select **Multipoint-to-Multipoint Ethernet (VPLS)**.
6. In the Comments field, enter a brief description or other comment that you want to appear in the Service Definition table. (Optional)
7. To enable QoS on the service, select the checkbox **Enable QoS**. (Release Candidate Feature).



NOTE: QoS features appear in the Junos Space user interface only if you deploy the QoS Design application in Junos Space.

8. Click **Next** to save the General step information. The Connectivity step appears.

Specifying Connectivity and Security Information

In the Connectivity step, specify the attributes that define the connectivity among remote sites across the service provider network and the service security. A sample Connectivity screen follows:

Connectivity

Connectivity Settings

Route target:

Route distinguisher:

Normalized VLAN:

MAC Security Settings

☒ MAC learning

Interface MAC limit:

☐ MAC statistics

MAC table size:

☐ Editable in service order

☐ Editable in service order

☐ Editable in service order

☐ Editable in service order

To specify connectivity between sites across the network, follow these steps:

1. In the Connectivity Settings box, select a value in the Normalized VLAN field:
 - To preserve customer VLAN IDs across the network, select **Normalized VLAN all**.
 - To preserve no VLAN IDs across the network, select **Normalized VLAN none**.
 - If VLAN IDs are to be provided manually and are required to match, select **Not normalized**.



NOTE: For services that transport a range of VLANs, you must select **Normalized VLAN all**. You cannot transport a range of VLANs without normalization.

For port-to-port services, you must select **Not normalized**.

For more information about VLAN normalization, see “Junos Space Layer 2 Services Overview” on page 3.

The Route target field and the Route distinguisher field are not editable. These values are always selected automatically.

2. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for MAC Interface MAC limit and MAC table size. To allow the service provisioner to override the MAC settings, select **Editable in service order**.
3. Click **Next** to save the connectivity settings. The UNI Settings step appears.

Specifying UNI Settings

In the UNI Settings step, provide the UNI service attributes for this service definition. The attributes you set depend on whether you are setting attributes for ports, 802.1Q interfaces, or Q-in-Q interfaces:

- Specifying UNI Settings for Port-to-Port Services on page 75
- Specifying UNI Settings for Services with 802.1Q interface Types on page 77
- Specifying UNI Settings for Services with Q-in-Q interface Types on page 78

Specifying UNI Settings for Port-to-Port Services

To set UNI attributes for port UNIs:

1. In the Ethernet option field, select **port-port**. The screen shows options specific to port-port option:

UNI Settings

Traffic Treatment

Ethernet option: **port-port**

Customer traffic type: **N/A**

VLAN ID selection: **Auto pick** ☐ Editable in service order

Interface Settings

Physical IF encapsulation: **ethernet-vpls**

Logical IF encapsulation: **N/A**

MTU Settings

Default MTU (Bytes): **1522** ☐ Editable in service order

MTU range (Bytes): **1522** **9192**

Bandwidth Settings

☒ Enable rate limiting ☐ Editable in service order

Default bandwidth (Mbps): **1**

Bandwidth range (Mbps): **1** **10**

Increment (Mbps): **1**

2. In the Customer traffic type field, select **N/A**. For port-to-port services, all traffic is always transported.

The VLAN ID cannot be selected. In port-to-port services, all traffic and all VLANs on one port are transported to all other ports.

3. In the Physical IF encapsulation field, select **ethernet-vpls**, which is the only valid physical interface encapsulation method for port-to-port services.

The Logical IF encapsulation field cannot be selected because it is not relevant to port-to-port services.

4. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order**. In the MTU range fields, enter the lowest and highest values for MTU that the service provisioner can enter.

5. To enable a service provisioner to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through

50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

6. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying UNI Settings for Services with 802.1Q interface Types

To set UNI attributes for 802.1Q interfaces:

1. In the Ethernet option field, select **dot1q**. The following screen shows options specific to 802.1Q interfaces.

UNI Settings

Traffic Treatment

Ethernet option: **dot1q**

Customer traffic type: **Transport single vlan**

VLAN ID selection: **Auto pick** ☐ Editable in service order

Interface Settings

Physical IF encapsulation: **flexible-ethernet-service**

Logical IF encapsulation: **vlan-vpls**

MTU Settings

Default MTU (Bytes): **1522** ☒ Editable in service order

MTU range (Bytes): **1522** **9192**

Bandwidth Settings

☒ Enable rate limiting

Default bandwidth (Mbps): **1** ☒ Editable in service order

Bandwidth range (Mbps): **1** **50**

Increment (Mbps): **1**

2. In the Customer Traffic type field, select **Transport single vlan** to transport the traffic for a specific VLAN across the network. Single VLAN is the only option for 802.1Q interface types.
3. In the VLAN ID selection field, specify how the VLAN ID will be determined:
 - To allow the service provider to specify the VLAN ID, choose **Select manually**. This option is used typically when no VLAN normalization is applied.
 - To cause the VLAN ID to be selected automatically from the VLAN ID pool, select **Auto pick**. This option is used typically when VLAN normalization is applied.

To enable the service provisioner to override this setting in a service order, select **Editable in service order**.

4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. We recommend you select **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical IF encapsulation field. If you selected the recommended physical encapsulation mode of flexible-ethernet-services, then your only option is to select **vlan-vpls** for the logical encapsulation method.

6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order** and, in the MTU range fields, enter the highest and lowest MTU values that the service provisioner can enter.

7. To enable a service to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner is allowed to enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

8. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying UNI Settings for Services with Q-in-Q interface Types

To set UNI attributes for Q-in-Q interfaces:

1. In the Ethernet option field, select **qinq**. The screen expands to include options specific to Q-in-Q interfaces, as shown in the following sample screen:

The screenshot shows the 'UNI Settings' configuration window with the following sections and values:

- Traffic Treatment:**
 - Ethernet option: **qinq**
 - Customer traffic type: **Transport vlan range**
 - VLAN ID selection: **Auto pick**
 - ☐ Editable in service order
- Interface Settings:**
 - Physical IF encapsulation: **flexible-ethernet-service**
 - Logical IF encapsulation: **vlan-vpls**
- MTU Settings:**
 - Default MTU (Bytes): **1522**
 - MTU range (Bytes): **1522** to **9192**
 - ☒ Editable in service order
- Bandwidth Settings:**
 - ☒ Enable rate limiting
 - Default bandwidth (Mbps): **1**
 - Bandwidth range (Mbps): **1** to **50**
 - Increment (Mbps): **1**
 - ☒ Editable in service order

2. In the Customer traffic type field:

- Select **Transport all traffic** if you want to transport the traffic from all VLANs across the network.

- Select **Transport vlan range** if you want to limit the traffic across the network to a specific range of VLANs.

If you select this option, the service provisioner will be prompted for the VLAN-ID range when creating a service order based on this service definition.

3. In the VLAN ID selection field, specify how the service VLAN ID will be set during service order creation:
 - To cause the provisioning software to automatically select the service VLAN ID from the VLAN ID pool, select **Autopick**. This option is used typically when no VLAN normalization is applied.
 - To allow the service provisioner to specify the service VLAN ID, choose **Select manually**. This option is used typically when VLAN normalization is applied.

To enable the service provisioner to override this setting, select **Editable in service order**.

4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. We recommend you choose **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical Interface Encapsulation field. If you selected the recommended physical encapsulation mode of flexible-ethernet-services, then your only option is to select **vlan-vpls** for the logical encapsulation method.
6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order** and, in the MTU range fields, enter the lowest and highest values for MTU that the service provisioner can enter.

7. To enable a service to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

8. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying Advanced Settings

In the Advanced step, you can specify the attributes that define advanced connectivity between sites across the service provider network. The following example shows the Advanced screen.

To specify advanced settings, follow these steps in the Advanced box:

1. Select the **Include** checkbox for each advanced setting that you want to include in the service definition.
2. You can enable tunnel-services to specify that traffic for particular VPLS routing instances be forwarded to specific virtual tunnel (VT) interfaces, allowing you to load-balance VPLS traffic among all the available VT interfaces on the router.
 - To enable tunnel-services, clear the **no tunnel-services** checkbox.
 - To disable tunnel-services, select the **no tunnel-services** checkbox (default).
3. Make a selection to enable or disable local switching. In local switching mode, you can terminate multiple Layer 2 circuit pseudowires at a single VPLS mesh group.
 - To enable local switching across the network, clear the **no local-switching** checkbox.
 - To disable local switching across the network, select the **no local-switching** checkbox (default).
4. In the fast-reroute-priority field, specify the reroute priority for a VPLS routing instance.

Default: LOW

 - **HIGH**—Set the fast reroute priority for a VPLS routing instance to high. During a fast reroute event, the router repairs next hops for high-priority VPLS routing instances first.
 - **MEDIUM**—Set the fast reroute priority for a VPLS routing instance to medium. During a fast reroute event, the router repairs next hops for medium-priority VPLS instances after high-priority VPLS routing instances but before low-priority VPLS routing instances.
 - **LOW**—Set the fast reroute priority for a VPLS routing instance to low, which is the default. During a fast reroute event, the router repairs next hops for low-priority VPLS routing instances last.
5. You can configure the label block size for VPLS labels.

Default: 8

 - **2**—Allocate the label blocks in increments of 2. Use this setting for a VPLS domain that has only two sites with no future expansion plans.
 - **4**—Allocate the label blocks in increments of 4.

- 8—Allocate the label blocks in increments of 8.
 - 16—Allocate the label blocks in increments of 16. A label block size of 16 enables you to minimize the number of routes in the VPLS domain. Use this setting only if the number of routes is the primary concern.
6. You can select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the VPLS routing instance is customer-facing or integrated routing and bridging (IRB).

Default: **ce**

- **ce**—Require that for the VPLS connection to be up, the customer-facing interface for the VPLS routing instance must also be up. If the customer-facing interface fails, the VPLS connection is taken down.
 - **irb**—Allow a VPLS connection to remain up so long as an IRB interface is configured for the VPLS routing instance.
7. By default, each advanced setting that you include in the service definition is editable in the service order. To prevent the service provisioner from overriding an advanced setting in the service order, clear the checkbox **Editable in Service Order**.
8. Click **Finish** to save the advanced settings.

The service definition is complete.

- Related Topics**
- Publishing a Customized Service Definition on page 90
 - Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
 - Viewing Service Definitions on page 61
 - Creating a Point-to-Point Ethernet Service Definition on page 66
 - Creating a Point-to-Multipoint Ethernet Service Definition on page 81

Creating a Point-to-Multipoint Ethernet Service Definition

This procedure provides the steps to create a definition for a point-to-multipoint Ethernet service. Point-to-multipoint services are also known as hub and spoke services.

The standard service definitions that came with your initial software installation are designed to be appropriate for most requirements. You can also create a customized service definition—for example, to set different bandwidth limits on the service than those offered in the standard service definitions.

When the new service definition is complete and published, network operators or service provisioners can use the completed service definition as a base for creating and then activating point-to-multipoint Ethernet services on the network.

The screens appear in the order stated. You can, however, perform these steps in any order by accessing them through the task list in the right panel. If the panel is not visible, click the snap tool on the right side of the main display area.

To create a point-to-multipoint Ethernet service definition, follow these procedures:

1. Specifying General Information on page 82
2. Specifying Connectivity and Security Information on page 82
3. Specifying UNI Settings on page 83
4. Specifying Advanced Settings on page 88

Specifying General Information

To specify the general information for a point-to-multipoint service definition, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. In the task ribbon, select the **Create VPLS Service Definition** task icon.

The first Create Service Definition screen appears. A sample screen follows:

4. In the Name field, enter a name for the service definition.
5. In the Service type field, select **Point-to-Multipoint Ethernet (VPLS)**.
6. In the Comments field, enter a brief description or other comment that you want to appear in the Service Definition table. (Optional)
7. To enable QoS for the service definition, select the checkbox **Enable QoS**. (Release Candidate Feature)



NOTE: QoS features appear in the Junos Space user interface only if you deploy the QoS Design application in Junos Space.

8. Click **Next** to save the General step information. The Connectivity step appears.

Specifying Connectivity and Security Information

In the Connectivity step, specify the attributes that define the connectivity among remote sites across the service provider network and the service security. A sample Connectivity screen follows:

The screenshot shows two configuration panels in the Junos GUI. The top panel, titled 'Connectivity', contains 'Connectivity Settings' with fields for 'Route target: Auto pick', 'Route distinguisher: Auto pick', and a dropdown for 'Normalized VLAN: Normalized VLAN none'. The bottom panel, titled 'MAC Security Settings', contains 'MAC Security Settings' with checkboxes for 'MAC learning' (checked) and 'MAC statistics' (unchecked), and input fields for 'Interface MAC limit: 1024' and 'MAC table size: 5120'. To the right of these fields are four checkboxes, all labeled 'Editable in service order'.

To specify connectivity between sites across the network, follow these steps:

1. In the Connectivity Settings box, select a value in the Normalized VLAN field:
 - To preserve customer VLAN IDs across the network, select **Normalized VLAN all**.
 - To preserve no VLAN IDs across the network, select **Normalized VLAN none**.
 - If VLAN IDs are to be provided manually and are required to match, select **Not normalized**.



NOTE: For services that transport a range of VLANs, you must select **Normalized VLAN all**. You cannot transport a range of VLANs without normalization.

For port-to-port services, you must select **Not normalized**.

For more information about VLAN normalization, see “Junos Space Layer 2 Services Overview” on page 3

The Route target field and the Route distinguisher field are not editable. These values are always selected automatically.

2. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for MAC Interface MAC limit and MAC table size. To allow the service provisioner to override the MAC settings, select **Editable in service order**.
3. Click **Next** to save the connectivity settings. The UNI Settings step appears.

Specifying UNI Settings

In the UNI Settings step, provide the UNI service attributes for this service definition. The attributes you set depend on whether you are setting attributes for ports, 802.1Q interfaces, or Q-in-Q interfaces:

- Specifying UNI Settings for Port-to-Port Services on page 84
- Specifying UNI Settings for Services with 802.1Q Interface Types on page 85
- Specifying UNI Settings for Services with Q-in-Q Interface Types on page 86

Specifying UNI Settings for Port-to-Port Services



NOTE: You can select the port-port option only for services that are not normalized. That is, you must have selected **Not Normalized** when specifying the connectivity. If you cannot select the **port-port** option, use the back button to return to the previous screen. See “Specifying Connectivity and Security Information” on page 82.

To set UNI attributes for port UNIs:

1. In the Ethernet option field, select **port-port**. The screen shows options specific to port-to-port interfaces:

UNI Settings

Traffic Treatment

Ethernet option: **port-port**

Customer traffic type: **N/A**

VLAN ID selection: **Auto pick**

☐ Editable in service order

Interface Settings

Physical IF encapsulation: **ethernet-vpls**

Logical IF encapsulation: **N/A**

MTU Settings

Default MTU (Bytes): **1522**

MTU range (Bytes): **1522** **9192**

☐ Editable in service order

Bandwidth Settings

☒ Enable rate limiting

Default bandwidth (Mbps): **1**

Bandwidth range (Mbps): **1** **10**

Increment (Mbps): **1**

☐ Editable in service order

2. In the Customer traffic type field, select **N/A**. For port-to-port services, all traffic is always transported.

The VLAN ID cannot be selected. In port-to-port services, all traffic and all VLANs on one port are transported to all other ports.

3. In the Physical IF encapsulation field, select **ethernet-vpls**, which is the only valid physical interface encapsulation method for port-to-port services.

The Logical IF encapsulation field cannot be selected because it is not relevant to port-to-port services.

4. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order**. In the MTU range fields, enter the lowest and highest values for MTU that the service provisioner can enter.

5. To enable a service provisioner to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

6. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying UNI Settings for Services with 802.1Q Interface Types

To set UNI attributes for 802.1Q interfaces:

1. In the Ethernet option field, select **dot1q**. The following screen shows options specific to 802.1Q interfaces.

The screenshot shows the 'UNI Settings' window with the following sections and values:

- Traffic Treatment:**
 - Ethernet option: **dot1q** (dropdown)
 - Customer traffic type: **Transport single vlan** (dropdown)
 - VLAN ID selection: **Auto pick** (dropdown)
 - ☐ Editable in service order
- Interface Settings:**
 - Physical IF encapsulation: **flexible-ethernet-service** (dropdown)
 - Logical IF encapsulation: **vlan-vpls** (dropdown)
- MTU Settings:**
 - Default MTU (Bytes): **1522** (text field)
 - MTU range (Bytes): **1522** (text field) to **9192** (text field)
 - ☒ Editable in service order
- Bandwidth Settings:**
 - ☒ Enable rate limiting
 - Default bandwidth (Mbps): **1** (text field)
 - Bandwidth range (Mbps): **1** (text field) to **50** (text field)
 - Increment (Mbps): **1** (text field)
 - ☒ Editable in service order

2. In the Customer Traffic type field, select **Transport single vlan** to transport the traffic for a specific VLAN across the network. Single VLAN is the only option for 802.1Q interface types.
3. In the VLAN ID selection field, specify how the VLAN ID is determined:
 - To allow the service provider to specify the VLAN ID, choose **Select manually**. This option is used typically when no VLAN normalization is applied.
 - To cause the VLAN ID to be selected automatically from the VLAN ID pool, select **Auto pick**. This option is used typically when VLAN normalization is applied.

To enable the service provisioner to override this setting in a service order, select **Editable in service order**.

4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. For point-to-multipoint services with 802.1Q interfaces, the only option is **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical IF encapsulation field. For the physical encapsulation mode of flexible-ethernet-services, your only option is to select **vlan-vpls** for the logical encapsulation method.
6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select **Editable in service order** and, in the MTU range fields, enter the highest and lowest MTU values that the service provisioner can enter.

7. To enable a service to limit the available bandwidth, select **Enable rate limiting** and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner is allowed to enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

8. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying UNI Settings for Services with Q-in-Q Interface Types

To set UNI attributes for Q-in-Q interfaces:

1. In the Ethernet option field, select **qinq**. The screen expands to include options specific to Q-in-Q interfaces, as shown in the following example screen:

The screenshot shows the 'UNI Settings' configuration page with the following sections:

- Traffic Treatment:**
 - Ethernet option: **qinq** (dropdown)
 - Customer traffic type: **Transport vlan range** (dropdown)
 - VLAN ID selection: **Auto pick** (dropdown)
 - ☐ Editable in service order
- Interface Settings:**
 - Physical IF encapsulation: **flexible-ethernet-service** (dropdown)
 - Logical IF encapsulation: **vlan-vpls** (dropdown)
- MTU Settings:**
 - Default MTU (Bytes): **1522** (text input)
 - MTU range (Bytes): **1522** (text input) to **9192** (text input)
 - ☒ Editable in service order
- Bandwidth Settings:**
 - ☒ Enable rate limiting
 - Default bandwidth (Mbps): **1** (text input)
 - Bandwidth range (Mbps): **1** (text input) to **50** (text input)
 - Increment (Mbps): **1** (text input)
 - ☒ Editable in service order

2. In the Customer traffic type field:
 - Select **Transport all traffic** if you want to transport the traffic from all VLANs across the network.
 - Select **Transport vlan range** if you want to limit the traffic across the network to a specific range of VLANs.
 If you select this option, the service provisioner will be prompted for the VLAN-ID range when creating a service order based on this service definition.
3. In the VLAN ID selection field, specify how the service VLAN ID will be set during service order creation:
 - To cause the provisioning software to automatically select the service VLAN ID from the VLAN ID pool, select **Auto pick**. This option is used typically when no VLAN normalization is applied.
 - To allow the service provisioner to specify the service VLAN ID, choose **Select manually**. This option is used typically when VLAN normalization is applied.

To enable the service provisioner to override this setting, select the **Editable in service order** checkbox.
4. In the Physical IF encapsulation field, select the default physical encapsulation scheme to be used by service orders based on this service definition. For point-to-multipoint services with Q-in-Q interfaces, the only option is **flexible-ethernet-services**.
5. The Logical IF encapsulation field is constrained by your selection in the Physical Interface Encapsulation field. For the physical encapsulation mode of

flexible-ethernet-services, your only option is to select **vlan-vpls** for the logical encapsulation method.

6. In the Default MTU field, specify the MTU for each UNI.

To allow the service provisioner to override the MTU setting, select the **Editable in service order** checkbox and, in the MTU range fields, enter the lowest and highest values for the MTU that the service provisioner can enter.

7. To enable a service to limit the available bandwidth, select the **Enable rate limiting** checkbox and enter a default bandwidth limit in the Default bandwidth (Mbps) field.

To enable the service provisioner to override the default bandwidth value, select the **Editable in service order** checkbox. The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.

- In the Bandwidth range (Mbps) fields, enter the lowest and highest values that the service provisioner can enter.
- In the Increment (Mbps) field, enter a value that defines which values in the range will be made available to the service provisioner. For example, a range of 10 through 50 with an increment of 10 makes the following values available to the service provisioner: 10, 20, 30, 40, and 50 Mbps.

8. Click **Next** to save the UNI settings. The Advanced step appears.

Specifying Advanced Settings

In the Advanced step, you can specify the attributes that define advanced connectivity between sites across the service provider network. The following example shows the Advanced screen.

To specify advanced settings, follow these steps in the Advanced box:

1. Select the **Include** checkbox for each advanced setting that you want to include in the service definition.
2. You can enable tunnel-services to specify that traffic for particular VPLS routing instances be forwarded to specific virtual tunnel (VT) interfaces, allowing you to load-balance VPLS traffic among all the available VT interfaces on the router.
 - To enable tunnel-services, clear the **no tunnel-services** checkbox.
 - To disable tunnel-services, select the **no tunnel-services** checkbox (default).
3. Make a selection to enable or disable local switching. In local switching mode, you can terminate multiple Layer 2 circuit pseudowires at a single VPLS mesh group.

- To enable local switching across the network, clear the **no local-switching** checkbox.
 - To disable local switching across the network, select the **no local-switching** checkbox (default).
4. In the fast-reroute-priority field, specify the reroute priority for a VPLS routing instance.
- Default: LOW
- HIGH—Set the fast reroute priority for a VPLS routing instance to high. During a fast reroute event, the router repairs next hops for high-priority VPLS routing instances first.
 - MEDIUM—Set the fast reroute priority for a VPLS routing instance to medium. During a fast reroute event, the router repairs next hops for medium-priority VPLS instances after high-priority VPLS routing instances but before low-priority VPLS routing instances.
 - LOW—Set the fast reroute priority for a VPLS routing instance to low, which is the default. During a fast reroute event, the router repairs next hops for low-priority VPLS routing instances last.
5. You can configure the label block size for VPLS labels.
- Default: 8
- 2—Allocate the label blocks in increments of 2. Use this setting for a VPLS domain that has only two sites with no future expansion plans.
 - 4—Allocate the label blocks in increments of 4.
 - 8 —Allocate the label blocks in increments of 8.
 - 16—Allocate the label blocks in increments of 16. A label block size of 16 enables you to minimize the number of routes in the VPLS domain. Use this setting only if the number of routes is the primary concern.
6. You can select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the VPLS routing instance is customer-facing or integrated routing and bridging (IRB).
- Default: **ce**
- **ce**—Require that for the VPLS connection to be up, the customer-facing interface for the VPLS routing instance must also be up. If the customer-facing interface fails, the VPLS connection is taken down.
 - **irb**—Allow a VPLS connection to remain up so long as an IRB interface is configured for the VPLS routing instance.
7. By default, each advanced setting that you include in the service definition is editable in the service order. To prevent the service provisioner from overriding an advanced setting in the service order, clear the checkbox **Editable in Service Order**.
8. Click **Finish** to save the advanced settings.
- The service definition is complete.

- Related Topics**
- Publishing a Customized Service Definition on page 90
 - Predefined Point-to-Multipoint Ethernet Service Definitions on page 140
 - Viewing Service Definitions on page 61
 - Creating a Point-to-Point Ethernet Service Definition on page 66
 - Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73

Publishing a Customized Service Definition

The service designer must publish a customized service definition before a service provisioner can use that definition to create a service request.



NOTE: Predefined service definitions are already in the Published state.

To publish a service definition, follow these steps:

1. In the task ribbon, select the **Service Design** workspace icon.
2. In the Network Activate task ribbon, select the **Manage Service Definitions** task icon.
3. In the Manage Service Definitions screen, select the service definition you want to publish.

In table view, the State column lists unpublished service definitions. In thumbnail view, the decoration in the top left of the icon indicates the service definitions that are in the unpublished state.

4. Select the unpublished service definition that you want to publish.
5. Open the Actions drawer and select **Publish Service Definition**.

The Publish Service Definitions window appears and prompts you to confirm your action.

6. Click **Publish**.

The Manage Service Definitions screen reappears. The selected service definition is now in the published state.

- Related Topics**
- Creating a Point-to-Point Ethernet Service Definition on page 66
 - Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73
 - Creating a Point-to-Multipoint Ethernet Service Definition on page 81
 - Unpublishing a Service Definition on page 91

Unpublishing a Service Definition

The service designer can unpublish a custom service definition to make it unavailable to service provisioners for creating a service request. You cannot unpublish a predefined service definition.

To unpublish a service definition, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. In the Manage Service Definitions screen, select the service definition you want to unpublish.

In table view, the State column lists published service definitions. In the thumbnail view, the decoration in the upper left corner of the thumbnail indicates the service definitions that are in the published state.

4. Select the published service definition that you want to unpublish.
5. Open the Actions drawer and select **Unpublish Service Definition**.

The Unpublish Service Definitions window appears and prompts you to confirm your action.

6. Click **Unpublish**.

The Manage Service Definitions screen reappears. The selected service definition is now in the unpublished state.

Related Topics • Publishing a Customized Service Definition on page 90

Deleting a Customized Service Definition



NOTE: Before you can delete a service definition, it must be in the unpublished state. You cannot delete a predefined service definition.

To delete a customized service definition, follow these steps:

1. In the Network Activate task ribbon, select the **Service Design** workspace icon.
2. In the task ribbon, select the **Manage Service Definitions** task icon.
3. In the Manage Service Definitions screen, select the customized service definition you want to delete.
4. Open the Actions drawer and select **Delete Service Definition**.
5. In the confirmation window, click **Delete**.

The Manage Service Definitions screen refreshes with the selected service definition removed.

Related Topics • [Unpublishing a Service Definition on page 91](#)

CHAPTER 7

Predefined Service Definitions

- Predefined Point-to-Point Ethernet Service Definitions on page 93
- Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
- Predefined Point-to-Multipoint Ethernet Service Definitions on page 140

Predefined Point-to-Point Ethernet Service Definitions

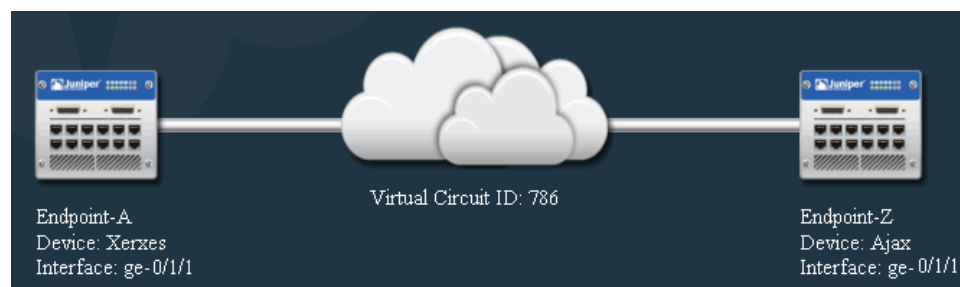
The Network Activate software provides predefined service definitions that a service provisioner can choose from when creating a service order. This section provides information about predefined service definitions used for creating Ethernet point-to-point services. For information about predefined service definitions used to create Ethernet multipoint (VPLS) service definitions, see the following topics:

- Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
- Predefined Point-to-Multipoint Ethernet Service Definitions on page 140

If none of the point-to-point predefined service definitions described here is appropriate for your needs, you can create a service definition as described in “Creating a Point-to-Point Ethernet Service Definition” on page 66,

The Network Activate software provides predefined service definitions for Ethernet point-to-point services that use LDP switching in the network core. These services are sometimes known as E-Line Martini services. Figure 12 on page 93 shows an example of such a service.

Figure 12: Point-to-Point Service



Information specific to each service instance, such as the device name, endpoint name, and customer VLAN ID, is provided in the service order. Attributes that can apply across

many service instances are typically defined in the service definition. These attributes include:

- Ethernet option (dot1.q, port-port, qinq)
- Traffic type (single VLAN, multiple VLAN, all traffic)
- Physical interface encapsulation
- Logical interface encapsulation
- Rate limit range

Table 9 on page 94 lists each of the standard Ethernet point-to-point service definitions. Each standard service definition is then described in detail in the sections that follow.

Table 9: Standard Ethernet Point-to-Point Ethernet Service Definitions

Standard Service Definition Name	Service Attributes
"ELine-Dot1q-SingleVLAN" on page 96	<ul style="list-style-type: none"> • Point-to-point service for M Series and MX Series devices • Gigabit Ethernet interfaces • 802.1Q endpoint interface types • Customer traffic is single VLAN • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-Dot1q-SingleVLAN-CCC" on page 98	<ul style="list-style-type: none"> • Point-to-point service for M Series and MX Series devices • Gigabit Ethernet interfaces • 802.1Q endpoint interface types • Customer traffic is single VLAN • Vlan-ccc physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-Dot1q-SingleVLAN-Ext-CCC" on page 100	<ul style="list-style-type: none"> • Point-to-point service for M Series and MX Series devices • Gigabit Ethernet interfaces • 802.1Q endpoint interface types • Customer traffic is single VLAN • Extended-vlan-ccc physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-PortBased" on page 102	<ul style="list-style-type: none"> • Point-to-point service for M Series and MX Series devices • Gigabit Ethernet interfaces • Port-based UNI • Ethernet-ccc physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

Table 9: Standard Ethernet Point-to-Point Ethernet Service Definitions (*continued*)

Standard Service Definition Name	Service Attributes
"ELine-QinQ-AllVLAN" on page 104	<ul style="list-style-type: none"> Point-to-point service for M Series and MX Series devices Gigabit Ethernet interfaces Q-in-Q endpoint interface types All customer traffic Flexible-ethernet-services physical encapsulation type Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-QinQ-AllVLAN-CCC" on page 106	<ul style="list-style-type: none"> Point-to-point service for M Series and MX Series devices Gigabit Ethernet interfaces Q-in-Q endpoint interface types All customer traffic Vlan-ccc physical encapsulation type Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-QinQ-AllVLAN-Ext-CCC" on page 108	<ul style="list-style-type: none"> Point-to-point service for M Series and MX Series devices Gigabit Ethernet interfaces Q-in-Q endpoint interface types All customer traffic Extended-vlan-ccc physical encapsulation type Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-QinQ-VLANRange" on page 110	<ul style="list-style-type: none"> Point-to-point service for MX Series devices only Gigabit Ethernet interfaces Q-in-Q endpoint interface types Customer traffic is range of VLANs Flexible-ethernet-services physical encapsulation type Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELine-QinQ-VLANRange-CCC" on page 112	<ul style="list-style-type: none"> Point-to-point service for MX Series devices only Gigabit Ethernet interfaces Q-in-Q endpoint interface types Customer traffic is range of VLANs Vlan-ccc physical encapsulation type Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

Table 9: Standard Ethernet Point-to-Point Ethernet Service Definitions (*continued*)

Standard Service Definition Name	Service Attributes
"ELine-QinQ-VLANRange-Ext-CCC" on page 114	<ul style="list-style-type: none"> Point-to-point service for MX Series devices only Gigabit Ethernet interfaces Q-in-Q endpoint interface types Customer traffic is range of VLANs Extended-vlan-ccc physical encapsulation Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

ELine-Dot1q-SingleVLAN

This service definition provides a base for creating point-to-point services that transport a single VLAN across an LDP network core using 802.1Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 96
- Configuration on Endpoint Z on page 97

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```

ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 1 {
        description "Dot1q Eline Martini ";
        encapsulation vlan-ccc;
        vlan-id 1;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
}

```

```

family ccc {
  filter filter_in_ge-0/1/1_1 {
    interface-specific;
    term 1 {
      then {
        policer policer_in_ge-0/1/1_1;
        accept;
      }
    }
  }

  protocols {
    l2circuit {
      neighbor 192.168.1.40
      interface ge-0/1/1.1 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation flexible-ethernet-services;
  unit 1 {
    description "Dot1q Eline Martini ";
    encapsulation vlan-ccc;
    vlan-id 1;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
}

family ccc {
  filter filter_in_ge-0/1/1_1 {
    interface-specific;
    term 1 {
      then {
        policer policer_in_ge-0/1/1_1;
        accept;
      }
    }
  }

  protocols {
    l2circuit {

```

```
        neighbor 192.168.1.30 {
            interface ge-0/1/1.1 {
                virtual-circuit-id 786;
                no-control-word;
                mtu 1522;
            }
        }
    }
```

ELine-Dot1q-SingleVLAN-CCC

This service definition provides a base for creating point-to-point services that transport a single VLAN across an LDP network core using 802.1Q endpoint interface types and vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 98
- Configuration on Endpoint Z on page 99

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation vlan-ccc;
    unit 513 {
        description VLANCCC-SR;
        encapsulation vlan-ccc;
        vlan-id 513;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_513;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_513 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family ccc {
        filter filter_in_ge-0/1/1_513 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1_513;
                    accept;
                }
            }
        }
    }
}
```



```

    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.513 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation vlan-ccc;
  unit 513 {
    description VLANCCC-SR;
    encapsulation vlan-ccc;
    vlan-id 513;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_513;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_513 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_513 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_513;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {

```

```
        neighbor 192.168.1.30 {
            interface ge-0/1/1.513 {
                virtual-circuit-id 786;
                no-control-word;
                mtu 1522;
            }
        }
    }
}
```

ELine-Dot1q-SingleVLAN-Ext-CCC

This service definition provides a base for creating point-to-point services that transport a single VLAN across an LDP network core using 802.1Q endpoint interface types and extended-vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 100
- Configuration on Endpoint Z on page 101

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation extended-vlan-ccc;
    unit 1 {
        description Extended-SR;
        vlan-id 1;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family ccc {
        filter filter_in_ge-0/1/1_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1_1;
                    accept;
                }
            }
        }
    }
}
```

```

    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.1 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation extended-vlan-ccc;
  unit 1 {
    description Extended-SR;
    vlan-id 1;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_1;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.30 {

```

```
        interface ge-0/1/1.1 {
            virtual-circuit-id 786;
            no-control-word;
            mtu 1522;
        }
    }
}
```

ELine-PortBased

This service definition provides a base for creating point-to-point services that transport all traffic across an LDP network core using an entire port at each endpoint using ethernet-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps to 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 102
- Configuration on Endpoint Z on page 103

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {
    encapsulation ethernet-ccc;
    unit 0 {
        family ccc {
            filter {
                input filter_in_ge-0/1/1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1 {
        if-exceeding {
            bandwidth-limit 10m;
            burst-size-limit 6250000;
        }
        then discard;
    }
    family ccc {
        filter filter_in_ge-0/1/1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1;
                    accept;
                }
            }
        }
    }
}
```

```

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.0 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  encapsulation ethernet-ccc;
  unit 0 {
    family ccc {
      filter {
        input filter_in_ge-0/1/1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1 {
    if-exceeding {
      bandwidth-limit 10m;
      burst-size-limit 6250000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.30 {
      interface ge-0/1/1.0 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

ELine-QinQ-AllVLAN

This service definition provides a base for creating point-to-point services that transport all customer traffic across an LDP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 104
- Configuration on Endpoint Z on page 105

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation flexible-ethernet-services;
  unit 1 {
    description "AllVlanTransport";
    encapsulation vlan-ccc;
    vlan-tags outer 1;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_1;
      }
    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.1 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_1 {
      interface-specific;
      term 1 {
        then {
```

```

        policer policer_in_ge-0/1/1_1;
        accept;
    }
}
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 1 {
        description "AllVlanTransport";
        encapsulation vlan-ccc;
        vlan-tags outer 1;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family ccc {
        filter filter_in_ge-0/1/1_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1_1;
                    accept;
                }
            }
        }
    }
}

protocols {
    l2circuit {
        neighbor 192.168.1.30 {
            interface ge-0/1/1.1 {
                virtual-circuit-id 786;
                no-control-word;
                mtu 1522;
            }
        }
    }
}

