



# Release Notes, 17.2.0

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# Document History

Version	Summary of Changes	Publication Date
1.0	New document	10 July 2017



# Overview

These release notes are for AT&T Vyatta Network Operating System Release 17.2.0.



# Supported Products

AT&T Vyatta Network Operating System supports the following products:

- AT&T Vyatta vRouter
- AT&T Services platform
- AT&T Distributed Services





# Behavior Changes

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## **Behavior changes in this release**

Refer to [Features \(page 10\)](#) and [CLI Commands \(page 17\)](#) of these notes for behavior changes in this release.



# Features

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## New features

The following sections describe the new features in this release.

### Application aware firewall—DPI support

Deep packet inspection (DPI) is a packet filtering process that examines the contents of packets. DPI can be configured to classify and route traffic by specifying an application rule.

The following configuration mode commands are introduced:

- `set security application firewall name name description description`  
Provides a description of a firewall application ruleset.
- `set security application firewall name name no-match-action { accept | drop }`  
Defines the actions for a firewall application rule set.
- `set security application firewall name name rule rule-number`  
Defines a rule for a firewall application rule set.
- `set security application firewall name name rule rule-number action { accept | drop }`  
Defines the actions for a firewall application rule.
- `set security application firewall name name rule rule-number description description`  
Provides a brief description of a firewall application rule.
- `set security application firewall name name rule rule-number name app-name`  
Specifies match by application name for a firewall application rule.
- `set security application firewall name name rule rule-number protocol protocol`  
Specifies match by application protocol for a firewall application rule.
- `set security application firewall name name rule rule-number type type`  
Specifies match by application type for a firewall application rule.
- `set security firewall name name rule rule-number session application firewall app-firewall`  
For a session, specifies match by application firewall for a firewall rule.
- `set security firewall name name rule rule-number session application name app-name`  
For a session, specifies match by application name for a firewall application rule.
- `set security firewall name name rule rule-number session application protocol protocol`  
For a session, specifies match by application protocol for a firewall rule.
- `set security firewall name name rule rule-number session type type`  
For a session, specifies match by application type for a firewall rule.

### DMVPN IKEv2 support

This release supports DMVPN IKEv2.

- Added the "DMVPN command reference" topic
- Updated three tables, adding the following command as an option: `set security vpn ipsec ike-group group-name ike-version 2`
- Updated the "Supported Standards" topic

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System DMVPN Configuration Guide, 17.2.0* and *AT&T Vyatta Network Operating System IPsec site-to-site Configuration Guide, 17.2.0*.



## Deep Packet Inspection for QoS

This release supports Deep Packet Inspection (DPI) for QoS.

The following configuration commands are introduced:

- `policy qos name policy-name shaper class class-id match match-name application name name`
- `policy qos name policy-name shaper class class-id match match-name application type type`

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System QoS Configuration Guide, 17.2.0*.

## Firewall Denial-of-Service Protection

The Firewall Denial-of-Service (DoS) Protection feature provides configuration commands to perform the following tasks:

- Monitor the number of sessions, rate of session creation, and time the last session was created
- Limit the maximum number of half-open sessions
- Rate-limit new sessions

The following DoS configuration commands have been added:

- `system session limit global max-halfopen 1..100000000`
- `system session limit global rate-limit rate { 1..4294967295 | burst 0..100000000 }`
- `system session limit group name group-name interface interface-name`
- `system session limit group name group-name rule rule-number destination { address value | port value }`
- `system session limit group name group-name rule rule-number icmp { group group-value | name name | type type-value code value }`
- `system session limit group name group-name rule rule-number icmpv6 { group group-value | name name | type type-value code value }`
- `system session limit group name group-name rule rule-number { parameter system-session-limit-parameter-name | protocol tcp-or-icmp-or-udp }`
- `system session limit group name group-name rule rule-number protocol protocol-name`
- `system session limit group name group-name rule rule-number source { address value | port value }`
- `system session limit group name group-name rule rule-number tcp flags value`
- `system session limit parameter name system-session-limit-parameter-name max-halfopen 1..100000000`
- `system session limit parameter name system-session-limit-parameter-name rate-limit { rate 1..4294967295 | burst 0..100000000 }`

The following DoS operational commands have been added:

- `clear session limit`
- `show session limit group [ group-name ]`
- `show session limit parameter brief [ name system-session-limit-parameter-name ]`
- `show session limit parameter [ global | parameter ]`

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System Firewall Configuration Guide, 17.2.0*.

## IPsec forwarding architecture

The IPsec forwarding feature parallelizes the existing support for IPsec in the AT&T Vyatta vRouter data plane, enabling multiple processor cores to be purposed and operated simultaneously as crypto engines for better performance.

Added topic: **Controlling IPsec crypto cores to obtain better performance**



For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System IPsec Site-to-Site VPN Configuration Guide, 17.2.0*.

## NETCONF documentation enhancements

The NETCONF documentation in *AT&T Vyatta Network Operating System Remote Management Configuration Guide* has been expanded to include information and examples on how to retrieve statistics and other information by using NETCONF.

Information and examples are provided for the following categories:

- CPU, memory usage, uptime, and version
- CPU, memory, network device, and block device
- Each hosted VM
- DHCP server
- Firewall, PBR, and NAT
- Interface
- QoS

## Path Performance Monitoring

The Path Performance Monitoring feature introduces the Path Monitor service, which monitors the quality of network paths on a periodic basis. Path Monitor lets you configure one or more Path Monitor hosts. Each host determines the target to be monitored (the path endpoint) and the types of probes it supports. Path Monitor also allows the configuration of policies that define the required quality of a network path. A Path Monitor instance defines the association between a host and policy set, and runs the instance in a given context (source interface), which determines the path being monitored.

A policy engine determines whether the results samples of a Path Monitor comply with the requirements of each associated policy, on a one-to-one basis. You can use the policy compliance results to influence PBR in the forwarding plane.

Path Monitor uses ping as the probe (type) to measure path performance.

