

Chapter 14

Summary of Layer 3 VPN Configuration Statements

The following section explains the major routing-instances configuration statements that apply specifically to Layer 3 virtual private networks (VPNs).

classifiers

Syntax	<pre>classifiers { exp (<i>classifier-name</i> default); }</pre>
Hierarchy Level	[edit class-of-service routing-instances <i>routing-instance-name</i>]
Release Information	Statement introduced before JUNOS 7.4.
Description	For routing instances with VRF table labels enabled, apply a custom MPLS EXP classifier to the routing instance. You can apply the default MPLS EXP classifier or one that is previously defined.
Options	<i>classifier-name</i> —Name of the behavior aggregate MPLS EXP classifier.
Default	If you do not include this statement, the default MPLS EXP classifier is applied to the routing instance.
Usage Guidelines	See “Applying MPLS EXP Classifiers to Routing Instances” on page 170 and the <i>JUNOS Network Interfaces Configuration Guide</i> .
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.

domain-id

Syntax	<code>domain-id domain-id;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols (ospf ospf3)], [edit routing-instances <i>routing-instance-name</i> protocols (ospf ospf3)]
Release Information	Statement introduced before JUNOS 7.4.
Description	Specify a domain ID for a route. The domain ID identifies the OSPFv2 domain from which the route originated.
Options	<i>domain-id</i> —IP address. Default: If the router ID is not configured in the routing instance, the router ID is derived from an interface address belonging to the routing instance.
Usage Guidelines	See “Configuring an OSPF Domain ID” on page 154.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

domain-vpn-tag

Syntax	<code>domain-vpn-tag number;</code>
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols (ospf ospf3)], [edit routing-instances <i>routing-instance-name</i> protocols (ospf ospf3)]
Release Information	Statement introduced before JUNOS 7.4.
Description	Set a virtual private network (VPN) tag for OSPFv2 external routes generated by the provider edge (PE) router.
Options	<i>number</i> —VPN tag.
Usage Guidelines	See “Configuring an OSPF Domain ID” on page 154.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

dynamic-tunnels

Syntax	dynamic-tunnels <i>tunnel-name</i> { destination-networks <i>prefix</i> ; source-address <i>address</i> ; tunnel-type gre; }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-options], [edit routing-options]
Release Information	Statement introduced before JUNOS 7.4.
Description	Enable dynamic tunnel creation.
Options	<p>destination-networks <i>prefix</i>—Specifies the IP version 4 (IPv4) prefix range for the destination network by including the destination-networks statement. Only tunnels within the specified IPv4 prefix range are allowed to be initiated.</p> <p>source-address <i>address</i>—Specifies the source address for the generic routing encapsulation (GRE) tunnels. The source address specifies the address used as the source for the local tunnel endpoint. This could be any local address on the router (typically the router ID or the loopback address).</p> <p><i>tunnel-name</i>—Specifies the name of the dynamic tunnel.</p> <p>tunnel-type gre—Specifies that a GRE tunnel is to be dynamically created.</p>
Usage Guidelines	See “Configuring GRE Tunnels Dynamically” on page 177 and the <i>JUNOS Routing Protocols Configuration Guide</i> .
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

independent-domain

Syntax	independent-domain;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> routing-options autonomous-system <loops <i>number</i> >], [edit logical-routers <i>logical-router-name</i> routing-options autonomous-system <loops <i>number</i> >], [edit routing-instances <i>routing-instance-name</i> routing-options autonomous-system <loops <i>number</i> >], [edit routing-options autonomous-system <loops <i>number</i> >]
Release Information	Statement introduced before JUNOS 7.4.
Description	Improve the transparency of Layer 3 VPN services for customer networks by preventing the internal Border Gateway Protocol (IBGP) routes that originate within an autonomous system (AS) in the customer network from being sent to a service provider's AS. Similarly, IBGP routes that originate within an AS in the service provider's network are prevented from being sent to a customer AS.
Usage Guidelines	See "Configuring Layer 3 VPNs to Carry IBGP Traffic" on page 163 and the <i>JUNOS Routing Protocols Configuration Guide</i> .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

