

# **Sun Ethernet Fabric Operating System**

CLI Enterprise Reference Manual



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## Review SEFOS command descriptions, syntax, and examples f

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# Using This Documentation

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This manual provides SEFOS CLI Enterprise command descriptions, syntax, and examples for the Sun Network 10GbE Switch 72p and Sun Blade 6000 Ethernet Switched NEM 24p 10GbE. You are expected to have a basic knowledge of Ethernet switching and routing administration as a prerequisite to using this manual. SEFOS is accessed through Oracle ILOM. For instructions on connecting to Oracle ILOM and SEFOS, refer to the user's guide for your switch.

- "Product Notes" on page xvii
- "Related Documentation" on page xviii
- "Acronyms and Abbreviations" on page xviii
- "CLI Command Modes" on page xxii
- "Feedback" on page xxiii
- "Support and Accessibility" on page xxiii

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## Product Notes

For late-breaking information and known issues about the following products, refer to the product notes at:

Sun Blade 6000 Ethernet Switched NEM 24p 10GbE:

<http://www.oracle.com/pls/topic/lookup?ctx=SB6K-24p-10GbE>

Sun Network 10GbE Switch 72p:

<http://www.oracle.com/pls/topic/lookup?ctx=SN-10GbE-72p>

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## Related Documentation

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Documentation	Links
All Oracle products	<a href="http://oracle.com/documentation">http://oracle.com/documentation</a>
Sun Blade 6000 Ethernet Switched NEM 24p 10GbE	<a href="http://www.oracle.com/pls/topic/lookup?ctx=SB6K-24p-10GbE">http://www.oracle.com/pls/topic/lookup?ctx=SB6K-24p-10GbE</a>
Sun Network 10GbE Switch 72p	<a href="http://www.oracle.com/pls/topic/lookup?ctx=SN-10GbE-72p">http://www.oracle.com/pls/topic/lookup?ctx=SN-10GbE-72p</a>
Sun Blade 6000 modular system	<a href="http://www.oracle.com/pls/topic/lookup?ctx=sb6000">http://www.oracle.com/pls/topic/lookup?ctx=sb6000</a>
Oracle Integrated Lights Out Manager (Oracle ILOM) 3.0	<a href="http://www.oracle.com/pls/topic/lookup?ctx=ilom30">http://www.oracle.com/pls/topic/lookup?ctx=ilom30</a>

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For detailed information about the commands and options described in this document, refer to the *Sun Ethernet Fabric Operating System CLI Base Reference Manual*.

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## Acronyms and Abbreviations

The following acronyms and abbreviations are used in this book:

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Acronym or Abbreviation	Explanation
AARP	AppleTalk Address Resolution
ACL	Access control list
APNIC	Asia-Pacific Network Information Centre
ARIN	American Registry for Internet Addresses
ARP	Address Resolution Protocol
AS	Autonomous system
ASBR	Autonomous border system router

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<b>Acronym or Abbreviation</b>	<b>Explanation</b>
BGP	Border Gateway Protocol
BPBDU	Bridge protocol data unit
BSD	Berkeley Software Distribution
CBS	Committed burst size
CEP	Customer edge port
CIDR	Classless inter-domain routing
CIR	Committed information rate
CIST	Common Internal Spanning Tree
CMM	Chassis Management Module
CNA	Converged network adapter
DCB	Data center bridging
DCBX	Data Center Exchange Protocol
DEC	Digital Equipment Corporation
DSCP	Differentiated services code point
EBS	Excess burst size
EF DSCP	Expedited forwarding DSCP
EIR	Excess information rate
ETS	Enhancement transmission selection
EIGRP	Enhanced Interior Gateway Protocol
FCoE	Fiber Channel over Ethernet
FDB	Forwarding database
FSAP	Flexible software architecture for portability
GARP	Generic Attribute Registration Protocol
GMRP	GARP Multicast Registration Protocol
GVRP	GARP VLAN Registration Protocol
ICMP	Internet Control Message Protocol
ICMPv4	Internet Control Message Protocol version 4
IGMP	Internet Group Management Protocol
IGS	IGMP snooping
IP TOS	IP type of service
ISL	Inter-switch link

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<b>Acronym or Abbreviation</b>	<b>Explanation</b>
IVL	Independent VLAN learning
LA	Link aggregation
LACP	Link aggregation Control Protocol
LACNIC	Latin American and Caribbean Network Information Centre
LLDP	Link Layer Discovery Protocol
MEF	Metro Ethernet Forum
MIB	Management information base
MLD	Multicast listener discovery
MLDS	Multicast listener discovery snooping
MSTP	Multiple Spanning Tree Protocol
NetBIOS	Network Basic Input/Output System
NPAPI	Network processor application programming interface
OPSF	Open Shortest Path First
PDU	Protocol description unit
PFC	Priority-based flow control
PG	Priority group
PHB	Per-hop behavior
PIM	Protocol independent multicast
PMTU	Path MTU
PMTUD	PMTU discovery
PVID	Port VLAN ID
PVRST	Per-VLAN Rapid Spanning Tree
PVRST+	Per-VLAN Rapid Spanning Tree Plus
PVST	Per-VLAN Spanning Tree
RFC	Request for comments
RIP	Routing Information Protocol
RIPE NCC	Reseaux IP Europeens Network Coordination Centre
RMON	Remote monitoring
RRD	Route redistribution
RST	Rapid Spanning Tree
RTM	Route table manager

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<b>Acronym or Abbreviation</b>	<b>Explanation</b>
SLA	service-level agreement
SLI	Socket layer interface
SNMP	Simple Network Management Protocol
srTCM	Single rate three color marker
STP	Spanning Tree Protocol
SVL	Shared VLAN learning
TCP/IP	Transmission Control Protocol/Internet Protocol
TCP ACK bit	TCP acknowledgement bit
TCP RST bit	TCP reset bit
TCN	Topology change notification
TFTP	Trivial File Transfer Protocol
trTCM	Two rate three color marker
TSWTCM	Time sliding window three color marker
TLV	Type, length, and value
TTL	Time-to-live value
UDP	User Datagram Protocol
VINES	Virtual integrated network service
VLAN	Virtual LAN
VLAN ID	VLAN identifier
XNS	Xerox network systems
XVLAN	Exclusive VLAN

---

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# CLI Command Modes

The following table provides the access and exit methods to various general configuration modes. The following table lists the different CLI command modes.

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Initial mode to start a session.	SEFOS>	Use the logout method.
Privileged EXEC	Use the <code>enable</code> command from User EXEC mode.	SEFOS#	Use the <code>disable</code> command to return to User EXEC mode.
Global Configuration	Use the <code>configure terminal</code> command from Privileged EXEC mode.	SEFOS(config)#	Use the <code>end</code> command to return to Privileged EXEC mode.
Interface Configuration	Use the <code>interface interface-type interface-id</code> from Global Configuration mode command.	SEFOS(config-if)#	Use the <code>exit</code> command to return to Global Configuration mode
Interface Range Configuration	Use the <code>interface range</code> command from Global Configuration mode.	SEFOS(config-if-range)#	Use the <code>exit</code> command to return to Global Configuration mode.
Config-VLAN	Use the <code>vlan vlan-id</code> command from Global Configuration mode.	SEFOS(config-vlan)#	Use the <code>exit</code> command to return to Global Configuration mode.
Line Configuration	Use the <code>line</code> command from Global Configuration mode.	SEFOS(config-line)#	Use the <code>exit</code> command to return to Global Configuration mode.
Profile Configuration	Use the <code>ip mcast profile profile-id [description (128)]</code> from Global Configuration mode.	SEFOS(config-profile)#	Use the <code>exit</code> command to return to Global Configuration mode.

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# Feedback

Provide feedback on this documentation at:

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# Support and Accessibility

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Description	Links
Access electronic support through My Oracle Support	<a href="http://support.oracle.com">http://support.oracle.com</a>
	For hearing impaired: <a href="http://www.oracle.com/accessibility/support.html">http://www.oracle.com/accessibility/support.html</a>
Learn about Oracle's commitment to accessibility	<a href="http://www.oracle.com/us/corporate/accessibility/index.html">http://www.oracle.com/us/corporate/accessibility/index.html</a>

---





# CLI

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This chapter describes how to configure SEFOS software with the CLI. Access the CLI with a console attached to the SER MGT port of the switch, or from a remote terminal using SSH (refer to the user's guide and software configuration guide for your switch).

- “CLI Command Modes” on page 3
  - “User EXEC Mode” on page 3
  - “Privileged EXEC Mode” on page 3
  - “Global Configuration Mode” on page 3
  - “Interface Configuration Mode” on page 3
  - “Interface Range Mode” on page 4
  - “Config-VLAN Mode” on page 4
  - “Line Configuration Mode” on page 4
  - “Profile Configuration Mode” on page 4
  - “Protocol-Specific Modes” on page 5

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## 1.1 SEFOS Overview

SEFOS is a layer 2 and layer 3 software solution that provides support for Ethernet switching and routing. It comprises the necessary switching, management, and system level features. SEFOS provides the basic bridging functionality and also offers features such as link aggregation, GVRP/GMRP, IGMP snooping, and network access control.

The native SEFOS CLI commands are the main tools for configuring the commonly used layer 2 and layer 3 protocols and switch interface features. In addition to its native CLI commands, SEFOS provides a subset of CLI commands that adhere to the

industry-standard CLI syntax. When an industry-standard command is available, the SEFOS native CLI command is shown first, with the industry-standard command shown after a slash (/).

In the following example, the `set port gvrp` command is the SEFOS native CLI command, and the `set port gvrp enable | disable` command is the industry-standard CLI command:

```
set port gvrp / set port gvrp enable | disable
```

Use the industry-standard CLI command whenever it is available.

## 1.1.1 Accessing SEFOS

You must access SEFOS through Oracle ILOM. Refer to the user's guide and software configuration guide for your switch for details.

The SEFOS CLI supports a simple login authentication mechanism. The authentication is based on a user name and password you provide during login. The root user is created by default with password `admin123`.

When SEFOS is started, you must enter the root user name and password at the login prompt to access the CLI shell:

```
Sun Ethernet Fabric Operating System

SEFOS Login: root
Password: *******

SEFOS>
```

The User EXEC mode is now available. The following section provides a detailed description of the various modes available for SEFOS.

- The command prompt always displays the current mode.
- Abbreviated CLI commands are accepted. For example, `show ip global config` can be typed as `sh ip gl co`.
- CLI commands are not case-sensitive.
- CLI commands are successful only if the dependencies are satisfied for the command. The general dependency is that the module specific commands are available only when the respective module is enabled. Appropriate error messages are displayed if the dependencies are not satisfied.

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**Note** – The type of Ethernet interface is determined during system startup. While configuring interface-specific parameters, the Ethernet type must be specified correctly. A FastEthernet interface cannot be configured as an extreme-ethernet interface and vice-versa.

---

## 1.2 CLI Command Modes

See the table in “CLI Command Modes” on page xxii for a quick reference of the command modes used in this document.

### 1.2.1 User EXEC Mode

When you log into the device, you are in User EXEC mode. In general, User EXEC commands temporarily change terminal settings, perform basic tests, and list system information.

### 1.2.2 Privileged EXEC Mode

Privileged access is protected with a case-sensitive password. The prompt is the device name followed by the hash (#) sign.

### 1.2.3 Global Configuration Mode

Global Configuration commands apply to features that affect the system as a whole, rather than to any specific interface.

### 1.2.4 Interface Configuration Mode

#### 1.2.4.1 Physical Interface Mode

Performs interface-specific operations.

## 1.2.4.2 Port Channel Interface Mode

Performs port-channel-specific operations.

## 1.2.4.3 VLAN Interface Mode

Performs L3-IPVLAN-specific operations.

## 1.2.4.4 Tunnel Interface Mode

Performs tunnel-specific operations.

## 1.2.5 Interface Range Mode

Specifies a range of interfaces, such as consecutive ports, to certain single interface commands. This mode does not specify a single port at a time.

## 1.2.6 Config-VLAN Mode

Performs VLAN specific operations.

## 1.2.7 Line Configuration Mode

Modifies the operations of a terminal line. These commands are used to change terminal parameter settings line by line or a range of lines at a time.

## 1.2.8 Profile Configuration Mode

Performs profile-specific operations.

## 1.2.9 Protocol-Specific Modes

### 1.2.9.1 PIM Component Mode

Configures the PIM component. To enter PIM Component mode, use the Global Configuration mode `ip pim component componentid` command.

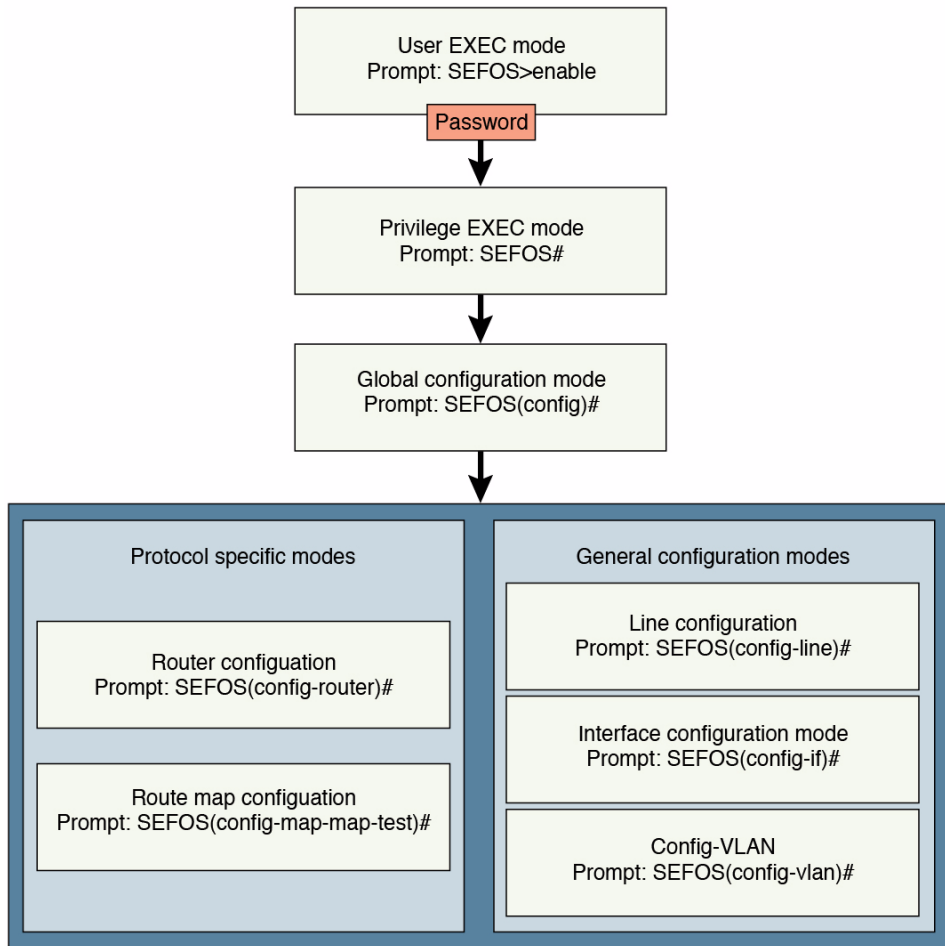
### 1.2.9.2 Router Configuration Mode

Configures the router protocol. To enter Router Configuration mode, use the Global Configuration mode `router router-protocol` command.

### 1.2.9.3 Route Map Configuration Mode

Configure route map parameters. To enter Router Map Configuration mode, use the Global Configuration mode `route-map 1-20 [{permit | deny}] [1-10]` command.

The following is a flowdiagram that shows the hierarchy of accessing command modes.



# IGMP

---

IGMP is a protocol used by IP hosts to inform adjacent routers about multicast group membership. The SEFOS implementation of IGMP conforms to RFC 3376 for IGMP v3 router functionality and supports the MIBs defined in the Internet Draft `draft-ietf-magma-rfc2933-update-00.txt`.

The deployment of the IGMP router can be within a routing domain that uses any MRP. IGMP informs MRPs about group membership messages and leave messages.

---

## 2.1 IGMP Commands

The list of CLI commands for the configuration of IGMP is as follows:

- `set ip igmp`
- `ip igmp immediate-leave`
- `ip igmp version`
- `ip igmp query-interval`
- `ip igmp query-max-response-time`
- `ip igmp robustness`
- `ip igmp last-member-query-interval`
- `ip igmp static-group`
- `no ip igmp`
- `debug ip igmp`
- `show ip igmp global-config`
- `show ip igmp interface`
- `show ip igmp groups`
- `show ip igmp sources`

- `show ip igmp statistics`

## 2.1.1 set ip igmp

Enables or disables IGMP globally or on a particular interface.

```
set ip igmp {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables IGMP. <b>disable</b> – Disables IGMP.
<b>Mode</b>	Global Configuration and Interface Configuration <b>Note</b> - Interface Configuration mode is applicable only in VLAN Interface.
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <b>interface vlan 2</b>  SEFOS(config-if)# <b>set ip igmp enable</b>

### Related Commands

- `ip igmp proxy-service / ip igmp proxy service` - Enables IGMP Proxy service in the system

## 2.1.2 ip igmp immediate-leave

Enables immediate leave processing on the interface and the no form of the command disables immediate-leave processing.

```
ip igmp immediate-leave
```

```
no ip igmp immediate-leave
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>ip igmp immediate-leave</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP



## 2.1.3 ip igmp version

Sets the IGMP version on the interface. The no form of the command sets the default IGMP version on the interface.

```
ip igmp version {1 | 2 | 3}
```

```
no ip igmp version
```

<b>Syntax</b>	1   2   3 - IGMP versions.
<b>Description</b>	
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	2
<b>Example</b>	SEFOS(config-if)# <b>ip igmp version 1</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.4 ip igmp query-interval

Sets the IGMP query interval for the interface and the no form of the command sets query-interval to the default value.

```
ip igmp query-interval seconds_1-65535
```

```
no ip igmp query-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	125
<b>Example</b>	SEFOS(config-if)# <b>ip igmp query-interval 30</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.5 ip igmp query-max-response-time

Sets the IGMP max query response value for the interface. The no form of the command sets the max query response to the default value.

```
ip igmp query-max-response-time seconds_1-255
```

```
no ip igmp query-max-response-time
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	100
<b>Example</b>	SEFOS(config-if)# <b>ip igmp query-max-response-time 20</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.6 ip igmp robustness

Sets the IGMP robustness value for the interface. The no form of the command sets the robustness value to default value.

```
ip igmp robustness 1-255
```

```
no ip igmp robustness
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	2
<b>Example</b>	SEFOS(config-if)# <b>ip igmp robustness 100</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.7 ip igmp last-member-query-interval

Sets the IGMP last member query interval for the interface. The `no` form of the command sets the last member query interval to the default value.

```
ip igmp last-member-query-interval 1-255
```

```
no ip igmp last-member-query-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	10
<b>Example</b>	SEFOS(config-if)# <b>ip igmp last-member-query-interval 100</b>
<b>Notes</b>	The igmp on this interface must be set to version 2 or 3. For example: SEFOS(config-if)# <b>ip igmp version 1</b> SEFOS(config-if)# <b>ip igmp last-member-query-interval 100</b> % CLI Command Failed SEFOS(config-if)# <b>ip igmp version 2</b> SEFOS(config-if)# <b>ip igmp last-member-query-interval 10</b> SEFOS(config-if)# <b>ip igmp version 3</b> SEFOS(config-if)# <b>ip igmp last-member-query-interval 100</b>

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.8 ip igmp static-group

Adds the static group membership on the interface. The `no` form of the command deletes the static group membership on the interface.

```
ip igmp static-group group-address [source source-address]
```

```
no ip igmp static-group group-address [source source-address]
```

<b>Syntax</b>	<i>group-address</i> – Group IP address
<b>Description</b>	<i>source-address</i> – Source IP address
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>ip igmp static-group 224.1.2.3 source 12.0.0.1</b>
<b>Notes</b>	The <code>igmp</code> version on this interface must be set to 3 for configuring static group along with source information.

### Related Commands

- `show ip igmp group` - Displays the IGMP groups information
- `show ip igmp sources` - Displays the IGMP sources information
- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.9 no ip igmp

Deletes the IGMP capable interface.

```
no ip igmp
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>no ip igmp</b>
<b>Notes</b>	At least one of the interface configuration commands must have been executed to create the IGMP interface. If not, the following error message is displayed: % Interface Entry not found For example: SEFOS(config)# <b>int vlan 3</b> SEFOS(config-if)# <b>no ip igmp</b> % Interface Entry not found SEFOS(config-if)#

### Related Commands

- `show ip igmp interface` - Displays the interface configuration of IGMP

## 2.1.10 debug ip igmp

Enables the IGMP trace. The no form of the command disables the IGMP trace.

```
debug ip igmp {[i/o] [grp] [qry] [tmr] [mgmt] | [all]}
```

```
no debug ip igmp {[i/o] [grp] [qry] [tmr] [mgmt] | [all]}
```

<b>Syntax Description</b>	<b>i/o</b> – Input/output messages. <b>grp</b> – Group related messages. <b>qry</b> – Query related messages. <b>tmr</b> – Timer related messages. <b>mgmt</b> – Management configuration messages. <b>all</b> – All traces.
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS# <b>debug ip igmp all</b>

## 2.1.11 show ip igmp global-config

Displays the global configuration of IGMP.

```
show ip igmp global-config
```

<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>show ip igmp global-config</b>  IGMP is globally enabled

### Related Commands

- `set ip igmp` - Enables or disables IGMP
- `ip igmp proxy-service / ip igmp proxy service` - Enables IGMP Proxy service in the system

## 2.1.12 show ip igmp interface

Displays the interface configuration of IGMP.

```
show ip igmp interface [{Vlan vlan-id | interface-type  
interface-id}]
```

**Syntax** **Vlan** – VLAN identifier.

**Description**

*interface-type* – Interface type.

*interface-id* – Interface identifier.

**Mode**

Privileged EXEC

**Example**

```
SEFOS# show ip igmp interface
```

```
vlan1, line protocol is up  
Internet Address is 10.0.0.1/8  
IGMP is enabled on interface  
Current IGMP router version is 2  
IGMP query interval is 125 seconds  
Last member query response interval is 10 seconds  
IGMP max query response time is 100 seconds  
Robustness value is 2  
IGMP querying router is 10.0.0.1 (this system)  
Fast leave is disabled on this interface  
  
No multicast groups joined
```

```
vlan2, line protocol is up  
Internet Address is 20.0.0.1/8  
IGMP is enabled on interface  
Current IGMP router version is 2  
IGMP query interval is 125 seconds  
Last member query response interval is 10 seconds  
IGMP max query response time is 100 seconds  
Robustness value is 2  
IGMP querying router is 20.0.0.1 (this system)  
Fast leave is disabled on this interface  
  
No multicast groups joined
```

### Related Commands

- `set ip igmp` - Enables or disables IGMP
- `ip igmp immediate-leave` - Enables immediate leave processing on the interface

- `ip igmp version` - Sets the IGMP version on the interface
- `ip igmp query-interval` - Sets the IGMP query interval for the interface
- `ip igmp query-max-response-time` - Sets the IGMP max query response value for the interface
- `ip igmp robustness` - Sets the IGMP robustness value for the interface
- `ip igmp last-member-query-interval` - Sets the IGMP last member query interval for the interface
- `no ip igmp` - Deletes the IGMP capable interface

## 2.1.13 `show ip igmp groups`

Displays the IGMP groups information.

```
show ip igmp groups
```

**Mode** Privileged EXEC

**Example** SEFOS# `show ip igmp groups`

I - Include Mode, E - Exclude Mode  
S - Static Mbr, D - Dynamic Mbr

GroupAddress	Flg	Iface	UpTime	ExpiryTime	LastReporter
-----	-----	-----	-----	-----	-----
224.5.5.5	S	vlan2	[0d 00:00:22.28]	[0d 00:00:00.00]	20.0.0.1
226.7.7.7	IS	vlan3	[0d 00:00:04.59]	[0d 00:00:00.00]	30.0.0.1

### Related Commands

- `ip igmp static-group` - Adds the static group membership on the interface

## 2.1.14 `show ip igmp sources`

Displays the IGMP source information.

```
show ip igmp sources
```

**Mode** Privileged EXEC

**Example** SEFOS# **show ip igmp sources**

I - Include Mode, E - Exclude Mode  
S - Static Mbr, D - Dynamic Mbr  
F - Forward List, N - Non-Forward List

GroupAddress	Iface	SrcAddress	Flg	ExpiryTime	LastReporter
-----	-----	-----	---	-----	-----
226.7.7.7	vlan3	12.0.0.1	ISF	[0d 00:00:00.00]	30.0.0.1

### Related Commands

- `ip igmp static-group` - Adds the static group membership on the interface

## 2.1.15 show ip igmp statistics

Displays the IGMP statistics information.

```
show ip igmp statistics [{Vlan vlan-id | interface-type  
interface-id}]
```



**Mode** Privileged EXEC

**Example** SEFOS# **show ip igmp statistics**

```
IGMP Statistics for vlan1
  Number of General queries received 1
  Number of Group Specific queries received 0
  Number of Group and Source Specific queries received 0
  Number of v1/v2 reports received 0
  Number of v3 reports received 8
  Number of v2 leaves received 0
  Number of General queries transmitted 1
  Number of Group Specific queries transmitted 1
  Number of Group and Source Specific queries
transmitted 2
```

```
IGMP Statistics for vlan3
  Number of General queries received 0
  Number of Group Specific queries received 0
  Number of Group and Source Specific queries received 0
  Number of v1/v2 reports received 0
  Number of v3 reports received 6
  Number of v2 leaves received 0
  Number of General queries transmitted 1
  Number of Group Specific queries transmitted 0
  Number of Group and Source Specific queries
transmitted 0
```



## IGMP Proxy

---

IGMP Proxy implementation is used to learn and proxy group membership information, and then forward multicast packets based on the learned membership information. The IGMP Proxy learns membership information from IGMP hosts in downstream interfaces (interface to which hosts are connected) and substitutes (proxy) the information to upstream interface (interface to which upstream router is connected), based on the requirements of IGMP hosts.

IGMP Proxy is used mainly in edge devices. It reduces not only the cost of the devices, but also the operational overhead because, it does not need to support more complicated multicast routing protocols such as PIM.

---

### 3.1 IGMP Proxy Commands

The list of CLI commands for the configuration of IGMP is as follows:

- `ip igmp proxy-service`
- `ip igmp proxy service`
- `ip igmp-proxy mrouter`
- `ip igmp mroute proxy`
- `ip igmp-proxy mrouter-time-out`
- `ip igmp-proxy mrouter-version`
- `show ip igmp-proxy mrouter`
- `show ip igmp-proxy forwarding-database`

## 3.1.1 ip igmp proxy-service

Enables IGMP Proxy service in the system. The no form of the command disables IGMP proxy service in the system.

```
ip igmp proxy-service
```

```
no ip igmp proxy-service
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	IGMP proxy service is disabled.
<b>Example</b>	SEFOS(config)# <b>ip igmp proxy-service</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• IGMP module must be enabled globally.</li><li>• PIM module must be disabled.</li></ul>

### Related Commands

- `set ip igmp` - Enables or disables IGMP
- `set ip pim` - Enables or disables PIM
- `ip multicast` - Enables PIM globally
- `show ip igmp global-config` - Displays the global configuration of IGMP

## 3.1.2 ip igmp proxy service

Enables IGMP Proxy service in the system. This command operates similar to the `ip igmp proxy-service` command.

```
ip igmp proxy service
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	IGMP proxy service is disabled.
<b>Example</b>	SEFOS(config)# <b>ip igmp proxy service</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• IGMP module must be enabled globally.</li><li>• PIM module must be disabled. If enabling IGMP proxy module failed with PIM/DVMRP not disabled, ignore the error message.</li></ul>

### Related Commands

- `set ip igmp` - Enables or disables IGMP

- `set ip pim` - Enables or disables PIM
- `show ip igmp global-config` - Displays the global configuration of IGMP

### 3.1.3 `ip igmp-proxy mrouter`

This command configures the interface as an upstream interface. The `no` form of the command removes the interface from the upstream interface list.

```
ip igmp-proxy mrouter
```

```
no ip igmp-proxy mrouter
```

<b>Mode</b>	Interface Configuration Mode. This command is applicable only in the VLAN interface mode.
<b>Defaults</b>	The interface is configured as downstream interface.
<b>Example</b>	SEFOS(config-if)# <b>ip igmp-proxy mrouter</b>
<b>Notes</b>	IGMP must be enabled in the interface on which this configuration is executed.

#### Related Commands

- `show ip igmp-proxy mrouter` - Displays the upstream interface configuration of IGMP Proxy

### 3.1.4 `ip igmp mroute proxy`

Configures the interface as an upstream interface. This command operates similar to the command `ip igmp-proxy mrouter`.

```
ip igmp mroute proxy
```

<b>Mode</b>	Interface Configuration Mode. This command is applicable only in the VLAN interface mode.
<b>Defaults</b>	The interface is configured as downstream interface.
<b>Example</b>	SEFOS(config-if)# <b>ip igmp mroute proxy</b>
<b>Notes</b>	IGMP must be enabled in the interface on which this configuration is executed.

## Related Commands

- `ip igmp-proxy mrouter` - Displays the upstream interface configuration of IGMP Proxy

### 3.1.5 `ip igmp-proxy mrouter-time-out`

Configures the upstream interface purge interval time limit. When the time limit is reached, the IGMP version on the upstream interface switches back to the configured version.

```
ip igmp-proxy mrouter-time-out <(60 - 600) seconds>
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	125
<b>Example</b>	SEFOS(config-if)# <b>ip igmp-proxy mrouter-time-out 100</b>
<b>Notes</b>	This configuration must be executed on an upstream interface.

## Related Commands

- `ip igmp-proxy mrouter` - Displays the upstream interface configuration of IGMP Proxy

### 3.1.6 `ip igmp-proxy mrouter-version`

Configures the version of IGMP on upstream interface.

```
ip igmp-proxy mrouter-version {1 | 2 | 3}
```

<b>Syntax Description</b>	<b>1</b> – IGMP Version 1. <b>2</b> – IGMP Version 2. <b>3</b> – IGMP Version 3.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	3
<b>Example</b>	SEFOS(config-if)# <b>ip igmp-proxy mrouter-version 2</b>
<b>Notes</b>	The interface, on which this configuration is executed, must be an upstream interface.

## Related Commands

- `show ip igmp-proxy mrouter` - Displays the upstream interface configuration of IGMP Proxy

## 3.1.7 show ip igmp-proxy mrouter

Displays the upstream interface configuration of IGMP Proxy.

```
show ip igmp-proxy mrouter [Vlan <vlan-id>]
```

**Syntax**      `vlan` - VLAN identifier

**Mode**        Privileged EXEC

**Example**     SEFOS# `show ip igmp-proxy mrouter`

```
IfName/IfId OperVersion CfgVersion UpTime/VersionExpiryTime PurgeIntvl
-----
vlan3 /35 IGMPv3 IGMPv3 [0d 00:08:01.31]/0 125
vlan4 /36 IGMPv2 IGMPv2 [0d 00:00:25.67]/0 100
```

SEFOS# `show ip igmp-proxy mrouter vlan 4`

```
IfName/IfId OperVersion CfgVersion UpTime/VersionExpiryTime PurgeIntvl
-----
vlan4 /36 IGMPv2 IGMPv2 [0d 00:00:48.40]/0 100
```

**Notes**        IGMP proxy module must be enabled globally.

## Related Commands

- `ip igmp-proxy mrouter / ip igmp mroute proxy` - Configures the interface as an upstream interface
- `ip igmp-proxy mrouter-time-out` - Configures the upstream interface purge interval
- `ip igmp-proxy mrouter-version` - Configures the version of IGMP on upstream interface

## 3.1.8 show ip igmp-proxy forwarding-database

Displays the multicast forwarding information.

```
show ip igmp-proxy forwarding-database {[Vlan vlan-id] | [group  
group-address] | [source source-address]}
```

<b>Syntax</b>	<b>Vlan</b> – VLAN identifier.
<b>Description</b>	<b>group</b> <i>group-address</i> – Multicast group address. <b>source</b> <i>source-address</i> – Multicast source address.
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>show ip igmp-proxy forwarding-database</b>  IGMP Proxy Multicast Routing table ----- (Source, Group), Uptime/Expires(seconds) Incoming Interface: Interface Outgoing Interface: Interface, State  (13.0.0.10, 234.0.0.3) , [0d 00:23:55.65]/ 26 Incoming Interface : vlan3 Outgoing InterfaceList : vlan1, Forwarding vlan4, Forwarding  (13.0.0.10, 234.0.0.4) , [0d 00:23:55.65]/ 13 Incoming Interface : vlan3 Outgoing InterfaceList : vlan1, Forwarding vlan2, Forwarding vlan4, Forwarding  (13.0.0.11, 234.0.0.3) , [0d 00:23:55.65]/ 107 Incoming Interface : vlan3 Outgoing InterfaceList : vlan2, Forwarding vlan4, Forwarding



```
SEFOS# show ip igmp-proxy forwarding-database group
234.0.0.4
```

```
IGMP Proxy Multicast Routing table
```

```
-----
(Source, Group) , Uptime/Expires(seconds)
Incoming Interface: Interface
Outgoing Interface:
Interface, State
```

```
(13.0.0.10, 234.0.0.4) , [0d 00:24:30.29]/ 77
  Incoming Interface : vlan3
  Outgoing InterfaceList :
    vlan1, Forwarding
    vlan2, Forwarding
    vlan4, Forwarding
```

```
SEFOS# show ip igmp-proxy forwarding-database source
13.0.0.11
```

```
IGMP Proxy Multicast Routing table
```

```
-----
(Source, Group) , Uptime/Expires(seconds)
Incoming Interface: Interface
Outgoing Interface:
Interface, State
```

```
(13.0.0.11, 234.0.0.3) , [0d 00:24:49.36]/ 53
  Incoming Interface : vlan3
  Outgoing InterfaceList :
    vlan2, Forwarding
    vlan4, Forwarding
```

**Notes** IGMP proxy module must be enabled globally.

## Related Commands

- `show ip igmp-proxy mrouter` - Displays the upstream interface configuration of IGMP proxy



## IPv6

---

IPv6 is a new version of IP which is designed to be an evolutionary step from IPv4. It can be installed as a normal software upgrade in Internet devices and is interoperable with the current IPv4. It has expanded routing and addressing capabilities because of the 128-bit addressing as compared to the 32-bit addressing in IPv4. Its deployment strategy is designed to not have any flag days or other dependencies. IPv6 is designed to run well on high performance networks (for example, extreme-Ethernet, OC-12, ATM, and so on.) and at the same time still be efficient for low-bandwidth networks (such as wireless). In addition, it provides a platform for new Internet functionality that will be required in the near future.

IPv6 includes a transition mechanism, which is designed to allow users to adopt and deploy IPv6 in a highly diffuse fashion and to provide direct interoperability between IPv4 and IPv6 hosts. The IPv6 transition allows the users to upgrade their hosts to IPv6, and the network operators to deploy IPv6 in routers, with very little coordination between the two.

The changes from IPv4 to IPv6 fall primarily into the following categories.