```

```
    }
  }
```

ELine-QinQ-AllVLAN-CCC

This service definition provides a base for creating point-to-point services that transport all customer traffic across an LDP network core using Q-in-Q endpoint interface types and vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 106
- Configuration on Endpoint Z on page 107

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation vlan-ccc;
  unit 515 {
    description QinQ-ALLVLAN;
    encapsulation vlan-ccc;
    vlan-tags outer 515;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_515;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_515 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }

  family ccc {
    filter filter_in_ge-0/1/1_515 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_515;
          accept;
        }
      }
    }
  }
}
```



```

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.515 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation vlan-ccc;
  unit 515 {
    description QinQ-ALLVLAN;
    encapsulation vlan-ccc;
    vlan-tags outer 515;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_515;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_515 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_515 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_515;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.30 {
      interface ge-0/1/1.515 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

```
    }  
  }  
}
```

ELine-QinQ-AllVLAN-Ext-CCC

This service definition provides a base for creating point-to-point services that transport all customer traffic across an LDP network core using Q-in-Q endpoint interface types and extended-vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 108
- Configuration on Endpoint Z on page 109

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```
ge-0/1/1 {  
    flexible-vlan-tagging;  
    mtu 1522;  
    encapsulation extended-vlan-ccc;  
    unit 1 {  
        description Ext-AllVLAN;  
        vlan-tags outer 1;  
        family ccc {  
            filter {  
                input filter_in_ge-0/1/1_1;  
            }  
        }  
    }  
}  
  
firewall {  
    policer policer_in_ge-0/1/1_1 {  
        if-exceeding {  
            bandwidth-limit 100m;  
            burst-size-limit 62500000;  
        }  
        then discard;  
    }  
    family ccc {  
        filter filter_in_ge-0/1/1_1 {  
            interface-specific;  
            term 1 {  
                then {  
                    policer policer_in_ge-0/1/1_1;  
                    accept;  
                }  
            }  
        }  
    }  
}
```

```

}

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.1 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation extended-vlan-ccc;
  unit 1 {
    description Ext-AllVLAN;
    vlan-tags outer 1;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_1;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.30 {
      interface ge-0/1/1.1 {

```

```

        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
    }
}
}

```

ELine-QinQ-VLANRange

This service definition provides a base for creating point-to-point services that transport a range of VLANs across an LDP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 110
- Configuration on Endpoint Z on page 111

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```

ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 2 {
        description "QinQ Eline Martini";
        encapsulation vlan-ccc;
        vlan-tags outer 2 inner-range 100-110;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_2;
            }
        }
    }
}

```

```

firewall {
    policer policer_in_ge-0/1/1_2 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
    }

    family ccc {
        filter filter_in_ge-0/1/1_2 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1_2;
                    accept;
                }
            }
        }
    }
}

```

```

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.2 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation flexible-ethernet-services;
  unit 2 {
    description "QinQ Eline Martini";
    encapsulation vlan-ccc;
    vlan-tags outer 2 inner-range 100-110;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_2;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_2 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }

  family ccc {
    filter filter_in_ge-0/1/1_2 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_2;
          accept;
        }
      }
    }
  }
}

protocols {
  l2circuit {
    interface ge-0/1/1.2 {

```

```

        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
    }
}
}

```

ELine-QinQ-VLANRange-CCC

This service definition provides a base for creating point-to-point services that transport a range of VLANs across an LDP network core using Q-in-Q endpoint interface types and vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 112
- Configuration on Endpoint Z on page 113

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```

ge-0/1/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation vlan-ccc;
    unit 514 {
        description VLANRANGE-SR;
        encapsulation vlan-ccc;
        vlan-tags outer 514 inner-range 600-610;
        family ccc {
            filter {
                input filter_in_ge-0/1/1_514;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_514 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family ccc {
        filter filter_in_ge-0/1/1_514 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/1_514;
                    accept;
                }
            }
        }
    }
}

```

```

    }
  }
}

protocols {
  l2circuit {
    neighbor 192.168.1.40 {
      interface ge-0/1/1.514 {
        virtual-circuit-id 786;
        no-control-word;
        mtu 1522;
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation vlan-ccc;
  unit 514 {
    description VLANRANGE-SR;
    encapsulation vlan-ccc;
    vlan-tags outer 514 inner-range 600-610;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_514;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/1_514 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_514 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/1/1_514;
          accept;
        }
      }
    }
  }
}

protocols {

```

```

12circuit {
  neighbor 192.168.1.30 {
    interface ge-0/1/1.514 {
      virtual-circuit-id 786;
      no-control-word;
      mtu 1522;
    }
  }
}

```

ELine-QinQ-VLANRange-Ext-CCC

This service definition provides a base for creating point-to-point services that transport a range of VLANs across an LDP network core using Q-in-Q endpoint interface types and extended-vlan-ccc as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 12 on page 93:

- Configuration on Endpoint A on page 114
- Configuration on Endpoint Z on page 115

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A:

```

ge-0/1/1 {
  flexible-vlan-tagging;
  mtu 1522;
  encapsulation extended-vlan-ccc;
  unit 2 {
    description Ext-VLANRange;
    vlan-tags outer 2 inner-range 100-110;
    family ccc {
      filter {
        input filter_in_ge-0/1/1_2;
      }
    }
  }
}

```

```

firewall {
  policer policer_in_ge-0/1/1_2 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family ccc {
    filter filter_in_ge-0/1/1_2 {
      interface-specific;
      term 1 {
        then {

```



```

12circuit {
  neighbor 192.168.1.30 {
    interface ge-0/1/1.2 {
      virtual-circuit-id 786;
      no-control-word;
      mtu 1522;
    }
  }
}

```

- Related Topics**
- Creating a Point-to-Point Ethernet Service Definition on page 66
 - Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
 - Predefined Point-to-Multipoint Ethernet Service Definitions on page 140

Predefined Multipoint-to-Multipoint Ethernet Service Definitions

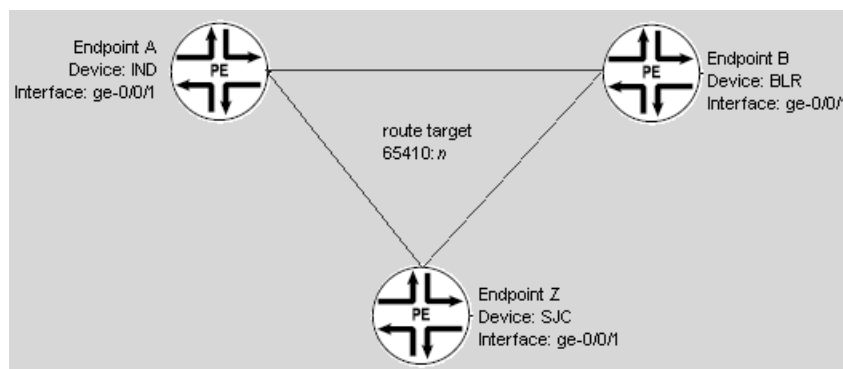
The Network Activate software provides predefined service definitions that a service provisioner can choose from when creating a service order. This section provides information about predefined service definitions used for creating multipoint-to-multipoint Ethernet services. For information about predefined service definitions used to create point-to-point service definitions or point-to-multipoint service definitions, see the following topics:

- Predefined Point-to-Multipoint Ethernet Service Definitions on page 140
- Predefined Point-to-Point Ethernet Service Definitions on page 93

If none of the multipoint-to-multipoint predefined service definitions described here is appropriate for your needs, you can create a service definition as described in “Creating a Multipoint-to-Multipoint Ethernet Service Definition” on page 73.

The Network Activate software provides predefined service definitions for VPLS services that use BGP switching in the network core. These services are sometimes known as E-LAN services. This section covers multipoint-to-multipoint (or full mesh) service definitions. Figure 13 on page 116 shows an example of such a service.

Figure 13: Multipoint-to-Multipoint Service



Information specific to each service instance, such as the device name, endpoint name, and customer VLAN ID, is provided in the service order. Attributes that can apply across many service instances are typically defined in the service definition. These attributes include:

- Ethernet option (dot1.q, port-port, qinq)
- Traffic type (single VLAN, VLAN range, all traffic)
- VLAN normalization
- Physical interface encapsulation
- Logical interface encapsulation
- Rate limit range

Table 10 on page 117 lists each of the standard VPLS service definitions. Each standard service definition is then described in detail in the sections that follow.

Table 10: Standard Multipoint-to-Multipoint Service Definitions

Standard Service Definition Name	Service Attributes
"ELAN-BGP-Dot1q-Normalized-VLAN-None" on page 118	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series and MX Series devices • Gigabit Ethernet interfaces • Customer VLAN IDs are not preserved • 802.1Q endpoint interface types • Customer traffic is single VLAN • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-BGP-Dot1Q-SingleVLAN" on page 122	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series or MX Series devices • Gigabit Ethernet interfaces • 802.1Q endpoint interface types • Customer traffic is single VLAN • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-BGP-PortBased" on page 125	<ul style="list-style-type: none"> • Multipoint Ethernet service for M series and MX Series devices • Gigabit Ethernet interfaces • Port-based UNIs • Transports all customer traffic • Ethernet VPLS as physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

Table 10: Standard Multipoint-to-Multipoint Service Definitions (*continued*)

Standard Service Definition Name	Service Attributes
"ELAN-BGP-QinQ-AllVLAN" on page 128	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series and MX Series devices • Gigabit Ethernet interfaces • Q-in-Q endpoint interface types • All customer traffic • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-BGP-QinQ-AllVLAN-Normalized-All" on page 131	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series and MX Series devices • Gigabit Ethernet interfaces • Customer VLAN IDs preserved • Q-in-Q endpoint interface types • All customer traffic • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-BGP-QinQ-AllVLAN-Normalized-None" on page 134	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series and MX Series devices • Gigabit Ethernet interfaces • Q-in-Q endpoint interface types • VLAN IDs not preserved • All customer traffic • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-BGP-QinQ-Range-Normalized-VLAN" on page 137	<ul style="list-style-type: none"> • Multipoint Ethernet service for MX Series devices only • Gigabit Ethernet interfaces • Customer VLAN IDs preserved • Q-in-Q endpoint interface types • Transports specified VLAN range • Flexible Ethernet services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

ELAN-BGP-Dot1q-Normalized-VLAN-None

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport traffic from a single VLAN on an endpoint across a BGP network

core using 802.1Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. VLAN IDs are not preserved across the network—traffic passes from the single VLAN on an endpoint to any VLANs in the broadcast domain. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 13 on page 116:

- Configuration on Endpoint A on page 119
- Configuration on Endpoint B on page 120
- Configuration on Endpoint Z on page 121

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device IND):

```
ge-0/0/1 {
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-id 1;
        family vpls {
            filter {
                input filter_in_ge-0/0/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/0/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/1_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/1_1;
                    accept;
                }
            }
        }
    }
}

routing-instances {
    BestCustomer_ELAN-BGP-Dot1q-Normalized-VLAN-SR {
        instance-type vpls;
        vlan-id none;
        interface ge-0/0/1.1;
        route-distinguisher 65410:1;
        vrf-target target:65410:0;
    }
}
```

```

protocols {
  vpls {
    no-tunnel-services;
    site Site_2 {
      site-identifier 2;
      site-preference primary;
      interface ge-0/0/1.1;
    }
  }
}

```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device BLR):

```

ge-0/0/1 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-id 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/1_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/1_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/0/1_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/0/1_1;
          accept;
        }
      }
    }
  }
}

routing-instances {
  BestCustomer_ELAN-BGP-Dot1q-Normalized-VLAN-SR {
    instance-type vpls;
    vlan-id none;
    interface ge-0/0/1.1;
    route-distinguisher 65410:0;
    vrf-target target:65410:0;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_1 {
          site-identifier 1;

```

```

        site-preference primary;
        interface ge-0/0/1.1;
    }
}
}
}
}
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/0/1 {
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-id 1;
        family vpls {
            filter {
                input filter_in_ge-0/0/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/0/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/1_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/1_1;
                    accept;
                }
            }
        }
    }
}

routing-instances {
    BestCustomer_ELAN-BGP-Dot1q-Normalized-VLAN-SR {
        instance-type vpls;
        vlan-id none;
        interface ge-0/0/1.1;
        vlan-id none;
        route-distinguisher 65410:2;
        vrf-target target:65410:0;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_3 {
                    site-identifier 3;
                    site-preference primary;
                    interface ge-0/0/1.1;
                }
            }
        }
    }
}

```

```

    }
  }
}

```

ELAN-BGP-Dot1Q-SingleVLAN

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport traffic on a single VLAN across a BGP network core using 802.1Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. No VLAN mapping is performed—the VLAN ID must be the same on all endpoints. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 13 on page 116:

- Configuration on Endpoint A on page 122
- Configuration on Endpoint B on page 123
- Configuration on Endpoint Z on page 124

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device IND):

```

ge-0/0/2 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-id 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/2_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/2_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }

  filter filter_in_ge-0/0/2_1 {
    interface-specific;
    term 1 {
      then {
        policer policer_in_ge-0/0/2_1;
        accept;
      }
    }
  }
}

```



```

}
routing-instances {
  BestCustomer_ELAN-BGP-Dot1Q-SingleVLAN-SR {
    instance-type vpls;
    interface ge-0/0/2.1;
    route-distinguisher 65410:4;
    vrf-target target:65410:1;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_2 {
          site-identifier 2;
          site-preference primary;
          interface ge-0/0/2.1;
        }
      }
    }
  }
}

```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device BLR):

```

ge-0/0/2 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-id 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/2_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/2_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  filter filter_in_ge-0/0/2_1 {
    interface-specific;
    term 1 {
      then {
        policer policer_in_ge-0/0/2_1;
        accept;
      }
    }
  }
}

routing-instances {
  BestCustomer_ELAN-BGP-Dot1Q-SingleVLAN-SR {
    instance-type vpls;
    interface ge-0/0/2.1;
  }
}

```

```

route-distinguisher 65410:3;
vrf-target target:65410:1;
protocols {
  vpls {
    no-tunnel-services;
    site Site_1 {
      site-identifier 1;
      site-preference primary;
      interface ge-0/0/2.1;
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/0/2 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-id 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/2_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/2_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/0/2_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/0/2_1;
          accept;
        }
      }
    }
  }
}

routing-instances {
  BestCustomer_ELAN-BGP-Dot1Q-SingleVLAN-SR {
    instance-type vpls;
    interface ge-0/0/2.1;
    route-distinguisher 65410:5;
    vrf-target target:65410:1;
    protocols {
      vpls {
        no-tunnel-services;

```

```

        site Site_3 {
            site-identifier 3;
            site-preference primary;
            interface ge-0/0/2.1;
        }
    }
}

```

ELAN-BGP-PortBased

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport all traffic on an entire port across a BGP network core using ethernet-vpls as the physical encapsulation type. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 13 on page 116:

- Configuration on Endpoint A on page 125
- Configuration on Endpoint B on page 126
- Configuration on Endpoint Z on page 127

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device IND):

```

ge-0/1/3 {
    mtu 1522;
    encapsulation ethernet-vpls;
    unit 0 {
        family vpls {
            filter {
                input filter_in_ge-0/1/3;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/3 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 15220;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/1/3 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/1/3;
                    accept;
                }
            }
        }
    }
}

```

```
    }  
  }  
  routing-instances {  
    ELAN_BGP_PortBased_10_100M {  
      instance-type vpls;  
      interface ge-0/1/3.0;  
      route-distinguisher 65410:3;  
      vrf-target target:65410:1;  
      protocols {  
        vpls {  
          no-tunnel-services;  
          site Site_2 {  
            site-identifier 2;  
            site-preference primary;  
            interface ge-0/1/3.0;  
          }  
        }  
      }  
    }  
  }  
}
```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device BLR):

```
ge-0/1/3 {  
  mtu 1522;  
  encapsulation ethernet-vpls;  
  unit 0 {  
    family vpls {  
      filter {  
        input filter_in_ge-0/1/3;  
      }  
    }  
  }  
}  
  
firewall {  
  policer policer_in_ge-0/1/3 {  
    if-exceeding {  
      bandwidth-limit 100m;  
      burst-size-limit 15220;  
    }  
    then discard;  
  }  
  family vpls {  
    filter filter_in_ge-0/1/3 {  
      interface-specific;  
      term 1 {  
        then {  
          policer policer_in_ge-0/1/3;  
          accept;  
        }  
      }  
    }  
  }  
}  
}  
routing-instances {  
  ELAN_BGP_PortBased_10_100M {  
    instance-type vpls;  
  }  
}
```

```

interface ge-0/1/3.0;
route-distinguisher 65410:2;
vrf-target target:65410:1;
protocols {
  vpls {
    no-tunnel-services;
    site Site_1 {
      site-identifier 1;
      site-preference primary;
      interface ge-0/1/3.0;
    }
  }
}
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/2/2 {
  mtu 1522;
  encapsulation ethernet-vpls;
  unit 0 {
    family vpls {
      filter {
        input filter_in_ge-0/2/2;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/2/2 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 15220;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/2/2 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/2/2;
          accept;
        }
      }
    }
  }
}

routing-instances {
  ELAN_BGP_PortBased_10_100M {
    instance-type vpls;
    interface ge-0/2/2.0;
    route-distinguisher 65410:4;
    vrf-target target:65410:1;
    protocols {

```

```

        vpls {
            no-tunnel-services;
            site Site_3 {
                site-identifier 3;
                site-preference primary;
                interface ge-0/2/2.0;
            }
        }
    }
}

```

ELAN-BGP-QinQ-AllVLAN

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport all traffic across a BGP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. No VLAN mapping is performed—customer VLAN IDs and service provider VLAN IDs must match on each endpoint that is to send or receive traffic. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 13 on page 116:

- Configuration on Endpoint A on page 128
- Configuration on Endpoint B on page 129
- Configuration on Endpoint Z on page 130

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device IND):

```

ge-0/1/1 {
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-tags outer 1;
        family vpls {
            filter {
                input filter_in_ge-0/1/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/1/1_1 {
            interface-specific;
            term 1 {

```



```

    }
  }
}
routing-instances {
  BestCustomer_ELAN-BGP-QinQ-AllVLAN-SR {
    instance-type vpls;
    interface ge-0/1/1.1;
    route-distinguisher 65410:12;
    vrf-target target:65410:4;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_1 {
          site-identifier 1;
          site-preference primary;
          interface ge-0/1/1.1;
        }
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/0/5 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-tags outer 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/5_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/5_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/0/5_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/0/5_1;
          accept;
        }
      }
    }
  }
}

```



```

routing-instances {
  BestCustomer_ELAN-BGP-QinQ-AllVLAN-SR {
    instance-type vpls;
    interface ge-0/0/5.1;
    route-distinguisher 65410:14;
    vrf-target target:65410:4;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_3 {
          site-identifier 3;
          site-preference primary;
          interface ge-0/0/5.1;
        }
      }
    }
  }
}

```

ELAN-BGP-QinQ-AllVLAN-Normalized-All

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport all traffic across a BGP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Customer VLAN IDs are preserved across the network—traffic passes only among matching customer VLAN IDs. However, traffic can pass among any service provider VLAN ID in the broadcast domain. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 13 on page 116:

- Configuration on Endpoint A on page 131
- Configuration on Endpoint B on page 132
- Configuration on Endpoint Z on page 133

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device IND):

```

ge-0/1/0 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-tags outer 1;
    family vpls {
      filter {
        input filter_in_ge-0/1/0_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/1/0_1 {
    if-exceeding {
      bandwidth-limit 100m;
    }
  }
}

```

```

        burst-size-limit 62500000;
    }
    then discard;
}
family vpls {
    filter filter_in_ge-0/1/0_1 {
        interface-specific;
        term 1 {
            then {
                policer policer_in_ge-0/1/0_1;
                accept;
            }
        }
    }
}
}
routing-instances {
    BestCustomer_ELAN-BGP-QinQ-AllVLAN-Normalized-All-SR {
        instance-type vpls;
        vlan-id all;
        interface ge-0/1/0.1;
        route-distinguisher 65410:10;
        vrf-target target:65410:3;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_2 {
                    site-identifier 2;
                    site-preference primary;
                    interface ge-0/1/0.1;
                }
            }
        }
    }
}
}

```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device BLR):

```

ge-0/1/0 {
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-tags outer 1;
        family vpls {
            filter {
                input filter_in_ge-0/1/0_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/1/0_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
}

```

```

family vpls {
    filter filter_in_ge-0/1/0_1 {
        interface-specific;
        term 1 {
            then {
                policer policer_in_ge-0/1/0_1;
                accept;
            }
        }
    }
}
}
routing-instances {
    BestCustomer_ELAN-BGP-QinQ-AllVLAN-Normalized-All-SR {
        instance-type vpls;
        vlan-id all;
        interface ge-0/1/0.1;
        route-distinguisher 65410:9;
        vrf-target target:65410:3;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_1 {
                    site-identifier 1;
                    site-preference primary;
                    interface ge-0/1/0.1;
                }
            }
        }
    }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/0/4 {
    flexible-vlan-tagging;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-tags outer 1;
        family vpls {
            filter {
                input filter_in_ge-0/0/4_1;
            }
        }
    }
}
firewall {
    policer policer_in_ge-0/0/4_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/4_1 {
            interface-specific;
            term 1 {
                then {

```



```

    }
  }
}

firewall {
  policer policer_in_ge-0/0/3_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/0/3_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/0/3_1;
          accept;
        }
      }
    }
  }
}

routing-instances {
  BestCustomer_ELAN-BGP-QinQ-AllVLAN-Normalized-SR {
    instance-type vpls;
    vlan-id none;
    interface ge-0/0/3.1;
    route-distinguisher 65410:7;
    vrf-target target:65410:2;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_2 {
          site-identifier 2;
          site-preference primary;
          interface ge-0/0/3.1;
        }
      }
    }
  }
}

```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device BLR):

```

ge-0/0/3 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-tags outer 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/3_1;
      }
    }
  }
}

```

```

firewall {
  policer policer_in_ge-0/0/3_1 {
    if-exceeding {
      bandwidth-limit 100m;
      burst-size-limit 62500000;
    }
    then discard;
  }
  family vpls {
    filter filter_in_ge-0/0/3_1 {
      interface-specific;
      term 1 {
        then {
          policer policer_in_ge-0/0/3_1;
          accept;
        }
      }
    }
  }
}

routing-instances {
  BestCustomer_ELAN-BGP-QinQ-AllVLAN-Normalized-SR {
    instance-type vpls;
    vlan-id none;
    interface ge-0/0/3.1;
    route-distinguisher 65410:6;
    vrf-target target:65410:2;
    protocols {
      vpls {
        no-tunnel-services;
        site Site_1 {
          site-identifier 1;
          site-preference primary;
          interface ge-0/0/3.1;
        }
      }
    }
  }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SJC):

```

ge-0/0/3 {
  flexible-vlan-tagging;
  encapsulation flexible-ethernet-services;
  unit 1 {
    encapsulation vlan-vpls;
    vlan-tags outer 1;
    family vpls {
      filter {
        input filter_in_ge-0/0/3_1;
      }
    }
  }
}

firewall {
  policer policer_in_ge-0/0/3_1 {

```

```

        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/3_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/3_1;
                    accept;
                }
            }
        }
    }
}
routing-instances {
    BestCustomer_ELAN-BGP-QinQ-AllVLAN-Normalized-SR {
        instance-type vpls;
        vlan-id none;
        interface ge-0/0/3.1;
        vlan-id none;
        route-distinguisher 65410:8;
        vrf-target target:65410:2;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_3 {
                    site-identifier 3;
                    site-preference primary;
                    interface ge-0/0/3.1;
                }
            }
        }
    }
}
}

```

ELAN-BGP-QinQ-Range-Normalized-VLAN

This service definition provides a base for creating multipoint-to-multipoint Ethernet services that transport traffic from a range of VLANs on an endpoint across a BGP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Services built from this service definition must use MX Series devices on the provider edge. Customer VLAN IDs are preserved across the network—traffic passes among like customer VLAN IDs on any service provider VLAN in the broadcast domain. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data for a service with only two endpoints, SJC and SFO.

- Configuration on Endpoint A on page 138
- Configuration on Endpoint Z on page 139

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device SJC):

```

ge-0/0/6 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 2 {
        encapsulation vlan-vpls;
        vlan-tags outer 2 inner-range 1500-2000;
        family vpls {
            filter {
                input filter_in_ge-0/0/6_2;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/0/6_2 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/6_2 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/6_2;
                    accept;
                }
            }
        }
    }
}

routing-instances {
    BestCustomer_ELAN-BGP-QinQ-Range-Normalized-VLAN-SR1 {
        instance-type vpls;
        vlan-id all;
        interface ge-0/0/6.2;
        vlan-id all;
        route-distinguisher 65410:19;
        vrf-target target:65410:6;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_2 {
                    site-identifier 2;
                    site-preference primary;
                    interface ge-0/0/6.2;
                }
            }
        }
    }
}

```


Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device SFO):

```

ge-0/0/1 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 1 {
        encapsulation vlan-vpls;
        vlan-tags outer 1 inner-range 1500-2000;
        family vpls {
            filter {
                input filter_in_ge-0/0/1_1;
            }
        }
    }
}

firewall {
    policer policer_in_ge-0/0/1_1 {
        if-exceeding {
            bandwidth-limit 100m;
            burst-size-limit 62500000;
        }
        then discard;
    }
    family vpls {
        filter filter_in_ge-0/0/1_1 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/1_1;
                    accept;
                }
            }
        }
    }
}

routing-instances {
    BestCustomer_ELAN-BGP-QinQ-Range-Normalized-VLAN-SR1 {
        instance-type vpls;
        vlan-id all;
        interface ge-0/0/1.1;
        route-distinguisher 65410:18;
        vrf-target target:65410:6;
        protocols {
            vpls {
                no-tunnel-services;
                site Site_1 {
                    site-identifier 1;
                    site-preference primary;
                    interface ge-0/0/1.1;
                }
            }
        }
    }
}

```

Related Topics • [Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73](#)

- [Predefined Point-to-Multipoint Ethernet Service Definitions on page 140](#)
- [Predefined Point-to-Point Ethernet Service Definitions on page 93](#)

Predefined Point-to-Multipoint Ethernet Service Definitions

The Network Activate software provides predefined service definitions that a service provisioner can choose from when creating a service order. This section provides information about predefined service definitions used for creating point-to-multipoint services. For information about predefined service definitions used to create point-to-point service definitions or multipoint-to-multipoint service definitions, see the following topics:

- [Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116](#)
- [Predefined Point-to-Point Ethernet Service Definitions on page 93](#)

If none of the point-to-multipoint predefined service definitions described here is appropriate for your needs, you can create a service definition as described in “Creating a Point-to-Multipoint Ethernet Service Definition” on page 81.

The Network Activate software provides predefined service definitions for VPLS services that use BGP switching in the network core. These services are sometimes known as E-LAN services. This section covers point-to-multipoint (or hub and spoke) service definitions.

Information specific to each service instance, such as the device name, endpoint name, customer VLAN ID, and whether a specific endpoint is a hub or a spoke is provided in the service order. Attributes that can apply across many service instances are typically defined in the service definition. These attributes include:

- Ethernet option (dot1.q, qinq)
- Traffic type (single VLAN, VLAN range, all traffic)
- VLAN normalization
- Physical interface encapsulation
- Logical interface encapsulation
- Rate limit range

Table 11 on page 141 lists each of the standard VPLS service definitions. Each standard service definition is then described in detail in the sections that follow.

Table 11: Standard Point-to-Multipoint Service Definitions

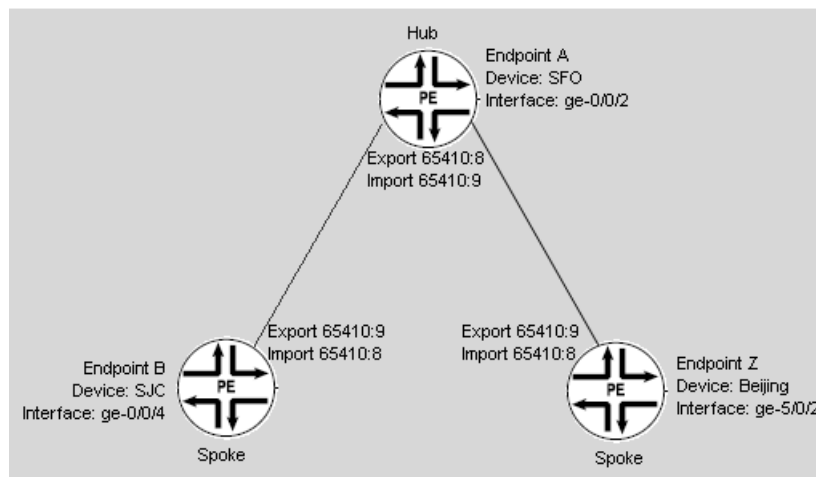
Standard Service Definition Name	Service Attributes
"ELAN-Hub-Spoke-QinQ-AllVLAN-Normalized-All" on page 141	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series or MX Series devices • Gigabit Ethernet interfaces • Customer VLAN IDs are preserved • Q-in-Q endpoint interface types • All customer traffic • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment
"ELAN-Hub-Spoke-QinQ-AllVLAN" on page 147	<ul style="list-style-type: none"> • Multipoint Ethernet service for M Series and MX Series devices • Gigabit Ethernet interfaces • Customer VLAN IDs are not preserved • Q-in-Q endpoint interface types • All customer traffic • Flexible-ethernet-services physical encapsulation type • Rate limiting from 10 Mbps to 100 Mbps with 10 Mbps increment

ELAN-Hub-Spoke-QinQ-AllVLAN-Normalized-All

This service definition provides a base for creating point-to-multipoint Ethernet services that transport all traffic on an endpoint across a BGP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. VLAN IDs are not preserved across the network—traffic passes from the single VLAN on an endpoint to any VLANs in the broadcast domain. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps.

The following sections show the configuration data on each endpoint when you use this service definition to create the service shown in Figure 14 on page 142—a point-to-multipoint service with one hub and two spokes.

Figure 14: Point-to-Multipoint Service with One Hub



- Configuration on Endpoint A on page 142
- Configuration on Endpoint B on page 144
- Configuration on Endpoint Z on page 145

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device SFO). This device is configured as the service hub.

```

interfaces {
  ge-0/0/2 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 4 {
      encapsulation vlan-vpls;
      vlan-tags outer 4;
      family vpls {
        filter {
          input filter_in_ge-0/0/2_4;
        }
      }
    }
  }
}

policy-options {
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-hm-export {
    term 1 {
      then {
        community add
        export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8;
        accept;
      }
    }
    term 2 {
      then reject;
    }
  }
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-hm-import {
    term 1 {

```

```

        from {
            protocol bgp;
            community [
import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9
import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8 ];
            }
            then accept;
        }
        term 2 {
            then reject;
        }
    }
    community export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8
members target:65410:8;
    community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8
members target:65410:8;
    community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9
members target:65410:9;
}
firewall {
    family vpls {
        filter filter_in_ge-0/0/2_4 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/2_4;
                    accept;
                }
            }
        }
    }
    policer policer_in_ge-0/0/2_4 {
        if-exceeding {
            bandwidth-limit 10m;
            burst-size-limit 15220;
        }
        then discard;
    }
}
routing-instances {
    ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All {
        instance-type vpls;
        vlan-id all;
        interface ge-0/0/2.4;
        route-distinguisher 65410:15;
        vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-hm-import;
        vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-hm-export;
        protocols {
            vpls {
                mac-table-size {
                    5120;
                }
                interface-mac-limit {
                    1024;
                }
            }
            no-tunnel-services;
            site Site_2 {
                site-identifier 2;
                site-preference primary;
                interface ge-0/0/2.4;
            }
        }
    }
}

```

```
    }
  }
```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device SJC). This device is a service spoke.

```
interfaces {
  ge-0/0/4 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 4 {
      encapsulation vlan-vpls;
      vlan-tags outer 4;
      family vpls {
        filter {
          input filter_in_ge-0/0/4_4;
        }
      }
    }
  }
}

policy-options {
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-export {
    term 1 {
      then {
        community add
        export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9;
        accept;
      }
    }
    term 2 {
      then reject;
    }
  }
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-import {
    term 1 {
      from {
        protocol bgp;
        community
        import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8;
      }
      then accept;
    }
    term 2 {
      then reject;
    }
  }
  community export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9
  members target:65410:9;
  community import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8
  members target:65410:8;
}

firewall {
  family vpls {
    filter filter_in_ge-0/0/4_4 {
      interface-specific;
      term 1 {
        then {
```

```

        policer policer_in_ge-0/0/4_4;
        accept;
    }
}
}
}
policer policer_in_ge-0/0/4_4 {
    if-exceeding {
        bandwidth-limit 10m;
        burst-size-limit 15220;
    }
    then discard;
}
}

routing-instances {
    ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All {
        instance-type vpls;
        vlan-id all;
        interface ge-0/0/4.4;
        route-distinguisher 65410:16;
        vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-import;
        vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-export;
        protocols {
            vpls {
                mac-table-size {
                    5120;
                }
                interface-mac-limit {
                    1024;
                }
                no-tunnel-services;
                site Site_3 {
                    site-identifier 3;
                    site-preference primary;
                    interface ge-0/0/4.4;
                }
            }
        }
    }
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device Beijing). Thus device is a service spoke.

```

interfaces{
    ge-5/0/2 {
        unit 2 {
            encapsulation vlan-vpls;
            vlan-tags outer 2;
            family vpls {
                filter {
                    input filter_in_ge-5/0/2_2;
                }
            }
        }
    }
}

policy-options {
    policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-export {
        term 1 {
            then {
                community add
            }
        }
    }
}

```

```

export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9;
    accept;
}
}
term 2 {
    then reject;
}
}
policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-import {
    term 1 {
        from {
            protocol bgp;
            community
import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8;
        }
        then accept;
    }
    term 2 {
        then reject;
    }
}
community export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:9
members target:65410:9;
community import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-65410:8
members target:65410:8;
}
firewall {
    family vpls {
        filter filter_in_ge-5/0/2_2 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-5/0/2_2;
                    accept;
                }
            }
        }
    }
}
policer policer_in_ge-5/0/2_2 {
    if-exceeding {
        bandwidth-limit 10m;
        burst-size-limit 15220;
    }
    then discard;
}
}
ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All {
    instance-type vpls;
    vlan-id all;
    interface ge-5/0/2.2;
    route-distinguisher 65410:14;
    vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-import;
    vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN_Normalized_All-export;
    protocols {
        vpls {
            mac-table-size {
                5120;
            }
            interface-mac-limit {
                1024;
            }
        }
    }
}

```



```

no-tunnel-services;
site Site_1 {
    site-identifier 1;
    site-preference primary;
    interface ge-5/0/2.2;
}
}
}
}
}

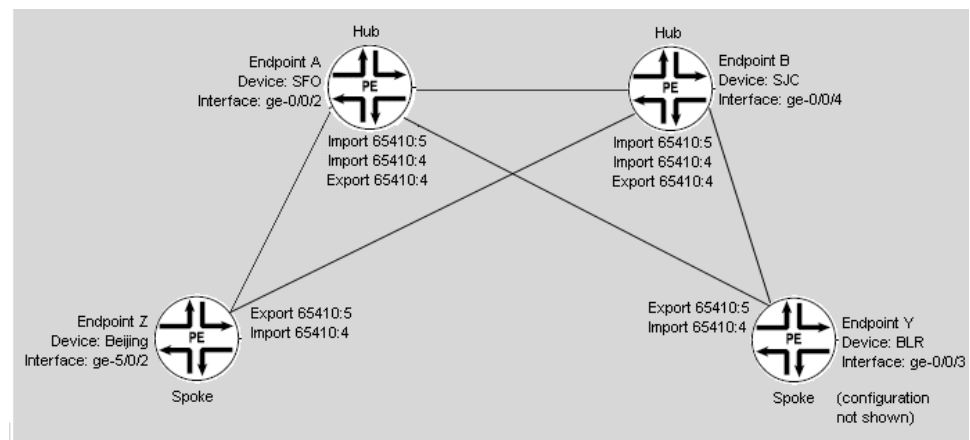
```

ELAN-Hub-Spoke-QinQ-AllVLAN

This service definition provides a base for creating point-to-multipoint Ethernet services that transport all traffic on an endpoint across a BGP network core using Q-in-Q endpoint interface types and flexible-ethernet-services as the physical encapsulation type. Customer VLAN IDs are preserved across the network—traffic passes among like customer VLAN IDs on any service provider VLAN in the broadcast domain. Service provisioners can limit the bandwidth of services built from this service definition to specific values from 10 Mbps through 100 Mbps. Figure 15 on page 147 shows a point-to-multipoint service with two hubs.

The following sections show the configuration data on endpoints A, B, and Z when you use this service definition to create the service shown in Figure 15 on page 147—a point-to-multipoint service with two service hubs and two spokes. The configuration for endpoint Y is not described.

Figure 15: Point-to-Multipoint Service with Two Hubs



- Configuration on Endpoint A on page 147
- Configuration on Endpoint B on page 149
- Configuration on Endpoint Z on page 151

Configuration on Endpoint A

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint A (device SFO). This device is configured as a service hub.

