



SRstackware[®] Intelligent Network Software

OSPF Command Reference

P/N: 6806800N87H

August 2022



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SMART Embedded Computing, Inc., dba Penguin Solutions

2900 S. Diablo Way, Suite 190

Tempe, Arizona 85282

USA

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About this Manual

Overview of Contents

Network administrators and application developers who install and configure SRstackware® IP routing software should use this manual.

This reference contains the following information:

- An overview of the SRstackware Command Line Interface.
- The complete command reference for SRstackware Open Shortest Path First (OSPF) protocol.

Users can use a telnet session to log onto the OSPF daemon and use the CLI described in this manual to issue commands to configure and to get information about the OSPF daemon.

This manual is divided into the following chapters and appendix.

[Chapter 1, Command Line Interface Environment on page 25](#)

[Chapter 2, OSPF Commands on page 43](#)

[Appendix A, Related Documentation on page 135](#)

Abbreviations

This document uses the following abbreviations:

Abbreviation	Definition
ABR	Area Border Routers
AMC	Alarm Management Controller
ARP	Address Resolution Protocol
ASBR	Autonomous System Boundary Router
BFD	Bidirectional Forwarding Detection
CLI	Command Line Interface
DD	Database Description
DR	Designated Router
IFSM	Interface Finite State Machine
IS-IS	Intermediate System to Intermediate System








About this Manual

Abbreviation	Definition
LSA	Link State Advertisements
MTU	Maximum Transmission Unit
NFSM	Neighbor Finite State Machines
NSSA	Not-So-Stubby-Area
OSPF	Open Shortest Path First
RIP	Routing Information Protocol
SPF	Shortest Path First

Conventions

The following table describes the conventions used throughout this manual.

Notation	Description
0x00000000	Typical notation for hexadecimal numbers (digits are 0 through F), for example used for addresses and offsets
0b0000	Same for binary numbers (digits are 0 and 1)
bold	Used to emphasize a word
Screen	Used for on-screen output and code related elements or commands. Sample of Programming used in a table (9pt)
Courier + Bold	Used to characterize user input and to separate it from system output
<i>Reference</i>	Used for references and for table and figure descriptions
File > Exit	Notation for selecting a submenu
<text>	Notation for variables and keys
[text]	Notation for software buttons to click on the screen and parameter description
...	Repeated item for example node 1, node 2, ..., node 12
.	Omission of information from example/command that is not necessary at the time
..	Ranges, for example: 0..4 means one of the integers 0,1,2,3, and 4 (used in registers)

Notation	Description
	Logical OR
	Indicates a hazardous situation which, if not avoided, could result in death or serious injury
	Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury
	Indicates a property damage message
	Indicates a hot surface that could result in moderate or serious injury
	Indicates an electrical situation that could result in moderate injury or death
<p data-bbox="272 1083 386 1135">Use ESD protection</p> 	Indicates that when working in an ESD environment care should be taken to use proper ESD practices
	No danger encountered, pay attention to important information

Summary of Changes

This manual has been revised and replaces all prior editions.

Part Number	Publication Date	Description
6806800N87H	August 2022	Rebrand to Penguin Solutions
6806800N87G	March 2020	Rebrand to SMART Embedded Computing template.
6806800N87F	July 2017	Added registered trademark to SRstackware.
6806800N87E	December 2014	Added bfd all-interfaces on page 56 and ip ospf bfd on page 78.
6806800N87D	June 2014	Rebrand to Artesyn template.
6806800N87C	April 2013	Updated Chapter 2, OSPF Commands.
6806800N87B	October 2012	Added a note that this document is relevant only if LAYER3SRS is licensed.
6806800N87A	February 2012	EA Release

Command Line Interface Environment

1.1 Command Line Interface Primer

The SRstackware® Command Line Interface (CLI) is a text based facility conforming to industry standards. Many of the commands may be used in scripts to automate configuration tasks. Each CLI is usually associated with a specific function or a common function performing a specific task. Multiple users can telnet and issue commands using the Exec mode and the Privileged Exec mode. Only one user is allowed to use the Configure mode at a time.

The Integrated Management Interface (IMI) Shell gives users and administrators the ability to issue commands to several daemons from a single telnet session.

1.1.1 Definitions

token	A non-character, non-numeric symbol: {}, {}, (), <>, , ?, >, ., =
parameter	An UPPERCASE term for which the user substitutes input.
keyword	A lowercase term that the user types exactly as shown.

1.1.2 Command Line Help

The SRstackware CLI contains a text-based help facility. Access this help by typing in the full or partial command string and then typing a question mark "?". The SRstackware CLI displays the command keywords or parameters along with a short description.

For example, at the CLI command prompt, type

```
> show ? (the CLI does not display the question mark).
```

The CLI displays this keyword list with short descriptions for each keyword:

```
# show
  debugging      Debugging functions (see also 'undebug')
  history        Display the session command history
  ip             IP information
  memory         Memory statistics
  route-map      route-map information
  running-config running configuration
  startup-config Contents of startup configuration
  version        Displays version
```

Command Line Interface Environment

If the ? is typed in the middle of a keyword, SRstackware displays help for that keyword only.

```
> show de? (the CLI does not display the question mark)
      debugging  Debugging functions (see also 'undebug')
```

If the ? is typed in the middle of a keyword but the incomplete keyword matches several other keywords, SRstackware displays help for all matching keywords.

```
> show i? (the CLI does not display the question mark)
      interface  Interface status and configuration
      ip         IP information
      isis       ISIS information
```

1.1.3 Syntax Help

1.1.3.1 Command Completion

The SRstackware CLI can complete the spelling of a command or a parameter. Begin typing the command or parameter and then press TAB. For example, at the CLI command prompt type `sh`:

```
> sh
Press TAB. The CLI shows:
> show
```

If the partial spelling of the command or parameter is ambiguous, then the SRstackware CLI displays the choices that match the abbreviation. Type `show i` and press TAB. The CLI shows:

```
> show i
      interface ip isis
> show i
```

The CLI displays the commands that start with letter `i`, such as `interface`, `ip`, and `isis`. Type `n` to select `interface` and press TAB. The CLI shows:

```
> show in
> show interface
```

Type `?` and the CLI displays the list of parameters for the `show interface` command.

```
> show interface
IFNAME Interface name
|      Output modifiers
>      Output redirection
<cr>
```

The CLI displays the only parameter associated with this command, the IFNAME parameter. For more information on the output modifiers and output redirection, see the Special Tokens for Show Commands section.

1.1.3.2 Command Abbreviations

The SRstackware CLI accepts abbreviations for commands. For example,

```
sh in eth0
```

is an abbreviation for the `show interface` command.

1.1.3.3 Command Line Errors

Any unknown spelling variation causes the command line parser to display in response to the `?`, the error `Unrecognized command`. The parser redisplay the command as last entered. When the user presses the enter key after typing an invalid command, the parser displays:

```
(config)#router ospf here
                        ^
```

```
% Invalid input detected at '^' marker.
```

where the `^` points to the first character in error in the command.

If a command is incomplete it displays this message:

```
> show
% Incomplete command
```

Some commands are too long for the display line and can wrap in mid-parameter or mid-keyword:

```
area 10.10.0.18 virtual-link 10.10.0.19 authentication-key
57393
```

1.2 Command Reference Primer

1.2.1 Typographic Conventions

The following table lists typographic conventions for command syntax descriptions.

Command Line Interface Environment

Table 1-1 *Typographic Conventions*

Convention	Name	Description	Example
Monospaced font	Command	Represents command strings entered on a command line and sample source code	show ip ospf
Proportional font	Description	Gives specific details about a parameter.	advertise Advertises this range
UPPERCASE	Variable parameter	Indicates user input. Values to be entered according to the descriptions that follow. Each uppercased token expands into one or more other tokens.	area AREAID range ADDRESS
lowercase	Keyword parameter	Indicates keywords. Values to be entered exactly as shown in the command description.	show ip ospf
	Vertical bar	Delimits choices; One to be selected from the list. Not to be entered as part of the command.	A.B.C.D <0-4294967295>
()	Parentheses	Encloses optional parameters. None or only one to be chosen. Not to be entered as part of the command.	(A.B.C.D <0-4294967295>)
{ }	Braces	Encloses optional parameters. None, one or more than one to be chosen. Not to be entered as part of the command.	{priority <0-255> poll-interval <1-65535>}
[]	Square brackets	Encloses optional parameters. Choose one. Not to be entered as part of the command.	[parm2 parm2 parm3]
?	Question mark	Used with the square brackets to limit the immediately following token to one occurrence. Not to be entered as part of the command.	[parm1 parm2 ?parm3] expands to parm1 parm3 parm1 parm2 (with parm3 occurring once)
< >	Angle brackets	Enclose a numeric range, endpoints inclusive. Not to be entered as part of the command	<0-65535>

Table 1-1 *Typographic Conventions (continued)*

Convention	Name	Description	Example
=	Equal sign	Separates the variable from explanatory text. Not to be entered as part of the command.	<code>PROCESSID = <0-65535></code>
.	Dot (period)	Allows the repetition of the element that immediately follows it multiple times. Not to be entered as part of the command.	<code>.AA:NN</code> can be expanded to: <code>1:01 1:02 1:03</code> .
A.B.C.D	IP address	An IPv4-style address.	<code>10.0.11.123</code>
X:X::X:X	IP address	An IPv6-style address.	<code>3ffe:506::1</code> , where the <code>::</code> represents all 0s for those address components not explicitly given.
LINE	End-of-line input token	Indicates user input of any string, including spaces. No other parameters may be entered after input for this token.	<code>string of words</code>
WORD	Single token	Indicates user input of any contiguous string (excluding spaces).	<code>singlewordnospaces</code>
IFNAME	Single token	Indicates the name of an interface.	<code>eth0</code>

1.3 Format Used for Command Description

1.3.1 Command Name

Description of the command. What the command does and when should it be used.

1.3.1.1 Command Syntax

`sample-command-name mandatory-parameters (OPTIONAL-PARAMETERS)`

1.3.1.2 Default

The status of the command before it is executed. Is it enabled or disabled by default.

1.3.1.3 Command Mode

Name of the command mode in which this command is to be used. Such as, Exec, Privilege Exec, Configure mode, and so on.

1.3.1.4 Usage

This section is optional. It describes the usage of a specific command and the interactions between parameters. It also includes appropriate sample outputs for `show` commands.

1.3.1.5 Example

Used if needed to show the complexities of the command syntax.

1.3.1.6 Related Commands

This section is optional and lists those commands that are of immediate importance.

1.3.1.7 Equivalent Commands

This section is optional and lists commands that accomplish the same function.

1.3.1.8 Validation Commands

This section is optional and lists commands that can be used to validate the effects of other commands.

1.3.2 Command Negation

Some commands can be negated by using a `no` keyword.

In the following area virtual-link command, the `no` keyword is optional. This means that the entire syntax can be negated. Depending on the command or the parameters, command negation can mean the disabling of one entire feature for the router or the disabling of that feature for a specific ID, interface, or address.

```
(no) area AREAADDRESSID virtual-link ROUTERID
(AUTHENTICATE | MSGD | INTERVAL)
```

In the following example, negation is for the base command only. The negated form does not take any parameter.

```
default-metric <1-16777214>
no default-metric
```

1.3.3 Variable Parameter Expansion

For the area virtual-link command,

```
(no) area AREAADDRESSID virtual-link ROUTERID
(AUTHENTICATE | MSGD | INTERVAL)
```

the `AREAADDRESSID` parameter is replaced by either an IP address or a number in the given range:

```
AREAADDRESSID=A.B.C.D | <0-4294967295>
```

and `ROUTERID` by an IP address. The minimum command then is:

```
area 10.10.0.11 virtual-link 10.10.0.12
```

The parameters in the string `(AUTHENTICATE | MSGD | INTERVAL)` are optional, and only one may be chosen. Each one can be replaced by more keywords and parameters. One of these parameters, `MD5`, is replaced by the following string:

```
MD5= [message-digest-key <1-255> md5 MD5_KEY]
```

with `MD5_KEY` replaced by a 1-16 character string.

1.4 Show Command Tokens

Two tokens modify the output of the show commands. Use the `?` after typing the command to display:

```
# show users
| Output modifiers
> Output redirection
```



These tokens are available only through the IMI shell; they are unavailable to users who telnet to daemons.

1.4.1 Output Modifiers

Type the | (vertical bar) to use output modifiers.

<code>begin</code>	Begin with the line that matches
<code>exclude</code>	Exclude lines that match
<code>include</code>	Include lines that match
<code>redirect</code>	Redirect output

1.4.1.1 Begin

The `begin` parameter displays the output beginning with the first line containing a token matching the input string (everything typed after the `begin` token).

```
# show run | begin eth1
...skipping
interface eth1
  ipv6 address fe80::204:75ff:fee6:5393/64
!
interface eth2
  ipv6 address fe80::20d:56ff:fe96:725a/64
!
line con 0
  login
line vty 0 4
  login
!
end
```

1.4.1.2 Exclude

The `exclude` parameter excludes all lines of output that contain the input string. In the following output all lines containing the word “include” are excluded:

```
# show interface eth1 | exclude input
Interface eth1
```



```
Scope: both
Hardware is Ethernet, address is 0004.75e6.5393
index 3 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST>
VRF Binding: Not bound
Label switching is disabled
No Virtual Circuit configured
Administrative Group(s): None
DSTE Bandwidth Constraint Mode is MAM
inet6 fe80::204:75ff:fee6:5393/64
    output packets 4438, bytes 394940, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0,
window 0
    collisions 0
```

1.4.1.3 Include

The include parameter includes only those lines of output that contain the input string. In the output below, all lines containing the word “input” are included:

```
# show interface eth1 | include input
    input packets 80434552, bytes 2147483647, dropped 0,
    multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 1,
    missed 0
```

1.4.1.4 Redirect

The redirect parameter puts the lines of output into the indicated file.

```
# show history | redirect /var/frame.txt
```

1.4.2 Output Redirection

The output redirection token > allows the user to specify a target file for the lines of output.

```
# show history > /var/frame.txt
```

1.5 Common Command Modes

The commands available for each protocol are separated into several modes (nodes) arranged in a hierarchy. The Exec mode is the lowest. Each mode has its own special commands; in some modes, commands from a lower level are available.