- Expanded routing and addressing capabilities
- Usage of anycast address
- Header format simplification
- Improved support for options
- Quality-of-service capabilities
- Authentication and privacy capabilities

---

### 4.1 IPv6 Commands

The list of CLI commands for the configuration of IPv6 is as follows:

- `ipv6 enable`

- `ipv6 unicast-routing`
- `ipv6 address - prefix prefix-len`
- `ipv6 address - ipv6-prefix | prefix-length`
- `ipv6 - link-local address`
- `ipv6 - static routes`
- `ipv6 - neighbor`
- `ipv6 default - hop limit`
- `ipv6 nd suppress-ra`
- `ipv6 nd managed-config flag`
- `ipv6 nd other-config flag`
- `ipv6 hop-limit`
- `ipv6 nd ra-lifetime`
- `ipv6 nd dad attempts`
- `ipv6 nd reachable-time`
- `ipv6 nd ns - interval`
- `ipv6 nd ra-mtu`
- `ipv6 nd ra-interval`
- `ipv6 nd prefix`
- `ping ipv6`
- `debug ipv6`
- `traceroute`
- `clear ipv6 neighbors`
- `clear ipv6 traffic`
- `clear ipv6 route`
- `show ipv6 interface`
- `show ipv6 route`
- `show ipv6 route summary`
- `show ipv6 neighbors`
- `show ipv6 traffic`

## 4.1.1 `ipv6 enable`

Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address. The `no` form of the command disables IPv6 processing on the interface that has not been configured with an explicit IPv6 address.

```
ipv6 enable
```

```
no ipv6 enable
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 enable</b>
<b>Notes</b>	IPv6 is enabled on the default VLAN interface.

### Related Commands

- `ipv6 address - prefix prefix-len` - Configures IPv6 address on the interface
- `show ipv6 interface` - Displays the IPv6 interfaces
- `ipv6 router rip / ipv6 router rip - name` - Enables RIP6 and enters into the router configuration mode

## 4.1.2 `ipv6 unicast-routing`

Enables unicast routing. The `no` form of the command disables unicast routing.

```
ipv6 unicast-routing
```

```
no ipv6 unicast-routing
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	Enabled.
<b>Example</b>	SEFOS(config)# <b>ipv6 unicast-routing</b>

### Related Commands

- `ipv6 router rip / ipv6 router rip - name` - Enables RIP6 and enters into the router configuration mode

## 4.1.3 `ipv6 address - prefix prefix-len`

Configures IPv6 address on the interface. The `no` form of the command deletes the configured IPv6 address.

```
ipv6 address prefix prefix-len [{unicast | anycast | eui64}]
```

```
no ipv6 address prefix prefix-len [{unicast | anycast | eui64}]
```

<b>Syntax</b>	<b>prefix</b> – IPv6 prefix for the interface.
<b>Description</b>	<b>prefix-len</b> – IPv6 prefix length. <b>unicast</b> – Unicast type of prefix. <b>anycast</b> – Anycast type of prefix. <b>eui64</b> – Type of prefix where the latter 64 bits are formed from the link layer address.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	unicast
<b>Example</b>	SEFOS(config-if)# <b>ipv6 address 3333::1111 64 unicast</b>
<b>Notes</b>	The prefix length for eui64 type must be 64.

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.4 `ipv6 address - ipv6-prefix | prefix-length`

Configures IPv6 address on the interface.

```
ipv6 address {ipv6-prefix | prefix-length} [{unicast | anycast | eui-64 | link-local}]
```

<b>Syntax Description</b>	<i>ipv6-prefix</i> – IPv6 prefix for the interface. <i>prefix-length</i> – IPv6 prefix length. <b>unicast</b> – Unicast type of prefix. <b>anycast</b> – Anycast type of prefix. <b>eui64</b> – Type of Prefix where the latter 64 bits are formed from the link layer address. <b>link-local</b> – Link local type prefix.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	unicast
<b>Example</b>	SEFOS(config-if)# <b>ipv6 address 3333::1111/64 unicast</b>
<b>Notes</b>	The prefix length for eui64 type must be 64.

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.5 ipv6 - link-local address

Configures the IPv6 link-local address on the interface. The no form of the command deletes the configured IPv6 link-local address.

```
ipv6 address prefix link-local
```

```
no ipv6 address prefix link-local
```

<b>Syntax Description</b>	<b>prefix</b> – IPv6 Prefix for the interface. <b>link-local</b> – Type of address.
<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 address fe80::2222 link-local</b>
<b>Notes</b>	The prefix specified must be a valid link-local prefix.

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.6 ipv6 - static routes

Configures static routes. The no form of the command deletes the configured static routes.

```
ipv6 route prefix prefix-len ([next-hop] {[vlan vlan-id]})  
[administrative-distance] [unicast]
```

```
no ipv6 route prefix prefix-len ([nex-hop] {[vlan vlan-id]})  
[administrative-distance] [unicast]
```

<b>Syntax Description</b>	<i>prefix</i> - IPv6 prefix of the destination. <i>prefix-len</i> - Destination prefix length. <i>next-hop</i> - IPv6 prefix of the next hop that is used to reach the destination network. <b>vlan</b> - VLAN identifier. <i>administrative-distance</i> - Metric to reach the destination. <b>unicast</b> - Unicast type of prefix.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	<i>administrative-distance</i> - 1 <b>unicast</b>
<b>Example</b>	SEFOS(config)# <b>ipv6 route 2111::1111 64 3111::1111</b>
<b>Notes</b>	A route will be configured only when a proper route exists for the next-hop prefix in the route table.

### Related Commands

- `ipv6 - link-local address` - Configures the IPv6 link-local address on the interface
- `show ipv6 route` - Displays the IPv6 routes

## 4.1.7 ipv6 - neighbor

Configures a static entry in the IPv6 neighbor cache table. The no form of the command removes the static entry from the IPv6 neighbor cache table.

```
ipv6 neighbor prefix {vlan vlan-id} mac-address
```

```
no ipv6 neighbor prefix {vlan vlan-id} mac-address
```



<b>Syntax</b>	<b>prefix</b> – IPv6 prefix of the neighbor
<b>Description</b>	<b>vlan</b> – VLAN identifier <i>mac-address</i> – Link layer address of the interface
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>ipv6 neighbor 3333::1111 vlan 1 00:11:22:33:44:55</b>

### Related Commands

- `show ipv6 neighbors` - Displays the IPv6 neighbor cache entries

## 4.1.8 `ipv6 default - hop limit`

Defaults hop limit for IPv6 datagrams. The no form of command resets default hop limit for IPv6 datagrams.

```
ipv6 default-hop limit hop-limit_1-255
```

```
no ipv6 default-hop limit
```

<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>ipv6 default-hop limit 100</b>

`ipv6 nd suppress-ra`

Suppresses IPv6 router advertisement. The no form of the command enables IPv6 router advertisement.

```
ipv6 nd suppress-ra
```

```
no ipv6 nd suppress-ra
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	Router advertisements are suppressed.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd suppress-ra</b>

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces
- `show ipv6 traffic` - Displays the IPv6 ICMP and UDP statistics

## 4.1.9 `ipv6 nd suppress-ra`

Suppresses IPv6 router advertisement. The `no` form of the command enables IPv6 router advertisement.

```
ipv6 nd suppress-ra
```

```
no ipv6 nd suppress-ra
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	Router advertisements are suppressed.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd suppress-ra</b>

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces
- `show ipv6 traffic` - Displays the IPv6 ICMP and UDP statistics

## 4.1.10 `ipv6 nd managed-config flag`

Sets the `managed-config flag` which allows the host to use DHCP for address configuration. The `no` form of the command resets the `managed-config flag` which in turn does not allow the host to use DHCP for address configuration.

```
ipv6 nd managed-config flag
```

```
no ipv6 nd managed-config flag
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd managed-config flag</b>

### Related Commands

- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement

## 4.1.11 `ipv6 nd other-config flag`

Sets the `other-config flag`, which allows the host to use DHCP for other stateful configuration. The `no` form of the command resets the `other-config flag`, which in turn does not allow the host to use DHCP for other stateful configuration.

```
ipv6 nd other-config flag
```

```
no ipv6 nd other-config flag
```

**Mode**            Interface Configuration

**Example**        SEFOS(config-if)# **ipv6 nd other-config flag**

### Related Commands

- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement

## 4.1.12 `ipv6 hop-limit`

Configures the maximum hoplimit for all IPv6 packets originating from the interface and the configured hop limit is also used in router advertisement packet current hop limit field. The `no` form of the command resets the hop limit to the default value for all IPv6 packets originating from the interface and also the value in the router advertisement packet current hop limit field is reset to the default value.

```
ipv6 hop-limit limit_0-255
```

```
no ipv6 hop-limit
```

**Mode**            Interface Configuration

**Defaults**        64

**Example**        SEFOS(config-if)# **ipv6 hop-limit 100**

## 4.1.13 `ipv6 nd ra-lifetime`

Sets the IPv6 router advertisement lifetime.

```
ipv6 nd ra-lifetime seconds_0-9000
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	1800 seconds.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd ra-lifetime 1000</b>
<b>Notes</b>	The ND RA lifetime value must be greater than or equal to the RA interval.

### Related Commands

- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement
- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.14 `ipv6 nd dad attempts`

Sets the number of duplicate address detection attempts. The `no` form of the command resets the duplicate address detection attempts to its default value.

```
ipv6 nd dad attempts number-of-attempts_1-10
```

```
no ipv6 nd dad attempts
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	1
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd dad attempts 5</b>

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces
- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement

## 4.1.15 `ipv6 nd reachable-time`

Sets the advertised reachability time. The `no` form of the command resets the advertised reachability time to default value.

```
ipv6 nd reachable-time seconds_0-3600 | msec milliseconds_0-3600000
```

```
no ipv6 nd reachable-time
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	30
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd reachable-time 500</b>

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces
- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement

## 4.1.16 `ipv6 nd ns - interval`

Sets the advertised retransmission time. The `no` form of the command resets the advertised retransmission time to default value.

```
ipv6 nd ns-interval retransmission-time-miliseconds_1000-3600000
```

```
no ipv6 nd ns-interval
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd ns-interval 1000</b>

### Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.17 `ipv6 nd ra-mtu`

Sets router advertisement MTU optional value. The value ranges between 1280 and 1500. The `no` form of command resets the router advertisement MTU option value to the default value.

```
ipv6 nd ra-mtu router-advertisement-MTU
```

```
no ipv6 nd ra-mtu
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd ra-mtu 1400</b>

## Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.18 `ipv6 nd ra-interval`

Sets the IPv6 router advertisement interval. The `no` form of the command resets the IPv6 Router Advertisement interval to its default value.

```
ipv6 nd ra-interval maximum-interval-seconds_4-1800  
[minimum-interval-seconds_3-1350]
```

```
no ipv6 nd ra-interval
```

<b>Syntax</b>	<i>minimum-interval-seconds_3-1350</i> - Minimum router advertisement interval time in seconds.
<b>Description</b>	<i>maximum-interval-seconds_4-1800</i> - Maximum router advertisement interval time in seconds.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	600 seconds.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd ra-interval 200</b>

## Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces
- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement

## 4.1.19 `ipv6 nd prefix`

Configures the prefix to be advertised in IPv6 router advertisement. The `no` form of the command removes the prefix from the IPv6 router advertisement.

```
ipv6 nd prefix {prefix-addr prefix-len | default}  
[{{valid-lifetime> | infinite | at var-valid-lifetime}]  
[{preferred-lifetime | infinite | at var-preferred-lifetime} |  
no-advertise]] [off-link] [no-autoconfig]
```

```
no ipv6 nd prefix {prefix-addr prefix-len | default}
```

<b>Syntax</b>	<i>prefix-addr</i> – IPv6 prefix to be advertised.
<b>Description</b>	<p><i>prefix-len</i> – Length of the configured prefix.</p> <p><b>default</b> – Changes the default value of the rest of the parameters.</p> <p><i>valid-lifetime</i> – Sets the valid lifetime value for the prefix.</p> <p><b>infinite</b> – Sets the infinite valid lifetime value for the prefix.</p> <p><b>at</b> – Sets the variable valid lifetime value for the prefix.</p> <p><i>preferred-lifetime</i> – Sets the preferred lifetime value for the prefix.</p> <p><b>infinite</b> – Sets the infinite Preferred lifetime value for the prefix.</p> <p><b>at</b> – Sets the variable valid lifetime value for the prefix.</p> <p><b>no-advertise</b> – Sets the No-Advertise flag.</p> <p><b>off-link</b> – Sets the off-link flag.</p> <p><b>no-autoconfig</b> – Sets the no-autoconfig flag.</p>
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	<p>RA <i>valid-lifetime</i> – 25,9200 seconds.</p> <p>RA <i>preferred-lifetime</i> – 60,4800 seconds.</p>
<b>Example</b>	SEFOS(config-if)# <b>ipv6 nd prefix 3333::1111 64 500 400</b>
<b>Notes</b>	<i>valid-lifetime</i> must be greater than or equal to <i>preferred-lifetime</i> .

## Related Commands

- `show ipv6 interface` - Displays the IPv6 interfaces

## 4.1.20 ping ipv6

Sends IPv6 echo messages.

```
ping ipv6 prefix [data hex-str] [repeat count] [size value]
[anycast] [source {vlan vlan-id | source-prefix}] [timeout
seconds_1-100]
```

<b>Syntax Description</b>	<p><i>prefix</i> – IPv6 Destination prefix.</p> <p><b>data</b> – Data to be sent in ping message.</p> <p><b>repeat</b> – Number of ping messages.</p> <p><b>size</b> – Size of the ping message.</p> <p><b>anycast</b> – Type of prefix.</p> <p><b>source</b> – Source interface of the ping message can be as follows:</p> <ul style="list-style-type: none"> <li>• <i>vlan</i></li> <li>• <i>source-prefix</i></li> </ul> <p><b>timeout</b> – Duration to wait for the reply.</p>
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	<p><b>data</b> – a5a5</p> <p><b>repeat count</b> – 5</p> <p><b>size</b> – 100 bytes.</p> <p><b>timeout</b> – 5 seconds.</p>
<b>Example</b>	SEFOS# <b>ping ipv6 3333::1111 data a6b6</b>

## 4.1.21 debug ipv6

Enables IPv6 trace. The no form of the command disables IPv6 trace.

<b>debug ipv6 {IP6   ICMP   UDP6   ND   PING6}</b>
--

<b>no debug ipv6</b>
----------------------

<b>Syntax Description</b>	<p><b>IP6</b> – IP6 trace.</p> <p><b>ICMP</b> – ICMP trace.</p> <p><b>UDP6</b> – UDP6 trace.</p> <p><b>ND</b> – Neighbor discovery trace.</p> <p><b>PING6</b> – PING6 trace.</p>
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS# <b>debug ipv6 IP6</b>



## 4.1.22 traceroute

Traces route to the destination.

```
traceroute [ipv6 prefix]
```

<b>Syntax Description</b>	<b>ipv6</b> – IPv6 destination prefix.
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>traceroute ipv6 4444::1111</b>

## 4.1.23 clear ipv6 neighbors

Removes all the entries in the IPv6 neighbor table.

```
clear ipv6 neighbors
```

<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>clear ipv6 neighbors</b>

### Related Commands

- `show ipv6 neighbors` - Displays the IPv6 Neighbor Cache Entries

## 4.1.24 clear ipv6 traffic

Removes all the entries in the IPv6 traffic table.

```
clear ipv6 traffic
```

<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>clear ipv6 traffic</b>

### Related Commands

- `show ipv6 traffic` - Displays the IPv6 ICMP and UDP statistics

## 4.1.25 clear ipv6 route

Removes all the entries in IPv6 route table.

```
clear ipv6 route
```

**Mode** Privileged EXEC

**Example** SEFOS# **clear ipv6 route**

### Related Commands

- `show ipv6 route` - Displays the IPv6 routes

## 4.1.26 show ipv6 interface

Displays the IPv6 interfaces.

```
show ipv6 interface [{vlan vlan-id}][prefix]
```

**Syntax** **vlan** - VLAN identifier.

**Description** **prefix** - Prefix information.

**Mode** Privileged EXEC

**Example** SEFOS# **show ipv6 interface vlan 1 prefix**

Codes: A - Address , P - Prefix-Advertisement

D - Default , N - Not Advertised

AD 2222:: 64 [LA] Valid lifetime 2592000 , Preferred  
lifetime 604800

AD 2223:1:2:3:: 64 [LA] Valid lifetime 2592000 ,  
Preferred lifetime 604800

P 3333:: 64 [LA] Valid lifetime 700 , Preferred  
lifetime 600

PD 3334:: 64 [LA] Valid lifetime 2592000 , Preferred  
lifetime 604800

PN 3335:: 64 [] Valid lifetime 2592000 , Preferred  
lifetime 604800

SEFOS# **show ipv6 interface**

vlan1 is up, line protocol is up

IPv6 is Enabled

```
Link local address:
    fe80::201:2ff:fe03:405
Global unicast address(es):
Not Configured.
    Joined group address(es):
        ff02::1

    ff02::2
        ff02::1:ff03:405

MTU is 1500
    ICMP redirects are enabled

ND DAD is enabled, Number of DAD attempts: 1
    ND router advertisement is enabled
```

### Related Commands

- `ipv6 enable` - Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address
- `ipv6 address - prefix prefix-len / ipv6 address - ipv6-prefix | prefix-length` - Configures IPv6 address on the interface
- `ipv6 - link-local address` - Configures the IPv6 link-local address on the interface
- `no ipv6 nd suppress-ra` - Enables IPv6 router advertisement
- `ipv6 nd ra-lifetime` - Sets the IPv6 router advertisement lifetime
- `ipv6 nd dad attempts` - Sets duplicate address detection attempts
- `ipv6 nd reachable-time` - Sets the advertised reachability time
- `ipv6 nd ra-interval` - Sets the IPv6 router advertisement interval
- `ipv6 nd prefix` - Configures the prefix to be advertised in IPv6 router advertisement

## 4.1.27 show ipv6 route

Displays the IPv6 routes.

```
show ipv6 route
```

**Mode** Privileged EXEC

**Example** SEFOS# **show ipv6 route**

```
IPv6 Routing Table - 4 entries
Codes : C - Connected, S - Static
        O - OSPF, R - RIP, B - BGP
C   2222::/64    [1/1]
    via ::, vlan1
C   2223:1:2:3::/64 [1/1]
    via ::, vlan1
S   4444::/64    [1/20]
    via 2222::2222, vlan1
S   4445::/64    [1/20]
    via 2222::2222, vlan1
```

### Related Commands

- `ipv6 - static routes` - Configures static routes

## 4.1.28 `show ipv6 route summary`

Displays the summary of IPv6 routes.

```
show ipv6 route summary
```

**Mode** Privileged EXEC

**Example** SEFOS# **show ipv6 route summary**

```
IPv6 Routing Table Summary - 4 entries
  2 Connected, 2 Static, 0 RIP, 0 BGP, 0 OSPF
Number of prefixes:
/64: 4
```

### Related Commands

- `show ipv6 route` - Displays the IPv6 routes

## 4.1.29 show ipv6 neighbors

Displays the IPv6 neighbour cache entries.

```
show ipv6 neighbors
```

<b>Mode</b>	Privileged EXEC																								
<b>Example</b>	SEFOS# <b>show ipv6 neighbors</b>																								
	<table><thead><tr><th>IPv6 Address</th><th>Age</th><th>Link-layer Addr</th><th>State</th></tr></thead><tbody><tr><td>Interface</td><td></td><td></td><td></td></tr><tr><td>5555::1111</td><td>58</td><td>00:11:22:33:44:55</td><td>Static</td></tr><tr><td>vlan1</td><td></td><td></td><td></td></tr><tr><td>5556::1111</td><td>58</td><td>11:22:33:44:55:66</td><td>Static</td></tr><tr><td>vlan1</td><td></td><td></td><td></td></tr></tbody></table>	IPv6 Address	Age	Link-layer Addr	State	Interface				5555::1111	58	00:11:22:33:44:55	Static	vlan1				5556::1111	58	11:22:33:44:55:66	Static	vlan1			
IPv6 Address	Age	Link-layer Addr	State																						
Interface																									
5555::1111	58	00:11:22:33:44:55	Static																						
vlan1																									
5556::1111	58	11:22:33:44:55:66	Static																						
vlan1																									

### Related Commands

- `ipv6 - neighbor` - Configures a static entry in the IPv6 neighbor cache table

## 4.1.30 show ipv6 traffic

Displays the IPv6 ICMP and UDP statistics.

```
show ipv6 traffic [interface {vlan vlan-id | tunnel tunnel-id |  
interface-type if-num}] [hc]
```

<b>Syntax</b>	<i>vlan-id</i> - Vlan identifier.
<b>Description</b>	<i>tunnel-id</i> - Tunnel identifier. <i>interface-type</i> - Interface type. <i>interface-id</i> - Interface identifier.
	<b>hc</b> - High counters (64-bit).
<b>Mode</b>	Privileged EXEC

**Example**SEFOS# **show ipv6 traffic**

```

IPv6 Statistics
*****
0   Rcvd          0   HdrErrors      0   TooBigErrors
0   AddrErrors   0   FwdDgrams     0   UnknownProtos
0   Discards     0   Delivers     1   OutRequests
0   OutDiscards  0   OutNoRoutes  0   ReasmReqds
0   ReasmOKs    0   ReasmFails
0   FragOKs     0   FragFails    0   FragCreates
0   RcvdMcastPkt 1   SentMcastPkts 0   TruncatedPkts
0   RcvdRedirects 0   SentRedirects

0   InOctets     0   InNoRoutes    0   OutFwdDatgrms
0   OutFrgRqds  1   OutTrnsmit    64  OutOctets
0   InMcastOctets 24  OutMcastOctets 0   InBcstPkts
0   OutBcstPkts 0   DiscntTime    1000 RefrshRate

ICMP Statistics
*****

Received :
0   ICMPPkts     0   ICMPErrPkt    0   DestUnreach  0   TimeExcds
0   ParmProbs   0   PktTooBigMsg  0   ICMPEchoReq  0   ICMPEchoReps
0   RouterSols  0   RouterAdv     0   NeighSols    0   NeighAdv
0   Redirects   0   AdminProhib   0   ICMPBadCode

Sent :
0   ICMPMsgs    0   ICMPErrMsgs   0   DstUnReach   0   TimeExcds
0   ParmProbs   0   PktTooBigs    0   EchoReq      0   EchoReply
0   RouterSols  0   RouterAdv     1   NeighSols    0   NeighborAdv
0   RedirectMsgs 0   AdminProhibMsgs

UDP statistics
*****

Received :
0   UDPDgrams   1   UDPNoPorts    0   UDPErrPkts

Sent :
0   UDPDgrams

```

```
SEFOS# show ipv6 traffic interface vlan 1
```

```
IPv6 Statistics for interface vlan1
```

```
-----
```

0	Rcvd	0	InOctets	0	HdrErrors
0	InNoRoutes	0	AddrErrors	0	UnknownProtos
0	TruncatedPkts	0	FwdDatagrms	0	ReasmReqds
0	ReasmOKs	0	ReasmFails	0	Discards
0	Delivers	0	OutRequests	0	OutFwdDgrms
0	OutDiscards	0	FragReqds	0	FragOKs
0	FragFails	0	FragCreates	0	OutTrnsmits
0	OutOctets	0	InMcstPkts	0	InMcstOctets
0	OutMcstPkts	0	OutMcstOctets	0	InBcstPkts
0	OutBcstPkts	0	DiscntTime	1000	RefrshRate

```
SEFOS# show ipv6 traffic hc
```

```
IPv6 Statistics
```

```
*****
```

0	InRcvd	0	InOctets	0	InFwdDgrms
0	InDelivers	2	OutRequests	0	OutFwdDgrms
2	OutTrnsmits	128	OutOctets	0	InMcstPkts
0	InMcstOctets	2	OutMcstPkts	48	OutMcstOctets
0	InBcast	0	OutBcast		

```
UDP statistics
```

```
*****
```

0	HC InDatagrams	0	HC OutDatagrams
---	----------------	---	-----------------





## PIMv6

---

PIMv6 is a portable software implementation of the PIM (sparse mode) specification for IPv6 networks. PIMv6 provides support for inter-domain routing between domains using PIMv6-SM. It also avoids the performance problems of earlier multicast routing protocols. This software provides multicast routing and forwarding capabilities to a router that runs the IPv6 protocol along with MLD. PIMv6 routes multicast data packets independent of any unicast routing protocol.

---

### 5.1 PIMv6 Commands

The list of CLI commands for the configuration of PIMv6 is as follows:

- `set ip pim`
- `set ipv6 pim`
- `set ip pim threshold`
- `set ip pim spt-switchperiod`
- `set ip pim rp-threshold`
- `set ip pim rp-switchperiod`
- `set ip pim regstop-ratelimit-period`
- `set ip pim pmbr`
- `set ip pim static-rp`
- `ip pim component`
- `ipv6 pim rp-candidate rp-address`
- `ipv6 pim rp-static rp-address`
- `ipv6 pim query-interval`
- `ipv6 pim message-interval`

- `ipv6 pim bsr-candidate`
- `ipv6 pim componentId`
- `ipv6 pim dr-priority`
- `ipv6 pim override-interval`
- `ipv6 pim lan-delay`
- `set ipv6 pim lan-prune-delay`
- `no ipv6 pim interface`
- `debug ipv6 pim`
- `show ipv6 pim interface`
- `show ipv6 pim neighbor`
- `show ipv6 pim rp-candidate`
- `show ipv6 pim rp-set`
- `show ipv6 pim bsr`
- `show ipv6 pim rp-static`
- `show ipv6 pim component`
- `show ipv6 pim thresholds`
- `show ipv6 pim mroute`

## 5.1.1 set ip pim

Enables or disables PIM globally.

---

**Note** – In addition to the `set ipv6 pim enable` command, the `set ip pim enable` command must be executed to enable PIMv6.

---

<code>set ip pim {enable   disable}</code>
--

<b>Syntax</b>	<code>enable</code> – Enables PIM.
<b>Description</b>	<code>disable</code> – Disables PIM.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <code>set ip pim enable</code>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• PIM mode will be set as sparse, when PIM is enabled globally.</li> <li>• IGMP proxy service must be disabled in the system, before enabling the PIM globally.</li> </ul>

## 5.1.2 set ipv6 pim

Enables or disables PIMv6 globally.

```
set ipv6 pim {enable | disable}
```

<b>Syntax</b>	<b>enable</b> – Enables PIMv6.
<b>Description</b>	<b>disable</b> – Disables PIMv6.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS (config)# <b>set ipv6 pim enable</b>
<b>Notes</b>	When PIMv6 is globally enabled, the mode will be sparse.

### Related Commands

- `no ipv6 pim interface` - Displays the PIMv6 interfaces of the router

## 5.1.3 set ip pim threshold

Configures the SPT group or source threshold, when exceeded, switching to shortest path tree is initiated.

```
set ip pim threshold {spt-grp | spt-src}
number-of-packets_0-2147483647
```

<b>Syntax</b>	<b>spt-grp</b> – The threshold of data rate for any group. When exceeded, source specific counters are initiated for that particular group. It is based on number of bits per second.
<b>Description</b>	<b>spt-src</b> – The switching to shortest path tree is initiated when the threshold of data rate for any source is exceeded. It is based on number of bits per second. <i>number-of-packets_0-2147483647</i> – Number of packets.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS (config)# <b>set ip pim threshold spt-grp 50</b>

### Related Commands

- `show ipv6 pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.4 set ip pim spt-switchperiod

Configures the period (in seconds) over which the data rate is to be monitored for switching to shortest path tree.

```
set ip pim spt-switchperiod seconds_0-2147483647
```

**Mode** Global Configuration

**Defaults** 0

**Example** SEFOS (config)# **set ip pim spt-switchperiod 60**

**Notes**

- The same period is used for monitoring the data rate for both source and group. To switch to SPT, this period must be configured.
- The SPT is used for multicast transmission of packets with the shortest path from sender to recipients.

### Related Commands

- [show ipv6 pim thresholds](#) - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.5 set ip pim rp-threshold

Sets the threshold at which RP initiates switching to source specific shortest path tree.

```
set ip pim rp-threshold number-of-reg-pkts_0-2147483647
```

**Mode** Global Configuration

**Example** SEFOS (config)# **set ip pim rp-threshold 200**

### Related Commands

- [show ipv6 pim thresholds](#) - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.6 set ip pim rp-switchperiod

Sets the period (in seconds) over which RP monitors register packets for switching to the source specific shortest path tree.

```
set ip pim rp-switchperiod seconds_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS (config)# <b>set ip pim rp-switchperiod 100</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• To switch to SPT, this period must be configured</li> <li>• RP-tree is a pattern that multicast packets are sent to a PIM-SM router by unicast and then forwarded to actual recipients from RP</li> </ul>

### Related Commands

- `show ipv6 pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.7 `set ip pim regstop-ratelimit-period`

Sets the period over which RP monitors the number of register packets after sending the register stop message.

```
set ip pim regstop-ratelimit-period seconds_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	5
<b>Example</b>	SEFOS (config)# <b>set ip pim regstop-ratelimit-period 100</b>
<b>Notes</b>	The register stop message is used to avoid encapsulation of multicast data packets from the first hop router to the RP.

### Related Commands

- `show ipv6 pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.8 `set ip pim pmbr`

Enables or disables the PMBR (PIM multicast border router) status.

```
set ip pim pmbr {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables the PMBR status. <b>disable</b> – Disables the PMBR status.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS (config)# <b>set ip pim pmbr enable</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• A PMBR integrates two different PIM domains (either PIM-SM or PIM-DM).</li> <li>• A PMBR connects a PIM domain to other multicast routing domain(s).</li> </ul>

### Related Commands

- `show ipv6 pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 5.1.9 set ip pim static-rp

Enables or disables the static RP configuration status. This command specifies whether to use the configured static RP.

```
set ip pim static-rp {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables the static RP configuration status. <b>disable</b> – Disables the static RP configuration status.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS (config)# <b>set ip pim static-rp enable</b>

### Related Commands

- `show ipv6 pim rp-set` - Displays the RP-set information
- `show ipv6 pim rp-static` - Displays the RP-static information

## 5.1.10 ip pim component

Configures the PIMv6 component in the router. The no form of the command destroys the PIMv6 component.

```
ip pim component component-id_1-255
```

```
no ip pim component component-id_1-255
```

**Mode** Global Configuration

**Example** SEFOS(config)# **ip pim component 1**

**Notes**

- PIMv6 component 1 cannot be deleted, as it is the default component.
- The PIMv6 component corresponds to each instance of a PIMv6 domain and classifies it as sparse or dense mode. Currently, only sparse mode is supported.

### Related Commands

- `show ipv6 pim component` - Displays the component information

## 5.1.11 ipv6 pim rp-candidate rp-address

Sets the address of the interface, which will be advertised as a candidate-RP. The `no` form of the command disables the address of the interface, which will be advertised as a candidate-RP.

```
ipv6 pim rp-candidate rp-address group-address group-mask  
rp-address
```

```
no ipv6 pim rp-candidate rp-address group-address group-mask  
rp-address
```

**Syntax Description**

*group-address* – IPv6 multicast group address.  
*group-mask* – IPv6 multicast group address mask that gives the group prefix for which the entry contains information about RP.  
*rp-address* – IPv6 address of the rendezvous point.

**Mode** PIM Component

**Example** SEFOS(pim-comp)# **ipv6 pim rp-candidate rp-address**  
**ff02::e001:0000 112 3333::1111**

**Notes** A candidate-RP is a router configured to send periodic candidate-RP-advertisement messages to the BSR, and processes join/prune or register messages for the advertised group prefix, when it is elected as a RP.

### Related Commands

- `show ipv6 pim rp-set` - Displays the PIMv6 RP-set information
- `show ipv6 pim rp-candidate` - Displays the PIMv6 RP-candidate information

## 5.1.12 ipv6 pim rp-static rp-address

Sets the address of the IPv6 interface, which will be advertised as a Static-RP. The no form of the command disables the address of the IPv6 interface, which will be advertised as a Static-RP.

```
ipv6 pim rp-static rp-address group-address group-mask rp-address
```

```
no ipv6 pim rp-static rp-address group-address group-mask  
rp-address
```

<b>Syntax Description</b>	<i>group-address</i> – IPv6 multicast group address. <i>group-mask</i> – IPv6 multicast group address mask that gives the group prefix for which the entry contains information about RP. <i>rp-address</i> – IPv6 address of the rendezvous point.
<b>Mode</b>	PIM Component
<b>Example</b>	SEFOS (pim-comp)# <b>ipv6 pim rp-static rp-address ff02::e001:0000 112 3333::1111</b>
<b>Notes</b>	The static configuration allows additional structuring of the multicast traffic by directing the multicast join or prune messages to statically configured RPs.

### Related Commands

- `show ipv6 pim rp-static` - Displays the RP-static information

## 5.1.13 ipv6 pim query-interval

Sets the frequency at which PIMv6 hello messages are transmitted on the interface. The no form of the command sets the default hello timer interval for the interface.

```
ipv6 pim query-interval seconds_0-65535
```

```
no ipv6 pim query-interval
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	30
<b>Example</b>	SEFOS (config-if)# <b>ipv6 pim query-interval 60</b>
<b>Notes</b>	The query message informs the presence of a PIMv6 router on the interface to the neighboring PIMv6 routers.



### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router

## 5.1.14 `ipv6 pim message-interval`

Sets the frequency at which the PIMv6 join or prune messages are transmitted on the PIMv6 interface. The `no` form of the command sets the default value for the PIMv6 join/prune messages.

```
ipv6 pim message-interval seconds_0-65535
```

```
no ipv6 pim message-interval
```

**Mode** Interface Configuration

**Defaults** 60

**Example** SEFOS (config-if)# **ipv6 pim message-interval 120**

**Notes** The join/prune message interval used on all the PIMv6 routers in the PIMv6 domain must be the same. If all the routers do not use the same timer interval, the performance of PIMv6 sparse can be adversely affected.

### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router.

## 5.1.15 `ipv6 pim bsr-candidate`

Sets the preference value for the local PIMv6 interface as a candidate bootstrap router. The `no` form of the command sets the default preference value for the local PIMv6 interface as a candidate bootstrap router.

```
ipv6 pim bsr-candidate 0-255
```

```
no ipv6 pim bsr-candidate
```

**Mode** Interface Configuration

**Defaults** 0

**Example** SEFOS (config-if)# **ipv6 pim bsr-candidate 1**

**Notes** A BSR is a dynamically elected router within the PIMv6 domain.

## Related Commands

- `show ipv6 pim bsr` - Displays the PIMv6 BSR information

## 5.1.16 `ipv6 pim componentId`

Adds the interface to the component.

```
ipv6 pim component-id 1-255
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	1
<b>Example</b>	SEFOS (config-if)# <b>ipv6 pim componentId 1</b>
<b>Notes</b>	This command adds the current VLAN into the specified PIMv6 component.

## Related Commands

- `debug ipv6 pim` - Enables or disables PIMv6 globally
- `show ipv6 pim component` - Displays the component information

## 5.1.17 `ipv6 pim dr-priority`

Sets the designated router priority value configured for the PIMv6 router interface. The `no` form of the command sets the default designated router priority value for the PIMv6 router interface.

```
ipv6 pim dr-priority 1-65535
```

```
no ipv6 pim dr-priority
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	1
<b>Example</b>	SEFOS (config-if)# <b>ipv6 pim dr-priority 100</b>
<b>Notes</b>	The DR sets up multicast route entries and sends corresponding join/prune and register messages on behalf of directly-connected receivers and sources, respectively.

### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router

## 5.1.18 `ipv6 pim override-interval`

Sets the override interval configured for the PIMv6 router interface. The no form of the command sets the default override interval for the PIMv6 router interface.