This feature introduces the following configuration commands:

- **policy route pbr pbr-policy rule rule path-monitor monitor monitor-name policy policy-name**  
Defines a PBR policy rule for a Path Monitor and policy pair.
- **service path-monitor host host-name**  
Creates a Path Monitor host.
- **service path-monitor host host-name target target-name-or-address**  
Sets the DNS name or IP address of the target host acting as the endpoint of the paths to be monitored.
- **service path-monitor host host-name type ping**  
Instructs the Path Monitor to use the IP ping method for path monitoring.
- **service path-monitor monitor monitor-name initial-state state**  
Determines how PBR handles matching traffic before the first Path Monitor measurements are available.
- **service path-monitor monitor monitor-name policy policy-name**  
Specifies the policy to be used by a Path Monitor.
- **service path-monitor monitor monitor-name type ping host host-name**  
Specifies the host to be pinged by a Path Monitor.
- **service path-monitor monitor monitor-name type ping interface interface-name**  
Specifies the interface to be used as the source for monitoring path activity.
- **service path-monitor monitor monitor-name type ping interval ping-interval**  
Sets the ping interval, that is, the number of seconds between successive path-monitoring operations.
- **service path-monitor policy policy-name**  
Creates a Path Monitor policy.
- **service path-monitor policy policy-name requires type ping round-trip-time robustness r-count**



Sets the number of consecutive measurement samples that a Path Monitor must collect before indicating a change in the state of a Path Monitor policy (in or out of compliance).

- **service path-monitor policy *policy-name* requires type ping round-trip-time threshold *rtt***  
Sets the threshold for the round-trip time.
- **service path-monitor policy *policy-name* requires type ping round-trip-time tolerance *rtt-delta***  
Sets the threshold delta for the round-trip time that is measured by a Path Monitor.

This feature introduces the following configuration commands:

- **monitor path-monitor**  
Displays the logs, or toggles debugging logs, for Path Monitor.
- **show service path-monitor monitor *monitor-name***  
Displays a summary of the policy compliance status for a Path Monitor instance.
- **show service path-monitor summary**  
Displays a summary of the policy compliance status for all configured Path Monitor instances.

For more information about this feature, refer to AT&T Vyatta Network Operating System Basic System Configuration Guide.

## PBR on IPsec

This release supports PBR on IPsec.

The following configuration commands are introduced:

- **interfaces bonding *dpFbondN* policy route pbr *name***
- **interfaces bonding *dpFbondN* vif *vif-id* policy route pbr *name***
- **interfaces dataplane *dpxx* policy route pbr *name***
- **interfaces dataplane *dpxx* vif *vif-id* policy route pbr *name***
- **interfaces l2tpeth *ltpN* policy route pbr *name***
- **interfaces l2tpeth *ltpN* vif *vif-id* policy route pbr *name***
- **interfaces openvpn *vtunx* policy route pbr *name***
- **interfaces tunnel *tunx* policy route pbr *name***
- **interfaces vti *vtix* policy route pbr *name***

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System IPsec Site-to-Site VPN Configuration Guide, 17.2.0*.

## Limitations and Restrictions

With PBR configured on an interface, a drop in performance is expected.

## PIM sparse-and-dense mode

This release supports PIM sparse-and-dense mode.

The following configuration commands are introduced:

- interfaces <interface> ip pim mode <mode>**
- interfaces <interface> ip pim mode sparse-dense**
- interfaces <interface> ip pim mode sparse-dense-passive**
- interfaces <interface> ipv6 pim mode sparse-dense**
- interfaces <interface> ipv6 pim mode sparse-dense-passive**
- protocols pim dense-group <x.x.x.x>**
- protocols pim6 dense-group <h:h:h:h:h:h:h>**

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System PIM Configuration Guide, 17.2.0*.



## RSVP-TE Graceful Restart

This release introduces the RSVP-TE graceful restart feature, which allows a vRouter to help a neighbor that supports RSVP-TE to gracefully restart.

The following commands were added to this release:

- **set protocols mpls-rsvp globals graceful-restart**  
Configures graceful restart on a vRouter.
- **show mpls rsvp graceful-restart**  
Displays information about graceful restart hello packets.

For more information about this feature, refer to AT&T Vyatta Network Operating System MPLS Configuration Guide.

## RSVP-TE Non-CSPF Path Computation

This release introduces the RSVP-TE Non-CSPF Path Computation feature.

By default, Constrained Shortest Path First (CSPF) is enabled for signaled LSP calculations, but you can now disable CSPF.

The following commands were added to this release:

- **set protocols mpls-rsvp tunnels tunnel tunnel-name primary no-cspf**  
Disables the use of CSPF for the primary path option.
- **set protocols mpls-rsvp tunnels tunnel tunnel-name secondary no-cspf**  
Disables the use of CSPF for the secondary path option.

For more information about this feature, refer to AT&T Vyatta Network Operating System Services Configuration Guide.

## Support for unnumbered interfaces

This release supports unnumbered interfaces.

The following configuration command is introduced:

**set security vpn ipsec ike-group <group name> ike-version 2**

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System VPN Support Configuration Guide, 17.2.0*.

## Support of x509 authentication for DMVPN

This release supports x509 authentication for DMVPN.

Added x509 as a supported value to the following command:

security vpn ipsec profile <profile-name> authentication mode <mode>

Added the new "Support x509 authentication for DMVPN" topic.

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta Network Operating System DMVPN Configuration Guide, 17.2.0* and *AT&T Vyatta Network Operating System IPsec site-to-site Configuration Guide, 17.2.0*.

## UEFI Secure Boot

The "Installing Certificates for Secure Boot" has been added to *AT&T Vyatta vRouter PXE Boot Installation Guide*.

For more information about this feature, configuration examples, and command reference documentation, refer to *AT&T Vyatta vRouter PXE Boot Installation Guide, 17.2.0*.