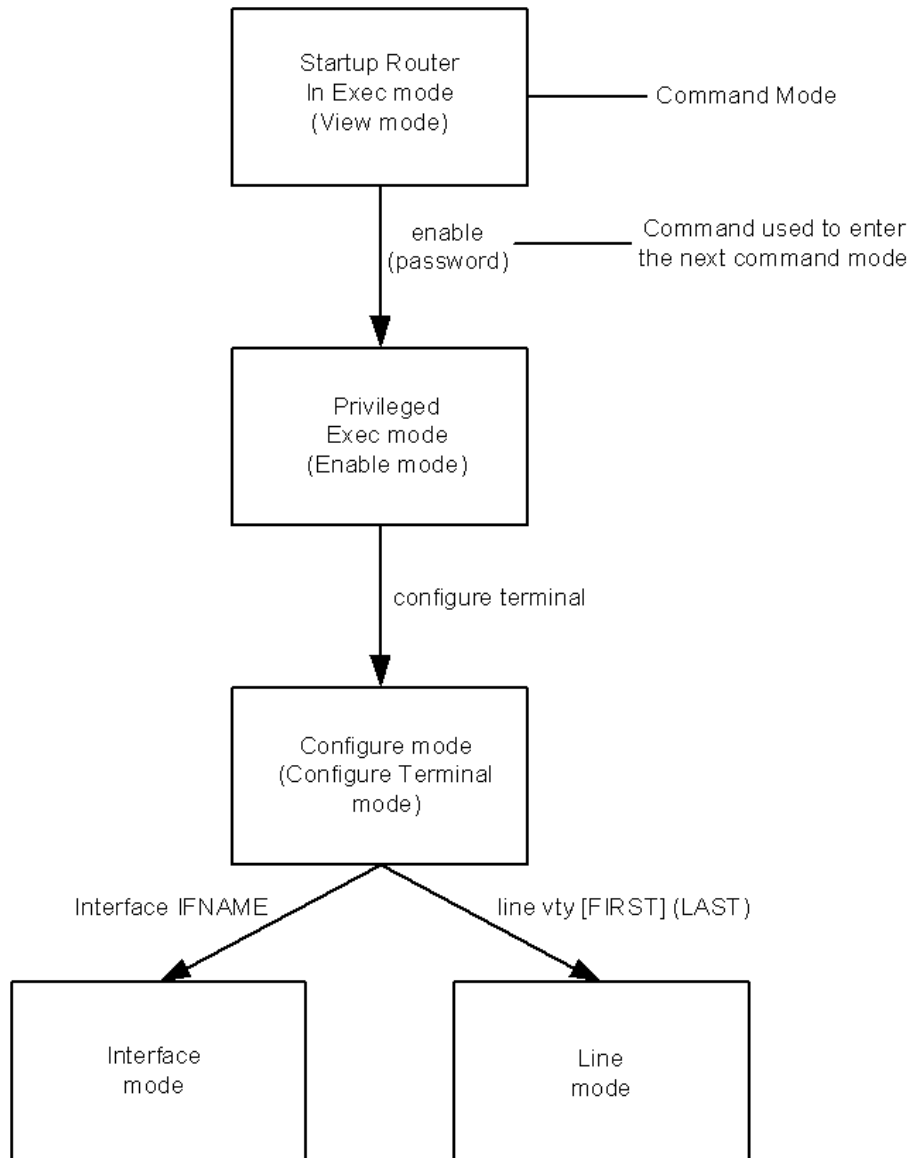
Multiple users can telnet and issue commands using the Exec mode and the Privileged Exec mode. Only one user is allowed to use the Configure mode at a time.

Table 1-2 Common Command Modes Descriptions

Mode	Description
Exec	Also called the View mode, is the base mode from where users can perform basic commands like <code>show</code> , <code>exit</code> , <code>quit</code> , <code>help</code> , <code>list</code> , and <code>enable</code> . All SRstackware daemons have this mode.
Privileged Exec	Also called the Enable mode, allows users to run <code>debug</code> , <code>write</code> (for saving and viewing the configuration) and <code>show</code> commands
Configure	Also called Configure Terminal mode, this mode serves as a gateway into the <code>Interface</code> , <code>Router</code> , <code>Line</code> , <code>Route Map</code> , <code>Key Chain</code> and <code>Address Family</code> modes.
Interface	Used to configure protocol-specific settings for a particular interface. Any attribute configured in this mode overrides an attribute configured in the <code>Router</code> mode
Line	Makes the <code>access-class</code> commands available

This diagram displays the common command mode tree.

Figure 1-1 Common Command Mode Tree



1.6 OSPF Command Modes

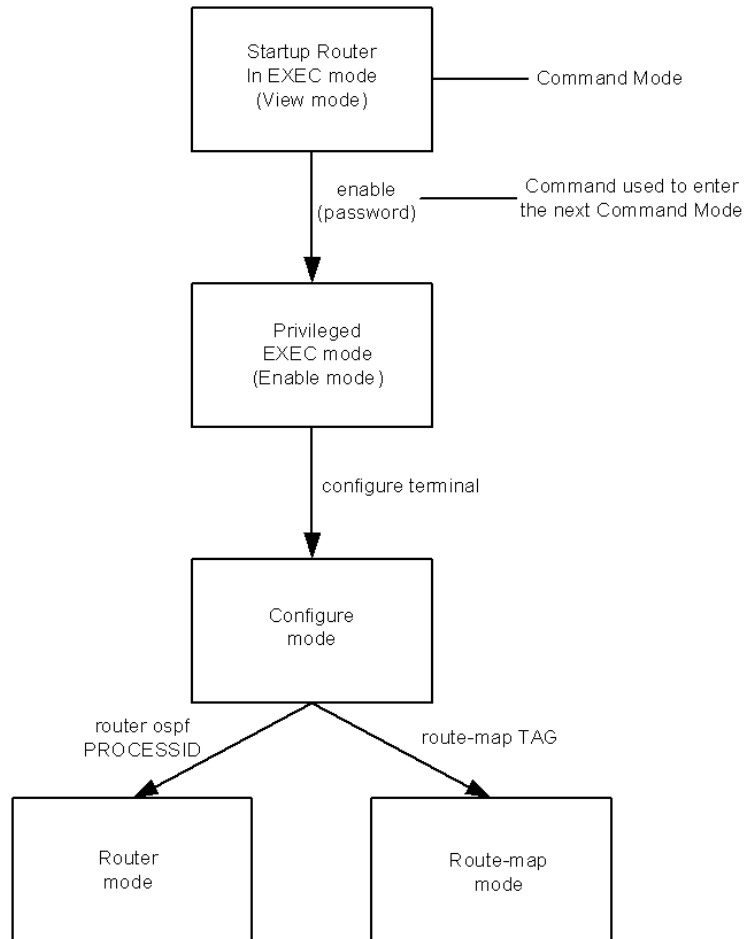
The command modes available for OSPF are listed in [Table 1-2](#).

Table 1-3 OSPF Command Modes

Mode	Description
Router	Sometimes referred to as configure router mode, this mode is available for the MPLS, BGP, OSPF, and RIP protocols only and makes available router and routing commands
Line	Used for access-class commands. Available for the BGP, OSPF, and RIP protocols only.
Route-map	Used to set route metric, route-length and cost data. It is available for the BGP, OSPF, and RIP protocols only

The following diagram shows the complete OSPF daemon command mode tree. For information about Exec, Privileged Exec, Configure and Interface modes please refer to the SRstackware daemon command modes mentioned earlier in this chapter.

Figure 1-2 OSPF Daemon Command Mode tree



Following is a description of the parameters used in the above mentioned commands.

PROCESSID = < 0-65535 >

TAG = WORD (deny|permit) <1-65535>

deny Route-map denies set operations

permit Route-map permits set operations

<1-65535> Sequence to insert to / delete from existing route-map entry.

1.7 Commands Common to Multiple Protocols

Refer to the SRstackware Layer 2 Command Reference, Layer 3 Command Reference, and the Switch Configuration Command Reference for information about using these commands in multiple protocol daemons.

Table 1-4 Commands Common to Multiple Protocols

Command Name	Use this command to
<code>access-class</code>	filter a connection based on an IP access list, for IPv4 networks
<code>access-list</code>	configure an access-list for filtering packets
<code>access-list extended</code>	configure an extended access-list for filtering packets
<code>access-list standard</code>	configure a standard access-list for filtering packets
<code>banner</code>	toggle the displaying of the banner text
<code>clear ip prefix-list</code>	clear the IP prefix-list
<code>configure terminal</code>	enter the Configure Terminal mode
<code>copy running-config startup-config</code>	copy the current running configuration to the startup configuration file
<code>description</code>	provide interface-specific information
<code>disable</code>	exit Privileged Exec mode
<code>enable</code>	enter the Privileged Exec mode
<code>enable password</code>	change the password for the enable command
<code>end</code>	leave the current mode
<code>exec-timeout</code>	set command interpreter wait interval
<code>exit</code>	leave the current mode, or logout of the session
<code>help</code>	display online text assistance
<code>hostname</code>	set or change network server name
<code>ip prefix-list</code>	create an entry for a prefix list
<code>ipv6 access-class</code>	filter connection based on an IP access list for IPv6 networks
<code>ipv6 access-list</code>	configure an access-list for filtering frames
<code>ipv6 prefix-list</code>	create an entry for an IPv6 prefix list
<code>line vty</code>	enter Line mode

Table 1-4 Commands Common to Multiple Protocols

Command Name	Use this command to
<code>list</code>	list all commands for a mode
<code>log file</code>	specify the file that collects logging information
<code>log record-priority</code>	specify the logging of the priority of a message
<code>log syslog</code>	begin logging information to the system log
<code>log trap</code>	limit logging to a specified level or type
<code>login</code>	set a password prompt and enable password checking
<code>match as-path</code>	match an autonomous system path access list
<code>match community</code>	specify the community to be matched
<code>match extcommunity</code>	specify the extended community to be matched
<code>match interface</code>	define the interface match criterion
<code>match ip address</code>	specify the match address of route
<code>match ip address prefix-list</code>	specify to match entries of prefix-lists
<code>match ip next-hop</code>	specify a next-hop address to be matched in a route-map
<code>match ip next-hop prefix-list</code>	specify the next-hop IP address match criterion, using the prefix-list
<code>match ipv6 address</code>	specify the match IPv6 address of route
<code>match ipv6 address prefix-list</code>	match entries of IPv6 prefix-lists
<code>match ipv6 next-hop</code>	specify a next-hop IPv6 address to be matched by the route-map
<code>match metric</code>	match a metric of a route
<code>match origin</code>	match origin code
<code>match route-type</code>	match specified external route type
<code>match tag</code>	match the specified tag value
<code>password</code>	specify a network password
<code>quit</code>	leave the current mode
<code>route-map</code>	enter the route-map mode and to permit or deny match/set operations

Command Line Interface Environment

Table 1-4 Commands Common to Multiple Protocols

Command Name	Use this command to
<code>service advanced-vty</code>	set the VTY session to Privileged Exec mode instead of the Exec mode (which is the default)
<code>service password-encryption</code>	specify encryption of passwords
<code>service terminal-length</code>	set the terminal length for VTY sessions
<code>set aggregator</code>	set the AS number for the route map and router ID
<code>set as-path</code>	modify an autonomous system path for a route
<code>set atomic-aggregate</code>	set an atomic aggregate attribute
<code>set comm-list delete</code>	delete matching communities from inbound or outbound updates.
<code>set community</code>	set the communities attribute
<code>set community-additive</code>	add a community to the already existing communities
<code>set dampening</code>	set route-flap dampening parameters
<code>set extcommunity</code>	set an extended community attribute
<code>set ip next-hop</code>	set the specified next-hop value
<code>set ipv6 next-hop</code>	set a next hop-address
<code>set metric</code>	set a metric value for a route
<code>set metric-type</code>	set the metric type for the destination routing protocol
<code>set next-hop</code>	specify the next-hop address
<code>set origin</code>	set the origin code
<code>set originator-id</code>	set the originator ID attribute
<code>set tag</code>	set specified tag value
<code>set vpnv4 next-hop</code>	set a VPNv4 next-hop address
<code>set weight</code>	set weights for the routing table
<code>show access-list</code>	display the list of IP access lists
<code>show cli</code>	display the CLI tree of the current mode
<code>show list</code>	display a list of all commands in the current mode

Table 1-4 *Commands Common to Multiple Protocols*

Command Name	Use this command to
<code>show history</code>	display all commands used in a session
<code>show ip prefix-list</code>	display the prefix list entries
<code>show memory all</code>	display the memory reports for all protocols
<code>show memory free</code>	display the statistics of free memory for all protocol
<code>show memory summary</code>	display the summary of memory subsystem statistics
<code>show route-map</code>	display user readable route-map information
<code>show running-config</code>	display the current configuration
<code>show startup-config</code>	display the startup configuration (from storage)
<code>show version</code>	display the current SRstackware version
<code>terminal length</code>	set the number of lines in a terminal display
<code>terminal monitor</code>	display debugging on a monitor
<code>who</code>	display other VTY connections
<code>write file</code> and <code>write memory</code>	write the current configuration file
<code>write terminal</code>	display current configurations to the VTY terminal

OSPF Commands

2.1 Introduction

This chapter provides an alphabetized reference for each of the OSPF Commands.

2.2 area authentication

Use this command to enable authentication for an OSPF area. Use the `no` parameter to remove the authentication specification for an area.

2.2.1 Command Syntax

```
area AREAID authentication (message-digest)
```

```
no area AREAID authentication
```

```
AREAID = A.B.C.D|<0-4294967295>
```

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

message-digest = Enables MD5 authentication on the area specified by AREAID

2.2.2 Default

Null authentication

2.2.3 Command Mode

Router mode

2.2.4 Usage

Specifying the area authentication sets the authentication to `Type 1` authentication or the `Simple Text` password authentication (details in RFC 2328). Setting up a `Type 1` authentication configures a 64-bit field for that particular network. All packets sent on this network must have this configured value in their OSPF header. This allows only routers that have the same passwords to join the routing domain. Give all routers that are to communicate with each other through OSPF the same authentication password.

Use the `ip ospf authentication-key` command to specify a `Simple Text` password.

Use the `ip ospf message-digest-key` command to specify `MD5` password.

OSPF Commands

2.2.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# area 1 authentication
```

2.2.6 Related Commands

`ip ospf authentication-key`, `ip ospf message-digest-key`

2.3 area default-cost

Use this command to specify a cost for the default summary route sent into a stub or NSSA area. Use the `no` form of this command to remove the assigned default-route cost.

2.3.1 Command Syntax

```
area AREAID default-cost <0-16777215>
no area AREAID default-cost
AREAID = A.B.C.D|<0-4294967295>
```

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

`default-cost` = Indicates the cost for the default summary route used for a stub or NSSA area. Default value of cost is 1.

2.3.2 Command Mode

Router mode

2.3.3 Usage

The `default-cost` option provides the metric for the summary default route, generated by the area border router, into the NSSA or stub area. Use this option only on an area border router that is attached to the NSSA or stub area. Refer to the RFC 3101 for information on NSSA.

2.3.4 Examples

This example sets the default-cost to 10 for area 1.