```

interfaces {
    ge-0/0/2 {

```

```

flexible-vlan-tagging;
mtu 1522;
encapsulation flexible-ethernet-services;
unit 3 {
    encapsulation vlan-vpls;
    vlan-tags outer 3;
    family vpls {
        filter {
            input filter_in_ge-0/0/2_3;
        }
    }
}

policy-options {
    policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-hm-export {
        term 1 {
            then {
                community add export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4;

                accept;
            }
        }
        term 2 {
            then reject;
        }
    }
    policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-hm-import {
        term 1 {
            from {
                protocol bgp;
                community [ import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5
import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 ];
            }
            then accept;
        }
        term 2 {
            then reject;
        }
    }
    community export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 members
target:65410:4;
    community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 members
target:65410:4;
    community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5 members
target:65410:5;
}

firewall {
    family vpls {
        filter filter_in_ge-0/0/2_3 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/2_3;
                    accept;
                }
            }
        }
    }

    policer policer_in_ge-0/0/2_3 {

```

```

        if-exceeding {
            bandwidth-limit 10m;
            burst-size-limit 15220;
        }
        then discard;
    }

    ELAN_Hub_Spoke_QinQ_AllVLAN {
        instance-type vpls;
        interface ge-0/0/2.3;
        route-distinguisher 65410:9;
        vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN-hm-import;
        vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN-hm-export;
        protocols {
            vpls {
                mac-table-size {
                    5120;
                }
                interface-mac-limit {
                    1024;
                }
                no-tunnel-services;
                site Site_2 {
                    site-identifier 2;
                    site-preference primary;
                    interface ge-0/0/2.3;
                }
            }
        }
    }
}

```

Configuration on Endpoint B

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint B (device SJC). This device is configured as a service hub.

```

interfaces {
    ge-0/0/4 {
        flexible-vlan-tagging;
        mtu 1522;
        encapsulation flexible-ethernet-services
        unit 3 {
            encapsulation vlan-vpls;
            vlan-tags outer 3;
            family vpls {
                filter {
                    input filter_in_ge-0/0/4_3;
                }
            }
        }
    }
}

policy-options {
    policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-hm-export {
        term 1 {
            then {
                community add export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4;
            }
            accept;
        }
    }
    term 2 {

```

```

        then reject;
    }
}
policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-hm-import {
    term 1 {
        from {
            protocol bgp;
            community [ import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5
import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 ];
        }
        then accept;
    }
    term 2 {
        then reject;
    }
}
community export-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 members
target:65410:4;
community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 members
target:65410:4;
community import-comm-hm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5 members
target:65410:5;
}

firewall {
    family vpls {
        filter filter_in_ge-0/0/4_3 {
            interface-specific;
            term 1 {
                then {
                    policer policer_in_ge-0/0/4_3;
                    accept;
                }
            }
        }
    }
    policer policer_in_ge-0/0/4_3 {
        if-exceeding {
            bandwidth-limit 10m;
            burst-size-limit 15220;
        }
        then discard;
    }
}

ELAN_Hub_Spoke_QinQ_AllVLAN {
    instance-type vpls;
    interface ge-0/0/4.3;
    route-distinguisher 65410:10;
    vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN-hm-import;
    vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN-hm-export;
    protocols {
        vpls {
            mac-table-size {
                5120;
            }
            interface-mac-limit {
                1024;
            }
            no-tunnel-services;
            site Site_3 {
                site-identifier 3;
            }
        }
    }
}

```

```

        site-preference primary;
        interface ge-0/0/4.3;
    }
}
}

```

Configuration on Endpoint Z

The following statements show the interface configuration, the filter configuration, and connectivity configuration on endpoint Z (device Beijing). This device is configured as a service spoke.

```

interfaces {
  ge-5/0/2 {
    flexible-vlan-tagging;
    mtu 1522;
    encapsulation flexible-ethernet-services;
    unit 1 {
      encapsulation vlan-vpls;
      vlan-tags outer 1;
      family vpls {
        filter {
          input filter_in_ge-5/0/2_1;
        }
      }
    }
  }
}

policy-options {
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-export {
    term 1 {
      then {
        community add export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5;
        accept;
      }
    }
    term 2 {
      then reject;
    }
  }
  policy-statement ELAN_Hub_Spoke_QinQ_AllVLAN-import {
    term 1 {
      from {
        protocol bgp;
        community import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4;
      }
      then accept;
    }
    term 2 {
      then reject;
    }
  }
  community export-comm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:5 members
  target:65410:5;
  community import-comm-ELAN_Hub_Spoke_QinQ_AllVLAN-65410:4 members
  target:65410:4;
}

