BIG-IP® Advanced Routing™

Intermediate System to Intermediate System Command Line Interface Reference Guide

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Preface

This document includes all of the ZebOS command line interface (CLI) commands that support the Intermediate System-to-Intermediate System (IS-IS) product module. All commands in this document are for the current software release.

Note: None of the Internet Protocol (IP) addresses used in this document is an actual working address. Therefore, all command examples, including configuration illustrations and sample display outputs are for display purposes only. Any actual IP address used in this document is both unintentional and coincidental.

Intended Audience

This guide is intended for networking administrators and other professionals who will configure and manage the ZebOS Intermediate System-to-Intermediate System (IS-IS) module.

Contents of this Guide

The following table describes the contents of each chapter in this guide.

Chapter	Contents
Chapter 1, *ZebOS Command Line Interface Environment*	Provides an overview of the command line interface.
Chapter 2, *IS-IS Commands*	Provides a description of all IS-IS commands.
Chapter 3, *IS-IS Show Commands*	Provides a description of all IS-IS show commands.

Related Documents

The following guides are related to this document:

- ZebOS Intermediate System to Intermediate System Developer Guide
- ZebOS Installation Guide

Note: All ZebOS technical manuals are available to licensed customers online (in PDF format) at the Customer Support Web site.

CHAPTER 1 ZebOS Command Line Interface Environment

This section provides an overview of the ZebOS Command Line Interface (CLI). It includes the features and tools that users can utilize when using the ZebOS CLI.

ZebOS Command Line Interface Overview

The ZebOS Command Line Interface (CLI) is a text-based facility conforming to industry standards. The commands can be used in scripts to automate configuration tasks. Each CLI command is usually associated with a specific function or a common function performing a specific task. The Integrated Management Interface (IMI) Shell, or IMISH, gives users and administrators the ability to issue commands to several daemons using a single TELNET session.

Command Line Interface Help

The ZebOS CLI contains a text-based help facility. Access this help by typing in a full or partial command string then typing a question mark "?". The ZebOS CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

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

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

```
ZebOS# show
  access-list                  List IP access lists
  bfd                          Bidirectional Forwarding Detection (BFD)
  bgp                          Border Gateway Protocol (BGP)
  cli                          Show CLI tree of current mode
  clns                         Connectionless-Mode Network Service (CLNS)
  debugging                    Debugging functions (see also 'undebug')
  faults                       Show recorded faults
  history                      Display the session command history
  interface                    Interface status and configuration
  ip                           Internet Protocol (IP)
  ipv6                         Internet Protocol version 6 (IPv6)
  isis                         Intermediate System-Intermediate System
  list                         Show command lists
  mrib                         MRIB
  nsm                          NSM
  privilege                    Show current privilege level
  proc-names                   Show process names
  process                      Process
  route-map                    route-map information
  router-id                    Router ID
  running-config               Current Operating configuration
```

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

```
ZebOS> show de? (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, ZebOS displays help for all matching keywords.

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

```
  interface  Interface status and configuration
  ip         IP information
  isis       ISIS information
```

Command Completion

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

```
ZebOS> sh
```

Press TAB. The CLI displays:

```
ZebOS> show
```

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

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

The CLI displays the `interface` and `ip` keywords. Type `n` to select `interface` and press TAB. The CLI displays:

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

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

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

The CLI displays the only parameter associated with this command, the `IFNAME` parameter.

Note: For more information about output modifiers and output redirection, see the Show Command Tokens section.

Command Abbreviations

The ZebOS CLI accepts abbreviations for commands. For example

```
sh in eth0
```

is an abbreviation for the `show interface` command.

Command Line Errors

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

```
ZebOS(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 the following message:

```
ZebOS> show
% Incomplete command.
```

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

```
area 10.10.0.18 virtual-link 10.10.0.19 authent
ication-key 57393
```

Definitions

The following table defines the terms used in this document.

Table 1: Definition of Terms

Term	Description
token	A token is a non-character, non-numeric symbol: {}, [], (), <>, |,?, >, =
parameter	A parameter is an UPPERCASE term for which the user substitutes input.
keyword	A keyword is a lowercase term that the user types exactly as shown.
line	A line is the user input of any text string, including spaces. No other parameters may be entered after input for this token.
word	A word is the user input of any contiguous text string (excluding spaces).

Typographic Conventions

The following table describes the typographic conventions that are used in this guide.

Table 2: .Typographic Conventions

Convention	Name	Description	Example
`Monospaced font`	Command	Represents command strings entered on a command line and sample source code.	`show ip ospf`
UPPERCASE	Variable parameter	Indicates user input. Enter values according to the description. Each uppercase token expands into one or more other tokens.	`area` **`AREAID`** `range` **`ADDRESS`**
`lowercase`	Keyword parameter	Indicates keywords. Enter values exactly as displayed in the command description.	`show ip ospf`
|	Vertical bar	Limits the choices. Select one from the list. Do not enter the bar as part of the command.	`A.B.C.D`**`|`**`<0-4294967295>`
()	Parentheses	Encloses optional parameters. Select one. Do not enter the parentheses as part of the command.	**`(`**`A.B.C.D|<0-4294967295>`**`)`**
{}	Braces	Encloses optional parameters. Select none, one or more than one. Do not enter the brace as part of the command.	**`{`**`priority <0-255>| poll-interval <1-65535>`**`}`**
[]	Square brackets	Encloses optional parameters. Select one. Do not enter the bracket as part of the command.	**[**parm2|parm2|parm3**]**
< >	Angle brackets	Encloses a numeric range, endpoints inclusive. Do not enter the bracket as part of the command.	**<**`0-65535`**>**
=	Equal sign	Separates the variable from explanatory text. Do not enter the equal sign as part of the command.	`PROCESSID` **`=`** `<0-65535>`

Convention	Name	Description	Example
A.B.C.D	IP address	An IPv4-style address	10.0.11.123
X:X::X:X	IP address	An IPv6-style address	3ffe:506::1 where the :: is all the zeros for address components not explicitly given.

Format used for Command Description

The following describes the format used when describing each command in this document.

Table 3: Command Description Formats

Format	Description
Command Name	Describes the command, what the command does and when should it be used.
Command Syntax	Displays the syntax of each command.
Parameters	Defines parameters and options within each command syntax.
Default	Displays the status of the command before it is executed.
Command Mode	Displays the name of the command mode in which this command is used. Examples include Exec or Configure modes.
Example	Displays an example of the command being executed and the complexities of the command syntax.

Command Negation

Many commands can be negated using the no keyword. Depending on the command or the parameters, some command negation can disable one feature or a feature for a specific ID, interface, address or other identifier. However, some negation is for the base command only; thus, the negated form does not take a parameter.

Variable Parameter Expansion

For some commands, an IP address or a number in a given range can replace a parameter. For example:

```
area AREAADDRESSID virtual-link ROUTERID (AUTHENTICATE|MSGD|INTERVAL)
AREAADDRESSID=A.B.C.D|<0-4294967295>
```

Therefore, the following is the minimum command for the ROUTERID by an IP address:

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

Users can only choose an optional parameter in the string [AUTHENTICATE|MSGD|INTERVAL]. In addition, users can replace a parameter by a keyword or parameter. For example, the following string replaces the MD5 parameter:

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

with MD5_KEY replaced by a 1-16 character string.