```
# configure terminal
(config)# router ospf 100
(config-router)# area 1 default-cost 10
```

2.3.5 Related Commands

area nssa, area stub

2.4 area filter-list

Use this command to configure filters to advertise summary routes on Area Border Routers (ABR). Use the `no` parameter with this command to remove the filter configuration.

2.4.1 Command Syntax

```
area AREAID filter-list TYPE WORD DIRECTION
```

AREAID = A.B.C.D|<0-4294967295>

A.B.C.D OSPF Area ID in IPv4 address format.

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

TYPE = access|prefix

access = Use access-list to filter summary

prefix = Use prefix-list to filter summary

WORD = Name of an access-list or prefix-list

DIRECTION = in|out

in = Filter routes from the other areas to this area

out = Filter routes from this area to the other areas

2.4.2 Command Mode

Router mode

OSPF Commands

2.4.3 Usage

This command is used to suppress particular intra-area from/to area to/from the other areas. You can use this command in conjunction with either the `access-list` or `prefix-list` commands.

2.4.4 Examples

```
# configure terminal
(config)# access-list 1 deny 172.22.0.0 225.255.255.0
(config)# router ospf 100
(config-router)# area 1 filter-list access 1 in
```

2.5 area nssa

Use this command to set an area as a Not-So-Stubby-Area (NSSA). Use the `no` parameter with this command to remove this designation.

2.5.1 Command Syntax

```
area AREAID nssa (OPTIONS)
no area AREAID nssa (OPTIONS)
AREAID = A.B.C.D|<0-4294967295>

A.B.C.D = OSPF Area ID in IPv4 address format
<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value
OPTIONS = {TRANSLATOR|no-redistribution|DEFAULT-ORIGINATE|no-summary}
TRANSLATOR = translator-role ROLE
translator-role = Specify NSSA-ABR translator-role
ROLE = candidate|never|always
candidate = Router may translate NSSA-LSA to Type-5 LSA if it is elected
never = Router never translate NSSA-LSA
always = Router always translate NSSA-LSA to Type-5 LSA
no-redistribution = Do not redistribute external route into NSSA
DEFAULT-ORIGINATE = default-information-originate {metric <0-16777214>|metric-type <1-2>}
```

`default-information-originate` = Originate Type-7 default LSA into NSSA

`metric <0-16777214>` = Specify metric value

`metric-type <1-2>` = Specify external metric type

`no-summary` = Do not inject inter-area route into NSSA

`no-redistribution` = No redistribution into this NSSA area

`translator-role` = NSSA-ABR translator role

2.5.2 Default

No NSSA area is defined.

2.5.3 Command Mode

Router mode

2.5.4 Usage

There are no external routes in an OSPF stub area, so you cannot redistribute from another protocol into a stub area. A `NSSA` allows external routes to be flooded within the area. These routes are then leaked into other areas. Although, the external routes from other areas still do not enter the `NSSA`.

You can either configure an area to be a stub area or an `NSSA`, not both.

Use the `area nssa` command to simplify administration if you are connecting a central site using OSPF to a remote site that is using a different routing protocol. You can extend OSPF to cover the remote connection by defining the area between the central router and the remote router as a `NSSA`.

2.5.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# area 0.0.0.51 nssa
(config-router)# area 3 nssa translator-role candidate no-redistribution
default-information-originate metric 34 metric-type 2
```

OSPF Commands

2.5.6 Related Commands

`area default-cost`

2.6 area range

Use this command to summarize OSPF routes at an area boundary. Use the `no` parameter with this command to disable this function.

2.6.1 Command Syntax

```
area AREAID range ADDRESS (advertise|not-advertise)
```

```
no area AREAID range
```

AREAID = A.B.C.D|<0-4294967295>

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

ADDRESS = A.B.C.D/M The area range prefix and length

advertise = Advertises this range

not-advertise = Does not advertise this range

2.6.2 Default

Disabled

2.6.3 Command Mode

Router mode

2.6.4 Usage

The `area range` command is used to summarize intra-area routes for an area. The single summary route is then advertised to other areas by the Area Border Routers (ABRs). Routing information is condensed at area boundaries and outside the area. If the network numbers in an area are assigned in a way such that they are contiguous, the ABRs can be configured to advertise a summary route that covers all the individual networks within the area that fall into the specified range.

2.6.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# area 1 range 192.16.0.0/24
```

2.7 area shortcut

Use this command to configure the short-cutting mode of an area. Use the `no` parameter with this command to disable this function.

2.7.1 Command Syntax

```
area AREAID shortcut (default|enable|disable)
```

```
no area AREAID shortcut (enable|disable)
```

AREAID = A.B.C.D|<0-4294967295>

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

default = Sets default short-cutting behavior

enable = Forces short-cutting through the area

disable = Disables short-cutting through the area

2.7.2 Command Mode

Router mode

2.7.3 Usage

The `area shortcut` command enables traffic to go through the non-backbone area with a lower metric; regardless of the ABR router being attached to the backbone area or not.

2.7.4 Examples

```
area 1 shortcut default
area 52 shortcut disable
no area 42 shortcut enable
```

OSPF Commands

2.7.5 Related Commands

`ospf abr-type shortcut`

2.8 area stub

Use this command to define an area as a stub area. Use the `no` parameter with this command to disable this function.

2.8.1 Command Syntax

`(no) area AREAID stub (no-summary)`

AREAID = A.B.C.D|<0-4294967295>

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

`no-summary` = Stops an ABR from sending summary link advertisements into the stub area

2.8.2 Default

No stub area is defined.

2.8.3 Command Mode

Router mode

2.8.4 Usage

Configures the `area stub` command on all routers in the stub area. There are two stub area router configuration commands: the `stub` and `default-cost` commands. In all routers attached to the stub area, configure the area by using the `stub` option of the area command. For an area border router (ABR) attached to the stub area, use the `area default-cost` command.

Use the `no-summary` parameter with this command to define a totally stubby area. Define an area as a totally stubby area, when routers in the area do not require learning about summary LSAs from other areas. The area can be defined as a totally stubby area by configuring the Area Border Router of that area using the `area stub no-summary` command.

2.8.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# area 1 stub
```

2.8.6 Related Commands

area default-cost

2.9 area virtual-link

Use this command to configure a link between two backbone areas that are physically separated through other non-backbone area. Use the `no` parameter with this command to remove a virtual link.

2.9.1 Command Syntax

```
(no) area AREAID virtual-link A.B.C.D (AUTH_KEY|MSG_KEY)
(no) area AREAID virtual-link A.B.C.D authentication (message-
digest|null) (AUTH_KEY|MSG_KEY)
(no) area AREAID virtual-link A.B.C.D (authentication) INTERVAL
AREAID = A.B.C.D|<0-4294967295>
```

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

A.B.C.D = The IP address associated with a virtual link neighbor.

MSG_KEY = message-digest-key KEYID md5 .LINE

message-digest-key = Set the message digest key

KEYID <1-255> = Specify the Key ID

md5 = Specify using of the md5 algorithm

LINE = Authentication password of 16 characters

AUTH_KEY = authentication-key KEY

KEY = An 8 character password

authentication = Enable authentication on this virtual link

OSPF Commands

`message-digest` = Use message-digest authentication

`null` = Use null authentication to override password or message digest

`INTERVAL` = {`dead-interval` <1-65535>|`hello-interval` <1-65535>|`retransmit-interval` <1-3600>|`transmit-delay` <1-3600>}

`dead-interval` = The interval, in seconds, during which no packets are received, and after which the router acknowledges a neighboring router as off-line. The default is 40 seconds.

`hello-interval` = The interval, in seconds, the router waits before it sends a hello packet. The default is 10 seconds.

`retransmit-interval` = The interval, in seconds, the router waits before it retransmits a packet. The default is 5 seconds.

`transmit-delay` = The interval, in seconds, the router waits before it transmits a packet. The default value is 1 second.

2.9.2 Command Mode

Router mode

2.9.3 Usage

In OSPF, all non-backbone areas must be connected to a backbone area. If the connection to the backbone is lost, the virtual link repairs the connection.

You can configure virtual links between any two backbone routers that have an interface to a common non-backbone area. The protocol treats these two routers joined by a virtual link as if they were connected by an unnumbered point-to-point network. To configure virtual link, include both the transit area ID and the corresponding virtual link neighbor's router ID in the virtual link neighbor. To see the router ID use the `show ip ospf` command.

Configure the `hello-interval` to be the same for all routers attached to a common network. A short `hello-interval` results in the router detecting topological changes faster but also an increase in the routing traffic.

The `retransmit-interval` is the expected round-trip delay between any two routers in a network. Set the value to be greater than the expected round-trip delay to avoid needless retransmissions.

The `transmit-delay` is the time taken to transmit a link state update packet on the interface. Before transmission, the link state advertisements in the update packet, are incremented by this amount. Set the `transmit-delay` to be greater than zero. Also, take into account the transmission and propagation delays for the interface.

Include the transit area ID and the corresponding virtual link neighbor's router ID in each virtual link neighbor to properly configure a virtual link.

2.9.4 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# area 1 virtual-link 10.10.11.50 hello 5 dead 10
```

2.9.5 Related Commands

area authentication, show ip ospf, show ip ospf virtual-links

2.10 auto-cost reference bandwidth

Use this command to control how OSPF calculates default metrics for the interface. Use the `no` parameter with this command to assign cost, based only on the interface bandwidth.

2.10.1 Command Syntax

```
auto-cost reference-bandwidth <1-4294967>
no auto-cost reference-bandwidth
```

<1-4294967> = The reference bandwidth in terms of Mbits per second. The default reference bandwidth is 100Mbps.

2.10.2 Command Mode

Router mode

2.10.3 Usage

By default OSPF calculates the OSPF metric for an interface by dividing the reference bandwidth by the interface bandwidth. The default value for the reference bandwidth is 100Mbps. The auto-cost command is used to differentiate high bandwidth links. For multiple links with high bandwidth, specify a larger reference bandwidth value to differentiate cost on those links.

OSPF Commands

2.10.4 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# auto-cost reference-bandwidth 50
```

2.10.5 Related Commands

```
ip ospf cost
```

2.11 bfd all-interfaces

This command is used to enable Bidirectional Forwarding Detection (BFD) on all OSPF interfaces. Use the `no` parameter with this command to disable it.

2.11.1 Command Syntax

```
bfd all-interfaces
no bfd all-interfaces
```

2.11.2 Default

By default, BFD is disabled.

2.11.3 Command Mode

Router mode

2.11.4 Usage

Using this command, you can enable or disable BFD globally for OSPF process. When BFD is enabled globally, for each OSPF interface, which has neighbor in state not less than two-way, a BFD session will be initiated. BFD session will not be initiated if OSPF interface is disabled to run BFD.



When OSPF is enabled with BFD, it responds only to the BFD session-down event and reflects the same behavior as OSPF kill-neighbor event.

2.11.5 Examples

```
#configure terminal
(config)#router ospf 1
(config-router)#bfd all-interfaces
(config)#router ospf 1
(config-router)#no bfd all-interfaces
```

2.11.6 Related Commands

```
ip ospf bfd
```

2.12 capability opaque

Use this command to enable opaque-LSAs. Use the `no` parameter with this command to disable it.

2.12.1 Command Syntax

```
(no) capability opaque
```

2.12.2 Default

Enabled

2.12.3 Command Mode

Router mode

2.12.4 Usage

Opaque-LSAs are Type 9, 10 and 11 LSAs that deliver information used by external applications.

2.12.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# no capability opaque
```

2.13 capability restart

Use this command to enable OSPF graceful restart or restart signaling features. Use the `no` parameter with this command to disable it.

2.13.1 Command Syntax

```
(no) capability restart [graceful|signaling]
```

`graceful` = Specify enabling OSPF graceful restart feature

`signaling` = Specify enabling OSPF signaling restart feature

2.13.2 Default

Enabled

2.13.3 Command Mode

Router mode

2.13.4 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# capability restart graceful
```

2.14 clear ip ospf process

Use this command to clear and restart the OSPF routing process. Specify the Process ID to clear one particular OSPF process. When no Process ID is specified, this command clears all running OSPF processes.

2.14.1 Command Syntax

```
clear ip ospf process
clear ip ospf PROCESSID process
```

PROCESSID = <0-65535> = Specifies the Routing Process ID

2.14.2 Command Mode

Privileged Exec Mode

2.14.3 Examples

```
# clear ip ospf process
```

2.15 compatible rfc1583

Use this command to restore the method used to calculate summary route costs per RFC. Use the `no` parameter with this command to disable RFC 1583 compatibility.

2.15.1 Command Syntax

```
(no) compatible rfc1583
```

2.15.2 Default

By default, OSPF is rfc 2328 compatible.

2.15.3 Command Mode

Router mode

2.15.4 Usage

Prior to RFC 2328, OSPF was compliant with RFC 1583, that specified method for calculating the metric for summary routes based on the minimum metric of the component paths available. RFC 2328 specifies a method for calculating metrics based on maximum cost. With this change, it is possible that all of the ABRs in an area might not be upgraded to the new code at the same time. `Compatible rfc1583` command addresses this issue and allows the selective disabling of compatibility with RFC 2328.

2.15.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# compatible rfc1583
```

2.16 debug ospf events

Use this command to specify debugging options for OSPF event troubleshooting. Use this command without parameters to turn on all the options. Use the `no` parameter with this command to disable this function.

2.16.1 Command Syntax

```
(no) debug ospf events (abr|asbr|lsa|nssa|os|router|vlink)
```

`abr` = Shows ABR events

`asbr` = Shows ASBR events

`lsa` = Shows LSA events

`nssa` = Shows NSSA events

`os` = Shows OS interaction events

`router` = Shows other router events

`vlink` = Shows virtual link events

2.16.2 Command Mode

Privileged Exec mode and Configure mode

2.16.3 Usage

The `debug ospf event` command enables the display of debug information related to OSPF internal events.

2.16.4 Examples

```
# no debug ospf event abr
# debug ospf event asbr
# debug ospf event lsa
# no debug ospf event nssa
# debug ospf event os
# debug ospf event router
# debug ospf event vl
```

2.16.5 Related Commands

log file

2.17 debug ospf ifsm

Use this command to specify debugging options for OSPF Interface Finite State Machine (IFSM) troubleshooting. Use the `no` parameter with this command to disable this function.

2.17.1 Command Syntax

```
(no) debug ospf ifsm (status|events|timers)
```

`events` = Displays IFSM event information

`status` = Displays IFSM status information

`timers` = Displays IFSM timer information

2.17.2 Command Mode

Privileged Exec mode and Configure mode

2.17.3 Usage

The `debug ospf ifsm` command enables the display of debug information related to the Interface Finite State Machine (IFSM).

2.17.4 Examples

```
# no debug ospf ifsm events  
# debug ospf ifsm status  
# debug ospf ifsm timers
```

2.17.5 Related Commands

log file

2.18 debug ospf lsa

Use this command to specify debugging options for OSPF Link State Advertisements (LSA) troubleshooting. Use the `no` parameter with this command to disable this function.

2.18.1 Command Syntax

```
(no) debug ospf lsa (flooding|generate|install|maxage|refresh)
```

`flooding` = Displays LSA flooding

`generate` = Displays LSA generation

`install` = Shows LSA installation

`maxage` = Shows maximum age of the LSA in seconds

`refresh` = Displays LSA refresh

2.18.2 Command Mode

Privileged Exec mode and Configure mode

2.18.3 Usage

The `debug ospf lsa` command enables the display of debug information related to internal operations of LSAs.

2.18.4 Examples

```
# no debug ospf lsa refresh
```

```
# debug ospf lsa flooding
```

```
# debug ospf lsa maxage
```

```
# debug ospf lsa generate
```

2.18.5 Related Commands

```
log file
```

2.19 debug ospf nfsm

Use this command to specify debugging options for OSPF Neighbor Finite State Machines (NFSMs). Use the `no` parameter with this command to disable this function.

2.19.1 Command Syntax

```
(no) debug ospf nfsm (events|status|timers)
```

`events` = Displays NSM event information

`status` = Displays NSM status information

`timers` = Displays NSM timer information

2.19.2 Command Mode

Privileged Exec mode Configure mode

2.19.3 Usage

The `debug ospf nfsm` command enables the display of debug information related to the Neighbor Finite State Machine (NFSM).

2.19.4 Examples

```
# debug ospf nfsm events  
# no debug ospf nfsm timers
```

2.19.5 Related Commands

`log file`

2.20 debug ospf nsm

Use this command to specify debugging options for OSPF NSM information. Use the `no` parameter with this command to disable this function.

OSPF Commands

2.20.1 Command Syntax

```
(no) debug ospf nsm (interface|redistribute)
```

`interface` = Specify NSM interface information

`redistribute` = Specify NSM redistribute information

2.20.2 Command Mode

Privileged Exec mode and Configure mode

2.20.3 Usage

The `debug ospf nsm` command enables the display of debug information related to the Network Services Module (NSM).