```
ipv6 pim override-interval seconds_0-65535
```

```
no ipv6 pim override-interval
```

**Mode** Interface Configuration

**Defaults** 0

**Example** SEFOS (config-if)# **ipv6 pim override-interval 100**

**Notes** The override interval is the random amount of time delayed for sending override messages to avoid synchronization of override messages when multiple downstream routers share a multi-access link.

### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router.

## 5.1.19 `ipv6 pim lan-delay`

Sets the LanDelay configured for the PIMv6 router interface. The no form of the command sets the default LanDelay for the PIMv6 router per interface.

```
ipv6 pim lan-delay seconds_0-65535
```

```
no ipv6 pim lan-delay
```

**Mode** Interface Configuration

<b>Defaults</b>	0
<b>Example</b>	SEFOS (config-if)# <b>ipv6 pim lan-delay 120</b>
<b>Notes</b>	The LAN delay inserted by a router in the LAN prune delay option expresses the expected message propagation delay on the interface. It is used by upstream routers to find out the delayed time interval for a Join override message before pruning an interface.

### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router.

## 5.1.20 `set ipv6 pim lan-prune-delay`

Sets the LanPruneDelay bit configured for the PIMv6 router interface to advertise the LAN delay. The command specifies whether to use LAN prune delay or not.

```
set ipv6 pim lan-prune-delay {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables LAN-prune-delay. <b>disable</b> – Disables LAN-prune-delay.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS (config-if)# <b>set ipv6 pim lan-prune-delay enable</b>

### Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router

## 5.1.21 `no ipv6 pim interface`

Deletes the IPv6 PIM Interface. That is, this command destroys the interface at PIMv6.

```
no ipv6 pim interface
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS (config-if)# <b>no ipv6 pim interface</b>

## Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router.

## 5.1.22 debug ipv6 pim

Enables PIMv6 trace. The no form of the command disables PIMv6 trace.

```
debug ipv6 pim {[nbr] [grp] [jp] [ast] [bsr] [io] [pibr] [mrt]
[mdh] [mgmt] | [all]}
```

```
no debug ipv6 pim {[nbr] [grp] [jp] [ast] [bsr] [io] [pibr] [mrt]
[mdh] [mgmt] | [all]}
```

<b>Syntax</b>	<b>nbr</b> – Neighbor Discovery traces
<b>Description</b>	<b>grp</b> – Group Membership traces <b>jp</b> – Join or Prune traces <b>ast</b> – Assert state traces <b>bsr</b> – Bootstrap/RP traces <b>io</b> – Input Output traces <b>pibr</b> – Interoperability traces <b>mrt</b> – Multicast Route Table Update traces <b>mdh</b> – Multicast Data Handling traces <b>mgmt</b> – Configuration traces <b>all</b> – All traces
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>debug ipv6 pim all</b>
<b>Notes</b>	A 4-byte integer value is specified for enabling the level of debugging. Each bit in the 4-byte integer variable represents a level of debugging. Combinations of levels are also allowed. The user has to enter the corresponding integer value for the bit set.

## Related Commands

- `show ipv6 pim interface` - Displays the PIMv6 interfaces of the router.

## 5.1.23 show ipv6 pim interface

Displays the PIMv6 interfaces of the router. The command shows the list of interface addresses, the mode of the interface, designated router on that interface, hello interval, join or prune interval of the interface.

```
show ipv6 pim interface [{Vlan vlan-id | detail}]
```

**Syntax**  
**Description**

**Vlan** – VLAN identifier.  
**detail** – Detailed information of the interface.

**Mode**  
Privileged EXEC

**Example**

```
SEFOS# show ipv6 pim interface
Address          IfName/      Ver/      Nbr      Qry      DR      DR
                  IfId         Mode      Count   Interval Address  Prio-
-----          -
fe80::2:a00:1    vlan1/33     2/Sparse  0        150     fe80::2:a00:1  1
fe80::2:1400:1   vlan2/34     2/Sparse  0         30     fe80::2:1400:1  1
fe80::2:1e00:1   vlan3/35     2/Sparse  0         30     fe80::2:1e00:1  1

SEFOS# show ipv6 pim interface vlan 1
Address          IfName/      Ver/      Nbr      Qry      DR      DR
                  IfId         Mode      Count   Interval Address  Prio-
-----          -
fe80::2:a00:1    vlan1/33     2/Sparse  0         150     fe80::2:a00:1  1

SEFOS# show ipv6 pim interface detail
vlan1 33 is up
  Internet Address is fe80::2:a00:1
  Multicast Switching : Enabled
  PIM : Enabled
  PIMv6 : Enabled
    PIM version : 2, mode: Sparse
    PIM DR : fe80::2:a00:1
    PIM DR Priority : 1
    PIM Neighbour Count : 0
    PIM Hello/Query Interval : 150
    PIM Message Interval : 200
    PIM Override Interval : 0
    PIM Lan Delay : 0
    PIM Lan-Prune-Delay : Disabled
    PIM Component Id : 1
    PIM domain border : disabled
```

## Related Commands

- `set ipv6 pim` - Enables or disables PIMv6
- `ipv6 pim query-interval` - Sets the frequency at which PIMv6 hello messages are transmitted on the interface
- `ipv6 pim message-interval` - Sets the frequency at which PIMv6 Join/Prune messages are transmitted on the PIMv6 interface
- `ipv6 pim bsr-candidate` - Sets the preference value for the local PIMv6 interface as a candidate bootstrap router
- `ipv6 pim dr-priority` - Sets the designated router priority value configured for the PIMv6 router interface
- `ipv6 pim override-interval` - Sets the override interval configured for the PIMv6 router interface
- `ipv6 pim lan-delay` - Sets the LanDelay configured for the PIMv6 router interface
- `set ipv6 pim lan-prune-delay` - Sets the LanPruneDelay bit configured for the PIMv6 router interface to advertise the lan delay
- `no ipv6 pim interface` - Deletes an interface at PIMv6 level
- `debug ipv6 pim` - Enables PIMv6 trace

## 5.1.24 `show ipv6 pim neighbor`

Displays the PIMv6 neighbor(s) information of the router. It displays the neighbor address, the interface used to reach the PIMv6 neighbor, the up time (the time since this neighbor became the neighbor of the local router), expiry time (the minimum time remaining before this PIMv6 neighbor will be aged out), LAN delay and override interval.

```
show ipv6 pim neighbor [Vlan vlan-id]
```

**Syntax  
Description**

**vlan** – VLAN identifier.

**Mode**

Privileged EXEC

**Example**

```
SEFOS# show ipv6 pim neighbor
Nbr          If          Uptime/      Ver  DRPri/  Comp Over-  Lan
Address      Name      Expiry      Mode  Id  ride  Delay
              /Idx                      Interval
-----
fe80::2:a00:a  vlan1/33  00:02:33/0  v2  0/S      1    0    0
fe80::2:1400:a  vlan2/34  00:02:33/0  v2  0/S      1    0    0
```

```
SEFOS# show ipv6 pim neighbor vlan 1
```

```
Nbr          If          Uptime/      Ver  DRPri/  Comp Over-  Lan
Address      Name      Expiry      Mode  Id  ride  Delay
              /Idx                      Interval
-----
fe80::2:a00:a  vlan1/33  00:02:58/0  v2  0/S      1    0    0
```

**Related Commands**

- `ipv6 pim query-interval` - Sets the frequency at which PIMv6 hello messages are transmitted on the interface
- `ipv6 pim message-interval` - Sets the frequency at which PIMv6 Join/Prune messages are transmitted on the PIMv6 interface
- `ipv6 pim bsr-candidate` - Sets the preference value for the local PIMv6 interface as a candidate bootstrap router

## 5.1.25 show ipv6 pim rp-candidate

Displays the PIMv6 RP-candidate information. It displays the group addresses, the group mask and the RP address that indicates the IP address of the rendezvous point (RP) for the listed PIM Sparse group.

```
show ipv6 pim rp-candidate component-id_1-255
```

**Mode** Privileged EXEC

**Example**

```
SEFOS# show ipv6 pim rp-candidate 1
CompId      GroupAddress/PrefixLength      RPAddress/Priority
-----
1           ff02::e000:0/112              3333::a00:1/192
```



### Related Commands

- `ipv6 pim rp-candidate rp-address` - Sets the address of the interface, which will be advertised as a candidate-RP
- `ipv6 pim rp-static rp-address` - Sets the address of the interface, which will be advertised as a static-RP

## 5.1.26 `show ipv6 pim rp-set`

Displays the PIMv6 RP-set information. It displays details of the group prefix, RP address, hold time, and expiry time.

```
show ipv6 pim rp-set rp-address
```

<b>Syntax Description</b>	<i>rp-address</i> - Indicates the IPv6 address of the rendezvous point (RP) for the listed PIM sparse group.
<b>Mode</b>	Privileged EXEC
<b>Example</b>	<pre>SEFOS# <b>show ipv6 pim rp-set 3333::a00:a</b> PIM Group-to-RP mappings ----- Group Address : ff00::Group Mask : 8 RP: 3333::a00:a Component-Id : 1 Hold Time : 102, Expiry Time : 00:00:35</pre>

### Related Commands

- `ipv6 pim rp-candidate rp-address` - Enables the address of the interface, which will be advertised as a candidate-RP
- `ipv6 pim rp-static rp-address` - Sets the address of the interface, which will be advertised as a static-RP

## 5.1.27 `show ipv6 pim bsr`

This command displays the PIMv6 BSR information.

```
show ipv6 pim bsr component-id_1-255
```

```

Mode           Privileged EXEC

Example       SEFOS# show ipv6 pim bsr 1
                PIMv2 Bootstrap Configuration For Component 1
                -----
                Elected BSR for Component 1
                V6 BSR Address : 3333::a00:1
                V6 BSR Priority : 100, Hash Mask Length : 126
                This System is V6 Candidate BSR for Component 1
                V6 BSR Address : 3333::a00:1
                V6 BSR Priority : 100

```

### Related Commands

- `ipv6 pim bsr-candidate` - Sets the preference value for the local interface as a candidate bootstrap router

## 5.1.28 `show ipv6 pim rp-static`

Displays the static RP information.

```
show ipv6 pim rp-static component-id_1-255
```

```

Mode           Privileged EXEC

Example       SEFOS# show ipv6 pim rp-static
                Static-RP Enabled

                CompId      GroupAddress/PrefixLength      RPAddress
                -----      -
                1           ff02::1111:2222/64             3333::4444

```

### Related Commands

- `ipv6 pim rp-static rp-address` - Enables or disables the Static RP configuration status

## 5.1.29 `show ipv6 pim component`

Displays the component information.

```
show ipv6 pim component component-id_1-255
```

```

Mode           Privileged EXEC
Example        SEFOS# show ipv6 pim component 1

PIM Component Information
-----
Component-Id: 1
PIM Mode: sparse,    PIM Version: 2
Elected BSR: 10.0.0.1
Candidate RP Holdtime: 0

```

### Related Commands

- `ipv6 pim componentId` - Adds the interface to the component

## 5.1.30 show ipv6 pim thresholds

Displays threshold configured for SPT, RP thresholds, and rate limit values for both SM and DM.

```
show ipv6 pim thresholds
```

```

Mode           Privileged EXEC
Example        SEFOS# show ipv6 pim thresholds

PIM SPT Threshold Information
-----
Group Threshold   : 111
Source Threshold  : 222
Switching Period  : 100

PIM SPT-RP Threshold Information
-----
Register Threshold      : 333
RP Switching Period     : 300
Register Stop rate limit : 400

```

### Related Commands

- `set ip pim threshold` - Configures the SPT group or source threshold
- `set ip pim spt-switchperiod` - Configures the period (in seconds) over which the data rate is to be monitored for switching to shortest path tree

- `set ip pim threshold` - Sets the threshold at which the RP initiates switching to source specific shortest path tree
- `set ip pim rp-switchperiod` - Sets the period (in seconds) over which RP monitors register packets for switching to the source specific shortest path tree
- `set ip pim regstop-ratelimit-period` - Sets the period over which RP monitors number of register packets after sending the register stop message
- `set ip pim pmbr` - Enables or disables the PMBR status
- `ipv6 pim dr-priority` - Sets the designated router priority value configured for the router interface

## 5.1.31 show ipv6 pim mroute

Displays the IPv6 PIM mroute information.

```
show ipv6 pim mroute [ {component-id_1-255 | group group-address
| source source-address} summary]
```

<b>Syntax</b>	<i>component-id_1-255</i> - Component identifier.
<b>Description</b>	<p><i>group-address</i> - Indicates the PIMv6 multicast group address using the listed RP.</p> <p><i>source-address</i> - The network address which identifies the sources for which this entry contains multicast routing information.</p> <p><b>summary</b> - Summary of PIMv6 mroute information.</p>
<b>Mode</b>	Privileged EXEC
<b>Example</b>	<pre>SEFOS# show ipv6 pim mroute IP Multicast Routing Table ----- Route Flags S: SPT Bit W: Wild Card Bit R: RPT Bit Timers: Uptime/Expires Interface State: Interface, State/Mode PIM Multicast Routing Table For Component 1 (*, ff02::e001:0) ,00:03:54/---3401:510a::3401:51a) Incoming Interface : vlan1 ,RPF nbr : fe80::2:a00:a ,Route Flags : WR Outgoing InterfaceList : vlan2, Forwarding/Sparse ,00:03:54/---</pre>

```

SEFOS# show ipv6 pim mroute group ff02::e001:0 summary
IP Multicast Routing Table
-----
Route Flags S: SPT Bit W: Wild Card Bit R: RPT Bit
Timers: Uptime/Expires
PIM Multicast Routing Table For Component 1
(*, ff02::e001:0) ,00:02:49/---3401:510a::3401:51a)
,Route Flags : WR

SEFOS# show ipv6 pim mroute source ca8d:5102::ca8d:5102
summary

IP Multicast Routing Table
-----
Route Flags S: SPT Bit W: Wild Card Bit R: RPT Bit
Timers: Uptime/Expires

(ca8d:5102::ca8d:5102, ff02::e001:0) ,00:01:04/04:01:45
,Route Flags : ---

```

**Notes** It shows details of the (S,G) ,(\*,G) and (\*,\*,RP) entries.

## Related Commands

- `ipv6 pim bsr-candidate` - Sets the preference value for the local IPv6 interface as a candidate bootstrap router



# RIP

---

RIP is a widely used protocol for managing router information within a self-contained network, such as a corporate LAN or an interconnected group of such LANs. RIP is classified by the IETF as one of several internal gateway protocols.

RIP sends routing-update messages at regular intervals and when the network topology changes. When a router receives a routing update that includes changes to an entry, it updates its routing table to reflect the new route. The metric value for the path is increased by 1, and the sender is indicated as the next hop. RIP routers maintain only the best route (the route with the lowest metric value) to a destination. After updating its routing table, the router immediately begins transmitting routing updates to inform other network routers of the change. These updates are sent independently of the regularly scheduled updates that RIP routers send. RIP uses a hop count as a way to determine network distance. Each host with a router in the network uses the routing table information to determine the next host to route a packet to for a specified destination.

---

## 6.1 RIP Commands

The list of CLI commands for the configuration of RIP is as follows:

- `router rip`
- `ip rip security`
- `ip rip retransmission`
- `network`
- `neighbor`
- `passive-interface vlan`
- `output-delay`
- `output-delay delay`

- `validate-update-source`
- `redistribute`
- `default-metric`
- `auto-summary - enable | disable`
- `auto-summary`
- `ip rip default route originate`
- `default-information originate`
- `ip rip summary-address`
- `ip summary-address rip`
- `ip rip default route install`
- `ip rip send version`
- `ip rip receive version`
- `version`
- `ip rip authentication mode`
- `ip rip authentication mode {text | md5}`
- `ip rip authentication key-chain`
- `timers basic - update-value`
- `timers basic - update-interval`
- `ip split-horizon`
- `debug ip rip`
- `debug ip rip {database | events | triggers}`
- `show ip rip`

## 6.1.1 router rip

Enters the router configuration mode. The `no` form of the command disables RIP on all the interfaces.

```
router rip
```

```
no router rip
```



<b>Syntax</b>	<b>router rip</b> - Enables router configuration mode.
<b>Description</b>	<b>no router rip</b> - Disables RIP on all interfaces.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>router rip</b>

### Related Commands

- `network` - Enables RIP on an IP network
- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.2 ip rip security

Accepts or ignores RIP1 packets when authentication is in use. The `no` form of the command sets the security level to its default value.

```
ip rip security {minimum | maximum}
```

```
no ip rip security
```

<b>Syntax</b>	<b>minimum</b> - Denotes that the RIP1 packets will be accepted even when authentication is in use.
<b>Description</b>	<b>maximum</b> - Denotes that the RIP1 packets will be ignored when authentication is in use.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>maximum</b>
<b>Example</b>	SEFOS(config-router)# <b>ip rip security minimum</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.3 ip rip retransmission

Configures the timeout interval and number of retries to retransmit the update request packet or an unacknowledged update response packet. The `no` form of the command sets the retransmission timeout interval or the number of retransmission retries to its default value.

```
ip rip retransmission {interval timeout_5-10 | retries 10-40}
```

```
no ip rip retransmission {interval | retries}
```

<b>Syntax Description</b>	<b>interval</b> – The timeout interval to be used to retransmit the update request packet or an unacknowledged update response packet. <b>retries</b> – The maximum number of retransmissions of the update request and update response packets.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>interval</b> – 5 <b>retries</b> – 36
<b>Example</b>	SEFOS(config-router)# <b>ip rip retransmission interval 6</b> SEFOS(config-router)# <b>no ip rip retransmission retries</b>
<b>Notes</b>	During retries, if no response is received the routes through the next hop router are marked unreachable.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.4 network

Enables RIP on an IP network or an unnumbered interface. The `no` form of the command disables RIP on an IP network or an unnumbered interface.

```
network ip-address [unnum {vlan 1-4094 | iftype ifnum}]
```

```
no network ip-address [unnum {vlan 1-4094 | iftype ifnum}]
```

<b>Syntax Description</b>	<b>ip-address</b> – IP address for the entry. <b>unnum vlan</b> – VLAN identifier for which no IP address is configured. <b>iftype</b> – Interface type. <b>ifnum</b> – Interface identifier.
---------------------------	--

<b>Mode</b>	Router Configuration
<b>Example</b>	<pre>SEFOS(config)# interface vlan 1 SEFOS(config-if)# shutdown SEFOS(config-if)# ip address 10.0.0.1 255.255.0.0 SEFOS(config-if)# no shutdown SEFOS(config-if)# exit SEFOS(config)# router rip SEFOS(config-router)# network 10.0.0.1</pre>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The network number specified must not contain any subnet information. RIP routing updates will be sent and received only through interfaces on this network.</li> <li>• RIP sends updates to the interfaces in the specified networks. Also, if the network of an interface is not specified, the interface will not be advertised in any RIP update.</li> </ul>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.5 neighbor

Adds a trusted neighbor router. The `no` form of the command deletes a trusted neighbor router.

```
neighbor ip-address
```

```
no neighbor ip-address
```

<b>Syntax</b>	<i>ip-address</i> – IP address of the trusted neighbor router.
<b>Description</b>	
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>neighbor 10.0.0.5</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• This command is used to configure the IP address of the router from which this router can accept RIP Packets.</li> <li>• Multiple neighbor commands can be used to specify additional trusted neighbors or peers.</li> </ul>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.6 passive-interface vlan

Suppresses routing updates on an interface. The **no** form of the command does not suppress routing updates from an interface.

```
passive-interface {vlan 1-4094 | interface-type interface-id}
```

```
no {vlan 1-4094 | interface-type interface-id}
```

<b>Syntax</b>	<b>vlan</b> – VLAN identifier.
<b>Description</b>	<i>interface-type</i> – Interface type. <i>interface-id</i> – Interface identifier.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>passive-interface vlan 1</b>
<b>Notes</b>	If the sending of routing updates is disabled on an interface, the particular subnet will continue to be advertised to other interfaces, and updates from other routers on that interface continue to be received and processed.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.7 output-delay

Enables interpacket delay for RIP updates. The **no** form of the command disables interpacket delay for RIP updates. This command also helps in preventing the routing table from losing information by enabling the interpacket delay.

```
output-delay
```

```
no output-delay
```

<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>output-delay</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.8 output-delay *delay*

This command configures the interpacket delay for the RIP updates. The interpacket delay ranges between 8 and 50 milliseconds. This command also helps in preventing the routing table from losing information by configuring the interpacket delay.

```
output-delay milliseconds_8-50
```

<b>Syntax</b>	<b>output-delay</b> - Configures the interpacket delay for RIP updates.
<b>Description</b>	
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>output-delay 10</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.9 validate-update-source

Configures the validate source option for RIP. That is, this command enables the source IP address validation of incoming routing updates for RIP and IGRP routing protocols.

```
validate-update-source
```

<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>validate-update-source</b>

## 6.1.10 redistribute

Enables redistribution of corresponding protocol routes into RIP. The no form of the command disables redistribution of corresponding protocol routes into RIP.

```
redistribute {all | connected | ospf | static} [ route-map  
name_1-20]
```

```
no redistribute {all | connected | ospf | static} [ route-map  
name_1-20]
```

<b>Syntax Description</b>	<p><b>all</b> – Advertises all routes learned in the RIP process.</p> <p><b>connected</b> – Connected routes redistribution.</p> <p><b>ospf</b> – Advertises routes learned by OSPF in the RIP process.</p> <p><b>static</b> – Statically configured routes to advertise in the RIP process.</p> <p><b>route-map</b> – Name of the Route Map to be applied during redistribution of routes from Route Table Manager to RIP. If this is not specified, all routes are redistributed.</p>
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>redistribute all</b>

### Related Commands

- `default-metric` - Sets the RIP default metric
- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.11 default-metric

Sets the metric to be used for redistributed routes. The `no` form of the command sets the metric used with redistributed routes to its default value. The metric value ranges between 1 and 16. The metric value given in the `no` form of the command is ignored during the execution of the command.

```
default-metric 1-16
```

```
no default-metric 1-16
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	3
<b>Example</b>	SEFOS(config-router)# <b>default-metric 1</b>
<b>Notes</b>	The <code>default-metric</code> command is used in conjunction with the <code>redistribute</code> router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes.

### Related Commands

- `redistribute` - Enables redistribution of corresponding protocol routes into RIP
- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.12 auto-summary - enable | disable

Enables or disables the auto-summarization of routes in RIP.

```
auto-summary {enable | disable}
```

<b>Syntax</b>	<b>enable</b> - Enables the auto-summarization feature in RIP.
<b>Description</b>	<b>disable</b> - Disables the auto-summarization feature in RIP.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	Enabled
<b>Example</b>	SEFOS(config-router)# <b>auto-summary disable</b>
<b>Notes</b>	The auto-summarization feature must be disabled to configure interface specific aggregation with RIP version 2.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.13 auto-summary

Enables the auto-summarization feature in RIP. The `no` form of the command disables the auto-summarization feature in RIP. This command operates similarly to the command `auto-summary - enable | disable`.

```
auto-summary
```

```
no auto-summary
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	Autosummarization is enabled.
<b>Example</b>	SEFOS(config-router)# <b>no auto-summary</b>
<b>Notes</b>	The auto-summarization feature must be disabled to configure interface specific aggregation with RIP version 2.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.14 ip rip default route originate

Sets the metric to be used for default route propagated over the interface. The no form of the command disables origination of default route over the interface.

```
ip rip default route originate metric_1-15
```

```
no ip rip default route originate
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>no ip rip default route originate</b>
<b>Example</b>	SEFOS(config)# <b>interface vlan 1</b> SEFOS(config-if)# <b>ip rip default route originate 10</b>
<b>Notes</b>	RIP must be enabled on the interface before executing this command.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics
- `network` - Enables RIP on an IP network

## 6.1.15 default-information originate

Sets the metric to be used for default route propagated over the interface. The no form of the command disables origination of default route over the interface.

This command operates similarly to the command `ip rip default route originate`.

```
default-information originate metric_1-15 [route-map string_32]
```

```
no default-information originate
```



<b>Syntax Description</b>	<i>metric_1-15</i> – Specifies the metric value. This value ranges between 1 and 15. <b>route-map</b> – Identifies the specified route-map in the list of route-maps. The length of the string ranges between 1 and 32. The keyword route-map is not supported.
<b>Mode</b>	Interface Configuration Applicable in VLAN Interface only.
<b>Defaults</b>	Origination of default route over the interface is disabled.
<b>Example</b>	SEFOS(config)# <b>interface vlan 1</b> SEFOS(config-if)# <b>default-information originate 10</b>
<b>Notes</b>	RIP must be enabled on the interface before executing this command.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics
- `network` - Enables RIP on an IP network

## 6.1.16 ip rip summary-address

Sets route aggregation over an interface for all subnet routes that fall under the specified IP address and mask. The `no` form of the command disables route aggregation with the specified IP address and mask.

```
ip rip summary-address ip-address mask
```

```
no ip rip summary-address ip-address mask
```

<b>Syntax Description</b>	<i>ip-address</i> – IP Address of the interface specific aggregation. <i>mask</i> – Subnet mask.
---------------------------	---

<b>Mode</b>	Interface Configuration Applicable only in VLAN interface.
<b>Example</b>	SEFOS(config)# <b>router rip</b> SEFOS(config-router)# <b>auto-summary disable</b> SEFOS(config-router)# <b>exit</b> SEFOS(config)# <b>interface vlan 1</b> SEFOS(config-if)# <b>ip rip summary-address 60.0.0.0 255.0.0.0</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• This command must not be used with RIPv1 send version.</li> <li>• Auto-summarization overrides interface specific aggregation. Therefore, auto-summarization must be disabled for interface specific route aggregation.</li> </ul>

## 6.1.17 ip summary-address rip

Sets the route aggregation for all subnet routes that fall under the specified IP address and mask. The no form of the command disables route aggregation with the specified IP address and mask. This command operates similarly to the command `ip rip summary-address`.

```
ip summary-address rip ip-address mask
```

```
no ip summary-address rip ip-address mask
```

<b>Syntax Description</b>	<i>ip-address</i> – IP address of the interface specific aggregation. <i>mask</i> – Subnet mask.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>ip summary-address rip 60.0.0.0 255.0.0.0</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• This command must not be used with RIPv1 send version.</li> <li>• Auto-summarization overrides interface specific aggregation. Therefore, auto-summarization must be disabled for interface specific route aggregation.</li> </ul>

## 6.1.18 ip rip default route install

Installs the default route received in updates to the RIP database. The no form of the command does not install default route received in updates to the RIP database.

```
ip rip default route install
```

```
no ip rip default route install
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>no ip rip default route install</b>
<b>Example</b>	SEFOS(config)# <b>interface vlan 1</b> SEFOS(config-if)# <b>shutdown</b> SEFOS(config-if)# <b>ip address 10.0.0.1 255.255.0.0</b> SEFOS(config-if)# <b>no shutdown</b> SEFOS(config-if)# <b>exit</b> SEFOS(config)# <b>router rip</b> SEFOS(config-router)# <b>network 10.0.0.1</b> SEFOS(config-router)# <b>exit</b> SEFOS(config)# <b>interface vlan 1</b> SEFOS(config-if)# <b>ip rip default route install</b>
<b>Notes</b>	RIP must be enabled on the interface on which this command is executed.

## 6.1.19 ip rip send version

Sets the IP RIP version number for transmitting advertisements and the no form of the command sets IP RIP send version number to its default value.

```
ip rip send version {1 | 2 | 1 2 | none}
```

```
no ip rip send version
```

<b>Syntax Description</b>	<b>1   2   1 2   none</b> – Indicates which version of RIP updates are to be sent. <ul style="list-style-type: none"> <li>• <b>1</b> - Sends RIP updates compliant with RFC 1058.</li> <li>• <b>2</b> - Sends multicasting RIP updates.</li> <li>• <b>1 2</b> - Sends both multicasting RIP updates and RIP updates compliant with RFC 1058.</li> <li>• <b>none</b> - No RIP updates are send.</li> </ul>
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>1 2</b>
<b>Example</b>	SEFOS(config-if)# <b>ip rip send version 1</b>

### Related Commands

- `ip rip receive version` - Sets IP RIP version number for receiving advertisements
- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.20 ip rip receive version

Sets the IP RIP version number for receiving advertisements. The no form of the command sets the IP RIP receive version number to its default value.

```
ip rip receive version {1 | 2 | 1 2 | none}
```

```
no ip rip receive version
```

<b>Syntax Description</b>	<b>1   2   1 2   none</b> – Indicates which version of RIP updates are to be sent. <ul style="list-style-type: none"> <li>• <b>1</b> - Sends RIP updates compliant with RFC 1058.</li> <li>• <b>2</b> - Sends multicasting RIP updates.</li> <li>• <b>1 2</b> - Sends both multicasting RIP updates and RIP updates compliant with RFC 1058.</li> <li>• <b>none</b> - No RIP updates are send.</li> </ul>
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.

<b>Defaults</b>	<b>1 2</b>
<b>Example</b>	SEFOS(config-if)# <b>ip rip receive version 1</b>
<b>Notes</b>	The command indicates which version of RIP updates are to be accepted. <code>rip2</code> and <code>rip1 2</code> implies reception of multicast packets.

### Related Commands

- `ip rip send version`- Sets IP RIP version number for transmitting advertisements
- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.21 version

Configures global version of the RIP. The `no` form of the command restores the default version for the RIP. This command operates similarly to the commands `ip rip send version` and `ip rip receive version`.

<b>version</b> { <b>1</b>   <b>2</b>   <b>1 2</b>   <b>none</b> }
---

<b>no version</b>
-------------------

<b>Syntax Description</b>	<b>1</b>   <b>2</b>   <b>1 2</b>   <b>none</b> – Indicates which version of RIP updates are to be sent. <ul style="list-style-type: none"> <li>• <b>1</b> - Sends RIP updates compliant with RFC 1058.</li> <li>• <b>2</b> - Sends multicasting RIP updates.</li> <li>• <b>1 2</b> - Sends both multicasting RIP updates and RIP updates compliant with RFC 1058.</li> <li>• <b>none</b> - No RIP updates are send.</li> </ul>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>1 2</b>
<b>Example</b>	SEFOS(config-router)# <b>version 1</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.22 ip rip authentication mode

Configures authentication mode and key. The no form of the command disables authentication.

```
ip rip authentication mode {text | md5} key-chain  
key-chain-name_16
```

```
no ip rip authentication
```

<b>Syntax</b>	<b>text</b> – Clear text authentication.
<b>Description</b>	<b>md5</b> – Keyed Message Digest 5 (MD5) authentication. More than one entry can be configured for an interface. <b>key-chain</b> – The value to be used as the Authentication Key.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	No authentication
<b>Example</b>	SEFOS(config-if)# <b>ip rip authentication mode text key-chain asdf123</b>
<b>Notes</b>	If a string shorter than 16 octets is supplied, it will be left-justified and padded to 16 octets, on the right, with nulls (0x00).

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.23 ip rip authentication mode {text | md5}

Configures the authentication mode. The no form of the command disables authentication. This command operates similarly to the command `ip rip authentication mode`.

```
ip rip authentication mode {text | md5}
```

```
no ip rip authentication mode
```

<b>Syntax Description</b>	<b>text</b> – Clear text authentication. <b>md5</b> – Keyed Message Digest 5 (MD5) authentication. This command will configure mode text and key-chain with defaults.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Authentication is disabled.
<b>Example</b>	SEFOS(config-if)# <b>ip rip authentication mode text</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.24 ip rip authentication key-chain

Configures the authentication key. The no form of the command disables authentication. This command operates similarly to the command `ip rip authentication mode`.

```
ip rip authentication key-chain key-chain-name_16
```

```
no ip rip authentication key-chain key-chain-name_16
```

<b>Syntax Description</b>	<b>key-chain</b> – Name of the authentication key to be used for authentication.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Authentication is disabled.
<b>Example</b>	SEFOS(config-if)# <b>ip rip authentication key-chain test</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.25 timers basic - update-value

Sets update, route age, and garbage collection timers. The no form of the command resets update, route age, and garbage collection timers to the default values.

```
timers basic update-value_10-3600 routeage-value_30-500  
garbage-value_120-180
```

```
no timers basic
```

<b>Syntax</b>	<i>update-value_10-3600</i> - 30
<b>Description</b>	<i>routeage-value_30-500</i> - 180 <i>garbage-value_120-180</i> - 120
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<i>update-value_10-3600</i> - Interval time between updates. <i>routeage-value_30-500</i> - Time after which the entry is put into garbage-collect interval. <i>garbage-value_120-180</i> - Interval before deleting an entry after not hearing it.
<b>Example</b>	SEFOS(config-if)# <b>timers basic 20 40 150</b>
<b>Notes</b>	The advertisements of garbage-value entry is set to INFINITY, while sending to others.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.26 timers basic - update-interval

Configures the update, invalid, hold down, and flush timers for RIP. This command operates similarly to the command `timers basic - update-value`.

```
timers basic update-interval_10-3600 invalid_30-500  
holddown_10-3600 flush_120-180 sleep_10-3600
```



<b>Syntax Description</b>	<p><i>update-interval_10-3600</i> – Rate (in seconds) at which the updates are sent. This is the fundamental timing parameter of the routing protocol. This value ranges between 10 and 3600 seconds.</p> <p><i>invalid_30-500</i> – Time interval (in seconds) after which a route is declared as invalid. This value ranges between 30 and 500 seconds.</p> <p><i>holddown_10-3600</i> – Interval (in seconds) during which the routing information regarding better paths are suppressed. This value ranges between 10 and 3600 seconds. The keyword <code>holddown</code> is not supported.</p> <p><i>flush_120-180</i> – Time interval (in seconds) after which the route is removed from the routing table. This value ranges between 120 and 180 seconds.</p> <p><i>sleep_10-3600</i> – Interval (in milliseconds) for postponing routing updates in the event of a flash update. This value ranges between 10 and 3600 milliseconds. The keyword <code>sleep</code> is not supported.</p>
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<p><i>update-interval_10-3600</i> – 30</p> <p><i>invalid_30-500</i> – 180</p> <p><i>holddown_10-3600</i> – 180</p> <p><i>flush_120-180</i> – 240</p>
<b>Example</b>	SEFOS(config-if)# <b>timers basic 20 40 180</b>

## Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.27 ip split-horizon

Sets the `split-horizon` status and the `no` form of the command disables the `split-horizon` status.

```
ip split-horizon [poisson]
```

```
no ip split-horizon
```

<b>Syntax Description</b>	<b>poisson</b> – <code>split-horizon</code> with <code>poisson</code> reverse is enabled.
---------------------------	---

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>ip split-horizon</b>
<b>Notes</b>	The value <code>split-horizon</code> denotes that <code>split-horizon</code> must be applied in the response packets that are going out.

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.28 debug ip rip

Sets the debug level for RIP module. The `no` form of the command resets the debug level for RIP module.