firewall {
  family vpls {
    filter filter_in_ge-5/0/2_1 {

```

```
        interface-specific;
        term 1 {
            then {
                policer policer_in_ge-5/0/2_1;
                accept;
            }
        }
    }
    policer policer_in_ge-5/0/2_1 {
        if-exceeding {
            bandwidth-limit 10m;
            burst-size-limit 15220;
        }
        then discard;
    }
}
routing-instances {
    ELAN_Hub_Spoke_QinQ_AllVLAN {
        instance-type vpls;
        interface ge-5/0/2.1;
        route-distinguisher 65410:8;
        vrf-import ELAN_Hub_Spoke_QinQ_AllVLAN-import;
        vrf-export ELAN_Hub_Spoke_QinQ_AllVLAN-export;
        protocols {
            vpls {
                mac-table-size {
                    5120;
                }
                interface-mac-limit {
                    1024;
                }
                no-tunnel-services;
                site Site_1 {
                    site-identifier 1;
                    site-preference primary;
                    interface ge-5/0/2.1;
                }
            }
        }
    }
}
```

- Related Topics**
- [Creating a Point-to-Multipoint Ethernet Service Definition on page 81](#)
 - [Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116](#)
 - [Predefined Point-to-Point Ethernet Service Definitions on page 93](#)

CHAPTER 8

Monitoring Service Definitions

- Viewing Service Design Statistics on page 153

Viewing Service Design Statistics

The following topics describe viewing statistics in the Service Design workspace:

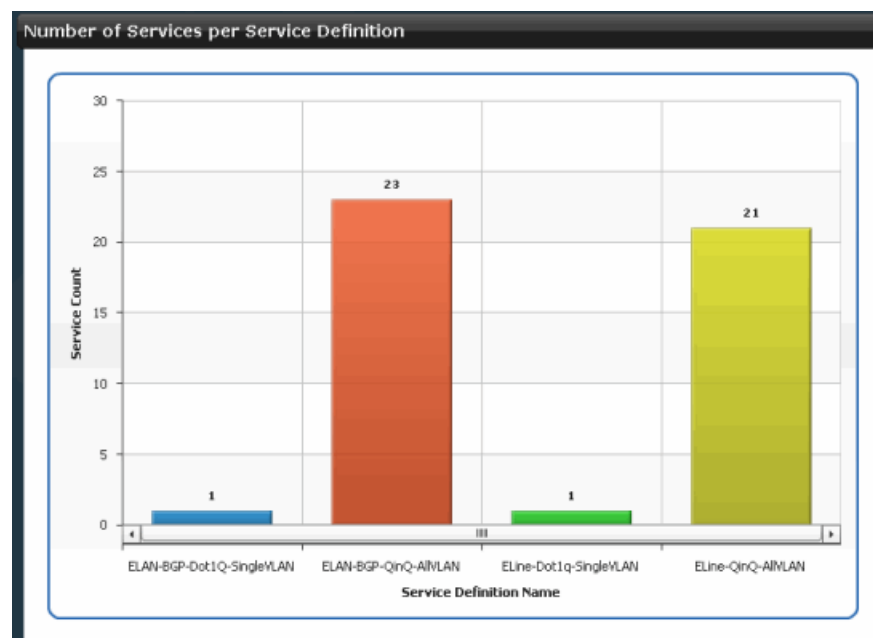
- Viewing Services Created From a Service Definition on page 153
- Viewing How Many Service Definitions are in Each Service Definition State on page 154

Viewing Services Created From a Service Definition

To view the number of services made from each service definition, follow these steps:

1. In the task ribbon, select the **Service Design** workspace icon.

The Junos Space software displays the chart named Number of Services per Service Definition. An example follows:



Each vertical bar represents a service definition. The number of services is shown on the Y axis. Drag the slider across the bottom of the graph to display all service definitions. This example shows 23 services have been created from the service definition named ELAN-BGP-QinQ-AllVLAN.

2. To see which services have been created from a specific service definition, click on the bar that represents the service definition.

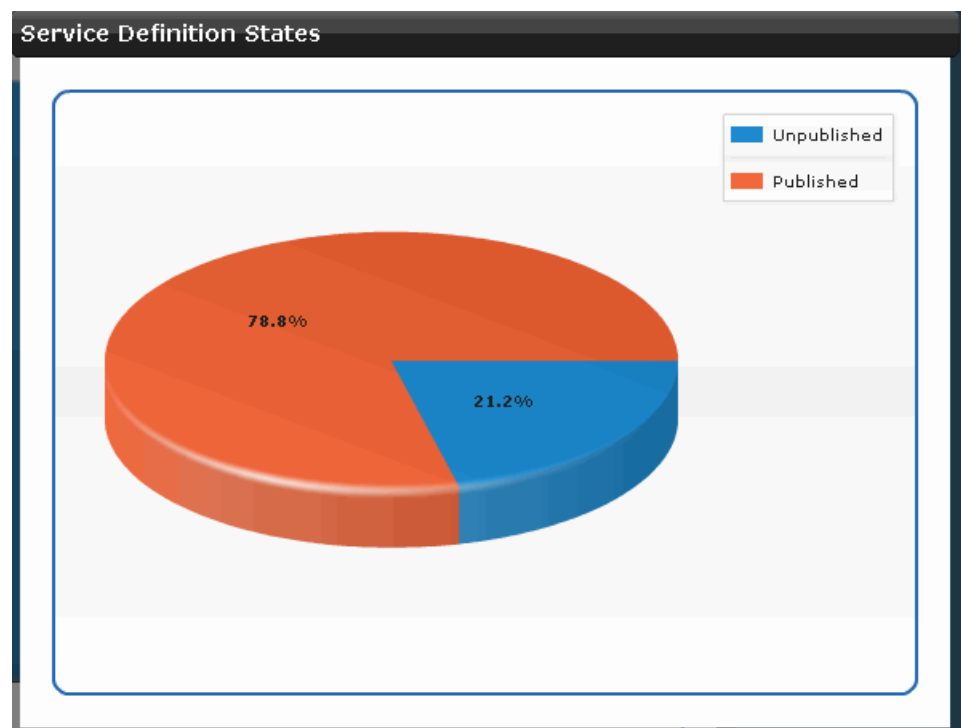
The Manage Services screen shows only the services created from that service definition.

Viewing How Many Service Definitions are in Each Service Definition State

To view the percentage or number of service definitions that are in each service definition state, follow these steps:

1. In the task ribbon, select the **Service Design** workspace icon.

The Junos Space software displays the chart named Service Definition States. An example follows:



Each segment of the pie chart represents the proportion of service definitions in the indicated state. In this example, 78.8 percent of all completed service definitions are in the Published state.

To view the number of service definitions in a state, move the mouse cursor over the segment.

2. To see which service definitions are in each state, click a segment in the pie chart.

The Manage Service Definitions screen shows only those service definitions from the selected segment.

- Related Topics**
- [Workspace Statistics Pages Overview](#)
 - [Viewing Service Definitions on page 61](#)
 - [Viewing Services on page 232](#)

PART 4

Provisioning and Troubleshooting Layer 2 Services

- Managing Customers on page 159
- Managing Services Orders on page 163
- Managing Services on page 191
- Monitoring Services and Service Orders on page 219
- Troubleshooting Services on page 253

CHAPTER 9

Managing Customers

- Viewing Customers on page 159
- Adding a New Customer on page 160
- Editing an Existing Customer on page 161
- Deleting Customers on page 162

Viewing Customers

The following topics describe how to view customer information either as graphics or in a table.

- Viewing Customers as Graphics on page 159
- Viewing Customers in a Table on page 160

Viewing Customers as Graphics

To view thumbnails of your customers, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Customers** task icon.
3. To display the customer inventory as thumbnails, in the filter bar, select the thumbnail view icon.

Thumbnails representing customers appear in the main display area.

4. To restrict the display of customers, enter a search criterion of one or more characters in the Search bar and press Enter. All customer names that match the search criterion are shown in the main display area.
5. For details about a specific customer, click **Details** in the thumbnail.

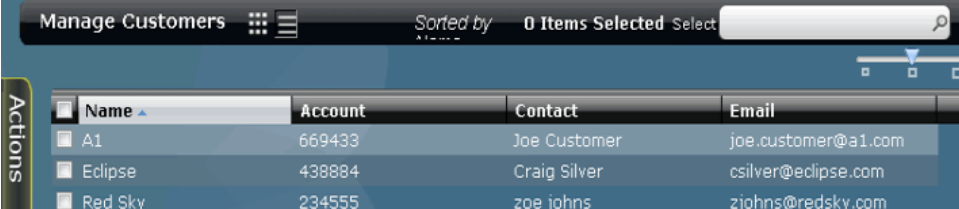
The Details screen displays the customer name, account number, contact name, contact email address, and contact information.

Viewing Customers in a Table

To view a list of your customers in a table, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the Network Activate task ribbon, select the **Manage Customers** task icon.
3. To display the customer inventory in a table, in the filter bar, select the table view icon.

A list of customers appears in a table in the main display area of the screen. The table view includes the customer name, account number, contact name, and email address, as shown in the following example:



Name	Account	Contact	Email
A1	669433	Joe Customer	joe.customer@a1.com
Eclipse	438884	Craig Silver	csilver@edipse.com
Red Sky	234555	zoe johns	zjohns@redsky.com

4. To restrict the display of customers, enter a search criterion of one or more characters in the Search bar and press Enter. All customer names that match the search criterion are shown in the main display area.

- Related Topics**
- Adding a New Customer on page 160
 - Editing an Existing Customer on page 161
 - Deleting Customers on page 162

Adding a New Customer

New customers must be identified to the system before you can provision and activate a service order for them.

To add a customer to the database, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Customers** task icon.

An inventory of existing customers appears in the Manage Customers screen.

3. In the task ribbon, select the **Create Customer** task icon.
4. On the Create Customer screen, provide the information requested for the customer, similar to the following example:

Name: A1-Enterprises

Account number: 1234568

Contact name: Joe Customer

Contact email: joe.customer@a1.com

Contact information:

Image File:

Fill out the fields in the form.

The Name and Account number fields are required. All other fields are optional.

5. Optionally, use the Image File field to upload a graphical image of the customer. This image will be used for the thumbnail representation of the customer in Junos Space screens to easily identify information about that customer. For example, the image might use the customer's corporate logo.

To upload an image file for the customer, follow these steps:

- a. In the Image File field, click **Browse**.
 - b. Navigate to the file that contains the image you want to use for this customer.
 - c. Click **Upload**.
6. Click **Create**.

The Manage Customers inventory page shows the new customer.

- Related Topics**
- Viewing Customers on page 159
 - Editing an Existing Customer on page 161
 - Deleting Customers on page 162

Editing an Existing Customer

To edit the information about an existing customer, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select **Manage Customers**.

The Manage Customers screen shows the customers already added to the system.

3. In the Manage customers screen, select the customer whose information you want to edit.
4. Open the Actions drawer and click **Modify Customer**.
5. Make the required changes to the customer information.
6. Click **Modify**.

The Manage Customers screen shows the modified information.

- Related Topics**
- Viewing Customers on page 159
 - Adding a New Customer on page 160
 - Deleting Customers on page 162

Deleting Customers

You cannot delete a customer from the database if an active service exists for that customer. You must decommission all such services before you can delete the customer.

To delete a customer from the database, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select **Manage Customers**.

The Manage Customers screen shows the customers in the database.

3. Select the customer you need to delete. To delete several customers at the same time, use the multiple selection capability in the quick-look panel.
4. Open the Actions drawer and click **Delete Customer**.

If the **Delete Customer** option is dimmed, drag your mouse over **Delete Customer** to display a tool tip that lists customers that must be deselected for the operation to succeed.

After successfully selecting the **Delete Customer** action, a pop-up window appears requesting confirmation.

5. Click **Delete**.

The Manage Customers screen no longer lists the deleted customer.

- Related Topics**
- Viewing Customers on page 159
 - Adding a New Customer on page 160
 - Editing an Existing Customer on page 161
 - Decommissioning a Service on page 217

CHAPTER 10

Managing Services Orders

- Creating a Point-to-Point Ethernet Service Order on page 163
- Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
- Creating a Point-to-Multipoint Ethernet Service Order on page 178
- Deploying a Service on page 188
- Deleting a Service Order on page 189
- Deleting a Partial Configuration on page 190

Creating a Point-to-Point Ethernet Service Order

To create a point-to-point Ethernet service order, follow the steps in these procedures:

1. Selecting the Service Definition on page 163
2. Entering General Settings Information on page 164
3. Specifying the Connectivity on page 164
4. Specifying Endpoint Information on page 165
5. Deploying the New Service on page 167

Selecting the Service Definition

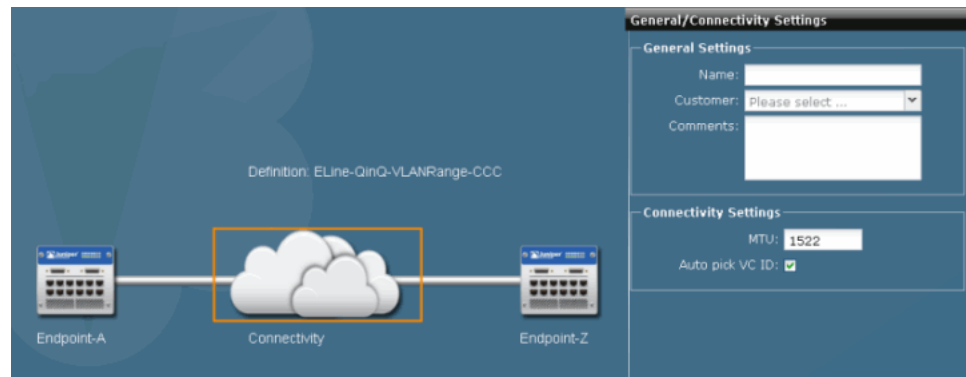
To select a service definition on which to base the new service order, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Orders** task icon.
3. In the task ribbon, select the **Create P2P Service Order** task icon.

The Select Service Definition screen displays an inventory of all available point-to-point service definitions.

4. Select the service definition you want to base your service order on, and then click **Next**.

A graphical image of a service order appears as shown in the following example:



The image in the left part of the main display area has multiple selectable elements. The right panel requests information depending on which element is selected.

The two router images represent the two endpoints of the point-to-point service. Text above the cloud image provides general information about the service. The cloud represents the connectivity across the network between the two endpoints.

When you select the cloud or the text, the right panel requests general information about the service order as well as connectivity information.

The General/Connectivity Settings panel appears initially in the right panel, as shown in the previous example.

Entering General Settings Information

In the General Settings box, enter the following information:

1. In the Name field, enter a unique name for the service.
The service order name can consist of only letters, numbers, and underscores.
2. In the Customer field, select the customer who is requesting the service.
If the customer is not in the list, you must add the customer to the database before proceeding. See “Adding a New Customer” on page 160.
3. In the Comments field, enter a description of the service. This description will appear in information screens about the request or service instance created from the request.

Specifying the Connectivity

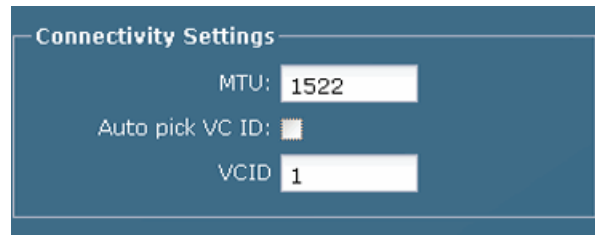
In the Connectivity Settings box, enter VCID and MTU information, as allowed by the service definition. This box might include:

- VCID—An integer that uniquely identifies the virtual circuit that the service will use.

The VCID can be either set automatically by the Junos Space software, or it can be set manually by the service provisioner in the service order. The service definition could force the system to pick the VCID, force the service provisioner to pick the VCID, or allow the service provisioner to override the settings in the service definition.

We recommend allocating the VCID automatically, however, service providers who have their own systems for allocating VCIDs will choose manual setting.

In the previous example, by default, the system picks a VCID from its pool automatically, but allows the service provisioner to override this value in the service order. Clear the checkbox to override the service definition setting. The form expands to include an additional field for entering the VCID manually as follows:

A screenshot of a 'Connectivity Settings' form. The form has a title bar 'Connectivity Settings' and contains three fields: 'MTU' with a value of '1522', 'Auto pick VC ID' with an unchecked checkbox, and 'VCID' with a value of '1'.

- MTU for the connection across the network.

Again, the service definition can constrain the MTU to a specific value or allow the service provisioner to override it in the service order. In this example, the service definition sets the MTU, but allows the service provisioner to change the value.

When you advance to the next step in creating your service order, your new connectivity settings appear under the Connectivity image in the main graphic and new general information is added to the text above the cloud. If you have incomplete or invalid information the General/Connectivity Settings panel, a warning icon appears next to the cloud image.

To provide endpoint information for the first endpoint, click the **Endpoint A** graphic element or click **Next**.

The Endpoint Settings form appears in the right panel.

Specifying Endpoint Information

An example Endpoint Settings screen follows:

The fields in this example are for a service with Q-in-Q endpoint interfaces. Some of the fields differ from one interface type to another and also differ depending on permissions assigned in the service definition.

Fill in the requested information as follows:

1. In the PE Device field, select the N-PE device you want to use for the first endpoint.
If you are unsure about which PE device to choose, go to the Prestaging Devices workspace landing page, which shows capacity information about UNIs on PE devices. You need to pick a device that has available UNIs.
This step is required for all service orders.
2. In the UNI interface field, select a UNI.
The dropdown list includes all UNIs available on the selected device.
This step is mandatory for all service orders.
The Physical IF encapsulation and Logical IF encapsulation fields are not selectable. These values are set in the service definition.
3. In the Traffic type field, designate whether the service will transport all traffic, a single VLAN, or multiple VLANs.
Although this field is present for all service orders, it is predetermined for some types of interface. For example, a port-to-port interface will always transport all traffic. Moreover, for interface types that do support multiple traffic types, you can select this value only if the service definition allows you to do so.

If you are allowed to select this field, depending on the interface type, you can choose from the following values:

- Transport single vlan

- Transport vlan range
 - Transport all traffic
4. In the C-VLAN ID field (or VLAN ID field), enter the customer's VLAN ID.
This field is mandatory for service orders that transport a single customer VLAN. The ID is provided by the customer.
 5. In the C-Vlan Start and C-Vlan End fields, enter the beginning and end of the range of customer VLANs that the service will transport.
This field is mandatory for all services that transport a specific range of customer VLANs. These VLAN IDs are provided by the customer.
 6. Select the **Auto pick S-VLAN ID** checkbox to have the system choose a service VLAN ID automatically.
This field is present only for interface types that provide double tagging; that is, only for Q-in-Q endpoint interface types. If this field is not set, then you must enter a service VLAN ID manually.
 7. In the S-VLAN ID field, enter the service VLAN ID that will be used to provide the outer tag for the service.
This field is present only for interface types that provide double tagging, and only if the Auto-pick S-VLAN ID checkbox is cleared.
 8. In the MTU (Bytes) field, enter the maximum transmission unit size for the UNI.
This field is present in all service orders. However, you can set this field only if the service definition allows you to do so.
 9. In the Bandwidth (Mbps) field, select a value from the list to limit the bandwidth of the service you are creating.
This field is present only if bandwidth limiting is allowed by the service definition, and is configurable in the service order only if the service definition allows you to do so.
When you click on another graphic element in the main graphic area, the selected device name and interface name appear beneath the endpoint image in the main graphic.
 10. To provide endpoint information for the second endpoint, click the **Endpoint Z** graphic element (or click **Next**).
The Endpoint Settings form appears in the right panel for the second endpoint. Complete this form as for the first endpoint.
 11. Click **Create**.
The deployment options window appears.

Deploying the New Service

An example of the deployment options window follows:

The screenshot shows a dialog box with a dark blue background. It contains three radio button options: 'Save only' (which is selected), 'Deploy now', and 'Schedule deployment'. Below these options is a 'Date and time:' label followed by a date input field, a time input field, and a dropdown menu currently set to 'PDT'. At the bottom of the dialog are two buttons: 'OK' and 'Cancel'.

To deploy the new service, follow these steps:

1. Perform one of these actions:
 - To save the request without deploying the service, select **Save only**, and then click **OK**.
See “Deploying a Service” on page 188 for information about how to deploy a saved service at a later time.
 - To deploy the service immediately, select **Deploy now**, and then click **OK**.
 - To deploy the service later, select **Schedule deployment**, select a date and time, and then click **OK**.
The time field specifies the time kept by the server, but in the time zone of the client.
2. To monitor the progress and status of the deployment, use the Jobs workspace. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

- Related Topics**
- Viewing Multipoint Ethernet Service Orders as Graphics on page 222
 - Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Service Attributes Overview on page 15
 - Adding a New Customer on page 160
 - Deploying a Service on page 188
 - Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
 - Creating a Point-to-Multipoint Ethernet Service Order on page 178

Creating a Multipoint-to-Multipoint Ethernet Service Order

The Network Activate software implements multipoint-to-multipoint Ethernet services as virtual private LAN (VPLS) services.

To create a multipoint-to-multipoint Ethernet service order, follow the steps in these procedures:

1. Selecting the Service Definition on page 169
2. Entering General Settings Information on page 169
3. Specifying QoS Settings (Release Candidate Feature) on page 170
4. Setting Attributes for All Endpoints on page 170
5. Selecting N-PE Devices on page 172
6. Modifying Endpoint Settings on page 172
7. Deploying the New Service on page 177

Selecting the Service Definition

To select a service definition on which to base the new service order, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Orders** task icon.
3. In the task ribbon, select the **Create VPLS Service Order** task icon.

The Select Service Definition screen appears and shows a filtered inventory view of only those published service definitions designed to work with multipoint Ethernet services.

4. Select the service definition you want to base your service order on, and then click **Next**.

The Enter Order Information screen appears.

Entering General Settings Information

This part of the create multipoint Ethernet service order procedure sets general information about the service order in the General Settings box of the Enter Order Information screen:

General Settings

Service definition: ELAN-BGP-QinQ-AllVLAN

Name:

Customer:

Comments:

Customer traffic type: Transport all traffic

☒ Autopick Route Target

Enter the following information:

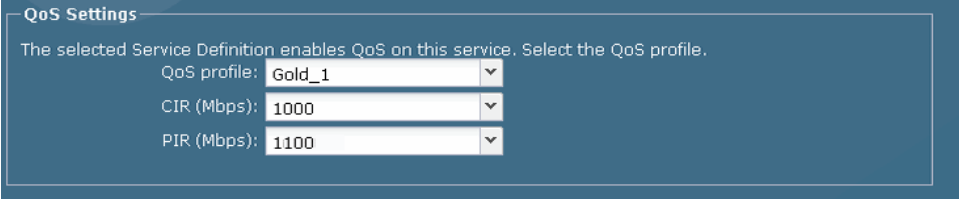
1. In the Name field, enter a unique name for the multipoint service.

The service order name can consist of only letters, numbers, and underscores.

2. In the Customer field, select the customer who is requesting the service.
If the customer is not in the list, you must add the customer to the database before proceeding. See “Adding a New Customer” on page 160.
3. In the Comments field, enter a description of the service. This description will appear in information screens about the request or service instance created from the request.
The Customer traffic type field is not selectable. Its value is set in the service definition.
The Autopick Route Target field cannot be changed. Route targets are always selected automatically.

Specifying QoS Settings (Release Candidate Feature)

If QoS is enabled on the service definition, enter information in the QoS Settings box. An example QoS Settings box follows:



1. In the QoS profile field, select a profile from the drop-down menu.
2. In the CIR field, select the committed information rate (CIR) from the drop-down menu. The CIR is the guaranteed rate and specifies the minimum bandwidth available if all sources are active at the same time.



NOTE: For bursty traffic, the CIR represents the average rate of traffic per unit time and the PIR represents the maximum amount of traffic that can be transmitted in a given interval.

3. In the PIR field, select the peak information rate (PIR) from the drop-down menu. The PIR is the shaping rate.



NOTE: If the QoS profile that you selected in Step 1 uses a single-rate TCM policer, do not select a PIR.

Setting Attributes for All Endpoints

This part of the create multipoint Ethernet service order procedure sets the attributes that are usually common for all endpoints in the service. The values that you enter will vary, depending on the service definition on which the service order is based.

If these attributes will not be the same on all endpoints, you can set them to be the same for now and then make changes later, or you can choose to skip this step and apply the attribute values one at a time later.

This procedure sets the attributes listed in the End Point Settings box of the Enter Order Information screen. The attributes shown depend on the interface type. The following example shows the endpoints settings box for a multipoint-to-multipoint service order with Q-in-Q interfaces, transporting a VLAN range.

End Point Settings

These settings from the selected Service Definition can be applied to all end points.
☒ Apply to all

Bandwidth (Mbps): 10

MTU (Bytes): 1522

☒ Autopick SVLAN ID

Customer VLAN Range Start:

Customer VLAN Range End:

Physical IF encapsulation: flexible-ethernet-services

Logical IF encapsulation: vlan-vpls

To skip this step and enter all the endpoint attributes individually later, clear the **Apply to all** checkbox.

To set attributes common to most endpoints, follow these steps:

1. In the Endpoint Settings box, leave the Apply to all checkbox selected so that you enter the endpoint parameter values only once.
2. In the Bandwidth field, select a value from the list to limit the bandwidth of the service you are creating.

This field is present only if bandwidth limiting is allowed by the service definition, and is configurable in the service order only if the service definition allows it.

3. In the MTU field, enter the maximum transmission unit size for the UNI.

This field is present in all service orders. However, you can set this field only if the service definition allows it.

4. Select the **Autopick SVLAN ID** checkbox if you want the service VLAN ID chosen automatically by the Network Activate software. Clear the checkbox to have the ID assigned manually.

To manually assign an SVLAN ID:

- a. Clear the **Autopick SVLAN ID** checkbox. The screen expands to include the SVLAN ID field.
- b. In the SVLAN ID field, enter a value.

This field is present only for service orders with UNIs that have Q-in-Q interface types.

5. In the Customer VLAN Range Start and Customer VLAN Range End fields, enter the first and last VLAN ID of the range of customer VLANs to be transported over the network.

These fields are present only for services with UNIs that have Q-in-Q interface types and allow a range of VLANs to be transported.

6. Select the **Autopick VLAN ID** checkbox if you want the customer VLAN ID chosen automatically by the Network Activate software. Clear the checkbox to have the ID assigned manually.

This field is present only for services with 802.1Q UNI endpoints and is configurable in the service order only if the service definition allows it.

7. In the VLAN ID field, enter a value for the customer VLAN.

This field is present only if Autopick VLAN ID is turned off in step 6.

The Physical IF encapsulation and Logical IF encapsulation fields are not selectable. These values are set in the service definition.

8. Click **Next**.

The Select Endpoint PE Devices screen appears.

Selecting N-PE Devices

This part of the create multipoint Ethernet service order procedure selects the N-PE devices that will host the service endpoints. The selection is made from the Select Endpoint PE Devices screen.



NOTE: The Select Endpoint PE Devices screen shows only assigned NPE devices that have an AS number configured. If you do not see the device you are looking for, use the CLI on the device to check for and assign an AS number.

To select endpoint N-PE devices, follow these steps:

1. In the Select Endpoint PE devices screen, select the devices that you want to participate in the service. Use the multiple selection feature to select more than one device.
2. Click **Next**.

The Endpoint Settings screen appears.

Modifying Endpoint Settings

This part of the create multipoint Ethernet service order procedure sets the attributes for each endpoint in the service. Selection is made using the Endpoint Settings screen:

Endpoint Settings						
Add Endpoints						
Device	UNI Interface	Bandwidth (Mbps)	AutoPick VLAN ID	VLAN ID	MTU (Bytes)	Action
Device: Laguna_pe_d1 (1 Interface)						
Laguna_pe_d1	ge-5/0/5	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface
Device: SanFrancisco (1 Interface)						
SanFrancisco	ge-0/0/2	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface
Device: SanJose (1 Interface)						
SanJose	ge-0/0/2	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface

This screen shows one endpoint for each device that you selected from the Select Endpoint PE devices screen, as described in “Selecting N-PE Devices” on page 172.

The interface shown in the UNI Interface field is automatically selected by the Network Activate software, which chooses the UNI that has the highest available capacity among interfaces that are in the Up state. To calculate the available capacity of the interface, the system subtracts the bandwidth reserved for each service deployed on that interface from the total capacity of the interface.

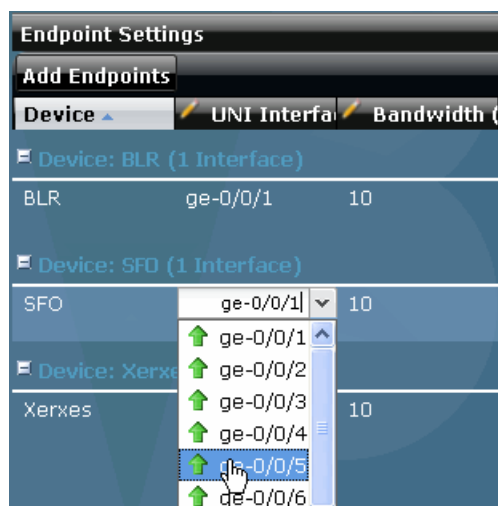
For each endpoint, the Endpoint Settings screen shows the following value for each UNI attribute:

- For port-to-port services, the displayed values are Bandwidth and MTU.
- For 802.1Q UNIs, the displayed attributes are Bandwidth, Autopick VLAN ID, VLAN ID, and MTU.
- For Q-in-Q UNIs, the displayed attributes include Bandwidth, AutoPick S-VLAN ID, and S-VLAN ID. For a service with Q-in-Q UNIs that specifies a customer VLAN range, the displayed attributes also include C-VLAN ID Start and C VLAN End.

The values shown are initially the values you set earlier on the Enter Order Information screen, as described in “Setting Attributes for All Endpoints” on page 170.

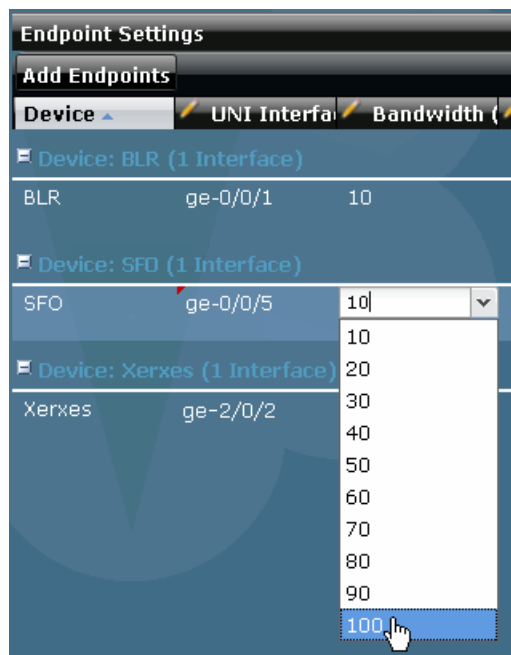
To modify the endpoint settings, follow these steps:

1. To select a different UNI on a device, on the Endpoint Settings screen, click the UNI name you want to change and choose another interface from the list, as shown in the following example:



Modified values are indicated by a small red triangle in the corner of the table cell.

2. To change the bandwidth on an endpoint, click the bandwidth value for the endpoint and select another value from the list:



3. For Q-in-Q interface endpoints, you can change the way the service VLAN ID is selected:

- To change an automatically selected service VLAN ID to manual selection, clear the **AutoPick S-VLAN ID** checkbox, and enter an S-VLAN ID value in the S VLAN ID field.
 - To change from manual selection to automatic selection, select the **AutoPick S-VLAN ID** checkbox.
 - To change the value of a manually selected service VLAN ID, enter a new value in the S-VLAN ID field.
4. For Q-in-Q interface endpoints with customer VLAN ranges specified, you can also change the range limits for an endpoint.
 5. For 802.1Q interface endpoints, you can change the customer VLAN ID.
 6. To change the MTU for the UNI, click the value in the MTU field and enter a new value.
 7. To add a UNI on a selected device, select **Add UNI Interface** in the Action column, and then select the interface you want from the UNI interface list.
 8. If the interface you selected in the previous step is already configured (duplicate) you must either enter a different value in the S-VLAN ID field manually, or check the **Autopick S-VLAN ID** field.
 9. To delete a UNI from a device, in the Actions column, click **Delete UNI Interface**.

If the deleted UNI is the only UNI selected from the device, then the device is deleted from the service configuration.
 10. Configuring advanced settings is optional. You can click on the **Advanced** link to view the default values for Advanced Settings. If the advanced settings are editable in

the service order, you can override the default values. If you do not click the **Advanced** link, the default advanced settings are applied to the service order.

To configure advanced settings for a device in the service order, follow these steps:

- a. Click **Advanced** in the Actions column.

The Advanced Setting screen displays the security and advanced settings that you can configure for a device, as shown in the following example:

Advanced Setting:

MAC Security Settings

Interface MAC limit:

MAC learning

MAC statistics

MAC table size:

no-tunnel-services

no-local-switching

Fast reroute priority: low

Label block size: 16

Connectivity type: ce

OK

- b. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for Interface MAC limit, MAC table size, and MAC table aging time.
- c. Enable or disable tunnel services by selecting or clearing the **no-tunnel-service** checkbox.
- d. Enable or disable local switching by selecting or clearing the **no-local-switching** checkbox.
- e. In the Fast reroute priority field, specify the reroute priority for a VPLS routing instance.
- f. In the Label block size field, specify the label block size for VPLS labels.
- g. In the Connectivity type field, select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the

VPLS routing instance is customer-facing or integrated routing and bridging (IRB)

- h. Click **OK** to save your Advanced Setting changes for the device.
11. To add an endpoint on a device not listed in the Endpoint Settings screen, follow these steps:
 - a. Click **Add Endpoints**.
 The Add Endpoint PE Devices screen displays the available N-PE devices that you did not assign when you first made your device selections from the Select Endpoint PE Devices screen.
 - b. Select additional devices, and then click **Next**.
 The Endpoint Settings screen appears with the new devices added.
 - c. Modify the endpoint settings for this device as required.
12. When you have finished modifying the endpoint settings, click **Create**.
 The Deployment Options window appears.

Deploying the New Service

This part of the create multipoint Ethernet service order procedure deploys the service.

To deploy the service, make selections from the Deployment Options window:

The screenshot shows a window titled 'Deployment Options'. It has a dark blue background. At the top, there are three radio buttons: 'Save only' (which is selected), 'Deploy now', and 'Schedule deployment'. Below these, there is a section labeled 'Date and time:' which contains a date input field, a time input field, and a dropdown menu set to 'PDT'. At the bottom of the window, there are two buttons: 'OK' and 'Cancel'.

1. Perform one of these actions:
 - To save the request without deploying the service, select **Save only** and then click **OK**.
 See “Deploying a Service” on page 188 for information about how to deploy a saved service at a later time.
 - To deploy the service immediately, select **Deploy now** and then click **OK**.
 - To deploy the service later, select **Schedule deployment**, select a date and time, and then click **OK**.

The time field specifies the time kept by the server, but in the time zone of the client.

2. To monitor the status of the deployment, use the Jobs workspace.

The service order is now complete.

The Manage Service Orders inventory panel shows the service order you just added. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details about the Jobs workspace.

- Related Topics**
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Multipoint Ethernet Service Orders as Graphics on page 222
 - Service Attributes Overview on page 15
 - Adding a New Customer on page 160
 - Deploying a Service on page 188
 - Creating a Point-to-Multipoint Ethernet Service Order on page 178
 - Creating a Point-to-Point Ethernet Service Order on page 163

Creating a Point-to-Multipoint Ethernet Service Order

The Network Activate software implements point-to-multipoint Ethernet services as virtual private LAN (VPLS) services. These services are also referred to as hub and spoke services.

To create a point-to-multipoint Ethernet service order, follow the steps in these procedures:

1. Selecting the Service Definition on page 178
2. Entering General Settings Information on page 179
3. Specifying QoS Settings (Release Candidate Feature) on page 179
4. Setting Attributes for All Endpoints on page 180
5. Selecting N-PE Devices on page 182
6. Selecting Hubs and Modifying Endpoint Settings on page 182
7. Deploying the New Service on page 187

Selecting the Service Definition

To select a service definition on which to base the new service order, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Orders** task icon.
3. In the task ribbon, select the **Create VPLS Service Order** task icon.

The Select Service Definition screen displays a filtered inventory view of only those published service definitions that are designed to work with multipoint Ethernet services:

4. Select the point-to-multipoint service definition you want to base your service order on and then click **Next**.

The Enter Order Information screen appears.

Entering General Settings Information

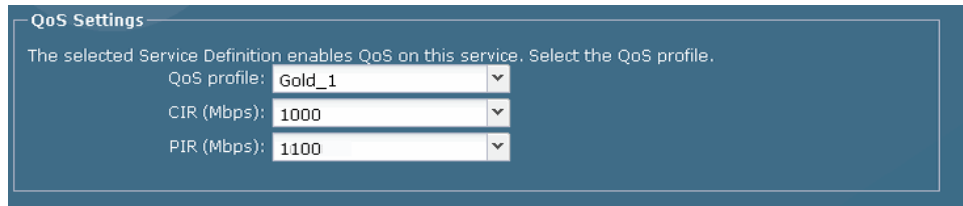
This part of the create point-to-multipoint Ethernet service order procedure sets general information about the service order in the General Settings box of the Enter Order Information screen:

Enter the following information:

1. In the Name field, enter a unique name for the point-to-multipoint service.
The service order name can consist of only letters, numbers, and underscores.
2. In the Customer field, select the customer who is requesting the service.
If the customer is not in the list, you must add the customer to the database before proceeding. See “Adding a New Customer” on page 160.
3. In the Comments field, enter a description of the service. This description appears in information screens about the request or service instance created from the request.
The Customer traffic type field is not selectable. Its value is set in the service definition.
The Autopick Route Target field cannot be changed. Route targets are always selected automatically.

Specifying QoS Settings (Release Candidate Feature)

If QoS is enabled in the service definition, enter information in the QoS Settings box. An example QoS Settings box follows:



NOTE: QoS features appear in the Junos Space user interface only if you deploy the QoS Design application in Junos Space.

1. In the QoS profile field, select a profile from the drop-down menu.
2. In the CIR field, select the committed information rate (CIR) from the drop-down menu. The CIR is the guaranteed rate and specifies the minimum bandwidth available if all sources are active at the same time.



NOTE: For bursty traffic, the CIR represents the average rate of traffic per unit time and the peak information rate (PIR) represents the maximum amount of traffic that can be transmitted in a given interval.

3. In the PIR field, select the peak information rate (PIR) from the drop-down menu. The PIR is the shaping rate.



NOTE: If the QoS profile that you selected in Step 1 uses a single-rate TCM policer, do not select a PIR.

Setting Attributes for All Endpoints

This part of the create point-to-multipoint Ethernet service order procedure sets the attributes that are usually common for all endpoints in the service. The values that you enter will vary, depending on the service definition on which the service order is based.

If these attributes will not be the same on all endpoints you can set them to be the same for now and then make changes later, or you can choose to skip this step and apply the attribute values one at a time later.

This procedure sets the attributes listed in the End Point Settings box of the Enter Order Information screen. The attributes shown depend on the interface type. The following example shows the endpoints settings box for a multipoint-to-multipoint service order with Q-in-Q interfaces, transporting a VLAN range.

To skip this step and enter all the endpoint attributes individually later, clear the **Apply to all** checkbox.

To set attributes common to most endpoints, follow these steps:

1. In the Endpoint Settings box, leave the Apply to all box selected so that you enter the endpoint parameter values only once.
2. In the Bandwidth field, select a value from the list to limit the bandwidth of the service you are creating.

This field is present only if bandwidth limiting is allowed by the service definition, and is configurable in the service order only if the service definition allows it.

3. In the MTU field, enter the maximum transmission unit size for the UNI.
This field is present in all service orders. However, you can set this field only if the service definition allows it.
4. Select the **Autopick SVLAN ID** checkbox if you want the service VLAN ID to be chosen automatically.

To assign an SVLAN ID manually:

- a. Clear the **Autopick SVLAN ID** checkbox. The screen expands to include the SVLAN ID field.
- b. In the SVLAN ID field, enter a value.

This field is present only for service orders with UNIs that have Q-in-Q interface types.

5. In the Customer VLAN Range Start and Customer VLAN Range End fields, enter the first and last VLAN ID of the range of customer VLANs to be transported over the network.

These fields are present only for services with UNIs that have Q-in-Q interface types and allow a range of VLANs to be transported.

6. In the Autopick VLAN ID field, choose whether you want the customer VLAN ID to be automatically selected by the Network Activate software, or whether you want to specify the customer VLAN ID yourself.

This field is present only for services with 802.1Q UNI endpoints and is configurable in the service order only if the service definition allows it.

7. In the VLAN ID field, enter a value for the customer VLAN.

This field is present only if Autopick VLAN ID is turned off in step 6.

The Physical IF encapsulation and Logical IF encapsulation fields are not selectable. These values are set in the service definition.

8. Click **Next**.

The Select Endpoint PE Devices screen appears.

Selecting N-PE Devices

This part of the create point-to-multipoint Ethernet service order procedure selects the N-PE devices that will host the service endpoints. The selection is made from the Select Endpoint PE devices screen.



NOTE: The Select Endpoint PE devices screen shows only assigned N-PE devices that have an AS number configured. If you do not see the device you are looking for, use the CLI on the device to check for and assign an AS number.

To select endpoint N-PE devices, follow these steps:

1. In the Select Endpoint PE devices screen, select the devices that you want to participate in the service. Use the multiple selection feature to select more than one device.
2. Click **Next**.

The Endpoint Settings screen appears.

Selecting Hubs and Modifying Endpoint Settings

This part of the create point-to-multipoint Ethernet service order procedure selects the devices that will be the service hubs and sets the attributes for each endpoint in the service. Selection is made using the Endpoint Settings screen:

Endpoint Settings							
Add Endpoints							
Device	UNI Interface	Bandwidth (Mbps)	AutoPick VLAN ID	VLAN ID	MTU (Bytes)	Action	
<div> <div></div> <div>Hub</div> </div>	Device: Laguna_pe_d1 (1 Interface)					Add UNI Interface Advanced	
Laguna_pe_d1	ge-5/0/5	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface	
<div> <div></div> <div>Hub</div> </div>	Device: SanFrancisco (1 Interface)					Add UNI Interface Advanced	
SanFrancisco	ge-0/0/2	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface	
<div> <div></div> <div>Hub</div> </div>	Device: SanJose (1 Interface)					Add UNI Interface Advanced	
SanJose	ge-0/0/2	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface	

This screen shows one endpoint for each device that you selected from the Select Endpoint PE devices screen, as described in “Selecting N-PE Devices” on page 182.

The interface shown in the UNI Interface field is automatically selected by the Network Activate software, which chooses the UNI that has the highest available capacity among interfaces that are in the Up state. To calculate the available capacity of the interface, the system subtracts the bandwidth reserved for each service deployed on that interface from the total capacity of the interface.

For each endpoint, the Endpoint Settings screen shows the value for each UNI attribute.

- For port-to-port services, the displayed values are for Bandwidth and MTU.
- For 802.1Q UNIs, the displayed attributes are for Bandwidth, Autopick VLAN ID, VLAN ID, and MTU.
- For Q-in-Q UNIs, the displayed attributes include Bandwidth, AutoPick S-VLAN ID, and S-VLAN ID. For a service with Q-in-Q UNIs that specifies a customer VLAN range, the displayed attributes also include C-VLAN ID Start and C VLAN End.

The values shown are initially the values you set earlier on the Enter Order Information screen, as described in “Setting Attributes for All Endpoints” on page 180.

To modify the endpoint settings, follow these steps:

1. To select a hub, choose the device you want to serve as a hub and, above the device name, check **Hub**.

To provide a higher level of availability, you can select multiple hubs.

2. To select a different UNI on a device, on the Endpoint Settings screen, click the UNI name you want to change and choose another interface from the list, as shown in the following example:



Modified values are indicated by a small red triangle in the corner of the table cell.

3. To change the bandwidth on an endpoint, click the bandwidth value for the endpoint and select another value from the list:



4. For Q-in-Q interface endpoints, you can change the way the service VLAN ID is selected:
 - To change an automatically selected service VLAN ID to manual selection, clear the **AutoPick S-VLAN ID** checkbox, and enter an S-VLAN ID value in the S-VLAN ID field.
 - To change from manual selection to automatic selection, select the **AutoPick S-VLAN ID** checkbox.
 - To change the value of a manually selected service VLAN ID, enter a new value in the S-VLAN ID field.
5. For Q-in-Q interface endpoints with customer VLAN ranges specified, you can also change the range limits for an endpoint.
6. For 802.1Q interface endpoints, you can change the customer VLAN ID.
7. To change the MTU for the UNI, click the value in the MTU field and enter a new value.
8. To add a UNI on a selected device, select **Add UNI Interface** in the Action column, and then select the interface you want from the UNI interface list.

9. If the interface you selected in the previous step is already configured (duplicate) you must either enter a different value in the S-VLAN ID field manually, or select the **Autopick S-VLAN ID** checkbox.
10. To delete a UNI from a device, in the Actions column, click **Delete UNI Interface**.
If the deleted UNI is the only UNI selected from the device, then the device is deleted from the service configuration.
11. Configuring advanced settings is optional. You can click on the **Advanced** link to view the default values for Advanced Settings. If the advanced settings are editable in the service order, you can override the default values. If you do not click the **Advanced** link, the default advanced settings are applied to the service order.

To change settings on an endpoint that has editable advanced settings, follow these steps:

- a. Click **Advanced** in the Actions column.

The Advanced Setting screen displays the security and advanced settings that you can configure for a device, as shown in the following example, in which all the advanced settings are editable:

Advanced Setting:

MAC Security Settings

☐ MAC learning

Interface MAC limit:

☐ MAC statistics

MAC table size:

☒ no-tunnel-services

☒ no-local-switching

Fast reroute priority: low

Label block size: 16

Connectivity type: ce

OK

See "Service Attributes Overview" on page 15 for complete information about MAC security settings and advanced settings.

- b. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for Interface MAC limit, MAC table size, and MAC table aging time.
- c. Enable or disable tunnel services by selecting or clearing the **no-tunnel-service** checkbox.
- d. Enable or disable local switching by selecting or clearing the **no-local-switching** checkbox.

- e. In the Fast reroute priority field, specify the reroute priority for a VPLS routing instance.
 - f. In the Label block size field, specify the label block size for VPLS labels.