```
# debug ospf nsm interface
```

```
# no debug ospf nsm redistribute
```

2.20.4 Related Commands

```
log file
```

2.21 debug ospf packet

Use this command to specify debugging options for OSPF packets. Use the `no` parameter with this command to disable this function.

2.21.1 Command Syntax

```
(no) debug ospf packet PARAMETERS
```

```
PARAMETERS = dd|detail|hello|ls-ack|ls-request|ls-update|recv|send
```

`dd` = Specifies debugging for OSPF database descriptions

`detail` = Sets the debug option to detailed information

`hello` = Specifies debugging for OSPF hello packets

`ls-ack` = Specifies debugging for OSPF link state acknowledgments

`ls-request` = Specifies debugging for OSPF link state requests

`ls-update` = Specifies debugging for OSPF link state updates

`rcv` = Specifies the debug option set for received packets

`send` = Specifies the debug option set for sent packets

2.21.2 Command Mode

Privileged Exec mode and Configure mode

2.21.3 Usage

The `debug ospf packet` command enables the display of debug information related to the sending and receiving of packets.

2.21.4 Examples

```
# debug ospf packet detail
# debug ospf packet dd send detail
# no debug ospf packet ls-request rcv detail
```

2.21.5 Related Commands

`log file`

2.22 debug ospf route

Use this command to specify which route calculation to debug. Use this command without parameters to turn on all the options. Use the `no` parameter with this command to disable this function.

2.22.1 Command Syntax

```
(no) debug ospf route (ase|ia|install|spf)
```

`ia` = Specifies the debugging of Inter-Area route calculation

`ase` = Specifies the debugging of external route calculation

`install` = Specifies the debugging of route installation

`spf` = Specifies the debugging of SPF calculation

OSPF Commands

2.22.2 Command Mode

Privileged Exec mode and Configure mode

2.22.3 Usage

The `debug ospf route` command enables the display of debug information related to route-calculation.

2.22.4 Examples

```
# debug ospf route
# no debug ospf route ia
# debug ospf route install
```

2.22.5 Related Commands

`log file`

2.23 default-information originate

Use this command to create a default external route into an OSPF routing domain. Use the `no` parameter with this command to disable this feature.

2.23.1 Command Syntax

```
default-information originate {always|METRIC|METRICTYPE|ROTEMAP}
```

```
no default-information originate
```

`always` = Used to advertise the default route regardless of whether there is a default route.

`METRIC` = `metric <0-16777214>` = Sets the OSPF metric used in creating the default route. The default metric value is 10. The value used is specific to the protocol.

`METRICTYPE` = `metric-type 1|2` = Sets the OSPF external link type for default routes

1 Sets OSPF External Type 1 metrics

2 Sets OSPF External Type 2 metrics

`ROTEMAP` = `route-map WORD`

`WORD` = Specifies the name of route-map. It is a string comprised of any characters, numbers or symbols.

2.23.2 Command Mode

Router mode

2.23.3 Usage

The system acts like an Autonomous System Boundary Router (ASBR) when you use the `default-information originate` command to redistribute routes into an OSPF routing domain. An ASBR does not by default, generate a default route into the OSPF routing domain.

When you use the `default-information originate` command, also specify the `route-map map-name` option to avoid a dependency on the default network in the routing table.

The `metric-type` is an external link type associated with the default route advertised into the OSPF routing domain. The value of the external route could be either Type 1 or 2; the default is the Type 2.

2.23.4 Examples

```
# configure terminal
```

```
(config)# router ospf 100
```

```
(config-router)# default-information originate always metric 23 metric-type 2 route-map myinfo
```

2.23.5 Related Commands

`route-map`

2.24 default-metric

Use this command to set default metric values for the OSPF routing protocol. Use the `no` parameter with this command to return to the default state.

2.24.1 Command Syntax

```
default-metric <1-16777214>
```

```
no default-metric
```

<1-16777214> = Default metric value appropriate for the specified routing protocol

OSPF Commands

2.24.2 Default

Built-in, automatic metric translations, as appropriate for each routing protocol.

2.24.3 Command Mode

Router mode

2.24.4 Usage

A default metric facilitates redistributing routes even with incompatible metrics. If the metrics do not convert, the default metric provides an alternative and enables the redistribution to continue. Default-metric command is used to cause the current routing protocol to use the same metric value for all redistributed routes. Use this command in conjunction with the `redistribute` command.

2.24.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# default-metric 100
```

2.24.6 Related Commands

`redistribute`

2.25 distance

Use this command to define OSPF route administrative distances based on route type. Use the `no` parameter with this command to restore the default value.

2.25.1 Command Syntax

```
distance <1-255>|ROUTEPARAMETER
no distance ospf
<1-255> = OSPF administrative distance.
ROUTEPARAMETER = ospf {ROUTE1|ROUTE2|ROUTE3}
```

ROUTE1= external <1-255> = Sets the distance for routes from other routing domains, learned by redistribution

`ROUTE2 = inter-area <1-255>` Sets the distance for all routes from one area to another area

`ROUTE3 = intra-area <1-255>` Sets the distance for all routes within an area

`<1-255>` = Distance for external, intra-area or inter-area routes

2.25.2 Default

The default distance for each type of route (intra, inter or external) is 110.

2.25.3 Command Mode

Router mode

2.25.4 Usage

The administrative distance rates the trustworthiness of a routing information source. The distance could be any integer from 0 to 255. A higher distance value indicates a lower trust rating. For example, an administrative distance of 255 indicates that the routing information source cannot be trusted and should be ignored.

Use this command to set the distance for an entire group of routes, rather than a specific route that passes an access list.

2.25.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# distance ospf inter-area 20 intra-area 10 external 40
```

2.26 distribute-list

Use this command to filter networks in routing updates. Use the `no` parameter with this command to disable this function.

2.26.1 Command Syntax

```
distribute-list LISTNAME out ROUTE
no distribute-list LISTNAME
```

`LISTNAME` = Specifies the name of the access list

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`out` = Indicates that outgoing advertised routes will be cleared

`ROUTE` = `bgp|ospf (WORD)|connected|isis|kernel|rip|static`

`bgp` = Specifies BGP routes

`ospf` = Specifies OSPF routes

`WORD` = Specifies OSPF route name

`connected` = Specifies connected routes

`isis` = Specifies IS-IS routes

`kernel` = Specifies kernel routes

`rip` = Specifies RIP routes

`static` = Specifies static routes

2.26.2 Command Mode

Router mode

2.26.3 Usage

Use this command when redistributing other routing protocols into the OSPF routing table.

2.26.4 Examples

The following example shows the distribution of BGP routing updates based on the access list `list1` (network 172.10.0.0).

```
# configure terminal
(config)# access-list list1 permit 172.10.0.0/16
(config)#router ospf 100
(config-router)# distribute-list list1 out bgp
(config-router)# redistribute bgp
```

2.26.5 Related Commands

`redistribute`

2.27 host area

Use this command to configure a stub host entry belonging to a particular area. Use the `no` parameter with this command to remove the host area configuration.

2.27.1 Command Syntax

```
(no) host A.B.C.D area AREAID (COST)
```

A.B.C.D = Specifies IP address of the host

AREAID = A.B.C.D | <0-4294967295>

A.B.C.D = OSPF Area ID in IPv4 address format

<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value

COST = cost <0-65535> = Specifies cost for stub host entry

2.27.2 Default

No host entry is configured.

2.27.3 Command Mode

Router mode

2.27.4 Usage

Using this command, you can advertise specific host routes in the router-LSA as stub link. Since stub host belongs to the specified router, specifying cost is not important.

2.27.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# host 172.16.10.100 area 1
(config-router)# host 172.16.10.101 area 2 cost 10
```

2.28 ip ospf authentication

Use this command to send and receive OSPF packets with the specified authentication method. Use the `no` parameter with this command to disable the authentication.

2.28.1 Command Syntax

```
ip ospf (A.B.C.D) authentication (message-digest|null)
no ip ospf (A.B.C.D) authentication
```

A.B.C.D = The IP address of the interface

message-digest = Use the message digest authentication

null = Use no authentication. It overrides password or message-digest authentication of the interface.

2.28.2 Command Mode

Interface mode

2.28.3 Usage

This command enables OSPF packet to use authentication on the current interface.

2.28.4 Examples

In this example, interface `eth0` is configured to have no authentication. This will override any `text` or MD5 authentication configured on this interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf authentication null
```

2.28.5 Related Commands

`ip ospf authentication-key`, `area authentication`, `ip ospf message-digest-key`

2.29 ip ospf authentication-key

Use this command to specify an OSPF authentication password for the neighboring routers. Use the `no` parameter with this command to remove an OSPF authentication password.

2.29.1 Command Syntax

```
ip ospf (A.B.C.D) authentication-key .LINE  
no ip ospf (A.B.C.D) authentication-key
```

A.B.C.D = The IP address of the interface

LINE = Specifies the authentication password. String by the end of line will be taken.

2.29.2 Default

Authentication password not specified.

2.29.3 Command Mode

Interface mode

2.29.4 Usage

This command creates a password (key) that is inserted into the OSPF header when SRstackware software originates routing protocol packets. Assign a separate password to each network for different interfaces. All neighboring routers on the same network with the same password exchange OSPF routing data.

The key can be used only when authentication is enabled for an area. Use the `area authentication` command to enable authentication.

Simple password authentication allows a password to be configured for each area. Configure the routers in the same routing domain with the same password.

2.29.5 Examples

In the following example, an authentication key `test` is created on interface `eth0` in area 0. Note that first authentication is enabled for area 0.

```
# configure terminal  
(config)# router ospf 100
```

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```
(config-router)# network 10.10.10.0/24 area 0
(config-router)# area 0 authentication
(config-router)# exit
(config)# interface eth0
(config-if)# ip ospf 3.3.3.3 authentication-key test
```

2.29.6 Related Commands

area authentication, ip ospf authentication

2.30 ip ospf bfd

This command is used to disable or enable Bidirectional Forwarding Detection (BFD) for an interface.

2.30.1 Command Syntax

```
ip ospf bfd disable|enable
disable = Disables interface to run BFD
enable = Enables interface to run BFD
```

2.30.2 Default

By default, interface is enabled for running BFD.

2.30.3 Command Mode

Interface mode

2.30.4 Usage

Use `disable` option of this command to exclude an OSPF interface from initiating BFD, even though BFD has been enabled globally using `bfd all-interfaces` command.

Use `enable` option to restore default settings, which allows OSPF interface to initiate BFD.

Only when BFD is enabled at both global and interface levels, BFD session will be triggered between the OSPF neighbors when they move to OSPF two-way state.

2.30.5 Examples

```
#configure terminal
(config)#interface xe58
(config-if)#ip ospf bfd disable
(config-if)#ip ospf bfd enable
```

2.30.6 Related Commands

bfd all-interfaces

NOTICE

If BFD session running on an OSPF interface goes down, OSPF considers neighbor as unreachable and deletes the neighbor.

2.31 ip ospf cost

Use this command to explicitly specify the cost of link-state metric in a router-LSA. Use the `no` parameter with this command to reset the interface cost to the default value.

2.31.1 Command Syntax

```
ip ospf (A.B.C.D) cost COST
no ip ospf (A.B.C.D) cost
```

A.B.C.D = The IP address of the interface

COST = <1-65535> = Specifies the link-state metric. The default value is 10.

2.31.2 Command Mode

Interface mode

2.31.3 Usage

The interface cost indicates the overhead required to send packets across a certain interface. This cost is stated in the Router-LSAs link. The cost is inversely proportional to the bandwidth of an interface. By default, the cost of an interface is calculated based on the bandwidth (108/ bandwidth); use this `ip ospf cost` command to set the cost manually.

OSPF Commands

2.31.4 Examples

The following example shows setting ospf cost as 10 on interface eth0 for IP address 10.10.10.50

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf 3.3.3.3 cost 10
```

2.31.5 Related Commands

show ip ospf interface, auto-cost

2.32 ip ospf database-filter

Use this command to turn on the LSA database-filter for a particular interface. Use the `no` parameter with this command to turn off the filter.

2.32.1 Command Syntax

```
ip ospf (A.B.C.D) database-filter all out
no ip ospf (A.B.C.D) database-filter
```

A.B.C.D = The IP address of the interface

all = Filter all LSAs

out = Outgoing LSAs

2.32.2 Default

Disabled, all outgoing LSAs are flooded to the interface.

2.32.3 Command Mode

Interface mode

2.32.4 Usage

OSPF floods new LSAs over all interfaces in an area, except the interface on which the LSA arrives. This redundancy ensures robust flooding. However, too much redundancy can waste bandwidth and might lead to excessive link and CPU usage in certain topologies, resulting in destabilizing the network. To avoid this, use the `database-filter` command to block flooding of LSAs over specified interfaces.

2.32.5 Examples

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf database-filter all out
```

2.33 ip ospf dead-interval

Use this command to set the interval during which no hello packets are received and after which a neighbor is declared dead.

Use the `no` parameter with this command to return to the default time. If you have configured this command specifying the IP address of the interface and want to remove the configuration, use the `no` parameter with the specified IP address (`no ip ospf dead-interval A.B.C.D`).

2.33.1 Command Syntax

```
ip ospf (A.B.C.D) dead-interval INTERVAL
no ip ospf (A.B.C.D) dead-interval
```

A.B.C.D = The IP address of the interface

INTERVAL = <1-65535> = Specifies the interval in seconds. The default interval is 40 seconds.

2.33.2 Command Mode

Interface mode

OSPF Commands

2.33.3 Usage

The dead-interval is the amount of time that the router waits to receive an OSPF hello packet from the neighbor before declaring the neighbor down. This value is advertised in the router's hello packets. It must be a multiple of hello-interval and be the same for all routers on a specific network.

2.33.4 Examples

The following example shows configuring dead-interval for 10 seconds on eth0 interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf dead-interval 10
```

2.33.5 Related Commands

ip ospf hello-interval, show ip ospf interface

2.34 ip ospf disable all

Use this command to completely disable OSPF packet processing on an interface.

2.34.1 Command Syntax

```
ip ospf disable all
all = All functionality
```

2.34.2 Command Mode

Interface mode

2.34.3 Usage

This command overrides the network area command and disables the processing of packets on the specific interface.

2.34.4 Examples

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf disable all
```

2.35 ip ospf hello-interval

Use this command to specify the interval between hello packets. Use the `no` parameter with this command to return to the default time.