```
debug ip rip {all | init | data | control | dump | os | mgmt |
failure | buffer}
```

```
no debug ip rip {all | init | data | control | dump | os | mgmt |
failure | buffer}
```

<b>Syntax Description</b>	<p><b>all</b> – All resources.</p> <p><b>init</b> – Initialization and shutdown messages.</p> <p><b>data</b> – Data path messages.</p> <p><b>control</b> – Control plane messages.</p> <p><b>dump</b> – Packet dump messages.</p> <p><b>os</b> – OS resource Messages.</p> <p><b>mgmt</b> – Management messages.</p> <p><b>failure</b> – All failure messages. (All failures including packet validation.)</p> <p><b>buffer</b> – Buffer messages.</p>
---------------------------	--

<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	<b>init</b>
<b>Example</b>	SEFOS# <b>debug ip rip all</b>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.29 `debug ip rip {database | events | triggers}`

Sets the debug level for RIP module. The `no` form of the command resets the debug level for RIP module. This command operates similarly to the command `debug ip rip`.

```
debug ip rip {database | events | triggers}
```

```
no debug ip rip {database | events | triggers}
```

<b>Syntax Description</b>	<b>database</b> – Database debug messages. <b>events</b> – Trace management messages. <b>triggers</b> – Triggers debug messages.
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <code>debug ip rip database</code>

### Related Commands

- `show ip rip` - Displays IP RIP protocol database or statistics

## 6.1.30 `show ip rip`

Displays IP RIP protocol database or statistics.

```
show ip rip {database ip-address ip-mask | statistics}
```

<b>Syntax Description</b>	<b>database</b> – RIP protocol database for the specified IP address and IP mask of the RIP interface entry. <b>statistics</b> – RIP statistics on the router.
<b>Mode</b>	Privileged EXEC

**Example**

```
SEFOS# show ip rip database 40.0.0.0 255.0.0.0
```

```
40.0.0.0/8 directly connected, vlan1
```

```
SEFOS# show ip rip statistics
```

```
Vrf default
```

```
RIP Global Statistics:
```

```
-----
```

```
Total number of route changes is 0  
Total number of queries responded is 0  
Total number of dropped packets is 0
```

```
RIP Interface Statistics:
```

```
-----
```

Interface	Periodic	BadRoutes	Triggered	BadPackets	Admin
IP Address	Updates Sent	Received	Updates Sent	Received	Status
-----	-----	-----	-----	-----	-----
10. 0.0.1	0	0	1	0	Enabled

### Related Commands

- `router rip` - Enables RIP on all the interfaces
- `ip rip security` - Accepts/ignores RIP1 packets when authentication is in use
- `ip rip retransmission` - Configures the timeout interval and number of retries to retransmit the update request packet or an unacknowledged update response packet
- `network` - Enables RIP on an IP network
- `neighbor` - Adds a neighbor router
- `passive-interface vlan` - Suppresses routing updates on an interface
- `output-delay / output-delay delay` - Enables interpacket delay for RIP updates
- `redistribute` - Enables redistribution of corresponding protocol routes into RIP
- `default-metric` - Sets the RIP default metric
- `auto-summary - enable | disable` - Enables/disables auto-summarization of routes in RIP
- `auto-summary` - Enables auto-summarization feature in RIP
- `ip rip default route originate / default-information originate` - Sets the metric to be used for default route propagated over the interface

- `ip rip send version` - Sets IP RIP version number for transmitting advertisements
- `ip rip receive version / version` - Sets IP RIP version number for receiving advertisements
- `ip rip authentication mode` - Configures authentication mode and key
- `ip rip authentication mode {text | md5}` - Configures authentication mode
- `ip rip authentication key-chain` - Configures authentication key
- `timers basic - update-value` - Sets update, route age, and garbage collection timers
- `timers basic - update-interval` - Sets update timer, invalid timer, and flush timers
- `ip split-horizon` - Sets the split-horizon status
- `debug ip rip / debug ip rip {database | events | triggers}` - Sets the debug level for RIP module



# OSPF

---

OSPF protocol is an IGP used to distribute routing information within a single autonomous system. Routers use link-state algorithms to send routing information to all nodes in an inter-network by calculating the shortest path to each node based on topography of the Internet constructed by each node. Each router sends that portion of the routing table (keeps track of routes to particular network destinations), which describes the state of its own links, and it also sends the complete routing structure (topography).

The advantage of shortest-path-first algorithms is that they result in smaller, more frequent updates everywhere. They converge quickly, thus preventing such problems as routing loops and count-to-infinity (when routers continuously increment the hop count to a particular network). This makes for a stable network.

All OSPF interface related configurations can be done only when the global OSPF is enabled.

The multiple instances feature is not supported.

---

## 7.1 OSPF Commands

The list of CLI commands for the configuration of OSPF is as follows:

- `router ospf`
- `router ospf - process-id`
- `router-id`
- `area - stability interval`
- `area - translation-role`
- `compatible rfc1583`
- `abr-type`

- neighbor
- area area-id default-cost
- area area-id nssa
- area area-id stub
- default-information originate always
- default-information originate
- area - virtual-link
- asbr router
- area - range
- area - range - cost
- summary-address
- redistribute
- redist-config
- network
- network - wildcard-mask
- set nssa asbr-default-route translator
- passive-interface vlan
- passive-interface default
- timers spf
- ip ospf demand-circuit
- ip ospf retransmit-interval
- ip ospf transmit-delay
- ip ospf priority
- ip ospf hello-interval
- ip ospf dead-interval
- ip ospf cost
- ip ospf network
- ip ospf authentication-key
- ip ospf authentication
- ip ospf message-digest-key
- debug ip ospf
- show ip ospf interface
- show ip ospf neighbor
- show ip ospf request-list
- show ip ospf retransmission-list



- `show ip ospf virtual-links`
- `show ip ospf border-routers`
- `show ip ospf - summary address`
- `show ip ospf`
- `show ip ospf route`
- `show ip ospf - database summary`
- `show ip ospf - database`

## 7.1.1 router ospf

Enables OSPF routing process. The `no` form of the command disables OSPF routing process.

<code>router ospf</code>
--------------------------

<code>no router ospf</code>
-----------------------------

<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <code>router ospf</code>
<b>Notes</b>	The command <code>no router ospf</code> disables the OSPF router admin status to terminate the OSPF process.

### Related Commands

- `router-id` - Sets the router-id for the OSPF process
- `network / network - wildcard-mask` - Defines the interfaces on which OSPF runs and the area ID for those interfaces
- `show ip ospf route` - Displays routes learned by OSPF process
- `show ip ospf - database` - Displays OSPF database summary for the LSA type

## 7.1.2 router ospf - process-id

Note - This command is not supported.

Enables the OSPF routing process. The `no` form of the command disables the OSPF routing process. This command operates similarly to the command `router ospf`.

<code>router ospf process-id_1-65535</code>
---

```
no router ospf process-id_1-65535
```

<b>Syntax</b>	<i>process-id_1-65535</i> – OSPF process identifier. This value ranges
<b>Description</b>	between 1 and 65535. This parameter is not currently supported.
<b>Mode</b>	Global Configuration The <b>no</b> form of the command can also be executed in Router Configuration.
<b>Example</b>	SEFOS(config)# <b>router ospf 1</b>

### Related Commands

- **router-id** - Sets the router ID for the OSPF process
- **network** - Defines the interfaces on which OSPF runs and the area ID for those interfaces
- **show ip ospf route** - Displays the routes learned by the OSPF process
- **show ip ospf - database** - Displays the OSPF Database summary for the LSA type

## 7.1.3 router-id

Sets the router identifier for the OSPF process.

```
router-id <router ip address>
```

<b>Syntax</b>	<b>router ip address</b> – Specifies the OSPF router ID as an IP address.
<b>Description</b>	
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>router-id 10.0.0.1</b>
<b>Notes</b>	An arbitrary value for the IP address for each router can be configured. However, each router ID must be unique. To ensure uniqueness, the router identifier must match one of the router's IP interface addresses.

### Related Commands

- **router ospf** - Enables OSPF routing process
- **router ospf - process-id** - Enables the OSPF routing process
- **show ip ospf route** - Displays routes learned by OSPF process

## 7.1.4 area - stability interval

Configures the stability interval NSSA. The no form of the command configures default stability interval for NSSA.

```
area area-id stability-interval interval-value_0-0x7fffffff
```

```
no area area-id stability-interval
```

<b>Syntax Description</b>	<i>area-id</i> - Area associated with the OSPF address range. It is specified as an IP address. <b>stability-interval</b> - The number of seconds after an elected translator determines its services are no longer required, during which time it must continue to perform its translation duties.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	40
<b>Example</b>	SEFOS(config-router)# <b>area 10.0.0.1 stability-interval 10000</b>
<b>Notes</b>	Area identifier 0.0.0.0 is used for the OSPF backbone. The OSPF sequence number is a 32-bit signed integer. It starts with the value '80000001'h, -- or -'7FFFFFFF'h, and increments until '7FFFFFFF'h. Thus, a typical sequence number will be very negative.

### Related Commands

- [area area-id nssa](#) - Configures an area as a NSSA and other parameters related to that area

## 7.1.5 area - translation-role

Configures the translation role for the NSSA. The no form of the command configures the default translation role for the NSSA.

```
area area-id translation-role {always | candidate}
```

```
no area area-id translation-role
```

<b>Syntax Description</b>	<i>area-id</i> – Area associated with the OSPF address range. It is specified as an IP address. <b>translation-role</b> – An NSSA Border router’s ability to perform NSSA Translation of Type-7 LSAs to Type-5 LSAs.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>candidate</b>
<b>Example</b>	SEFOS(config-router)# <b>area 10.0.0.1 translation-role always</b>
<b>Notes</b>	Type-5 LSAs - Originated by AS boundary routers, and flooded throughout the AS. Each AS-external-LSA describes a route to a destination in another autonomous system. Default routes for the AS can also be described by AS-external-LSAs.

### Related Commands

- `area area-id nssa` - Configures an area as a NSSA and other parameters related to that area

## 7.1.6 compatible rfc1583

Sets the OSPF compatibility list compatible with RFC 1583. The no form of the command disables RFC 1583 compatibility.

```
compatible rfc1583
```

```
no compatible rfc1583
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>compatible rfc1583</b>
<b>Example</b>	SEFOS(config-router)# <b>compatible rfc1583</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• This command enables support of RFC1583 compatibility in products that support later standards.</li> <li>• It controls the preference rules, when choosing among multiple AS external LSAs advertising the same destination. When set to <code>compatible rfc1583</code>, the preference rules remain those specified by RFC 1583. When set to <code>no compatible rfc1583</code>, the preference rules are those stated in RFC 2178.</li> <li>• To minimize the chance of routing loops, all OSPF routers in an OSPF routing domain must have RFC compatibility set identically.</li> </ul>

## 7.1.7 abr-type

Sets the alternative ABR type.

```
abr-type {standard | cisco | ibm}
```

<b>Syntax Description</b>	<b>standard</b> – Standard ABR type as defined in RFC 2328. <b>cisco</b> – CISCO ABR type as defined in RFC 3509. <b>ibm</b> – IBM ABR type as defined in RFC 3509.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>standard</b>
<b>Example</b>	SEFOS(config-router)# <b>abr-type standard</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• RFC 2328 - OSPF version 2.</li><li>• RFC-3509 - Alternative implementations of OSPF area border routers.</li></ul>

### Related Commands

- `router ospf` - Enables OSPF routing process
- `show ip ospf` - Displays general information about the OSPF routing process

## 7.1.8 neighbor

Specifies a neighbor router and its priority. The `no` form of the command removes the neighbor set default value for the neighbor priority.

```
neighbor neighbor-id [priority 0-255]
```

```
no neighbor neighbor-id [priority]
```

<b>Syntax Description</b>	<i>neighbor-id</i> – Neighbor router identifier. <b>priority</b> – A number value that specifies the router priority. <b>poll-interval</b> <i>seconds</i> – A number value that represents the poll interval time. <b>cost</b> 1-65535 – Assigns a cost value to the neighbor. This value ranges between 1 and 65535. <b>database-filter all</b> – Filters the outgoing link-state advertisements provided to an OSPF neighbor.
<b>Mode</b>	Router Configuration

<b>Defaults</b>	<b>priority</b>
<b>Example</b>	SEFOS(config-router)# <b>neighbor 20.0.0.1 priority 25</b>
<b>Notes</b>	The value 0 signifies that the neighbor is not eligible to become the designated router on this particular network.

### Related Commands

- `ip ospf priority` - Sets the router priority
- `ip ospf network` - Configures the OSPF network type to a type other than the default for a given media
- `show ip ospf neighbor` - Displays OSPF neighbor information list

## 7.1.9 `area area-id default-cost`

Specifies a cost for the default summary route sent into a stub or NSSA. The `no` form of the command removes the assigned default route cost.

```
area area-id default-cost cost [tos 0-30]
```

```
no area area-id default-cost cost [tos 0-30]
```

<b>Syntax Description</b>	<p><i>area-id</i> – Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>default-cost</b> – Cost for the default summary route used for a stub area.</p> <p><b>tos</b> – Type of service of the route being configured.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<p><b>default-cost</b> – 10</p> <p><b>tos</b> – 0</p>
<b>Example</b>	SEFOS(config-router)# <b>area 10.0.0.1 default-cost 5</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• A default cost can be defined only for a valid area.</li> <li>• The only supported <b>tos</b> value is 0.</li> <li>• In the area 0.0.0.0, the <b>default-cost</b> and the <b>tos</b> must be set at the same time. If setting only the <b>default-cost</b>, SEFOS does not accept the command and a message similar to the following is displayed: Invalid Metric.Exceeded the range</li> <li>• The <b>tos</b> range of 0-30 is also not accepted.</li> </ul>

## Related Commands

- `area area-id stub` - Specifies an area as a stub area and other parameters related to that area
- `area - range / area - range - cost` - Consolidates and summarizes routes at an area boundary
- `ip ospf cost` - Specifies the cost of sending a packet on an interface
- `ip ospf authentication` - Specifies the authentication type for an interface

## 7.1.10 `area area-id nssa`

Configures an area as a NSSA and other parameters related to that area.

```
area area-id nssa [{no-summary | default-information-originate  
[metric value] [metric-type type_1-3] [tos 0-30]]
```

<b>Syntax Description</b>	<p><i>area-id</i> - Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>nssa</b> - Configures an area as a not-so-stubby area (NSSA).</p> <p><b>no-summary</b> - Allows an area to be a not-so-stubby area without requiring injection of summary routes.</p> <p><b>default-information-originate</b> - Default route into OSPF. Possible values:</p> <ul style="list-style-type: none"><li>• <b>metric</b> - The Metric value applied to the route before it is advertised into the OSPF domain.</li><li>• <b>metric-type</b> - The metric type applied to the route before it is advertised into the OSPF domain.</li><li>• <b>tos</b> - Type of service of the route being configured. The only supported <b>tos</b> value is 0.</li></ul>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>metric</b> - 10 <b>metric-type</b> - 1 <b>tos</b> - 0
<b>Example</b>	<pre>SEFOS(config-router)# <b>area 40.0.0.1 nssa</b> SEFOS(config-router)# <b>area 40.0.0.1 nssa no-sum</b> SEFOS(config-router)# <b>area 40.0.0.1 nssa</b> <b>default-information-originate metric 8</b></pre>
<b>Notes</b>	The <code>no area area-id [{stub   nssa}]</code> command removes an area or converts <code>stub</code> or <code>nssa</code> to normal area.

## Related Commands

- `area - range / area - range - cost` - Consolidates and summarizes routes at an area boundary
- `area - translation-role` - Configures the translation role for the NSSA

### 7.1.11 `area area-id stub`

Specifies an area as a stub area and other parameters related to that area. The `no` form of the command removes an area or converts stub/nssa to normal area.

```
area area-id stub [no-summary]
```

```
no area area-id [[stub [no-summary] | nssa [no-redistribution]  
[default-information-originate [metric value] [metric-type  
type_1-3]] [no-summary]]]
```

<b>Syntax Description</b>	<p><i>area-id</i> - Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>stub</b> - Configures an area as a stub area.</p> <p><b>no-summary</b> - The router will neither originate nor propagate summary LSAs into the stub area. This option is not currently supported with the <code>no</code> form of the command.</p> <p><b>nssa</b> - Configures an area as a not-so-stubby area (NSSA).</p> <p><b>no-redistribution</b> - Imports routes only into the normal areas, but not into the NSSA area.</p> <p><b>default-information-originate</b> - Default route into OSPF.</p> <p><b>metric</b> - The metric value applied to the route before it is advertised into the OSPF domain.</p> <p><b>metric-type</b> - The metric type applied to the route before it is advertised into the OSPF domain.</p>
<b>Mode</b>	Router Configuration
<b>Example</b>	<pre>SEFOS(config-router)# area 10.0.0.1 stub</pre>
<b>Notes</b>	The command must be configured on all routers and access servers in the stub area.

## Related Commands

- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA
- `area - range / area - range - cost` - Consolidates and summarizes routes at an area boundary
- `ip ospf authentication` - Specifies the authentication type for an interface



## 7.1.12 default-information originate always

Enables generation of a default external route into an OSPF routing domain and other parameters related to that area. The no form of the command disables generation of a default external route into an OSPF routing domain.

```
default-information originate always [metric  
metric-value_0-0xffffffff] [metric-type type_1-2]
```

```
no default-information originate always [metric  
metric-value_0-0xffffffff] [metric-type type_1-2]
```

<b>Syntax</b>	<b>metric</b> – The metric value applied to the route before it is advertised into the OSPF domain.
<b>Description</b>	<b>metric-type</b> – The metric type applied to the route before it is advertised into the OSPF domain.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>metric</b> – 10 <b>metric-type</b> – 2
<b>Example</b>	SEFOS(config-router)# <b>default-information originate always metric 1 metric-type 1</b>
<b>Notes</b>	The [ <b>route-map</b> <i>route-map-name</i> ] option is not supported.

### Related Commands

- [redistribute](#) - Configures the protocol from which the routes have to be redistributed into OSPF.

## 7.1.13 default-information originate

Enables the generation of a default external route into an OSPF routing domain. The no form of the command disables the generation of a default external route into an OSPF routing domain. This command operates similarly to the command [default-information originate always](#).

```
default-information originate {[always] [metric  
metric-value_0-0xffffffff] [metric-type type_1-2] [route-map  
route-map-name]}
```

```
no default-information originate {[always] [metric  
metric-value_0-0xffffffff] [metric-type type_1-2] [route-map  
route-map-name]}
```

<b>Syntax Description</b>	<p><b>always</b> – Always advertises the default route regardless of whether the software has a default route.</p> <p><b>metric</b> <i>metric-value</i> – Metric value to be applied to the route before it is advertised into the OSPF Domain. This value ranges between 0 and 0xfffff.</p> <p><b>metric-type</b> – Metric type to be applied to the route before it is advertised into the OSPF Domain. The type can be as follows:</p> <ul style="list-style-type: none"> <li>• 1 - Type 1 external route.</li> <li>• 2 - Type 2 external route.</li> </ul> <p><b>route-map</b> – Route map name to be satisfied for the routing process to generate the default route.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<p><b>metric</b> – 10</p> <p><b>metric-type</b> – 2</p>
<b>Example</b>	SEFOS(config-router)# <b>default-information originate always metric 1 metric-type 1</b>
<b>Notes</b>	The [ <b>route-map</b> <i>route-map-name</i> ] option is not supported.

## Related Commands

- **redistribute** - Configures the protocol from which the routes have to be redistributed into the OSPF

## 7.1.14 area - virtual-link

Defines an OSPF virtual link and its related parameters. The no form of removes an OSPF virtual link.

```
area area-id virtual-link router-id [authentication {simple |
message-digest | null}] [hello-interval 1-65535]
[retransmit-interval 0-3600] [transmit-delay 0-3600]
[dead-interval value] [{authentication-key key_8 |
message-digest-key key-id_0-255 md5 key_16}]
```

```
no area area-id virtual-link router-id [authentication]
[hello-interval] [retransmit-interval] [transmit-delay]
[dead-interval] [{authentication-key | message-digest-key
key-id_0-255}]
```

<b>Syntax Description</b>	<p><i>area-id</i> – The Transit Area that the Virtual Link traverses. It is specified as an IP address.</p> <p><b>virtual-link</b> – The Router ID of the Virtual Neighbor.</p> <p><b>authentication</b> – The authentication type for an interface.</p> <p><b>hello-interval</b> – The interval between hello packets that the software sends on the OSPF virtual link interface.</p> <p><b>retransmit-interval</b> – The time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the OSPF virtual link interface.</p> <p><b>transmit-delay</b> – The time the router will stop using this key for packets generation.</p> <p><b>dead-interval</b> – The interval at which hello packets must not be seen before its neighbors declare the router down. (The range of values for the dead interval is 0-0x7ffffff.)</p> <p><b>authentication-key</b> – Identifies the secret key used to create the message digest appended to the OSPF packet.</p> <p><b>message-digest-key</b> – OSPF MD5 authentication. Enables Message Digest 5 (MD5) authentication on the area specified by the area-id.</p> <p><b>md5</b> – The secret key which is used to create the message digest appended to the OSPF packet.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<p><b>authentication</b> – null</p> <p><b>hello-interval</b> – 10</p> <p><b>retransmit-interval</b> – 5</p> <p><b>transmit-delay</b> – 1</p> <p><b>dead-interval</b> – 40</p>
<b>Example</b>	<pre>SEFOS(config-router)# area 10.0.0.1 virtual-link 20.0.0.1 authentication message-digest hello-interval 100 retransmit-interval 100 transmit-delay 50 dead-interval 200 authentication-key asdf</pre>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• In OSPF, all areas must be connected to a backbone area. If the connection to the backbone is lost, it can be repaired by establishing a virtual link.</li> <li>• hello-interval and dead-interval: The value must be the same for all routers and access servers on a specific network.</li> </ul>

## Related Commands

- [area - range / area - range - cost](#) - Consolidates and summarizes routes at an area boundary
- [ip ospf authentication](#) - Specifies the authentication type for an interface.
- [show ip ospf](#) - Displays general information about OSPF routing process
- [show ip ospf virtual-links](#) - Displays OSPF Virtual link information

## 7.1.15 asbr router

Specifies this router as ASBR. The no form of the command disables this router as ASBR.

```
asbr router
```

```
no asbr router
```

**Mode** Router Configuration

**Example** SEFOS(config-router)# **asbr router**

**Notes** Routers that act as gateways (redistribution) between OSPF and other routing protocols (IGRP, EIGRP, RIP, BGP, Static) or other instances of the OSPF routing process are called (ASBR).

### Related Commands

- `set nssa asbr-default-route translator` - Enables or disables setting of P bit in the default Type-7 LSA generated by NSSA internal ASBR
- `show ip ospf` - Displays general information about the OSPF routing process

## 7.1.16 area - range

Consolidates and summarizes routes at an area boundary. The no form of the command deletes the summary address.

```
area area-id range network mask {summary | type7} [{advertise | not-advertise}] [tag value]
```

```
no area area-id range network mask [{advertise | not-advertise}] [tag tag-value] [cost value]
```

<b>Syntax Description</b>	<p><i>area-id</i> – Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>range</b> – OSPF address range.</p> <p><i>network</i> – The IP address of the Net indicated by the range.</p> <p><i>Mask</i> – The subnet mask that pertains to the range.</p> <p><b>summary</b> – Summary LSAs.</p> <p><b>type7</b> – Type-7 LSA.</p> <p><b>advertise</b> – When associated area identifier (area-id) is 0.0.0.0, aggregated Type-5 are generated. Otherwise if associated area-id is x.x.x.x (other than 0.0.0.0) aggregated Type-7 is generated in NSSA x.x.x.x.</p> <p><b>not-advertise</b> – When associated area-id is 0.0.0.0, Type-5 is not generated for the specified range, while aggregated Type-7 are generated in all attached NSSA. While if associated area-id is x.x.x.x (other than 0.0.0.0), Type-7 are not generated in NSSA x.x.x.x for the specified range.</p> <p><b>tag</b> – The Tag Type describes whether Tags will be automatically generated or will be manually configured This parameter is currently not supported in the no form of the command.</p> <p><b>cost</b> – Metric or cost for a summary route, which is used during OSPF SPF (Shortest Path First) calculation to determine the shortest paths to the destination. This value ranges between 0 and 16777215.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>tag</b> – 2
<b>Example</b>	SEFOS(config-router)# <b>area 10.0.0.1 range 10.0.0.0 255.0.0.0 summary advertise tag 10</b>
<b>Notes</b>	<p>The mask indicates the range of addresses being described by the particular route. For example, a summary-LSA for the destination 128.185.0.0 with a mask of 0xffff0000 actually is describing a single route to the collection of destinations 128.185.0.0 - 128.185.255.255.</p> <p>This command is used only with Area Border Routers (ABRs). It is used to consolidate or summarize routes for an area. The result is that a single summary route is advertised to other areas by the ABR.</p>

## Related Commands

- `ip ospf authentication` - Specifies the authentication type for an interface
- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA
- `area area-id nssa` - Configures an area as a NSSA and other parameters related to that area
- `area area-id stub` - Specifies an area as a stub area and other parameters related to that area
- `area - virtual-link` - Defines an OSPF virtual link and its related parameters
- `summary-address` - Creates aggregate addresses for OSPF

- `show ip ospf - Summary address` - Displays OSPF Summary-address redistribution Information

## 7.1.17 area - range - cost

Consolidates and summarizes routes at an area boundary. This command operates similarly to the command `area - range`.

```
area area-id range network mask [{advertise | not-advertise}] [tag
value] [cost value]
```

<b>Syntax Description</b>	<p><i>area-id</i> – Area associated with the OSPF address range. This is specified as an IP address.</p> <p><i>network</i> – The IP address of the network indicated by the range.</p> <p><i>mask</i> – The subnet mask that pertains to the range. The mask indicates the range of addresses described by the particular route. For example, a summary-LSA for the destination 128.185.0.0 with a mask of 0xffff0000 is actually describing a single route to the collection of destinations 128.185.0.0 - 128.185.255.255.</p> <p><b>advertise</b> – When associated area-id is 0.0.0.0, aggregated Type-5 LSAs are generated. Otherwise if associated area-id is x.x.x.x (other than 0.0.0.0) aggregated Type-7 LSA is generated in NSSA x.x.x.x.</p> <p><b>not-advertise</b> – When associated area-id is 0.0.0.0, Type-5 LSA is not generated for the specified range, while aggregated Type-7 LSAs are generated in all attached NSSA. If associated area-id is x.x.x.x (other than 0.0.0.0), Type-7 LSAs are not generated in NSSA x.x.x.x for the specified range.</p> <p><b>tag</b> – Specifies whether the tags will be automatically generated or manually configured.</p> <p><b>cost</b> – Metric or cost for a summary route, which is used during OSPF SPF calculation to determine the shortest paths to the destination. This value ranges between 0 and 16777215.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>tag</b> – 2
<b>Example</b>	SEFOS(config-router)# <b>area 10.0.0.1 range 10.0.0.0 255.0.0.0 advertise tag 10</b>

### Related Commands

- `ip ospf authentication` - Specifies the authentication type for an interface
- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA

- `area area-id nssa` - Configures an area as a NSSA and other parameters related to that area
- `area area-id stub` - Specifies an area as a stub area and other parameters related to that area
- `area - virtual-link` - Defines an OSPF virtual link and its related parameters
- `summary-address` - Creates aggregate addresses for OSPF
- `show ip ospf` - Summary address - Displays OSPF Summary-address redistribution Information

## 7.1.18 summary-address

Creates aggregate addresses for OSPF. The `no` form of the command deletes the external summary address.

```
summary-address network mask area-id [{allowAll | denyAll | advertise | not-advertise}] [Translation {enabled | disabled}]
```

```
no summary-address network mask area-id [not-advertise]
```

<b>Syntax Description</b>	<p><i>network</i> – The IP address of the Net indicated by the range.</p> <p><i>mask</i> – The subnet mask that pertains to the range.</p> <p><i>area-id</i> – Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>allowAll</b> – When set to allowAll and associated area-id is 0.0.0.0 aggregated Type-5 are generated for the specified range. In addition aggregated Type-7 are generated in all attached NSSA, for the specified range.</p> <p><b>denyAll</b> – When set to denyAll neither Type-5 nor Type-7 will be generated for the specified range.</p> <p><b>advertise</b> – When associated area-id is 0.0.0.0, aggregated Type-5 are generated. Otherwise if associated area-id is x.x.x.x (other than 0.0.0.0) aggregated Type-7 is generated in NSSA x.x.x.x.</p> <p><b>not-advertise</b> – When associated area-id is 0.0.0.0, Type-5 is not generated for the specified range, while aggregated Type-7 are generated in all attached NSSA. While associated area-id is x.x.x.x (other than 0.0.0.0), Type-7 are not generated in NSSA x.x.x.x for the specified range.</p> <p><b>Translation</b> – Indicates how an NSSA Border router is performing NSSA translation of Type-7 to into Type-5 LSAs. When set to enabled, P Bit is set in the generated Type-7 LSA. When set to disabled P Bit is cleared in the generated Type-7 LSA for the range.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<p><b>summary-address</b> – advertise</p> <p><b>translation</b> – disabled</p>
<b>Example</b>	SEFOS(config-router)# <b>summary-address 10.0.0.6 255.0.0.0 10.0.0.0 allowAll Translation enabled</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The router with the highest <code>router_id</code> becomes and remains the default router regardless of whether it has the highest priority or not. The router with the highest priority becomes the default router only after the VLAN interface of the router is brought down and back up.</li> <li>• When translation is set to enabled, the NSSA border router's <code>futOspfAreaNssaTranslatorRole</code> is set to always. When this object is set to disabled, a candidate NSSA border router does not perform translation.</li> <li>• This command indicates whether Type-5/Type-7 will be aggregated or not generated for the specified range.</li> <li>• <code>allowAll</code> and <code>denyAll</code> are not valid for <i>area-id</i> other than 0.0.0.0.</li> <li>• Routes learned from other routing protocols can be summarized. The metric used to advertise the summary is the smallest metric of all the more specific routes.</li> <li>• This command helps reduce the size of the routing table.</li> </ul>

## Related Commands

- [ip ospf authentication](#) - Specifies the authentication type for an interface



- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA
- `area area-id nssa` - Configures an area as a NSSA and other parameters related to that area
- `area area-id stub` - Specifies an area as a stub area and other parameters related to that area
- `area - virtual-link` - Defines an OSPF virtual link and its related parameters
- `summary-address` - Creates aggregate addresses for OSPF
- `show ip ospf` - Summary address - Displays OSPF Summary-address redistribution Information

## 7.1.19 redistribute

Configures the protocol from which the routes have to be redistributed into OSPF. The `no` form of the command disables redistribution of routes from the given protocol into OSPF.

```
redistribute {static | connected | rip | bgp | all} [route-map
name_1-20]
```

```
no redistribute {static | connected | rip | bgp | all} [route-map
name_1-20]
```

<b>Syntax</b>	<b>static</b> – Redistributes routes, configured statically, to the OSPF routing protocol.
<b>Description</b>	<b>connected</b> – Redistributes directly connected network routes, to the OSPF routing protocol. <b>rip</b> – Redistributes routes, that are learned by the RIP process, to the OSPF routing protocol. <b>bgp</b> – Redistributes routes, that are learned by the BGP process, to the OSPF routing protocol. <b>all</b> – Redistributes all routes to the OSPF routing protocol. <b>route-map</b> – Identifies the specified route-map in the list of route-maps. The length of the name ranges from 1 to 20.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>redistribute static</b>
<b>Notes</b>	The ASBR Router command must be configured prior to the execution of this command.

## Related Commands

- `default-information originate always` - Enables generation of a default external route into an OSPF routing domain
- `default-information originate` - Enables the generation of a default external route into an OSPF routing domain
- `redist-config` - Configures the information to be applied to routes learned from RTM

## 7.1.20 `redist-config`

Configures the information to be applied to routes learned from RTM. The no form of the command deletes the information applied to routes learned from RTM.

```
redist-config network mask [metric-value metric_1-16777215]  
[metric-type {asExttype1 | asExttype2}] [tag tag-value]
```

```
no redist-config network mask
```

<b>Syntax</b>	<i>network</i> - IP Address of the destination route.
<b>Description</b>	<i>mask</i> - Mask of the destination route. <i>metric-value</i> - The metric value applied to the route before it is advertised into the OSPF domain. <b>metric-type</b> - The metric type applied to the route before it is advertised into the OSPF domain. <b>tag</b> - The tag type describes whether tags will be automatically generated or will be manually configured.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>metric-value</b> - 10 <b>metric-type</b> - <i>asExttype2</i> <b>tag</b> - manual
<b>Example</b>	SEFOS(config-router)# <b>redist-config 10.0.0.0 255.0.0.0 metric-value 100 metric-type asExttype1 tag 10</b>
<b>Notes</b>	<b>tag</b> <i>tag-value</i> : This is not used by OSPF protocol itself. It may be used to communicate information between AS boundary routers. The precise nature of this information is outside the scope of OSPF. If tags are manually configured, the <code>futospfRRDRouteTag</code> MIB has to be set with the Tag value needed.

## Related Commands

- `redistribute` - Configures the protocol from which the routes have to be redistributed into OSPF

## 7.1.21 network

Defines the interfaces on which OSPF runs and the area identifier for those interfaces. The `no` form of the command disables OSPF routing for interfaces defined and to remove the area ID of that interface.

```
network network-number area area-id [unnum Vlan port-number]
```

```
no network network-number area area-id [unnum Vlan port-number]
```

<b>Syntax</b>	<i>network-number</i> – Network type.
<b>Description</b>	<b>area</b> – Area associated with the OSPF address range. It is specified as an IP address. <b>unnum Vlan</b> – VLAN identifier for which no IP address is configured.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>network 20.0.0.1 area 20.0.0.0</b> <b>unnum Vlan 1</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• When a more specific OSPF network range is removed, interfaces belonging to that network range will be retained and remain active if and only if a less specific network range exists.</li><li>• There is no limit to the number of network commands that can be used on the router.</li></ul>

## Related Commands

- `router ospf` - Enables OSPF routing process
- `router ospf - process-id` - Enables the OSPF routing process
- `show ip ospf - database` - Displays OSPF Database summary for the LSA type
- `show ip ospf interface` - Displays OSPF interface information

## 7.1.22 network - wildcard-mask

Defines the interfaces on which OSPF runs, and the area identifier for those interfaces. The `no` form of the command disables OSPF routing for interfaces defined, and removes the area identifier of that interface. This command operates similarly to the command [network](#).

```
network network number wildcard-mask area area-id [unnum Vlan
port-number]
```

```
no network network number wildcard-mask area area-id [unnum Vlan
port-number]
```

<b>Syntax</b>	<i>network-number</i> – IP address of the network.
<b>Description</b>	<i>wildcard-mask</i> – IP-address-type mask that includes don't care bits. <i>area-id</i> – Area associated with the OSPF address range. This is specified as an IP address. <b>unnum Vlan</b> – VLAN identifier for which no IP address is configured.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>network 20.0.0.1 255.0.0.0 area</b> <b>20.0.0.0 unnum Vlan 1</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• When a more specific OSPF network range is removed, interfaces belonging to that network range will be retained and will remain active only if a less specific network range exists.</li><li>• There is no limit to the number of network commands that can be used on the router.</li></ul>

### Related Commands

- [router ospf](#) - Enables OSPF routing process
- [show ip ospf - database](#) - Displays OSPF Database summary for the LSA type
- [show ip ospf interface](#) - Displays OSPF interface information

## 7.1.23 set nssa asbr-default-route translator

Enables or disables setting of P bit in the default Type-7 LSA generated by NSSA internal ASBR.

```
set nssa asbr-default-route translator {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – When set to enabled, P-Bit is set in the generated Type-7 default LSA. <b>disable</b> – When set disabled, P-Bit is clear in the generated default LSA.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-router)# <b>set nssa asbr-default-route translator enable</b>
<b>Notes</b>	Specifies the P-Bit setting for the default Type-7 LSA generated by ASBR (which is not ABR).

### Related Commands

- `asbr router` - Specifies this router as ASBR

## 7.1.24 `passive-interface vlan`

Suppresses routing updates on an interface. The `no` form of the command enables routing updates on an interface.