Show Command Tokens

Users can use two tokens to modify the output of a show command. Enter a question mark to display these tokens:

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

Output Modifiers

Users can type the | (vertical bar character) to use output modifiers. For example:

ZebOS>show rsvp | ?

```
   begin     Begin with the line that matches
   exclude   Exclude lines that match
   include   Include lines that match
   redirect  Redirect output
```

Begin Parameter

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

```
ZebOS# 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
!
end
```

Exclude Parameter

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

```
ZebOS# 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
```

Include Parameter

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:

```
ZebOS# 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
```

Redirect Parameter

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

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

In addition, the output redirection token (>) allows the user to specify a target file for the lines of output.

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

Note: To modify the lines displayed for any Show command in this guide, use the | (vertical bar) output modifier token; to save the output to a file, use the > (right arrow) output redirection token.

Command Modes

Commands available for each protocol separate into several modes (or nodes) and are arranged in a hierarchy. Each mode has its own special commands.

Table 4: Command Modes

Name	**Description**
Exec Mode	Also called the `View` mode, this mode the first mode to appear after logging in to the CLI. It is a base mode from where users can perform basic commands, such as `show`, `exit`, `quit`, `help`, `list`, and `enable`.
Privileged Exec Mode	Also called the `Enable` mode, it allows users to run additional basic commands, such as `debug`, `write` (for saving and viewing the configuration) and `show` commands.
Configure Mode	Also called `Configure Terminal` mode, it allows users to run configuration commands and to serve as a gateway into the `Interface`, `Router`, `Line`, `Route Map`, `Key Chain` and `Address Family` modes.
Interface Mode	Is used to configure protocol-specific settings for a particular interface. Any attribute configured in this mode overrides an attribute configured in the `Router` mode.
Line Mode	Is used to make the `access-class` commands available.

Common Command Mode Tree

The diagram displays the common command mode tree.

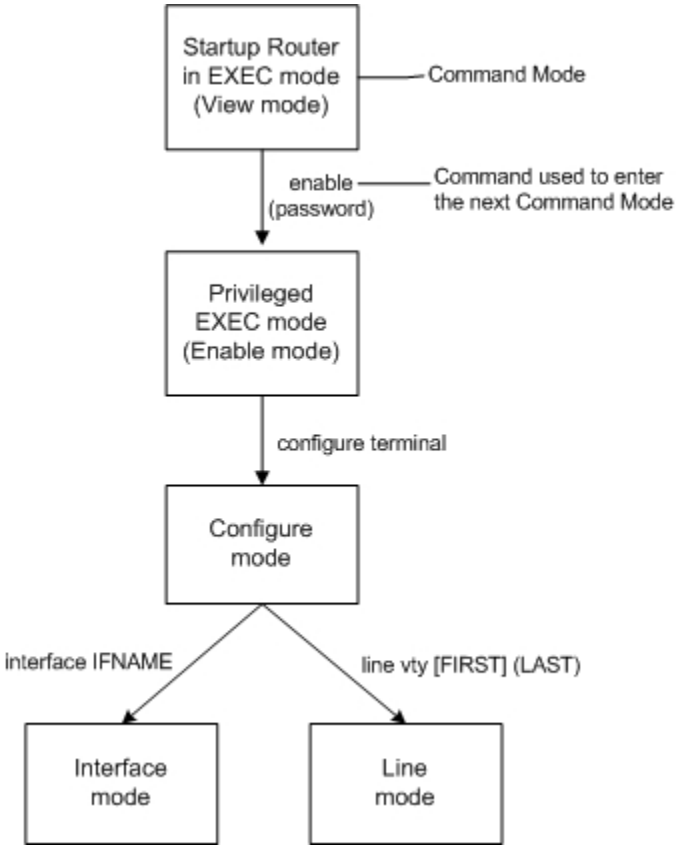

Figure 1: Common Command Mode Tree

ISIS Daemon Command Modes

Router Sometimes referred to as configure-router mode, this mode, available for the BGP, OSPF, ISIS, and RIP protocols only, makes available router and routing commands. This diagram show the complete ISIS daemon command tree.

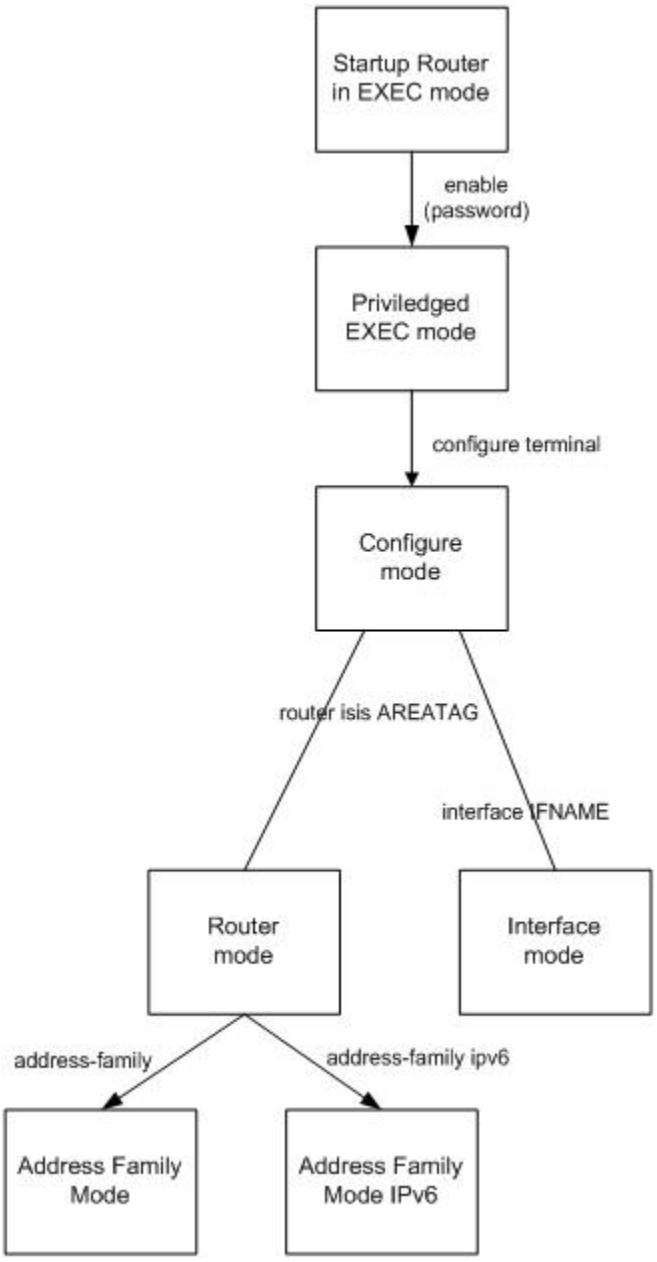

Figure 2: ISIS Daemon Command Modes Tree

CHAPTER 2 IS-IS Commands

This chapter provides a description, syntax, and examples for the IS-IS CLI commands. It includes the following commands:

accept-lifetime

Use this command to specify the time period during which the authentication on a key chain is received as valid.