## VPNv4 route reflection

Support is now provided for Route Reflector (RR) for VPNv4 address families in addition to IPv4 and IPv6 address families. RR in BGP improves the scalability of iBGP sessions between iBGP peers and reduces the connectivity overload

The following configuration mode commands are introduced:

- `protocols bgp asn address-family vpnv4-unicast`  
Defines parameters for controlling VPNv4 unicast routes.
- `protocols bgp asn neighbor id address-family vpnv4-unicast`  
Enables the VPNv4 unicast address family for a neighbor and defines parameters for controlling VPNv4 unicast routes when subsequent configuration parameters are present.
- `protocols bgp asn neighbor id address-family vpnv4-unicast capability graceful-restart`  
Advertises the graceful-restart capability to a specified neighbor
- `protocols bgp asn neighbor id address-family vpnv4-unicast distribute-list export access-list-name`  
Applies an access list to filter outbound routing updates to a specified neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast distribute-list import access-list-name`  
Applies an access list to filter inbound routing updates from a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast filter-list export as-path-list-name`  
Applies an AS path list to routing updates to a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast filter-list import as-path-list-name`  
Applies an AS path list to routing updates from a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast maximum-prefix max-number [ threshold threshold-value [ warning-only ] warning-only ]`  
Sets the maximum number of prefixes to accept from a VPNv4 neighbor before that neighbor is taken down.
- `protocols bgp asn neighbor id address-family vpnv4-unicast prefix-list export list-name`  
Applies a prefix list to filter VPNv4 messages to a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast prefix-list import list-name`  
Applies a prefix list to filter VPNv4 messages from a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast route-map export map-name`  
Applies a route map to filter VPNv4 messages to a neighbor.
- `protocols bgp asn neighbor id address-family vpnv4-unicast route-map import map-name`
- `protocols bgp asn neighbor id address-family vpnv4-unicast route-reflector-client`  
Configures a specified neighbor as a VPNv4 route reflector client.

The following operational commands are introduced.

- `show ip bgp vpnv4 unicast`  
Displays VPNv4 unicast route information.
- `show ip bgp vpnv4 unicast prefix`  
Displays VPNv4 unicast route information for a specified address or prefix.
- `show ip bgp vpnv4 unicast dampening`  
Displays dampened BGP VPNv4 unicast routes or flap statistics.
- `show ip bgp vpnv4 unicast filter-list`  
Displays the BGP VPNv4 unicast routes that conform to a specified filter list.
- `show ip bgp vpnv4 unicast neighbors`  
Displays information about BGP VPNv4 unicast neighbor connections.
- `show ip bgp vpnv4 unicast neighbors id advertised-routes`  
Displays advertised BGP VPNv4 unicast routes for a BGP neighbor.



- `show ip bgp vpnv4 unicast neighbors id received-routes`  
Displays the BGP VPNv4 unicast routes received from a BGP neighbor.
- `show ip bgp vpnv4 unicast neighbors id routes`  
Displays BGP VPNv4 unicast received and accepted routes from a BGP neighbor.
- `show ip bgp vpnv4 unicast prefix-list`  
Displays the BGP VPNv4 unicast routes matching a specified prefix list.
- `show ip bgp vpnv4 unicast regexp`  
Displays the BGP VPNv4 unicast routes that match an AS path regular expression.
- `show ip bgp vpnv4 unicast summary`  
Displays a summary of BGP VPNv4 unicast neighbor status.

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## Modified features

No modified features in this release.

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## Deprecated features

No deprecated features in this release.