```
passive-interface {vlan 1-4094 | interface-type interface-id}
```

```
no passive-interface {vlan 1-4094 | interface-type interface-id}
```

<b>Syntax Description</b>	<i>vlan-id</i> – LSA retransmissions for adjacencies belonging to the VLAN interface. <i>interface-type</i> – Interface type. The keyword <code>interface-type</code> is not supported. <i>interface-id</i> – Interface identifier. The keyword <code>interface-id</code> is not supported.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>passive-interface vlan 1</b>
<b>Notes</b>	OSPF routing information is neither sent nor received through the specified router interface. The specified interface address appears as a stub network in the OSPF domain.

### Related Commands

- `passive-interface default` - Suppresses routing updates on all interfaces
- `show ip ospf interface` - Displays OSPF interface information

- `show ip ospf request-list` - Displays OSPF Link state request list information

## 7.1.25 `passive-interface default`

Suppresses routing updates on all interfaces. The no form of the command enables routing updates on all interfaces.

```
passive-interface default
```

```
no passive-interface default
```

**Mode** Router Configuration

**Example** SEFOS(config-router)# **passive-interface default**

**Notes** All the OSPF interfaces created after the execution of this command will be passive. This is useful in Internet service provider (ISP) and large enterprise networks where many of the distribution routers have more than 200 interfaces.

### Related Commands

- `passive-interface vlan` - Suppresses routing updates on an interface
- `show ip ospf interface` - Displays OSPF interface information
- `show ip ospf request-list` - Displays OSPF Link state request list information

## 7.1.26 `timers spf`

Sets OSPF SPF delay and hold timers. The no form of the command resets OSPF SPF delay and hold timers to the default value.

```
timers spf spf-delay_1-100 spf-holdtime_1-1000
```

```
no timers spf
```

<b>Syntax Description</b>	<i>spf-delay_1-100</i> – Delay time (in seconds) in starting a SPF calculation after receiving a topology change. This value ranges between 1 and 100 seconds. A value of 0 means that there is no delay. That is, the SPF calculation is started immediately. <i>spf-holdtime_1-1000</i> – Minimum time (in seconds) between two consecutive SPF calculations. This value ranges between 1 and 1000 seconds.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<i>spf-delay_1-100</i> – 5 seconds. <i>spf-holdtime_1-1000</i> – 10 seconds.
<b>Example</b>	SEFOS(config-router)# <b>timers spf 10 20</b>

## 7.1.27 ip ospf demand-circuit

Configures OSPF to treat the interface as an OSPF demand circuit. The `no` form of the command removes the demand circuit designation from the interface.

```
ip ospf demand-circuit
```

```
no ip ospf demand-circuit
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>ip ospf demand-circuit</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• It indicates whether demand OSPF procedures (hello suppression to FULL neighbors and setting the DoNotAge flag on prorogated LSAs) must be performed on this interface.</li> <li>• On point-to-point interfaces, only one end of the demand circuit must be configured with this command. Periodic hello messages are suppressed and periodic refreshes of LSAs do not flood the demand circuit.</li> </ul>

### Related Commands

- `show ip ospf interface` - Displays OSPF interface information

## 7.1.28 ip ospf retransmit-interval

Specifies the time between LSA retransmissions for adjacencies belonging to the interface. The no form of the command uses the default time between LSA retransmissions for adjacencies belonging to the interface.

```
ip ospf retransmit-interval seconds_0-3600
```

```
no ip ospf retransmit-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN interface.
<b>Defaults</b>	5
<b>Example</b>	SEFOS(config-if)# <b>ip ospf retransmit-interval 300</b>
<b>Notes</b>	This value is also used while retransmitting database description and link-state request packets.

### Related Commands

- `ip ospf hello-interval` - Specifies the interval between hello packets sent on the interface
- `ip ospf dead-interval` - Sets the interval at which hello packets must not be seen before neighbors declare the router down
- `ip ospf transmit-delay` - Sets the estimated time it takes to transmit a link state update packet on the interface
- `show ip ospf retransmission-list` - Displays OSPF Link state retransmission list information

## 7.1.29 ip ospf transmit-delay

Sets the estimated time it takes to transmit a link state update packet on the interface. The no form of the command sets the default estimated time it takes to transmit a link state update packet on the interface.

```
ip ospf transmit-delay seconds_0-3600
```

```
no ip ospf transmit-delay
```



<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	1
<b>Example</b>	SEFOS(config-if)# <b>ip ospf transmit-delay 50</b>
<b>Notes</b>	Link-state advertisements (LSAs) in the update packet must have their ages incremented by the amount specified in the seconds argument before transmission.

### Related Commands

- `ip ospf hello-interval` - Specifies the interval between hello packets sent on the interface
- `ip ospf dead-interval` - Sets the interval at which hello packets must not be seen before neighbors declare the router down
- `ip ospf retransmit-interval` - Specifies the time between LSA retransmissions for adjacencies belonging to the interface

## 7.1.30 ip ospf priority

Sets the router priority.

```
ip ospf priority 0-255
```

```
no ip ospf priority
```

<b>Mode</b>	Interface Configuration This command is applicable only in VLAN interface.
<b>Defaults</b>	1
<b>Example</b>	SEFOS(config-if)# <b>ip ospf priority 25</b>
<b>Notes</b>	When two routers attached to a network attempt to become the designated router, the one with the higher router priority takes precedence. If there is a tie, the router with the higher router identifier takes precedence.

### Related Commands

- `ip ospf network` - Configures the OSPF network type to a type other than the default for a given media.
- `neighbor` - Specifies a neighbor router and its priority.

## 7.1.31 ip ospf hello-interval

Specifies the interval between hello packets sent on the interface. The `no` form of the command sets default value for, interval between hello packets sent on the interface.

```
ip ospf hello-interval seconds_1-65535
```

```
no ip ospf hello-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	10
<b>Example</b>	SEFOS(config-if)# <b>ip ospf hello-interval 75</b>
<b>Notes</b>	This value must be the same for all routers attached to a common network.

### Related Commands

- `ip ospf retransmit-interval` - Specifies the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface.
- `ip ospf dead-interval` - Sets the interval at which hello packets must not be seen before neighbors declare the router down.
- `ip ospf transmit-delay` - Sets the estimated time it takes to transmit a link state update packet on the interface.
- `show ip ospf interface` - Displays OSPF interface information.

## 7.1.32 ip ospf dead-interval

This command sets the interval at which hello packets must not be seen before neighbors declare the router down and the `no` form of the command sets default value for the interval at which hello packets must not be seen before neighbors declare the router down.

```
ip ospf dead-interval seconds_0-0x7fffffff
```

```
no ip ospf dead-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN interface.
<b>Defaults</b>	40
<b>Example</b>	SEFOS(config-if)# <b>ip ospf dead-interval 1000</b>
<b>Notes</b>	This value must be the same for all routers and access servers on a specific network.

### Related Commands

- `ip ospf retransmit-interval` - Specifies the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface
- `ip ospf hello-interval` - Specifies the interval between hello packets sent on the interface
- `ip ospf transmit-delay` - Sets the estimated time it takes to transmit a link state update packet on the interface
- `show ip ospf interface` - Displays OSPF interface information.

## 7.1.33 ip ospf cost

Explicitly specifies the cost of sending a packet on an interface. The no form of the command resets the path cost to the default value.

```
ip ospf cost cost_1-65535 [tos tos-value_0-30]
```

```
no ip ospf cost [tos tos-value_0-30]
```

<b>Syntax Description</b>	<b>cost</b> – Type 1 external metrics which is expressed in the same units as OSPF interface cost, that is in terms of the OSPF link state metric. <b>tos</b> – TOS of the route being configured. The only tos value you can enter is 0. because TOS is not supported.
<b>Mode</b>	Interface Configuration This command is applicable only in VLAN Interface.
<b>Defaults</b>	<b>cost</b> – 10
<b>Example</b>	SEFOS(config-if)# <b>ip ospf cost 10</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• In general, the path cost is calculated using the following formula: 108 / bandwidth .</li> <li>• Using this formula, the default path costs are calculated. Example: Ethernet-Default cost is 10.</li> </ul>

## Related Commands

- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA
- `show ip ospf interface` - Displays OSPF interface information

## 7.1.34 ip ospf network

Configures the OSPF network type to a type other than the default for a given media. The `no` form of the command sets the OSPF network type to the default type.

```
ip ospf network {broadcast | non-broadcast | point-to-multipoint  
| point-to-point}
```

```
no ip ospf network
```

<b>Syntax Description</b>	<b>broadcast</b> – Networks supporting many (more than two) attached routers, together with the capability to address a single physical message to all of the attached routers (broadcast). <b>non-broadcast</b> – Networks supporting many (more than two) routers, but having no broadcast capability. <b>point-to-multipoint</b> – Treats the non-broadcast network as a collection of point-to-point links. <b>point-to-point</b> – A network that joins a single pair of routers.
<b>Mode</b>	Interface Configuration This command is applicable only in VLAN Interface.
<b>Defaults</b>	<b>broadcast</b>
<b>Example</b>	SEFOS(config-if)# <b>ip ospf network broadcast</b>
<b>Notes</b>	Each pair of routers on a broadcast network is assumed to be able to communicate directly. An Ethernet is an example of a broadcast network. A 56Kb serial line is an example of a point-to-point network.

## Related Commands

- `neighbor` - Specifies a neighbor router and its priority
- `ip ospf priority` - Sets the router priority
- `show ip ospf interface` - Displays OSPF interface information

## 7.1.35 ip ospf authentication-key

Specifies a password to be used by neighboring routers that are using the OSPF simple password authentication. The `no` form of the command removes a previously assigned OSPF password.

```
ip ospf authentication-key password_8
```

```
no ip ospf authentication-key
```

**Mode** Interface Configuration

Applicable only in VLAN interface.

**Example** SEFOS(config-if)# **ip ospf authentication-key asdf123**

- Notes**
- The password string can contain from 1 to 8 uppercase and lowercase alphanumeric characters.
  - A separate password can be assigned to each network on a per-interface basis. All neighboring routers on the same network must have the same password to be able to exchange OSPF information.

### Related Commands

- `ip ospf authentication` - Specifies the authentication type for an interface
- `summary-address` - Creates aggregate addresses for OSPF
- `show ip ospf` - Displays general information about OSPF routing process

## 7.1.36 ip ospf authentication

Specifies the authentication type for an interface. The `no` form of the command removes the authentication type for an interface and set it to NULL authentication.

```
ip ospf authentication [{message-digest | null}]
```

```
no ip ospf authentication
```

**Syntax Description** **message-digest** – Message Digest authentication.  
**null** – NULL authentication.

**Mode** Interface Configuration

Applicable only in VLAN Interface.

<b>Defaults</b>	<b>null</b>
<b>Example</b>	SEFOS(config-if)# <b>ip ospf authentication</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Before using the ip ospf authentication command, a password for the interface must be configured using the ip ospf authentication-key command.</li> <li>• If the authentication type is 'message digest' then key will be selected from the md-5 table.</li> </ul>

### Related Commands

- `area area-id stub` - Specifies an area as a stub area and other parameters related to that area
- `area area-id default-cost` - Specifies a cost for the default summary route sent into a stub or NSSA
- `area - virtual-link` - Defines an OSPF virtual link and its related parameters
- `area - range / area - range - cost` - Consolidates and summarizes routes at an area boundary
- `ip ospf authentication-key` - Specifies a password to be used by neighboring routers that are using the OSPF simple password authentication
- `ip ospf message-digest-key` - Enables OSPF MD5 authentication

## 7.1.37 ip ospf message-digest-key

Enables OSPF MD5 authentication. The no form of the command removes an old MD5 key.

```
ip ospf message-digest-key key-id_0-255 md5 md5-key_16
```

```
no ip ospf message-digest-key key-id_0-255
```

<b>Syntax Description</b>	<p><i>key-id_0-255</i> – Identifies the secret key, which is used to create the message digest appended to the OSPF packet.</p> <p><b>md5</b> – Secret key, which is used to create the message digest appended to the OSPF packet.</p>
---------------------------	---

<b>Mode</b>	Interface Configuration This command is applicable only in VLAN Interface.
<b>Example</b>	SEFOS(config-if)# <b>ip ospf message-digest-key 5 md5 abcd123</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Message Digest authentication is a cryptographic authentication. A key (password) and key-id are configured on each router. The router uses an algorithm based on the OSPF packet, the key, and the key-id to generate a "message digest" that gets appended to the packet.</li> <li>• Usually, one key per interface is used to generate authentication information when sending packets and to authenticate incoming packets. The same key identifier on the neighbor router must have the same key value.</li> </ul>

### Related Commands

- `ip ospf authentication` - Specifies the authentication type for an interface
- `summary-address` - Creates aggregate addresses for OSPF
- `show ip ospf` - Displays general information about OSPF routing process

## 7.1.38 debug ip ospf

Sets the OSPF debug level. The no form of the command removes an old MD5 key.

```
debug ip ospf {pkt {hp | ddp | lrq | lsu | lsa} | module
{adj-formation | ism | nsm | config | interface}}
```

```
no debug ip ospf {pkt {hp | ddp | lrq | lsu | lsa} | module
{adj-formation | ism | nsm | config | interface} | all}
```

<b>Syntax Description</b>	<p><b>pkt</b> – Packet high level dump debug messages.</p> <p><b>hp</b> – Hello packet debug messages.</p> <p><b>ddp</b> – DDP packet debug messages.</p> <p><b>lrq</b> – Link state Request Packet debug messages.</p> <p><b>lsu</b> – Link state Update Packet debug messages.</p> <p><b>lsa</b> – Link state Acknowledge Packet debug messages.</p> <p><b>module</b> – RTM module debug messages.</p> <p><b>adj-formation</b> – Adjacency formation debug messages.</p> <p><b>ism</b> – Interface state machine debug messages.</p> <p><b>nsm</b> – Neighbor state machine debug messages.</p> <p><b>config</b> – Configuration debug messages.</p> <p><b>interface</b> – Interface.</p>
---------------------------	---

<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>debug ip ospf pkt hp</b>
<b>Notes</b>	The information displayed by the <code>show ip ospf retransmission-list</code> command is useful in debugging OSPF routing operations.

### Related Commands

- `show ip ospf` - Displays general information about OSPF routing process

## 7.1.39 `show ip ospf interface`

Displays OSPF interface information.

```
show ip ospf interface [vlan 1-4094]
```

**Syntax  
Description**

**vlan** – LSA retransmissions for adjacencies belonging to the VLAN interface.

**Mode**

Privileged EXEC



**Example**

```
Single Instance:
SEFOS# show ip ospf interface
vlan4 is up line protocol is up
  Internet Address 10.1.4.1, Mask 255.255.255.0, Area 0.0.0.5
  AS 1, Router ID 10.1.100.1, Network Type BROADCAST, Cost 1
  Transmit Delay is 1 sec, State 4, Priority 1
  Designated RouterId 10.1.100.1, Interface address 10.1.4.1
  No backup designated router on this network
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 6 sec
  Neighbor Count is 0, Adjacent neighbor count is 0
Connected to VRF default
vlan100 is up line protocol is up
  Internet Address 10.1.100.1, Mask 255.0.0.0, Area 33.0.0.12
  AS 1, Router ID 10.0.0.1, Network Type BROADCAST, Cost 1
  Transmit Delay is 1 sec, State 5, Priority 1
  Designated RouterId 10.1.100.2, Interface address 10.1.100.2
  Backup Designated RouterId 10.1.100.1, Interface address 10.1.100.1
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 6 sec
  Neighbor Count is 1, Adjacent neighbor count is 1
  Adjacent with the neighbor 10.1.100.2
Connected to VRF default
```

**Related Commands**

- `network / network - wildcard-mask` - Defines the interfaces on which OSPF runs and to define the area ID for those interfaces
- `passive-interface vlan` - Suppresses routing updates on an interface
- `passive-interface default` - Suppresses routing updates on all interfaces
- `ip ospf demand-circuit` - Configures OSPF to treat the interface as an OSPF demand circuit
- `ip ospf hello-interval` - Specifies the interval between hello packets sent on the interface
- `ip ospf dead-interval` - Sets the interval at which hello packets must not be seen before neighbors declare the router down
- `ip ospf cost` - Specifies the cost of sending a packet on an interface

## 7.1.40 show ip ospf neighbor

Displays OSPF neighbor information list.

```
show ip ospf neighbor [vlan 1-4094] [neighbor-id] [detail]
```

### Syntax Description

**vlan** - LSA retransmissions for adjacencies belonging to the VLAN interface.

*neighbor-id* - Neighbor router identifier.

**detail** - OSPF neighbor information in detail.

### Mode

Privileged EXEC

### Example

Single Instance:

```
SEFOS# show ip ospf neighbor
```

```
Vrf default
```

Neighbor-ID	Pri	State	DeadTime	Address	Interface
-----	---	-----	-----	-----	-----
10.1.100.2	1	FULL/DR	33	10.1.100.2	vlan100

### Related Commands

- [neighbor](#) - Specifies a neighbor router and its priority

## 7.1.41 show ip ospf request-list

Displays OSPF Link state request list information.

```
show ip ospf request-list [neighbor-id] [vlan 1-4094]
```

```
show ip ospf [vrf name] request-list [neighbor-id] [vlan 1-4094]
```

**Syntax** *neighbor-id* - Neighbor router ID.

**Description** **vlan** - LSA retransmissions for adjacencies belonging to the VLAN interface.

**Mode** Privileged EXEC

**Example** Single Instance:  
 SEFOS# **show ip ospf request-list**

```

OSPF Router with ID (10.1.100.1) (Vrf default)
Neighbor 10.1.100.2, interface - address 10.1.100.2
Type LS-ID    ADV-RTR      SeqNo        Age         Checksum
----  ----    -

```

### Related Commands

- [passive-interface vlan](#) - Suppresses routing updates on an interface
- [passive-interface default](#) - Suppresses routing updates on all interfaces

## 7.1.42 show ip ospf retransmission-list

Displays OSPF Link state retransmission list information.

```
show ip ospf retransmission-list [neighbor-id] [vlan 1-4094]
```

```
show ip ospf [vrf name] retransmission-list [neighbor-id] [vlan
vlan 1-4094]
```

**Syntax** *neighbor-id* - Neighbor router identifier.

**Description** **vlan** - LSA retransmissions for adjacencies belonging to the VLAN interface.

**Mode** Privileged EXEC

**Example** Single Instance:  
 SEFOS# **show ip ospf retransmission-list**  
 OSPF Router with ID (10.1.100.1) (Vrf default)

**Notes** This value is also used while retransmitting database description and link-state request packets.

### Related Commands

- [ip ospf retransmit-interval](#) - Specifies the time between LSA retransmissions for adjacencies belonging to the interface

## 7.1.43 show ip ospf virtual-links

Displays OSPF virtual link information.

```
show ip ospf virtual-links
```

**Mode** Privileged EXEC

**Example** Single Instance:

```
SEFOS# show ip ospf virtual-links
```

```
Vrf default
```

```
Virtual Link to router 10.1.100.2, Interface State is  
POINT_TO_POINT
```

```
Transit Area 0.0.0.1
```

```
Transmit Delay is 1 sec, Neighbor State FULL
```

```
Timer intervals configured, Hello 10, Dead 40,  
Retransmit 5
```

### Related Commands

- `area - virtual-link` - Defines an OSPF virtual link and its related parameters

## 7.1.44 show ip ospf border-routers

Displays OSPF border and boundary router information.

```
show ip ospf border-routers
```

**Mode** Privileged EXEC

**Example** Single Instance:

```
SEFOS# show ip ospf border-routers
```

```
Vrf default
```

```
OSPF Process Border Router Information
```

Destination	TOS	Type	NextHop	Cost	Rt.Type	Area
-----	---	----	-----	----	-----	----
10.1.100.2	0	ABR	10.1.100.2	1	intraArea	0.0.0.1

## Related Commands

- `abr-type` - Sets the alternative ABR type

## 7.1.45 `show ip ospf - summary address`

Displays OSPF summary-address redistribution information.

```
show ip ospf {area-range | summary-address}
```

**Syntax** `area-range` – Area associated with the OSPF address range. It is specified as an IP address.  
`summary-address` – Aggregate addresses for OSPF.

**Mode** Privileged EXEC

**Example** Single Instance:

```
SEFOS# show ip ospf area-range
Display of Summary addresses for Type3 and Translated Type5
Summary Address
-----
Network      Mask          LSAType Area          Effect          Tag
-----
10.0.0.0    255.0.0.0    Summary 33.0.0.12  Advertise 1074636208
SEFOS# show ip ospf summary-address
Display of Summary addresses for Type5 and Type7 from redistributed routes
OSPF External Summary Address Configuration Information
-----
Network      Mask          Area          Effect          TranslationSt
-----
10.0.0.1    255.0.0.0    33.0.0.12    advertiseMatching  enabled
```

## Related Commands

- `area - range / area - range - cost` - Consolidates and summarizes routes at an area boundary
- `summary-address` - Creates aggregate addresses for OSPF

## 7.1.46 `show ip ospf`

Displays general information about the OSPF routing process.

```
show ip ospf
```

**Mode** Privileged EXEC

**Example** Single Instance:  
SEFOS# **show ip ospf**  
OSPF Router with ID(10.1.100.1) (Vrf default)  
Supports only single TOC(TOS0) route  
ABR Type supported is Standard ABR  
It is an Area Border Router  
Number of Areas in this router is 3  
Area is 0.0.0.5  
Number of interfaces in this area is 1  
SPF algorithm executed 35 times  
Area is 0.0.0.1  
Number of interfaces in this area is 1  
SPF algorithm executed 44 times  
Area is 0.0.0.0  
Number of interfaces in this area is 1  
SPF algorithm executed 20 times

### Related Commands

- `area - stability interval` - Configures the Stability interval for NSSA
- `area - virtual-link` - Defines an OSPF virtual link and its related parameters
- `ip ospf authentication-key` - Specifies a password to be used by neighboring routers that are using the OSPF simple password authentication.
- `debug ip ospf` - Sets the OSPF debug level

## 7.1.47 `show ip ospf route`

Displays routes learned by OSPF process.

```
show ip ospf route
```

**Mode** Privileged EXEC

**Example**

```

Single Instance:
SEFOS# show ip ospf route
  Vrf default
OSPF Routing Table
Dest/Mask          TOS NextHop/Interface  Cost Rt.Type  Area
-----          --- - - - - - / - - - - -  - - - - -  - - - - -
10.1.4.0/255.255.255.0    0  0.0.0.0/vlan4        1      IntraArea
0.0.0.5
10.1.11.0/255.255.255.0   0  10.1.100.2/vlan1002  2      InterArea
0.0.0.0
10.1.100.0/255.255.255.0  0  0.0.0.0/vlan100     1      IntraArea
0.0.0.1

```

**Related Commands**

- `router ospf` - Enables OSPF routing process
- `router ospf - process-id` - Enables the OSPF routing process
- `router-id` - Sets the router-id for the OSPF process

## 7.1.48 `show ip ospf - database summary`

Displays OSPF LSA Database summary.

```

show ip ospf area-id database [{database-summary | self-originate
| adv-router ip-address}]

```

**Syntax Description**

*area-id* – Area associated with the OSPF address range. It is specified as an IP address.

**database** – Displays how many of each type of LSA for each area there are in the database.

**database-summary** – Displays how many of each type of LSA for each area there are in the database, and the total number of LSA types.

**self-originate** – Displays only self-originated LSAs (from the local router).

**adv-router** – Displays all the specified router link-state advertisements (LSAs). If no IP address is included, the information is about the local router itself.

**Mode**

Privileged EXEC

**Example**

```

Single Instance:
SEFOS# show ip ospf database
OSPF Router with ID (10.1.100.1) (Vrf default)
      Router Link States (Area 0.0.0.0)
      -----
Link ID      ADV Router  Age      Seq#        Checksum    Link Count
-----
10.1.100.2  10.1.100.2  32769   0x80000026 0x7aa4      2
10.1.100.1  10.1.100.1  1626    0x80000036 0x1e1a      1
      Summary Link States (Area 0.0.0.0)
      -----
Link ID      ADV Router  Age      Seq#        Checksum
-----
10.1.100.0  10.1.100.1  566     0x80000031 0x2dfe
10.1.4.0    10.1.100.1  566     0x80000030 0x533a
10.1.100.0  10.1.100.2  33600   0x80000001 0x87d3
      Router Link States (Area 0.0.0.1)
      -----
Link ID      ADV Router  Age      Seq#        Checksum    Link Count
-----
10.1.100.2  10.1.100.2  135     0x8000000b 0x5609      1
10.1.100.1  10.1.100.1  1626    0x8000003d 0xf33c      1
      Network Link States (Area 0.0.0.1)
      -----
Link ID      ADV Router  Age      Seq#        Checksum
-----
10.1.100.1  10.1.100.1  673     0x80000009 0xff6e
      Summary Link States (Area 0.0.0.1)
      -----
Link ID      ADV Router  Age      Seq#        Checksum
-----
10.1.4.0    10.1.100.1  755     0x80000030 0x533a
10.1.11.0   10.1.100.2  882     0x80000008 0x505d
      Router Link States (Area 0.0.0.5)
      -----
Link ID      ADV Router  Age      Seq#        Checksum    Link Count
-----

```



```
10.1.100.1 10.1.100.1 755 0x80000038 0xf118 1
Summary Link States (Area 0.0.0.5)
```

```
-----
Link ID      ADV Router  Age      Seq#      Checksum
-----
10.1.100.0  10.1.100.1  755      0x80000009 0x7dd6
10.1.11.0   10.1.100.1  1621     0x80000008 0x604d
```

## 7.1.49 show ip ospf - database

Displays OSPF Database summary for the LSA type.

```
show ip ospf [area-id] database {asbr-summary | external | network
| nssa-external | opaque-area | opaque-as | opaque-link | router
| summary } [link-state-id] [{adv-router ip-address |
self-originate}]
```

<b>Syntax Description</b>	<p><i>area-id</i> – Area associated with the OSPF address range. It is specified as an IP address.</p> <p><b>database</b> – Displays how many of each type of LSA for each area there are in the database.</p> <p><b>asbr-summary</b> – Displays information only about the ASBR summary LSAs.</p> <p><b>external</b> – Displays information only about the external LSAs.</p> <p><b>network</b> – Displays information only about the network LSAs.</p> <p><b>nssa-external</b> – Displays information about the NSSA external LSAs.</p> <p><b>opaque-area</b> – Displays information about the Type-10 LSAs.</p> <p><b>opaque-as</b> – Displays information about the Type-11 LSAs.</p> <p><b>opaque-link</b> – Displays information about the Type-9 LSAs.</p> <p><b>router</b> – Displays information only about the router LSAs.</p> <p><b>summary</b> – Displays information only about the summary LSAs.</p> <p>link-state-id – Portion of the Internet environment that is being described by the advertisement. The value entered depends on the type of the LSA. The value must be entered in the form of an IP address.</p> <p><b>adv-router</b> – Displays all the specified router link-state advertisements (LSAs). If no IP address is included, the information is about the local router itself.</p> <p><b>self-originate</b> – Displays only self-originated LSAs (from the local router).</p>
<b>Mode</b>	Privileged EXEC
<b>Example</b>	<p>Single Instance:</p> <pre>SEFOS# show ip ospf database summary</pre> <p>OSPF Router with ID (10.0.100.1) (Vrf default)</p> <pre>SEFOS# show ip ospf database network</pre> <p>OSPF Router with ID (10.0.100.1) (Vrf default)</p>

### Related Commands

- `network / network - wildcard-mask` - Defines the interfaces on which OSPF runs and to define the area ID for those interfaces
- `router ospf` - Enables OSPF routing process
- `router ospf - process-id` - Enables the OSPF routing process

# OSPFv3

---

OSPFv3 is the modified form of OSPF to support version 6 of IP. The fundamental mechanisms of OSPF remain unchanged, such as: flooding, DR election, area support, SPF calculations, and so on. However, some changes have been necessary due to either changes in protocol semantics from IPv4 to IPv6, or simply to handle the increased address size of IPv6.

---

## 8.1 OSPFv3 Commands

The list of CLI commands for the configuration of OSPFv3 are as follows:

- `ipv6 router ospf`
- `router-id - IPv4-address`
- `area - stub | nssa`
- `area - stability-interval`
- `area - translation-role`
- `timers spf`
- `abr-type`
- `area - default-metric value`
- `area - default-metric type`
- `area - virtual-link`
- `ASBR Router`
- `area - range`
- `area - range - cost`
- `area - summary-prefix`
- `redistribute`

- passive-interface
- host - metric | area-id
- no area
- no area - range
- nssaAsbrDfRtTrans
- redist-config
- as-external lsdB-limit
- exit-overflow-interval
- demand-extensions
- reference-bandwidth
- auto-cost reference-bandwidth
- ipv6 ospf area
- ipv6 ospf demand-circuit
- ipv6 ospf retransmit-interval
- ipv6 ospf transmit-delay
- ipv6 ospf priority
- no ipv6 ospf priority
- ipv6 ospf hello-interval
- ipv6 ospf dead-interval
- ipv6 ospf poll-interval
- ipv6 ospf metric
- ipv6 ospf network
- ipv6 ospf neighbor
- ipv6 ospf passive-interface
- ipv6 ospf neighbor probing
- ipv6 ospf neighbor-probe retransmit-limit
- ipv6 ospf neighbor-probe interval
- debug ipv6 ospf - pkt
- debug ipv6 ospf
- debug ipv6 ospf - packet | events
- show ipv6 ospf interface
- show ipv6 ospf neighbor
- show ipv6 ospf - request/retrans-list
- show ipv6 ospf virtual-links
- show ipv6 ospf border-routers

- `show ipv6 ospf - area-range / summary-prefix`
- `show ipv6 ospf - General Information`
- `show ipv6 ospf - LSA Database`
- `show ipv6 ospf route`
- `show ipv6 ospf areas`
- `show ipv6 ospf host`
- `show ipv6 ospf redist-config`

## 8.1.1 `ipv6 router ospf`

Enables the OSPFv3 routing protocol. The `no` form of the command disables the OSPFv3 routing protocol.

```
ipv6 router ospf
```

```
no ipv6 router ospf
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <b>ipv6 router ospf</b>
<b>Notes</b>	The <code>no</code> form of the command disables all the interfaces and triggers flushing of self-originated LSAs and deletes the router's link state database.

## 8.1.2 `router-id - IPv4-address`

Sets a fixed router identifier.

```
router-id IPv4-address
```

<b>Syntax Description</b>	<i>IPv4-address</i> – A 32-bit integer that uniquely identifies the router in the autonomous system.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<i>IPv4-address</i> – <b>0.0.0.0</b>
<b>Example</b>	SEFOS(config-router)# <b>router-id 11.0.0.1</b>

## Related Commands

- `show ipv6 ospf - General Information` – Displays general information about the OSPFv3 routing process

## 8.1.3 `area - stub | nssa`

Defines an area as a stub area or an NSSA.

```
area area-id {stub | nssa} [no-summary]
```

<b>Syntax</b>	<i>area-id</i> – A 32-bit integer.
<b>Description</b>	<b>stub</b> – Stub area. <b>nssa</b> – NSSA. <b>no-summary</b> – Allows an area to be a stubby or not-so-stubby but does not allow it to have summary routes injected into it.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>area 1.1.1.1 stub no-summary</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• In stub area, the generation of summary LSA is optional.</li><li>• If <code>no-summary</code> option is specified in the command, then the router neither originates nor propagates summary LSAs into the stubby area or NSSA. It relies entirely on its default route.</li><li>• If the <code>no-summary</code> option is not specified, the router summarizes and propagates summary LSAs.</li><li>• The <code>no-summary</code> option can be specified only in the area border Routers and by default, it is set to send summary.</li></ul>

## Related Commands

- `show ipv6 ospf areas` – Displays the area table

## 8.1.4 `area - stability-interval`

Configures the stability interval (in seconds) for the NSSA. The `no` form of the command sets the default value of the stability interval for the NSSA.

```
area area-id stability-interval seconds_1-65535
```

```
no area area-id stability-interval
```

<b>Syntax</b>	<i>area-id</i> – A 32 bit integer.
<b>Description</b>	<b>stability-interval</b> – The number of seconds after which an elected translator determines that its services are no longer required, and that it must continue to perform its translation duties.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>stability-interval</b> – 40
<b>Example</b>	SEFOS(config-router)# <b>area 0.0.0.1 stability-interval 50</b>

### Related Commands

- `show ipv6 ospf areas` – Displays the area table

## 8.1.5 area - translation-role

Configures the translation role for NSSA. The no form of the command configures the default translation role for the NSSA.

```
area area-id translation-role {always | candidate}
```

```
no area area-id translation-role
```

<b>Syntax</b>	<i>area-id</i> – A 32-bit integer.
<b>Description</b>	<b>translation-role</b> – An NSSA border router’s ability to perform NSSA Translation of Type-7 LSAs to Type-5 LSAs.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>translation-role – candidate</b>
<b>Example</b>	SEFOS(config-router)# <b>area 0.0.0.1 translation-role always</b>
<b>Notes</b>	When the translator role is set to always, the Type-7 LSAs are always translated into Type-5 LSAs. When translator role is set to candidate, an NSSA border router participates in the translator election process.

### Related Commands

- `show ipv6 ospf areas` – Displays the area table

## 8.1.6 timers spf

Configures the delay time and the hold time between two consecutive SPF calculations. The `no` form of the command sets the default values for `spf-delay` and `spf-holdtime`.

---

**Note** – Delay time is the time interval when OSPFv3 receives a topology change and when it starts a Shortest Path First (SPF) calculation.

---

```
timers spf spf-delay spf-holdtime
```

```
no timers spf
```

<b>Syntax Description</b>	<code>spf-delay</code> – The interval by which SPF calculation is delayed after a topology change reception. <code>spf-holdtime</code> – The delay between two consecutive SPF calculations.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<code>spf-delay</code> – 5 <code>spf-holdtime</code> – 10
<b>Example</b>	SEFOS(config-router)# <b>timers spf 10 20</b>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.7 abr-type

Sets the ABR (Area Border Router) type.

```
abr-type {standard | cisco | ibm}
```

```
no abr-type
```

<b>Syntax Description</b>	<b>standard</b> – Standard ABR type. <b>cisco</b> – CISCO ABR type. <b>ibm</b> – IBM ABR type.
---------------------------	--



<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>standard</b>
<b>Example</b>	SEFOS(config-router)# <b>abr-type cisco</b>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.8 area - default-metric value

Sets the default metric value for an area of type NSS/stub only.

```
area area-id default-metric metric
```

<b>Syntax Description</b>	<i>area-id</i> – A 32-bit integer. <b>default-metric</b> – Cost for the default summary route in a stub/NSS area.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>default-metric</b> – 1
<b>Example</b>	SEFOS(config-router)# <b>area 1.1.1.1 default-metric 20</b>
<b>Notes</b>	Default metric can be defined only for a valid area.