2.35.1 Command Syntax

```
ip ospf (A.B.C.D) hello-interval INTERVAL
no ip ospf (A.B.C.D) hello-interval
```

A.B.C.D = The IP address of the interface

INTERVAL = <1-65535> = Specifies the interval in seconds. The default interval is 10 seconds.

2.35.2 Command Mode

Interface mode

2.35.3 Usage

The hello-interval is advertised in the hello packets. Configure the same hello-interval for all routers on a specific network. A shorter hello interval ensures faster detection of topological changes but results in more routing traffic.

2.35.4 Examples

The following example shows setting the hello-interval for 3 seconds on interface eth0.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf hello-interval 3
```

OSPF Commands

2.35.5 Related Commands

`ip ospf dead-interval`, `show ip ospf interface`

2.36 ip ospf message-digest-key

Use this command to register MD5 key for OSPF MD5 authentication. Use the `no` parameter with this command to remove an MD5 key.

2.36.1 Command Syntax

```
ip ospf A.B.C.D message-digest-key KEYID md5 .LINE  
no ip ospf A.B.C.D message-digest-key KEYID
```

A.B.C.D = The IP address of the interface

KEYID = <1-255> = Specifies a key ID

md5 = Use the MD5 algorithm

LINE 1-16 = characters that specify the OSPF password. String by the end of line will be taken.

2.36.2 Default

Disabled.

2.36.3 Command Mode

Interface mode

2.36.4 Usage

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.

Use this command for uninterrupted transitions between passwords. This is helpful for administrators who want to change the OSPF password without disrupting communication. The system begins a rollover process until all the neighbors have adopted the new password. This allows neighboring routers to continue communication while the network administrator is updating them with a new password. The router will stop sending duplicate packets once it detects that all of its neighbors have adopted the new password.

Maintain only one password per interface, removing the old password whenever you add a new one. This will prevent the local system from continuing to communicate with the system that is using the old password. Removing the old password also reduces overhead during rollover.

All neighboring routers on the same network must have the same password value to enable exchange of OSPF routing data.

2.36.5 Examples

The following example shows OSPF authentication on the interface eth0 when IP address has not been specified.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf authentication message-digest
(config-if)# ip ospf message-digest-key 1 md5 yourpass
```

The following example shows OSPF authentication on the interface eth0 for the IP address 1.1.1.1. (If the interface has two IP addresses assigned-- 1.1.1.1 & 2.2.2.2, OSPF authentication will be enabled only for the IP address 1.1.1.1)

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf 1.1.1.1 authentication message-digest
(config-if)# ip ospf 1.1.1.1 message-digest-key 2 md5 yourpass
```

2.37 ip ospf mtu

Use this command to set MTU size for OSPF to construct packets based on this value. Use the `no` parameter with this command to return to the default value.

2.37.1 Command Syntax

```
ip ospf mtu <576-65535>
no ip ospf mtu <576-65535>
```

OSPF Commands

2.37.2 Default

By default, OSPF uses interface MTU derived from the kernel.

2.37.3 Command Mode

Interface mode

2.37.4 Usage

Whenever OSPF constructs packets, it uses interface MTU size as Maximum IP packet size. This command forces OSPF to use the specified value overriding the actual interface MTU size.

This command allows an administrator to configure the MTU size recognized by the OSPF protocol. It does not configure the MTU settings on the kernel. OSPF will not recognize MTU size configuration changes made to the kernel until the MTU size is updated through the CLI.

2.37.5 Examples

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf mtu 1480
```

2.38 ip ospf mtu-ignore

Use this command to configure OSPF so that it does not check the MTU size during DD (Database Description) exchange.

Use the `no` parameter with this command to make sure that OSPF checks MTU size during DD exchange.

2.38.1 Command Syntax

```
ip ospf (A.B.C.D) mtu-ignore
no ip ospf (A.B.C.D) mtu-ignore
```

A.B.C.D = IP address of the interface

2.38.2 Command Mode

Interface mode

2.38.3 Usage

By default, during DD exchange process, OSPF checks the MTU size described in DD packets received from the neighbor. If the MTU size does not match the interface MTU, the neighbor adjacency is not established. Using this command makes OSPF ignore this check and allows establishing of adjacency regardless of MTU size in the DD packet.

2.38.4 Examples

```
# configure terminal
(config)# interface eth0
(config-router)# ip ospf mtu-ignore
```

2.39 ip ospf network

Use this command to configure the OSPF network type to a type different from the default for the media. Use the `no` parameter with this command to return to the default value.

2.39.1 Command Syntax

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

```
no ip ospf network
```

`broadcast` = Sets the network type to broadcast.

`non-broadcast` = Sets the network type to NBMA.

`point-to-multipoint` = Sets the network type to point-to-multipoint.

`point-to-point` = Sets the network type to point-to-point.

2.39.2 Default

Broadcast type.

OSPF Commands

2.39.3 Command Mode

Interface mode

2.39.4 Usage

Use the `ip ospf network` command to force interface network type as a specified type. Depending on the network type, OSPF changes the behavior of the sending packet and describes link in LSAs.

2.39.5 Examples

The following example shows setting the network to point-to-point type on the `eth0` interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf network point-to-point
```

2.40 ip ospf priority

Use this command to set the router priority to determine the designated router for the network. Use the `no` parameter with this command to return to the default value.

2.40.1 Command Syntax

```
ip ospf (A.B.C.D) priority PRIORITY
no ip ospf (A.B.C.D) priority
```

A.B.C.D = The IP address of the interface

PRIORITY = <0-255> = Specifies the Router Priority of the interface. Default value is 1.

2.40.2 Default

The default priority is 1.

2.40.3 Command Mode

Interface mode

2.40.4 Usage

Set the priority to help determine the OSPF Designated Router (DR) for a network. If two routers attempt to become the DR, the router with the higher router priority becomes the DR. If the router priority is the same for two routers, the router with the higher router ID takes precedence.

Only routers with nonzero router priority values are eligible to become the designated or backup designated router.

Configure router priority for multi access networks only and not for point-to-point networks.

2.40.5 Examples

The following example shows setting the OSPF priority value to 3 on the `eth0` interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf priority 3
```

2.40.6 Related Commands

`ip ospf network`

2.40.7 Equivalent Commands

`ospf priority`

2.41 ip ospf resync-timeout

Use this command to set the interval after which adjacency is reset if out-of-band resynchronization has not occurred. The interval period starts from the time a restart signal is received from a neighbor. Use the `no` parameter with this command to return to the default value.

2.41.1 Command Syntax

```
ip ospf (A.B.C.D) resync-timeout <1-65535>
no ip ospf (A.B.C.D) resync-timeout
```

A.B.C.D = The IP address of the interface

<1-65535> = Specifies the resynchronization timeout value of the interface in seconds

OSPF Commands

2.41.2 Command Mode

Interface mode

2.41.3 Examples

The following example shows setting the OSPF resynchronization timeout value to 65 seconds on the `eth0` interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf resync-timeout 65
```

2.42 ip ospf retransmit-interval

Use this command to specify the time between link-state advertisement (LSA) retransmissions for adjacencies belonging to the interface. Use the `no` parameter with this command to return to the default value.

2.42.1 Command Syntax

```
ip ospf A.B.C.D retransmit-interval INTERVAL
no ip ospf A.B.C.D retransmit-interval
```

A.B.C.D = The IP address of the interface

INTERVAL = <1-65535> = Specifies the interval in seconds. The default interval is 5 seconds.

2.42.2 Command Mode

Interface mode

2.42.3 Usage

After sending an LSA to a neighbor, the router keeps the LSA until it receives an acknowledgment. In case the router does not receive an acknowledgment during the set time (the retransmit interval value) it retransmits the LSA.

Set the retransmission interval value conservatively to avoid needless retransmission. The interval should be greater than the expected round-trip delay between two routers.

2.42.4 Examples

The following example shows setting the `ospf retransmit interval` to 6 seconds on the `eth0` interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf retransmit-interval 6
```

2.43 ip ospf transmit-delay

Use this command to set the estimated time it takes to transmit a link-state-update packet on the interface. Use the `no` parameter with this command to return to the default value.

2.43.1 Command Syntax

```
ip ospf A.B.C.D transmit-delay DELAY
no ip ospf A.B.C.D transmit-delay
```

A.B.C.D = The IP address of the interface

DELAY = <1-65535> = Specifies the time, in seconds, to transmit a link-state update. The default interval is 1 second.

2.43.2 Command Mode

Interface mode

2.43.3 Usage

The transmit delay value adds a specified time to the age field of an update. If the delay is not added, the time in which the LSA transmits over the link is not considered. This command is especially useful for low speed links. Add transmission and propagation delays when setting the transmit delay value.

2.43.4 Examples

The following example shows setting the OSPF transmit delay time to 3 seconds on the `eth0` interface.

```
# configure terminal
(config)# interface eth0
(config-if)# ip ospf transmit-delay 3
```

2.44 max-concurrent-dd

Use this command to set the limit for the number of Database Descriptors (DD) that can be processed concurrently.

2.44.1 Command Syntax

```
max-concurrent-dd <1-65535>
```

<1-65535> = Specify the number of DD processes

2.44.2 Command Mode

Router mode

2.44.3 Usage

This command is useful when a router's performance is affected from simultaneously bringing up several OSPF adjacencies. This command limits the maximum number of DD exchanges that can occur concurrently per OSPF instance, thus allowing for all of the adjacencies to come up.

2.44.4 Examples

The following example set the max-concurrent-dd value to 4 that will allow processing of only 4 DD processes at a time.

```
# configure terminal
(config)# router ospf 100
(config-router)# max-concurrent-dd 4
```

2.45 neighbor

Use this command to configure OSPF routers interconnecting to NBMA networks. Use the `no` parameter with this command to remove a configuration.

2.45.1 Command Syntax

```
(no) neighbor A.B.C.D (COST) {PRIORITY|POLL-INTERVAL}
```

A.B.C.D = Specifies the interface IP address of the neighbor

`PRIORITY = priority <0-255>` = Specifies the 8-bit number indicating the router priority value of the non-broadcast neighbor associated with the specified IP address. The default value is 0. This keyword does not apply to point-to-multipoint interfaces.

`POLL-INTERVAL = poll-interval <1-65535>` = Dead neighbor polling interval in seconds. It is recommended to set this value much higher than the hello interval. The default value is 120 seconds.

`COST = cost <1-65535>` = Specifies the link-state metric to this neighbor

2.45.2 Command Mode

Router mode

2.45.3 Usage

To configure neighbor on NBMA network manually use the `neighbor` command and include one neighbor entry for each known non-broadcast network neighbor. Configure the neighbor address on the primary address of the interface.

Poll interval is the reduced rate at which routers continue to send hello packets, when a neighboring router has become inactive. Set the poll interval to be much larger than hello interval.

2.45.4 Examples

This example shows neighbor configured with a priority value and poll interval time.

```
# configure terminal
(config)# router ospf 100
(config-router)# neighbor 1.2.3.4 priority 1 poll-interval 90
(config-router)# neighbor 1.2.3.4 cost 15
```

2.46 network area

Use this command to enable OSPF routing with a specified Area ID on interfaces with IP addresses that match the specified network address. Use the `no` parameter with this command to unconfigure the configuration and disable OSPF routing on the interfaces.

OSPF Commands

2.46.1 Command Syntax

```
(no) network NETWORKADDRESS area AREAID
no network
NETWORKADDRESS = A.B.C.D/M|A.B.C.D X.Y.Z.W

A.B.C.D/M = IPv4 network address with prefix length
A.B.C.D = IPv4 network address
X.Y.Z.W = Wildcard mask

AREAID = A.B.C.D|<0-4294967295>
A.B.C.D = OSPF Area ID in IPv4 address format
<0-4294967295> = OSPF Area ID as 4 octets unsigned integer value
```

2.46.2 Default

No `network` area is configured.

2.46.3 Command Mode

Router mode

2.46.4 Usage

OSPF routing can be enabled per IPv4 subnet basis. Each subnet can belong to one particular OSPF area. Network address can be defined using the prefix length or a wild card mask. A wild card mask is comprised of consecutive 0 as network bits and consecutive 1 as host bits.

2.46.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# network 10.0.0.0/8 area 3
(config-router)# network 10.0.0.0/8 area 1.1.1.1
```


2.47 ospf abr-type

Use this command to set an OSPF Area Border Router (ABR) type. Use the `no` parameter with this command to revert the ABR type to the default setting (`Cisco`).

2.47.1 Command Syntax

```
ospf abr-type cisco|ibm|shortcut|standard  
no ospf abr-type (cisco|ibm)
```

`cisco` = Specifies an alternative ABR using Cisco implementation (RFC 3509). This is the default ABR type.

`ibm` = Specifies an alternative ABR using IBM implementation (RFC 3509)

`shortcut` = Specifies a Shortcut ABR (draft-ietf-ospf-shortcut-abr-02.txt)

`standard` = Specifies a standard behavior ABR (RFC 2328)

2.47.2 Default

ABR type `Cisco`

2.47.3 Command Mode

Router mode

2.47.4 Usage

Specifying the ABR type allows better functioning between different implementations. This command is specially useful in a multi-vendor environment. The different ABR types are:

Cisco ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and one of them is the backbone area.

Standard ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached to it.

IBM ABR Type: By this definition, a router is considered an ABR if it has more than one area actively attached and the backbone area is configured. In this case the configured backbone need not be actively connected.

OSPF Commands

Shortcut ABR Type: The Shortcut ABR improves over the Standard ABR behavior by modifying the calculation of inter-area routes. It is allowed to install inter-area routes through non-backbone areas if the non-backbone path is better, thus providing a shortcut through these areas. To prevent routing loops, the inter-area routes are re-advertised only if they are associated with the backbone area.

2.47.5 Examples

```
# configure terminal
(config)# router ospf 100
(config-router)# ospf abr-type ibm
```

2.47.6 Related Commands

area short-cut

2.48 ospf restart grace-period

Use this command to configure the Grace Period for restarting the router. Use the `no` parameter with this command to revert to default.



This command is available only when configuration option `--enable-restart` is enabled when compiling SRstackware.

2.48.1 Command Syntax

```
(no)ospf restart grace-period <1-1800>
<1-1800> = Specifies the grace period in seconds
```

2.48.2 Command Mode

Configure mode

2.48.3 Usage

Use this command to enable the OSPF Graceful Restart feature on OSPF daemon. If this command is configured, NSM is notified about the Grace Period. In case, OSPF daemon unexpectedly shuts down, NSM sends this value to the OSPF daemon when it comes up again. OSPF daemon uses this value to end the `Graceful` state.

2.48.4 Examples

```
# configure terminal
(config)# ospf restart grace-period 250
```

2.49 ospf restart helper

Use this command to configure the helper behavior for Graceful Restart. Use the `no` parameter with this command to revert to default.



This command is available only when configuration option `--enable-restart` is enabled when compiling SRstackware.

2.49.1 Command Syntax

```
(no) ospf restart helper (never|POLICY)
never Local Policy to never to act as Helper
POLICY = only-reload|only-upgrade|max-grace-period <1-1800>
only-reload = Help only on software reloads
only-upgrade = Help only on software upgrades
max-grace-period = Help only if received grace-period is less than this value
```

2.49.2 Command Mode

Configure mode

2.49.3 Examples

```
# configure terminal
(config)# ospf restart helper only-reload
```

2.50 ospf router-id

Use this command to specify a router ID for the OSPF process. Use the `no` parameter with this command to disable this function.

2.50.1 Command Syntax

```
ospf router-id IPADDRESS  
no ospf router-id
```

IPADDRESS = Specifies the router ID in IPv4 address format

2.50.2 Command Mode

Router mode

2.50.3 Usage

Configure each router with a unique router-id. In an OSPF router process which has active neighbors, a new router-id is used at the next reload or when you start the OSPF manually.

2.50.4 Examples

The following example shows a specified router ID 2.3.4.5.