# CLI Commands and API Calls

## CLI commands

### New commands

#### New configuration commands

The following configuration commands have been added to this release.

```
interfaces bonding <interface-name> ip pim mode sparse-dense
interfaces bonding <interface-name> ip pim mode sparse-dense-passive
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces bonding <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces bonding <interface-name> ipv6 pim mode sparse-dense
interfaces bonding <interface-name> ipv6 pim mode sparse-dense-passive
interfaces bonding <interface-name> vif <number> ip pim mode sparse-dense
interfaces bonding <interface-name> vif <number> ip pim mode sparse-dense-passive
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> dead-
interval <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> hello-
interval <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> link-lsa-
suppression <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> neighbor
<address>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> network
<network-type>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> priority
<value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> retransmit-
interval <value>
interfaces bonding <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> transmit-
delay <value>
interfaces bonding <interface-name> vif <number> ipv6 pim mode sparse-dense
interfaces bonding <interface-name> vif <number> ipv6 pim mode sparse-dense-passive
interfaces bridge <interface-name> ip pim mode sparse-dense
interfaces bridge <interface-name> ip pim mode sparse-dense-passive
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
```



```
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces bridge <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces bridge <interface-name> ipv6 pim mode sparse-dense
interfaces bridge <interface-name> ipv6 pim mode sparse-dense-passive
interfaces dataplane <interface-name> ip pim mode sparse-dense
interfaces dataplane <interface-name> ip pim mode sparse-dense-passive
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces dataplane <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces dataplane <interface-name> ipv6 pim mode sparse-dense
interfaces dataplane <interface-name> ipv6 pim mode sparse-dense-passive
interfaces dataplane <interface-name> vif <number> ip pim mode sparse-dense
interfaces dataplane <interface-name> vif <number> ip pim mode sparse-dense-passive
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> area
<value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> cost
<value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> dead-
interval <value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> hello-
interval <value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> link-lsa-
suppression <value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> neighbor
<address>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> network
<network-type>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> priority
<value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id>
retransmit-interval <value>
interfaces dataplane <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> transmit-
delay <value>
interfaces dataplane <interface-name> vif <number> ipv6 pim mode sparse-dense
interfaces dataplane <interface-name> vif <number> ipv6 pim mode sparse-dense-passive
interfaces l2tpeth <interface-name> ip pim mode sparse-dense
interfaces l2tpeth <interface-name> ip pim mode sparse-dense-passive
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
```



```
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces l2tpeth <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces l2tpeth <interface-name> ipv6 pim mode sparse-dense
interfaces l2tpeth <interface-name> ipv6 pim mode sparse-dense-passive
interfaces l2tpeth <interface-name> vif <number> ip pim mode sparse-dense
interfaces l2tpeth <interface-name> vif <number> ip pim mode sparse-dense-passive
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> dead-
interval <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> hello-
interval <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> link-lsa-
suppression <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> neighbor
<address>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> network
<network-type>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> priority
<value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> retransmit-
interval <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 ospfv3 instance-id <instance-id> transmit-
delay <value>
interfaces l2tpeth <interface-name> vif <number> ipv6 pim mode sparse-dense
interfaces l2tpeth <interface-name> vif <number> ipv6 pim mode sparse-dense-passive
interfaces loopback <interface-name> ip pim mode sparse-dense
interfaces loopback <interface-name> ip pim mode sparse-dense-passive
interfaces loopback <interface-name> ipv6 disable
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces loopback <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces loopback <interface-name> ipv6 pim mode sparse-dense
interfaces loopback <interface-name> ipv6 pim mode sparse-dense-passive
interfaces openvpn <tunnel-interface-name> ip pim mode sparse-dense
interfaces openvpn <tunnel-interface-name> ip pim mode sparse-dense-passive
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval
<value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval
<value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-
suppression <value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-
type>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
```



```
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-
interval <value>
interfaces openvpn <tunnel-interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay
<value>
interfaces openvpn <tunnel-interface-name> ipv6 pim mode sparse-dense
interfaces openvpn <tunnel-interface-name> ipv6 pim mode sparse-dense-passive
interfaces openvpn <tunnel-interface-name> policy route pbr <value>
interfaces openvpn <tunnel-interface-name> protocol udp6
interfaces tunnel <interface-name> ip pim mode sparse-dense
interfaces tunnel <interface-name> ip pim mode sparse-dense-passive
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces tunnel <interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces tunnel <interface-name> ipv6 pim mode sparse-dense
interfaces tunnel <interface-name> ipv6 pim mode sparse-dense-passive
interfaces tunnel <interface-name> policy route pbr <value>
interfaces vti <vt-interface-name> ip pim mode sparse-dense
interfaces vti <vt-interface-name> ip pim mode sparse-dense-passive
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> area <value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> cost <value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> dead-interval <value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> hello-interval <value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> link-lsa-suppression
<value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> mtu-ignore
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> neighbor <address>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> network <network-type>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> priority <value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> retransmit-interval
<value>
interfaces vti <vt-interface-name> ipv6 ospfv3 instance-id <instance-id> transmit-delay <value>
interfaces vti <vt-interface-name> ipv6 pim mode sparse-dense
interfaces vti <vt-interface-name> ipv6 pim mode sparse-dense-passive
interfaces vti <vt-interface-name> multicast disable
interfaces vti <vt-interface-name> multicast enable
interfaces vti <vt-interface-name> policy route pbr <value>
policy qos name <id> shaper class <id> match <id> application name <name>
policy qos name <id> shaper class <id> match <id> application type <value>
policy route pbr <pbr-group> rule <rule-number> path-monitor
policy route pbr <pbr-group> rule <rule-number> path-monitor monitor <name>
policy route pbr <pbr-group> rule <rule-number> path-monitor monitor <name> policy <value>
policy route route-map <map-name> rule <rule-number> set level level-1
policy route route-map <map-name> rule <rule-number> set level level-1-2
policy route route-map <map-name> rule <rule-number> set level level-2
protocols bgp <as-number> address-family vpnv4-unicast
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening half-life <value>
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening max-suppress-time
<value>
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening re-use <value>
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening start-suppress <value>
protocols bgp <as-number> address-family vpnv4-unicast parameters dampening un-reachability-half-
life <value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast
```



```
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast capability graceful-
restart
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast capability graceful-
restart disable
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast distribute-list export
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast distribute-list import
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast filter-list
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast filter-list export
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast filter-list import