Use the no parameter with this command to negate this command.

Command Syntax

```
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> infinite
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> duration <1-2147483646>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> duration <1-2147483646>
no accept-lifetime
```

Parameters

HH:MM:SS	Specify the start time of accept-lifetime in hours, minutes and seconds.
<1-31>	Specify the day of the month to start.
MONTH	Specify the month of the year to start as the first three letters of the month, for example, Jan.
<1993-2035>	Specify the year to start.
HH:MM:SS	Specify the end time of accept-lifetime in hours, minutes and seconds.
<1-31>	Specify the day of the month to end.
MONTH	Specify the month of the year to end as the first three letters of the month, for example, Jan.
<1993-2035>	Specify the year to end.
duration	Indicate the duration parameter.
<1-2147483646>	Specify the actual end time duration of a key in seconds.
infinite	Specify the end time to never expire.

Command Mode

Keychain-key mode

Examples

The following example shows the setting of accept-lifetime for key1 on the key chain named mychain.

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#accept-lifetime 03:03:01 Dec 3 2004 04:04:02 Oct 6
2006
```

address-family ipv6

Use this command to enter 'address-family ipv6' mode, where users can configure IPv6 routing specific configuration.

Use the no parameter with this command to remove all configuration under 'address-family ipv6'.

Command Syntax

```
address-family ipv6 (unicast|)
no address-family ipv6 (unicast|)
```

Parameters

unicast	Specify unicast routing for IPv6.

Default

Unicast routing is not configured.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#address-family ipv6 unicast
ZebOS(config-router-af)#
```

adjacency-check

Use this command to configure the policy of adjacency based on the protocol related TLVs in the ISIS Hello packet. ISIS checks adjacency with protocol related TLVs including Protocols Supported TLV or IP Interface Address TLV by default. The command with no parameter disables this check.

Use the no parameter with this command to disable the adjacency check.

Command Syntax

```
adjacency-check
no adjacency-check
```

Parameters

None

Default

ISIS provides adjacency check with protocol-related TLVs.

Command Mode

Router mode, Address-family IPv6

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#address-family ipv6 unicast
ZebOS(config-router-af)#adjacency-check
```

area-password

Use this command to set the authentication password for the Level-1 area and to set authentication on Level-1 SNP PDUs. This command enables authentication when receiving and sending LSP and SNP PDU in Level-1 areas. Area password must be the same for all the ISIS routers in the same area.

Use the no parameter with this command to clear the area password.

Command Syntax

```
area-password WORD
area-password WORD authenticate snp (send-only|validate)
no area-password
```

Parameters

WORD	Specify the password string.
authenticate	Specify to insert the password into Level-1 SNP PDUs.
snp	Specify the sequence number PDU (SNP).
send-only	Specify to only insert the password into the Level-1 SNP PDUs, but not check the password in SNP PDUs that it receives. Use this keyword during a software upgrade to ease the transition.
validate	Specify to insert the password into the Level-1 SNP PDUs and check the password in SNPs that it receives.

Default

By default, the area password is not configured.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis bb
ZebOS(config-router)#area-password ipi
ZebOS(config-router)#area-password mypasswd

ZebOS(config)#router isis bb
ZebOS(config-router)#area-password ipi authenticate snp send-only

ZebOS(config)#router isis bb
ZebOS(config-router)#no area-password
```

authentication key-chain

Use this command to set the key chain to be used for authentication at the instance level. Authentication mode must be set to `md5` to configure the key chain. If no key chain is configured with the key-chain command, no key-chain authentication is performed.

Only one authentication key-chain is applied to an ISIS interface at a time. That is, issuing a second `isis authentication key-chain` command overrides the first `isis authentication key-chain` command. If neither the `level-1` nor the `level-2` keyword is configured, the chain applies to both levels. Authentication can be specified for an individual ISIS interface using the `isis authentication key-chain` command.

Use the `no` parameter with this command to unset the key chain used for authentication.

Command Syntax

```
authentication key-chain WORD (level-1|level-2|)
no authentication key-chain WORD (level-1|level-2|)
no authentication key-chain (level-1|level-2|)
```

Parameters

`WORD`	Specify the chain name (valid authentication keys).
`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

The key chain applies to the level(s) on which authentication mode is configured as MD5 if no level is specified.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis 1
ZebOS(config-router)#authentication key-chain ipi level-1
```

authentication mode

Use this command to set the authentication mode at the instance level.

If clear-text authentication was configured using the `area-password` or `domain-password` commands, the `authentication mode` command overrides both of those commands (based on the level at which MD5 is configured). If the `authentication mode` command was used first, and subsequently an attempt is made to use the `area-password` or `domain-password` commands, the attempt fails. To configure clear-text authentication using the `area-password` or `domain-password` commands, first use the `no authentication mode` command.

The type of authentication and the level to which it applies can be specified for a single ISIS interface, rather than per ISIS instance, using the `isis authentication mode` command.

Use the `no` parameter with this command to unset the authentication mode.

Command Syntax

```
authentication mode {md5|text} (level-1|level-2|)
no authentication mode {md5|text} (level-1|level-2|)
```

Parameters

`md5`	Keyed message digest
`text`	Text mode
`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

The authentication mode is set to MD5 for both levels if no level is specified.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis 1
ZebOS(config-router)#authentication mode md5 level-1

ZebOS(config-router)#no authentication mode md5 level-1
```

authentication send-only

Use this command to set the send-only option at the instance level.

Use this command before configuring the authentication mode and authentication key-chain, so that the implementation of authentication goes smoothly. That is, the routers will have more time for the keys to be configured on each router if authentication is inserted only on the packets being sent, not checked on packets being received. After all routers that must communicate are configured with this command, enable the authentication mode and key chain on each router. Then, specify the `no authentication send-only` command to disable the send-only feature.

If neither the `level-1` nor `level-2` keyword is configured, the send-only feature applies to both levels.The send-only option applies to both levels if no level is specified.

Use the no parameter with this command to unset the send-only option.

Command Syntax

```
authentication send-only (level-1|level-2|)
no authentication send-only (level-1|level-2|)
```

Parameters

`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

This option is disabled by default.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis 1
ZebOS(config-router)#authentication send-only level-1

ZebOS(config-router)#no authentication send-only level-1
```

bfd all-interfaces

Use this command to enable the Bidirectional Forwarding Detection (BFD) feature on the interfaces enabled with this ISIS instance.

This command sets BFD fall-over check for all the neighbors under specified process. To disable BFD checking on particular interface use `isis bfd disable` command at interface mode.

Use the no parameter with this command to disable BFD functionality for an ISIS instance.

Command Syntax

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

Parameters

None

Default

By default, the BFD feature is disabled.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis
ZebOS(config-router)#bfd all-interfaces

ZebOS(config-router)#no bfd all-interfaces
```

capability cspf

Use this command to enable the constrained shortest path first (CSPF) feature in the ISIS module. CSPF calculates optimum explicit route (ER), using Traffic Engineering Database and (TED) and pre-existing Label Switched Path (LSP). The resulting ER is used by a signaling protocol (RSVP-TE) to set up LSPs.