```
# configure terminal  
(config)# router ospf 100  
(config-router)# ospf router-id 2.3.4.5
```

2.50.5 Related Commands

```
show ip ospf
```

2.51 overflow database

Use this command to limit the maximum number of LSAs that can be supported by the current OSPF instance. Use the `no` parameter with this command to have no limit on the maximum number of LSAs.

2.51.1 Command Syntax

```
overflow database <0-4294967294> hard|soft  
no overflow database
```

<0-0-4294967294> = The maximum number of LSAs

`hard` = Shutdown occurs if the number of LSAs exceeds the specified value

`soft` = Warning message appears if the number of LSAs exceeds the specified value

2.51.2 Command Mode

Router mode

2.51.3 Usage

Use `hard` with this command if a shutdown is required if the number of LSAs exceeds the specified number. Use `soft` with this command if a shutdown is not required, but a warning message is required, if the number of LSAs exceeds the specified number.

2.51.4 Examples

The following example shows setting the database overflow to 5, and a shutdown to occur, if the number of LSAs exceeds 5.

```
# configure terminal  
(config)# router ospf 100  
(config-router)# overflow database 5 hard
```

2.52 overflow database external

Use this command to configure the size of the external database and the time the router waits before it tries to exit the overflow state. Use the `no` parameter with this command to revert to default.

2.52.1 Command Syntax

```
overflow database external MAXLSAS RECOVERTIME  
no overflow database external
```

OSPF Commands

`MAXLSAS = <0-2147483647>` = The maximum number of LSAs. Note that this value should be the same on all routers in the AS.

`RECOVERTIME = <0-65535>` = The number of seconds the router waits before trying to exit the database overflow state. If this parameter is 0, router exits the overflow state only after an explicit administrator command.

2.52.2 Command Mode

Router mode

2.52.3 Usage

Use this command to limit the number of AS-external-LSAs a router can receive, once it is in the wait state. It takes the number of seconds specified as the `RECOVERTIME` to recover from this state.

2.52.4 Examples

The following example shows setting the maximum number of LSAs to 5 and the time to recover from overflow state to be 3.

```
# configure terminal
(config)# router ospf 100
(config-router)# overflow database external 5 3
```

2.53 passive-interface

Use this command to suppress sending Hello packets on the specified interface.

2.53.1 Command Syntax

```
passive-interface INTERFACENAME (A.B.C.D)
```

`INTERFACENAME` = The name of the interface

`A.B.C.D` = IP address of the interface

2.53.2 Command Mode

Router mode

2.53.3 Usage

The `passive-interface` command is used to configure OSPF on simplex Ethernet interfaces. Since the simplex interfaces represent only one network segment between two devices, configure the transmitting interface as a passive interface. This ensures that OSPF does not send hello packets for the transmitting interface. Both the devices can see each other via the hello packet generated for the receiving interface.

2.53.4 Examples

```
(config)# router ospf 100
(config-router)# passive-interface eth0
```

2.54 redistribute

Use this command to redistribute routes from other routing protocols, static routes and kernel routes into an ospf routing table. Use the `no` parameter with this command to disable this function.

2.54.1 Command Syntax

```
redistribute PROTOCOL {METRIC|METRIC-TYPE|ROUTE-MAP|TAG}
```

```
no redistribute PROTOCOL
```

```
PROTOCOL = (bgp|isis|rip|connected|static|kernel)
```

`bgp` = Specifies BGP routes

`isis` = Specifies IS-IS routes

`rip` = Specifies RIP routes

`connected` = Specifies connected routes

`static` = Specifies static routes

`kernel` = Specifies kernel routes

`METRIC` = `metric <0-16777214>` = Specifies the external metric

`METRIC-TYPE` = `metric-type (1|2)` = Specifies the external metric-type

`ROUTE-MAP` = `route-map WORD` = Specifies name of the route-map

`TAG` = `tag <0-4294967295>` = Specifies the external route tag

OSPF Commands

2.54.2 Command Mode

Router mode

2.54.3 Usage

Use the redistribute command to inject routes, learned from other routing protocols, into the OSPF domain to generate AS-external-LSAs.

2.54.4 Examples

The following example shows redistribution of bgp routes into ospf routing table, with metric as 12.

```
# configure terminal
(config)# router ospf 100
(config-router)# redistribute bgp metric 12
```

2.55 redistribute ospf

Use this command to redistribute a particular OSPF instance into another OSPF instance, or optionally redistribute a particular OSPF instance into another OSPF instance by setting metrics, route maps, and tags. Use the no parameter with this command to negate the distribution of a particular OSPF instance.

2.55.1 Command Syntax

```
redistribute ospf <1-65535> {METRIC METRIC-TYPE ROUTE-MAP TAG}
```

```
no redistribute ospf <1-65535>
```

METRIC = metric <0-16777214> = Specifies the external metric

METRIC-TYPE = metric-type (1|2) = Specifies the external metric-type

ROUTE-MAP = route-map WORD = Specifies name of the route-map

TAG = tag <0-4294967295> = Specifies the external route ta.

2.55.2 Command Mode

Router mode

2.55.3 Usage

Use the `redistribute ospf` command to inject routes, learned from other OSPF instances, into this OSPF instance to generate AS-external-LSAs.

2.55.4 Examples

The following example shows redistributing OSPF instance 2 into OSPF instance 1.

```
# configure terminal
(config)# router ospf 1
(config-router)# redistribute ospf 2
```

The following example shows redistributing OSPF instance 2 into OSPF instance 1, with an external metric of 10, metric type 1, a route-map named `rpm1`, and an external route tag of 3.

```
# configure terminal
(config)# router ospf 1
(config-router)# redistribute ospf 2 metric 10 metric-type 1 route-map
rpm1 tag 3
```

2.56 restart ospf graceful

Use this command to force restarting OSPF as Graceful Restart.



This command is available only when configuration option `--enable-restart` is enabled when compiling SRstackware.

2.56.1 Command Syntax

```
restart ospf graceful (grace-period <1-1800>)
```

2.56.2 Command Mode

Privileged Exec mode and Exec mode

OSPF Commands

2.56.3 Usage

After this command is executed, router immediately shuts down. It is notified to NSM that OSPF has shutdown as Graceful and NSM preserves routes installed by OSPF until grace-period expires.

2.56.4 Examples

```
# restart ospf graceful grace-period 200
```

2.57 router ospf

Use this command to enter router mode and to configure an OSPF routing process. Specify the process ID with this command to configure multiple instances. Use the `no` parameter with this command to terminate an OSPF routing process. Use the `no` parameter with the process ID parameter, to terminate and delete a specific OSPF routing process.

2.57.1 Command Syntax

```
(no) router ospf  
(no) router ospf PROCESSID
```

PROCESSID = <1-65535> = Any positive integer identifying a routing process. The process ID should be unique for each routing process.

2.57.2 Default

No routing process defined.

2.57.3 Command Mode

Configure mode

2.57.4 Usage

Process ID of OSPF is an optional parameter. When running a single instance of OSPF, you may or may not specify the Process ID but for running multiple instances of OSPF you must specify the Process ID.

2.57.5 Examples

This example shows the use of `router ospf` command to enter router mode. Note the change in the prompt.

```
# configure terminal
(config)# router ospf 100
(config-router)#
```

2.58 router-id

Use this command to specify a router ID for the OSPF process. Use the `no` parameter with this command to force OSPF to use the previous OSPF router-id behavior.

2.58.1 Command Syntax

```
router-id IPADDRESS
no router-id
```

IPADDRESS = Specifies the router ID in IPv4 address format

2.58.2 Command Mode

Router mode

2.58.3 Usage

Configure each router with a unique router-id. In an OSPF router process that has active neighbors, a new router-id is used at the next reload or when you start the OSPF manually.

2.58.4 Examples

The following example shows a fixed router ID 10.10.10.60

```
# configure terminal
(config)# router ospf 100
(config-router)# router-id 10.10.10.60
```

2.58.5 Related Commands

```
show ip ospf
```

2.59 show debugging ospf

Use this command to display the set OSPF debugging option.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.59.1 Command Syntax

```
show debugging ospf
```

2.59.2 Command Mode

Privileged Exec mode

2.59.3 Usage

This is a sample output from the `show debugging ospf` command. Some lines in this output wrap around, they might not wrap around in the actual display.

```
# show debugging ospf
OSPF debugging status:
  OSPF packet Link State Update debugging is on
  OSPF all events debugging is on
# te mo
# 2002/05/09 14:08:11 OSPF: RECV[LS-Upd]: From 10.10.10.70 via
eth0:10.10.10.50 (10.10.10.10 -> 224.0.0.5)
2002/05/09 14:08:11 OSPF: LSA[10.10.10.10:10.10.10.70]:
instance(0x8139cd0) created with Link State Update
2002/05/09 14:08:11 OSPF: RECV[LS-Upd]: From 10.10.10.70 via
eth0:10.10.10.50 (10.10.10.10 -> 224.0.0.5)
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: Begin send queue
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: # of LSAs 1, destination 224.0.0.5
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: End send queue
2002/05/09 14:12:33 OSPF: SEND[LS-Upd]: To 224.0.0.5 via
eth0:10.10.10.50.
```

2.59.4 Examples

```
# show debugging ospf
```

2.60 show ip ospf

Use this command to display general information about all OSPF routing processes. Include the `process ID` parameter with this command to display information about specified instances.

To modify the lines displayed, use the `|` (output modifier token); to save the output to a file, use the `>` output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.60.1 Command Syntax

```
show ip ospf
show ip ospf PROCESSID
```

`PROCESSID = <0-65535>` = The ID of the router process for which information will be displayed. If this parameter is included, only the information for the specified routing process is displayed.

2.60.2 Command Mode

Privileged Exec mode

2.60.3 Usage

The following are sample outputs from the `show ip ospf` command with and without the `process ID` parameter. Notice that the first output (without process ID), shows information about both instances and the second output shows information only about the instance specified by the process ID.

```
# show ip ospf
Routing Process "ospf 1" with ID 10.10.11.60
Process uptime is 46 minutes
Conforms to RFC2328, and RFC1583Compatibility flag is disabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
This router is an ASBR (injecting external routing information)
```

OSPF Commands

```
SPF schedule delay 5 secs, Hold time between two SPF's 10 secs
Refresh timer 10 secs
Number of external LSA 1. Checksum Sum 0xBC1E
Number of non-default external LSA 1
External LSA database is unlimited.
Number of areas attached to this router: 1
    Area 0 (BACKBONE)
        Number of interfaces in this area is 1(1)
        Number of fully adjacent neighbors in this area is 1
        Area has no authentication
        SPF algorithm last executed 00:46:27.935 ago
        SPF algorithm executed 2 times
        Number of LSA 5. Checksum Sum 0x026a20
Routing Process "ospf 100" with ID 10.10.11.146
Process uptime is 0 minute
Conforms to RFC2328, and RFC1583Compatibility flag is disabled
Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPF's 10 secs
Refresh timer 10 secs
Number of external LSA 0. Checksum Sum 0x0
Number of non-default external LSA 0
External LSA database is unlimited.
Number of areas attached to this router: 1
    Area 1
        Number of interfaces in this area is 1(1)
        Number of fully adjacent neighbors in this area is 0
        Number of fully adjacent virtual neighbors through this area is 0
        Area has no authentication
        SPF algorithm executed 0 times
        Number of LSA 1. Checksum Sum 0x00e3e2

# show ip ospf 100
Routing Process "ospf 100" with ID 10.10.11.146
Process uptime is 0 minute
Conforms to RFC2328, and RFC1583Compatibility flag is disabled
```

```

Supports only single TOS(TOS0) routes
Supports opaque LSA
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Refresh timer 10 secs
Number of external LSA 0. Checksum Sum 0x0
Number of non-default external LSA 0
External LSA database is unlimited.
Number of areas attached to this router: 1
  Area 1
    Number of interfaces in this area is 1(1)
    Number of fully adjacent neighbors in this area is 0
    Number of fully adjacent virtual neighbors through this area is 0
    Area has no authentication
    SPF algorithm executed 0 times
    Number of LSA 1. Checksum Sum 0x00e3e2

```

2.60.4 Examples

```

# show ip ospf
# show ip ospf 100

```

2.60.5 Related Commands

```
router ospf
```

2.61 show ip ospf border-routers

Use this command to display the ABRs and ASBRs for all OSPF instances. Include the process ID parameter with this command to view data about specified instances.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

OSPF Commands

2.61.1 Command Syntax

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

PROCESSID = <0-65535> = The ID of the router process for which information will be displayed

2.61.2 Command Mode

Privileged Exec mode

2.61.3 Usage

This is a sample output from the `show ip ospf border-routers` command.

```
# show ip ospf border-routers
OSPF process 1 internal Routing Table
Codes: i - Intra-area route, I - Inter-area route
i 10.15.0.1 [10] via 10.10.0.1, eth0, ASBR, Area 0.0.0.0
i 172.16.10.1 [10] via 10.10.11.50, eth1, ABR, ASBR, Area 0.0.0.0
```

2.61.4 Examples

```
# show ip ospf border-routers
# show ip ospf 721 border-routers
```

2.62 show ip ospf database

Use this command to display a database summary for OSPF information. This command displays BGP tags for prefixes. Include the process ID parameter with this command to display information about specified instances.

To modify the lines displayed, use the `|` (output modifier token); to save the output to a file, use the `>` output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.62.1 Command Syntax

```
show ip ospf database(self-originate|max-age)
show ip ospf PROCESSID database (self-originate|max-age)
```

PROCESSID = <0-65535> = The ID of the router process for which information will be displayed

self-originate = Displays self-originated link states

max-age = Displays LSAs in MaxAge list. It maintains the list of the all LSAs in the database which have reached the max-age which is 3600 seconds.

2.62.2 Command Mode

Privileged Exec mode

2.62.3 Usage

The following are sample outputs from the `show ip ospf database` command with and without the `process ID` parameter. Notice that the first output (without process ID), shows database information about both the instances and the second and third outputs show database information only about the instances specified by the process ID. The last two displays show the use of the `self-originate` and `max-age` parameters.