### Related Commands

- [area - stub](#) | [nssa](#) – Defines an area as a stub area or an NSSA

## 8.1.9 area - default-metric type

Sets the default metric-type for an area type of NSS or stub only.

```
area area-id default-metric type metric-type_1-3
```

<b>Syntax Description</b>	<i>area-id</i> – A 32 bit integer. <b>default-metric type</b> – Type of metric.
<b>Mode</b>	Router Configuration

<b>Defaults</b>	<b>default-metric type - 1</b>
<b>Example</b>	SEFOS(config-router)# <b>area 1.1.1.1 default-metric type 2</b>
<b>Notes</b>	Default metric can be defined only for a valid area.

### Related Commands

- `show ipv6 ospf - General Information` – Displays general information about the OSPFv3 routing process

## 8.1.10 area - virtual-link

Sets the virtual link between areas.

In OSPFv3, all areas must be connected to a backbone area. If there is a break in backbone continuity, or the backbone is purposefully partitioned, a virtual link can be established. The two endpoints of a virtual link are ABRs. The virtual link must be configured in both routers. The configuration information in each router consists of the other virtual endpoint (the other ABR) and the non-backbone area that the two routers have in common (called the transit area).

If 20.0.0.3 is the Router ID of the Neighbor and 100 is the Interface Index assigned to the OSPFv3 virtual interface, then this interface index is advertised in Hello packet sent over the virtual link and in the router's router-LSAs.

```
area area-id virtual-link router-id if-index [hello-interval
seconds] [retransmit-interval seconds] [transmit-delay seconds]
[dead-interval seconds]
```

<b>Syntax Description</b>	<p><i>area-id</i> – A 32-bit integer.</p> <p><i>router-id</i> – The Router ID of the virtual neighbor.</p> <p><i>if-index</i> – Interface Index assigned to the OSPFv3 virtual interface.</p> <p><b>hello-interval</b> – The interval between hello packets on the OSPFv3 virtual link interface. This value ranges between 1 and 65535 seconds.</p> <p><b>retransmit-interval</b> – The time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the OSPFv3 virtual link interface. This value ranges between 1 and 1800 seconds.</p> <p><b>transmit-delay</b> – The estimated time it takes to transmit a link state update packet over this interface. This value ranges between 1 and 1800 seconds.</p> <p><b>dead-interval</b> – The interval at which hello packets must not be seen before its neighbors declare the router down. This value ranges between 1 and 65535 seconds.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<p><b>hello-interval</b> – 10</p> <p><b>retransmit-interval</b> – 20</p> <p><b>transmit-delay</b> – 1</p> <p><b>dead-interval</b> – 60</p>
<b>Example</b>	<pre>SEFOS(config-router)# area 1.1.1.1 virtual-link 20.0.0.3 1 hello-interval 50 retransmit-interval 6 transmit-delay 6 dead-interval 100</pre>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Virtual links cannot be configured through stub areas.</li> <li>• <i>hello-interval</i> and <i>dead-interval</i> values must be the same for all routers on a specific network.</li> </ul>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information
- `show ipv6 ospf virtual-links` – Displays the parameters and the current state of OSPFv3 virtual links

## 8.1.11 ASBR Router

Configures the router as an ASBR. The `no` form of the command disables the ASBR status of the router.

<b>ASBR Router</b>
--------------------

<b>no ASBR Router</b>
-----------------------

<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>ASBR Router</b>
<b>Notes</b>	Only when ASBR status is configured to enable, routes from other protocols are redistributed into OSPFv3 domain.

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.12 area - range

Creates the internal aggregation address range. The internal address range is of two types:

- Type-3 aggregation
- Type 7 translation aggregation

```
area area-id range IPv6-prefix prefix-length [{advertise | not-advertise}] {summary | Type7} [tag tag-value]
```

<b>Syntax</b>	<i>area-id</i> – A 32-bit integer.
<b>Description</b>	<p><b>range</b> – Internal aggregation address range.</p> <p><i>ipv6-prefix</i> – The IPv6 address prefix of the range.</p> <p><i>prefix-length</i> – The prefix length of the address range.</p> <p><b>advertise</b> – Flushes out all the routes (LSAs) falling in the range and generates aggregated LSA for the range.</p> <p><b>not-advertise</b> – Suppresses routes that match the prefix/prefix-length pair.</p> <p><b>summary</b> – Summary LSA.</p> <p><b>Type7</b> – Type-7 LSA.</p> <p><b>tag</b> – Sets the tag value for the aggregated route.</p>
<b>Mode</b>	Router Configuration

<b>Defaults</b>	<code>tag - 0</code>
<b>Example</b>	SEFOS(config-router)# <b>area 0.0.0.0 range 3ffe:5000:481d::5 80 advertise Type7 tag 20</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• When parameter <code>summary</code> is specified, the configured range is used for aggregating Type-3 LSA.</li> <li>• When parameter <code>Type7</code> is specified, the configured range is used for aggregating Type-7 LSAs.</li> <li>• The optional parameter <code>tag</code> is used to set the tag value for the aggregated route. This is not used by the OSPFv3 protocol alone. It can be used to communicate information between AS boundary routers.</li> </ul>

### Related Commands

- `show ipv6 ospf - area-range / summary-prefix` – Displays either the list of all area address ranges information or all external summary address configuration information

## 8.1.13 area - range - cost

Summarizes routes at an area boundary. This command operates similar to the command `area - range`.

```
area area-id range IPv6-prefix | prefix-length [{advertise | not-advertise}] [tag value] [cost cost]
```

<b>Syntax</b>	<i>area-id</i> – Area identifier. This is a 32-bit integer.
<b>Description</b>	<p><i>ipv6-prefix</i> – The IPv6 address prefix of the range.</p> <p><i>prefix-length</i> – The prefix length of the address range.</p> <p><b>advertise</b> – Flushes out all the routes (LSAs) falling in the range and generates aggregated LSA for the range.</p> <p><b>not-advertise</b> – Suppresses routes that match the prefix/prefix-length pair.</p> <p><b>tag</b> – Sets the tag value for the aggregated route. The tag value is used to communicate information between AS boundary routers.</p> <p><b>cost</b> – Metric or cost for a summary route, which is used during OSPF SPF calculation to determine the shortest paths to the destination. This value ranges between 0 and 16777215.</p>
<b>Mode</b>	Router Configuration

<b>Defaults</b>	<b>tag - 0</b>
<b>Example</b>	SEFOS(config-router)# <b>area 0.0.0.0 range 3ffe:5000:481d::5 / 80 advertise tag 20</b>
<b>Notes</b>	The optional parameter tag is used to set the tag value for the aggregated route. This is not used by the OSPFv3 protocol alone. It can be used to communicate information between AS boundary routers.

### Related Commands

- `show ipv6 ospf - area-range / summary-prefix` - Displays either the list of all area address ranges information or all external summary address configuration information

## 8.1.14 area - summary-prefix

Enables route aggregation or filtering while importing routes in the OSPFv3 domain. The command configures Type-5 and Type-7 address range specifying whether Type-5 or Type-7 LSAs are generated or not for the configured range for the particular area.

```
area area-id summary-prefix IPv6-prefix prefix-length [{allowAll
| denyAll | advertise | not-advertise}] [Translation {enabled |
disabled}]
```

<b>Syntax</b>	<i>area-id</i> – A 32-bit integer.
<b>Description</b>	<p><b>summary-prefix</b> – Summary prefix.</p> <p><i>ipv6-prefix</i> – The IPv6 address prefix of the range.</p> <p><i>prefix-length</i> – The prefix length of the address range.</p> <p><b>allowAll</b> – When set to allowAll and the associated area-id is 0.0.0.0, aggregated Type-5 LSAs are generated for the specified range. In addition, aggregated Type-7 LSAs are generated in all the attached NSSAs for the specified range.</p> <p><b>denyAll</b> – When set to denyAll, neither Type-5 LSA nor Type-7 LSAs are generated for the specified range.</p> <p><b>advertise</b> – When the associated area-id is 0.0.0.0, aggregated Type-5 LSAs are generated. Otherwise, if the associated <i>area-id</i> is x.x.x.x (other than 0.0.0.0), aggregated Type-7 LSA is generated in NSSA area x.x.x.x.</p> <p><b>not-advertise</b> – When the associated area-id is 0.0.0.0, Type-5 LSA is not generated for the specified range, while all the NSSA LSAs within this range are flushed out and aggregated Type-7 LSA is generated in all attached NSSAs. If associated <i>area-id</i> is x.x.x.x (other than 0.0.0.0), Type-7 LSA is not generated in NSSA x.x.x.x for the specified range.</p> <p><b>Translation</b> – When set to enabled, the P-Bit is set in the generated Type-7 LSA. When set to disabled, the P-Bit is cleared in the generated Type-7 LSA for the range.</p>
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>Translation – enabled</b> <b>advertise</b>
<b>Example</b>	SEFOS(config-router)# <b>area 0.0.0.0 summary-prefix 3ffe:5000::481d::5 80 allowall Translation enabled</b>
<b>Notes</b>	The value allowAll/denyall is not valid for <i>area-id</i> other than 0.0.0.0.

## Related Commands

- `show ipv6 ospf - area-range / summary-prefix` – Displays either the list of all area address ranges information or all external summary address configuration information

## 8.1.15 redistribute

Configures the protocol from which the routes have to be redistributed into OSPFv3. The no form of the command disables the redistribution of routes from the given protocol into OSPFv3.

```
redistribute {static | connected | ripng | bgp}
```

```
no redistribute {static | connected | ripng | bgp}
```

<b>Syntax Description</b>	<b>static</b> – Advertises routes, configured statically in the OSPFv3 routing process. <b>connected</b> – Advertises directly connected networks routes in the OSPFv3 routing process. <b>ripng</b> – Advertises routes that are learnt by the RIP process in the OSPFv3 routing process. <b>bgp</b> – Advertises routes that are learnt by the BGP process in the OSPFv3 routing process.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>redistribute static</b>
<b>Notes</b>	To configure Redistribution of routes from other protocols, the following steps must be performed. 1. Configure the router as ASBR. 2. Configure redistribution of routes from particular protocol. The above order must be maintained and ASBR setting must be done before enabling redistribution.

### Related Commands

- [ASBR Router](#) – Configures the router as an ASBR
- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.16 passive-interface

Sets the global default passive interface status. All the interfaces created after executing this command become passive interfaces. The no form of the command resets the global default passive interface status. All the interfaces created after executing this command become non-passive interfaces.

```
passive-interface
```



```
no passive-interface
```

**Mode** Router Configuration  
**Defaults** Disabled.  
**Example** SEFOS(config-router)# **passive-interface**

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.17 host - metric | area-id

Configures a host entry with metric or *area-id*.

```
host IPv6-address {metric cost} [area-id {area-id}]
```

```
no host IPv6-address
```

**Syntax Description** *IPv6-address* – IPv6 address prefix.  
**metric** – Metric to be advertised.  
*area-id* – A 32-bit integer.

**Mode** Router Configuration

**Example** SEFOS(config-router)# **host 3ffe:481d::5 metric 10 area-id 0.0.0.1**

### Related Commands

- [show ipv6 ospf host](#) – Displays the host table information

## 8.1.18 no area

Deletes an area and does any one of the following based on the optional parameter.

- Converts stub or nss area to normal area
- Deletes virtual link
- Deletes stub cost

- Deletes area-range or summary-prefix values

```
no area area-id [{stub | nssa | virtual-link router-id |
default-metric | {range {summary | Type7} | summary-prefix}
IPv6-prefix prefix-length}]
```

**Syntax** *area-id* - A 32-bit integer

**Description**

- stub** - Stub area.
- nssa** - Not so stubby area.
- virtual-link** - The Router ID of the virtual neighbor.
- default-metric** - Cost for the default summary route in a stub/NSS area.
- range** - Type-3 or Type-7 or external LSA range.
- IPv6-prefix* - The IPv6 address prefix of the range.
- prefix-length* - The prefix length of the address range.

**Mode** Router Configuration

**Example**

```
SEFOS(config-router)# no area 1.1.1.1
SEFOS(config-router)# no area 1.1.1.1 stub
SEFOS(config-router)# no area 1.1.1.1 default-metric
SEFOS(config-router)# no area 1.1.1.1 virtual-link
20.0.0.3
SEFOS(config-router)# no area 1.1.1.1 range summary
3ffe:3010:481d::5 80
```

**Notes** Before deleting an area, it is necessary to delete all the interfaces attached to that area.

## Related Commands

- `show ipv6 ospf areas` - Displays the Area Table
- `show ipv6 ospf - area-range / summary-prefix` - Displays either the list of all area address ranges information or all external summary address configuration information
- `no ipv6 ospf area` - Disables OSPFv3 routing protocol on the interface

## 8.1.19 no area - range

Deletes an area-range. This command operates similar to that of the command `no area`.

```
no area area-id range IPv6-prefix | prefix-length [{advertise |
not-advertise}] [cost cost]
```

<b>Syntax Description</b>	<p><i>area-id</i> – Area identifier. This is a 32-bit integer.</p> <p><i>IPv6-prefix</i> – The IPv6 address prefix of the range.</p> <p><i>prefix-length</i> – The prefix length of the address range.</p> <p><b>advertise</b> – Flushes out all the routes (LSAs) falling in the range and generates aggregated LSA for the range.</p> <p><b>not-advertise</b> – Suppresses routes that match the prefix/prefix-length pair.</p> <p><b>cost</b> – Metric or cost for a summary route, which is used during OSPF SPF calculation to determine the shortest paths to the destination. This value ranges between 0 and 16777215.</p>
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>no area 1.1.1.1 range 3ffe:3010:481d::5 / 80</b>
<b>Notes</b>	All the interfaces attached to an area must be deleted before deleting an area.

## Related Commands

- `show ipv6 ospf areas` – Displays the Area Table
- `show ipv6 ospf - area-range / summary-prefix` – Displays either the list of all area address ranges information or all external summary address configuration information
- `no ipv6 ospf area` – Disables OSPFv3 routing protocol on the interface

## 8.1.20 nssaAsbrDfRtTrans

This command enables setting of P bit in the default Type-7 LSA generated by an NSSA internal ASBR. The no form of the command disables setting of P bit in the default Type-7 LSA generated by an NSSA internal ASBR.

```
nssaAsbrDfRtTrans
```

```
no nssaAsbrDfRtTrans
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	Disabled
<b>Example</b>	SEFOS(config-router)# <b>nssaAsbrDfRtTrans</b>

## Related Commands

- `show ipv6 ospf - General Information` – Displays general information about the OSPFv3 routing process

## 8.1.21 `redist-config`

Configures the information to be applied to routes learnt from RTM. The `no` form of the command deletes the information applied to routes learnt from RTM.

```
redist-config IPv6-prefix prefix-length [metric-value metric]  
[metric-type {asExttype1 | asExttype2}] [tag tag-value]
```

```
no redist-config IPv6-prefix prefix-length
```

<b>Syntax</b>	<i>IPv6-prefix</i> – The IPv6 address prefix.
<b>Description</b>	<i>prefix-length</i> – The prefix length of the address. <b>metric-value</b> – The metric value applied to the route before it is advertised into the OSPFv3 Domain. <b>metric-type</b> – The metric type applied to the route before it is advertised into the OSPFv3 Domain. <b>tag</b> – The tag type describes whether tags will be automatically generated or will be manually configured.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>redist-config 3ffe:5000:481d::5 80 metric-value 30 metric-type asExttype1 tag 12</b>

## Related Commands

- `show ipv6 ospf redist-config` – Displays the configuration information to be applied to the routes learnt from the RTM

## 8.1.22 `as-external lsdb-limit`

Sets the maximum number of non-default AS-external-LSA entries that can be stored in the link-state database. If the value is -1, then there is no limit.

```
as-external lsdb-limit lsdb-limit_-1-0x7fffffff
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>lsdb-limit</b> - -1
<b>Example</b>	SEFOS(config-router)# <b>as-external lsdb-limit 10</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• When the number of non-default AS-external-LSAs in a router's link-state database reaches the configured limit, the router enters Overflow- State. The router never holds more than the configured non-default AS-external-LSAs in its database.</li> <li>• The LSDB limit MUST be set identically in all routers attached to the OSPFv3 backbone and/or any regular OSPFv3 area. (i.e. OSPFv3 stub areas and NSSAs are excluded).</li> </ul>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process
- [exit-overflow-interval](#) – Sets the number of seconds after which a router will attempt to leave the overflow state

## 8.1.23 exit-overflow-interval

Sets the number of seconds after which a router will attempt to leave the overflow state.

```
exit-overflow-interval interval
```

<b>Mode</b>	Router Configuration
<b>Defaults</b>	<b>interval</b> - 0
<b>Example</b>	SEFOS(config-router)# <b>exit-overflow-interval 10</b>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.24 demand-extensions

Enables routing support for demand routing. The no form of the command disables routing support for demand routing.

```
demand-extensions
```

```
no demand-extensions
```

**Mode** Router Configuration

**Defaults** Enabled.

**Example** SEFOS(config-router)# **demand-extensions**

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.25 reference-bandwidth

Sets the reference bandwidth in kilobits per second for calculating the default interface metrics.

```
reference-bandwidth ref-bw
```

**Mode** Router Configuration

**Defaults** *ref-bw* – 100,000 KBPS

**Example** SEFOS(config-router)# **reference-bandwidth 100000**

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.26 auto-cost reference-bandwidth

Sets the reference bandwidth in kilobits per second for calculating the default interface metrics. The no form of the command sets the reference bandwidth to the default value. This command operates similar to that of the command [reference-bandwidth](#).

```
auto-cost reference-bandwidth ref-bw
```

```
no auto-cost reference-bandwidth
```

<b>Syntax Description</b>	<i>ref-bw</i> – Reference bandwidth (in kilobits per second) for calculating the default interface metrics.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	<i>ref-bw</i> – 100,000 kbps.
<b>Example</b>	SEFOS(config-router)# <b>auto-cost reference-bandwidth 1000000</b>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.27 `ipv6 ospf area`

Enables OSPFv3 for IPv6 on an interface. The `no` form of the command disables OSPFv3 routing protocol on the interface.

```
ipv6 ospf area IPv4-address
```

```
no ipv6 ospf
```

<b>Syntax Description</b>	<i>IPv4-address</i> – A 32-bit integer.
<b>Mode</b>	Router Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf area 0.0.0.0</b>
<b>Notes</b>	The <code>no</code> form of the command disables an interface and triggers flushing of self-originated link scope LSAs, and deletes the link scope LSAs associated with this interface from the link state database. If there is a single interface in the associated area, then this command deletes its area scope LSAs from the link state database.

### Related Commands

- [no area - range](#) – Deletes an area
- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process
- [show ipv6 ospf interface](#) – Displays the OSPFv3-related interface information

## 8.1.28 ipv6 ospf demand-circuit

Configures OSPFv3 to treat the interface as an OSPFv3 demand circuit. The command indicates whether demand OSPFv3 procedures (hello suppression to FULL neighbors and setting the DoNotAge flag on propagated LSAs) must be performed on the configured interface. The no form of the command disables the demand circuit on an interface.

```
ipv6 ospf demand-circuit
```

```
no ipv6 ospf demand-circuit
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf demand-circuit</b>
<b>Notes</b>	The routing support for demand routing must have been enabled (using the demand-extensions command) prior to the execution of this command.

### Related Commands

- `demand-extensions` – Enables routing support for demand routing
- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.29 ipv6 ospf retransmit-interval

Sets the time between LSA retransmissions for adjacencies belonging to interface. The no form of the command sets the default retransmit interval for an interface.

```
ipv6 ospf retransmit-interval interval
```

```
no ipv6 ospf retransmit-interval
```

<b>Syntax Description</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Mode</b>	Router Configuration



<b>Defaults</b>	<b>interval</b> - 5
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf retransmit-interval 10</b>
<b>Notes</b>	The retransmit time interval is the number of seconds between the link-state advertisement retransmissions for adjacencies belonging to an interface. The retransmit-interval value is also used while retransmitting database description and link-state request packets.

### Related Commands

- `show ipv6 ospf interface` - Displays the OSPFv3-related interface information

## 8.1.30 `ipv6 ospf transmit-delay`

Sets the estimated time taken to transmit LS update packet over a particular interface. The `no` form of the command sets the default transmit delay for an interface.

```
ipv6 ospf transmit-delay 1-1800
```

```
no ipv6 ospf transmit-delay
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>delay</b> - 1
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf transmit-delay 10</b>

### Related Commands

- `show ipv6 ospf interface` - Displays the OSPFv3-related interface information

## 8.1.31 `ipv6 ospf priority`

Sets the router priority, which helps to determine the designated router for this network. The `no` form of the command sets the default router priority for an interface.

```
ipv6 ospf priority 1-255
```

```
no ipv6 ospf priority
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>priority - 1</b>
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf priority 7</b>
<b>Notes</b>	A priority value of 0 signifies that the router is not eligible to become the designated router on a particular network.

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.32 no ipv6 ospf priority

Sets the default router priority for an interface. This command operates similar to that of the command `ipv6 ospf priority`.

```
no ipv6 ospf priority priority-value
```

<b>Syntax Description</b>	<i>priority-value</i> – Priority value of the router. A priority value of 0 signifies that the router is not eligible to become the designated router on a particular network.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>priority - 1</b>
<b>Example</b>	SEFOS(config-if)# <b>no ipv6 ospf priority 7</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.33 ipv6 ospf hello-interval

Specifies the time interval between the OSPFv3 hello packets on a particular interface (the length of time, in seconds, between the Hello packets that the router sends on the interface). The `no` form of the command sets the default hello interval for an interface.

```
ipv6 ospf hello-interval seconds_1-65535
```

```
no ipv6 ospf hello-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>interval</b> - 10
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf hello-interval 20</b>
<b>Notes</b>	The hello interval value must be same for all routers attached to a common link.

### Related Commands

- `show ipv6 ospf interface` - Displays the OSPFv3-related interface information

## 8.1.34 ipv6 ospf dead-interval

Configures the router dead interval. The command is configured in seconds and indicates the time period for which the router waits for hello packet from the neighbor before declaring this neighbor down. The `no` form of the command sets the interface dead interval to default value.

```
ipv6 ospf dead-interval seconds_1-65535
```

```
no ipv6 ospf dead-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>interval</b> - 40
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf dead-interval 50</b>
<b>Notes</b>	This value must be a multiple of the hello interval and must be same for all routers attached to a common link.

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.35 `ipv6 ospf poll-interval`

Configures the larger time interval, in seconds, between the hello packets sent to an inactive non-broadcast multi-access neighbor. The `no` form of the command sets the default poll interval for an interface.

```
ipv6 ospf poll-interval seconds_1-65535
```

```
no ipv6 ospf poll-interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>interval</b> – 120
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf poll-interval 30</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.36 `ipv6 ospf metric`

Explicitly specifies the metric value for sending a packet on an interface. The `no` form of the command sets the default value for the interface metric.

```
ipv6 ospf metric 1-65535
```

```
no ipv6 ospf metric
```

<b>Mode</b>	Interface Configuration This command is applicable only in VLAN Interface.
<b>Defaults</b>	<b>metric</b> – 10
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf metric 20</b>

## Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.37 `ipv6 ospf network`

Sets the network type for an interface. The `no` form of the command sets the default value for the network type.

```
ipv6 ospf network {broadcast | non-broadcast |  
point-to-multipoint | point-to-point}
```

```
no ipv6 ospf network
```

<b>Syntax Description</b>	<b>broadcast</b> – Networks supporting many (more than two) attached routers, together with the capability to address a single physical message to all of the attached routers (broadcast). <b>non-broadcast</b> – Networks supporting many (more than two) routers, but having no broadcast capability. <b>point-to-multipoint</b> – Treats the non-broadcast network as a collection of point-to-point links. <b>point-to-point</b> – A network that joins a single pair of routers.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>broadcast</b>
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf network non-broadcast</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• If the Interface Network type is NBMA or Point-to-Multipoint, neighbor must be configured.</li><li>• When there are few configured neighbors on the interface, then both network type change command and the <code>no</code> form of the command do not succeed.</li></ul>

## Related Commands

- `show ipv6 ospf neighbor` – Configures a neighbor on non-broadcast networks and sets the priority value for the neighbor if specified
- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.38 ipv6 ospf neighbor

Configures a neighbor on non-broadcast networks and sets the priority value for the neighbor if specified. The no form of the command deletes a configured neighbor or sets the default priority value (if the priority option is specified).

```
ipv6 ospf neighbor IPv6-address [priority 1-255]
```

```
no ipv6 ospf neighbor IPv6-address [priority 1-255]
```

<b>Syntax</b>	IPv6-address – IPv6 Address prefix.
<b>Description</b>	<b>priority</b> – A number that specifies the router priority.
<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>priority</b> – 1
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf neighbor</b> <b>fe80::220:35ff:fe43:6020 priority 2</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• In the OSPFv3 protocol packets, the IPv6 address indicates the source address of the neighbor. The link local address of the neighbor must be used for this field.</li><li>• Neighbors can be configured only in NBMA networks and point-to-multipoint networks.</li></ul>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information
- `show ipv6 ospf neighbor` – Displays OSPFv3 neighbors information

## 8.1.39 ipv6 ospf passive-interface

Configures an OSPFv3 interface to be passive. The execution of the command results in suppressing OSPFv3 protocol packets traffic on this interface. The no form of the command configures an OSPFv3 interface to be non-passive.

```
ipv6 ospf passive-interface
```

```
no ipv6 ospf passive-interface
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Disabled
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf passive-interface</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3 related interface information

## 8.1.40 `ipv6 ospf neighbor probing`

Enables neighbor probing on demand-circuit enabled interface. The **no** form of the command disables neighbor probing on demand-circuit enabled interface.

```
ipv6 ospf neighbor probing
```

```
no ipv6 ospf neighbor probing
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf neighbor probing</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.41 `ipv6 ospf neighbor-probe retransmit-limit`

Sets the number of consecutive LSA retransmissions before the neighbor is deemed inactive. The **no** form of the command sets the default neighbor probe retransmission limit.

```
ipv6 ospf neighbor-probe retransmit-limit retrans-limit
```

```
no ipv6 ospf neighbor-probe retransmit-limit
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<i>retrans-limit - 10</i>
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf neighbor-probe retransmit-limit 30</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.42 `ipv6 ospf neighbor-probe interval`

Sets the number of seconds, that indicates how often neighbor will be probed. The no form of the command sets the default neighbor probe interval.

```
ipv6 ospf neighbor-probe interval interval
```

```
no ipv6 ospf neighbor-probe interval
```

<b>Mode</b>	Interface Configuration Applicable only in VLAN Interface.
<b>Defaults</b>	<b>interval - 120</b>
<b>Example</b>	SEFOS(config-if)# <b>ipv6 ospf neighbor-probe interval 200</b>

### Related Commands

- `show ipv6 ospf interface` – Displays the OSPFv3-related interface information

## 8.1.43 `debug ipv6 ospf - pkt`

Sets the trace levels.

```
debug ipv6 ospf [pkt ({high | low | hex}) [hp] [ddp] [lrq] [lsu] [lsa]] [level ({fn_entry} [fn_exit] [critical] [mem_alloc_succ] [mem_alloc_fail])] [module ({ppp} [rtm] [nssa] [rt_aggrg] [adj_formation] [lsdb] [ism] [nsm] [rt_calc] [interface] [config])]
```



```
no debug ipv6 ospf [ pkt ( [{high | low | hex}] [hp] [ddp] [lrq]
[lsu] [lsa]) ] [level ( [fn_entry] [fn_exit] [critical]
[mem_alloc_succ] [mem_alloc_fail] ) ] [module ( [ppp] [rtm] [nssa]
[rt_aggrg] [adj_formation] [lsdb] [ism] [nsm] [rt_calc]
[interface] [config] ) ]
```

**Syntax**  
**Description**

**pkt** – Packet high level dump debug messages.  
**high** – Packet high level dump trace.  
**low** – Packet low level dump trace.  
**hex** – Packet hex dump trace.  
**hp** – Hello packet trace.  
**ddp** – DDP packet trace.  
**lrq** – Link state request packet trace.  
**lsu** – Link state update packet trace.  
**lsa** – Link state acknowledge packet trace.  
**level** – Trace level debug messages.  
**fn\_entry** – Function entry trace.  
**fn\_exit** – Function exit trace.  
**critical** – Critical trace.  
**mem\_alloc\_succ** – Memory allocation success trace.  
**mem\_alloc\_fail** – Memory allocation failure trace.  
**module** – OSPFv3 module debug messages.  
**ppp** – Protocol packet processing trace.  
**rtm** – RTM module trace.  
**nssa** – NSSA trace.

**Mode** Privileged EXEC

**Defaults** Debugging is disabled.

**Example** SEFOS# **debug ipv6 ospf pkt high hp level fn\_entry**  
**module ppp**

## Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.44 debug ipv6 ospf

Sets the IPv6 OSPF trace levels. The no form of the command resets the IPv6 OSPF trace levels. This command operates similar to the command `debug ipv6 ospf - pkt`.

```
debug ipv6 ospf {adj | ipsec | database-timer | flood | hello |  
lsa-gen | retransmission | lsdb | spf statistic}
```

```
no debug ipv6 ospf {adj | ipsec | database-timer | flood | hello  
| lsa-gen | retransmission | lsdb}
```

<b>Syntax</b>	<b>adj</b> – Adjacency information.
<b>Description</b>	<b>ipsec</b> – The interaction between OSPF and IPSec in IPv6 networks, including creation and removal of policy definitions. <b>database-timer</b> – Database-timer information. <b>flood</b> – Flooding information. <b>hello</b> – Hello packet information. <b>lsa-gen</b> – Link-state advertisement (LSA) generation information for all LSA types. <b>retransmission</b> – Retransmission information. <b>lsdb</b> – Link state database information. <b>spf statistic</b> – Shortest path first statistics information.
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	Debugging is disabled.
<b>Example</b>	SEFOS# <code>debug ipv6 ospf adj</code>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.45 debug ipv6 ospf - packet | events

Sets the IPv6 OSPF event trace. The no form of the command resets the IPv6 OSPF event trace. This command operates similar to that of the command `debug ipv6 ospf - pkt`.

```
debug ipv6 ospf {packet | events}
```

```
no debug ipv6 ospf {packets | events}
```

<b>Syntax</b>	<b>packet</b> – Received OSPFv3 packet information.
<b>Description</b>	<b>events</b> – OSPFv3-related events information.
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	Debugging is disabled.
<b>Example</b>	SEFOS# <b>debug ipv6 ospf adj</b>

### Related Commands

- [show ipv6 ospf - General Information](#) – Displays general information about the OSPFv3 routing process

## 8.1.46 show ipv6 ospf interface

Displays the OSPFv3-related interface information.

```
show ipv6 ospf interface [vlan 1-4094]
```

<b>Syntax Description</b>	<b>vlan</b> – VLAN identifier.
<b>Mode</b>	User/Privileged EXEC
<b>Example</b>	<pre>SEFOS# show ipv6 ospf interface vlan 1  OSPFv3 Interface Information  Interface Name: vlan2      Interface Id: 1 Area Id: 0.0.0.0  Local Address: fe80::211:22ff:fe33:4412 Router Id: 11.0.0.2 Network Type: BROADCAST      Cost: 10      State: WAITING  Designated Router Id: 0.0.0.0 local address: (null)  Backup Designated Router Id: 0.0.0.0 local address: (null)  Transmit Delay: 1 sec      Priority: 1      IfOptions: 0x0  Timer intervals configured: Hello: 10, Dead: 40, Retransmit: 5, Poll: 120 Demand Circuit: Disable Neighbor Probing: Disable  Nbr Probe Retrans Limit: 10 Nbr Probe Interval: 120  Hello due in 4 sec Neighbor Count is: 1 Adjacent with the neighbor 11.0.0.1</pre>

### Related Commands

- `area - virtual-link` – Sets the Virtual Link between Areas
- `ipv6 ospf area` – Enables OSPFv3 for IPv6 on an interface
- `ipv6 ospf demand-circuit` – Configures OSPFv3 to treat the interface as an OSPFV3 demand circuit
- `ipv6 ospf retransmit-interval` – Sets the time between LSA retransmissions for adjacencies belonging to an interface
- `ipv6 ospf transmit-delay` – Sets the estimated time taken to transmit LS update packet over a particular interface
- `ipv6 ospf priority` – Sets the router priority, which helps to determine the Designated Router for this network

- `no ipv6 ospf priority` – Sets the default router priority for an interface
- `ipv6 ospf hello-interval` – Specifies the time interval between the OSPFv3 hello packets on a particular interface
- `ipv6 ospf dead-interval` – Configures the router dead interval
- `ipv6 ospf poll-interval` – Configures the larger time interval, in seconds, between the Hello packets sent to an inactive non-broadcast multi-access neighbor
- `ipv6 ospf metric` – Specifies the metric value for sending a packet on an interface
- `ipv6 ospf network` – Sets the network type for an interface
- `ipv6 ospf neighbor` – Configures a neighbor on non-broadcast networks and sets the priority value for the neighbor if specified
- `ipv6 ospf passive-interface` – Configures an OSPFv3 interface to be Passive
- `ipv6 ospf neighbor probing` – Enables neighbor probing on demand-circuit enabled interface
- `ipv6 ospf neighbor-probe retransmit-limit` – Sets the number of consecutive LSA retransmissions before the neighbor is deemed inactive
- `ipv6 ospf neighbor-probe interval` – Sets the number of seconds, that indicates how often neighbor will be probed

## 8.1.47 `show ipv6 ospf neighbor`

Displays OSPFv3 neighbor information.

```
show ipv6 ospf neighbor [neighbor-router-id]
```

**Mode** User or Privileged EXEC

**Example** SEFOS# `show ipv6 ospf neighbor`

```
ID PriStateDead Address
Time
11.0.0.41FULL/PTOP 31 fe80::211:22ff:fe33:4434
11.0.0.510FULL/BACKUP 35 fe80::260:83ff:fe38:8aa2
```

### Related Commands

- `ipv6 ospf neighbor` – Configures a neighbor on non-broadcast networks and sets the priority value for the neighbor if specified

## 8.1.48 show ipv6 ospf - request/retrans-list

Displays the list of all LSAs in request-list or in retransmission-list.

```
show ipv6 ospf {request-list | retrans-list} [neighbor-router-id]
```

**Syntax**  
**Description**

**request-list** – The list of link state advertisements for which the neighbor has more up-to-date instances.

**retrans-list** – The list of link state advertisements that have been sent but not acknowledged.

*neighbor-router-id* – Neighbor router identifier.

**Mode** User/Privileged EXEC

**Example** SEFOS# **show ipv6 ospf retrans-list**

```
NeighborId 20.0.0.3, Nbr Address
fe80::220:35ff:fe43:6020
Type          LsId          AdvRtr          SeqNo          Age
Checksum
0x2001        0.0.0.2      11.0.0.2       0x80000011     0
0xcddf
```

SEFOS# **show ipv6 ospf request-list**

```
Neighbor 20.0.0.3, Address fe80::220:35ff:fe43:6020
Type      LSID          ADVRTR          SeqNo          Age
Checksum
8193     0.0.0.1      11.0.0.3       0x80000002     6
0x1211
```

## 8.1.49 show ipv6 ospf virtual-links

Displays the parameters and the current state of OSPFv3 virtual links.