Use the no parameter with this command to disable CSPF functionality for an ISIS instance.

Command Syntax

```
capability cspf
no capability cspf
```

Parameters

None

Default

If this command is not used, the CSPF feature is disabled.

Command Mode

Router mode

Example

```
ZebOS(config)#router isis
ZebOS(config-router)#capability cspf
```

clear clns neighbors

Use this command to clear CLNS neighbor adjacencies.

Command Syntax

```
clear clns neighbors
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS>ena
ZebOS#clear clns neighbors
```

clear clns is-neighbors

Use this command to clear IS neighbor adjacencies.

Command Syntax

```
clear clns is-neighbors System-ID
```

Parameters

System-ID	Neighbor system ID in XXXX.XXXX.XXXX format.

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS>ena
ZebOS#clear clns is-neighbors
```

clear ip isis route

Use this command to clear IPv4 routes.

Command Syntax

```
clear ip isis (WORD|) route (redistribution|all)
```

Parameters

`WORD`	Routing area tag.
`redistribution`	Clear ISIS local redistribution routes.
`all`	Clear all of the ISIS routing table.s

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS>ena
ZebOS#clear ip isis route redistribution
```

clear ipv6 isis route

Use this command to clear IPv6 routes.

Command Syntax

```
clear ipv6 isis (WORD|) route (redistribution|all)
```

Parameters

`WORD`	Routing area tag.
`redistribution`	Clear ISIS local redistribution routes.
`all`	Clear all of the ISIS routing table.s

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS>ena
ZebOS#clear ip isis route redistribution
```

clear isis counter

Use this command to clear system-wide IS-IS counters (IsisSystemCounterEntry in RFC 4444).

Command Syntax

```
clear isis counter
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#clear isis counter
```

clear isis interface counter

Use this command to clear interface counters. If you do not specify a parameter, then counters for all interfaces are cleared.

Command Syntax

```
clear isis interface counter (IFNAME|)
```

Parameters

IFNAME	Interface name.

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#clear isis interface counter
```

clear isis process

Use this command to restart ISIS processes. If you do not specify a parameter, then all ISIS processes are restarted.

Command Syntax

```
clear isis (WORD|) process
```

Parameters

WORD	Routing area tag.

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#clear isis process
```

debug isis

Use this command to turn on debugging for specified criteria. Debug commands enable to show some debugging information about specified criteria into file or terminal.

Use the no parameter to turn off debugging for specified criteria.

Command syntax

```
debug isis (all|)
debug isis (authentication|bfd|checksum|events|hello (interface IFNAME | System-ID|)|ifsm|isis|local-updates|lsp|nfsm|nsm|pdu|protocol-errors|spf)
no debug isis (all|)
no debug all
no debug all isis
undebug all
undebug isis (all|)
undebug all isis
no debug isis (authentication|bfd|checksum|events|hello (interface IFNAME | System-ID|)|ifsm|isis|local-updates|lsp|nfsm|nsm|pdu|protocol-errors|spf)
undebug isis (authentication|bfd|checksum|events|hello (interface IFNAME | System-ID|)|ifsm|isis|local-updates|lsp|nfsm|nsm|pdu|protocol-errors|spf)
```

Parameters

`all`	Enables all debugging.
`authentication`	Debugging for authentication.
`checksum`	Debugging for checksums.
`bfd`	Debugging for bidirectional forwarding detection.
`events`	Debugging for internal events.
`hello`	Debugging for hello processing.
`interface`	Interface.
`IFNAME`	Interface name.
`System-ID`	System identifier.
`ifsm`	Debugging for interface finite state machine.
`isis`	Debugging for intermediate system to intermediate system.
`local-updates`	Debugging for local updates.
`lsp`	Debugging for label switched path.
`nfsm`	Debugging for neighbor finite state machine.
`nsm`	Debugging for NSM messages.
`pdu`	Debugging for protocol data unit.
`protocol-errors`	Debugging for protocol errors.

`spf`	Debugging for shortest path first route calculation.

Default

By default, all options are turned off.

Command Mode

Privileged Exec mode and Configure mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#debug isis pdu

ZebOS#configure terminal
ZebOS(config)#debug isis nsm
```

default-information originate

Use this command to originate reachability information to Default destination into LSP.

There is no default information in Level-2 domain by default, while Level-1 router calculates default to L1L2 route during SPF calculation. This command enables to originate default route into Level-2 domain.

Use the no parameter with this command to withdraw reachability information to default destination from LSP.

Command Syntax

```
default-information originate
no default-information originate
```

Parameters

`originate`	Specify to distribute a default route

Command Mode

Router mode, Address-family ipv6 mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#default-information originate

ZebOS(config-router)#address-family ipv6
ZebOS(config-router-af)#default-information originate
```

distance (IPv4)

Use this command in router mode to set the administrative distance for all IPv4 routes.

Use the no parameter with this command to remove an administrative distance.

Command Syntax

```
distance <1-255> (System-ID (WORD|)|)
no distance ((System-ID | System-ID WORD)|)
```

Parameters

<1-255>	Distance range.
System-ID	Source ID in XXXX.XXXX.XXXX format.
WORD	Access-list name.

Default

By default, all options are turned off.

Command Mode

Router mode

Examples

The following example shows setting the administrative distance for all routes.

```
ZebOS#configure terminal
ZebOS(config)#router isis
ZebOS(config-router)#distance 10
```

The following example shows setting the administrative distance for a specific route source.

```
ZebOS#configure terminal
ZebOS(config)#router isis
ZebOS(config-router)#distance 40 0000.0000.0001
```

distance

Use this command in router mode to set the administrative distance for all IPv6 routes.

Use the no parameter with this command to remove an administrative distance.

Command Syntax

```
distance <1-255>
no distance
```

Parameters

<1-255>	Distance range.

Default

By default, all options are turned off.

Command Mode

Address-family ipv6 mode

Examples

The following example shows setting the administrative distance for all routes for the IPv6 address family.

```
ZebOS>enable
ZebOS#con term
Enter configuration commands, one per line.  End with CNTL/Z.
ZebOS(config)#router isis
ZebOS(config-router)#address-family ipv6
ZebOS(config-router-af)#distance 20
```

domain-password

Use this command to set the authentication password for the Level-2 domain, and optionally, the authentication password on Level-2 SNP PDUs.

Configuring this command to enable authentication when receiving and sending LSP and SNP PDU in Level-2 domain. Domain password must be the same in Level-2 domain.

Use the `no` parameter with this command to clear the domain password.

Command Syntax

```
domain-password WORD
domain-password WORD authenticate snp (send-only|validate)
no domain-password
```

Parameters

`WORD`	The password string.
`authenticate`	Inserts the password into Level-1 SNP PDUs.
`snp`	SNP PDUs.
`send-only`	Only inserts the password into the Level-1 SNP PDUs, but does not check the password in SNP PDUs that it receives. Use this keyword during a software upgrade to ease the transition.
`validate`	Inserts the password into the Level-1 SNP PDUs, and checks the password in SNP PDUs that it receives.

Default

By default, there is no domain password.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#domain-password mypasswd

ZebOS(config)#router isis bb
ZebOS(config-router)#domain-password ipi authenticate snp send-only

ZebOS(config)#router isis bb
ZebOS(config-router)#no domain-password
```

dynamic-hostname

Use this command to configure the hostname to be advertised for an ISIS instance using the dynamic hostname exchange mechanism (RFC 2763) and system-ID-to-hostname translation.