```
# show ip ospf database
    OSPF Router process 1 with ID (10.10.11.60)
          Router Link States (Area 0.0.0.1)
Link ID          ADV Router      Age  Seq#           CkSum  Link count
10.10.11.60     10.10.11.60      32  0x80000002    0x472b  1
    OSPF Router process 100 with ID (10.10.11.60)
          Router Link States (Area 0.0.0.0)
Link ID          ADV Router      Age  Seq#           CkSum  Link count
10.10.11.60     10.10.11.60      219 0x80000001    0x4f5d  0

# show ip ospf 1 database
    OSPF Router process 1 with ID (10.10.11.60)
          Router Link States (Area 0.0.0.1)
Link ID          ADV Router      Age  Seq#           CkSum  Link count
10.10.11.60     10.10.11.60      43  0x80000002    0x472b  1
```

OSPF Commands

```
# show ip ospf 100 database
    OSPF Router process 100 with ID (10.10.11.60)
        Router Link States (Area 0.0.0.0)
Link ID          ADV Router      Age  Seq#           CkSum  Link count
10.10.11.60     10.10.11.60    244 0x80000001    0x4f5d 0

# show ip ospf database self-originate
    OSPF Router process 100 with ID (10.10.11.50)
        Router Link States (Area 0.0.0.1 [NSSA])
Link ID          ADV Router      Age  Seq#           CkSum  Link count
10.10.11.50     10.10.11.50    20  0x80000007    0x65c3 2
        Area-Local Opaque-LSA (Area 0.0.0.1 [NSSA])
Link ID          ADV Router      Age  Seq#           CkSum  Opaque ID
67.1.4.217      10.10.11.50    37  0x80000001    0x2129 66777
        AS-Global Opaque-LSA
Link ID          ADV Router      Age  Seq#           CkSum  Opaque ID
67.1.4.217      10.10.11.50    37  0x80000001    0x2daa 66777

# show ip ospf database max-age
    OSPF Router process 100 with ID (3.3.3.4)
        MaxAge Link States:
Link type: 7
Link State ID: 37.37.37.0
Advertising Router: 3.3.3.1
LSA lock count: 6
Link type: 7
Link State ID: 10.0.0.0
Advertising Router: 3.3.3.1
LSA lock count: 6
```

2.62.4 Examples

```
# show ip ospf database external 1.2.3.4 self-originate
# show ip ospf database self-originate
# show ip ospf 1 database max-age
# show ip ospf 1 database router adv-router 2.3.4.5
```

2.63 show ip ospf database asbr-summary

Use this command to display information about the Autonomous System Boundary Router (ASBR) summary LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.63.1 Command Syntax

```
show ip ospf database asbr-summary (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.63.2 Command Mode

Privileged Exec mode

2.63.3 Examples

```
# show ip ospf database asbr-summary 1.2.3.4 self-originate
# show ip ospf database asbr-summary self-originate
# show ip ospf database asbr-summary 1.2.3.4 adv-router 2.3.4.5
```

2.64 show ip ospf database external

Use this command to display information about the external LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

OSPF Commands

2.64.1 Command Syntax

```
show ip ospf database external (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.64.2 Command Mode

Privileged Exec mode

2.64.3 Usage

This is a sample output from the `show ip ospf database external` command with the `self-originate` option selected.

```
# show ip ospf database external self-originate
      OSPF Router process 100 with ID (10.10.11.50)
          AS External Link States

LS age: 298
Options: 0x2 (*|---|E|)
LS Type: AS-external-LSA
Link State ID: 10.10.100.0 (External Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x7033
Length: 36
Network Mask: /24
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 20
    Forward Address: 10.10.11.50
    External Route Tag: 0
```

2.64.4 Examples

```
# show ip ospf database external 1.2.3.4 self-originate
# show ip ospf database external self-originate
# show ip ospf database external 1.2.3.4 adv-router 2.3.4.5
```

2.65 show ip ospf database network

Use this command to display information about the network LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.65.1 Command Syntax

```
show ip ospf database network (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.65.2 Command Mode

Privileged Exec mode

2.65.3 Usage

The following is a sample output from the `show ip ospf database network` command, with and without the `adv-router` option selected:

```
# show ip ospf database network
      OSPF Router process 200 with ID (192.30.30.2)
          Net Link States (Area 0.0.0.0)

LS age: 1175
Options: 0x2 (*|---|---|E|-)
LS Type: network-LSA
Link State ID: 192.10.10.9 (address of Designated Router)
Advertising Router: 192.30.30.3
```

OSPF Commands

```
LS Seq Number: 80000002
Checksum: 0xdfb1
Length: 32
Network Mask: /24
    Attached Router: 192.20.20.1
    Attached Router: 192.30.30.3
LS age: 1327
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.20.20.2 (address of Designated Router)
Advertising Router: 192.20.20.2
LS Seq Number: 8000000d
Checksum: 0xbce6
Length: 32
Network Mask: /24
    Attached Router: 192.20.20.1
    Attached Router: 192.20.20.2
LS age: 1278
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.30.30.3 (address of Designated Router)
Advertising Router: 192.30.30.3
Advertising Router: 192.30.30.3
LS Seq Number: 80000001
Checksum: 0x0556
Length: 32
Network Mask: /24
    Attached Router: 192.30.30.2
    Attached Router: 192.30.30.3
LS age: 1436
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.40.40.2 (address of Designated Router)
Advertising Router: 192.20.20.2
LS Seq Number: 8000000e
Checksum: 0xf173
```

```

Length: 32
Network Mask: /24
    Attached Router: 192.20.20.2
    Attached Router: 192.30.30.2

# show ip ospf database network adv-router 192.30.30.3
    OSPF Router process 200 with ID (192.30.30.2)
        Net Link States (Area 0.0.0.0)

LS age: 1387
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.10.10.9 (address of Designated Router)
Advertising Router: 192.30.30.3
LS Seq Number: 80000001
Checksum: 0xelb0
Length: 32
Network Mask: /24
    Attached Router: 192.20.20.1
    Attached Router: 192.30.30.3

LS age: 1648
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: network-LSA
Link State ID: 192.30.30.3 (address of Designated Router)
Advertising Router: 192.30.30.3
LS Seq Number: 8000000f
Checksum: 0xe864
Length: 32
Network Mask: /24
    Attached Router: 192.30.30.2
    Attached Router: 192.30.30.3

```

2.65.4 Examples

```

# show ip ospf database network 1.2.3.4 self-originate
# show ip ospf database network self-originate
# show ip ospf database network 1.2.3.4 adv-router 2.3.4.5

```

2.66 show ip ospf database nssa-external

Use this command to display information about the NSSA external LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.66.1 Command Syntax

```
show ip ospf database nssa-external (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.66.2 Command Mode

Privileged Exec mode

2.66.3 Usage

The following is a sample output from the `show ip ospf database nssa-external` command with the `adv-router` and `ip address` option selected.

```
# show ip ospf database nssa-external adv-router 10.10.11.50
    OSPF Router process 100 with ID (10.10.11.50)
        NSSA-external Link States (Area 0.0.0.0)
        NSSA-external Link States (Area 0.0.0.1 [NSSA])

LS age: 78
Options: 0x0 (*|---|---|---|)
LS Type: AS-NSSA-LSA
Link State ID: 0.0.0.0 (External Network Number For NSSA)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xc9b6
Length: 36
Network Mask: /0
```



```

    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 1
    NSSA: Forward Address: 0.0.0.0
--More--
OSPF Router process 100 with ID (10.10.11.50)
    NSSA-external Link States (Area 0.0.0.0)
    NSSA-external Link States (Area 0.0.0.1 [NSSA])
LS age: 78
Options: 0x0 (*|-|-|-|-|-|-)
LS Type: AS-NSSA-LSA
Link State ID: 0.0.0.0 (External Network Number For NSSA)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xc9b6
Length: 36
Network Mask: /0
    Metric Type: 2 (Larger than any link state path)
    TOS: 0
    Metric: 1
    NSSA: Forward Address: 0.0.0.0
    External Route Tag: 0
    NSSA-external Link States (Area 0.0.0.1 [NSSA])

```

2.66.4 Examples

```

# show ip ospf database nssa-external 1.2.3.4 self-originate
# show ip ospf database nssa-external self-originate
# show ip ospf database nssa-external 1.2.3.4 adv-router 2.3.4.5

```

2.67 show ip ospf database opaque-area

Use this command to display information about the area-local (link state type 10) scope LSAs. Type-10 Opaque LSAs are not flooded beyond the borders of their associated area.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.67.1 Command Syntax

```
show ip ospf database opaque-area (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.67.2 Command Mode

Privileged Exec mode

2.67.3 Usage

The following is a sample output from the show ip ospf database opaque-area command, with the self-originate option selected.

```
# show ip ospf database opaque-area self-originate
    OSPF Router process 100 with ID (10.10.11.50)
        Area-Local Opaque-LSA (Area 0.0.0.0)
    LS age: 262
    Options: 0x2 (*|_|_|_|_|E|_|)
    LS Type: Area-Local Opaque-LSA
    Link State ID: 10.0.25.176 (Area-Local Opaque-Type/ID)
    Opaque Type: 10
    Opaque ID: 6576
    Advertising Router: 10.10.11.50
    LS Seq Number: 80000001
    Checksum: 0xb413
    Length: 26
```

2.67.4 Examples

```
# show ip ospf database opaque-area 1.2.3.4 self-originate
# show ip ospf database opaque-area self-originate
# show ip ospf database opaque-area 1.2.3.4 adv-router 2.3.4.5
```

2.68 show ip ospf database opaque-as

Use this command to display information about the link-state type 11 LSAs. This type of link-state denotes that the LSA is flooded throughout the Autonomous System (AS).

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.68.1 Command Syntax

```
show ip ospf database opaque-as (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.68.2 Command Mode

Privileged Exec mode

2.68.3 Usage

The following is a sample output from the `show ip ospf database opaque-as` command, with the `self-originate` option selected.

```
# show ip ospf database opaque-as self-originate
      OSPF Router process 100 with ID (10.10.11.50)
          AS-Global Opaque-LSA
LS age: 325
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: AS-external Opaque-LSA
Link State ID: 11.10.9.23 (AS-external Opaque-Type/ID)
```

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```
Opaque Type: 11
Opaque ID: 657687
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0xb018
Length: 25
```

2.68.4 Examples

```
# show ip ospf database opaque-as 1.2.3.4 self-originate
# show ip ospf database opaque-as self-originate
# show ip ospf database opaque-as 1.2.3.4 adv-router 2.3.4.5
```

2.69 show ip ospf database opaque-link

Use this command to display information about the link-state type 9 LSAs. This type denotes a link-local scope. The LSAs are not flooded beyond the local network.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.69.1 Command Syntax

```
show ip ospf database opaque-link (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.69.2 Command Mode

Privileged Exec mode

2.69.3 Usage

The following is a sample output from the `show ip ospf database opaque-link` command, with a link-state selected.

```
# show ip ospf database opaque-link 10.0.220.247
      OSPF Router process 100 with ID (10.10.11.50)
          Link-Local Opaque-LSA (Link hme0:10.10.10.50)
LS age: 276
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: Link-Local Opaque-LSA
Link State ID: 10.0.220.247 (Link-Local Opaque-Type/ID)
Opaque Type: 10
Opaque ID: 56567
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x744e
Length: 26
          Link-Local Opaque-LSA (Link hme1:10.10.11.50)
```

2.69.4 Examples

```
# show ip ospf database opaque-link 1.2.3.4 self-originate
# show ip ospf database opaque-link self-originate
# show ip ospf database opaque-link 1.2.3.4 adv-router 2.3.4.5
```

2.70 show ip ospf database router

Use this command to display information only about the router LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.70.1 Command Syntax

```
show ip ospf database router (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

OSPF Commands

2.70.2 Command Mode

Privileged Exec mode

2.70.3 Usage

The following is a sample output from the `show ip ospf database router` command, with the ip address selected.

```
# show ip ospf database router 10.10.11.50
      OSPF Router process 100 with ID (10.10.11.50)
          Router Link States (Area 0.0.0.0)

LS age: 878
Options: 0x2 (*|---|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 10.10.11.50
Advertising Router: 10.10.11.50
LS Seq Number: 80000004
Checksum: 0xe39e
Length: 36
Number of Links: 1
    Link connected to: Stub Network
        (Link ID) Network/subnet number: 10.10.10.0
        (Link Data) Network Mask: 255.255.255.0
        Number of TOS metrics: 0
            TOS 0 Metric: 10
                Router Link States (Area 0.0.0.1)

LS age: 877
Options: 0x2 (*|---|---|E|)
Flags: 0x3 : ABR ASBR
LS Type: router-LSA
Link State ID: 10.10.11.50
Advertising Router: 10.10.11.50
LS Seq Number: 80000003
Checksum: 0xee93
Length: 36
Number of Links: 1
```

```
Link connected to: Stub Network
(Link ID) Network/subnet number: 10.10.11.0
(Link Data) Network Mask: 255.255.255.0
Number of TOS metrics: 0
TOS 0 Metric: 10
```

2.70.4 Examples

```
# show ip ospf database router 1.2.3.4 self-originate
# show ip ospf database router self-originate
# show ip ospf database router 1.2.3.4 adv-router 2.3.4.5
```

2.71 show ip ospf database summary

Use this command to display information about the summary LSAs.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.71.1 Command Syntax

```
show ip ospf database summary (A.B.C.D)(self-originate|ADVROUTER)
ADVROUTER = adv-router A.B.C.D
```

adv-router = Displays all the LSAs of the specified router.