 - g. In the Connectivity type field, select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the VPLS routing instance is customer-facing or integrated routing and bridging (IRB)
 - h. Click **OK** to save your changes in the Advanced Setting screen.
12. To add an endpoint on a device not listed in the Endpoint Settings screen, follow these steps:
 - a. Click **Add Endpoints**.
 The Add Endpoint PE Devices screen displays the available N-PE devices that you did not assign when you first made your device selections from the Select Endpoint PE devices screen.
 - b. Select additional devices, and then click **Next**.
 The Endpoint Settings screen appears with the new devices added.
 - c. Modify the endpoint settings for this device as required.
 13. When you have finished modifying the endpoint settings, click **Create**.
 The Deployment Options window appears.

Deploying the New Service

This part of the create multipoint Ethernet service order procedure deploys the service.

To deploy the service, make selections from the Deployment Options window:

The screenshot shows a window titled 'Deployment Options'. It has a dark blue background. At the top, there are three radio buttons: 'Save only' (which is selected), 'Deploy now', and 'Schedule deployment'. Below these, there is a section labeled 'Date and time:'. This section contains a date input field, a time input field, and a 'PDT' label. At the bottom of the window, there are two buttons: 'OK' and 'Cancel'.

1. Perform one of these actions:
 - To save the request without deploying the service, select **Save only** and then click **OK**.

See “Deploying a Service” on page 188 for information about how to deploy a saved service at a later time.

- To deploy the service immediately, select **Deploy now** and then click **OK**.
- To deploy the service later, select **Schedule deployment**, select a date and time, and then click **OK**.

The time field specifies the time kept by the server, but in the time zone of the client.

2. To monitor the status of the deployment, use the Jobs workspace.

The service order is now complete.

The Manage Service Orders inventory panel shows the service order you just added. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* in the Junos Space Network Application Platform User Guide for details about the Jobs workspace.

- Related Topics**
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Multipoint Ethernet Service Orders as Graphics on page 222
 - Service Attributes Overview on page 15
 - Adding a New Customer on page 160
 - Deploying a Service on page 188
 - Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
 - Creating a Point-to-Point Ethernet Service Order on page 163

Deploying a Service

This procedure schedules a service for deployment on the network. Use this procedure to perform the following tasks:

- Deploy a new service.
- Deploy a modified service.
- Redeploy a service order that failed deployment.

You cannot deploy an invalid service order.

To schedule a service for deployment, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the Service Orders States pie chart, click the **Requested** segment.

The Manage Service Orders screen shows only those service orders in the Requested state.

3. Click the service order you want to deploy.

4. Open the Actions drawer and select **Deploy Service Order**.

The Deploy Service screen appears as follows:

5. To deploy the service immediately, select **Deploy now**, and click **OK**.

To deploy the service at a later time, select **Schedule deployment**, select a date and time for deployment, and then click **OK**.

The time field specifies the time kept by the server, but in the time zone of the client.

After scheduling the service order for deployment, the provisioning software begins validating the service order.

6. Use the Jobs workspace to monitor the outcome of the deployment. See *Viewing Scheduled Jobs in the Junos Space Network Application Platform User Guide* for details about the Jobs workspace.

- Related Topics**
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Services on page 232

Deleting a Service Order

You can delete a service order that is in the requested state, the scheduled state, the invalid state, or the failed deployment state. To correct a service order in the invalid state, you must delete it and then recreate it; the Network Activate software does not support modifying the service order directly.

To delete a service order from the database, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Requests** workspace icon.
3. In the Manage Service Orders inventory page, select the service order you want to delete.
4. Open the Actions drawer and select **Delete Service Order**.
A pop-up window appears requesting confirmation.
5. Click **Delete**.

The Manage Service Requests inventory page reappears with the deleted service orders removed.

- Related Topics**
- Creating a Point-to-Point Ethernet Service Order on page 163
 - Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
 - Creating a Point-to-Multipoint Ethernet Service Order on page 178
 - Viewing Multipoint Ethernet Service Orders as Graphics on page 222

Deleting a Partial Configuration

A failed service order of type Provisioning can leave parts of the service configuration on the devices. To remove this partial configuration, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace.
2. In the task ribbon, select **Manage Service Orders**.
3. In the Manage Service Orders screen, select the failed service order for which you want to delete the partial configuration.
4. Open the Actions drawer and select **Delete Partial Configuration**.
5. In the confirmation screen, select **Delete**.

- Related Topics**
- Viewing Multipoint Ethernet Service Orders as Graphics on page 222

CHAPTER 11

Managing Services

- Understanding Service Validation on page 191
- Validating a Service on page 195
- Modifying a Point-to-Point Ethernet Service on page 198
- Modifying a Multipoint-to-Multipoint Ethernet Service on page 200
- Modifying a Point-to-Multipoint Ethernet Service on page 206
- Decommissioning a Service on page 217

Understanding Service Validation

You can use a functional audit and a configuration audit to monitor the health of a service for any of the following reasons:

- You have just deployed a service and want to verify that it works before your customer starts to use it.
- You want to perform periodic verification that a service is functioning correctly.
- A customer has reported that a service is not functioning correctly and you need to find out what the problem is and fix it.

The following sections provide overview information about functional audit and configuration audit:

- Functional Audit on page 191
- Configuration Audit on page 195

Functional Audit

A functional audit determines whether the service is up or down. It checks the control plane to ensure connectivity among endpoints and that the UNIs are functioning correctly. It also checks the data plane to verify packet transmission between each valid pair of endpoints in the service.

A functional audit works by running commands that perform verification and reporting relevant information to the user. The specific commands are different for checking the control plane and the data plane, and for verifying a point-to-point service or a VPLS service.

Summary information about the functional audit is available in the Manage Jobs screen of the Jobs Management workspace. More details are available in the Functional Audit Result screens, which are available from the Manage Services window of the Service Provisioning Workspace.

A Manage Jobs screen example screen follows.

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	FAILURE	Functional Audit	65679	Functionally Audited [ELANBGPQinQAIIVLA] Failed on Device [Beijing-mx480-pe7] Failed on Device [SanFrancisco] Failed on Device [SanJose]	Feb 16, 2010 12:28:18 PM PST

The State field indicates whether the service is up or down. If the service is down, the Summary field provides some information about the problem.

The following sections describe the Functional Audit Results screens:

- Point-to-Point Service Functional Audit on page 192
- VPLS Service Functional Audit—Full Mesh or Hub and Spoke on page 193

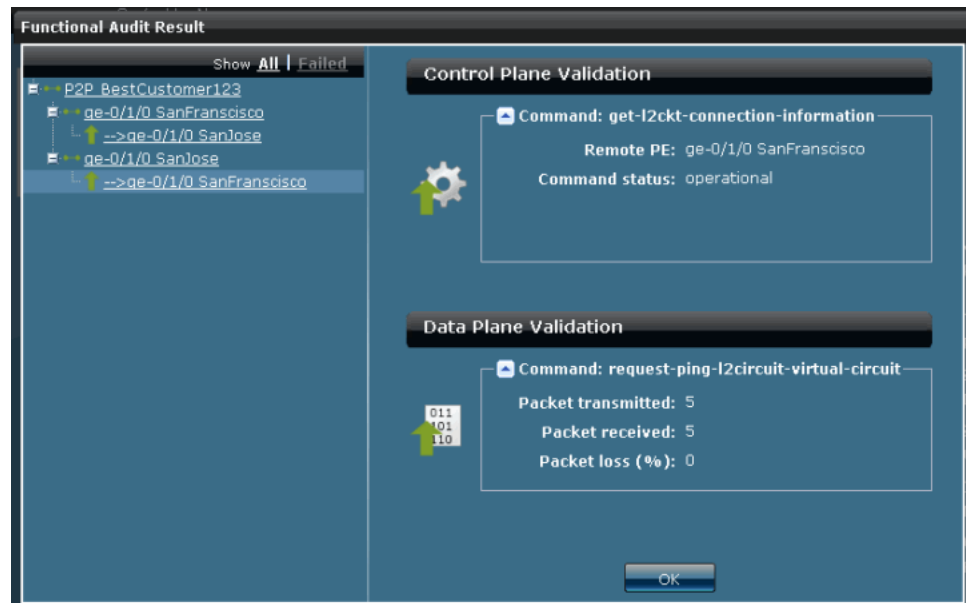
Point-to-Point Service Functional Audit

For a point-to-point service, a functional audit uses the **get-l2ckt-connection-information** command to validate the control plane. The command runs on each service endpoint and checks for correct functioning of the pseudowire between the two N-PE devices and that the UNIs are operational.

To validate the data plane, a functional audit runs the **request-ping-l2circuit-virtual-circuit** command on each endpoint to check for correct packet transmission to and from the other endpoint. The command uses an OAM ping to simulate traffic between the endpoints. The data plane is functional if the number of packets transmitted from an endpoint is the same as the number received.

The Functional Audit Result screens show the results of these commands. They include an option to limit the display of information to test failures only. You can access this series of Functional Audit Result screens from the Manage Services screen:

- The Service status screen shows information about the service, including its operational status.
- The Endpoint Status screen shows information about a specific endpoint.
- The Control Plane Validation and Data Plane Validation screen shows the results of the control plane and data plane verification tests performed on a specific link between two endpoints in the service, as shown in the following example:



VPLS Service Functional Audit—Full Mesh or Hub and Spoke

For a multipoint-to-multipoint VPLS service or a point-to-multipoint VPLS service, a functional audit uses the **get-vpls-connection-information** command to validate the control plane. The command validates connectivity between each pair of endpoints for which the service specifies a connection. For a multipoint-to-multipoint service, the command runs once on each endpoint for each other endpoint in the service. For a spoke in a point-to-multipoint service, the command checks for connectivity with the hub, or runs once for each hub in a dual-hub configuration. For a hub in a point-to-multipoint service, the command runs once for each spoke and each additional hub.

To validate the data plane, a functional audit runs the **request-ping-vpls-instance** command on each endpoint. This command simulates traffic between the endpoint it runs on and each other endpoint for which the service specifies a connection. The data plane is functional if the number of packets transmitted from an endpoint is the same as the number received.



NOTE: Data plane validation of a VPLS service works for MX Series devices running Junos version 9.4 or later. If the service under audit contains an M Series device or an N-PE device running Junos version 9.2 or 9.3, the functional audit does not complete successfully and generates a message stating that functional audit is not supported on that platform.

The Functional Audit Result screens show the results of these commands. They include an option to limit the display of information to test failures only. You can access this series of Functional Audit Result screens from the Manage Services screen:

- The Service status screen shows information about the service, including its operational status.
- The Endpoint Status screen shows information about a specific endpoint.

- The Control Plane Validation and Data Plane Validation screen shows the results of the control plane and data plane verification tests on a specific link between two endpoints in the service. The following example shows the output for one link in a point-to-multipoint service:

Functional Audit Result

Show **All** | Failed

- BestCustomer_HSVPLS1982
 - ge-0/0/2.2 SanFrancisco
 - ge-5/0/1.2 Beijing-mx480-pe7
 - ge-0/0/2.2 SanJose
 - ge-0/0/2.2 SanJose
 - ge-0/0/2.2 SanFrancisco
 - ge-5/0/1.2 Beijing-mx480-pe7
 - ge-0/0/2.2 SanFrancisco

Control Plane Validation

Command: get-vpls-connection-information

Remote PE: ge-0/0/2.2 SanJose

Remote PE site id: 3

Command status: operational

Data Plane Validation

Command: request-ping-vpls-instance

Packet transmitted: 5

Packet received: 5

Packet loss (%): 0

OK

In this case, the service has three endpoints. The endpoint named ge-0/0/2.2 on device SanFrancisco is the hub. Endpoints ge-5/0/1.2 on Beijing-mx480-pe7 and ge-0/0/2.2 on SanJose are the spokes. This example shows the results of attempts to ping SanJose from SanFrancisco. The control plane and data plane are both shown to be operational.

The following example shows a similar output for a multipoint-to-multipoint service:

Functional Audit Result

Show **All** | Failed

- QQ_VPLS_BestCustomer
 - xe-4/0/0.1 Beijing-mx480-pe7
 - ge-0/0/1.1 SanJose
 - ge-0/0/1.1 SanFrancisco
 - ge-0/0/1.1 SanFrancisco
 - ge-0/0/1.1 SanJose
 - xe-4/0/0.1 Beijing-mx480-pe7
 - ge-0/0/1.1 SanJose

Control Plane Validation

Command: get-vpls-connection-information

Remote PE: ge-0/0/1.1 SanFrancisco

Remote PE site id: 2

Command status: local site signaled down

Data Plane Validation

Command: request-ping-vpls-instance

Packet transmitted: 5

Packet received: 0

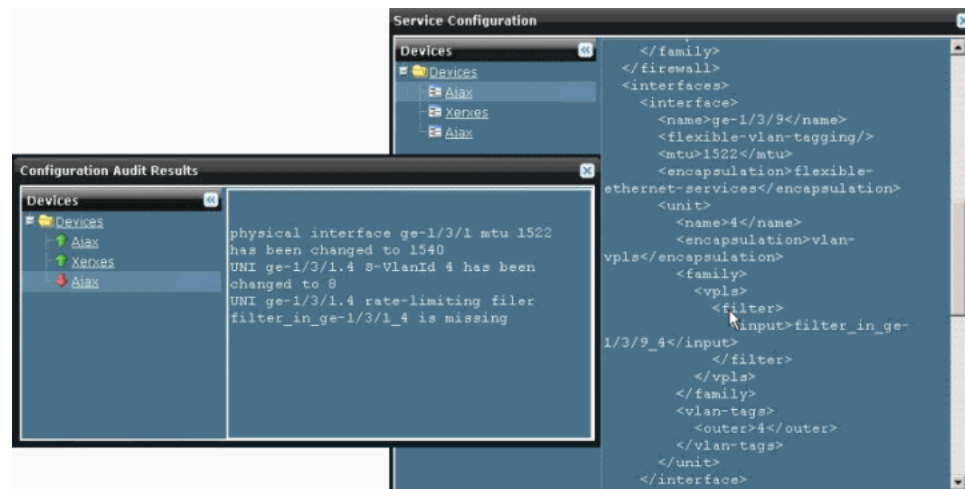
Packet loss (%): 100

OK

In this case, both the control plane validation test and the data plane validation test reported failures.

Configuration Audit

A configuration audit can help you determine whether the service configuration on the device has been changed out of band. To this end, you can compare the results of a configuration audit with the service configuration in the Junos Space database. The following example shows a sample comparison:



You can view the results of a configuration audit from the Manage Services screen. You can view the service configuration also from the Manage Services screen.

- Related Topics**
- Validating a Service on page 195
 - Troubleshooting Service Problems on page 255
 - Viewing Functional Audit Results on page 241

Validating a Service

These procedures validate a deployed service instance. You can perform a functional audit or a configuration audit. You can perform the audit immediately, or you can schedule it.

Use these procedures to validate a service instance:

- Performing a Functional Audit on page 195
- Performing a Configuration Audit on page 197

Performing a Functional Audit

A functional audit verifies that a deployed service instance is functioning on the device.

To perform a functional audit, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select **Manage Services**.

The Audit Services screen appears. It lists all deployed services.

3. In the Manage Services screen, select the service you want to audit.
4. Open the Actions drawer and select **Perform Functional Audit**.
5. In the Schedule Functional Audit window, either:

- Select **Audit Now**, and then click **OK**.

An Audit Information window appears and provides a link to details about the audit in the Jobs workspace.

- Select **Audit Later**, enter a date and time, and then click **OK**.

6. To monitor the progress of an audit after selecting Audit Now in the previous step, click the Job ID in the Audit Information window. The Manage Jobs screen shows information about the functional audit job. An example follows:

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	FAILURE	Functional Audit	65679	Functionally Audited [ELANBGPQinQAIIVLAI Failed on Device [Beijing-mx480-pe7] Failed on Device [SanFrancisco] Failed on Device [SanJose]	Feb 16, 2010 12:28:18 PM PST

The State field tells you whether the service passed or failed the audit. If the service failed the audit, then the Summary field provides information about the failure.

To monitor the progress of an audit after selecting Audit Later in the previous step, after the scheduled time of the audit, follow these steps:

- a. In the task ribbon, select the **Job Management** workspace icon.
 - b. In the Job Types window, select the **Functional Audit** segment of the pie chart.
 - c. Select the functional audit of interest from the inventory list.
Summary information about the audit appears in the quick look panel.
 - d. In the filter bar, select the table view icon to see additional information about the job. If the service failed the audit, information about the failure appears in the Summary field.
7. To view additional details about the functional audit, including results from checking the control plane and the data plane, follow these steps:
 - a. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
 - b. In the task ribbon, select the **Manage Services** task icon.

- c. In the Manage Services screen, select the service you are validating.
- d. Open the Actions drawer and select **View Functional Audit** results.

See “Viewing Functional Audit Results” on page 241 for details.

Performing a Configuration Audit

A configuration audit checks that the network devices are correctly configured to support the requested services and to ensure that the configuration on the device is synchronized with the Junos Space database.

To perform a configuration audit, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select **Manage Services**.
The Manage Services screen appears. It lists all deployed services.
3. In the Manage Services screen, select the service you want to audit.
4. Open the Actions drawer and select **Perform Configuration Audit**.
5. In the Schedule Configuration Audit window, either:

- Select **Audit Now**, and then click **OK**.

An Audit Information window appears and provides a link to details about the audit in the Jobs workspace.

- Select **Audit Later**, enter a date and time, and then click **OK**.

6. To monitor the progress of an audit after selecting Audit Now in the previous step, click the Job ID in the Audit Information window. The Manage Jobs screen shows information about the configuration audit job. An example follows:



The screenshot shows the 'Manage Jobs' interface with a table of audit results. The table has columns for Percent, State, Job Type, ID, Summary, and Scheduled Start Time. A single row is visible, showing a 100.0% success rate for a Configuration Audit job with ID 65677. The summary indicates the audit was successful on four devices: ELANBGPQinQAIIVLANN, Beijing-mx480-pe7, SanFrancisco, and SanJose.

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	✓ SUCCESS	Configuration Audit	65677	Audited [ELANBGPQinQAIIVLANN: 20:28:12.589] Success on Device [Beijing-mx480-pe7] Success on Device [SanFrancisco] Success on Device [SanJose]	Feb 16, 2010 12:28:12 PM PST

The State field tells you whether the service passed or failed the audit. If the service failed the audit, then the Summary field provides information about the failure.

To monitor the progress of an audit after selecting Audit Later in the previous step, after the scheduled time of the audit, follow these steps:

- a. In the task ribbon, select the **Job Management** workspace icon.
- b. In the Job Types window, select the **Configuration Audit** segment of the pie chart.
- c. Select the configuration audit of interest from the inventory list.

Summary information about the audit appears in the quick look panel.

- d. In the filter bar, select the table view icon to see additional information about the job. If the service failed the audit, information about the failure appears in the Summary field.
7. If the configuration audit failed, view the results of the configuration audit as follows:
 - a. Return to the Manage Services inventory screen and select the service.
 - b. Open the Actions drawer and select **View Configuration Audit Results**.

The Configuration Audit Results screen shows the configuration elements that are inconsistent or missing on the device.

- Related Topics**
- Understanding Service Validation on page 191
 - Service Troubleshooting Overview on page 253
 - Troubleshooting Service Problems on page 255
 - Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Functional Audit Results on page 241

Modifying a Point-to-Point Ethernet Service

You can modify the following entities of a point-to-point Ethernet service:

- MTU across the network
- Rate limiting bandwidth of an endpoint
- MTU of an endpoint

After modifying a service, the configuration audit and functional audit information is cleared and the functional audit status is set to pending.

To modify the attributes of a service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services screen, select the service you want to modify.
4. Open the Actions drawer and select **Modify Service**.

A graphical image of the service appears, showing device images that represent the service endpoints and a cloud image that represents the network core. By default, the cloud image is selected, which displays general settings and connectivity information in the right panel. The General Settings box contains a unique name for the service order that will request the change.

Definition: ELine-QinQ-AllVLAN
Service Order Name: ELineQnqall1_modify_2010-02-17 04:35:29
Customer: A1
Service Name: ELineQnqall1

Endpoint A
Device: Denver
Interface: ge-0/0/1

Connectivity
Virtual Circuit ID: 1
MTU: 1522

Endpoint Z
Device: HongKong
Interface: ge-0/0/1

General/Connectivity Settings

General Settings

Name: ELineQnqall1_modify_2010-02-17
Comments: ELineQnqall1
Customer: A1
Service type: Point-to-Point Ethernet (LDP)
Service: ELine-QinQ-AllVLAN definition:

Connectivity Settings

VCID: 1
MTU: 1522

5. In the Name field, change the name of the modification service order, if desired.
6. Change the MTU setting, as required.
7. Click **Next**.

The service order endpoint settings information for endpoint A appears in the right panel, as shown in the following example:

Endpoint Settings

PE device: Denver

UNI interface: ge-0/0/1

Physical IF encapsulation: flexible-ethernet-services

Logical IF encapsulation: vlan-ccc

Traffic type: QINQORANGE

S-VLAN ID: 1

MTU (Bytes): 1522

Bandwidth (Mbps): 10

8. Change the bandwidth or MTU setting as required.
9. Click **Next** and make any required changes to endpoint Z.
10. Click **Modify**.

The Network Activate software modifies the service.

11. Use the Jobs workspace to check for successful completion of the action. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* in the Junos Space Network Application Platform User Guide for details.

Related Topics

- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
- Viewing Services on page 232
- Deploying a Service on page 188
- Creating a Point-to-Point Ethernet Service Order on page 163

- Changing Advanced Settings for an Endpoint on page 200
- Modifying a Point-to-Multipoint Ethernet Service on page 206

Modifying a Multipoint-to-Multipoint Ethernet Service

For a multipoint-to-multipoint service, you can change the bandwidth or MTU of a specific UNI, add or delete a UNI, change advanced settings for a device endpoint or add a new device endpoint.

You cannot change the interface of an existing UNI. Neither can you change the S VLAN ID.

To perform the equivalent of changing the interface on an existing UNI, add a new UNI with the desired interface, and then delete the old UNI.

After modifying a service, the configuration audit and functional audit information is cleared and the functional audit status is set to pending.

Modifying a service creates a new service order based on the attribute settings of the existing service.

The following topics provide instructions for modifying a multipoint-to-multipoint (full mesh) Ethernet service:

- Adding an Endpoint on page 200
- Adding a UNI Interface on page 201
- Deleting a UNI Interface and Deleting an Endpoint on page 203
- Changing the Endpoint Bandwidth on page 204
- Changing Advanced Settings for an Endpoint on page 205

Adding an Endpoint

To add an endpoint to a multipoint-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service to which you want to add an endpoint.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

General Settings

Service order name: ELANBGPQinQAllVLANNormalizedAll_modify_2010-02-16 21:0 !

Customer: A1

Service name: ELANBGPQinQAllVLANNormalizedAll

Service definition: ELAN-BGP-QinQ-AllVLAN-Normalized-All

Comments: ELANBGPQinQAllVLANNormalizedAll

Endpoint Settings

Add Endpoints

Device	UNI Interface	Bandwidth (Mbps)	AutoPick S-VLAN	S-VLAN ID	MTU (Bytes)	Action
Device: Beijing-mx480-pe7 (1 Interface)						
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	3	1522	Add UNI Interface Delete UNI Interface
Device: SanFrancisco (1 Interface)						
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	3	1522	Add UNI Interface Delete UNI Interface
Device: SanJose (1 Interface)						
SanJose	ge-0/0/2	10	<input type="checkbox"/>	3	1522	Add UNI Interface Delete UNI Interface

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Endpoint Settings table, click **Add Endpoints**.
The Add Endpoint PE Devices screen shows available N-PE devices that are not part of the service.
7. Select the devices on which you want to add new endpoints, and then click **Next**.
The service modification screen shows the added devices with system recommended choices for UNI. To select a different UNI, see “Adding a UNI Interface” on page 201. To select a different bandwidth than the applied default, see “Changing the Endpoint Bandwidth” on page 204.
8. Click **Modify**.
9. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
10. Click **OK**.
11. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Adding a UNI Interface

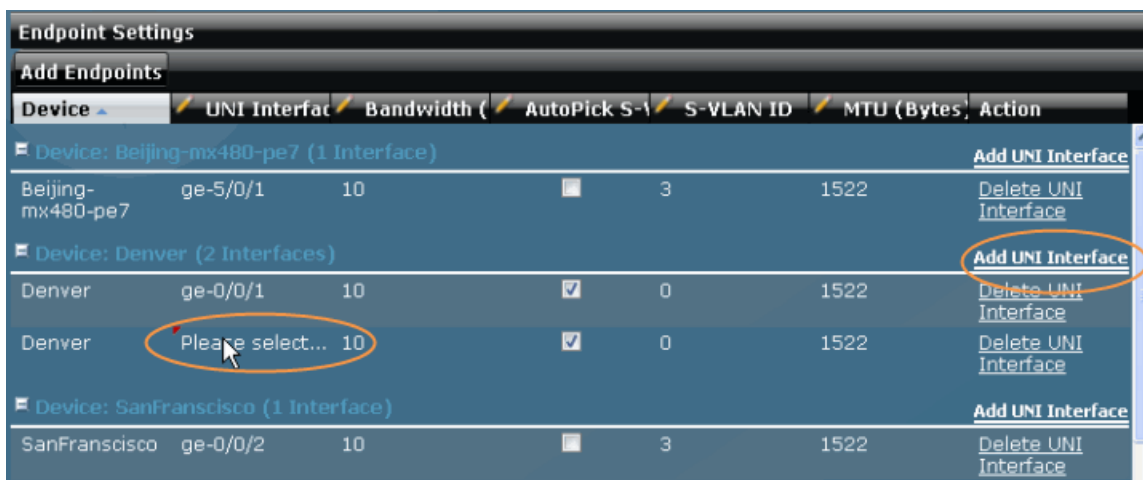
To add a UNI on a device that is already part of a multipoint-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service to which you want to add a UNI.

4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the Endpoint Settings table, click **Add UNI Interface** for the device, as shown in the following example, which adds a UNI to the device named Denver.



Device	UNI Interface	Bandwidth (Kbps)	AutoPick S-VLAN	S-VLAN ID	MTU (Bytes)	Action
Device: Beijing-mx480-pe7 (1 Interface)						
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	3	1522	Add UNI Interface Delete UNI Interface
Device: Denver (2 Interfaces)						
Denver	ge-0/0/1	10	<input checked="" type="checkbox"/>	0	1522	Add UNI Interface Delete UNI Interface
Denver	Please select... 10	10	<input checked="" type="checkbox"/>	0	1522	Add UNI Interface Delete UNI Interface
Device: SanFrancisco (1 Interface)						
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	3	1522	Add UNI Interface Delete UNI Interface

An additional UNI appears in the endpoint table.

7. If the interface you selected in the previous step is already configured (duplicate) you must either enter a different value in the S-VLAN ID field manually, or check the **Autopick S-VLAN ID** field.
8. Select an interface from the UNI Interface column.
9. Click **Modify**.
10. In the Deployment Options window, select one of the following options:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
11. Click **OK**.
12. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Deleting a UNI Interface and Deleting an Endpoint

To delete a UNI from a multipoint-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service from which you want to delete a UNI.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the Endpoint Settings table, find the UNI you want to delete and click **Delete UNI Interface** for that table row, as shown in the following example:

Endpoint Settings						
Add Endpoints						
Device	UNI Interface	Bandwidth	AutoPick S-VLAN	S-VLAN ID	MTU (Bytes)	Action
Device: Beijing-mx480-pe7 (1 Interface)						
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	3	1522	Delete UNI Interface
Device: Denver (2 Interfaces)						
Denver	ge-0/0/1	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface
Denver	ge-0/0/2	10	<input checked="" type="checkbox"/>	0	1522	Delete UNI Interface
Device: SanFrancisco (1 Interface)						
SanFrancisco	ge-0/0/2	70	<input type="checkbox"/>	3	1522	Delete UNI Interface

The selected UNI is removed from the table. If the deleted UNI was the only UNI selected on that device, then the device is deleted from the Endpoint Settings table.

7. Click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See *Viewing Scheduled Jobs* in the *Junos Space Network Application Platform User Guide* for details.

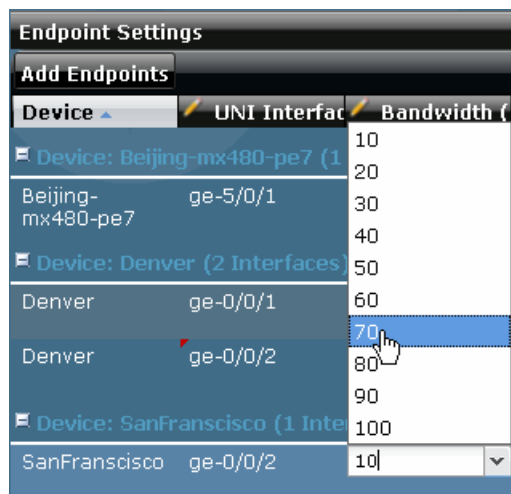
Changing the Endpoint Bandwidth

To change the rate limit or bandwidth for an endpoint of a multipoint-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service on which you want to change the bandwidth of an endpoint.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the endpoint Settings table, click on the Bandwidth entry for the UNI on which you want to change the bandwidth, as shown:



The screenshot shows the 'Endpoint Settings' window with a table of endpoints. A dropdown menu is open for the 'Bandwidth' column of the 'Denver ge-0/0/2' endpoint, showing a list of values from 10 to 100. The value 70 is highlighted by the mouse cursor.

Device	UNI Interface	Bandwidth (Kbps)
Device: Beijing-mx480-pe7 (1)		
Beijing-mx480-pe7	ge-5/0/1	10
		20
		30
		40
Device: Denver (2 Interfaces)		
Denver	ge-0/0/1	50
		60
Denver	ge-0/0/2	70
		80
		90
		100
Device: SanFrancisco (1 Interface)		
SanFrancisco	ge-0/0/2	10

7. From the list of valid bandwidth settings, select the one you want, and then click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See *Viewing Scheduled Jobs* in the *Junos Space Network Application Platform User Guide* for details.

Changing Advanced Settings for an Endpoint

To change advanced settings for an endpoint of a multipoint-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service on which you want to change one or more advanced settings for an endpoint.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modified service order, if desired.
6. In the Action column of the Endpoint Settings table, find the device endpoint you want to modify, and click **Advanced** for that table row, as shown in the following example:

Device	UNI Interface	Bandwidth (Mbps)	AutoPick VLAN ID	VLAN ID	MTU (Bytes)	Action
Device: SanJose (1 Interface)						
SanJose	ge-0/0/1	1	<input type="checkbox"/>	1	1522	Add UNI Interface Advanced Delete UNI Interface
Device: Xerxes (1 Interface)						
Xerxes	ge-2/0/2	1	<input type="checkbox"/>	14	1522	Add UNI Interface Advanced Delete UNI Interface

The Advanced Setting screen displays the security and advanced settings that you can configure for a device, as shown in the following example:

Advanced Setting:

MAC Security Settings

☐ MAC learning

Interface MAC limit:

☐ MAC statistics

MAC table size:

☒ no-tunnel-services

☒ no-local-switching

Fast reroute priority: low

Label block size: 16

Connectivity type: ce

OK

See the “Service Attributes Overview” on page 15 for more information about configuring MAC security settings and advanced settings.

7. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for Interface MAC limit, MAC table size, and MAC table aging time.
8. Enable or disable tunnel services by selecting or clearing the **no-tunnel-service** checkbox.
9. Enable or disable local switching by selecting or clearing the **no-local-switching** checkbox.
10. In the Fast reroute priority field, specify the reroute priority for a VPLS routing instance.
11. In the Label block size field, specify the label block size for VPLS labels.
12. In the Connectivity type field, select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the VPLS routing instance is customer-facing or integrated routing and bridging (IRB)
13. Click **OK** to save all your changes in the Advanced Setting screen.
14. Click **Modify**.
15. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
16. Click **OK**.
17. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

- Related Topics**
- Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
 - Deploying a Service on page 188
 - Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Services on page 232
 - Modifying a Point-to-Point Ethernet Service on page 198
 - Modifying a Point-to-Multipoint Ethernet Service on page 206

Modifying a Point-to-Multipoint Ethernet Service

For a point-to-multipoint service, you can add a spoke or a hub, change the role of a device from hub to spoke or spoke to hub, change the bandwidth or MTU of a specific UNI, or add or delete a UNI.

You cannot change the interface of an existing UNI or the S VLAN ID.

To perform the equivalent of changing the interface on an existing UNI, add a new UNI with the desired interface, and then delete the old UNI.

After modifying a service, the configuration audit and functional audit information is cleared and the functional audit status is set to pending.

Modifying a service creates a new service order based on the attribute settings of the existing service.

The following topics provide instructions for modifying a multipoint Ethernet (VPLS) service:

- Adding a Spoke on page 207
- Adding a Hub on page 208
- Changing a Spoke to a Hub on page 209
- Changing a Hub to a Spoke on page 210
- Adding a UNI Interface on page 211
- Deleting a UNI Interface or Deleting an Endpoint on page 213
- Changing the Endpoint Bandwidth on page 214
- Changing Advanced Settings for an Endpoint on page 215

Adding a Spoke

To add an endpoint configured as a spoke to a multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the point-to-multipoint service to which you want to add a spoke.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

The screenshot shows the 'General Settings' and 'Endpoint Settings' sections of a service configuration interface.

General Settings

- Service order name: ELANHubSpokeQinQAllVLANNormalizedAll_modify_2010-02-1
- Customer: A1
- Service name: ELANHubSpokeQinQAllVLANNormalizedAll
- Service definition: ELAN-Hub-Spoke-QinQ-AllVLAN-Normalized-All
- Comments: ELANHubSpokeQinQAllVLANNormalizedAll

Endpoint Settings

Add Endpoints

Device	UNI Interface	Bandwidth (MB)	AutoPick S-VLA	S-VLAN ID	MTU (Bytes)	Action
Hub Device: Beijing-mx480-pe7 (1 Interface)						
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	5	1522	Delete UNI Interface
Spoke Device: SanFrancisco (1 Interface)						
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Delete UNI Interface
Hub Device: SanJose (1 Interface)						
SanJose	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Delete UNI Interface

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Endpoint Settings table, click **Add Endpoints**.
The Add Endpoint PE Devices screen shows available N-PE devices that are not part of the service.
7. Select the devices on which you want to add new endpoints, and then click **Next**.
The service modification screen shows the added devices with system recommended choices for UNI. To select a different UNI, see “Adding a UNI Interface” on page 211. To select a different bandwidth than the applied default, see “Changing the Endpoint Bandwidth” on page 214.
8. Click **Modify**.
9. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
10. Click **OK**.
11. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.


Adding a Hub

To add an endpoint to a multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service to which you want to add a hub.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

General Settings

Service order name: ELANHubSpokeQinQAllVLANNormalizedAll_modify_2010-02-1 

Customer: A1

Service name: ELANHubSpokeQinQAllVLANNormalizedAll

Service definition: ELAN-Hub-Spoke-QinQ-AllVLAN-Normalized-All

Comments: ELANHubSpokeQinQAllVLANNormalizedAll

Endpoint Settings

Add Endpoints

Device	UNI Interface	Bandwidth (Mb)	AutoPick S-VLA	S-VLAN ID	MTU (Bytes)	Action
Hub	Device: Beijing-mx480-pe7 (1 Interface)					
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	5	1522	Delete UNI Interface
Hub	Device: SanFrancisco (1 Interface)					
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Delete UNI Interface
Hub	Device: SanJose (1 Interface)					
SanJose	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Delete UNI Interface

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Endpoint Settings table, click **Add Endpoints**.
The Add Endpoint PE Devices screen shows available N-PE devices that are not part of the service.
7. Select the devices on which you want to add new endpoints, and then click **Next**.
The service modification screen shows the added devices with system recommended choices for UNI. To select a different UNI, see “Adding a UNI Interface” on page 211. To select a different bandwidth than the applied default, see “Changing the Endpoint Bandwidth” on page 214.
8. In the Endpoint Settings table, check **Hub** for the device you just added.
9. Click **Modify**.
10. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
11. Click **OK**.
12. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Changing a Spoke to a Hub

To change a spoke to a hub in a point-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.

3. In the Manage Services inventory, select the point-to-multipoint service for which you want to change a spoke to a hub.
4. Open the Actions drawer and select **Modify Service**.
Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.
5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Device column of the Endpoint Settings table, find the spoke endpoint you want to change to a hub and select the **Hub** checkbox, as shown in the following example:

Endpoint Settings		
Add Endpoints		
Device	UNI Interface	Bandwidth (Mbps)
Device: Beijing-mx480-pe7 (1 Interface)		
Beijing-mx480-pe7	ge-5/0/1	10
Device: SanFrancisco (1 Interface)		
SanFrancisco	ge-0/0/2	10
Device: SanJose (1 Interface)		
SanJose	ge-0/0/2	10

7. Click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Changing a Hub to a Spoke




NOTE: You cannot change the only hub of a point-to-multipoint service to a spoke. You will receive an error message when you try to save such a service configuration.

To change a hub to a spoke in a point-to-multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.

3. In the Manage Services inventory, select the point-to-multipoint service for which you want to change a hub to a spoke.
4. Open the Actions drawer and select **Modify Service**.
Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.
5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Device column of the Endpoint Settings table, find the hub endpoint you want to change to a spoke and clear the **Hub** checkbox, as shown in the following example:



Endpoint Settings		
Add Endpoints		
Device	UNI Interface	Bandwidth (Mbps)
Beijing-mx480-pe7	ge-5/0/1	10
SanFrancisco	ge-0/0/2	10
SanJose	ge-0/0/2	10

7. Click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Adding a UNI Interface

To add a UNI on a device that is already part of a multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service to which you want to add a UNI.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the Endpoint Settings table, click **Add UNI Interface** for the device, as shown in the following example, which adds a UNI to the device named SanFrancisco.

Device	UNI Interface	Bandwidth (Mbps)	AutoPick S-VLAN	S-VLAN ID	MTU (Bytes)	Action
Hub Device: Beijing-mx480-pe7 (1 Interface)						
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface
Hub Device: SanFrancisco (2 Interfaces)						
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface
SanFrancisco	Please select...	10	<input type="checkbox"/>	5	1522	Delete UNI Interface
Hub Device: SanJose (1 Interface)						
SanJose	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface

An additional UNI appears in the endpoint table.

7. Select an interface from the UNI Interface column:

Device	UNI Interface	Bandwidth (Mbps)
Hub Device: Beijing-mx480-pe7 (1 Interface)		
Beijing-mx480-pe7	ge-5/0/1	10
Hub Device: SanFrancisco (2 Interfaces)		
SanFrancisco	ge-0/0/2	10
SanFrancisco	ge-0/0/1	10
Hub Device: SanJose (1 Interface)		
SanJose	ge-0/0/2	10

8. If the interface you selected in the previous step is already configured (duplicate) you must either enter a different value in the S-VLAN ID field manually, or check the **Autopick S-VLAN ID** field.
9. Click **Modify**.
10. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
11. Click **OK**.
12. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Deleting a UNI Interface or Deleting an Endpoint



NOTE: You cannot delete the last endpoint on the only hub device in the service. You will receive an error message when you try to save such a service configuration.

To delete a UNI from a multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service from which you want to delete a UNI.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the Endpoint Settings table, find the UNI you want to delete and click **Delete UNI Interface** for that table row, as shown in the following example:

Device	UNI Interface	Bandwidth (Mbps)	AutoPick S-VLAN	S-VLAN ID	MTU (Bytes)	Action
Beijing-mx480-pe7	ge-5/0/1	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface
SanFrancisco	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface
SanJose	ge-0/0/2	10	<input type="checkbox"/>	5	1522	Add UNI Interface Delete UNI Interface

The selected UNI is removed from the table. If the deleted UNI was the only UNI selected on that device, then the device is deleted from the Endpoint Settings table.

7. Click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See *Viewing Scheduled Jobs* in the *Junos Space Network Application Platform User Guide* in the Junos Space Network Application Platform User Guide for details.

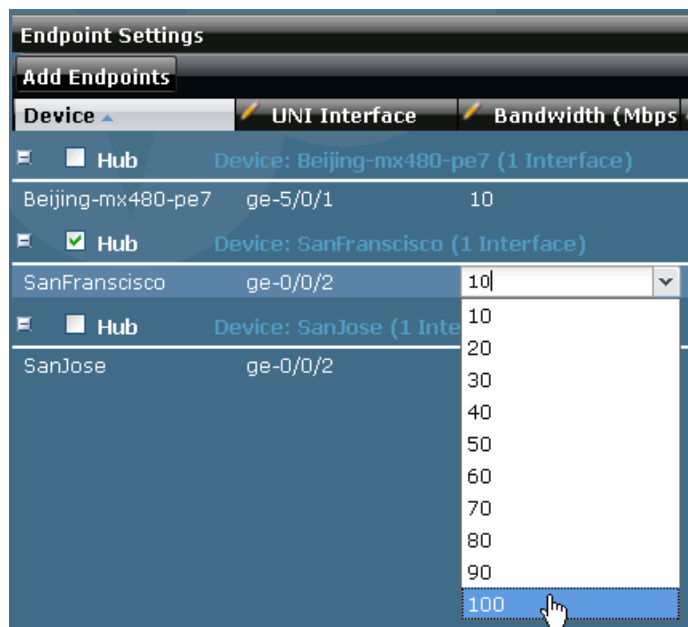
Changing the Endpoint Bandwidth

To change the rate limit or bandwidth for an endpoint of a multipoint Ethernet service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service on which you want to change the bandwidth of an endpoint.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modification service order, if desired.
6. In the Action column of the endpoint Settings table, click on the Bandwidth entry for the UNI on which you want to change the bandwidth, as shown:



7. From the list of valid bandwidth settings, select the one you want, and then click **Modify**.
8. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.

9. Click **OK**.
10. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* in the Junos Space Network Application Platform User Guide for details.

Changing Advanced Settings for an Endpoint

To change advanced settings for an endpoint of a point-to-multipoint Ethernet service, follow these steps:

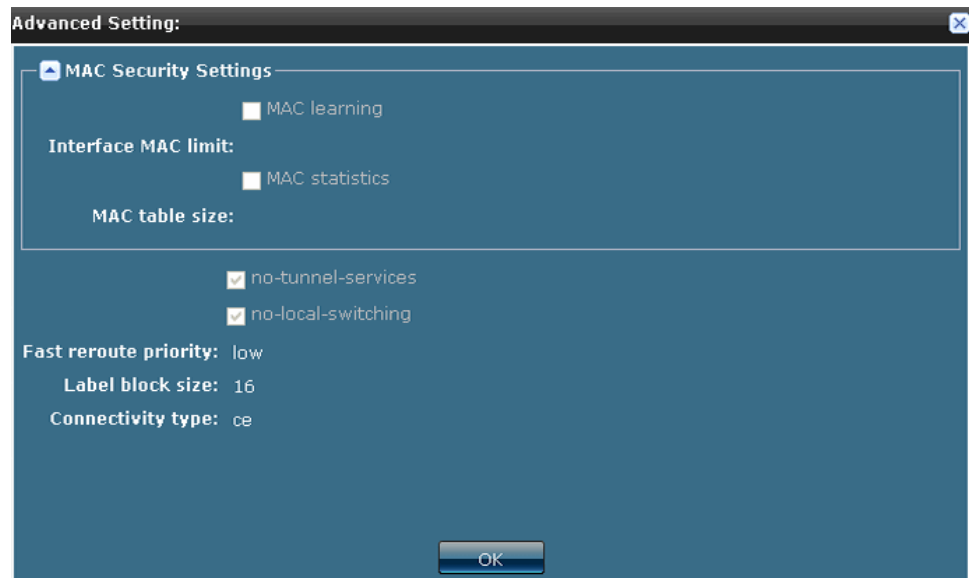
1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory, select the service on which you want to change one or more advanced settings for an endpoint.
4. Open the Actions drawer and select **Modify Service**.

Current service settings appear in the main display area. The General Settings box contains a unique name for the service order that will request the change.

5. In the Service order name field, change the name of the modified service order, if desired.
6. In the Action column of the Endpoint Settings table, find the device endpoint you want to modify, and click **Advanced** for that table row, as shown in the following example:

Endpoint Settings						
Add Endpoints						
Device	UNI Interface	Bandwidth (Mbps)	AutoPick VLAN ID	VLAN ID	MTU (Bytes)	Action
Device: SanJose (1 Interface)						
SanJose	ge-0/0/1	1	<input type="checkbox"/>	1	1522	Add UNI Interface Advanced Delete UNI Interface
Device: Xerxes (1 Interface)						
Xerxes	ge-2/0/2	1	<input type="checkbox"/>	14	1522	Add UNI Interface Advanced Delete UNI Interface

The Advanced Setting screen displays the security and advanced settings that you can configure for a device, as shown in the following example:



See the “Service Attributes Overview” on page 15 for more information about configuring MAC security settings and advanced settings.

7. In the MAC Security Settings box, make selections for MAC learning and MAC statistics and enter values for Interface MAC limit, MAC table size, and MAC table aging time.
8. Enable or disable tunnel services by selecting or clearing the **no-tunnel-service** checkbox.
9. Enable or disable local switching by selecting or clearing the **no-local-switching** checkbox.
10. In the Fast reroute priority field, specify the reroute priority for a VPLS routing instance.
11. In the Label block size field, specify the label block size for VPLS labels.
12. In the Connectivity type field, select a connection-type to specify when a VPLS connection is taken down, depending on whether or not the interface for the VPLS routing instance is customer-facing or integrated routing and bridging (IRB)
13. Click **OK** to save all your changes in the Advanced Setting screen.
14. In the Deployment Options window, select one of the following:
 - Save the change without scheduling it.
 - Schedule the change for immediate deployment.
 - Schedule the change for later deployment.
15. Click **OK**.
16. Use the Jobs workspace to monitor the progress and status of the deployment. See Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide* for details.

Related Topics • Creating a Point-to-Multipoint Ethernet Service Order on page 178

- Deploying a Service on page 188
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
- Viewing Services on page 232
- Modifying a Point-to-Point Ethernet Service on page 198
- Changing Advanced Settings for an Endpoint on page 200

Decommissioning a Service

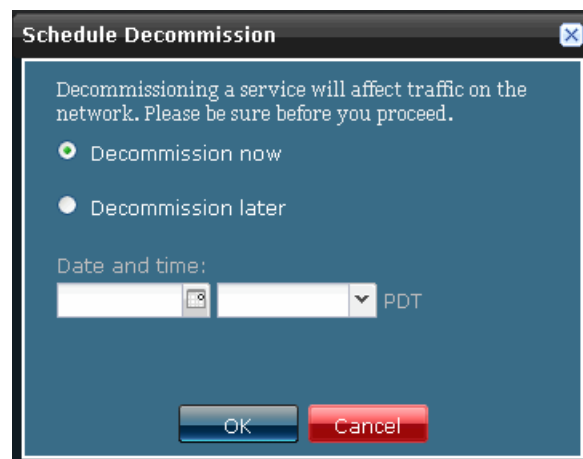
You can decommission a service that a customer no longer needs.

You cannot decommission a service if a service order requesting action on that service is in the Requested, Scheduled, In Progress, or Invalid state.

To decommission a service, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory panel, select the service you want to decommission.
4. Open the Actions drawer and click **Decommission Service**.

The Schedule Decommission window appears as follows:



5. To decommission the service immediately, select **Decommission now**, and click **OK**.

In the Order Information window, click the job ID of the decommission job.

The Jobs workspace window appears and shows a filtered view of the job inventory, showing only the decommission job. See *Viewing Scheduled Jobs* in the *Junos Space Network Application Platform User Guide* for details.

To deploy the service at a later time, select **Decommission later**, select a date and time to perform the operation, and then click **OK**.

- Related Topics**
- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
 - Viewing Services on page 232

CHAPTER 12

Monitoring Services and Service Orders

- Viewing Service Provisioning Statistics on page 219
- Viewing Service Orders on page 222
- Viewing Services on page 232
- Viewing Functional Audit Results on page 241

Viewing Service Provisioning Statistics

The Service Provisioning workspace provides a visual overview of customers and service orders on your network and enables you to quickly access related and commonly needed information.

The following topics describe viewing statistics in the Service Provisioning workspace.