This command configures a hostname to be used for the Dynamic Hostname Exchange Mechanism and System-ID to hostname translation. This is required to get accurate results when using the `show isis database` and a few other commands

Use the no parameter to disable the Hostname configured.

Command Syntax

```
dynamic-hostname
hostname dynamic
dynamic-hostname area-tag
no dynamic-hostname
no hostname dynamic
```

Parameters

`area-tag`	Use the routing area tag as the hostname, not the router's global hostname.

Default

By default, the Dynamic Hostname Exchange Mechanism is disabled.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#dynamic-hostname area-tag
```

exit-address-family

Use this command to exit the `address family` mode. See address-family ipv6 on page 23 for steps on how to enter the address family mode.

Command Syntax

```
exit-address-family
```

Parameters

None

Command Mode

Address Family mode

Examples

The following example shows the use of `exit-address-family` command and the change in the prompt after using this command.

```
ZebOS#configure terminal
ZebOS(config)#router isis 100
ZebOS(config-router)#address-family ipv6
ZebOS(config-router-af)#exit-address-family
ZebOS(config-router)#
```

ignore-lsp-errors

Use this command to ignore LSPs with checksum errors. By default, ISIS validates checksum for LSP whenever it receives LSPs and if the checksum has an error, the LSP will be dropped. Configuring this command to ignore the LSP checksum error and treat it as if checksum is passed.

Use the no parameter to turn off this function.

Command Syntax

```
ignore-lsp-errors
no ignore-lsp-errors
```

Parameters

None

Default

By default, the LSP checksum is checked on receipt.

Command Mode

Router mode

Example

In this sample, rtr1 does not drop LSP packets with bad checksum.

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#ignore-lsp-errors
```

ip route high-priority tag

Use this command to set a high priority tag value.

Use the no parameter to turn off this function.

Command Syntax

```
ip route high-priority tag <1-4294967295>
no ip route high-priority tag
```

Parameters

`<1-4294967295>` Tag value

Command Mode

Router mode

Example

```
ZebOS>ena
ZebOS#con term
Enter configuration commands, one per line.  End with CNTL/Z.
ZebOS(config)#router isis A
ZebOS(config-router)#ip route high-priority tag 500
```

ip router isis

Use this command to enable ISIS IPv4 routing on the interface. This command is mandatory to ISIS configuration. Match the ISIS instance tag to one of existing instance's tags, or a new instance with the tag name should be initiated, otherwise routing will not run on this interface.

Configuring this command, the router sends ISIS Hello with IP address TLV on this interface, and IP reachability information TLV in the LSP will be updated.

Use the no parameter with this command to disable ISIS IPv4 routing on the interface. This action does not clear the ISIS database. To clear the database, unconfigure the ISIS routing instance.

Command Syntax

```
ip router isis (WORD|)
no ip router isis (WORD|)
```

Parameters

WORD	ISIS instance name.

Default

By default, IPv4 routing is disabled on the router.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip router isis bb
```

ipv6 router isis

Use this command to enable ISIS IPv6 routing on the interface. This command is mandatory to IPv6 ISIS configuration. Match the ISIS instance tag to one of existing instance's tags, or a new instance with the tag name should be initiated, otherwise routing will not run on this interface.

Configuring this command, the router sends ISIS Hello with IPv6 address TLV on this interface, and IPv6 reachability information TLV in the LSP will be updated.

Use the `no` parameter with this command to disable ISIS IPv6 routing on the interface.

Command Syntax

```
ipv6 router isis (WORD|)
no ipv6 router isis (WORD|)
```

Parameters

`WORD`	ISIS instance name.

Default

By default, IPv6 routing is disabled on the router.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ipv6 router isis bb
```

isis authentication key-chain

Use this command to set the key chain to be used for authentication on the interface-related packets.

Authentication mode must be set to `md5` to configure the key chain. If no key chain is configured with the `key-chain` command, no key-chain authentication is performed. Only one authentication key-chain is applied to an ISIS interface at a time. That is, issuing a second `isis authentication key-chain` command overrides the first `isis authentication key-chain` command.

If neither the `level-1` nor `level-2` keyword is configured, the key chain applies to the level(s) on which the authentication mode is configured as `md5`. Authentication can be specified for an entire instance of ISIS, instead of at the interface level, by using the `authentication key-chain` command.

Use the `no` parameter with this command to unset the key chain used for authentication on the interface-related packets.

Command Syntax

```
isis authentication key-chain WORD (level-1|level-2|)
no isis authentication key-chain (level-1|level-2|)
no isis authentication key-chain WORD (level-1|level-2|)
```

Parameters

`WORD`	Chain name - valid authentication keys.
`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

By default, this option is disabled. The key chain applies to the level(s) on which authentication mode is configured as MD5 if no level is specified.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#isis authentication key-chain ipi level-1
```

isis authentication mode md5

Use this command to set the MD5 authentication mode. If clear text authentication was configured using the `isis password` command, the `isis authentication mode` command overrides the `isis password` command. If the `isis authentication mode` command was used, then subsequently an attempt is made to use the `isis password` command, the attempt fails.

To configure clear text authentication using the `isis password` command, first use the `no isis authentication mode` command. The the type of authentication and the level to which it applies can be specified for the entire ISIS instance, rather than per interface, using the `authentication mode` command.

Use the `no` parameter with this command to unset the MD5 authentication mode.

Command Syntax

```
isis authentication mode {md5|text} (level-1|level-2|)
no isis authentication mode {md5|text} (level-1|level-2|)
```

Parameters

`md5`	Keyed message digest
`text`	Text mode
`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

By default, this option is disabled. The authentication mode will be set to MD5 for both levels if no level is specified.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#isis authentication mode md5 level-1
```

isis authentication send-only

Use this command to set the send-only option to the interface-related packets.

Use this command before configuring the ISIS authentication mode and ISIS authentication key-chain, so that the implementation of authentication goes smoothly. That is, the routers will have more time for the keys to be configured on each router if authentication is inserted only on the packets being sent, not checked on packets being received. After all routers that must communicate are configured with this command, enable the authentication mode and key chain on each router.

Use the no parameter with this command to unset the send-only option to the interface-related packets.

Command Syntax

```
isis authentication send-only (level-1|level-2|)
no isis authentication send-only (level-1|level-2|)
```

Parameters

`level-1`	Specify an authentication key-chain for level-1 PDUs.
`level-2`	Specify an authentication key-chain for level-2 PDUs.