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast maximum-prefix <address>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast maximum-prefix <address>
threshold <percentage>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast maximum-prefix <address>
threshold <percentage> warning-only
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast maximum-prefix <address>
warning-only
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast peer-group <value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast prefix-list export
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast prefix-list import
<value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast route-map export <value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast route-map import <value>
protocols bgp <as-number> neighbor <address> address-family vpnv4-unicast route-reflector-client
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast capability graceful-
restart
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast capability graceful-
restart disable
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast distribute-list
export <value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast distribute-list
import <value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast filter-list
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast filter-list export
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast filter-list import
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast maximum-prefix
<address>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast maximum-prefix
<address> threshold <percentage>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast maximum-prefix
<address> threshold <percentage> warning-only
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast maximum-prefix
<address> warning-only
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast prefix-list export
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast prefix-list import
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast route-map export
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast route-map import
<value>
protocols bgp <as-number> peer-group <group-name> address-family vpnv4-unicast route-reflector-
client
protocols mpls-rsvp globals graceful-restart
protocols mpls-rsvp tunnels tunnel <name> primary no-cspf
protocols mpls-rsvp tunnels tunnel <name> secondary no-cspf
protocols ospfv3 address-family
protocols ospfv3 address-family ipv4
protocols ospfv3 address-family ipv4 unicast
```



```
protocols ospfv3 address-family ipv4 unicast area <area-identifier>
protocols ospfv3 address-family ipv4 unicast area <area-identifier> range <prefix>
protocols ospfv3 address-family ipv4 unicast area <area-identifier> range <prefix> advertise
protocols ospfv3 address-family ipv4 unicast area <area-identifier> range <prefix> not-advertise
protocols ospfv3 address-family ipv4 unicast default-information
protocols ospfv3 address-family ipv4 unicast default-information originate
protocols ospfv3 address-family ipv4 unicast default-information originate always
protocols ospfv3 address-family ipv4 unicast default-information originate metric <value>
protocols ospfv3 address-family ipv4 unicast default-information originate metric-type <value>
protocols ospfv3 address-family ipv4 unicast default-information originate route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute
protocols ospfv3 address-family ipv4 unicast redistribute bgp
protocols ospfv3 address-family ipv4 unicast redistribute bgp metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute bgp metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute bgp route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute bgp tag <value>
protocols ospfv3 address-family ipv4 unicast redistribute connected
protocols ospfv3 address-family ipv4 unicast redistribute connected metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute connected metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute connected route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute connected tag <value>
protocols ospfv3 address-family ipv4 unicast redistribute kernel
protocols ospfv3 address-family ipv4 unicast redistribute kernel metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute kernel metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute kernel route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute kernel tag <value>
protocols ospfv3 address-family ipv4 unicast redistribute ospf
protocols ospfv3 address-family ipv4 unicast redistribute ospf metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute ospf metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute ospf route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute ospf tag <value>
protocols ospfv3 address-family ipv4 unicast redistribute rip
protocols ospfv3 address-family ipv4 unicast redistribute rip metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute rip metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute rip route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute rip tag <value>
protocols ospfv3 address-family ipv4 unicast redistribute static
protocols ospfv3 address-family ipv4 unicast redistribute static metric <value>
protocols ospfv3 address-family ipv4 unicast redistribute static metric-type <value>
protocols ospfv3 address-family ipv4 unicast redistribute static route-map <value>
protocols ospfv3 address-family ipv4 unicast redistribute static tag <value>
protocols ospfv3 address-family ipv4 unicast summary-address <address>
protocols ospfv3 address-family ipv4 unicast summary-address <address> advertise
protocols ospfv3 address-family ipv4 unicast summary-address <address> advertise tag <value>
protocols ospfv3 address-family ipv4 unicast summary-address <address> not-advertise
protocols pim dense-group <group>
protocols pim6 dense-group <group>
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening half-life <value>
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening max-suppress-time <value>
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening re-use <value>
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening start-suppress <value>
routing routing-instance <instance-name> protocols bgp <as-number> address-family vpnv4-unicast
parameters dampening un-reachability-half-life <value>
routing routing-instance <instance-name> protocols bgp <as-number> neighbor <address> address-
family vpnv4-unicast
routing routing-instance <instance-name> protocols bgp <as-number> neighbor <address> address-
family vpnv4-unicast capability graceful-restart
routing routing-instance <instance-name> protocols bgp <as-number> neighbor <address> address-
family vpnv4-unicast capability graceful-restart disable
```







```
security application firewall name <ruleset-name>
security application firewall name <ruleset-name> description <value>
security application firewall name <ruleset-name> no-match-action accept
security application firewall name <ruleset-name> no-match-action drop
security application firewall name <ruleset-name> rule <rule-number>
security application firewall name <ruleset-name> rule <rule-number> action accept
security application firewall name <ruleset-name> rule <rule-number> action drop
security application firewall name <ruleset-name> rule <rule-number> description <value>
security application firewall name <ruleset-name> rule <rule-number> name <name>
security application firewall name <ruleset-name> rule <rule-number> protocol <protocol>
security application firewall name <ruleset-name> rule <rule-number> type <type>
security firewall name <ruleset-name> rule <rule-number> session
security firewall name <ruleset-name> rule <rule-number> session application firewall <value>
security firewall name <ruleset-name> rule <rule-number> session application name <name>
security firewall name <ruleset-name> rule <rule-number> session application protocol <protocol>
security firewall name <ruleset-name> rule <rule-number> session application type <value>
security vpn ipsec profile <ipsec-profile> authentication x509
security vpn ipsec profile <ipsec-profile> authentication x509 cert-file <value>
security vpn ipsec profile <ipsec-profile> authentication x509 key file <value>
security vpn ipsec profile <ipsec-profile> authentication x509 key password <value>
service diamond session-name <name>
service diamond session-name <name> collector netconf get path <value>
service diamond session-name <name> handler amqp-topic
service diamond session-name <name> handler amqp-topic password <value>
service diamond session-name <name> handler amqp-topic port <value>
service diamond session-name <name> handler amqp-topic server <value>
service diamond session-name <name> handler amqp-topic ssl-certificate-path <value>
service diamond session-name <name> handler amqp-topic topic-exchange <value>
service diamond session-name <name> handler amqp-topic user <value>
service diamond session-name <name> interval <value>
service path-monitor
service path-monitor host <name>
service path-monitor host <name> target <value>
service path-monitor host <name> type ping
service path-monitor host <name> type ping dscp af11
service path-monitor host <name> type ping dscp af12
service path-monitor host <name> type ping dscp af13
service path-monitor host <name> type ping dscp af21
service path-monitor host <name> type ping dscp af22