inet6-vpn

Syntax	inet6-vpn (any multicast unicast) { aggregate-label; prefix-limit <i>maximum</i> ; rib-group <i>rib-group-name</i> ; }
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> protocols bgp family], [edit logical-routers <i>logical-router-name</i> protocols bgp group <i>group-name</i> family], [edit protocols bgp family], [edit protocols bgp group <i>group-name</i> family]
Release Information	Statement introduced before JUNOS 7.4.
Description	Enable IP version 6 (IPv6) on the provider edge (PE) router for the Layer 3 VPN.
Options	<p>any—Configure the family type to be both multicast and unicast.</p> <p>multicast—Configure the family type to be multicast. This means that the BGP peers are being used only to carry the unicast routes that are being used by multicast for resolving the multicast routes.</p> <p>prefix-limit <i>maximum</i>—Maximum prefix limit. Range: 1 through 4,294,967,295 Default: 1</p> <p>rib-group <i>rib-group-name</i>—The name of the routing table group.</p> <p>unicast—Configure the family type to be unicast. This means that the BGP peers only carry the unicast routes that are being used for unicast forwarding purposes.</p>
Usage Guidelines	See “Configuring IPv6 Between the PE and CE Routers” on page 159 and the <i>JUNOS Routing Protocols Configuration Guide</i> .
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

maximum-paths

Syntax	maximum-paths <i>path-limit</i> <log-interval <i>interval</i> log-only threshold <i>percentage</i> >;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> routing-options], [edit logical-routers <i>logical-router-name</i> routing-options], [edit routing-instances <i>routing-instance-name</i> routing-options], [edit routing-options]
Release Information	Statement introduced in JUNOS 8.0.
Description	Specify a maximum limit on the number of paths that can be installed into the routing tables. Using a path limit, you can curtail the number of paths received from a CE router in a VPN. Path limits apply only to dynamic routing protocols and are not applicable to static or interface routes.
Options	<p><i>path-limit</i>—Specify the maximum number of paths. Range: 1 through 4,294,967,295 paths</p> <p>log-interval—Minimum interval between log messages. Range: 5 through 86,400 seconds</p> <p>log-only—Generate warning messages only. No limit is placed on the number of paths stored in the routing tables.</p> <p>threshold—Percentage of the path limit at which to begin sending warning log messages.</p>
Usage Guidelines	See “Limiting the Paths and Prefixes Accepted from a CE Router” on page 158.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

maximum-prefixes

Syntax	maximum-prefixes <i>prefix-limit</i> <log-interval <i>interval</i> log-only threshold <i>percentage</i> >;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> routing-options], [edit logical-routers <i>logical-router-name</i> routing-options], [edit routing-instances <i>routing-instance-name</i> routing-options], [edit routing-options]
Release Information	Statement introduced in JUNOS 8.0.
Description	Specify a maximum limit on the number of prefixes that can be installed into the routing tables. Using a prefix limit, you can curtail the number of prefixes received from a CE router in a VPN. Prefix limits apply only to dynamic routing protocols and are not applicable to static or interface routes.
Options	<p><i>prefix-limit</i>—Specify the maximum number of prefixes. Range: 1 through 4,294,967,295 prefixes</p> <p>log-interval—Minimum interval between log messages. Range: 5 through 86,400 seconds</p> <p>log-only—Generate warning messages only. No limit is placed on the number of prefixes stored in the routing tables.</p> <p>threshold—Percentage of the prefix limit at which to begin sending warning log messages.</p>
Usage Guidelines	See “Limiting the Paths and Prefixes Accepted from a CE Router” on page 158.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

metric

Syntax	metric <i>number</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols ospf area <i>area-id</i> sham-link-remote], [edit routing-instances <i>routing-instance-name</i> protocols ospf area <i>area-id</i> sham-link-remote]
Release Information	Statement introduced before JUNOS 7.4.
Description	Specify the cost of using the Open Shortest Path First (OSPF) sham link. Range: 1 through 65,535 Default: 1
Usage Guidelines	See “Configuring OSPF Sham Links” on page 151.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

multihop

Syntax	multihop <i>ttl-value</i> ;
Hierarchy Level	[edit logical routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols bgp], [edit logical routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>], [edit logical routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp], [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols bgp group <i>group-name</i> neighbor <i>address</i>]
Release Information	Statement introduced before JUNOS 7.4.
Description	Configure an external BGP (EBGP) multihop session between the PE and customer edge (CE) routers of a Layer 3 VPN. This allows you to have one or more routers between the PE and CE routers.
Options	<i>ttl-value</i> —Specify the time-to-live (TTL) value for the multihop session to prevent routing loops.
Usage Guidelines	See “Configuring EBGP or IBGP Multihop Between PE and CE Routers” on page 163.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