Default

By default, this option is disabled. The send-only option applies to both levels if no level is specified.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#isis authentication send-only level-1
```

isis bfd

Use this command to enable/disable the BFD check on interface.

The `isis bfd` command allows a user to enable BFD on an interface. The `isis bfd disable` command disables BFD checking on an interface. However, the `no isis bfd` and `no isis bfd disable` commands both remove the enable/disable configuration, but do not disable/enable BFD.

The `bfd all-interfaces` command enables BFD on all interfaces attached to an instance then configuring. This command disables BFD configuration on a particular interface.

Command Syntax

```
isis bfd (disable|)
no isis bfd (disable|)
```

Parameters

`disable`	Specify to disable BFD.

Default

By default, bfd feature enable/disable is not configured.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis bfd disable
```

isis circuit-type

Use this command to set the circuit type for the interface.

If level-1 or level-2-only is specified in this command, ISIS sends only the specified level of PDUs. On the point-to-point interface, there is only one type of Hello packet, so in this case ISIS Hello will be sent regardless of circuit-type. If is-type is configured as level-1 or level-2 only, routing for this instance is performed for only the specified level. In this manner, only the particular level of PDU is sent on the interface.

Use the no parameter to reset circuit type to the default.

Command Syntax

```
isis circuit-type (level-1|level-1-2|level-2-only)
no isis circuit-type
```

Parameters

`level-1`	Specify that only Level-1 adjacencies are formed.
`level-1-2`	Specify that Level-1-2 adjacencies are formed.
`level-2-only`	Specify that only Level-2 adjacencies are formed.

Default

By default, the default circuit-type is level-1-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis circuit-type level-2-only
```

isis csnp-interval

Use this command to set CSNP (Complete sequence number PDU) interval in seconds.

Configuring this command changes the interval between two consecutive CSNP transmission. By default, CSNP is sent every 10 seconds only by LAN DIS. This parameter is only valid on broadcast interface, since periodic CSNP is only sent on broadcast interface, while CSNP on Point-to-Point interface is sent only when adjacency is initiated.

Use the `no` parameter with this command to reset CSNP interval to the default value.

Command Syntax

```
isis csnp-interval <1-65535> (level-1|level-2|)
no isis csnp-interval (level-1|level-2|)
no isis csnp-interval <1-65535> (level-1|level-2|)
```

Parameters

`<1-65535>`	Specify the CSNP interval in seconds.
`level-1`	Specify Level-1 CSNP.
`level-2`	Specify Level-2 CSNP.

Default

By default, ISIS uses 10 seconds for the interval and the interval is applied to both level-1 and level-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis csnp-interval 20
```

isis hello

Use this command to configure the padding of the ISIS Hello packet. ISIS pads the Hello packet by default to notify neighbors of the supported MTU size.

Use the no parameter with this command to disable the padding.

Command Syntax

```
isis hello padding
no isis hello padding
```

Parameters

`padding`	Specify pad hello packets

Default

By default, ISIS pads the ISIS Hello packet.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis hello padding
```

isis hello-interval

Use this command to set the Hello interval in seconds. The Hello-interval is set with the hello-multiplier (see `isis hello-multiplier` command).

Configuring this command changes the time interval between two consecutive Hello transmissions. If a device receives its own LSP with a maximum sequence number, then it suspends ISIS for the hold interval. DIS sends Hello transmissions at three times the rate than non-DIS. If ISIS is elected as DIS on this interface, ISIS sends Hello every 3.3 seconds.

If `minimal` keyword is specified, Holding timer in Hello PDU is set to 1 second and Hello interval is calculated by dividing by the hello-multiplier. For example, if the hello-multiplier is configured as 4 and `hello-interval minimal` is the command used, an Hello PDU is sent every 250 milliseconds.

Use the `no` parameter to set the Hello interval to the default.

Command Syntax

```
isis hello-interval <1-65535> (level-1|level-2|)
isis hello-interval minimal (level-1|level-2|)
no isis hello-interval (level-1|level-2|)
no isis hello-interval <1-65535> (level-1|level-2|)
no isis hello-interval minimal (level-1|level-2|)
```

Parameters

`<1-65535>`	Specify the hello interval in seconds.
`minimal`	Specify the holding-time as 1 second.
`level-1`	Specify Level-1 CSNP.
`level-2`	Specify Level-2 CSNP.

Default

By default, ISIS uses 10 seconds for the interval and the interval is applied to both level-1 and level-2.

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOSZebOS(config)#interface eth0
ZebOS(config-if)#isis hello-interval 5 level-1

ZebOS(config)#interface eth0
ZebOS(config-if)#isis hello-interval minimal
```

isis hello-multiplier

Use this command to set multiplier for Hello holding time.

Changes Holding Timer in Hello PDU. Holding timer is calculated by “Hello-Interval” multiplied by this value. If `minimal` keyword is specified with the Hello-Interval, the holding timer is set to 1 second and the hello-interval is calculated by dividing 1 by this value.

Use the `no` parameter with this command to set multiplier to the default.

Command Syntax

```
isis hello-multiplier <2-100> (level-1|level-2|)
no isis hello-multiplier (level-1|level-2|)
no isis hello-multiplier <2-100> (level-1|level-2|)
```

Parameters

`<2-100>`	Specify a hello multiplier value.
`level-1`	Specify Level-1 hello.
`level-2`	Specify Level-2 hello.

Default

By default, ISIS uses 3 seconds for the multiplier value and the multiplier is applied to both level-1 and level-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis hello-multiplier 4
```

isis lsp-interval

Use this command to set the Link State Packet (LSP) transmission interval.

Configuring this command changes the minimum interval between two consecutive LSP transmission. When flooding or some other event triggers LSP to transmit, the LSP is put on the interface queue and scheduled to transmit according to this interval. Two consecutive LSP transmissions are scheduled to have at least this interval.

Use the `no` parameter with this command to set LSP transmission interval to the default.

Command Syntax

```
isis lsp-interval <1-4294967295>
no isis lsp-interval
```

Parameters

`<1-4294967295>` Specify an LSP transmission interval in milliseconds.

Default

By default, ISIS uses 33 milliseconds for the interval.

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis lsp-interval 100

ZebOS(config-if)#no isis lsp-interval
```

isis mesh-group

Use this command to set Mesh Group ID on the current interface.

Use the no parameter to unset mesh group on the current interface.

Command Syntax

```
isis mesh-group <1-4294967295>
isis mesh-group blocked
no isis mesh-group
```

Parameters

`<1-4294967295>`	Specify a mesh group number
`blocked`	Specify to block LSPs on the current interface. If an interface is configured as “mesh group blocked,” the standard LSP database synchronization process is applied if the interface receives CSNP or PSNP.

Default

By default, mesh groups are not enabled on this interface.

Command Mode

Interface mode

Examples

```
ZebOS(config)#interface eth0
ZebOS(config-if)#isis mesh-group 20

ZebOS(config)#interface eth2
ZebOS(config-if)#isis mesh-group blocked

ZebOS(config)#interface eth2
ZebOS(config-if)#no isis mesh-group
```

isis metric

Use this command to set default metric for the interface. The interface default metric is put into IP reachability information TLVs, IS reachability information TLVs and IPv6 reachability TLVs in LSPs. The value is used for SPF calculation, and is applied when the metric-style is configured as “narrow”.

Use the no parameter with this command to set default metric to the default.