- Viewing Service Orders by Customer on page 219
- Viewing the Percentage of Service Orders in Each Service Order State on page 220

Viewing Service Orders by Customer

To view the number of service orders created for each customer, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
The system displays the chart named Services by Customer, as shown in the following example:



Each vertical bar represents a customer. The number of service orders is shown on the Y axis. In this example, three service orders has been issued on behalf of Best Customer.

2. To list the service orders created for a specific customer, click on the bar that represents the customer.

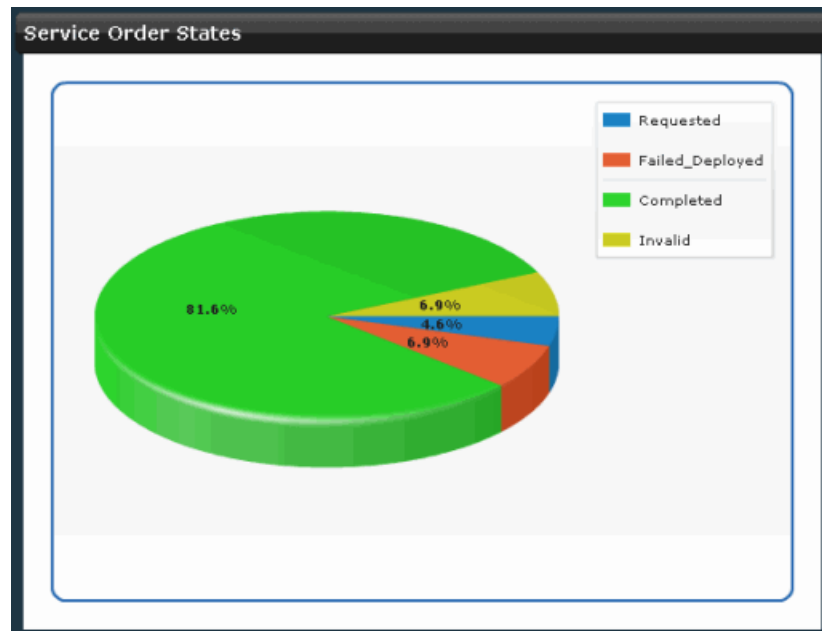
The Manage Service Orders screen shows only those service orders made on behalf of the selected customer.

Viewing the Percentage of Service Orders in Each Service Order State

You can view service orders in a specific state. For example, you can check for failed service orders and then access a list of failed requests so you can begin to take corrective action.

To view service orders by service order state, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
The system displays the chart named Service Order States, as shown in the following example:



Each segment of the pie chart represents the proportion of service orders in a specific service order state:

- Completed—The service order has been successfully deployed.
 - Scheduled for deployment—The service provisioner has scheduled the service order for deployment.
 - Deployment Failed—An attempted service deployment was not successfully completed or failed an audit.
 - In Progress—The Network Activate software is in the process of deploying the service.
 - Requested—The service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment.
 - Invalid—The service order is not valid.
2. To list the service orders in a specific state, click on the state's segment of the pie chart.

The Manage Service Orders screen shows only those services in the specified state.

Related Topics

- Workspace Statistics Pages Overview
- Viewing Services on page 232
- Viewing Multipoint Ethernet Service Orders as Graphics on page 222

Viewing Service Orders

The following topics describe how you can view service orders either graphically or in a table:

- Viewing Point-to-Point Ethernet Service Orders as Graphics on page 222
- Viewing Multipoint Ethernet Service Orders as Graphics on page 226
- Viewing Service Orders in a Table on page 231

Viewing Point-to-Point Ethernet Service Orders as Graphics

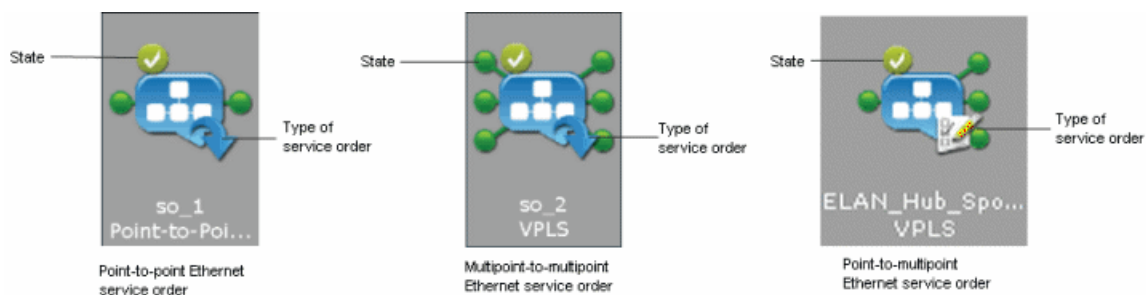
To view an inventory of service orders in a graphical form, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Orders** task icon.
3. In the filter bar, click the thumbnail view icon.

Thumbnails of service orders appear in the main display area of the screen.

From the thumbnail, you can see whether the service order is for a point-to-point Ethernet service or a multipoint Ethernet (or VPLS) service. In Figure 16 on page 222, the thumbnail on the left shows one service endpoint on either side of the service order, indicating a point-to-point service order. The thumbnail in the center shows three service endpoints either side of the service order, indicating a multipoint-to-multipoint VPLS service order. The thumbnail on the right shows one service endpoint to the left and three to the right, indicating a point-to-multipoint service order. This topic describes point-to-point service orders. For details about viewing multipoint service orders, see “Viewing Multipoint Ethernet Service Orders as Graphics” on page 226.

Figure 16: Service Order Thumbnail



Each service order thumbnail includes decorations that show the state and type of service order. The service order state is indicated by a symbol in the upper left corner of the thumbnail. The type of service order is indicated by a symbol in the lower right corner. Table 12 on page 223 explains each of the thumbnail decorations that represents a service order state:

Table 12: Service Order State Thumbnail Decorations










Decoration	State	Meaning
	Completed	Service deployment is complete.
	In Progress	Network Activate software is in the process of deploying the service.
	Deployment Failed	Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service.
	Invalid	Service order contains invalid data.
	Requested	Service provisioner has created the service request, but has not yet attempted to deploy it or schedule it for deployment.
	Scheduled	Service provisioner has scheduled the service request for deployment.

Table 13 on page 223 explains each of the service type icons.

Table 13: Service Order Type Icons

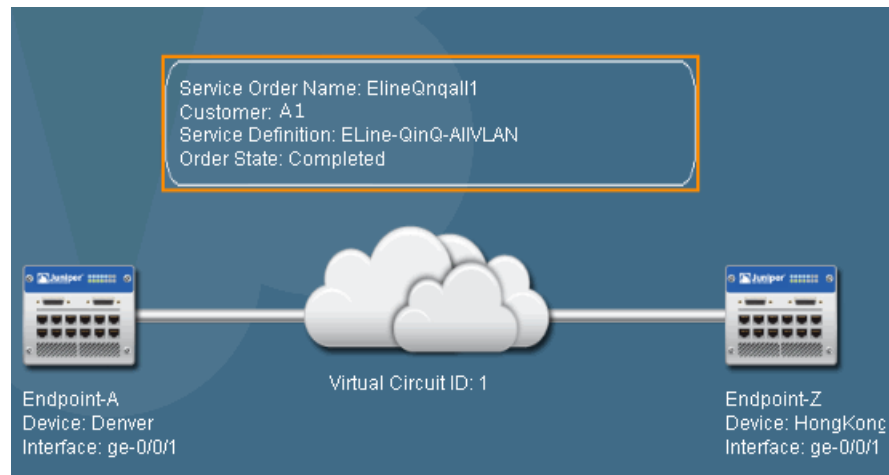
Service Order Type Icon	Meaning
	Configuration audit—Service provisioner has requested a configuration audit on a service.
	Function audit—Service provisioner has requested a functional audit on a service.
	Provision—Service provisioner has placed a service order for a new service.

- To restrict the display of service orders, enter a search criterion of one or more characters in the search bar and press Enter. All service orders that match the search criterion are shown in the main display area.
- To view summary information for a specific service order, drag the zoom slider to the rightmost position. A service order summary appears in the main display area. Table 14 on page 224 explains each of the fields in summary view.

Table 14: Fields in the Service Order Summary View

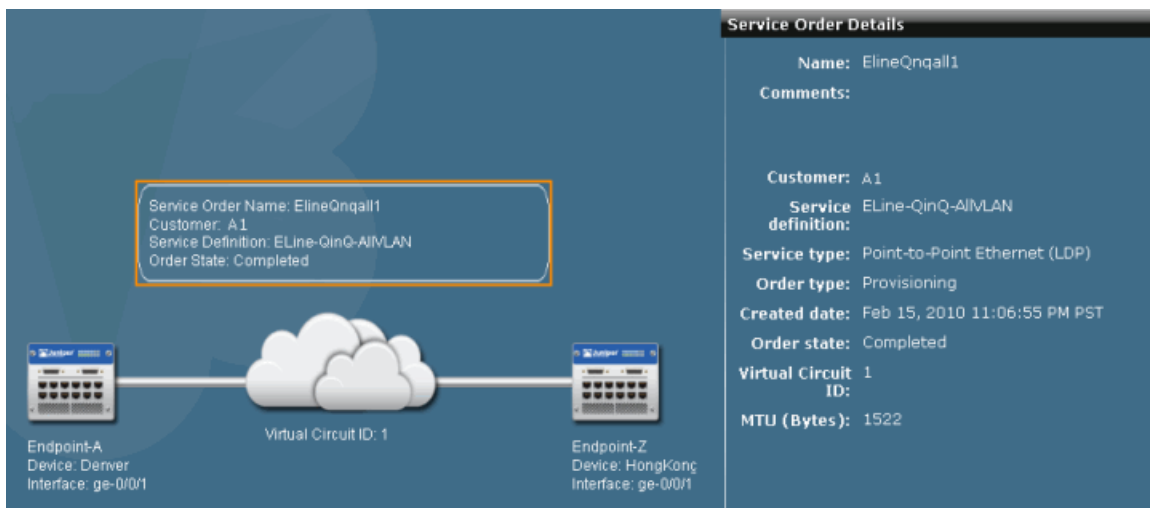
Field	Meaning
Name	Unique name assigned to the service order.
Created by	User name of the service provisioner who created the request.
Order state	One of the following: <ul style="list-style-type: none"> Scheduled for deployment—Service provisioner has scheduled the service order for deployment. Deployment failed—Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service. In progress—Network Activate software is in the process of deploying the service. Requested—Service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment. Completed—Request has been successfully deployed. Invalid—Service order contains invalid data.
Operation type	Specifies the operation to be performed on the service: <ul style="list-style-type: none"> Provisioning Decommission Configuration audit Functional audit Modification
Service type	One of the following: <ul style="list-style-type: none"> Point-to-Point Ethernet (LDP). VPLS—Multipoint-to-multipoint Ethernet service order or point-to-multipoint Ethernet service order.

- To view details of a specific service order, click **Details** in the service order thumbnail. A new screen appears and shows a graphical representation of the service order, as shown in the following example:



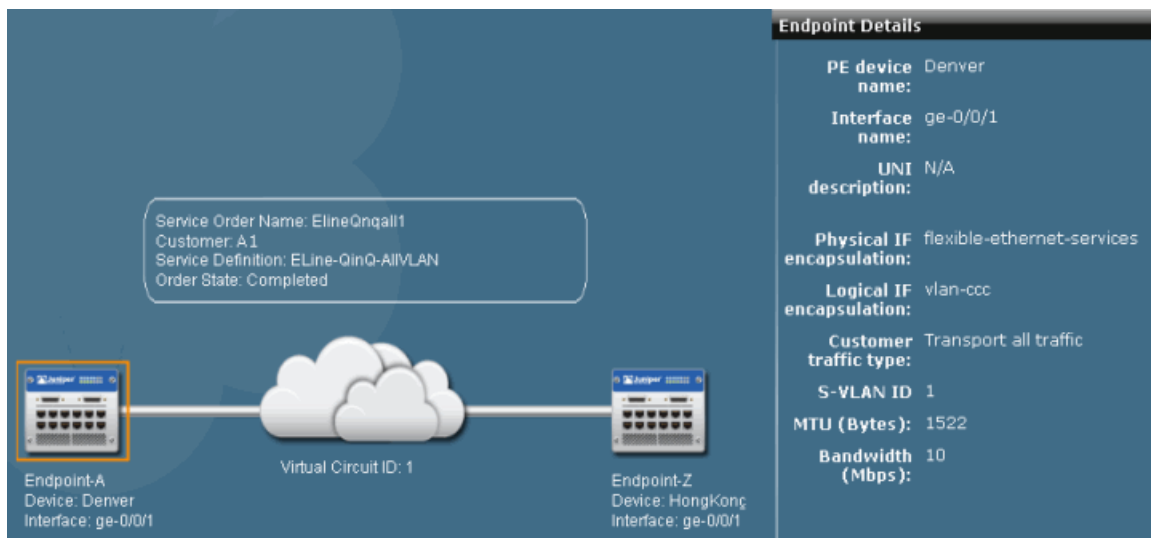
The graphic is made up of several selectable items. Each selectable item represents part of the information provided in the service order. The cloud represents the connectivity, the server images represent endpoints, and the information box above the cloud provides summary information about the service request.

- To view general information about the service, such as the customer name, type of service, and order status, click the information box. General information about the service order appears in the panel to the right, as shown in the following example:



This view also provides the connectivity details in the Virtual Circuit ID and MTU fields. Clicking on the cloud icon provides the same information as clicking on the information box.

- To view additional information about an endpoint, click on the server image that represents the endpoint. Endpoint information contained in the service order appears in the right panel, as shown in the following example:



9. When you are finished viewing the service order details, click **Cancel**. The Manage Service Orders screen reappears.

Viewing Multipoint Ethernet Service Orders as Graphics

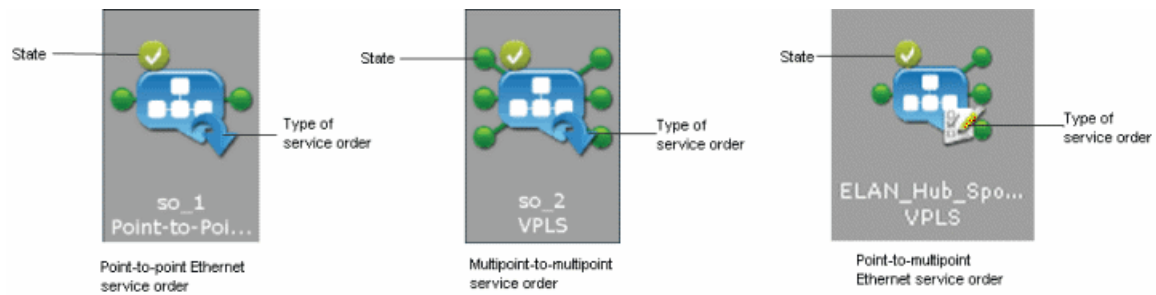
To view an inventory of service orders in a graphical form, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Service Orders** task icon.
3. In the filter bar, click the thumbnail view icon.

Thumbnails of service orders appear in the main display area of the screen.

From the thumbnail, you can see whether the service order is for a point-to-point Ethernet service or a multipoint Ethernet (or VPLS) service. In Figure 17 on page 227, the thumbnail on the left shows one service endpoint on either side of the service order, indicating a point-to-point service order. The thumbnail in the center shows three service endpoints either side of the service order, indicating a multipoint-to-multipoint VPLS service order. The thumbnail on the right shows one service endpoint to the left and three to the right, indicating a point-to-multipoint service order. This topic describes multipoint service orders. For details about viewing point-to-point service orders, see "Viewing Point-to-Point Ethernet Service Orders as Graphics" on page 222.

Figure 17: Service Order Thumbnail



Each service order thumbnail includes decorations that show the state and type of service order. The service order state is indicated by a symbol in the upper left corner of the thumbnail. The type of service order is indicated by a symbol in the lower right corner. Table 15 on page 227 explains each of the thumbnail decorations that represents a service order state:

Table 15: Service Order State Thumbnail Decorations










Decoration	State	Meaning
	Completed	Service deployment is complete.
	In Progress	Network Activate software is in the process of deploying the service.
	Deployment Failed	Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service.
	Invalid	Service order contains invalid data.
	Requested	Service provisioner has created the service request, but has not yet attempted to deploy it or schedule it for deployment.
	Scheduled	Service provisioner has scheduled the service request for deployment.

Table 16 on page 228 explains each of the service type icons.

Table 16: Service Order Type Icons

Service Order Type Icon	Meaning
	Configuration audit—Service provisioner has requested a configuration audit on a service.
	Function audit—Service provisioner has requested a functional audit on a service.
	Provision—Service provisioner has placed a service order for a new service.

- To restrict the display of service orders, enter a search criterion of one or more characters in the search bar and press Enter. All service orders that match the search criterion are shown in the main display area.
- To view summary information for a service order, drag the zoom slider to the rightmost position. A service order summary appears in the main display area. Table 17 on page 228 explains each of the fields in the summary view.

Table 17: Summary Information for a Service Order

Field	Meaning
Name	Unique name assigned to the service order.
Created by	User name of the service provisioner who created the request.
Order state	One of the following: <ul style="list-style-type: none"> Scheduled for deployment—Service provisioner has scheduled the service order for deployment. Deployment failed—Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service. In progress—Network Activate software is in the process of deploying the service. Requested—Service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment. Completed—Request has been successfully deployed. Invalid—Service order contains invalid data.
Operation type	Specifies the operation to be performed on the service: <ul style="list-style-type: none"> Provisioning Decommission Configuration audit Functional audit Modification

Table 17: Summary Information for a Service Order (*continued*)

Field	Meaning
Service type	One of the following: <ul style="list-style-type: none"> Point-to-Point Ethernet (LDP) VPLS—Either a multipoint-to-multipoint service or a point-to-multipoint service

6. To see details of a specific multipoint service, click **Details** from the thumbnail. The Service Order Details screen shows details of the multipoint service order.

The screenshot displays the 'Service Order Details' window. The 'General Settings' tab is active, showing the following information:

- Name:** ELANBGPQinQAI/VLANNormalizedNone
- Service definition:** ELAN-BGP-QinQ-AI/VLAN-Normalized-None
- Order type:** ADD
- Service type:** Multipoint-to-Multipoint Ethernet (VPL)
- Customer:** A1
- Customer traffic type:** Transport all traffic
- Order state:** Completed
- Route target:** 65410:3
- Created date:** Feb 16, 2010 12:25:35 PM PST
- Created by:** super
- Comments:** Normalized None

Below the general settings is the 'End Point Settings' section, which contains a table with the following data:

Device	UNI Interface	Bandwidth (Mbps)	S-VLAN ID	MTU (Bytes)
Device: Beijing-mx480-pe7 (1 Interface)				
Beijing-mx480-pe7	ge-5/0/1	10	4	1522
Device: SanFrancisco (1 Interface)				
SanFrancisco	ge-0/0/2	10	4	1522
Device: SanJose (1 Interface)				
SanJose	ge-0/0/2	10	4	1522

The Service Order Details screen provides general information about the service and information about each service endpoint. Table 18 on page 229 explains each of the general information fields.

Table 18: VPLS Service Order Details—General Settings

Service Attribute	Meaning
Name	Name of the service order.
Service definition	Name of the service definition that the service order is based on.
Order type	One of the following: <ul style="list-style-type: none"> ADD—Provisions a new service or performs an audit on a service. DELETE—Decommissions a service.
Customer	Customer name

Table 18: VPLS Service Order Details—General Settings (*continued*)

Service Attribute	Meaning
Order state	<p>One of the following:</p> <ul style="list-style-type: none"> Scheduled for deployment—Service provisioner has scheduled the service order for deployment. Deployment failed—Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service. In progress—Network Activate software is in the process of deploying the service. Requested—Service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment. Completed—Request has been successfully deployed. Invalid—Service order contains invalid data.
Created date	Date and time at which the service order was created.
Comments	Comments entered in the service order.
Service definition	Name of the service definition that the service is based on
Service type	VPLS
Customer traffic type	<p>One of the following:</p> <ul style="list-style-type: none"> Transport all traffic Transport VLAN range Transport single VLAN
Route target	Unique route target assigned to this service.
Created by	Provisioner who created the service order.

Table 19 on page 230 describes each of the endpoint information fields.

Table 19: VPLS Service Order Details—Endpoint Settings

Endpoint Attribute	Meaning
Device	Name of the N-PE device.
UNI interface	Name of the interface on the N-PE device that connects to the customer site.
Bandwidth	Rate limit in Mbps set for this endpoint.
S-VLAN ID	Service VLAN ID (Q-in-Q interfaces only).

Table 19: VPLS Service Order Details—Endpoint Settings (*continued*)

Endpoint Attribute	Meaning
MTU	MTU of the UNI.

- When you have finished viewing the service order details, click **OK**. The Manage Service Orders screen reappears.

Viewing Service Orders in a Table

To view and determine the status of service orders in a tabular form, follow these steps:

- In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
- In the task ribbon, select the **Manage Service Orders** task icon.
- In the filter bar, click the table view icon.

A table of service orders on the system appears in the main display area.

Table 20 on page 231 describes each of the fields in the service orders table.

Table 20: Fields in the Service Orders Table

Field	Description
Name	Name of the service order assigned during service creation or edit.
Order State	Status of the service order: <ul style="list-style-type: none"> Completed—Service order has been successfully deployed. Deploy failed—Device is down or the Network Activate software was unable to push the service configuration to a device configured for the service. In-progress—Network Activate software is in the process of deploying the service. Requested—Service provisioner has created the service order, but has not yet attempted to deploy it or schedule it for deployment. Scheduled—Service provisioner has scheduled the service order for deployment. Invalid—Service order contains invalid data.
Customer	Name of the enterprise customer who placed an order for the service.
Service Type	One of the following: <ul style="list-style-type: none"> Point-to-Point Ethernet (LDP) VPLS—Either a multipoint-to-multipoint service or a point-to-multipoint service
Created Date	Date that the service provisioner created the request.

Table 20: Fields in the Service Orders Table (*continued*)

Field	Description
Created By	Screen name of the service provisioner who created the service order.

- To view details of a specific service order, double click the table row that summarizes the service order.

For a point-to-point service order, a graphical illustration of the service order appears. See “Viewing Point-to-Point Ethernet Service Orders as Graphics” on page 222 for information about interpreting this graphic.

For a multipoint service order, a table of information about the service order appears. See “Viewing Multipoint Ethernet Service Orders as Graphics” on page 226 for details.

- Related Topics**
- Deploying a Service on page 188
 - Deleting a Service Order on page 189
 - Viewing Services on page 232

Viewing Services

The following topics describe how to view services either graphically using thumbnails, or in a tabular form:

- Viewing Point-to-Point Ethernet Services as Graphics on page 232
- Viewing Multipoint Ethernet Services as Graphics on page 235
- Viewing Services in a Table on page 239

Viewing Point-to-Point Ethernet Services as Graphics

You can view thumbnail, summary, and detailed information about services on your network. Typically, you use this feature to determine which services need attention.

To view the services on your network, follow these steps:

- In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
- In the task ribbon, select the **Manage Services** task icon.
- To display the service inventory in graphical form, in the filter bar, select the thumbnail view icon.

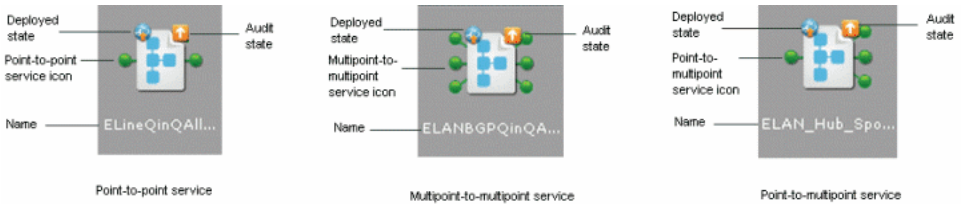
The services appear in the main display area of the screen, each represented by an icon that also shows its name.

From the thumbnail, you can see whether a service is a point-to-point Ethernet service, a multipoint-to-multipoint Ethernet service, or a point-to-multipoint Ethernet service. In Figure 18 on page 233, the thumbnail on the left shows one service endpoint either side of the service order, indicating a point-to-point service. The thumbnail in the center shows three service endpoints either side of the service order, indicating

a multipoint-to-multipoint VPLS service. The thumbnail on the right shows one service endpoint to the left and three to the right, indicating a point-to-multipoint VPLS service.

This topic describes point-to-point services. For details about viewing VPLS services, see “Viewing Multipoint Ethernet Services as Graphics” on page 235.

Figure 18: Service Thumbnails



Each service thumbnail can include decorations that show the deployed state of the service and its audit state. The deployed state is indicated by a symbol in the top left corner of the thumbnail. The audit state is indicated by a symbol in the upper right corner. Table 21 on page 233 explains the thumbnail decoration that represents a deployed state.

Table 21: Service Deployment State Decoration




Decoration	Meaning
	Deployed—A service does not exist until it is deployed.

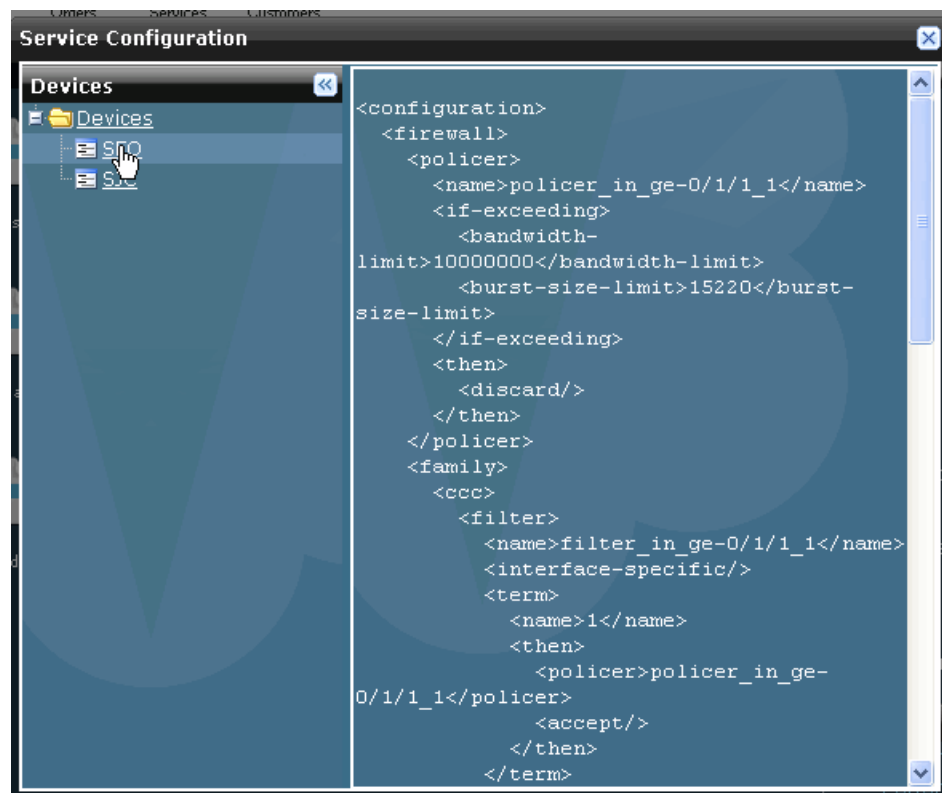
Table 22 on page 233 explains each of the thumbnail decorations that represent an audit state.

Table 22: Service Audit Status Decorations

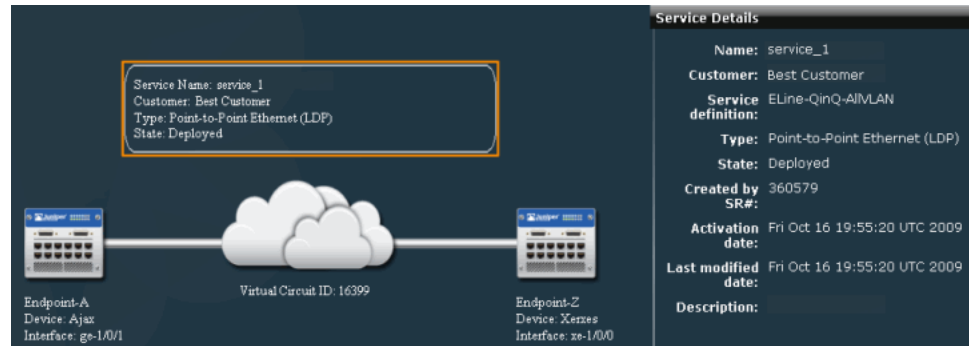
Decoration	Meaning
	Up—Service passed a functional audit.
	Down—Service failed a functional audit.

- To restrict the display of services, enter a search criterion of one or more characters in the search bar and press Enter. All services that match the search criterion appear in the main display area.
- To view information about a specific service, drag the zoom slider to the rightmost position. The following information for the service appears in the main display area:
 - Name—Unique name assigned to the service.
 - Type—Point-to-point Ethernet (LDP) or VPLS.

- State—one of:
 - Deployed—Service does not exist until it is deployed.
 - Failed Deploy—An attempt to modify the service failed.
 - Status—One of the following values:
 - Up—Service passed functional audit.
 - Down—Service failed functional audit.
 - Pending Functional Audit—Service is deployed but a functional audit has not yet been performed, or the service has been modified since the last functional audit was performed.
 - Customer—Name of the customer the service is provided for.
 - Activation time—Date and time the service was activated.
 - Last modification—Date and time at which the service was last modified.
6. To view XML coding of the service configuration, click **View Service Configuration Change** from the Actions drawer, and then select a device. An example output follows:

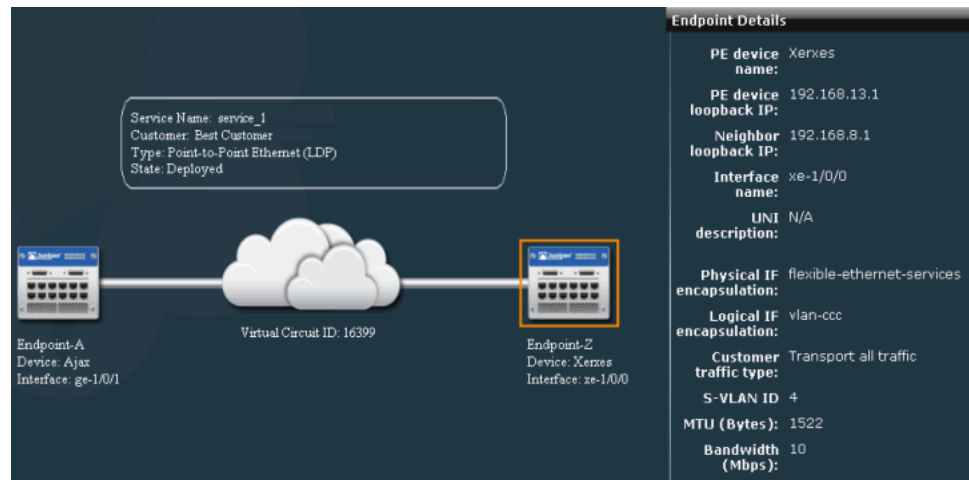


7. To see details for a specific service, click **Details** in the thumbnail. A new screen shows a graphical representation of the service with information about the service in the Service Details panel, as shown in the following example for a point-to-point service:



The graphic shows selectable items that each represent part of the service. The cloud represent the connectivity, the server images represents endpoints, and the information box above the cloud provides summary information about the service.

8. To view details about an endpoint, click on the box that represents the endpoint. Endpoint details appear in the quick view panel, as shown in the following example:



9. To view connectivity details, click on the cloud. The following connectivity details appear in the look panel:

- The unique virtual circuit ID used by this service.
- The MTU for the connectivity.

Viewing Multipoint Ethernet Services as Graphics

You can view thumbnail, summary, and detailed information about services on your network. Typically, you will use this feature to view the state of services and determine which services need attention.

To view the services on your network, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.

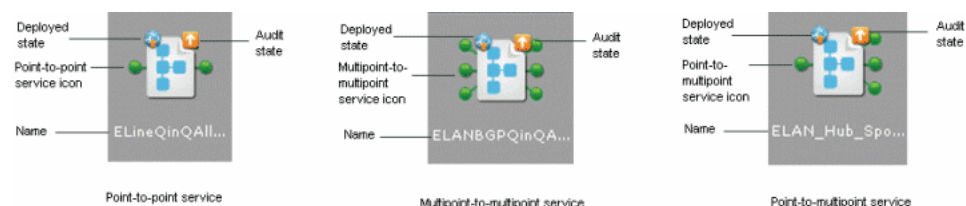
- To display the service inventory in graphical form, in the filter bar, select the thumbnail view icon.

The service thumbnails appear in the main display area of the screen.

From the thumbnail, you can see whether the service is a point-to-point Ethernet service, a multipoint-to-multipoint Ethernet service, or a point-to-multipoint Ethernet service. In Figure 19 on page 236, the thumbnail on the left shows one service endpoint either side of the service, indicating a point-to-point service. The thumbnail in the center shows three service endpoints either side of the service order, indicating a multipoint-to-multipoint VPLS service. The thumbnail on the right shows one service endpoint to the left and three to the right, indicating a point-to-multipoint VPLS service.

This topic describes multipoint-to-multipoint and point-to-multipoint Ethernet services. For details about viewing point-to-point services, see “Viewing Point-to-Point Ethernet Services as Graphics” on page 232.

Figure 19: Service Thumbnails



Each service thumbnail can include decorations that show the deployed state of the service and its audit state. The deployed state is indicated in the upper-left corner of the thumbnail. The audit state is indicated in the upper-right corner. Table 23 on page 236 explains the thumbnail decoration that represents a deployed state.

Table 23: Service Deployment State Decoration




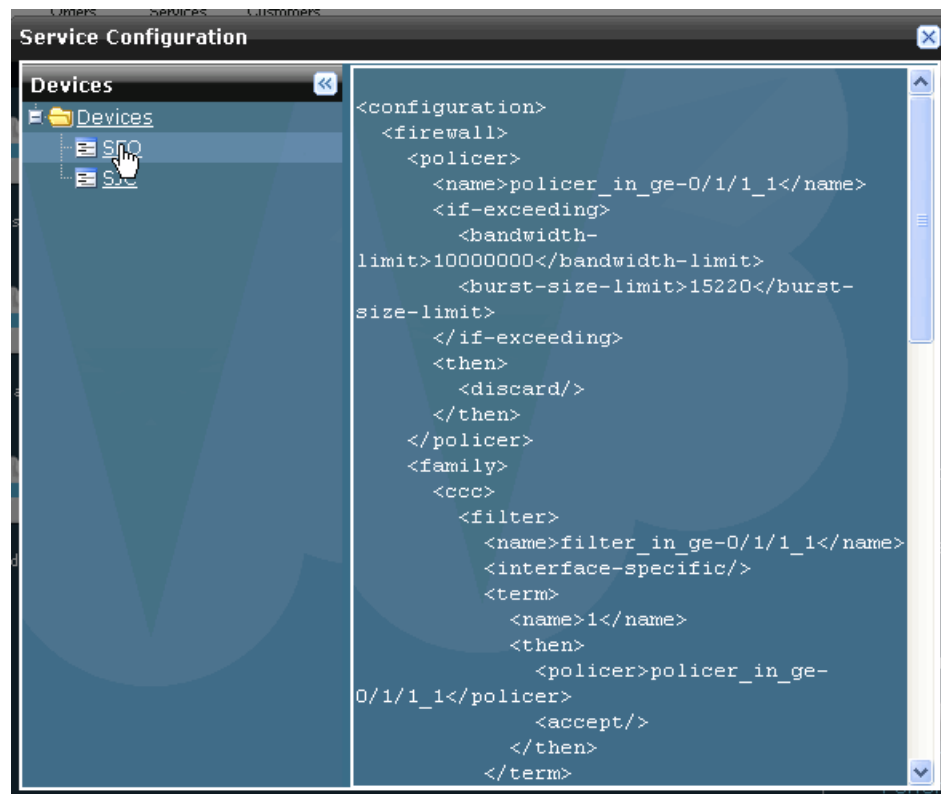
Decoration	Meaning
	Deployed—A service does not exist until it is deployed.

Table 24 on page 236 explains each of the thumbnail decorations that represent a service audit status.

Table 24: Service Audit Status Decorations

Decoration	Meaning
	Up—The service passed a functional audit.
	Down—The service failed a functional audit.

4. To restrict the display of services, enter a search criterion of one or more characters in the search bar and press Enter. All services that match the search criterion appear in the main display area.
5. To view information about specific service, drag the zoom slider to the rightmost position. The following information for the service appears in the main display area:
 - Name—Unique name assigned to the service.
 - Type—Point-to-point Ethernet (LDP) or VPLS.
 - State—one of:
 - Deployed—Service does not exist until it is deployed.
 - Failed Deploy—An attempt to modify the service failed.
 - Status—One of:
 - Up—Service passed functional audit.
 - Down—Service failed functional audit.
 - Pending Functional Audit—Service is deployed but a functional audit has not yet been performed, or the service has been modified since the last functional audit was performed.
6. To view XML coding of the service configuration, click **View Service Configuration Change**, and then select a device. An example output follows:



- To see details of a VPLS service, click **Details** from the thumbnail. A new screen appears and shows service details in a table, as shown in the following example of a multipoint-to-multipoint service:

Service Details

General Information

Name: ELANHubSpokeQinQAllVLANNormalizedAll

Type: VPLS

Customer: A1

State: Deployed

Status: Down

Comments: ELANHubSpokeQinQAllVLANNormalizedAll

Service definition: ELAN-Hub-Spoke-QinQ-AllVLAN-Normalized-All




Activation date: Feb 16, 2010 12:26:47 PM PST

Last modified date: Feb 16, 2010 12:26:47 PM PST

Hub route target: 65410:4

Spoke route target: 65410:5

End Point Settings

Device	UNI Interface	Bandwidth (Mbps)	S-VLAN ID	MTU (Bytes)
 Hub Device: Beijing-mx480-pe7 (1 Interface)				
Beijing-mx480-pe7	ge-5/0/1	10	5	1522
 Hub Device: SanFrancisco (1 Interface)				
SanFrancisco	ge-0/0/2	10	5	1522
 Hub Device: SanJose (1 Interface)				
SanJose	ge-0/0/2	10	5	1522

The Service details screen provides general information about the service and information about each service endpoint. Table 25 on page 239 explains each of the general information fields.

Table 25: VPLS Service Details—General Information

Service Attribute	Meaning
Name	Name of the service
Service definition	Name of the service definition that the service is based on
State	Deployed or Failed Deploy
Activation date	Date on which the service was activated
Route target	Unique route target assigned to this service
Customer	Customer name
Type	VPLS
Comments	Comments entered in the service order
Last modified date	Date on which the service was last modified

Table 26 on page 239 describes each of the endpoint information fields.

Table 26: VPLS Service Details—Endpoint Information

Endpoint Attribute	Meaning
Device	Name of the N-PE device. For point-to-multipoint services, this field also indicates whether the device is a services hub or spoke.
UNI interface	Name of the interface on the N-PE device that connects to the customer site.
Bandwidth	Rate limit in Mbps set for this endpoint.
S-VLAN ID	Service provider VLAN ID (Q-in-Q service only).
MTU	MTU of the UNI.

Viewing Services in a Table

To view the services inventory in a table, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. To display the service inventory in a table, in the filter bar, click the table view icon.

The services appear in a table in the main display area of the screen. A sample service inventory follows:

Manage Services		Sorted by Name					
Actions	Name	Customer	State	Status	Definition	Activation Date	Last Modified Date
	ELANHubSpokeQi	A1	✓ Deployed	Down	ELAN-Hub-Spoke-QinQ-AI/VLAN-Normalized-All	Feb 16, 2010 12:26:47 PM PST	Feb 16, 2010 12:26:47 PM PST
	ELANHubSpokeQi	A1	✓ Deployed	Up	ELAN-Hub-Spoke-QinQ-AI/VLAN	Feb 16, 2010 12:09:33 PM PST	Feb 16, 2010 2:52:47 PM PST
	ELANBGPQinQAIIV	A1	✓ Deployed	Up	ELAN-BGP-QinQ-AI/VLAN-Normalized-None	Feb 16, 2010 12:25:43 PM PST	Feb 16, 2010 12:25:43 PM PST
	ELANBGPQinQAIIV	Best Customer	✓ Deployed	Down	ELAN-BGP-QinQ-AI/VLAN-Normalized-All	Feb 16, 2010 12:24:59 PM PST	Feb 16, 2010 12:24:59 PM PST
	ELANBGPQinQAIIV	A1	✓ Deployed	Up	ELAN-BGP-QinQ-AI/VLAN	Feb 16, 2010 11:56:36 AM PST	Feb 16, 2010 11:56:36 AM PST
	ELANBGPPortBased	A1	✓ Deployed	Up	ELAN-BGP-PortBased-10-100M	Feb 16, 2010 11:59:03 AM PST	Feb 16, 2010 11:59:03 AM PST
	ELANBGPDot1QSiI	Best Customer	✓ Deployed	Up	ELAN-BGP-Dot1Q-SingleVLAN	Feb 16, 2010 11:57:39 AM PST	Feb 16, 2010 11:57:39 AM PST
	2domainVPLS	Best Customer	✓ Deployed	Pending Functional Audit	ELAN-BGP-QinQ-AI/VLAN	Feb 16, 2010 1:34:12 PM PST	Feb 16, 2010 1:34:12 PM PST

The Manage Services table provides the following information about each service:

- Name—Unique name assigned to the service.
 - Customer—Name of the customer the service is provided for.
 - State—one of:
 - Deployed—Service does not exist until it is deployed.
 - Failed Deploy—An attempt to modify the service failed.
 - Status—One of:
 - Up—Service passed functional audit.
 - Down—Service failed functional audit.
 - Definition—Service definition the service is based on.
 - Activation Date—Date and time the service was activated.
 - Last Modified Date—Date and time at which the service was last modified
4. To restrict the display of services, enter a search criterion of one or more characters in the search bar and press Enter. All services that match the search criterion are shown in the main display area.
 5. To view details of a specific service, double click the table row that summarizes the service. For a point-to-point Ethernet service, a graphical illustration of the service appears. See “Viewing Point-to-Point Ethernet Services as Graphics” on page 232 for information about interpreting this graphic and obtaining additional information.

For a VPLS service (point-to-multipoint or multipoint-to-multipoint), a table of service details appears. See “Viewing Multipoint Ethernet Services as Graphics” on page 235.

- Related Topics**
- Validating a Service on page 195
 - Decommissioning a Service on page 217

- Modifying a Point-to-Point Ethernet Service on page 198
- Changing Advanced Settings for an Endpoint on page 200
- Modifying a Point-to-Multipoint Ethernet Service on page 206
- Viewing Multipoint Ethernet Service Orders as Graphics on page 222
- Deploying a Service on page 188

Viewing Functional Audit Results

To view the results of a functional audit of a service, use the following procedures:

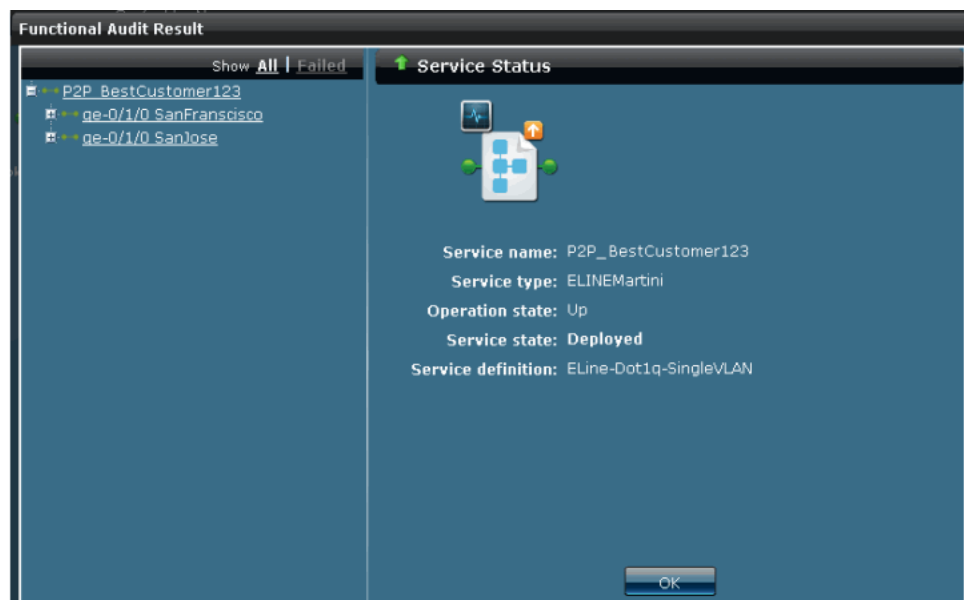
- Viewing the Results of a Functional Audit of a Point-to-Point Service on page 241
- Viewing the Results of a Functional Audit of a Multipoint-to-Multipoint Service on page 244
- Viewing the Results of a Functional Audit of a Point-to-Multipoint Service on page 248

Viewing the Results of a Functional Audit of a Point-to-Point Service

After performing a functional audit on a service, to view the functional audit results, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** task icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services screen, select the point-to-point service for which you want to view the functional audit results.
4. Open the Actions drawer and select **View Functional Audit Results**.



A screen similar to the following appears:



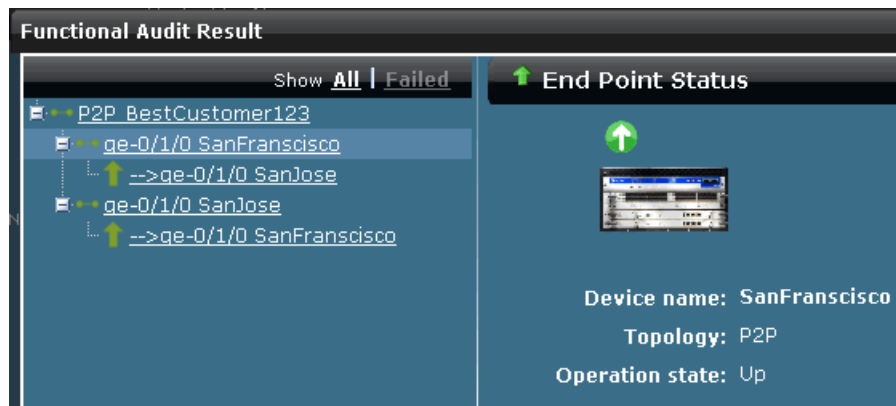
The right panel shows the overall service status. A green up-arrow in the Service Status header bar indicates that the service has passed the functional audit in both the control plane and the data plane. A red down-arrow indicates that the service failed either the control plane validation or the data plane validation.

The left panel lists each endpoint in the service. Each listed endpoint includes its interface name and the device name. Icons next to the endpoints indicate the service role of each endpoint and its up or down state as shown in Table 27 on page 242

Table 27: Point-to-Point Service Endpoint Icons

Icon	Meaning
	Point-to-point service endpoint. Endpoint state is up.
	Point-to-point service endpoint. Endpoint state is down.

- In the left panel header, to show all endpoints in the service, select **All**. To display only the endpoints indicating failed validation, select **Failed**. Failed is dimmed if the functional audit returned no validation errors.
- To view service status information related a specific endpoint, select the endpoint. The right panel shows the operational state of the device (up or down), the device name, its topology (always P2P in a point-to-point Ethernet service), and whether the remote site is up or down. For example:



- Expand each device to show the link from that device to the other N-PE device in the service.

An icon next to each link indicates whether the functional audit commands reported correct functioning of the control plane and data plane. Table 28 on page 242 explains these icons.

Table 28: Functional Audit Success Status Icons



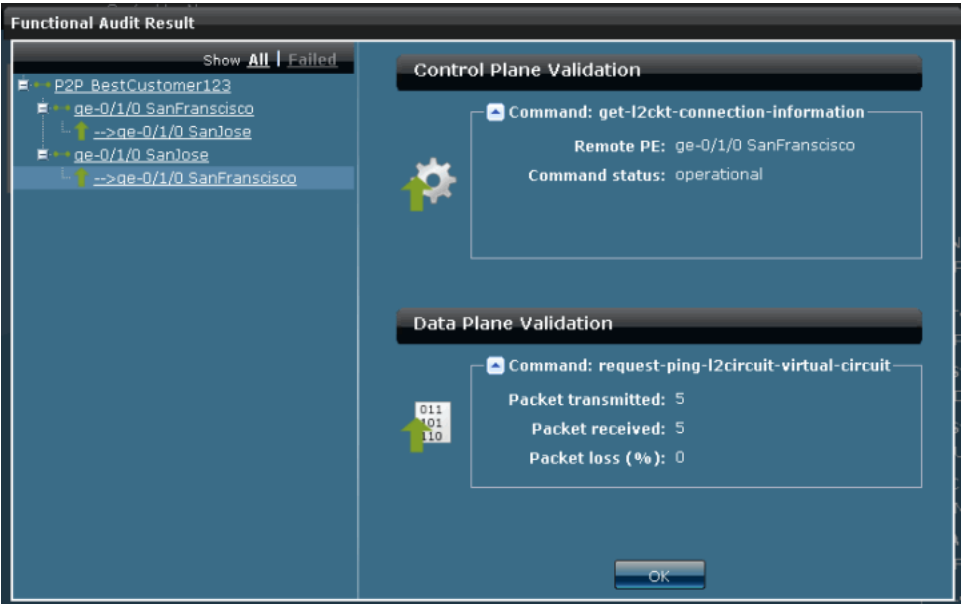
Icon	Meaning
	Control plane and data plane function correctly.

Table 28: Functional Audit Success Status Icons (*continued*)

Icon	Meaning
	Errors were reported in the functioning of either the control plane or the data plane.

8. In the left panel, select a link.
- A screen similar to the following appears:



The panel to the right shows the validation results for the control plane validation and data plane validation for the selected link. Icons indicate the success or failure of each of these sets of tests. Table 29 on page 243 explains each of these icons and the textual information provided in the box beside the icon.

Table 29: Point-to-Point Service Control Plane and Data Plane Validation Icons







Icon	Meaning	Explanation
	Control plane up	The text box shows the name of the remote N-PE device and confirms that the data plane is operational.
	Control plane down	The text box shows the name of the configured remote N-PE device and, in the Command status field, explains why the test failed.

Table 29: Point-to-Point Service Control Plane and Data Plane Validation Icons (*continued*)

Icon	Meaning	Explanation
	Control plane status unknown	The functional audit operation was unable to test the control plane.
	Data plane up	The text box indicates the number of packets transmitted and received, and confirms that no data packets were lost during the audit.
	Data plane down	The text box indicates that data packets were lost during the audit.
	Data plane status unknown	The functional audit was unable to complete the data plane test. The Result field in the text box indicates the reason—for example, the connection to the remote N-PE device is down.

The control plane and data plane validation checks must both show operational status for the link to be considered operational.

Viewing the Results of a Functional Audit of a Multipoint-to-Multipoint Service



NOTE:

- Data plane information between two endpoints in a VPLS service shows only for MX Series devices. This information is not provided for M Series devices.
- Junos Release 9.3 and Junos Release 9.4 do not support data plane validation. The Functional Audit Results screens do not display data plane validation information if any device in the service is running one of these Junos releases.

After performing a functional audit on a multipoint-to-multipoint service, to view the functional audit results, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** task icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services screen, select the multipoint-to-multipoint service for which you want to view the functional audit results.
4. Open the Actions drawer and select **View Functional Audit Results**.

For a multipoint-to-multipoint service, a screen similar to the following appears:



The right panel shows the overall service status and general information about the service. A green up-arrow in the Service Status header bar indicates that the service has passed the functional audit in both the control plane and the data plane. A red down-arrow indicates that the service failed either the control plane validation or the data plane validation.

The left panel lists each endpoint in the service. Each listed endpoint name includes:

- The interface name, for example ge-0/3/4.
- A numeric value indicating the subinterface name—the VLAN-ID for an 802.1Q interface, the service VLAN-ID for a Q-in-Q interface, or 0 for a dedicated port.
- The device name.

An icon next to the endpoint name identifies the service role of the endpoint and its up or down status as shown in Table 30 on page 245:

Table 30: Multipoint-to-Multipoint Service Endpoint Icons

Icon	Meaning
	Multipoint-to-multipoint (full mesh) node. Endpoint state is up.
	Multipoint-to-multipoint (full mesh) node. Endpoint state is down.

5. In the left panel header, to show all device endpoints in the service, select **All**. To display only the device endpoints indicating failed validation, select **Failed**. Failed is dimmed and cannot be selected if the functional audit returned no validation errors.
6. To view service information related to a specific endpoint, select the endpoint. Endpoint status information appears in the right pane and includes the device name, the device topology (VPLS full mesh), the operational state of the endpoint (up or

down), the number of remote sites the service connects the device to, and how many of those sites are up or down. For example:

The screenshot shows the 'Functional Audit Result' interface. On the left, a list of endpoints is displayed under the 'Show All | Failed' filter. The endpoints are: 'QQ VPLS BestCustomer', 'xe-4/0/0.1 Beijing-mx480-pe7', 'ge-0/0/1.1 SanFrancisco', and 'ge-0/0/1.1 SanJose'. Each endpoint has a red 'F' icon indicating a failure. On the right, the 'End Point Status' for 'Beijing-mx480-pe7' is shown. It includes a red arrow icon, a device image, and the following details: Device name: Beijing-mx480-pe7, Topology: VPLSFULLMESH, Operation state: Down, Remote sites: 2, Up remote sites: 0, and Down remote sites: 2.

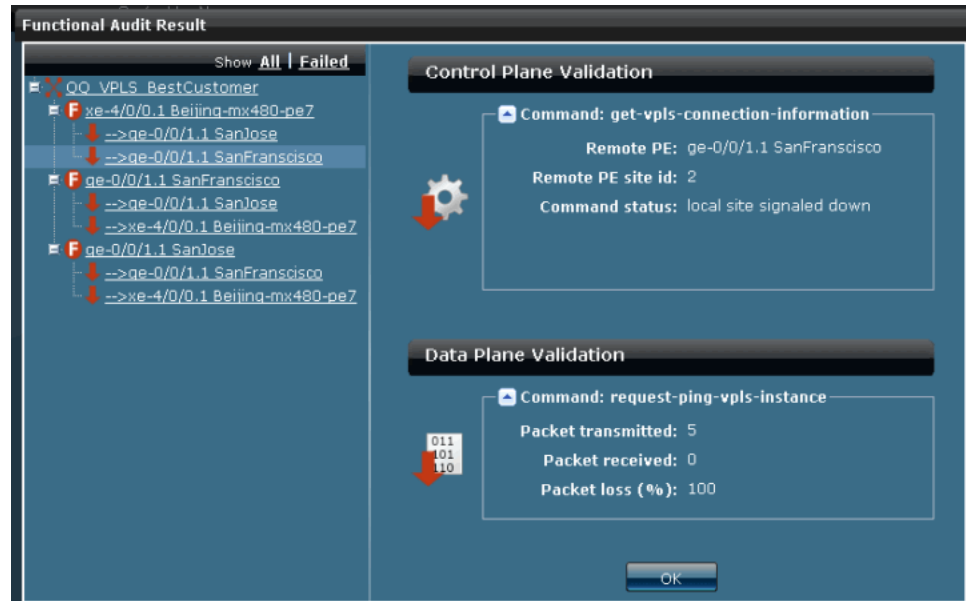
7. To list each link in the service, expand each endpoint.

An icon next to the link indicates the status of the link.

Table 31: Link Status Icons

Icon	Meaning
	Control plane and data plane function correctly.
	Errors were reported in the functioning of either the control plane or the data plane.

8. To view control plane and data plane validation results for a specific link, select that link.



The panel to the right shows the validation results for the control plane validation and data plane validation for the selected link. Icons indicate the success or failure of each of these sets of tests. Table 32 on page 247 explains each of these icons and the textual information provided in the box beside the icon.

Table 32: Multipoint-to-Multipoint Service Control Plane and Data Plane Validation Icons







Icon	Meaning	Explanation
	Control plane up	The text box shows the name of the remote N-PE device and confirms that the data plane is operational.
	Control plane down	The text box shows the name of the configured remote N-PE device and, in the Command status field, explains why the test failed.
	Control plane status unknown	The text box indicates the name of the configured remote N-PE device and, in the Result field, an explanation as to why the functional audit operation was unable to test the control plane—for example, configuration was missing on the device.

Table 32: Multipoint-to-Multipoint Service Control Plane and Data Plane Validation Icons (*continued*)

Icon	Meaning	Explanation
	Data plane up	The text box indicates the number of packets transmitted and received, and confirms that no data packets were lost during the audit.
	Data plane down	The text box indicates that data packets were lost during the audit.
	Data plane status unknown	The functional audit was unable to complete the data plane test. The Result field in the text box indicates the reason—for example, the platform does not support data plane testing, or the connection to the remote N-PE device is down.

The control plane and data plane validation checks must both show operational status for the link to be considered operational.

Viewing the Results of a Functional Audit of a Point-to-Multipoint Service



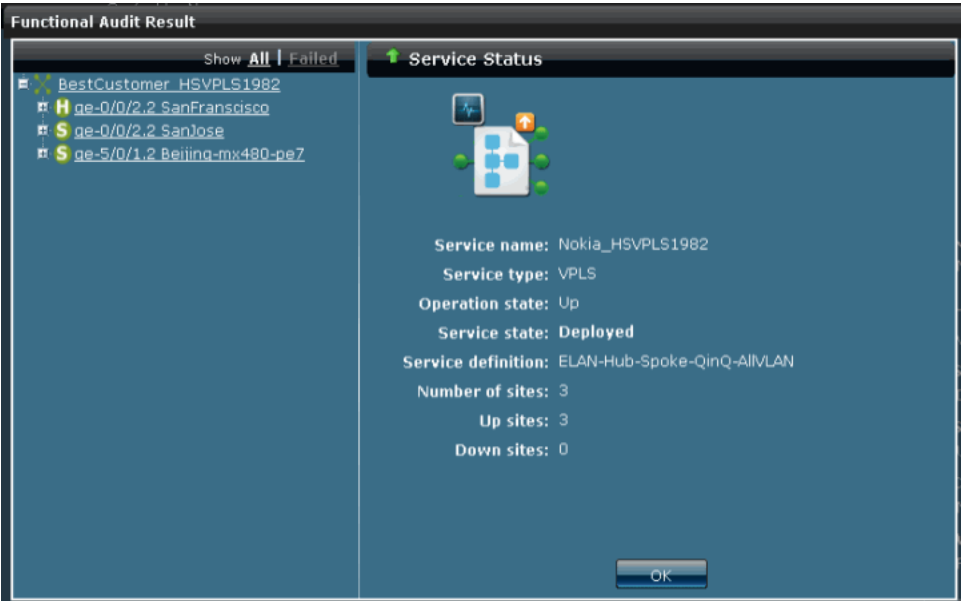
NOTE:

- Data plane information between two endpoints in a VPLS service shows only for MX Series devices. This information is not provided for M Series devices.
- Junos Release 9.3 and Junos Release 9.4 do not support data plane validation. The Functional Audit Results screens do not display data plane validation information if any device in the service is running one of these Junos releases.

After performing a functional audit on a point-to-multipoint service, to view the functional audit results, follow these steps:

1. In the Network Activate task ribbon, select the **Service Provisioning** task icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services screen, select the VPLS service for which you want to view the functional audit results.
4. Open the Actions drawer and select **View Functional Audit Results**.

For a point-to-multipoint service, a screen similar to the following one appears:



The right panel shows the overall service status and general information about the service. A green up-arrow in the Service Status header bar indicates that the service has passed the functional audit in both the control plane and the data plane. A red down-arrow indicates that the service failed either the control plane validation or the data plane validation.

The left panel lists each endpoint in the service. Each listed endpoint name includes:

- The interface name, for example ge-0/3/4.
- A numeric value indicating the subinterface name—the VLAN-ID for an 802.1Q interface, the service VLAN-ID for a Q-in-Q interface, or 0 for a dedicated port.
- The device name.

Icons representing the endpoint indicate it's role in the service and its up or down state. Table 33 on page 249 explains these icons.



Table 33: Point-to-Multipoint Service Endpoint Icons

Icon	Meaning
	Hub in a point-to-multipoint service. Endpoint state is up.
	Hub in a point-to-multipoint service. Endpoint state is down.
	Spoke in a point-to-multipoint service. Endpoint state is up.
	Spoke in a point-to-multipoint service. Endpoint state is down.

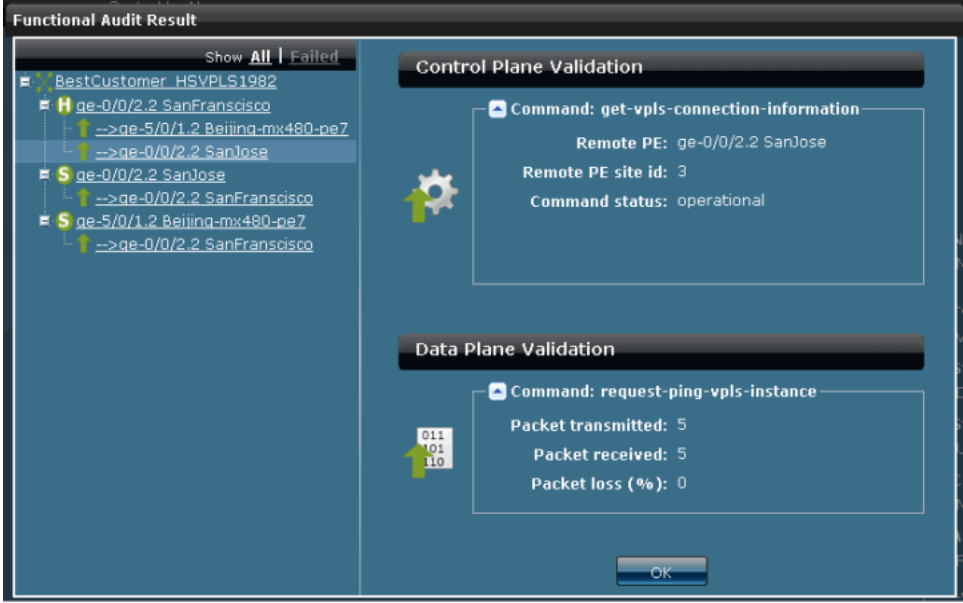
5. In the left panel header, to show all device endpoints in the service, select **All**. To display only the device endpoints indicating failed validation, select **Failed**. Failed is dimmed and cannot be selected if the functional audit returned no validation errors.

6. To view service information related to a specific endpoint, select the endpoint. Endpoint status information appears in the right pane and includes the device name, UNI name, the device topology (VPLS full mesh, hub, or spoke), the operational status of the device (up or down), the number of remote sites the service connects the device to, and how many of those sites are up or down.
7. To list each link in the service, expand each device.
An icon next to the link indicates the status of the link.

Table 34: Link Status Icons

Icon	Meaning
	Control plane and data plane function correctly.
	Errors were reported in the functioning of either the control plane or the data plane.

8. To view control plane and data plane validation results for a specific link, select that link.



The screenshot shows the 'Functional Audit Result' window. On the left, a tree view shows the hierarchy: 'BestCustomer_HSVPLS1982' expanded to show links between 'SanFrancisco' and 'SanJose'. A link is selected, and the right pane displays validation results.

Control Plane Validation

Command: get-vpls-connection-information
 Remote PE: ge-0/0/2.2 SanJose
 Remote PE site id: 3
 Command status: operational







Data Plane Validation

Command: request-ping-vpls-instance
 Packet transmitted: 5
 Packet received: 5
 Packet loss (%): 0

Icons indicate success (green up arrow) for both validations.

The panel to the right shows the validation results for the control plane validation and data plane validation for the selected link. Icons indicate the success or failure of each of these sets of tests. Table 35 on page 251 explains each of these icons and the textual information provided in the box beside the icon.

Table 35: Point-to-Multipoint Service Control Plane and Data Plane Validation Icons

Icon	Meaning	Explanation
	Control plane up	The text box shows the name of the remote N-PE device and confirms that the data plane is operational.
	Control plane down	The text box shows the name of the configured remote N-PE device and, in the Command status field, explains why the test failed.
	Control plane status unknown	The text box indicates the name of the configured remote N-PE device and, in the Result field, an explanation as to why the functional audit operation was unable to test the control plane—for example, configuration was missing on the device.
	Data plane up	The text box indicates the number of packets transmitted and received, and confirms that no data packets were lost during the audit.
	Data plane down	The text box indicates that data packets were lost during the audit.
	Data plane status unknown	The functional audit was unable to complete the data plane test. The Result field in the text box indicates the reason—for example, the platform does not support data plane testing, or the connection to the remote N-PE device is down.

The control plane and data plane validation checks must both show operational status for the link to be considered operational.

CHAPTER 13

Troubleshooting Services

- Service Troubleshooting Overview on page 253
- Troubleshooting Service Problems on page 255

Service Troubleshooting Overview

Common reasons for the failure of a service are that a PE device configured for that service is down, or that device has had its service configuration changed so that it no longer matches the service configuration in the Junos Space database.

The primary tools in the Junos Space product for troubleshooting service problems are:

- Functional audit
- Configuration audit
- Job manager

Overview information is provided here. For step-by-step instructions on recommended troubleshooting procedures, see “Troubleshooting Service Problems” on page 255.

Functional Audit

A functional audit can help you determine whether a device is down.

A functional audit checks the control plane for connectivity between two N-PE devices and the data plane to ensure correct packet transmission between the N-PE devices. To perform these checks, the functional audit runs the following commands:

- For point-to-point services:

```
get-l2ckt-connection-information
```

(for the control plane)

```
request-ping-l2circuit-virtual-circuit
```

(for the data plane)

- For multipoint services:

```
get-vpls-connection-information
```

(for the control plane)

```
request-ping-vpls-instance
```

(for the data plane)

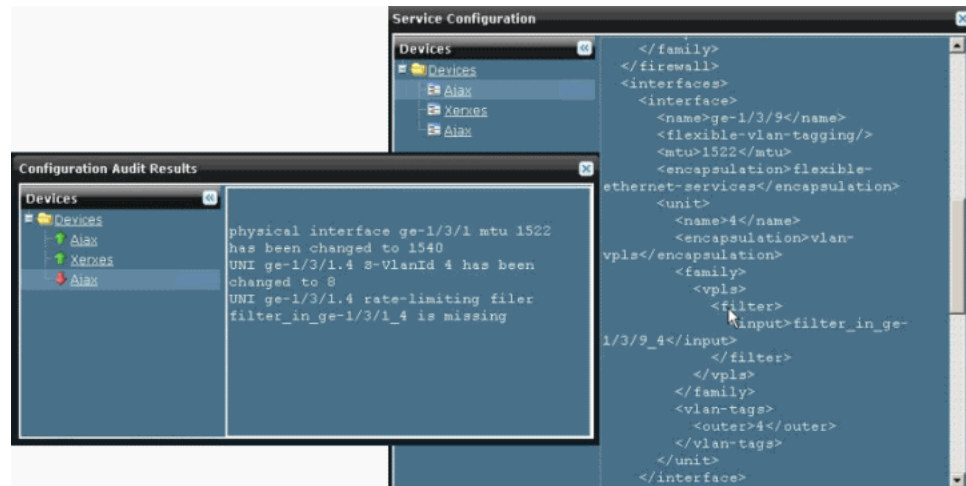
You can view the results of a functional audit from the Manage Services inventory screen.

Related Topics

- Viewing Functional Audit Results on page 241

Configuration Audit

A configuration audit can help you determine whether the service configuration on the device has been changed out of band. To this end, you can compare the results of a configuration audit with the service configuration in the Junos Space database. The following example shows a sample comparison:



You can view the results of a configuration audit from the Manage Services screen. You can view the service configuration also from the Manage Services screen.

Job Manager

In the Job manager, use the Summary column to obtain information about failed deployments and failed audits. For deployments in general, the Summary column contains useful service information such as the VC ID and endpoint information. For some failed deployments, this column also contains information about why the deployment failed. An example of a failed deployment in the Job manager follows:

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	FAILURE	Functional Audit	65679	Functionally Audited [ELANBGPQinQAIIVLAI Failed on Device [Beijing-mx480-pe7] Failed on Device [SanFrancisco] Failed on Device [SanJose]	Feb 16, 2010 12:28:18 PM PST

For details on using the Job manager, see Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*.

Related Topics

- Troubleshooting Service Problems on page 255

- Viewing Scheduled Jobs in the *Junos Space Network Application Platform User Guide*
- Viewing Functional Audit Results on page 241
- Understanding Service Validation on page 191

Troubleshooting Service Problems

To troubleshoot a problem with a service, use the following procedures:

1. Performing a Functional Audit on page 255
2. Performing a Configuration Audit on page 256

Performing a Functional Audit

Perform a functional audit of the service to find out whether the service is up or down:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory list, select the service you want to investigate.
4. Open the Actions drawer and select **Perform Functional Audit**.
5. In the Schedule Functional Audit window, select **Audit now**, and then click **OK**.
6. In the Order Information window, click the job ID of the functional audit.

The Job Manager window appears and shows a filtered view of the job inventory, showing only the functional audit job.

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	● FAILURE	Functional Audit	65679	Functionally Audited [ELANBGpQinQaIlVLA] PST Failed on Device [Beijing-mx480-pe7] Failed on Device [SanFrancisco] Failed on Device [SanJose]	Feb 16, 2010 12:28:18 PM

7. In the State column, check the status of the audit.
A checkmark indicates that the audit passed. An X indicates that the audit failed. If the State field indicates a failed functional audit, the device is down.
8. If the State field indicates the device is up, skip to “Performing a Configuration Audit” on page 256.
9. If the State field indicates the device is down, check the Summary column for further information about the problem.
10. Check also the detailed results of the functional audit:
 - a. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
 - b. In the task ribbon, select the **Manage Services** task icon.

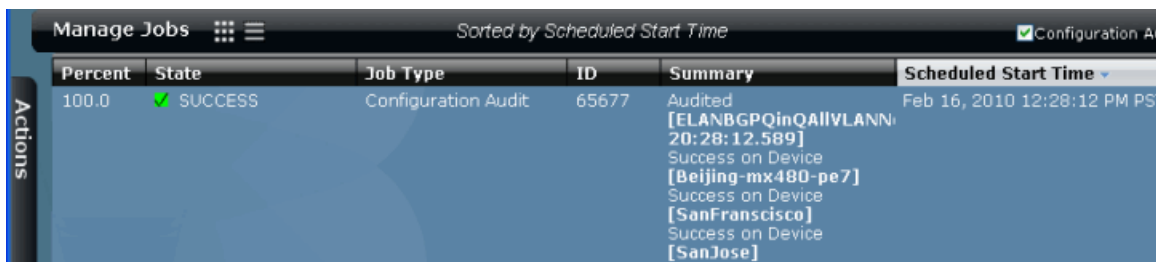
- c. In the Manage Services inventory panel, select the service you are investigating.
 - d. Open the Actions drawer and select **View Functional Audit Results**.
11. Use the information from the Summary field of the Job Manager and the output of the View Functional Audit results to determine the device with a problem so that the device can be brought up.

Performing a Configuration Audit

If the functional audit shows the service to be running, the next step is to perform a configuration audit to see whether the service configuration has been changed out of band, and is no longer consistent with the service configuration in the Junos Space database:

1. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
2. In the task ribbon, select the **Manage Services** task icon.
3. In the Manage Services inventory panel, select the service you want to investigate.
4. Open the Actions drawer and select **Perform Configuration Audit**.
5. In the Schedule Configuration Audit window, select **Audit now**.
6. In the Audit Information window, click the job ID of the functional audit.

The Job Manager window appears and shows a filtered view of the job inventory, showing only the configuration audit job. An example follows:



The screenshot shows the 'Manage Jobs' window in Junos Space. The title bar indicates 'Sorted by Scheduled Start Time' and a 'Configuration Audit' filter is active. The table below lists the audit results.

Percent	State	Job Type	ID	Summary	Scheduled Start Time
100.0	✓ SUCCESS	Configuration Audit	65677	Audited [ELANBGPQinQAIIVLANN: 20:28:12.589] Success on Device [Beijing-mx480-pe7] Success on Device [SanFrancisco] Success on Device [SanJose]	Feb 16, 2010 12:28:12 PM PST

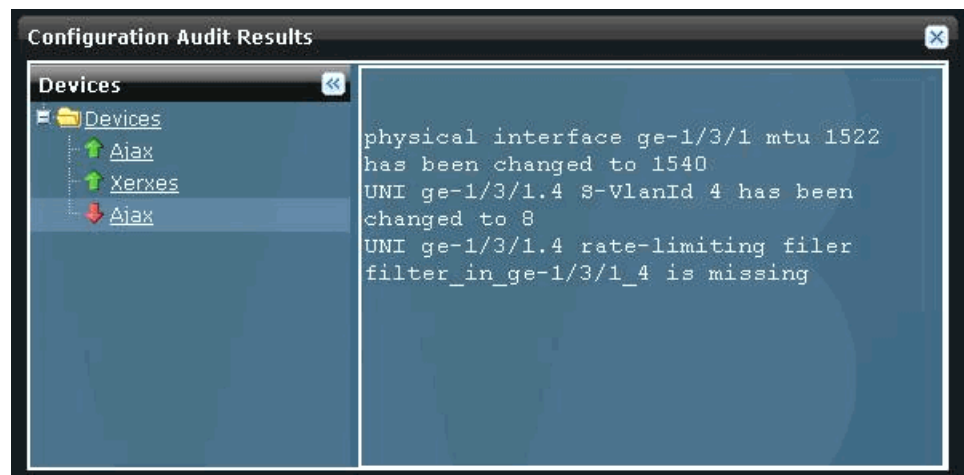


NOTE: If a resynchronization between a device and the Junos Space database is ongoing when the configuration audit job starts, the configuration audit job suspends until the resynchronization job finishes. If the resynchronization job fails to complete, the audit could be suspended indefinitely. To allow the audit to proceed, go to the Job Manager workspace and cancel the resynchronization job, as described in [Canceling a Job](#).

7. In the State column, check the status of the audit to determine whether it succeeded or failed.

Check also the Summary column, which contains useful service information such as the VC ID and endpoint information. For some failed deployments, this column also contains information about why the deployment failed.

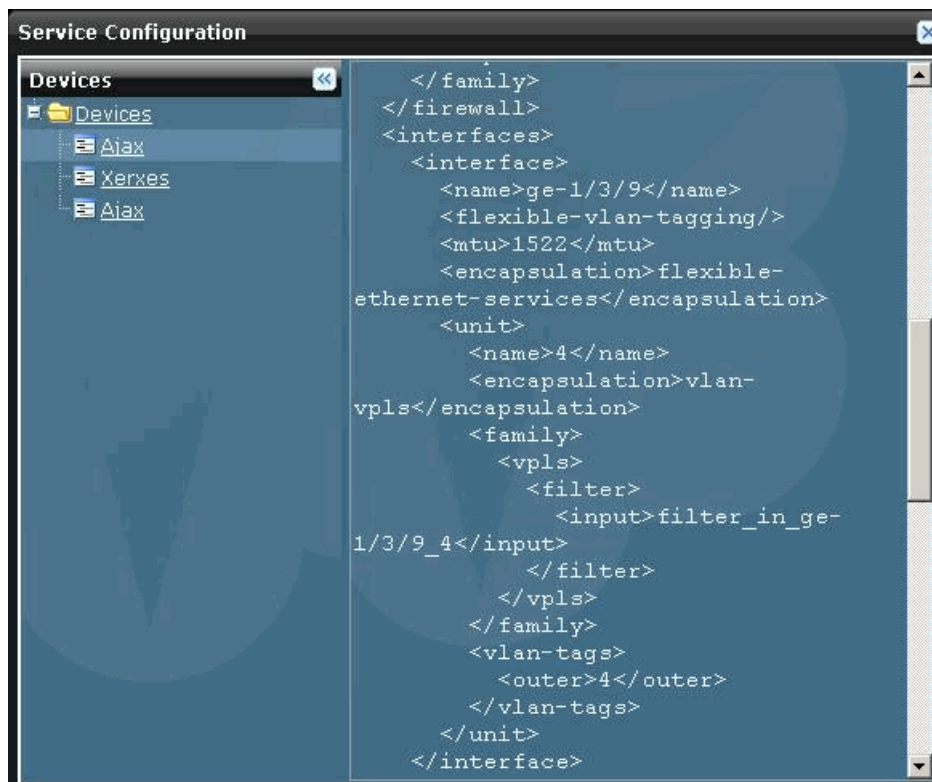
8. Check also the detailed results of the configuration audit:
 - a. In the Network Activate task ribbon, select the **Service Provisioning** workspace icon.
 - b. In the task ribbon, select the **Manage Services** task icon.
 - c. In the Manage Services inventory panel, select the service you are investigating.
 - d. Open the Actions drawer and select View Configuration Audit Results. A sample result follows:



Examine the audit results for missing configuration information, and keep the window open for later comparison with the service configuration in the Junos Space database.

9. To view the service configuration in the Junos Space database, double click the service icon in the Manage Services inventory panel, and then in the Actions drawer, select **View Service Configuration**.

A new window opens and shows the service configuration, as shown in the following example:



10. Compare the contents of the Service Configuration with those of the Configuration Audit Results window for each device in turn. If you see discrepancies, then it is likely that the service configuration was modified out-of-band. If so, you might need to synchronize the device with the Junos Space database.

For step-by-step instructions about synchronizing devices, see *Resynchronizing Managed Devices* for details.

For details about using the Job manager, see *Viewing Scheduled Jobs in the Junos Space Network Application Platform User Guide*.

Related Topics

- [Service Troubleshooting Overview](#) on page 253
- [Understanding Service Validation](#) on page 191
- [Resynchronizing Managed Devices](#)
- [Viewing Scheduled Jobs in the Junos Space Network Application Platform User Guide](#)
- [Canceling a Job](#)

PART 5

Examples

- End-to-End Examples on page 261

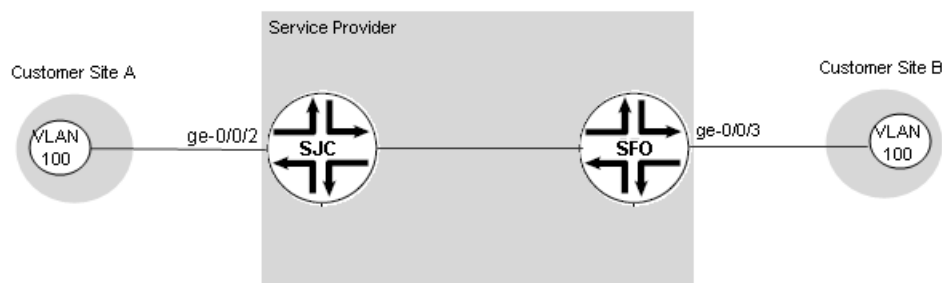
End-to-End Examples

- Point-to-Point Ethernet Service Example on page 261
- Multipoint-to-Multipoint Ethernet Service Example on page 270

Point-to-Point Ethernet Service Example

This example deploys and verifies a point-to-point Ethernet service starting with two MX Series devices. Figure 20 on page 261 shows the service.

Figure 20: Simple Point-to-Point Service



This service provides connectivity for one VLAN, using 802.1Q interface endpoints. Customer site A connects to the network through UNI ge-0/0/2 on an N-PE device named SJC. Customer site B connects to the network through UNI ge-0/0/3 on an N-PE device named SFO.

Each UNI is to have its bandwidth limited to 25 Mbps.

You can create this service by performing the following tasks:

1. Prepare Devices for Discovery on page 262
2. Discover Devices on page 262
3. Prepare Devices for Prestaging on page 264
4. Discover and Assign N-PE Roles on page 265
5. Choose or Create a Service Definition on page 265
6. Create a Customer on page 267

7. Create and Deploy a Point-to-Point Service Order on page 268
8. Perform a Functional Audit and a Configuration Audit on page 269

Prepare Devices for Discovery

Before you can add a device using device discovery, the following conditions must be met:

- SSH v2 is enabled on the device. To enable SSH v2 on a device, issue the following CLI command:

```
set system services ssh protocol-version v2
```

- NETCONF protocol over SSH is enabled on the device. To enable the NETCONF protocol over SSH on a device, issue the following CLI command:

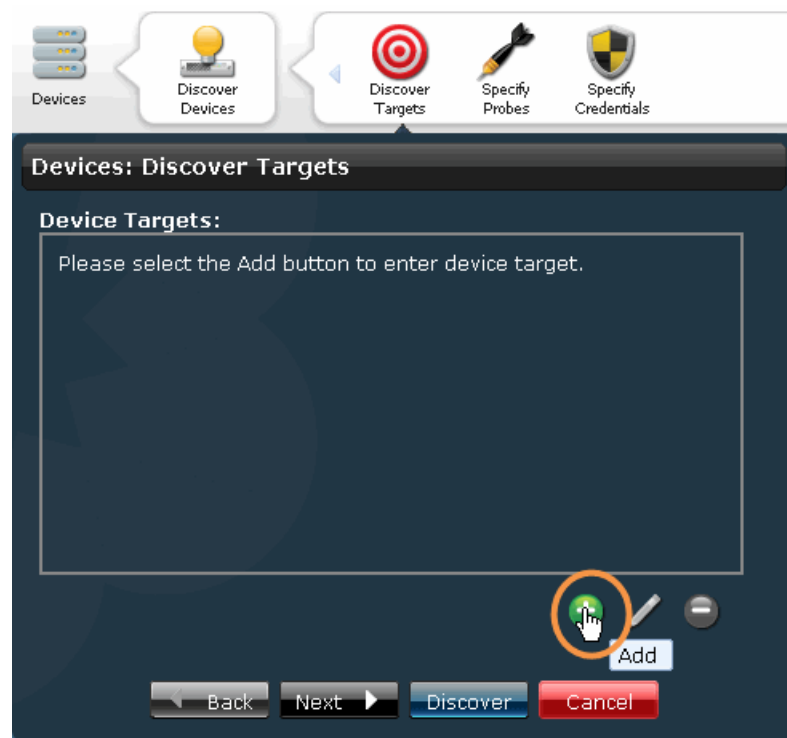
```
set system services netconf ssh
```

- The device is configured with a static management IP address that is reachable from the Junos Space server. The IP address could be in-band or out-of-band.
- A user with full administrative privileges is created on the device for the Junos Space administrator.
- If you plan to use SNMP to probe devices as part of device discovery, SNMP should be enabled on the device with appropriate read-only V1/V2C/V3 credentials.

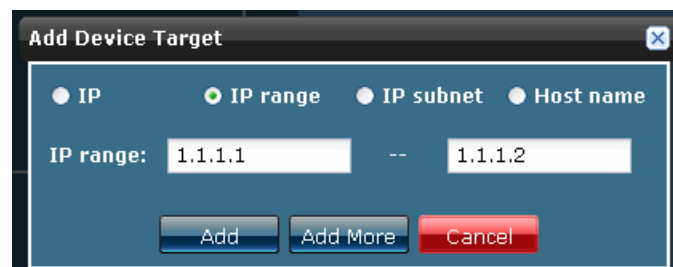
Discover Devices

Device discovery is a process that Junos Space uses to bring network devices under its control. This example brings two MX Series devices under Junos Space management:

1. Login to Junos Space using your credentials.
2. In the Application Chooser, Select **Network Application Platform**.
3. In the task ribbon, select the **Devices** workspace.
4. In the task ribbon, select **Discover Devices**.
5. In the task ribbon, select **Discover Targets**.
6. In the Device Discover Targets window, click **+**.



7. In the Add Device Target window, select **IP Range**.
8. Enter the IP address information. This example uses a range of two addresses.



9. Click **Add**, and then click **Next**.
10. In the Devices: Specify Probes window, select both **Ping** and **SNMP** as probes.
11. Click **Next**.
12. In the Devices: Specify Credentials window, click **+** and enter the device login credentials.
13. Click **Finish**.

Device discovery begins. It displays a graph showing the status of the discovery operation. Initially, it shows two devices discovered. When the Junos Space software

has accessed both devices and brought them under its management, both devices move from the Discovered column of the graph to the Managed column.

14. To check the results of the device discovery operation, select the **Devices** workspace again, and then select **Device Management**. The Manage Devices screen shows the added devices:



Prepare Devices for Prestaging

Before prestaging devices for point-to-point services, the following entities must be configured:

- MPLS must run on each N-PE device.
- LDP signaling must be established between N-PE devices that will participate in the same point-to-point service.

To satisfy these configurations, ensure that the following configuration exists on each N-PE device:

```

interfaces {
  ge-0/0/0 {
    unit 0 {
      family inet {
        address 10.1.18.2/30;
      }
      family mpls;
    }
  }
}

lo0 {
  unit 0 {
    family inet {
      address 192.168.1.20/32;
    }
  }
}

}

protocols {
  mpls {
    interface ge-0/0/0.0;
    interface lo0.0;
  }
  ospf {
    traffic-engineering;
  }
}

```

```

        area 0.0.0.0 {
            interface lo0.0 {
                passive;
            }
            interface ge-0/0/0.0;
        }
    ldp {
        interface ge-0/0/0.0;
        interface lo0.0;
    }

```

Discover and Assign N-PE Roles

Before you can provision services, you must prestage the devices. Prestaging includes assigning device roles and designating interfaces on those devices as UNIs. This example provides the steps to accept the recommendations of the Network Activate software for N-PE devices and UNIs.

1. In the Application Switcher, select the **Network Activate** application:
2. In the task ribbon, select the **Prestage Devices** workspace.
3. In the task ribbon, select **Manage Device Roles**.
4. In the task ribbon, select **Discover Roles**.

This action launches the role discovery process in which the Network Activate software examines the devices under Junos Space management looking for devices that match predefined rules that identify N-PE devices. In this example, the Role Discovery Status graph shows that the Network Activate software has discovered two such devices.

5. In the Assign Roles screen, switch to multiple selection mode and select both N-PE devices.
6. Open the Actions drawer and select **Assign NPE role**.
7. In the Assign NPE window, click **Assign** to confirm the assignment.
8. To view the assignment status, in the Job Details screen, click the job ID of the assignment job.

The Manage Jobs screen shows the progress and status of the role assignment job.

9. To verify the result, in the task ribbon, select **Prestage Devices > Manage Device Roles**. The Manage Device Roles screen shows two devices that can be used for provisioning.

Choose or Create a Service Definition

A service definition provides a template upon which services are built. It specifies service attributes that are not specific to a service instance. In our example, the service definition provides all service attributes except the N-PE devices, the UNIs, and bandwidth.

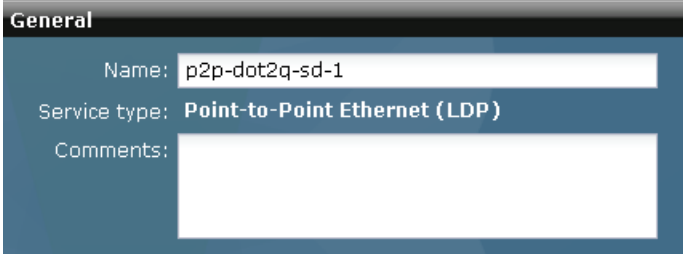
The Network Activate software ships with standard service definitions. First, we check the standard service definitions to determine whether one already exists that will work.

1. In the task ribbon, select the **Service Design** workspace.
2. In the task ribbon, select **Manage Service Definitions**.

The Manage Service Definitions screen lists all service definitions in the system. In a new system, the screen lists only predefined service definitions.

This example needs a service definition with UNIs that use 802.1Q interfaces and allow you to set a bandwidth of 25 Mbps. The standard service definitions have several examples for provisioning 802.1Q UNIs, but none that allow the setting of a 25 Mbps bandwidth limit. So you need to create a new service definition.

3. In the task ribbon, select **Create P2P Service Definition**.
4. In the General screen, enter a name for the service definition. For this example, enter **p2p-dot1q-sd-1**.



The screenshot shows the 'General' configuration screen for a service definition. It has a dark blue header with the word 'General' in white. Below the header, there are three fields: 'Name:' with the value 'p2p-dot2q-sd-1', 'Service type:' with the value 'Point-to-Point Ethernet (LDP)', and 'Comments:' with an empty text area.

5. Click **Next**.
6. In the Connectivity Settings screen, to pick the default connectivity settings, click **Next**.
7. In the UNI Settings screen, in the Ethernet option field, select **dot1q**.
8. In the Customer traffic type field, select **Transport single VLAN**.
9. In the VLAN ID selection field, choose **Select manually**.
10. In the Physical IF encapsulation field, select **flexible-ethernet-services**.
11. In the Logical IF encapsulation field, select **vlan-ccc**.
12. Select the **Enable rate limiting** checkbox.
13. In the Default Bandwidth field, enter **10**, for a default bandwidth of 10 Mbps.
14. To the right of the value you just entered, select the **Editable in service order** checkbox.
The Bandwidth range and Increment fields become active.
15. In the Bandwidth range fields enter **5** and **50**
16. In the increment field, enter **5**.

These settings of the Bandwidth range and Increment fields allow the bandwidth to be set in the service to any 5 Mbps increment in the range 5 Mbps through 50 Mbps.

UNI Settings

Traffic Treatment

Ethernet option:
 Customer traffic type:
 VLAN ID selection: ☐ Editable in service

Interface Settings

Physical IF encapsulation:
 Logical IF encapsulation:

MTU Settings

Default MTU (Bytes): ☐ Editable in service
 MTU range (Bytes):

Bandwidth Settings

☒ Enable rate limiting ☐ Editable in service
 Default bandwidth (Mbps):
 Bandwidth range (Mbps):
 Increment (Mbps):

17. To save and complete the service definition, click **Finish**.

The Service Definition Management screen includes the new service definition.

You have created a customized Service Definition, but it has not yet been published. Before a service definition can be used in provisioning, it must be published.

18. To publish the service definition, in the Manage Service Definitions screen, select the p2p-dot1q-sd-1 service definition, and then in the Actions drawer, select **Publish Service Definition**.

The Publish Service Definition window appears.

19. To confirm that you want to publish this service definition, click **Publish**.

In the Manage Service Definitions screen, the symbol in the upper left corner of the service definition thumbnail changes to a check mark, indicating that the status has changed to Published.

The service definition is now ready for use in provisioning.

Create a Customer

Before you can provision the service, customer details must be present in the Junos Space data base. To add a customer, follow these steps:

1. In the task ribbon, select the **Service Provisioning** workspace.
2. In the task ribbon, select **Manage Customers**.
3. In the task ribbon select **Create Customer**.
4. In the Name field, enter **Best Customer**.

5. In the Account number field, enter **1234**.
6. Click **Create**.

The Manage Customers screen shows the new customer.

Create and Deploy a Point-to-Point Service Order

Now that you have prestaged your devices, created a suitable service definition, and added the customer information to the database, you are ready to create and deploy a service order. Follow these steps:

1. In the task ribbon, select the **Service Provisioning** workspace.
2. In the task ribbon, select **Manage Service Orders**.
3. In the task ribbon select **Create P2P Service Order**.
4. In the Select Service Definition screen, select the service named **p2p-dot1q-sd-1**.
This is the customized service definition you created earlier.
5. Click **Next**.
6. In the General/Connectivity Settings screen, in the Name field, enter **so_1**.
7. In the Customer field, select **Best Customer**.
8. Click **Next**.
9. In the Endpoint Settings screen for endpoint A, in the PE device field, select **SJC**.
10. In the UNI Interface field, select **ge-0/0/2**.

Endpoint Settings

PE device: SJC

UNI interface: ge-0/0/2

UNI No description available
description: for selected UNI interface.

Physical IF flexible-ethernet-services
encapsulation:

Logical IF vlan-ccc
encapsulation:

Traffic type: Transport single vlan

Auto pick VLAN ☐
ID:

VLAN-ID 100

MTU (Bytes): 1522

Bandwidth 10
(Mbps):

11. In the VLAN-ID field, enter **100**.
12. Click **Next**.

13. In the Endpoint Settings screen for endpoint Z, in the PE device field, select **SFO**.
14. In the UNI interface field, select **ge-0/0/3**.
15. In the Bandwidth field, select **25**.
16. Click **Create**.
17. In the Deployment Options window, you can save the service order for later deployment, schedule the service order for later deployment, or deploy the service order now. Select **Deploy now**.
18. Click **OK** to start the deployment.
19. To monitor the progress and status of the deployment, in the Order Information window, click the job ID. The Job Management screen shows the status of the job.
20. When you see in the Manage Jobs window that the deployment is successful, in the task ribbon, select the **Service Provisioning** workspace again.
21. In the task ribbon, select **Manage Services**.

The Manage Services screen shows the new service.

Perform a Functional Audit and a Configuration Audit

Now that your new service is deployed, you should validate its configuration and functional integrity. A functional audit runs operational commands on the device to verify that the service is up or down. A configuration audit verifies whether the configuration that was pushed to the device during deployment is actually on the device.

To perform a configuration audit and a functional audit of the service, follow these steps:

1. In the Manage Services screen, select the service instance you just deployed.
2. Open the Actions drawer and select **Perform Functional Audit**.
3. In the Schedule Functional Audit window, you can choose to perform the audit now or schedule it for later. Select **Audit now**, and then click **OK**.
4. In the Order Information screen, click **OK**.
5. Open the Actions drawer and select **Perform Configuration Audit**.
6. In the Schedule Configuration Audit window, you can choose to perform the audit now or schedule it for later. Select **Audit now**, and then click **OK**.
7. In the Order Information screen, click **OK**.
8. When the audit jobs have finished, success is indicated by an up arrow in the top right corner of the service thumbnail.
9. To view the functional audit results:
 - a. In the Manage Services screen, select the **so_1** service instance.
 - b. Open the Actions drawer and select **View Functional Audit Results**.

- c. In the Functional Audit Results window, select each device to view the results.
10. To view the results of the configuration audit:
 - a. Open the Actions drawer and select **View Configuration Audit Results**.
 - b. In the Configuration Audit Results window, select each device in turn and review the results. This report indicates any part of the service configuration that is missing on the device, or inconsistent with the Junos Space database.

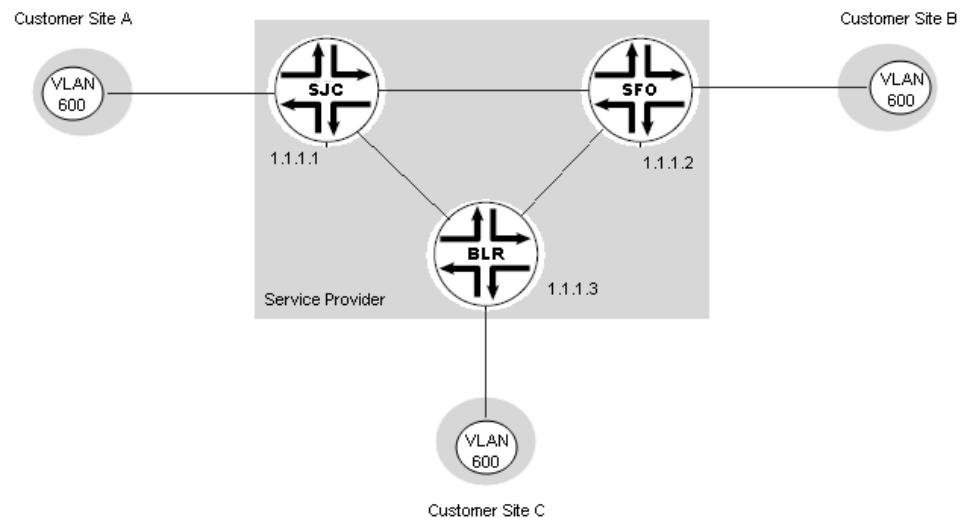
Following successful audit, the service is deployed and ready to be used.

- Related Topics**
- Device Discovery Overview in the *Junos Space Network Application Platform User Guide*
 - Discovering Devices in the *Junos Space Network Application Platform User Guide*
 - Prestaging Devices Overview on page 27
 - Discovering and Assigning All N-PE Devices on page 45
 - Discovering and Assigning N-PE Devices with Exceptions on page 47
 - Predefined Point-to-Point Ethernet Service Definitions on page 93
 - Creating a Point-to-Point Ethernet Service Definition on page 66
 - Publishing a Customized Service Definition on page 90
 - Adding a New Customer on page 160
 - Creating a Point-to-Point Ethernet Service Order on page 163
 - Deploying a Service on page 188
 - Validating a Service on page 195

Multipoint-to-Multipoint Ethernet Service Example

This example deploys and verifies a multipoint-to-multipoint Ethernet service starting with three MX Series devices. Figure 21 on page 271 shows the service.

Figure 21: Simple Multipoint-to-Multipoint Service



This service provides connectivity for one VLAN, using 802.1Q interface endpoints. Customer site A connects to the network through an N-PE device named SJC (IP address 1.1.1.1). Customer site B connects to the network through an N-PE device named SFO (IP address 1.1.1.2). Customer site C connects to the network through an N-PE device named BLR (IP address 1.1.1.3). In this example, we will allow the Network Activate software to select each UNI automatically.

Each UNI is to have its bandwidth limited to 25 Mbps.

You can create this service by performing the following tasks:

1. Prepare Devices for Discovery on page 271
2. Discover Devices on page 272
3. Prepare Devices for Prestaging on page 274
4. Discover and Assign N-PE Roles on page 275
5. Choose or Create a Service Definition on page 276
6. Create a Customer on page 278
7. Create and Deploy a Multipoint-to-Multipoint Service Order on page 279
8. Perform a Functional Audit and a Configuration Audit on page 280

Prepare Devices for Discovery

Before you can add a device using device discovery, the following conditions must be met:

- SSH v2 is enabled on the device. To enable SSH v2 on a device, issue the following CLI command:

```
set system services ssh protocol-version v2
```

- NETCONF protocol over SSH is enabled on the device. To enable the NETCONF protocol over SSH on a device, issue the following CLI command:

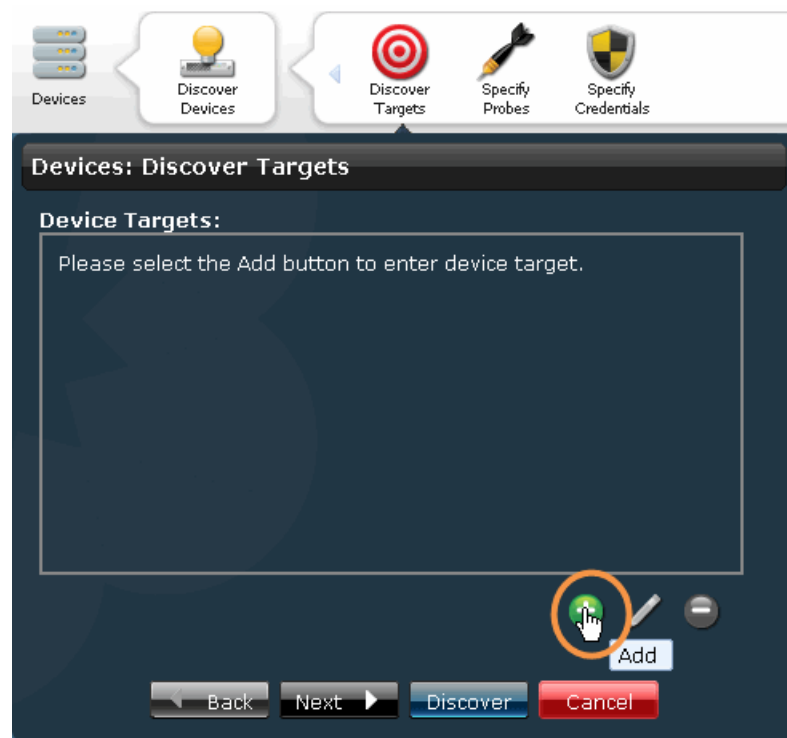
```
set system services netconf ssh
```

- The device is configured with a static management IP address that is reachable from the Junos Space server. The IP address could be in-band or out-of-band.
- A user with full administrative privileges is created on the device for the Junos Space administrator.
- If you plan to use SNMP to probe devices as part of device discovery, SNMP should be enabled on the device with appropriate read-only V1/V2C/V3 credentials.

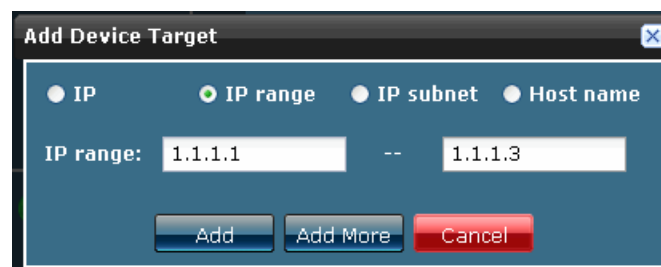
Discover Devices

Device discovery is a process that Junos Space uses to bring network devices under its control. This example brings two MX Series devices under Junos Space management:

1. Login to Junos Space using your credentials.
2. In the Application Chooser, Select **Network Application Platform**.
3. In the task ribbon, select the **Devices** workspace.
4. In the task ribbon, select **Discover Devices**.
5. In the task ribbon, select **Discover Targets**.
6. In the Devices: Discover Targets window, click **+**.



7. In the Add Device Target window, select **IP Range**.
8. Enter the IP address information. This example uses a range of three addresses.

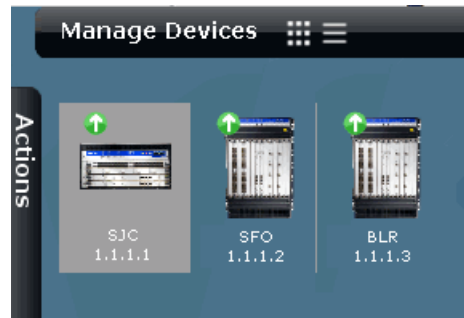


9. Click **Add**, and then click **Next**.
10. In the Devices: Specify Probes window, select both **Ping** and **SNMP** as probes.
11. Click **Next**.
12. In the Devices: Specify Credentials window, click **+** and enter the device login credentials.
13. Click **Finish**.

Device discovery begins. It displays a graph showing the status of the discovery operation. Initially, it shows three devices discovered. When the Junos Space software

has accessed all three devices and brought them under its management, all three devices move from the Discovered column of the graph to the Managed column.

14. To check the results of the device discovery operation, select the **Devices** workspace again, and then select **Device Management**. The Manage Devices screen shows the added devices:



Prepare Devices for Prestaging

Before prestaging devices for multipoint-to-multipoint services, the following entities must be configured:

- MPLS must run on each N-PE device.
- MPBGP must run on each N-PE device that will participate in a multipoint-to-multipoint service.

To satisfy the above criteria, ensure that the following configuration exists on each N-PE device:

```
interfaces {
  ge-0/0/0 {
    unit 0 {
      family inet {
        address 10.1.22.2/30;
      }
      family mpls;
    }
  }
  lo0 {
    unit 0 {
      family inet {
        address 192.168.1.30/32;
      }
    }
  }
}
routing-options {
  autonomous-system 65410;
}
protocols {
  mpls {
    interface ge-0/0/0.0;
    interface lo0.0;
```



```

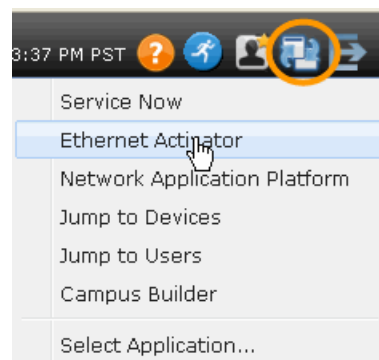
}
bgp {
  group CA-Peer {
    type internal;
    local-address 192.168.1.30;
    family l2vpn {
      signaling;
    }
    neighbor 192.168.1.40;
    neighbor 192.168.1.10;
    neighbor 192.168.1.20;
    neighbor 192.168.1.50;
    neighbor 192.168.1.60;
  }
}
ospf {
  traffic-engineering;
  area 0.0.0.0 {
    interface lo0.0 {
      passive;
    }
    interface ge-0/0/0.0;
  }
}
ldp {
  interface ge-0/0/0.0;
  interface lo0.0;
}
}

```

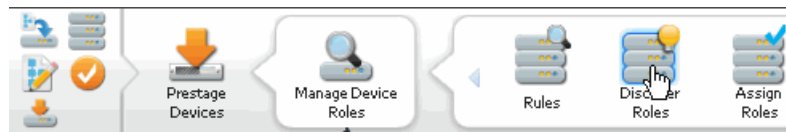
Discover and Assign N-PE Roles

Before you can provision services, you must prestage the devices. Prestaging includes assigning device roles and designating interfaces on those devices as UNIs. This example provides the steps to accept the recommendations of the Network Activate software for N-PE devices and UNIs.

1. In the Application Switcher, select the **Network Activate** application:



2. In the task ribbon, select the **Prestage Devices** workspace.
3. In the task ribbon, select **Manage Device Roles**.



4. In the task ribbon, select **Discover Roles**.

This action launches the role discovery process in which the Network Activate software examines the devices under Junos Space management looking for devices that match predefined rules that identify N-PE devices. The Role Discovery Status graph shows that, in this case, the Network Activate software has discovered three such devices.

5. In the Assign Roles screen, switch to multiple selection mode and select both N-PE devices.
6. Open the Actions drawer and select **Assign NPE role**.
7. In the Assign NPE window, click **Assign** to confirm the assignment.
8. To view the assignment status, in the Job Details screen, click the job ID of the assignment job.

The Manage Jobs screen shows the progress and status of the role assignment job.

9. To verify the result, in the task ribbon, select **Prestage Devices > Manage Device Roles**. The Manage Device Roles screen shows three devices that can be used for provisioning.

Choose or Create a Service Definition

A service definition provides a template upon which services are built. It specifies service attributes that are not specific to a service instance. In this example, the service definition provides all service attributes except the N-PE devices, the UNIs, and bandwidth.

The Network Activate software ships with standard service definitions. First, we check the standard service definitions to determine whether one already exists that will work.

1. In the task ribbon, select the **Service Design** workspace.
2. In the task ribbon, select **Manage Service Definitions**.

The Manage Service Definitions screen lists all service definitions in the system. In a new system, the screen lists only predefined service definitions.

This example needs a multipoint-to-multipoint service definition with UNIs that use 802.1Q interfaces and allow you to set a bandwidth of 25 Mbps. The standard service definitions have several examples for provisioning 802.1Q UNIs, but none that allow the setting of a 25 Mbps bandwidth limit. So you need to create a new service definition.

3. In the task ribbon, select **Create VPLS Service Definition**.
4. In the General screen, enter a name for the service definition:

General

Name: vpls-dot1q-sd-1

Service type: Multipoint-to-Multipoint Ethernet (VPLS) ▼

Comments:

5. Click **Next**.
6. In the Connectivity Settings screen—because we will select a specific VLAN for each endpoint in the service—leave the Normalized VLAN setting as the the default **Normalized VLAN none**, and then click **Next**.
7. In the UNI Settings screen, in the Ethernet option field, select **dot1q**.
8. In the Customer traffic type field, select **Transport single VLAN**.
9. In the VLAN ID selection field, choose **Select manually**.
10. In the Physical IF encapsulation field, select **flexible-ethernet-services**.
11. In the Logical IF encapsulation field, select **vlan-vpls**.
12. Check **Enable rate limiting**.
13. In the Default Bandwidth field, enter **10**, for a default bandwidth of 10 Mbps.
14. To the right of the value you just entered, select the **Editable in service order** checkbox.
The Default Bandwidth (Mbps) field becomes active.
15. Select the **Enable in Service Order** checkbox for the Default Bandwidth (Mbps) field.
The Bandwidth Range (Mbps) and Increment (Mbps) fields become active.
16. In the Bandwidth range fields enter **10** and **50**.
17. In the increment field, enter **5**.

These settings of the Bandwidth range and Increment fields allow the bandwidth to be set in the service to any 5 Mbps increment in the range 10 Mbps through 50 Mbps.

UNI Settings

Traffic Treatment

Ethernet option:

Customer traffic type:

VLAN ID selection:

☒ Editable in service

Interface Settings

Physical IF encapsulation:

Logical IF encapsulation:

MTU Settings

Default MTU (Bytes):

MTU range (Bytes):

☒ Editable in service

Bandwidth Settings

☒ Enable rate limiting

Default bandwidth (Mbps):

Bandwidth range (Mbps):

Increment (Mbps):

☒ Editable in service

18. To save and complete the service definition, click **Finish**.

The Service Definition Management screen includes the new service definition.

You have created a customized Service Definition, but it has not yet been published. Before a service definition can be used in provisioning, it must be published.

19. To publish the service definition, in the Manage Service Definitions screen, select the vpls-dot1q-sd-1 service definition, and then in the Actions drawer, select **Publish Service Definition**.

The Publish Service Definition window appears.

20. To confirm that you want to publish this service definition, click **Publish**.

In the Manage Service Definitions screen, the symbol in the upper left corner of the service definition thumbnail changes to a check mark, indicating that the status has changed to Published.

The service definition is now ready for use in provisioning.

Create a Customer

Before you can provision the service, customer details must be present in the Junos Space data base. To add a customer, follow these steps:

1. In the task ribbon, select the **Service Provisioning** workspace.
2. In the task ribbon, select **Manage Customers**.
3. In the task ribbon select **Create Customer**.
4. In the Name field, enter **Best Customer**.

5. In the Account number field, enter **1234**.
6. Click **Create**.

The Manage Customers screen shows the new customer.

Create and Deploy a Multipoint-to-Multipoint Service Order

Now that you have prestaged your devices, created a suitable service definition, and added the customer information to the database, you are ready to create and deploy a service order.

1. In the task ribbon, select the **Service Provisioning** workspace.
2. In the task ribbon, select **Manage Service Orders**.
3. In the task ribbon select **Create VPLS Service Order**.
4. In the Select Service Definition screen, select the service definition named **vpls-dot1q-sd-1**.

This service definition is the customized service definition you created earlier.

5. Click **Next**.
6. In the General Settings box of the Enter Order screen, in the Name field, enter **vpls_so_1**.
7. In the General Settings box of the Customer field, select **Best Customer**.
8. In the Endpoint Settings box of the Enter Order Information screen, in the Bandwidth field, select **25**.

The screenshot displays the 'Enter Order Information' form. The 'General Settings' section includes fields for 'Service definition' (ELAN-BGP-Dot1Q-SingleVLAN), 'Name' (vpls_so_1), 'Customer' (AcmeGizmo), and 'Comments'. The 'Customer traffic type' is set to 'Transport single vlan' and 'Autopick Route Target' is checked. The 'End Point Settings' section has a note about applying settings to all endpoints, with 'Apply to all' checked. A dropdown menu is open for 'Bandwidth (Mbps)', showing options from 10 to 40, with 25 selected. Other fields like 'MTU (Bytes)', 'Physical IF encapsulation', and 'Logical IF encapsulation' are visible but not selected.

9. Clear the **Autopick VLAN ID** checkbox.
The End Point Settings box expands to include the VLAN ID field.
10. In the VLAN ID field, enter **600**.
11. Click **Next**.
12. In the Select Endpoint PE Devices screen, select **BLR, SFO, and SJC**.
13. Click **Create**.
14. In the Endpoint Settings screen click **Next** to accept the system-selected endpoints.
15. In the Deployment Options window, you can save the service order for later deployment, schedule the service order for later deployment, or deploy the service order now. Select **Deploy now**.
16. Click **OK** to start the deployment.
17. To monitor the progress and status of the deployment, in the Order Information window, click the job ID. The Job Management screen shows the status of the job.
18. When you see in the Manage Jobs window that the deployment is successful, in the task ribbon, select the **Service Provisioning** workspace again.
19. In the task ribbon, select **Manage Services**.

The Manage Services screen shows the new service.

Perform a Functional Audit and a Configuration Audit

Now that your new service is deployed, you should validate its configuration and functional integrity. A functional audit runs operational commands on the device to verify that the service is up or down. A configuration audit verifies whether the configuration that was pushed to the device during deployment is actually on the device.

To perform a configuration audit and a functional audit of the service, follow these steps:

1. In the Manage Services screen, select the service instance you just deployed.
2. Open the Actions drawer and select **Perform Functional Audit**.
3. In the Schedule Functional Audit window, you can choose to perform the audit now or schedule it for later. Select **Audit now**, and then click **OK**.
4. In the Order Information screen, click **OK**.
5. Open the Actions drawer and select **Perform Configuration Audit**.
6. In the Schedule Configuration Audit window, you can choose to perform the audit now or schedule it for later. Select **Audit now**, and then click **OK**.
7. In the Order Information screen, click **OK**.
8. When the audit jobs have finished, success is indicated by an up arrow in the top right corner of the service thumbnail.

9. To view the functional audit results:
 - a. In the Manage Services screen, select the **vpls_so_1** service instance.
 - b. Open the Actions drawer and select **View Functional Audit Results**.
 - c. In the Functional Audit Results window, select each device to view the results.
10. To view the results of the configuration audit:
 - a. Open the Actions drawer and select **View Configuration Audit Results**.
 - b. In the Configuration Audit Results window, select each device in turn and review the results. This report indicates any part of the service configuration that is missing on the device, or inconsistent with the Junos Space database.

Following successful audit, the service is deployed and ready to be used.

- Related Topics**
- Device Discovery Overview in the *Junos Space Network Application Platform User Guide*
 - Discovering Devices in the *Junos Space Network Application Platform User Guide*
 - Prestaging Devices Overview on page 27
 - Discovering and Assigning All N-PE Devices on page 45
 - Discovering and Assigning N-PE Devices with Exceptions on page 47
 - Predefined Multipoint-to-Multipoint Ethernet Service Definitions on page 116
 - Creating a Multipoint-to-Multipoint Ethernet Service Definition on page 73
 - Publishing a Customized Service Definition on page 90
 - Adding a New Customer on page 160
 - Creating a Multipoint-to-Multipoint Ethernet Service Order on page 168
 - Deploying a Service on page 188
 - Validating a Service on page 195

PART 6

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