service path-monitor host <name> type ping dscp af23
service path-monitor host <name> type ping dscp af31
service path-monitor host <name> type ping dscp af32
service path-monitor host <name> type ping dscp af33
service path-monitor host <name> type ping dscp af41
service path-monitor host <name> type ping dscp af42
service path-monitor host <name> type ping dscp af43
service path-monitor host <name> type ping dscp cs1
service path-monitor host <name> type ping dscp cs2
service path-monitor host <name> type ping dscp cs3
service path-monitor host <name> type ping dscp cs4
service path-monitor host <name> type ping dscp cs5
service path-monitor host <name> type ping dscp cs6
service path-monitor host <name> type ping dscp cs7
service path-monitor host <name> type ping dscp default
service path-monitor host <name> type ping dscp ef
service path-monitor host <name> type ping dscp va
service path-monitor monitor <name>
service path-monitor monitor <name> initial-state compliant
service path-monitor monitor <name> initial-state non-compliant
service path-monitor monitor <name> policy <value>
service path-monitor monitor <name> type ping
service path-monitor monitor <name> type ping host <value>
service path-monitor monitor <name> type ping interface <value>
service path-monitor monitor <name> type ping interval <value>
service path-monitor policy <name>
service path-monitor policy <name> requires type ping
```





```
service path-monitor policy <name> requires type ping round-trip-time
service path-monitor policy <name> requires type ping round-trip-time robustness <value>
service path-monitor policy <name> requires type ping round-trip-time threshold <value>
service path-monitor policy <name> requires type ping round-trip-time tolerance <value>
system session limit global max-halfopen <value>
system session limit global rate-limit
system session limit global rate-limit burst <value>
system session limit global rate-limit rate <value>
system session limit group name <group-name>
system session limit group name <group-name> interface <interface-name>
system session limit group name <group-name> rule <rule-number>
system session limit group name <group-name> rule <rule-number> description <value>
system session limit group name <group-name> rule <rule-number> destination address <value>
system session limit group name <group-name> rule <rule-number> destination port <value>
system session limit group name <group-name> rule <rule-number> disable
system session limit group name <group-name> rule <rule-number> icmp group <value>
system session limit group name <group-name> rule <rule-number> icmp name TOS-host-redirect
system session limit group name <group-name> rule <rule-number> icmp name TOS-host-unreachable
system session limit group name <group-name> rule <rule-number> icmp name TOS-network-redirect
system session limit group name <group-name> rule <rule-number> icmp name TOS-network-unreachable
system session limit group name <group-name> rule <rule-number> icmp name address-mask-reply
system session limit group name <group-name> rule <rule-number> icmp name address-mask-request
system session limit group name <group-name> rule <rule-number> icmp name communication-prohibited
system session limit group name <group-name> rule <rule-number> icmp name destination-unreachable
system session limit group name <group-name> rule <rule-number> icmp name echo-reply
system session limit group name <group-name> rule <rule-number> icmp name echo-request
system session limit group name <group-name> rule <rule-number> icmp name fragmentation-needed
system session limit group name <group-name> rule <rule-number> icmp name host-precedence-violation
system session limit group name <group-name> rule <rule-number> icmp name host-prohibited
system session limit group name <group-name> rule <rule-number> icmp name host-redirect
system session limit group name <group-name> rule <rule-number> icmp name host-unknown
system session limit group name <group-name> rule <rule-number> icmp name host-unreachable
system session limit group name <group-name> rule <rule-number> icmp name ip-header-bad
system session limit group name <group-name> rule <rule-number> icmp name network-prohibited
system session limit group name <group-name> rule <rule-number> icmp name network-redirect
system session limit group name <group-name> rule <rule-number> icmp name network-unknown
system session limit group name <group-name> rule <rule-number> icmp name network-unreachable
system session limit group name <group-name> rule <rule-number> icmp name parameter-problem
system session limit group name <group-name> rule <rule-number> icmp name port-unreachable
system session limit group name <group-name> rule <rule-number> icmp name precedence-cutoff
system session limit group name <group-name> rule <rule-number> icmp name protocol-unreachable
system session limit group name <group-name> rule <rule-number> icmp name redirect
system session limit group name <group-name> rule <rule-number> icmp name required-option-missing
system session limit group name <group-name> rule <rule-number> icmp name router-advertisement
system session limit group name <group-name> rule <rule-number> icmp name router-solicitation
system session limit group name <group-name> rule <rule-number> icmp name source-quench
system session limit group name <group-name> rule <rule-number> icmp name source-route-failed
system session limit group name <group-name> rule <rule-number> icmp name time-exceeded
system session limit group name <group-name> rule <rule-number> icmp name timestamp-reply
system session limit group name <group-name> rule <rule-number> icmp name timestamp-request
system session limit group name <group-name> rule <rule-number> icmp name ttl-zero-during-
reassembly
system session limit group name <group-name> rule <rule-number> icmp name ttl-zero-during-transit
system session limit group name <group-name> rule <rule-number> icmp type <type-number>
system session limit group name <group-name> rule <rule-number> icmp type <type-number> code
<value>
system session limit group name <group-name> rule <rule-number> icmpv6 group <value>
system session limit group name <group-name> rule <rule-number> icmpv6 name address-unreachable
system session limit group name <group-name> rule <rule-number> icmpv6 name bad-header
system session limit group name <group-name> rule <rule-number> icmpv6 name communication-
prohibited
system session limit group name <group-name> rule <rule-number> icmpv6 name destination-unreachable
system session limit group name <group-name> rule <rule-number> icmpv6 name echo-reply
system session limit group name <group-name> rule <rule-number> icmpv6 name echo-request
system session limit group name <group-name> rule <rule-number> icmpv6 name mobile-prefix-
advertisement
```



```
system session limit group name <group-name> rule <rule-number> icmpv6 name mobile-prefix-
solicitation
system session limit group name <group-name> rule <rule-number> icmpv6 name multicast-listener-done
system session limit group name <group-name> rule <rule-number> icmpv6 name multicast-listener-
query
system session limit group name <group-name> rule <rule-number> icmpv6 name multicast-listener-
report
system session limit group name <group-name> rule <rule-number> icmpv6 name neighbor-advertisement
system session limit group name <group-name> rule <rule-number> icmpv6 name neighbor-solicitation
system session limit group name <group-name> rule <rule-number> icmpv6 name no-route
system session limit group name <group-name> rule <rule-number> icmpv6 name packet-too-big
system session limit group name <group-name> rule <rule-number> icmpv6 name parameter-problem
system session limit group name <group-name> rule <rule-number> icmpv6 name port-unreachable
system session limit group name <group-name> rule <rule-number> icmpv6 name redirect
system session limit group name <group-name> rule <rule-number> icmpv6 name router-advertisement
system session limit group name <group-name> rule <rule-number> icmpv6 name router-solicitation
system session limit group name <group-name> rule <rule-number> icmpv6 name time-exceeded
system session limit group name <group-name> rule <rule-number> icmpv6 name ttl-zero-during-
reassembly
system session limit group name <group-name> rule <rule-number> icmpv6 name ttl-zero-during-transit
system session limit group name <group-name> rule <rule-number> icmpv6 name unknown-header-type
system session limit group name <group-name> rule <rule-number> icmpv6 name unknown-option
system session limit group name <group-name> rule <rule-number> icmpv6 type <type-number>
system session limit group name <group-name> rule <rule-number> icmpv6 type <type-number> code
<value>
system session limit group name <group-name> rule <rule-number> parameter <value>
system session limit group name <group-name> rule <rule-number> protocol <value>
system session limit group name <group-name> rule <rule-number> source address <value>
system session limit group name <group-name> rule <rule-number> source port <value>
system session limit group name <group-name> rule <rule-number> tcp flags <value>
system session limit parameter name <param-name>
system session limit parameter name <param-name> max-halfopen <value>
system session limit parameter name <param-name> rate-limit
system session limit parameter name <param-name> rate-limit burst <value>
system session limit parameter name <param-name> rate-limit rate <value>
```