Command Syntax

```
isis metric <1-63> (level-1|level-2|)
no isis metric (level-1|level-2|)
no isis metric <1-63> (level-1|level-2|)
```

Parameters

<1-63>	Specify a default metric.
level-1	Specify default metric for level-1 circuit.
level-2	Specify default metric for level-2 circuit.

Default

By default, ISIS uses 10 for the metric value and the value is applied to both level-1 and level-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis metric 20
```

isis network

Use this command to change a broadcast interface network type to a point-to-point network type.

Use the no parameter with this command to revert to the default setting of a broadcast interface network type.

Command Syntax

```
isis network (broadcast|point-to-point)
no isis network (broadcast|point-to-point|)
```

Parameters

`broadcast`	Specify ISIS a broadcast multi-access network.
`point-to-point`	Specify ISIS a point-to-point network.

Default

By default, the network is set to a broadcast multi-access network type.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis network point-to-point
```

isis password

Use this command to set the authentication password of Hello PDU on the interface.

Use the no parameter to clear the password.

Command Syntax

```
isis password WORD (level-1|level-2|)
no isis password (level-1|level-2|)
no isis password WORD (level-1|level-2|)
```

Parameters

WORD	Specify a password string.
level-1	Specify a password for Level-1 hello PDUs.
level-2	Specify a password for Level-2 hello PDUs.

Default

By default, no password is configured; this applies to both level-1 and level-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis password mypassword level-1
```

isis priority

Use this command to set the priority for LAN DIS election. This command changes the priority value in LAN ISIS Hello PDUs. A lower priority value is less preferred in DIS election, and a higher priority value is more preferred.

Note: This command is not valid for Point-to-Point interface.

Use the no parameter to set priority to the default.

Command Syntax

```
isis priority <0-127> (level-1|level-2|)
no isis priority (level-1|level-2|)
no isis priority <0-127> (level-1|level-2|)
```

Parameters

`<0-127>`	Priority value
`level-1`	Specify a password for Level-1 hello PDUs.
`level-2`	Specify a password for Level-2 hello PDUs.

Default

By default, ISIS uses 64 for the priority value, and the priority is applied to both level-1 and level-2.

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis priority 127
```

isis restart grace-period

Use this command to configure the T3 timer, the time the restarting router retains the forwarding table.

Use the no parameter to use the default value.

Command Syntax

```
isis restart grace-period <1-65535>
no isis restart grace-period (<1-65535>|)
```

Parameters

<1-65535>	Specify the number of seconds in the grace period.

Default

By default, ISIS uses 65535 for the period value, and the value is applied to both level-1 and level-2.

Command Mode

Configure mode

Examples

The following example enables and then disables a restart grace period at one second.

```
ZebOS#configure terminal
ZebOS(config)#isis restart grace-period 1

ZebOS(config)#no isis restart grace-period 1
```

isis restart-hello-interval

Use this command to configure the T1 timer, interval of ISIS Hello packet with restart TLV.

Use the no parameter to use the default value.

Command Syntax

```
isis restart-hello-interval <1-65535> (level-1|level-2|)
no isis restart-hello-interval <1-65535> (level-1|level-2|)
no isis restart-hello-interval (level-1|level-2|)
```

Parameters

`<1-65535>`	Specify the number of seconds in the interval.
`level-1`	Specify the hello-interval for level-1 IIHs.
`level-2`	Specify the hello-interval for level-1 IIHs.

Default

By default, ISIS uses 3 seconds for the hello value, and the interval is applied to both level-1 and level-2.

Command Mode

Interface mode

Example

The following example enables and then disables a restart hello interval at 123 seconds for a level 1 interface.

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis restart-hello-interval 123 level-1

ZebOS(config-if)#no isis restart-hello-interval 123 level-1
```

isis restart helper

Use this command to configure the router's helper mode capability.

Use the no parameter to disable the helper mode for this router.

Command Syntax

```
isis restart helper
no isis restart helper
```

Parameters

None

Default

By default, most routers are not a restart helper router.

Command Mode

Configure mode

Example

The following example enables and then disables ISIS restart helper.

```
ZebOS#configure terminal
ZebOS(config)#isis restart helper

ZebOS(config)#no isis restart helper
```

isis restart suppress-adjacency

Use this command to enable ISIS to request that its adjacency be suppressed after the ISIS daemon process starts or restarts until the Link State Packet Database (LSPDB) synchronizes.

Use the no parameter to disable suppress-adjacency.

Command Syntax

```
isis restart suppress-adjacency
no isis restart suppress-adjacency
```

Parameters

None

Default

By default, ISIS does not request that its adjacency be suppressed after the ISIS daemon process starts or restarts.

Command Mode

Configure mode

Example

The following example enables and then disables ISIS restart suppress adjacency.

```
ZebOS#configure terminal
ZebOS(config)#isis restart suppress-adjacency

ZebOS(config)#no isis restart suppress-adjacency
```

isis retransmit-interval

Use this command to set LSP retransmission interval.

Use the no parameter to set the interval to the default.

Command Syntax

```
isis retransmit-interval <0-65535>
no isis retransmit-interval
```

Parameters

<0-65535>	Specify an interval for retransmission of the same LSP in seconds.

Default

By default, ISIS uses an interval of 5 seconds.

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis retransmit-interval 10

ZebOS(config-if)#no isis retransmit-interval
```

isis tag

Use this command to sets the tag for link-state packets (LSPs) sent out advertising routes for networks directly connected to an interface.

If you do not specify a parameter, then the tag value is set for level-1-2 boundary.

Use the no parameter to unset the tag.

Command Syntax

```
isis tag <1-4294967295> (level-1|level-2|)
no isis tag
```

Parameters

`<1-4294967295>`	Tag value.
`level-1`	Specify the tag value for the level-1 boundary.
`level-2`	Specify the tag value for the level-2 boundary.

Command Mode

Interface mode

Examples

```
ZebOS>ena
ZebOS#con term
Enter configuration commands, one per line.  End with CNTL/Z.
ZebOS(config)#interface eth0
ZebOS(config-if)#isis tag 500 level-1
```

isis wide-metric

Use this command to set wide metric for the interface.

Interface wide-metric is put into Extended IP reachability TLVs, Extended IS reachability TLVs and IPv6 reachability TLVs in LSPs. The value is used for SPF calculation. This value is applied when metric-style is configured as 'wide'.

Use the `no` parameter to set wide metric to the default.

Command Syntax

```
isis wide-metric <1-16777214> (level-1|level-2|)
no isis wide-metric <1-16777214> (level-1|level-2|)
no isis wide-metric (level-1|level-2|)
```

Parameters

`<1-16777214>`	Specify a wide metric.
`level-1`	Specify the wide metric for level-1 circuit.
`level-2`	Specify the wide metric for level-2 circuit.

Default

By default, ISIS uses 10 for the metric value and the metric is applied to both level-1 and level-2.

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#isis wide-metric 100

ZebOS(config)#interface eth0
ZebOS(config-if)#no isis wide-metric 100
```

ispf

Use this command to enable incremental SPF for a routing process.

Use the no parameter to disable incremental SPF from a routing process.

Command Syntax

```
ispf
ispf (level-1|level-1-2|level-2-only)
no ispf
```

Parameters

`level-1`	Act as level-1 only IS.
`level-1-2`	Act as level-1-2 IS.
`level-2-only`	Act as level-2 only IS.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#ispf level-1

ZebOS(config)#router isis bb
ZebOS(config-router)#no ispf
```

is-type

Use this command to set the IS to the specified level of routing.