multipath

Syntax	<pre> multipath { vpn-unequal-cost; } </pre>
Hierarchy Level	<p>[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> routing-options],</p> <p>[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> routing-options rib <i>routing-table-name</i>],</p> <p>[edit routing-instances <i>routing-instance-name</i> routing-options],</p> <p>[edit routing-instances <i>routing-instance-name</i> routing-options rib <i>routing-table-name</i>]</p>
Release Information	Statement introduced before JUNOS 7.4.
Description	Enable protocol-independent load balancing for Layer 3 VPNs. This allows the forwarding next hops for both the active route and alternative paths to be used for load balancing.
Options	<p>vpn-unequal-cost—Apply protocol-independent load balancing to VPN routes that are equal until their interior gateway protocol (IGP) metrics with regard to route selection. If you do not configure the vpn-unequal-cost statement, protocol-independent load balancing is applied to VPN routes that are equal until their router identifiers with regard to route selection.</p>
Usage Guidelines	See “Protocol-Independent Load Balancing for Layer 3 VPNs” on page 185.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

routing-instances

Syntax	<pre>routing-instances <i>routing-instance-name</i> { classifiers { exp (<i>classifier-name</i> default); } }</pre>
Hierarchy Level	[edit class-of-service]
Release Information	Statement introduced before JUNOS 7.4.
Description	For routing instances with the <code>vrf-table-label</code> statement configured, apply a custom MPLS EXP classifier to the routing instance. You can apply the default MPLS EXP classifier or one that is previously defined.
Options	<p><i>routing-instance-name</i>—Name of the routing instance.</p> <p>The other statements are explained separately.</p>
Usage Guidelines	See “Applying MPLS EXP Classifiers to Routing Instances” on page 170 and the <i>JUNOS Network Interfaces Configuration Guide</i> .
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

sham-link

Syntax	<pre>sham-link { local <i>address</i>; }</pre>
Hierarchy Level	<p>[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols ospf],</p> <p>[edit routing-instances <i>routing-instance-name</i> protocols ospf]</p>
Release Information	Statement introduced before JUNOS 7.4.
Description	Configure a sham link for the Layer 3 VPN routing instance.
Options	<i>local address</i> —The address for the local endpoint of the sham link.
Usage Guidelines	See “Configuring OSPF Sham Links” on page 151 and the <i>JUNOS Routing Protocols Configuration Guide</i> .
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

sham-link-remote

Syntax	sham-link-remote <i>address</i> <metric <i>number</i> >;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols ospf area <i>area-id</i>], [edit routing-instances <i>routing-instance-name</i> protocols ospf area <i>area-id</i>]
Release Information	Statement introduced before JUNOS 7.4.
Description	Configure the address for the remote end point of the sham link.
Options	<i>address</i> —Address for the remote end point of the sham link. The <i>metric</i> statement is explained separately.
Usage Guidelines	See “Configuring OSPF Sham Links for Layer 3 VPNs” on page 150 and the <i>JUNOS Routing Protocols Configuration Guide</i> .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

vpn-group-address

Syntax	vpn-group-address <i>address</i> ;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i> protocols pim], [edit routing-instances <i>routing-instance-name</i> protocols pim]
Release Information	Statement introduced before JUNOS 7.4.
Description	Configure the group address for the Layer 3 VPN in the service provider’s network.
Options	<i>address</i> —Address for the Layer 3 VPN in the service provider’s network.
Usage Guidelines	See “Configuring Multicast over Layer 3 VPNs” on page 173 and the <i>JUNOS Multicast Protocols Configuration Guide</i> .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

vrf-table-label

Syntax	vrf-table-label;
Hierarchy Level	[edit logical-routers <i>logical-router-name</i> routing-instances <i>routing-instance-name</i>], [edit routing-instances <i>routing-instance-name</i>]
Release Information	Statement introduced before JUNOS 7.4.
Description	Map the inner label of a packet to a specific VPN routing and forwarding (VRF) table. This allows the examination of the encapsulated IP header.
Usage Guidelines	See “Filtering Traffic Based on the IP Header” on page 164.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.