A.B.C.D = A link state ID (as an IP address)

self-originate = Displays self-originated link states

2.71.2 Command Mode

Privileged Exec mode

2.71.3 Usage

The following are the sample outputs from the `show ip ospf database summary` command, using the `self-originate`, `adv-router` and `ip address` options.

```
# show ip ospf database summary 10.10.10.0
    OSPF Router process 100 with ID (10.10.11.50)
        Summary Link States (Area 0.0.0.0)
        Summary Link States (Area 0.0.0.1)

LS age: 1124
Options: 0x2 (*|---|E|)
LS Type: summary-LSA
Link State ID: 10.10.10.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x41a2
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10

# show ip ospf database summary self-originate
    OSPF Router process 100 with ID (10.10.11.50)
        Summary Link States (Area 0.0.0.0)

LS age: 1061
Options: 0x2 (*|---|E|)
LS Type: summary-LSA
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10
        Summary Link States (Area 0.0.0.1)

LS age: 1061
Options: 0x2 (*|---|E|)
LS Type: summary-LSA
```



```

Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10
        Summary Link States (Area 0.0.0.1)
LS age: 1061
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.10.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x41a2
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10

# show ip ospf database summary adv-router 10.10.11.50
    OSPF Router process 100 with ID (10.10.11.50)
        Summary Link States (Area 0.0.0.0)
LS age: 989
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10
        Summary Link States (Area 0.0.0.1)
LS age: 989
Options: 0x2 (*|-|-|-|-|E|-)
LS Type: summary-LSA

```

OSPF Commands

```
Link State ID: 10.10.11.0 (summary Network Number)
Advertising Router: 10.10.11.50
LS Seq Number: 80000001
Checksum: 0x36ac
Length: 28
Network Mask: /24
    TOS: 0 Metric: 10
```

2.71.4 Examples

```
# show ip ospf database summary 1.2.3.4 self-originate
# show ip ospf database summary self-originate
# show ip ospf database summary 1.2.3.4 adv-router 2.3.4.5
```

2.72 show ip ospf interface

Use this command to display interface information for OSPF.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.72.1 Command Syntax

```
show ip ospf interface IFNAME

IFNAME = An alphanumeric string that is the interface name.
```

2.72.2 Command Mode

Privileged Exec mode and Exec mode

2.72.3 Usage

The following is a sample output of this command:

```
# show ip ospf interface eth1
eth1 is up, line protocol is up
    Internet Address 1.1.1.1/24, Area 0.0.0.0, MTU 1500
    Process ID 0, Router ID 33.33.33.33, Network Type BROADCAST, Cost: 10
```

```

Transmit Delay is 1 sec, State Waiting, Priority 1, TE Metric 0
No designated router on this network
No backup designated router on this network
Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:02
Neighbor Count is 0, Adjacent neighbor count is 0
Crypt Sequence Number is 1106347721
Hello received 0 sent 1, DD received 0 sent 0
LS-Req received 0 sent 0, LS-Upd received 0 sent 0
LS-Ack received 0 sent 0, Discarded 0

```

2.72.4 Examples

```
# show ip ospf interface eth0
```

2.73 show ip ospf neighbor

Use this command to display information on OSPF neighbors. Include the `process ID` parameter with this command to display information about specified instances.

To modify the lines displayed, use the `|` (output modifier token); to save the output to a file, use the `>` output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.73.1 Command Syntax

```

show ip ospf neighbor A.B.C.D|all|DETAIL|INTERFACE
show ip ospf PROCESSID neighbor A.B.C.D|all|DETAIL|INTERFACE

```

PROCESSID = <0-65535> = The ID of the router process for which information will be displayed

A.B.C.D = A.B.C.D (detail) = Neighbor ID

all = Include downstatus neighbor

DETAIL = detail (all) = Detail of all neighbors

INTERFACE = Interface (A.B.C.D)

A.B.C.D = Address of the interface

OSPF Commands

2.73.2 Command Mode

Privileged Exec mode and Exec mode

2.73.3 Usage

The following are sample outputs from the `show ip ospf neighbor` command with and without the process ID parameter. Notice that the first output (without process ID), shows database information about both the instances and the second output shows database information only about the instance specified by the process ID. The last display shows the use of the `detail` parameter.

```
# show ip ospf neighbor
```

```
OSPF process 1:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.10.10.50	1	Full/DR	00:00:38	10.10.10.50	eth0

```
OSPF process 100:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.10.11.50	1	Full/Backup	00:00:31	10.10.11.50	eth1

```
# show ip ospf 1 neighbor
```

```
OSPF process 1:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.10.10.50	1	Full/DR	00:00:38	10.10.10.50	eth0

```
# show ip ospf 100 neighbor
```

```
OSPF process 100:
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
10.10.11.50	1	Full/Backup	00:00:31	10.10.11.50	eth1

```
# show ip ospf neighbor detail
```

```
Neighbor 10.10.10.50, interface address 10.10.10.50
```

```
  In the area 0.0.0.0 via interface eth0
```

```
  Neighbor priority is 1, State is Full, 5 state changes
```

```
  DR is 10.10.10.50, BDR is 10.10.10.10
```

```
  Options is 0x42 (*|O|-|-|-|E|-)
```

```
  Dead timer due in 00:00:38
```

```
  Neighbor is up for 00:53:07
```

```

Database Summary List 0
Link State Request List 0
Link State Retransmission List 0
Crypt Sequence Number is 0
Thread Inactivity Timer on
Thread Database Description Retransmission off
Thread Link State Request Retransmission off
Thread Link State Update Retransmission on

Neighbor 10.10.11.50, interface address 10.10.11.50
  In the area 0.0.0.0 via interface eth1
  Neighbor priority is 1, State is Full, 5 state changes
  DR is 10.10.11.10, BDR is 10.10.11.50
  Options is 0x42 (*|O|-|-|-|E|-)
  Dead timer due in 00:00:31
  Neighbor is up for 00:26:50
  Database Summary List 0
  Link State Request List 0
  Link State Retransmission List 0
  Crypt Sequence Number is 0
  Thread Inactivity Timer on
  Thread Database Description Retransmission off
  Thread Link State Request Retransmission off
  Thread Link State Update Retransmission on

```

2.73.4 Examples

```

# show ip ospf neighbor detail
# show ip ospf neighbor 1.2.3.4
# show ip ospf neighbor myifname detail all

```

2.74 show ip ospf route

Use this command to display the OSPF routing table. Include the `process ID` parameter with this command to display the OSPF routing table for specified instances.

OSPF Commands

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.74.1 Command Syntax

```
show ip ospf route
show ip ospf PROCESSID route
```

PROCESSID = <0-65535> = The ID of the router process for which information will be displayed. If this parameter is included, only the information for this specified routing process is displayed.

2.74.2 Command Mode

Privileged Exec mode

2.74.3 Usage

The following is a sample output from the `show ip ospf route` command with the process ID parameter.

```
# show ip ospf route
OSPF process 1:
Codes: C - connected, D - Discard, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
O 10.10.0.0/24 [10] is directly connected, eth0, Area 0.0.0.0
O 10.10.11.0/24 [10] is directly connected, eth1, Area 0.0.0.0
O 10.10.11.100/32 [10] is directly connected, lo, Area 0.0.0.0
E2 10.15.0.0/24 [10/50] via 10.10.0.1, eth0
IA 172.16.10.0/24 [30] via 10.10.11.50, eth1, Area 0.0.0.0
E2 192.168.0.0/16 [10/20] via 10.10.11.50, eth1
```

2.74.4 Examples

```
# show ip ospf route
```

2.75 show ip ospf virtual-links

Use this command to display virtual link information.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.75.1 Command Syntax

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

2.75.2 Command Mode

Privileged Exec mode and Exec mode

2.75.3 Usage

The following is the display of the virtual link information for two routers, one with the virtual link up and one with virtual link down.

```
ospfd# show ip ospf virtual-links
Virtual Link VLINK0 to router 10.10.0.9 is up
  Transit area 0.0.0.1 via interface eth0
  Transmit Delay is 1 sec, State Point-To-Point,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in 00:00:02
  Adjacency state Full
Virtual Link VLINK1 to router 10.10.0.123 is down
  Transit area 0.0.0.1 via interface *
  Transmit Delay is 1 sec, State Down,
  Timer intervals configured, Hello 10, Dead 40, Wait 40, Retransmit 5
  Hello due in inactive
  Adjacency state Down
```

2.75.4 Examples

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

2.76 show ip protocols

Use this command to display OSPF process parameters and statistics.

To modify the lines displayed, use the | (output modifier token); to save the output to a file, use the > output redirection token. For more information, see [Chapter 1, Command Line Interface Environment on page 25](#).

2.76.1 Command Syntax

```
show ip protocols
```

There are no arguments or keywords for this command.

2.76.2 Command Mode

Privileged Exec mode

2.76.3 Usage

This is an example of the output from the `show ip protocols` command:

```
# show ip protocols
Routing Protocol is "ospf 200"
  Invalid after 0 seconds, hold down 0, flushed after 0
  Outgoing update filter list for all interfaces is
    Redistributed kernel filtered by filter1
  Incoming update filter list for all interfaces is
  Redistributing: kernel
  Routing for Networks:
    192.30.30.0/24
    192.40.40.0/24
  Routing Information Sources:
    Gateway          Distance      Last Update
  Distance: (default is 110)
    Address          Mask          Distance List
```

2.76.4 Examples

```
# show ip protocols
```


2.77 summary-address

Use this command to summarize or suppress external routes with the specified address range.

2.77.1 Command Syntax

```
summary-address A.B.C.D/M (not-advertise)(tag <0-4294967295>)
```

A.B.C.D/M = The range of addresses given as IPv4 starting address and a mask indicating the range

not-advertise = Suppresses external routes

tag <0-4294967295> = The default tag value is 0

2.77.2 Command Mode

Router mode

2.77.3 Usage

An address range is a pairing of an address and a mask that is almost the same as IP network number. For example, if the specified address range is 192.168.0.0/255.255.240.0, it matches: 192.168.1.0/24, 192.168.4.0/22, 192.168.8.128/25 and so on.

Redistributing routes from other protocols into OSPF requires the router to advertise each route individually in an external LSA. Use `summary address` command to advertise one summary route for all redistributed routes covered by a specified network address and mask. This helps decrease the size of the OSPF link state database.

2.77.4 Examples

The following example uses the `summary-address` command to aggregate external LSAs that match the network 172.16.0.0/24 and assign a Tag value of 3.

```
# configure terminal
(config)# router ospf 100
(config-router)# summary-address 172.16.0.0/16 tag 3
```

2.78 timers spf exp

Use this command to adjust route-calculation timers using exponential back-off delays. Use the `no` parameter with this command to return to the default exponential back-off timer values.

2.78.1 Command Syntax

```
timers spf exp MIN_HOLDTIME MAX_HOLDTIME  
no timers spf exp
```

`MIN_HOLDTIME` = <0-2147483647> = Specifies the minimum delay between receiving a change to SPF calculation in milliseconds. The default SPF minimum hold-time delay value is 50 milliseconds.

`MAX_HOLDTIME` = <0-2147483647> = Specifies the maximum delay between receiving a change to SPF calculation in milliseconds. The default SPF maximum hold-time delay value is 50 seconds.

2.78.2 Command Mode

Router mode

2.78.3 Usage

The `timers spf exp` command configures the minimum and maximum delay time between the receipt of a topology change and the calculation of the Shortest Path First (SPF).

2.78.4 Examples

```
# configure terminal  
(config)# router ospf 100  
(config-router)# timers spf exp 5 10
```

2.79 undebug ospf events

Use this command to disable debugging options for OSPF event troubleshooting. Use this command without parameters to disable all the options.

2.79.1 Command Syntax

```
undebug ospf event (abr|asbr|lsa|nssa|os|router|vlink)
```

`abr` = Disables debugging of ABR events

`asbr` = Disables debugging of ASBR events

`lsa` = Disables debugging of LSA events

`nssa` = Disables debugging of NSSA events

`os` = Disables debugging of OS interaction events

`router` = Disables debugging of other router events

`vlink` = Disables debugging of virtual link events

2.79.2 Command Mode

Privileged Exec mode

2.79.3 Examples

```
# undebug ospf event abr
```

2.80 undebug ospf ifsm

Use this command to disable debugging options for OSPF Interface Finite State Machine (IFSM) troubleshooting.

2.80.1 Command Syntax

```
undebug ospf ifsm (status|events|timers)
```

`events` = Disables debugging of IFSM event information

`status` = Disables debugging of IFSM status information

`timers` = Disables debugging of IFSM timer information

2.80.2 Command Mode

Privileged Exec mode

OSPF Commands

2.80.3 Examples

```
# undebug ospf ifsm events
```

2.81 undebug ospf lsa

Use this command to disable debugging options for OSPF Link State Advertisements (LSA) troubleshooting.

2.81.1 Command Syntax

```
undebug ospf lsa (generate|flooding|install|maxage|refresh)
```

`generate` = Disables debugging of the LSA generation

`flooding` = Disables debugging of the LSA flooding

`install` = Disables debugging of the LSA installation

`maxage` = Disables debugging of maximum age of the LSA in seconds

`refresh` = Disables debugging of LSA refresh

2.81.2 Command Mode

Privileged Exec mode

2.81.3 Examples

```
# undebug ospf lsa refresh
```

2.82 undebug ospf nfsm

Use this command to disable the debugging options for OSPF Neighbor Finite State Machines (NFSMs).

2.82.1 Command Syntax

```
undebug ospf nfsm (status|events|timers)
```

`status` = Disable the logging of NFSM status information

`events` = Disable the logging of NFSM event information

`timers` = Disable the logging of NFSM timer information

2.82.2 Command Mode

Privileged Exec mode

2.82.3 Examples

```
# undebug ospf nsm events
```

2.83 undebug ospf nsm

Use this command to disable debugging options for OSPF NSM information.

2.83.1 Command Syntax

```
undebug ospf nsm (interface|redistribute)
```

`interface` = Disable logging of NSM interface information

`redistribute` = Disable logging of NSM redistribute information

2.83.2 Command Mode

Privileged Exec mode

2.83.3 Usage

```
# undebug ospf nsm interface
```

2.84 undebug ospf packet

Use this command to disable debugging options for OSPF packets.

2.84.1 Command Syntax

```
undebug ospf packet PARAMETERS
```

```
PARAMETERS = dd|detail|hello|ls-ack|ls-request|ls-update|recv|detail
```

`dd` = Disable debugging for OSPF database descriptions

`detail` = Disable the setting of the debug option set to detailed information

`hello` = Disable debugging for OSPF hello packets

OSPF Commands

`ls-ack` = Disable debugging for OSPF link state acknowledgments

`ls-request` = Disable debugging for OSPF link state requests

`ls-update` = Disable debugging for OSPF link state updates

`send` = Disable the debug option set for sent packets

`recv` = Disable the debug option set for received packets

2.84.2 Command Mode

Privileged Exec mode

2.84.3 Examples

```
# undebug ospf packet ls-request recv detail
```

2.85 undebug ospf route

Use this command to disable route calculation for OSPF debugging. Use this command without parameters to disable all the options.

2.85.1 Command Syntax

```
undebug ospf route (ase|ia|install|spf)
```

`ia` = Disable the debugging of Inter-Area route calculation

`ase` = Disable the debugging of external route calculation

`install` = Disable the debugging of route installation

`spf` = Disable the debugging of SPF calculation

2.85.2 Command Mode

Privileged Exec mode

2.85.3 Examples

```
# undebug ospf route install
```

Related Documentation

A.1 Penguin Solutions Documentation

Technical documentation can be found by using the Documentation Search at <https://www.penguinsolutions.com/edge/support/> or you can obtain electronic copies of documentation by contacting your local sales representative.

Table A-1 Penguin Solutions Documentation

Document Title and Source	Document Number
SRstackware Intelligent Network Software Troubleshooting Guide	6806800N83
SRstackware Intelligent Network Software VRRP Command Reference	6806800N84
SRstackware Intelligent Network Software RIP Command Reference	6806800N85
SRstackware Intelligent Network Software Layer 2 Configuration Guide	6806800N86
SRstackware Intelligent Network Software Layer 2 Command Reference	6806800N88
SRstackware Application Programming Interface Developer Guide	6806800N90
SRstackware Intelligent Network Software Layer 3 Configuration Guide	6806800N89
SRstackware Intelligent Network Software Switch Configuration Command Reference	6806800N92
SRstackware Intelligent Network Software Layer 3 Command Reference	6806800N93
SRstackware Intelligent Network Software Protocol Demo Guide	6806800N07
SRstackware FAQ	6806800N91

Related Documentation

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