```
show ipv6 ospf virtual-links
```

**Mode** User or Privileged EXEC

**Example** SEFOS# **show ipv6 ospf virtual-links**

```
Interface State: PointToPoint, Neighbor State: FULL
Transit Area: 2.2.2.2, Virtual Neighbor: 11.0.0.7
Intervals Configured for the Virtual Interface:
Hello: 10, Dead: 60, Transit: 1, Retransmit : 20
```

### Related Commands

- [area - virtual-link](#) – Sets the virtual link between Areas

## 8.1.50 show ipv6 ospf border-routers

Displays the internal OSPFv3 routing table entries to an ABR or ASBR.

```
show ipv6 ospf border-routers
```

**Mode** User or Privileged EXEC

**Example** SEFOS# **show ipv6 ospf border-routers**

OSPFv3 Process Border Router Information

Destination	Type	NextHop	Cost	Rt Area	Type Id
11.0.0.2	ABR	fe80::211:22ff:fe33:4412	10	intraArea	0.0.0.0
11.0.0.2	ABR	fe80::211:22ff:fe33:4422	10	intraArea	0.0.0.1
11.0.0.2	ASBR	fe80::211:22ff:fe33:4412	10	intraArea	0.0.0.0
11.0.0.2	ASBR	fe80::211:22ff:fe33:4422	10	intraArea	0.0.0.0

### Related Commands

- [abr-type](#) – Sets the ABR type
- [ASBR Router](#) – Configures the router as an ASBR

## 8.1.51 show ipv6 ospf - area-range / summary-prefix

Displays either the list of all area address ranges information or all external summary address configuration information.

```
show ipv6 ospf {area-range | summary-prefix}
```

**Syntax** **area-range** – Area associated with the OSPFv3 address range.

**summary-prefix** – Aggregate addresses for OSPFv3.

**Mode** User or Privileged EXEC

**Example** SEFOS# **show ipv6 ospf area-range**

```
OSPFv3 Summary Address Configuration Information
Network          Pfx      LSA      Area      Effect      Tag
                  Length  Type
3ffe::100:0:0:0  80      Summary  0.0.0.0   advertise   0
3ffe::110:0:0:0  80      Summary  0.0.0.0   doNotAdvertise 0
3ffe::120:0:0:0  80      Summary  0.0.0.1   advertise   0
3ffe::130:0:0:0  80      Type7    0.0.0.1   advertise   0
```

SEFOS# **show ipv6 ospf summary-prefix**

```
OSPFv3 External Summary Address Configuration Information

Prefix          Pfx      Area-id      Effect      TranslationState
                  Length
3ffe::200:0:0:0  80      0.0.0.0      advertise   enabled
3ffe::210:0:0:0  80      0.0.0.0      advertise   disabled
3ffe::220:0:0:0  80      0.0.0.0      doNotAdvertise enabled
3ffe::230:0:0:0  80      0.0.0.0      allowAll    enabled
3ffe::240:0:0:0  80      0.0.0.0      denyAll     enabled
```

### Related Commands

- **area - range** – Creates the internal aggregation address range
- **area - range - cost** – Summarizes routes at an area boundary
- **area - summary-prefix** – Enables route aggregation or filtering while importing routes in the OSPFv3 domain
- **no area / no area - range** – Deletes an area



## 8.1.52 show ipv6 ospf - General Information

Displays general information about OSPFv3 routing process.

```
show ipv6 ospf
```

**Mode** User or Privileged EXEC

**Example** SEFOS# **show ipv6 ospf**

```
Router Id: 11.0.0.1                      ABR Type: Standard ABR
  SPF schedule delay: 5 secs             Hold time between two SPFs: 10 secs
  Exit Overflow Interval: 0               Ref BW: 100000000           Ext Lsdb
Limit: -1
Trace Value: 0x00000800                 As Scope Lsa: 0           Checksum Sum: 0x0
Demand Circuit: Enable                   Passive Interface: Disable
Nssa Asbr Default Route Translation: Disable
Autonomous System Boundary Router
Number of Areas in this router 2
      Area 0.0.0.0
        Number of interfaces in this area is 1
        Number of Area Scope Lsa: 4       Checksum Sum: 0x1210e
        Number of Indication Lsa: 0       SPF algorithm
        executed: 6 times
      Area 0.0.0.1
        Number of interfaces in this area is 1
        Number of Area Scope Lsa: 3       Checksum Sum: 0x18d41
        Number of Indication Lsa: 0       SPF algorithm
        executed: 2 times
```

### Related Commands

- `router-id - IPv4-address` – Sets a fixed router identifier
- `timers spf` – Configures the delay time and the hold time between two consecutive SPF calculations
- `abr-type` – Sets the ABR type
- `ASBR Router` – Configures the router as an ASBR
- `passive-interface` – Sets the global default passive interface status
- `nssaAsbrDfRtTrans` – Enables setting of P bit in the default Type-7 LSA generated by an NSSA internal ASBR
- `as-external lsdb-limit` – Sets the maximum number of non-default AS-external-LSAs entries that can be stored in the link-state database

- `exit-overflow-interval` – Sets the number of seconds after which a router will attempt to leave the Overflow State
- `demand-extensions` – Enables routing support for demand routing
- `reference-bandwidth / auto-cost reference-bandwidth` – Sets the reference bandwidth in kilobits per second for calculating the default interface metrics
- `ipv6 ospf area` – Enables OSPFv3 for IPv6 on an interface
- `debug ipv6 ospf - pkt` – Sets the trace levels
- `debug ipv6 ospf` – Sets the IPv6 OSPF trace levels
- `debug ipv6 ospf - packet | events` – Sets the IPv6 OSPF event trace

## 8.1.53 show ipv6 ospf - LSA Database

Displays the LSA information.

```
show ipv6 ospf [area area-id] database [{router | network |
as-external | inter-prefix | inter-router | intra-prefix | link |
nssa}] [{detail | HEX}]
```

### Syntax Description

**area** – A 32-bit integer.  
**database** – Displays the number of each type of LSA for each area in the database.  
**router** – Router LSAs.  
**network** – Network LSAs.  
**as-external** – AS-external LSAs.  
**inter-prefix** – Inter-prefix LSAs.  
**inter-router** – Inter-router LSAs.  
**intra-prefix** – Intra-prefix LSAs.  
**link** – Link State LSAs.  
**nssa** – NSSA LSAs.  
**detail** – Displays the LSAs information in detail.  
**HEX** – Displays the LSAs information in hexadecimal format.

### Mode

User/Privileged EXEC

### Example

```
SEFOS# show ipv6 ospf database
```

Area-id	RtrId	LsaType	Age	Seq#	Checksum
0.0.0.0	11.0.0.1	0x0008	300	0x80000002	0x323f
0.0.0.0	11.0.0.2	0x0008	300	0x80000001	0xa426
0.0.0.0	11.0.0.1	0x2001	1	0x80000003	0x3b9a

```

0.0.0.0 11.0.0.2 0x2001 0 0x80000006 0x2fa2
0.0.0.0 11.0.0.2 0x2002 0 0x80000001 0x6081
0.0.0.0 11.0.0.2 0x2009 0 0x80000002 0x504c

```

SEFOS# **show ipv6 ospf database detail**

```

Age: 0 Seconds LS Type: Router Lsa
Link State Id: 0.0.0.0 Adv Rtr Id: 12.0.0.2
Sequence: 0x80000001 Checksum: 0x7c85 Length: 24
Router is an AS Boundary Router
Number of Links: 0 Options: 0x33

Age: 0 Seconds LS Type: Intra Area Prefix Lsa
Link State Id: 0.0.0.0 Adv Rtr Id: 12.0.0.2
Sequence: 0x80000001 Checksum: 0x4966 Length: 52
#Prefixes: 1 Referenced LS Type: Router Lsa
Ref Link State Id: 0.0.0.0 Ref Adv Router: 12.0.0.2
Prefix Length (Bytes): 16 Prefix Options: 0x00
Metric: 0xa
Prefix: 3ffe:481d::5

```

SEFOS# **show ipv6 ospf database hex**

```

00 00 00 08 00 00 00 02 0b 00 00 01 80 00 00 02 e9 d0 00 2c 01 00 00
33 fe 80 00
    00 00 00 00 00 02 11 22 ff fe 33 44 21 00 00 00 00
00 07 00 08 00 00 00 02 0b 00 00 02 80 00 00 02 f9 be 00 2c 01 00 00
33 fe 80 00
    00 00 00 00 00 02 11 22 ff fe 33 44 22 00 00 00 00
00 00 20 01 00 00 00 00 0b 00 00 01 80 00 00 01 fe e2 00 28 00 00 00
33 01 00 00
    02 00 00 00 02 00 00 00 02 0b 00 00 02
00 06 20 01 00 00 00 00 0b 00 00 02 80 00 00 03 e7 f4 00 28 03 00 00
33 01 00 00
02 00 00 00 02 00 00 00 02 0b 00 00 01

```

## 8.1.54 show ipv6 ospf route

Displays routes learned by the OSPFv3 process.

```
show ipv6 ospf route
```

**Mode**

User or Privileged EXEC

**Example**

```
SEFOS# show ipv6 ospf route
```

```
OSPFV3 Process Routing Table
```

Dest/Prefix-Length	NextHop/IfIndex	Cost	Rt.Type	Area
3333::/96	fec0::4444:0:2/vlan4	10	type2Ext	0.0.0.0
fec0::3003:0:0/96	:: /vlan5	1	intraArea	0.0.0.4
fec0::4444:0:0/96	:: /vlan4	1	intraArea	0.0.0.3

**Related Commands**

- `ipv6 router ospf` – Enables the OSPFv3 routing protocol
- `router-id - IPv4-address` – Sets a fixed router ID

## 8.1.55 show ipv6 ospf areas

Displays the area table.

```
show ipv6 ospf areas
```

**Mode** Useror Privileged EXEC

**Example** SEFOS# `show ipv6 ospf areas`

```
OSPFV3 AREA CONFIGURATION INFORMATION

AreaId: 0.0.0.0 Area Type: NORMAL AREA
Spf Calculation: 3 (times) Area Bdr Rtr Count: 1
As Bdr Rtr Count: 0 Area Summary: Send Summary

Area-id: 0.0.0.1 Area Type: NSSA AREA
Spf Calculation: 0 (times) Area Bdr Rtr Count: 1
As Bdr Rtr Count: 0 Area Summary: Send Summary
Stub Metric: 0x1 Stub Metric Type: 1
Translator Role: Candidate Translator State: Disabled
Nssa Stability Interval: 40
```

**Related Commands**

- `area - stub | nssa` – Defines an area as a stub area or an NSSA
- `area - stability-interval` – Configures the stability interval (in seconds) for the NSSA
- `area - translation-role` – Configures the translation role for NSSA

- `no area / no area - range` – Deletes an area

## 8.1.56 `show ipv6 ospf host`

Displays the host table information.

```
show ipv6 ospf host
```

**Mode** User/Privileged EXEC

**Example** SEFOS# `show ipv6 ospf host`

```
OSPFv3  HOST  CONFIGURATION Information
Address                Area-id          StubMetric
3ffe::80:0:1          0.0.0.0         30
```

### Related Commands

- `host - metric | area-id` – Configures a host entry with metric and *area-id*

## 8.1.57 `show ipv6 ospf redist-config`

Displays the configuration information to be applied to the routes learnt from the RTM.

```
show ipv6 ospf redist-config
```

**Mode** User/Privileged EXEC

**Example** SEFOS# `show ipv6 ospf redist-config`

```
Address  Prefix  PfxLength  MetricType  Metric  TagType  TagValue
3ffe::   64      asExt      Type2       10     manual   10
```

### Related Commands

- `redist-config` – Configures the information to be applied to routes learnt from RTM



# PIM

---

PIM is a multicast routing architecture that allows the addition of IP multicast routing on existing IP networks. Multicast IP routing protocols are used to distribute data to multiple recipients. Using multicast, a source can send a single copy of data to a single multicast address, which is then distributed to an entire group of recipients. A multicast group identifies a set of recipients that are interested in a particular data stream, and is represented by an IP address from a well-defined range. Data sent to this IP address is forwarded to all members of the multicast group.

PIM is a unicast routing protocol independent and can be operated in two modes: dense and sparse (currently, only sparse mode is supported) It is designed to provide scalable inter-domain multicast routing across the Internet. PIM provides multicast routing and forwarding capability to the switch. It maintains the integrity of the hardware based multicast forwarding table with respect to the forwarding table existing in the software. It is independent of the underlying unicast routing protocol and uses the information from the unicast routing protocol.

---

## 9.1 PIM Commands

The list of CLI commands for the configuration of PIM is as follows:

- `set ip pim / ip multicast`
- `ip pim version`
- `set ip pim threshold`
- `set ip pim spt-switchperiod`
- `set ip pim rp-threshold`
- `set ip pim rp-switchperiod`
- `set ip pim regstop-ratelimit-period`

- set ip pim pmbr
- ip pim component
- set ip pim static-rp
- rp-candidate rp-address
- rp-candidate holdtime
- ip pim query-interval
- ip pim message-interval
- ip pim bsr-candidate - value
- ip pim bsr-candidate - vlan
- ip pim componentId
- ip pim dr-priority
- ip pim override-interval
- ip pim lan-delay
- set ip pim lan-prune-delay
- set ip pim graft-retry interval
- no ip pim interface
- debug ip pim
- show ip pim interface
- show ip pim neighbor
- show ip pim rp-candidate
- show ip pim rp-set
- show ip pim bsr
- show ip pim rp-static
- show ip pim component
- show ip pim thresholds
- show ip pim mroute

## 9.1.1 set ip pim

Enables or disables PIM globally.

<b>set ip pim {enable   disable}</b>
--------------------------------------



<b>Syntax Description</b>	<b>enable</b> – Enables PIM. <b>disable</b> – Disables PIM.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <b>set ip pim enable</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• PIM mode will be set as sparse, when PIM is enabled globally.</li> <li>• IGMP proxy service must be disabled in the system, before enabling the PIM globally.</li> </ul>

### Related Commands

- `no ip igmp proxy-service` - Disables IGMP Proxy service in the system
- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.2 ip multicast

Enables PIM globally. This command operates similar to the command `set ip pim`.

```
ip multicast
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <b>ip multicast</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• PIM mode will be set as sparse, when PIM is enabled globally.</li> <li>• IGMP proxy service must be disabled in the system, before enabling the PIM globally.</li> </ul>

### Related Commands

- `no ip igmp proxy-service` - Disables IGMP Proxy service in the system
- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.3 ip pim version

Sets the PIM version.

```
ip pim version {1 | 2}
```

<b>Syntax</b>	<b>1</b>   <b>2</b> – PIM version is configured either as v1 or v2.
<b>Description</b>	Only PIM version 2 is currently supported.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>ip pim version 2</b>

## 9.1.4 set ip pim threshold

Specifies the SPT group or source threshold when exceeded, switching to shortest path tree is initiated. To switch to SPT, the threshold must be configured.

```
set ip pim threshold {spt-grp | spt-src}
number-of-packets_0-2147483647
```

<b>Syntax</b>	<b>spt-grp</b> – The threshold of data rate for any group when exceeded, source specific counters are initiated for that particular group. It is based on number of bits per second.
<b>Description</b>	<b>spt-src</b> – The switching to Shortest Path Tree is initiated, when the threshold of data rate for any source is exceeded. It is based on number of bits per second.
	<i>number-of-packets_0-2147483647</i> – Number of packets.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config)# <b>set ip pim threshold spt-grp 50</b>

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for SM

## 9.1.5 set ip pim spt-switchperiod

Specifies the time period (in seconds) during which the data rate is to be monitored for switching to shortest path tree.

```
set ip pim spt-switchperiod seconds_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config)# <b>set ip pim spt-switchperiod 60</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The same period is used for monitoring the data rate for both source and group. To switch to SPT, this period must be configured.</li> <li>• The SPT (Shortest Path Tree) is used for multicast transmission of packets with the shortest path from sender to recipients</li> </ul>

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 9.1.6 `set ip pim rp-threshold`

Specifies the threshold at which the Rendezvous Point (RP) initiates switching to source specific shortest path tree.

```
set ip pim rp-threshold number-of-reg-packets_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config)# <b>set ip pim rp-threshold 50</b>
<b>Notes</b>	To switch to SPT, this threshold must be configured and this switching is based on the number of registered packets received.

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for both SM and DM

## 9.1.7 `set ip pim rp-switchperiod`

Specifies the time period (in seconds) during which RP monitors register packets for switching to the source specific shortest path tree.

```
set ip pim rp-switchperiod seconds_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config)# <b>set ip pim rp- switchperiod 100</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• To switch to SPT, this time period must be configured.</li> <li>• RP-tree is a pattern that multicast packets are sent to a PIM-SM router by unicast and then forwarded to actual recipients from RP.</li> </ul>

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for SM

## 9.1.8 `set ip pim regstop-ratelimit-period`

Specifies the time period during which RP monitors the number of register packets after sending the register stop message.

```
set ip pim regstop-ratelimit-period seconds_0-2147483647
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	5
<b>Example</b>	SEFOS(config)# <b>set ip pim regstop-ratelimit-period 100</b>
<b>Notes</b>	Register stop message is used to avoid encapsulation of multicast data packets from the first hop router to the RP.

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for SM

## 9.1.9 `set ip pim pmbr`

Enables or disables the PMBR (PIM Multicast Border Router) status.

```
set ip pim pmbr {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables the PMBR status. <b>disable</b> – Disables the PMBR status.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config)# <b>set ip pim pmbr enable</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• A PMBR integrates two different PIM domains (either PIM -SM or PIM -DM).</li> <li>• A PMBR connects a PIM domain to other multicast routing domain(s).</li> </ul>

### Related Commands

- `show ip pim thresholds` - Displays threshold configured for SPT, RP thresholds, rate limit values for SM

## 9.1.10 ip pim component

Configures the PIM component in the router. The no form of the command destroys the PIM component.

```
ip pim component component-id_1-255
```

```
no ip pim component component-id_1-255
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config)# <b>ip pim component 1</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The PIM Component 1 cannot be deleted as it is the default component.</li> <li>• The PIM Component corresponds to each instance of a PIM domain and classifies it as sparse or dense mode. Currently, only sparse mode is supported.</li> </ul>

### Related Commands

- `show ip pim component` - Displays the component information.

## 9.1.11 set ip pim static-rp

Enables or disables the Static RP configuration Status. This command specifies whether to use the configured static- RP.

```
set ip pim static-rp {enable | disable}
```

<b>Syntax</b>	<b>enable</b> – Enables the static RP configuration status.
<b>Description</b>	<b>disable</b> – Disables the static RP configuration status.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	Disabled
<b>Example</b>	SEFOS(config)# <b>set ip pim static-rp enable</b>

### Related Commands

- `show ip pim rp-set` - Displays the RP-set information
- `show ip pim rp-static` - Displays the RP-static information

## 9.1.12 rp-candidate rp-address

Sets the address of the interface, which is advertised as a candidate-RP. The no form of the command disables the address of the interface, which will be advertised as a candidate-RP.

```
rp-candidate rp-address group-address group-mask ip-address
```

```
no rp-candidate rp-address group-address group-mask ip-address
```

<b>Syntax</b>	<i>group-address</i> – The IP multicast group address for which this entry
<b>Description</b>	contains multicast routing information. <i>group-mask</i> – The IP multicast group address mask that gives the group prefix for which this entry contains information about the RP. <i>ip-address</i> – IP address.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(pim-comp)# <b>rp-candidate rp-address 224.1.0.0</b> <b>255.255.0.0 20.0.0.2</b>
<b>Notes</b>	A candidate-RP is a router configured to send periodic candidate-RP-advertisement messages to the BSR and to process join or prune or register messages for the advertised group prefix, when it is elected as a RP.

### Related Commands

- `show ip pim rp-set` - Displays the RP-set information
- `show ip pim rp-candidate` - Displays the RP-candidate information

## 9.1.13 `rp-candidate holdtime`

Sets the hold time of the component when it is a candidate RP in the local domain. The `no` form of the command sets the default hold time (0) of the component.

```
rp-candidate holdtime 0-255
```

```
no rp-candidate holdtime
```

<b>Mode</b>	PIM Component
<b>Defaults</b>	0
<b>Example</b>	SEFOS (pim-comp) # <b>rp-candidate holdtime 25</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• If its value is set to 0, it indicates that the local system is not a candidate RP.</li><li>• Hold time is the amount of time the candidate RP advertisement is valid. This field allows advertisements to be aged out.</li></ul>

### Related Commands

- `show ip pim rp-candidate` - Displays the RP candidate information

## 9.1.14 `rp-static rp-address`

Sets the address of the interface, which is advertised as a static-RP. The `no` form of the command disables the address of the interface, which is advertised as a static-RP.

```
rp-static rp-address group-address group-mask ip-address
```

```
no rp-static rp-address group-address group-mask
```

<b>Syntax Description</b>	<i>group-address</i> – Indicates the PIM Sparse multicast group address using the listed RP. <i>group-mask</i> – The IP multicast group address mask that gives the group prefix for which this entry contains information about the RP. <i>ip-address</i> – IP address.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS (pim-comp)# <b>rp-candidate rp-address 224.1.0.0 255.255.0.0 20.0.0.2</b>
<b>Notes</b>	A candidate-RP is a router configured to send periodic candidate-RP-advertisement messages to the BSR and to process join or prune or register messages for the advertised group prefix, when it is elected as a RP.

### Related Commands

- `show ip pim rp-static` - Displays the RP-static information

## 9.1.15 ip pim query-interval

Sets the frequency at which PIM hello messages are transmitted on this interface. The no form of the command sets the default hello timer interval for this interface. This command is applicable only in VLAN Interface mode.

```
ip pim query-interval seconds_0-65535
```

```
no ip pim query-interval
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	30
<b>Example</b>	SEFOS (config-if)# <b>ip pim query-interval 60</b>
<b>Notes</b>	The query message informs the presence of a PIM router on the interface to the neighboring PIM routers.

### Related Commands

- `show ip pim interface` - Displays the router's PIM interfaces



## 9.1.16 `ip pim message-interval`

Sets the frequency at which PIM join or prune messages are transmitted on this PIM interface. The `no` form of the command sets the default value for PIM join/prune message. This command is applicable only in VLAN Interface mode.

```
ip pim message-interval interval_0-65535
```

```
no ip pim message-interval
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	60
<b>Example</b>	SEFOS(config-if)# <b>ip pim message-interval 120</b>
<b>Notes</b>	The same join or prune message interval must be used on all the PIM routers in the PIM domain. If all the routers do not use the same timer interval, the performance of PIM Sparse can be adversely affected.

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.17 `ip pim bsr-candidate - value`

Sets the preference value for the local interface as a candidate bootstrap router. The `no` form of the command sets the default preference value for the local interface as a candidate bootstrap router. This command is applicable only in VLAN Interface mode.

```
ip pim bsr-candidate 0-255
```

```
no ip pim bsr-candidate
```

<b>Mode</b>	Interface Configuration Applicable only in the VLAN Interface.
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config-if)# <b>ip pim bsr-candidate 1</b>
<b>Notes</b>	A BSR is a dynamically elected router within a PIM domain.

## Related Commands

- `show ip pim bsr` - Displays the BSR information

## 9.1.18 `ip pim bsr-candidate - vlan`

Sets the local interface as a candidate BSR. This command operates similar to the command `ip pim bsr-candidate - value`. This command is applicable only in VLAN Interface mode.

```
ip pim bsr-candidate vlan-id_1-4094 [priority value]
```

<b>Syntax</b>	<i>vlan-id_1-4094</i> - VLAN interface number from which BSR address is
<b>Description</b>	derived to make BSR as a candidate. This value ranges between 1 and 4094.
	<b>priority</b> - Priority of the candidate BSR. This value ranges between 0 and 255.
<b>Mode</b>	Global Configuration
<b>Defaults</b>	<b>priority</b> - 0
<b>Example</b>	SEFOS(config)# <b>ip pim bsr-candidate 1 priority 100</b>
<b>Notes</b>	The router with highest priority is considered as the BSR. If the priority values are same, then the router with largest IP address is considered as the BSR.

## Related Commands

- `show ip pim bsr` - Displays the BSR information

## 9.1.19 `ip pim componentId`

Adds the interface to the component.

```
ip pim componentId 1-255
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	1
<b>Example</b>	SEFOS(config-if)# <b>ip pim componentId 1</b>
<b>Notes</b>	This command adds the current VLAN into the specified PIM component.

### Related Commands

- `ip pim component` - Configures the PIM component in the router
- `show ip pim component` - Displays the component information

## 9.1.20 `ip pim dr-priority`

Sets the designated router priority value configured for the router interface. The `no` form of the command sets the default designated router priority value (0) for the router interface. This command is applicable only in VLAN Interface mode.

```
ip pim dr-priority 1-65535
```

```
no ip pim dr-priority
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	1
<b>Example</b>	SEFOS(config-if)# <b>ip pim dr-priority 100</b>
<b>Notes</b>	The DR sets up multicast route entries and sends corresponding join or prune and register messages on behalf of directly-connected receivers and sources, respectively.

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.21 `ip pim override-interval`

Sets the override interval configured for router interface and the `no` form of the command sets the default override interval (0) for router interface. This command is applicable only in VLAN Interface mode.

```
ip pim override-interval 0-65535
```

```
no ip pim override-interval
```

<b>Mode</b>	Interface Configuration
-------------	-------------------------

<b>Defaults</b>	0
<b>Example</b>	SEFOS(config-if)# <b>ip pim override-interval 100</b>
<b>Notes</b>	Override interval is the random amount of time delayed for sending override messages to avoid synchronization of override messages when multiple downstream routers share a multi-access link.

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.22 ip pim lan-delay

Sets the LanDelay configured for the router interface. The no form of the command sets the default LanDelay (0) for the router per interface. This command is applicable only in VLAN Interface mode.

```
ip pim lan-delay 0-65535
```

```
no ip pim lan-delay
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	0
<b>Example</b>	SEFOS(config-if)# <b>ip pim lan-delay 120</b>
<b>Notes</b>	The LAN delay inserted by a router in the LAN prune delay option expresses the expected message propagation delay on the interface. It is used by upstream routers to find out the delayed time interval for a Join override message before pruning an interface.

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.23 set ip pim lan-prune-delay

Sets the LanPruneDelay bit configured for the router interface to advertise the LAN delay. This command is applicable only in VLAN Interface mode.

```
set ip pim lan-prune-delay {enable | disable}
```

<b>Syntax Description</b>	<b>enable</b> – Enables LAN-prune-delay. <b>disable</b> – Disables LAN-prune-delay.
<b>Mode</b>	Interface Configuration
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS(config-if)# <b>set ip pim lan-prune-delay enable</b>
<b>Notes</b>	The command specifies whether to use LAN prune delay or not.

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.24 `set ip pim graft-retry interval`

Sets the time before which graft is retransmitted upon no receipt of graft ACK. The `no` form of the command sets the graft retry interval to the default value. This command is applicable only in VLAN Interface mode.

```
set ip pim graft-retry interval 1-10
```

```
no ip pim graft-retry interval
```

<b>Mode</b>	Interface Configuration
<b>Defaults</b>	3 seconds.
<b>Example</b>	SEFOS(config-if)# <b>set ip pim graft-retry interval 4</b>

### Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.25 `no ip pim interface`

Deletes an interface at PIM level. This command is applicable only in VLAN Interface mode.

```
no ip pim interface
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>no ip pim interface</b>
<b>Notes</b>	This command is used to destroy the interface at PIM.

## Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.26 debug ip pim

Enables PIM trace and the no form of the command disables PIM trace.

```
debug ip pim {[nbr] [grp] [jp] [ast] [bsr] [io] [pmbr] [mrt] [mdh]
[mgmt] [srm] | [all]}
```

```
no debug ip pim {[nbr] [grp] [jp] [ast] [bsr] [io] [pmbr] [mrt]
[mdh] [mgmt] [srm] | [all]}
```

<b>Syntax Description</b>	<p><b>nbr</b> – Neighbor discovery traces.</p> <p><b>grp</b> – Group membership traces.</p> <p><b>jp</b> – Join or prune traces.</p> <p><b>ast</b> – Assert state traces.</p> <p><b>bsr</b> – Bootstrap/RP traces.</p> <p><b>io</b> – Input/output traces.</p> <p><b>pmbr</b> – Interoperability traces.</p> <p><b>mrt</b> – Multicast route table update traces.</p> <p><b>mdh</b> – Multicast data handling traces.</p> <p><b>mgmt</b> – Configuration traces.</p> <p><b>srm</b> – State refresh messages.</p> <p><b>all</b> – All traces.</p>
---------------------------	--

**Mode** Privileged EXEC

**Example** SEFOS# **debug ip pim all**

**Notes** A four-byte integer value is specified for enabling the level of debugging. Each bit in the four-byte integer variable represents a level of debugging. The combinations of levels are also allowed. You must enter the corresponding integer value for the bit set.

## Related Commands

- `show ip pim interface` - Displays the routers PIM interfaces

## 9.1.27 show ip pim interface

Displays the router's PIM interfaces.

```
show ip pim interface [{Vlan vlan-id | interface-type interface-id | detail}]
```

**Syntax**  
**Description**

**vlan** – VLAN identifier.  
**detail** – Detailed information of the interface.  
**interface-type** – Interface type.  
**interface-id** – Interface identifier.

**Mode**

Privileged EXEC

**Example**

```
SEFOS# show ip pim interface
Address IfName/IfId Ver/Mode Nbr Qry      DR-Address DR-Prio
                Count Interval
10.0.0.1  vlan1/160 2/Sparse  0  45    10.0.0.1    5
20.0.0.1  vlan2/33  2/Sparse  0  30    20.0.0.1    1
30.0.0.1  vlan3/34  2/Sparse  0  60    30.0.0.1    1

SEFOS# show ip pim interface vlan 1

Address IfName/IfId Ver/Mode Nbr Qry      DR-Address DR-Prio
                Count Interval
10.0.0.1  vlan1/160 2/Sparse  0  45    10.0.0.1    5

SEFOS# show ip pim interface detail

vlan1 33 is up
  Internet Address is 12.0.0.1
  Multicast Switching : Enabled
  PIM : Enabled
  PIMv6 : Disabled
    PIM version : 2, mode: Sparce
    PIM DR : 12.0.0.1
    PIM DR Priority : 1
    PIM Neighbour Count : 0
    PIM Hello/Query Interval : 90
    PIM Message Interval : 60
    PIM Override Interval : 0
    PIM Lan Delay : 0
    PIM Lan-Prune-Delay : Disabled
    PIM Graft Retry Interval : 3
```

```
PIM State Refresh : Uncapable
PIM Component Id : 1
PIM domain border : disabled
PIM State Refresh Processing : enabled
PIM Refresh Origination : Disabled
```

#### Notes

It shows the list of interface addresses, the mode of the interface, designated router on that interface, hello interval, join/prune Interval of the interface.

#### Related Commands

- `set ip pim` - Enables or disables PIM
- `ip multicast` - Enables PIM globally
- `ip pim query-interval` - Sets the frequency at which PIM hello messages are transmitted on this interface
- `ip pim message-interval` - Sets the frequency at which PIM Join/Prune messages are transmitted on this PIM interface
- `ip pim bsr-candidate - value` - Sets the preference value for the local interface as a candidate bootstrap router
- `ip pim dr-priority` - Sets the designated router priority value configured for the router interface
- `ip pim override-interval` - Sets the override interval configured for router interface
- `ip pim lan-delay` - Sets the LanDelay configured for the router interface
- `set ip pim lan-prune-delay` - Sets the LanPruneDelay bit configured for the router interface to advertise the LAN delay
- `no ip pim interface` - Deletes an interface at PIM level
- `debug ip pim` - Enables PIM trace

## 9.1.28 show ip pim neighbor

Displays the router's PIM neighbors' information.

```
show ip pim neighbor [{vlan vlan-id | interface-type
interface-id}]
```

#### Syntax

**vlan** - VLAN identifier.  
*interface-type* - Interface type.  
*interface-id* - Interface identifier.

#### Mode

Privileged EXEC



**Example** SEFOS# `show ip pim neighbor vlan 1`

```
Neighbour IfName/Idx Uptime/Expiry Ver DRPri CompId Override LanDelay
Address /Mode Interval
-----
12.0.0.2 vlan1/33 00:00:45/275 v2 1 1 0 0
```

**Notes** It shows the neighbor address, the interface used to reach the PIM neighbor, the up time (the time since this neighbor became the neighbor of the local router), expiry time (the minimum time remaining before this PIM neighbor will be aged out), LAN delay and override interval.

### Related Commands

- `ip pim query-interval` - Sets the frequency at which PIM hello messages are transmitted on this interface
- `ip pim message-interval` - Sets the frequency at which PIM join or prune messages are transmitted on this PIM interface
- `ip pim bsr-candidate value` - Sets the preference value for the local interface as a candidate bootstrap router

## 9.1.29 show ip pim rp-candidate

Displays the candidate RP information.

```
show ip pim rp-candidate [ComponentId 1-255]
```

**Syntax Description** `ComponentId` – Component ID.

**Mode** Privileged EXEC

**Example** SEFOS# `show ip pim rp-candidate 2`

```
CompId GroupAddress Group Mask RPAddress/Priority
2 224.1.0.0 255.255.0.0 20.0.0.1/192
```

**Notes** It shows the group addresses, the group mask and the RP address that indicates the IP address of the rendezvous point (RP) for the listed PIM sparse group.

### Related Commands

- `rp-candidate rp-address` - Enables the address of the interface, which is advertised as a candidate-RP
- `rp-candidate holdtime` - Sets the holdtime of the component when it is a candidate RP in the local domain

- `rp-static rp-address` - Sets the address of the interface, which is advertised as a static-RP

## 9.1.30 `show ip pim rp-set`

Displays the RP-set information.

```
show ip pim rp-set [rp-address]
```

<b>Syntax Description</b>	<b>rp-address</b> – Indicates the IP address of the rendezvous point for the listed PIM sparse group.
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>show ip pim rp-set</b> PIM Group-to-RP mappings ----- Group Address: 224.1.1.0    Group Mask: 255.255.0.0 RP: 20.0.0.1 Component-Id: 2 Hold Time: 120, Expiry Time: 00:01:43
<b>Notes</b>	It shows details of the Group Prefix, RP address, hold time and expiry time.