## New operational commands

The following operational commands have been added to this release.

```
clear session limit
clear session limit group
clear session limit parameter
clear session limit parameter <text>
monitor path-monitor
monitor path-monitor disable
monitor path-monitor enable
reset ip bgp all vpnv4 unicast
reset ip bgp all vpnv4 unicast soft
reset ip bgp all vpnv4 unicast soft in
reset ip bgp all vpnv4 unicast soft out
show application info
show ip bgp vpnv4 unicast
show ip bgp vpnv4 unicast <text>
show ip bgp vpnv4 unicast <text> longer-prefixes
show ip bgp vpnv4 unicast dampening dampened-paths
show ip bgp vpnv4 unicast dampening flap-statistics
show ip bgp vpnv4 unicast filter-list <text>
show ip bgp vpnv4 unicast neighbors
show ip bgp vpnv4 unicast neighbors <text>
show ip bgp vpnv4 unicast neighbors <text> advertised-routes
show ip bgp vpnv4 unicast neighbors <text> received-routes
show ip bgp vpnv4 unicast neighbors <text> routes
show ip bgp vpnv4 unicast prefix-list <text>
show ip bgp vpnv4 unicast regexp <text>
show ip bgp vpnv4 unicast summary
```



```
show mpls rsvp graceful-restart
show mpls rsvp graceful-restart <text>
show service path-monitor monitor <text>
show service path-monitor summary
show session limit
show session limit brief
show session limit group
show session limit group <text>
show session limit group brief
show session limit group brief name <text>
show session limit parameter
show session limit parameter <text>
show session limit parameter brief
show session limit parameter brief name <text>
```

## Modified commands

No modified commands in this release.

## Deprecated and deleted commands

### Deprecated commands

The following configuration commands have been deprecated in this release.

```
routing routing-instance <instance-name> system session timeout tcp closed <value>
system session timeout tcp closed <value>
```

### Deleted commands

The following operational command has been deleted in this release.

```
delete session-table application
```

---

## Modified API calls

### New API calls

No new API calls in this release.

### Modified API calls

No modified API calls in this release.

### Deprecated API calls

No deprecated API calls in this release.



# MIBs

---

## **New MIBs**

No new MIBs in this release.

---

## **Modified MIBs**

No modified MIBs in this release.

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## **Deprecated MIBs**

No deprecated MIBs in this release.



# RFCs and Standards

No RFCs and standards changes in this release.



# Hardware Support

## Supported devices

### Supported NICs

The following table lists, by vendor and model, network interface cards (NICs) that are supported by the AT&T Vyatta vRouter data plane for bare-metal installations or for PCI-passthrough or SR-IOV configurations.

NIC vendor and model	Description	Controller type
Intel 82598, 82598AF, 82598AT, 82598AT2, 82598EB, 82599EB, 82599EN, 82599ES (X520-2)	Dual 10 GbE with SFP+	82599EB
Intel 82599ES	10 GbE with SFI/SFP+	
Intel X540T1, X540T2, X540AT2	Dual 10 GbE copper	X540
Intel X520	Dual 10 GbE fiber	
Intel Ethernet Controller XL710	Converged Network Adapter XL710 10/40 GbE	I40E
Intel 82540, 82545, 82546, 82571, 82572, 82573, 82574, 82583	1 GbE	E1000-style single-queue devices
Intel 82575, 82576, 82580, I350, I210, I211, I354, DH89XXC	1 GbE	Multiqueue devices

**Note:** AT&T Vyatta Network Operating System supports the Wind River Accelerated Virtual Port (AVP) poll-mode virtual NIC driver.

### Supported vNICs

The following table lists the virtual NICs (vNICs) that are supported by the AT&T Vyatta vRouter.

vNIC model	Hypervisor
Virtio	Linux KVM
VMXNET3 (VMXNET Generation 3)	VMware ESXi
QEMU (Realtek 8139)	Citrix XenServer
rte_hyperv_pmd	Microsoft Hyper-V

**Note:** To support XL710 SR-IOV on vmWare ESXi, at minimum, version 6.0 of vmWare ESXi is required along with version 2.0.6 of the VMware-supported XL710 driver.

### Supported SFP and SFP+ transceivers

A Services platform image that runs on a SuperMicro E300-8D system supports the following SFP and SFP+ transceivers:

- AT&T/E1MG-SX-OM—1000BASE-SX
- AT&T/E1MG-LX-OM—1000BASE-LX
- AT&T/E1MG-LHA-OM—1000BASE-EX
- AT&T/10G-SFPP-SR—10GBASE-SR



- AT&T/10G-SFPP-LR—10GBASE-LR
- AT&T/10G-SFPP-ER—10GBASE-ER



# Software Upgrade

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## Upgrade considerations

### IPsec-protected GRE tunnels fail to establish IKE sessions after upgrading to 17.2.0

After upgrading to 17.2.0 with a configuration that contains an IPsec-protected GRE tunnel, the vRouter establishes the IKE protocol with a misconfigured tunnel that is missing the GRE protocol selector (`set security vpn ipsec site-to-site peer peer tunnel tunnel_number protocol gre`).

This issue is fixed in the 17.2.0 release.





# Limitations and Restrictions

IPv6 is not supported on the 40G Fortville NIC.



# Defects

## Security vulnerabilities

The following security issues are resolved in this release:

- [CVE-2015-8270, CVE-2015-8271, CVE-2015-8272] Debian DSA-3850-1: rtmpdump security update (VRVDR-37296)
- [CVE-2016-1908] Possible fallback from untrusted to trusted X11 forwarding (VRVDR-35135)
- [CVE-2016-6252, CVE-2017-2616] Debian DSA-3793-1: Shadow security update (VRVDR-36258)
- [CVE-2016-6786, CVE-2016-6787, CVE-2016-8405, CVE-2016-9191, CVE-2017-2583, CVE-2017-2584, CVE-2017-2618, CVE-2017-5549, CVE-2017-5551, CVE-2017-5897, CVE-2017-5970, CVE-2017-6001, CVE-2017-6074] Linux security update (VRVDR-36173)
- [CVE-2016-7098] Race condition in wget 1.17 and earlier (VRVDR-34072)
- [CVE-2016-7141] curl and libcurl allow TLS authentication hijack (VRVDR-34264)
- [CVE-2016-8610] SSL-Death-Alert OpenSSL SSL/TLS SSL3\_AL\_WARNING: undefined alert flood remote DoS (VRVDR-33233)
- [CVE-2016-9588, CVE-2017-2636, CVE-2017-5669, CVE-2017-5986, CVE-2017-6214, CVE-2017-6345, CVE-2017-6346, CVE-2017-6348, CVE-2017-6353] Linux security update (VRVDR-36340)
- [CVE-2016-10088] The sg implementation in the Linux kernel through version 4.9 does not properly restrict write operations in situations where the KERNEL\_DS option is set (VRVDR-36831)
- [CVE-2016-10195, CVE-2016-10196, CVE-2016-10197] Debian DSA-3789-1: libevent security update (VRVDR-36068)
- [CVE-2016-10244, CVE-2017-8105, CVE-2017-8287] Debian DSA-3839-1: freetype security update (VRVDR-37113)
- [CVE-2017-2596] Linux security update (VRVDR-36782)
- [CVE-2017-3730] Bad (EC)DHE parameters cause a client crash (VRVDR-35972)
- [CVE-2017-5461, CVE-2017-5462, CVE-2017-7502] Debian DSA-3872-1: NSS security update (VRVDR-37534)
- [CVE-2017-5596, CVE-2017-5597, CVE-2017-6014, CVE-2017-6467, CVE-2017-6468, CVE-2017-6469, CVE-2017-6470, CVE-2017-6471, CVE-2017-6472, CVE-2017-6473, CVE-2017-6474] Debian DSA-3811-1: Wireshark security update (VRVDR-36519,VRVDR-36485)
- [CVE-2017-6512] Debian DSA-3873-1: Perl security update (VRVDR-37565)
- [CVE-2017-6964] Debian DSA-3823-1: eject security update (VRVDR-36701)
- [CVE-2017-7867, CVE-2017-7868]: Debian DSA-3830-1: icu security update (VRVDR-36983)
- [CVE-2017-9287] Debian DSA-3868-1: OpenLDAP security update (VRVDR-37524)
- [CVE-2017-1000367] Debian DSA-3867-1: sudo security update (VRVDR-37525)

## Resolved issues

The following table lists the issues that are resolved in this release.

**Table 1: Resolved issues**

Component	Priority	Key	Summary
Firewall	Minor	VRVDR-37315	In the output of the <b>show session-table statistics</b> command, the Used field shows a negative value.



Component	Priority	Key	Summary
Interfaces	Major	VRVDR-37250	The MTU change on the bonding interface does not reflect the VIF and VRRP MTU size.
SSH	Minor	VRVDR-37220	A VRF-aware SSH client creates, as the root user, an ssh_known_hosts file.
SNMP	Minor	VRVDR-36977	There is a discrepancy in the SNMP values of ifDescr and ifName.
Interfaces	Minor	VRVDR-36903	When setting an alias for an interface, a "failed" message is displayed.
NTP	Major	VRVDR-36829	The <code>ntp</code> command does not display the entire address of the IPv6 NTP server.
BGP	Major	VRVDR-36772	When configuring BGP dampening, the "Start-suppress-time should be greater than or equal to re-use-time" error message is displayed.
VRRP	Minor	VRVDR-36734	A lower-VRRP priority vRouter goes back and forth between MASTER and BACKUP if VRRP packets are filtered by an incoming firewall.
Interfaces	Major	VRVDR-36695	When using iperf with a heavy load for testing, the interface goes down.
VRRP	Major	VRVDR-36549	When in the RFC mode, the vRouter does not reply to unicast ARP requests for VRRP vIP, but broadcast ARP requests work fine.
NTP	Minor	VRVDR-36458	NTP does not stay synchronized.
VRRP	Critical	VRVDR-36373	A host becomes unpingable when the ARP table is cleared until a ping from the vRouter is initiated.
VRRP	Minor	VRVDR-36284	Mismatched VRRPv2 timers cause a flood of (6K PPS) of VRRP advertisement packets on the link.



Component	Priority	Key	Summary
Firewall	Minor	VRVDR-36271	When the vRouter has a zone-based stateful firewall configured in both directions, a ping does not go through the firewall.
Firewall, NAT	Major	VRVDR-36183	NAT does not work in conjunction with a zone-based firewall.
GRE, L3 dataplane	Major	VRVDR-36009	Frames that need fragmentation are not forwarded over a bridged GRE.
Config Infrastructure	Minor	VRVDR-36004	After a client sends a discard-changes message, the NETCONF RPC reply is "Candidate configuration is changed."
L3 dataplane	Minor	VRVDR-35472	An ECMP polarization issue is observed.
QoS	Minor	VRVDR-35447	QoS shaping is bypassed on two CPU VMs.
IPsec/VPN	Minor	VRVDR-35095	The "Odd number of elements in hash assignment" message appears in the output of the <code>show vpn ipsec sa</code> command.
Config Infrastructure, Operational Infrastructure	Minor	VRVDR-35054	When configuring 50 login users on the vRouter, a UNIX socket error occurs.
System	Minor	VRVDR-34774	When loading configuration in bulk, config-sync does not change the interface firewall order.
IPsec/VPN, L3 dataplane	Major	VRVDR-34618	Encryption is not forced on an IPsec-protected ipip tunnel.
IPsec/VPN	Major	VRVDR-34520	The vRouter is not initiating VPN connections over VTI interfaces.

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## Known issues

The following table lists the known issues in this release.

**Table 2: Known issues**

Component	Priority	Key	Summary
IPsec/VPN	Trivial	VRVDR-37338	The output of the <b>show vpn ipsec sa</b> command is different between the 4.2 and 5.2 releases.
DPDK, Hardware	Major	VRVDR-37052	Intel i210 NIC interfaces report no link (no-carrier).
BGP	Major	VRVDR-36420	BGP is not forming the sessions when the hold timer is 0.
L3 dataplane	Major	VRVDR-35474	Transient packet drops are observed during linkup and in BGP convergence tests.
IPsec/VPN	Minor	VRVDR-34842	DMVPN: The Spoke receives the INVALID_ID_INFORMATION message after changing the logging configuration on the Hub.
BGP, RIB	Major	VRVDR-34097	The ibgp double-recursive lookup uses first the nh rather than the second nh for path selection, thereby breaking best exit.
DMVPN	Major	VRVDR-33940	IPsec does not establish a connection on a DMVPN HUB and Spoke within an AWS cloud.
TACACS	Minor	VRVDR-15866	TACACS authentication, authorization, and accounting is out of sync after TACACS servers go offline or online and the TACACS user exits the session.