### Related Commands

- `rp-candidate rp-address` - Enables the address of the interface, which is advertised as a candidate-RP
- `set ip pim static-rp` - Enables or disables the static RP configuration status

## 9.1.31 `show ip pim bsr`

Displays the BSR information.

```
show ip pim bsr [Component-Id 1-255]
```

```

Mode          Privileged EXEC

Example       SEFOS# show ip pim bsr 1
              PIMv2 Bootstrap Configuration For Component 1
              -----
              This system is the Bootstrap Router (BSR)
              BSR Address: 10.0.0.1
              BSR Priority: 6, Hash Mask Length: 30

```

### Related Commands

- `ip pim bsr-candidate - value` - Sets the preference value for the local interface as a candidate bootstrap router
- `ip pim bsr-candidate - vlan` - Sets the local interface as a candidate bootstrap router

## 9.1.32 show ip pim rp-static

Displays the static RP information.

```
show ip pim rp-static [ComponentId 1-255]
```

```

Mode          Privileged EXEC

Example       SEFOS# show ip pim rp-static 2
              Static-RP Enabled
              CompId  GroupAddress  Group Mask      RPAddress
              2      225.1.0.0      255.255.0.0    20.0.0.1

```

### Related Commands

- `set ip pim static-rp` - Enables or disables the static RP configuration status

## 9.1.33 show ip pim component

Displays the component information.

```
show ip pim component [ComponentId 1-255]
```

```

Mode           Privileged EXEC

Example        SEFOS# show ip pim component 1
                  PIM Component Information
                  -----
                  Component-Id: 1
                     PIM Mode: sparse,    PIM Version: 2
                     Elected BSR: 10.0.0.1
                     Candidate RP Holdtime: 0

```

### Related Commands

- `ip pim component` - Configures the PIM component in the router
- `ip pim componentId` - Adds the interface to the component

## 9.1.34 show ip pim thresholds

Displays threshold configured for SPT, RP thresholds, and rate limit values for SM (sparse mode).

```
show ip pim thresholds
```

```

Mode           Privileged EXEC

Example        SEFOS# show ip pim thresholds
                  PIM SPT Threshold Information
                     Group Threshold: 0
                     Source Threshold: 0
                     Switching Period: 0
                  PIM SPT-RP Threshold Information
                     Register Threshold: 0
                     RP Switching Period: 0
                     Register Stop rate limit: 5

```

### Related Commands

- `set ip pim threshold` - Specifies the SPT group or source threshold when exceeded, switching to shortest path tree is initiated
- `set ip pim spt-switchperiod` - Specifies the period (in seconds) over which the data rate is to be monitored for switching to shortest path tree
- `set ip pim rp-threshold` - Specifies the threshold at which the RP initiates switching to source specific shortest path tree

- `set ip pim rp-switchperiod` - Specifies the period (in seconds) over which RP monitors register packets for switching to the source specific shortest path tree
- `set ip pim regstop-ratelimit-period` - Specifies the period over which RP monitors number of register packets after sending the register stop message
- `set ip pim pmbr` - Enables or disables the PMBR status
- `ip pim dr-priority` - Sets the designated router priority value configured for the router interface

## 9.1.35 show ip pim mroute

Displays the PIM multicast information.

<pre>show ip pim mroute [{<i>comp-id_1-255</i>   <b>group-address</b>   <b>source-address</b>} <b>summary</b>]</pre>
--

<b>Syntax</b>	<code>comp-id_1-255</code> - Component identifier.
<b>Description</b>	<p><b>group-address</b> - Indicates the PIM multicast group address using the listed RP.</p> <p><b>source-address</b> - The network address that identifies the sources for which this entry contains multicast routing information.</p> <p><b>summary</b> - Summary of PIM mroute information.</p>
<b>Mode</b>	Privileged EXEC
<b>Example</b>	<pre>SEFOS# show ip pim mroute IP Multicast Routing Table ----- Route Flags S: SPT Bit W: Wild Card Bit R: RPT Bit IIF State P: Pruned F: Forwarding A: Graft Ack Pending Timers: Uptime/Expires Interface State: Interface, State/Mode  PIM Multicast Routing Table For Component 1 (12.0.0.10,227.1.1.1) ,00:00:03/05:43:11   Incoming Interface : vlan1 ,RPF nbr : NULL ,Route Flags : ---   IIF State : P ,SRM Generation : Enabled   Source Active Timer Value 210   Source Active Remaining Time : 05:43:11   State Refresh Remaining Time : 00:00:00   Prune Limit Remaining Time : 00:00:00 Outgoing Interface List : NULL</pre>

```

SEFOS# show ip pim mroute 1 summary
IP Multicast Routing Table
-----
Route Flags S: SPT Bit W: Wild Card Bit R: RPT Bit
Timers : Uptime/Expires
Interface State : Interface, State/Mode

PIM Multicast Routing Table For Component 1
(*, 224,1,0.0) , 00:04:35/--- , RP : 12.0.0.1
Incoming Interface : vlan1, RPF nbr : NULL, Route Flags
: WR
Outgoing InterfaceList:
  vlan2, Forwarding/Sparse, 00:04:35/---
(12.0.0.30,224.1.0.0) , 00:00:04/00:03:26
Incoming Interface : vlan1, RPF nbr : NULL, Route Flages
: S
Outgoing InterfaceList :
  vlan2, Forwarding/Sparse , 00:00:04/---

```

**Notes** It shows details of the (S,G),(\*,G) and (\*,\*,RP) entries.

### Related Commands

- `ip pim bsr-candidate - value` - Sets the preference value for the local interface as a candidate bootstrap router

## RIPv6

---

IPv6 RIP functions the same and offers the same benefits as RIP in IPv4. RIP enhancements for IPv6, detailed in RFC 2080, include support for IPv6 addresses and prefixes, and the use of all-RIP-routers multicast group address as the destination address for RIP update messages. This module describes how to configure Routing Information Protocol for IPv6. IPv6 RIP process maintains a local routing table, referred to as a RIB. The IPv6 RIP RIB contains a set of IPv6 RIP routes learnt from all its neighboring networking devices.

Before configuring the router to run IPv6 RIP, the `ipv6 unicast-routing` must be enabled globally, and IPv6 must be enabled on any interface in which IPv6 RIP is to be processed.

---

### 10.1 RIPv6 Commands

The list of CLI commands for the configuration of RIPv6 is as follows:

- `ipv6 router rip`
- `ipv6 router rip - name`
- `ipv6 split-horizon`
- `ipv6 rip enable`
- `ipv6 rip name enable`
- `ipv6 rip default-information originate`
- `ipv6 rip default-information - originate | only`
- `ipv6 rip metric-offset`
- `redistribute`
- `distribute prefix`
- `debug ipv6 rip`

- `show ipv6 rip`
- `show ipv6 rip stats`
- `show ipv6 rip filter`

## 10.1.1 `ipv6 router rip`

Enables RIP6 and enters into the router configuration mode and the `no` form of the command disables RIP6 on all the interfaces.

```
ipv6 router rip
```

```
no ipv6 router rip
```

<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>ipv6 router rip</b>
<b>Notes</b>	Before configuring the router to run IPv6 RIP, the <code>ipv6 unicast-routing</code> must be enabled globally, and IPv6 must be enabled on the interface in which IPv6 RIP is to be processed.

### Related Commands

- `ipv6 enable` - Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address
- `ipv6 unicast-routing` - Enables unicast routing

## 10.1.2 `ipv6 router rip - name`

Enables RIP6 and enters into the router configuration mode. The `no` form of the command disables RIP6 on all the interfaces. This command operates similar to that of the command `ipv6 router rip`.

```
ipv6 router rip name
```

```
no ipv6 router rip name
```



<b>Syntax Description</b>	<i>name</i> – Specific IPv6 RIP routing process. This feature is ignored during the command execution.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>ipv6 router rip router1</b>
<b>Notes</b>	Before configuring the router to run IPv6 RIP, the <code>ipv6 unicast-routing</code> must be enabled globally, and IPv6 must be enabled on the interface in which IPv6 RIP is to be processed.

### Related Commands

- `ipv6 enable` - Enables IPv6 processing on an interface that has not been configured with an explicit IPv6 address
- `ipv6 unicast-routing` - Enables unicast routing

## 10.1.3 `ipv6 split-horizon`

Enables the `split-horizon` updates and the `no` form of the command disables the `split-horizon` updates.

```
ipv6 split-horizon
```

```
no ipv6 split-horizon
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 split-horizon</b>
<b>Notes</b>	The value <code>split-horizon</code> denotes that <code>split-horizon</code> algorithm must be applied in the response packets that are going out.

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.4 `ipv6 rip enable`

Enables RIP routing and the `no` form of the command disables the RIP routing.

```
ipv6 rip
```

```
no ipv6 rip
```

**Mode** Interface Configuration  
Applicable only in the VLAN interface mode.

**Example** SEFOS(config-if)# **ipv6 rip enable**

### Related Commands

- `show ipv6 rip` - Displays IPv6 Local RIB and routing protocol information

## 10.1.5 `ipv6 rip name enable`

Enables the specified IPv6 RIP routing process on an interface. The `no` form of the command disables the specified routing process on an interface. This command operates similar to that of the command `ipv6 rip enable`.

```
ipv6 rip name enable
```

```
no ipv6 rip name enable
```

**Syntax Description** *name* – Specific IPv6 RIP routing process. This feature is ignored during the command execution.

**Mode** Interface Configuration  
Applicable in the VLAN Interface mode only.

**Example** SEFOS(config-if)# **ipv6 rip name enable**  
SEFOS(config-if)# **no ipv6 rip name enable**

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.6 `ipv6 rip default-information originate`

Configures handling of default route originate. This command originates the IPv6 default route into the specified RIP routing process updates sent out of the specified interface. The `no` form of the command disables handling of default route originate.

```
ipv6 rip default-information originate
```

```
no ipv6 rip default-information
```

**Mode** Interface Configuration  
Applicable only in the VLAN interface mode.

**Example** SEFOS(config-if)# **ipv6 rip default-information originate**

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.7 `ipv6 rip default-information - originate | only`

Originates the IPv6 default route into the specified RIP routing process updates, sent from the specified interface. This command operates similar to that of the command `ipv6 rip default-information originate`.

---

**Note** – The routing process ignores all default routes received on any interface, after originating the IPv6 default route out of any interface to avoid routing loops.

---

```
ipv6 rip process-name default-information {originate | only }
[metric value]
```

**Syntax Description** *process-name* – Specific IPv6 RIP routing process. This feature is ignored during the command execution.

**originate** – Default route is originated in addition to all other routes in the updates sent from the interface.

**only** – Default route is originated while suppressing all other routes in the updates sent from the interface.

**metric** – Metric to be used for redistributed routes.

**Mode** Interface Configuration  
Applicable only in the VLAN interface mode.

**Example** SEFOS(config-if)# **ipv6 rip process1 default-information originate**

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.8 ipv6 rip metric-offset

Adjusts default metric increment.

```
ipv6 rip metric-offset 1-15
```

<b>Mode</b>	Interface Configuration
<b>Example</b>	SEFOS(config-if)# <b>ipv6 rip metric-offset 6</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• The ipv6 rip metric-offset command is used in conjunction with the redistribute router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes.</li><li>• The maximum metric that RIP can advertise is 16, and a metric of 16 denotes a route that is unreachable.</li></ul>

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.9 redistribute

Enables redistribution of IPv6 prefix from another protocol into RIP6. The no form of the command disables redistribution of IPv6 prefix from another protocol into RIP6.

```
redistribute {static | connected | ospf} metric 0-16
```

```
no redistribute {static | connected | ospf}
```

<b>Syntax Description</b>	<b>static</b> – Statically configured routes to advertise in the RIP6 process. <b>connected</b> – Connected routes to advertise in the RIP6 process. <b>ospf</b> – OSPF routes to advertise in the RIP6 process. <b>metric</b> – Routing metric associated with the route.
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>redistribute static metric 6</b>

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.10 distribute prefix

Enables filter network in routing updates sent or received and the `no` form of the command disables Filter network in routing updates sent or received.

```
distribute prefix ipv6_addr {in | out}
```

```
no distribute prefix ipv6_addr {in | out}
```

<b>Syntax</b>	<i>ipv6-addr</i> - IPv6 Address
<b>Description</b>	<b>in</b> - Filter network in routing updates received <b>out</b> - Filter network in routing updates sent out
<b>Mode</b>	Router Configuration
<b>Example</b>	SEFOS(config-router)# <b>distribute prefix</b> <b>fe80::208:2ff:fe02:408 in</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• Filtering is controlled by distribute lists. Input distribute lists control route reception and input filtering is applied to advertisements received from neighbors. Only those routes that pass input filtering are inserted in the RIP local routing table and become candidates for insertion into the IPv6 routing table.</li><li>• Output distribute lists control route advertisement. Output filtering is applied to route advertisements sent to neighbors. Only those routes passing output filtering will be advertised.</li></ul>

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information
- `show ipv6 rip filter` - Displays peer and Advfilter table

## 10.1.11 debug ipv6 rip

Enables IPv6 RIP routing protocol debugging and the `no` form of the command disables IPv6 RIP routing protocol debugging.

```
debug ipv6 rip {all | data | control}
```

```
no debug ipv6 rip
```

<b>Syntax Description</b>	<b>all</b> – All resources. <b>data</b> – Data path messages. <b>control</b> – Control Plane messages.
<b>Mode</b>	Privileged EXEC
<b>Defaults</b>	Disabled.
<b>Example</b>	SEFOS# <b>debug ipv6 rip all</b>

### Related Commands

- `show ipv6 rip` - Displays IPv6 local RIB and routing protocol information

## 10.1.12 show ipv6 rip

Displays IPv6 local RIB and routing protocol information.

```
show ipv6 rip [database]
```

<b>Syntax Description</b>	<b>database</b> – IPv6 RIP protocol database
<b>Mode</b>	Privileged EXEC
<b>Example</b>	SEFOS# <b>show ipv6 rip database</b> RIP local RIB 4444::/64, metric 10, local vlan1::, expires in 180 secs 5555::/64, metric 10, local vlan2::, expires in 180 secs 6666::/64, metric 7, static tunnel0::, expires in 180 secs

### Related Commands

- `ipv6 router rip` - Enables the router configuration mode
- `ipv6 split-horizon` - Enables the split-horizon updates
- `ipv6 rip enable / ipv6 rip name enable` - Enables RIP routing
- `ipv6 rip default-information originate` - Configures handling of default route originate
- `ipv6 rip default-information - originate | only` - Originates the IPv6 default route into the specified RIP routing process updates sent from the specified interface.
- `ipv6 rip metric-offset` - Adjusts default metric increment

- `redistribute` - Redistributes IPv6 prefix from another protocol into RIP6
- `distribute prefix` - Enables filter network in routing updates sent or received
- `debug ipv6 rip` - Enables IPv6 RIP routing protocol debugging

## 10.1.13 `show ipv6 rip stats`

Displays all the interface statistics.

```
show ipv6 rip stats
```

```

Mode          Privileged EXEC
Example       SEFOS# show ipv6 rip stats
              Interface Index      vlan1
              *****          ***
Rcvd   :
Messages      0   Requests      0   Responses
0
UnknownComnds 0   OtherVer      0   Discards
0
Sent   :
Messages      1   Requests      1   Responses
0
Trigger Updates 0

```

## 10.1.14 `show ipv6 rip filter`

Displays peer and advfilter table.

```
show ipv6 rip filter
```

```

Mode          Privileged EXEC
Example       SEFOS# show ipv6 rip filter
              Filter Address      FilterType
              *****          *****
fe80::200:ff:febb:e01      IN
fe80::200:ff:fecc:102      IN
3333::1111                 OUT

```

## Related Commands

- `distribute prefix` - Enables Filter network in routing updates sent or received



## RRD6

---

RRD6 allows different routing protocols to exchange IPv6 routing information.

---

### 11.1 RRD6 Commands

The list of CLI commands for the configuration of RRD6 is as follows:

- `export ospfv3`
- `redistribute-policy`
- `default redistribute-policy`
- `throt`
- `show redistribute-policy ipv6`
- `show redistribute information ipv6`

#### 11.1.1 `export ospfv3`

Enables redistribution of OSPF area or external routes to the protocol. The `no` form of the command disables redistribution of OSPF area or external routes to the protocol.

```
export ospfv3 {area-route | external-route} {rip}
```

```
no export ospfv3 {area-route | external-route} {rip}
```

<b>Syntax</b>	<b>area-route</b> – OSPFv3 inter-area and intra-area address/mask pairs to be exported into the routing protocol.
<b>Description</b>	<b>external-route</b> – OSPFv3 Type 1 and Type 2 External address/mask pairs to be exported into the routing protocol. <b>rip</b> – Routing information protocol.
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <b>export ospfv3 area-route rip</b>

### Related Commands

- `show redistribute information ipv6` - Displays the RTM6 RRD status for registered protocols

## 11.1.2 redistribute-policy

Adds the IPv6 permit or deny redistribution policy. The no form of the command removes the IPv6 permit or deny redistribution policy.

```
redistribute-policy {ipv6} {permit|deny} DestIp DestRange {static
| local | rip | ospf} {rip | ospf | all}
```

```
no redistribute-policy {ipv6} DestIp DestRange
```

<b>Syntax</b>	<b>ipv6</b> – IPv6 protocol.
<b>Description</b>	<b>permit</b> – Sets the default rule for all prefixes to permit. <b>deny</b> – Sets the default rule for all prefixes to deny. <b>DestIp</b> – Destination IP address. <b>DestRange</b> – Destination range. <b>static</b> – Static routes. <b>local</b> – Local routes. <b>rip</b> – Routing Information protocol. <b>ospf</b> – Open Shortest Path First protocol. <b>all</b> – All.
<b>Mode</b>	Global Configuration

<b>Defaults</b>	<code>permit all</code>
<b>Example</b>	SEFOS(config)# <code>redistribute-policy ipv6 permit 4444::1111 64.static ospf</code>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The addresses learnt within the specified range through the specified routing protocol will be redistributed to other routing protocols.</li> <li>• No routes will be exchanged between RTM and the re-distributing protocols.</li> </ul>

### Related Commands

- `show redistribute information ipv6` - Displays route redistribution filters

## 11.1.3 default redistribute-policy

Sets the default behavior of the RRD6 control table.

```
default redistribute-policy {ipv6} {permit | deny}
```

<b>Syntax Description</b>	<p><code>ipv6</code> – IPv6 protocol.</p> <p><code>permit</code> – Sets the default rule for all prefixes to permit.</p> <p><code>deny</code> – Sets the default rule for all prefixes to deny.</p>
<b>Mode</b>	Global Configuration
<b>Example</b>	SEFOS(config)# <code>default redistribute-policy ipv6 permit</code>

### Related Commands

- `show redistribute information ipv6` - Displays route redistribution filters

## 11.1.4 throt

Configures the maximum number of routes processed for every iteration.

```
throt value
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	1000
<b>Example</b>	SEFOS(config)# <code>throt 100</code>

## 11.1.5 show redistribute-policy ipv6

Displays the route redistribution filters

```
show redistribute-policy ipv6
```

**Mode** Privileged EXEC

**Example** SEFOS# **show redistribute-policy ipv6**

Destination	Range	SrcProto	DestProto	Flag
3434::1111	64	static	rip	Deny
::	128	all	others	Allow

### Related Commands

- `redistribute-policy` - Adds the IPv6 permit or deny redistribution policy
- `default redistribute-policy` - Sets the default behavior of the RRD6 control table

## 11.1.6 show redistribute information ipv6

Displays the RTM6 RRD status for registered protocols.

```
show redistribute information ipv6
```

**Mode** Privileged EXEC

**Example** SEFOS# **show redistribute information ipv6**

```
Current State is enabled
ProtoName      OspfAreaRoutes  OspfExtRoutes
-----
local          Disable         Disable
static         Disable         Disable
rip            Enable          Enable
```

### Related Commands

- `export ospfv3` - Enables redistribution of OSPF area/External routes to the protocol

# VRRP

---

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**Note** – This chapter applies to the Sun Network 10GbE Switch 72p product only. VRRP is not supported on the Sun Blade 6000 Ethernet Switched NEM 24p 10GbE, so do not use any of the procedures in this chapter for that product.

---

VRRP is an election protocol that dynamically assigns responsibility for one or more virtual router to the VRRP routers on a LAN, allowing several routers on a multi-access link to utilize the same virtual IP address. A VRRP router is configured to run the VRRP protocol in conjunction with one or more other routers attached to a LAN. In a VRRP setup, one router is elected as the master router with the other routers acting as backups for the case of failure of the master router. VRRP is designed to eliminate the router as a single point of failure when static routes are used.

---

## 12.1 VRRP Commands

The list of CLI commands for the configuration of VRRP is as follows:

- `router VRRP`
- `interface`
- `vrrp - ipv4 address`
- `vrrp - ip address`
- `vrrp group shutdown`
- `vrrp - priority`
- `vrrp - preempt`
- `vrrp - text-authentication`
- `vrrp - authentication text`

- `vrrp - interval`
- `vrrp - timers advertise`
- `vrrp - accept-mode`
- `show vrrp interface - vrid`
- `show vrrp interface`

## 12.1.1 router VRRP

- Enables VRRP in the router and is used to enter the VRRP configuration mode. The `no` form of the command disables VRRP in the router.

```
router vrrp
```

```
no router vrrp
```

<b>Mode</b>	Global Configuration
<b>Defaults</b>	VRRP is disabled.
<b>Example</b>	SEFOS(config)# <b>router vrrp</b>
<b>Notes</b>	Enabling the VRRP router will transition the state of the virtual router from <code>initialize</code> to <code>backup</code> or <code>master</code> ( <code>Initialize</code> indicates that the virtual router is waiting for a startup event. <code>backup</code> indicates that the virtual router is monitoring the availability of the master router. <code>master</code> indicates that the virtual router is forwarding the packets for IP addresses that are associated with this router.) Disabling the VRRP router will transition the state from <code>backup</code> or <code>master</code> to <code>initialize</code> . State transitions may not be immediate but may depend on other factors such as the interface state.

### Related Commands

- `show vrrp interface - vrid` - Displays the VRRP status information
- `vrrp group shutdown` - Shuts down all VRRP groups

## 12.1.2 interface

Selects an interface to configure. The `no` form of the command deletes the virtual router entries on the given interface.

```
interface {vlan 1-4094 | interface-type interface-id}
```

```
no interface {vlan 1-4094 | interface-type interface-id}
```

**Mode** VRRP Router Configuration

**Example** SEFOS(config-vrrp)# **interface vlan 3**

**Notes**

- VRRP must be enabled prior to the execution of this command.
- This interface must have an ip address prior to the execution of this command.

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `show vrrp interface - vrid` - Displays the VRRP status information
- `show vrrp interface` - Displays the VRRP status information

## 12.1.3 vrrp - ipv4 address

Sets an associated IP address for the virtual router. The no form of the command deletes the associated IP address for the virtual router.

```
vrrp vr-id_1-255 ipv4 uast-addr [secondary]
```

```
no vrrp vr-id_1-255 ipv4 uast-addr [secondary]
```

**Syntax Description**

*vr-id\_1-255* - Virtual router identifier. VRID is a number which along with an interface index uniquely identifies a virtual router instance on a given VRRP router. This value ranges between 1 and 255.

*uast-addr* - Associated IP address to be added.

**secondary** - Indicates that this is a secondary IP address.

**Mode** VRRP Interface Configuration

**Example** SEFOS(config-vrrp-if)# **vrrp 3 ipv4 10.0.0.1**

**Notes**

- Once this command is executed, the VRRP Module starts the transition from `initial` state to either `backup` state or `master` state as per the election process on the specific interface.
- This command should precede any other interface command for this VR identifier.

### Related Commands

- `router VRRP` - Enables VRRP in the router

- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process
- `vrrp - text-authentication / vrrp - authentication text` - Sets the authentication type for the virtual router to simple password
- `vrrp - interval / vrrp - timers advertise` - Sets the advertisement timer for a virtual router
- `show vrrp interface - vrid` - Displays the VRRP status information
- `show vrrp interface` - Displays the VRRP status information

## 12.1.4 vrrp - ip address

Sets an associated IP address for the virtual router. The `no` form of the command deletes the associated IP address for the virtual router. This command operates similar to that of the command `vrrp - ipv4 address`.

```
vrrp vr-id_1-255 ip uicast-addr [secondary]
```

<b>Syntax Description</b>	<p><i>vr-id_1-255</i> – Virtual router identifier. VRID is a number which along with an interface index uniquely identifies a virtual router instance on a given VRRP router. This value ranges between 1 and 255.</p> <p><i>uicast-addr</i> – Associated IP address to be added.</p> <p><b>secondary</b> – Indicates that this is a secondary IP address.</p>
<b>Mode</b>	VRRP Interface Configuration
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 ip 10.0.0.1</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Once this command is executed, the VRRP Module starts the transition from <code>initial</code> state to either <code>backup</code> state or <code>master</code> state as per the election process on the specific interface.</li> <li>• This command should precede any other interface command for this VR identifier.</li> </ul>

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process
- `vrrp - text-authentication / vrrp - authentication text` - Sets the authentication type for the virtual router to simple password
- `vrrp - interval / vrrp - timers advertise` - Sets the advertisement timer for a virtual router
- `show vrrp interface - vrid` - Displays the VRRP status information



- `show vrrp interface` - Displays the VRRP status information

## 12.1.5 vrrp group shutdown

Shuts down all VRRP groups. This command operates similar to the `no` form of the command `vrrp - ipv4 address`, except that all the associated IP addresses of the virtual router will be deleted.

```
vrrp group shutdown
```

**Mode** VRRP Interface Configuration

**Example** SEFOS(config-vrrp-if)# **vrrp group shutdown**

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `show vrrp interface - vrid` - Displays the VRRP status information
- `show vrrp interface` - Displays the VRRP status information

## 12.1.6 vrrp - priority

Sets the priority for the virtual router. The `no` form of the command sets the priority for the virtual router to the default value.

```
vrrp vr-id_1-255 priority 1-254
```

```
no vrrp vr-id_1-255 priority
```

**Syntax** `vr-id_1-255` - Virtual router identifier.

**Description** `priority` - Priority used for the virtual router master election process.

**Mode** VRRP Interface Configuration

<b>Defaults</b>	<b>priority</b> - 100
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 priority 7</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Higher values imply higher priority.</li> <li>• A priority of 255 is used for the router that owns the associated IP address (es).</li> <li>• The command <code>vrrp &lt;vrid(1-255)&gt; ipv4 &lt;ip address&gt;</code> must be entered for the current interface (with the proper vrid) before the execution of this command.</li> </ul>

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `show vrrp interface - vrid` - Displays the VRRP status information

## 12.1.7 vrrp - preempt

Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process. The no form of the command disables the preempt mode.

```
vrrp vr-id_1-255 preempt [delay minimum 0-30]
```

```
no vrrp vr-id_1-255 preempt
```

<b>Syntax Description</b>	<p><i>vr-id_1-255</i> - Virtual router identifier.</p> <p><b>delay minimum</b> - Number of seconds that the router will delay before issuing an advertisement claiming master ownership. This value ranges between 0 and 30.</p>
<b>Mode</b>	VRRP Interface Configuration
<b>Defaults</b>	Pre-emption is enabled. <b>delay minimum</b> - 0
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 preempt</b>
<b>Notes</b>	The command <code>vrrp - ipv4 address</code> must be entered for the current interface (with the proper vr-id) before the execution of this command.

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router

- `show vrrp interface - vrid` - Displays the VRRP status information
- `show vrrp interface` - Displays the VRRP status information

## 12.1.8 vrrp - text-authentication

Sets the authentication type for the virtual router to simple password. The `no` form of the command sets the authentication type for the virtual router to none.

```
vrrp vr-id_1-255 text-authentication password
```

```
no vrrp vr-id_1-255 text-authentication
```

<b>Syntax</b>	<i>vr-id_1-255</i> - Virtual router identifier.
<b>Description</b>	<i>password</i> - Authentication password used to validate the incoming VRRP packets.
<b>Mode</b>	VRRP Interface Configuration
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 text-authentication abcdefgh</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The authentication password is an alphanumeric string with up to 8 characters.</li> <li>• The command <code>vrrp - ipv4 address</code> must be entered for the current interface (with the proper vrid) before the execution of this command.</li> </ul>

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `show vrrp interface` - Displays the VRRP status information

## 12.1.9 vrrp - authentication text

Sets the authentication type for the virtual router to simple password. This command operates similar to the command `vrrp - text-authentication`.

```
vrrp vr-id_1-255 authentication text password
```

<b>Syntax Description</b>	<i>vr-id_1-255</i> – Virtual router identifier. This value ranges between 1 and 255. <i>password</i> – Authentication password used to validate the incoming VRRP packets.
<b>Mode</b>	VRRP Interface Configuration
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 authentication text abcdefgh</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• The authentication password is an alphanumeric string of up to 8 characters.</li> <li>• The command <code>vrrp - ipv4 address</code> must be entered for the current interface (with the proper vr-id) before the execution of this command.</li> </ul>

### Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `show vrrp interface` - Displays the VRRP status information

## 12.1.10 vrrp - interval

Sets the advertisement timer for a virtual router. The `no` form of the command sets the advertisement timer for a virtual router to the default value.

```
vrrp vr-id_1-255 timer interval-seconds_1-255
```

```
no vrrp vr-id_1-255 timer
```

<b>Syntax Description</b>	<i>vr-id_1-255</i> – Virtual router identifier. This value ranges between 1 and 255. <b>timer</b> – The time interval, in seconds, between successive advertisement messages. This value ranges between 1 and 255.
<b>Mode</b>	VRRP Interface Configuration
<b>Defaults</b>	1 second
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 4 timer 6</b>
<b>Notes</b>	<ul style="list-style-type: none"> <li>• Only the master router sends advertisements.</li> <li>• On expiry of the advertise timer, the Master sends advertisement packets to the backup</li> <li>• The command <code>vrrp - ipv4 address</code> must be entered for the current interface (with the proper vrid) before the execution of this command.</li> </ul>

## Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `show vrrp interface` - Displays the VRRP status information

## 12.1.11 vrrp - timers advertise

Sets the advertisement timer for a virtual router. This command operates similar to that of the command `vrrp - interval`.

```
vrrp vr-id_1-255 timers advertise [msec] interval-seconds_1-255
```

<b>Syntax Description</b>	<i>vr-id_1-255</i> - Virtual identifier. This value ranges between 1 and 255. <b>msec</b> - Unit of advertisement time is changed from seconds to milliseconds. <b>interval</b> - The time interval, in seconds, between successive advertisement messages. This value ranges between 1 and 255.
<b>Mode</b>	VRRP Interface Configuration
<b>Defaults</b>	1 second
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 3 timers advertise 100</b>
<b>Notes</b>	<ul style="list-style-type: none"><li>• Only the master router sends advertisements</li><li>• On expiry of the advertise timer, the master sends advertisement packets to the backup.</li><li>• The command <code>vrrp - ipv4 address</code> must be entered for the current interface (with the proper <i>vr-id</i>) before the execution of this command.</li></ul>

## Related Commands

- `router VRRP` - Enables VRRP in the router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `show vrrp interface` - Displays the VRRP status information

## 12.1.12 vrrp - accept-mode

Enables VRRP accept mode. The no form of the command disables the VRRP accept mode.

```
vrrp vr-id_1-255 accept-mode enable
```

```
no vrrp vr-id_1-255 accept-mode enable
```

<b>Syntax</b>	<i>vr-id_1-255</i> - Virtual router identifier. This value ranges between 1 and 255.
<b>Description</b>	<b>accept-mode</b> - Identifies the mode to be enables.
<b>Mode</b>	VRRP Interface Configuration
<b>Default</b>	Accept mode disabled.
<b>Example</b>	SEFOS(config-vrrp-if)# <b>vrrp 1 accept-mode enable</b>

### Related Commands

- `router VRRP` - Enables VRRP in the router.
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router.
- `show vrrp interface` - Displays the VRRP status information.

## 12.1.13 show vrrp interface - vrid

Displays the VRRP status information.

```
show vrrp [interface {vlan 1-4094 | interface-type interface-id} vr-id_1-255] [{brief | detail | statistics}]
```

**Syntax**            **interface vlan** – VRRP information on the given VLAN ID and VRID.  
**Description**      **brief** – Information about VRRP in brief.  
                       **detail** – Information about VRRP in detail.  
                       **statistics** – VRRP statistics.  
                       *vr-id\_1-255* – Virtual Router ID.  
                       *interface-type* – Interface type.  
                       *interface-id* – Interface identifier.

**Mode**              Privileged EXEC

**Example**            SEFOS# **show vrrp interface vlan 2 detail**  
 vlan2 - vrID 1  
 -----  
                       State is Master  
                       Virtual IP address is 12.0.0.2  
                       Virtual MAC address is 00:00:5e:00:01:01  
                       Master router is 12.0.0.2  
                       Associated IpAddresses :  
                       -----  
 12.0.0.2  
                       Advertise time is 1 secs  
                       Current priority is 100  
                       Configured priority is 100, may preempt  
 vlan2 - vrID 2  
 -----  
                       State is Master  
                       Virtual IP address is 12.0.0.1  
 Virtual MAC address is 00:00:5e:00:01:02  
                       Master router is 12.0.0.1  
                       Associated IpAddresses :  
                       -----  
 12.0.0.1  
 Advertise time is 1 secs  
                       Current priority is 255  
                       Configured priority is 255, may preempt

SEFOS# **show vrrp interface vlan 2 brief**  
 P indicates configured to preempt

Interface	vrID	Priority	P	State	Master Addr	VRouter Addr
vlan2	1	100	P	Master	local	12.0.0.2
vlan2	2	255	P	Master	local	12.0.0.1

```
SEFOS# show vrrp interface vlan 2 statistics
```

```
vlan2 - vrID 1
```

```
-----  
Transitions to Master           : 2  
Advertisements Received         : 0  
Advertise Internal Errors       : 0  
Authentication Failures         : 0  
TTL Errors                      : 0  
Zero Priority Packets Received  : 1  
Zero Priority Packets Sent      : 0  
  
Invalid Type Packets Received   : 0  
Address List Errors             : 0  
Invalid Authentication Type     : 0  
Authentication Type Mismatch   : 0  
Packet Length Errors           : 0  
vlan2 - vrID 2
```

```
-----  
Transitions to Master           : 1  
Advertisements Received         : 0  
Advertise Internal Errors       : 0  
Authentication Failures         : 0  
TTL Errors                      : 0  
Zero Priority Packets Received  : 0  
Zero Priority Packets Sent      : 0  
Invalid Type Packets Received   : 0  
Address List Errors             : 0  
  
Invalid Authentication Type     : 0  
Authentication Type Mismatch   : 0  
Packet Length Errors           : 0
```

```
SEFOS# show vrrp interface vlan 2
```

```
P indicates configured to preempt
```

Interface	vrID	Priority	P	State	Master Addr	VRouter Addr
vlan2	1	100	P	Master	local	12.0.0.2
vlan2	2	255	P	Master	local	12.0.0.1

**Notes**

This command can be executed with the VLAN identifier (1-4094) as the mandatory parameter.



## Related Commands

- `router VRRP` - Enables VRRP in the router
- `interface` - Selects an interface to be configured
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `vrrp group shutdown` - Shuts down all VRRP groups.
- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process
- `vrrp - text-authentication / vrrp - authentication text` - Sets the authentication type for the virtual router to simple password.
- `vrrp - interval / vrrp - timers advertise` - Sets the advertisement timer for a virtual router

## 12.1.14 show vrrp interface

Displays the VRRP status information.

```
show vrrp interface [{vlan 1-4094 | interface-type interface-id }]
[ {brief | detail | statistics} ]
```

### Syntax Description

**interface vlan** – VRRP information on the given VLAN identifier.

**brief** – Information about VRRP in brief.

**detail** – Information about VRRP in detail.

**statistics** – VRRP statistics.

*interface-type* – Interface type.

*interface-id* – Interface identifier.

### Mode

Privileged EXEC

### Example

```
SEFOS# show vrrp interface
P indicates configured to preempt
Interface  vrID Priority P  State  Master Addr  VRouter Addr
-----  -  -  -  -  -  -  -
vlan2      1    100  P  Master  local      21.0.0.1
```

## Related Commands

- `router VRRP` - Enables VRRP in the router
- `interface` - Selects an interface to configure

- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router
- `vrrp group shutdown` - Shuts down all VRRP groups.
- `vrrp - preempt` - Enables the pre-emption of state change from either Backup to Master or vice versa based on the election process
- `vrrp - ipv4 address / vrrp - ip address` - Sets the IP address for the virtual router