Changing `is-type` brings down, then brings up a particular level of routing. There is a limitation: Only one ISIS instance can run Level-2 routing (either Level-2 only IS, or Level-1-2 IS).

Use the `no` parameter to set the IS to the default.

Command Syntax

```
is-type (level-1|level-1-2|level-2-only)
no is-type
```

Parameters

`level-1`	Act as level-1 only IS.
`level-1-2`	Act as level-1-2 IS.
`level-2-only`	Act as level-2 only IS.

Default

By default, ISIS uses level-1-2 if there is no Level-2 instance nor a Level-1-2 instance. Otherwise, it uses level-1.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#is-type level-1

ZebOS(config)#router isis bb
ZebOS(config-router)#no is-type
```

key chain

Use this command to enter the key chain management mode and to configure a key chain with a key chain name. This command allows you to enter the keychain mode to specify keys on this key chain.

Command Syntax

```
key chain WORD
no key chain WORD
```

Parameters

WORD	Specify the name of the key chain to manage.

Command Mode

Configure mode

Examples

The following example shows the creation of a key chain named `mychain` and the change to keychain mode:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#
```

key

Use this command to manage, add or delete authentication keys in a key-chain. This command allows you to enter the keychain-key mode to set a password for the key.

Command Syntax

```
key <0-2147483647>
no key <0-2147483647>
```

Parameters

`<0-2147483647>` Specify a key identifier.

Default

By default, ISIS uses level-1-2 if there is no Level-2 instance nor a Level-1-2 instance. Otherwise, it uses level-1.

Command Mode

Keychain mode

Examples

The following example configures a key number 1 and shows the change to keychain-key command mode.

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#
```

key-string

Use this command to define a password to be used by a key.

Use the no parameter with this command to disable this feature.

Command Syntax

```
key-string LINE
no key-string
```

Parameters

LINE	Specify a string of characters to be used as a password by the key.

Command Mode

Keychain-key mode

Examples

In the following example, the password for `key 1` in the key chain named `mychain` is set to `prime`:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#key-string prime

ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#no key-string
```

lsp-gen-interval

Use this command to set minimum interval before regenerating the same LSP. The smaller the interval, the faster the convergence. However, this setting might cause more frequent flooding.

Use the no parameter with this command to set the interval to the default.

Command Syntax

```
lsp-gen-interval <1-120>
lsp-gen-interval (level-1|level-2) <1-120>
no lsp-gen-interval
```

Parameters

<1-120>	Specify an LSP generation interval in seconds.
level-1	Specify an interval for Level-1 IS.
level-2	Specify an interval for Level-2 IS.
<1-120>	Specify a minimum interval in seconds.

Default

By default, ISIS uses 30 seconds for the interval and the interval is applied to both level-1 and level-2.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#lsp-gen-interval 5
```

lsp-mtu

Use this command to set minimum interval before regenerating the same LSP.

Use the no parameter with this command to set the interval to the default.

Command Syntax

```
lsp-mtu (level-1|level-2|) <512-1492>
no lsp-mtu (level-1|level-2|)
```

Parameters

`<512-1492>`	Specify an MTU size
`level-1`	Specify an interval for Level-1 IS.
`level-2`	Specify an interval for Level-2 IS.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#lsp-mtu 555
```

lsp-refresh-interval

Use this command to set the LSP refresh interval.

F5 Networks recommends making the `lsp-refresh-interval` smaller than `max-lsp-lifetime` value.

Use the `no` parameter to set the interval to the default value.

Command Syntax

```
lsp-refresh-interval <1-65535>
no lsp-refresh-interval
```

Parameters

`<1-65535>`	Specify an LSP refresh interval in seconds.

Default

By default, the interval is 900 seconds.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#lsp-refresh-interval 600

ZebOS(config)#router isis bb
ZebOS(config-router)#no lsp-refresh-interval
```

max-area-address

Use this command to set the maximum number of ISIS areas that can be configured on this router with the `net` command. By default, ISIS permits a maximum of three areas that can be defined on a router.

Use the `no` parameter with this command to set the maximum number of ISIS areas to its default (3).

Command Syntax

```
max-area-address <3-254>
no max-area-address
```

Parameters

`<3-254>`	The maximum number of areas in the network.

Default

By default, the maximum number of areas is 3.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis net2
ZebOS(config-router)#max-area-address 5
ZebOS(config-router)#net 71.0001.0000.0000.0001.00
ZebOS(config-router)#net 72.0001.0000.0000.0001.00
ZebOS(config-router)#net 73.0001.0000.0000.0001.00
ZebOS(config-router)#net 74.0001.0000.0000.0001.00
ZebOS(config-router)#net 75.0001.0000.0000.0001.00
```

Related Commands

net

max-lsp-lifetime

Use this command to set the maximum LSP lifetime. You must set `max-lsp-lifetime` greater than `lsp-refresh-interval`.

Use the `no` parameter to set the lifetime to the default.

Command Syntax

```
max-lsp-lifetime <350-65535>
no max-lsp-lifetime
```

Parameters

`<350-65535>`	Specify an maximum LSP lifetime in seconds.

Default

By default, `max-lsp-lifetime` is set to 1200 seconds.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#max-lsp-lifetime 1500

ZebOS(config)#router isis bb
ZebOS(config-router)#no max-lsp-lifetime
```

metric-style

Use this command to configure the ISIS metric style. Use the following table when changing the method of how TLV encodes and SPF calculates a decision:

Metric-style Command	Wide SPF	Wide TLV	Narrow SPF	Narrow TLV
narrow (default)	OFF	OFF	ON	OFF
narrow transition	ON	OFF	ON	ON
wide	ON	ON	OFF	OFF
wide transition	ON	ON	ON	OFF
transition	ON	ON	ON	ON

Where:

- Wide SPF: Uses wide TLVs for SPF calculation.
- Wide TLV: Encodes wide TLVs in the LSP.
- Narrow SPF: Uses narrow TLVs for SPF calculation.
- Narrow TLV: Encodes narrow TLVs in the LSP.

Use the no parameter to set the style to the default style, narrow.

Command Syntax

```
metric-style (narrow|wide|transition) (level-1|level-1-2|level-2|)
metric-style (narrow|wide) transition (level-1|level-1-2|level-2|)
no metric-style (narrow|wide|transition) (level-1|level-1-2|level-2|)
```

Parameters

`narrow`	Specify the old style of TLVs with narrow metric.
`wide`	Specify the new style of TLVs to carry wider metric.
`transition`	Specify to send and accept both styles of TLVs during transition.
`level-1`	Specify the level-1 metric style.
`level-2`	Specify the level-2 metric style.
`level-1-2`	Specify the level-1-2 metric style.
`transition`	Accept both styles of TLVs during transition

Default

By default, ISIS uses narrow metric style for level 1 and 2.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis bb
ZebOS(config-router)#metric-style narrow transition
```

multi-topology

Use this command to configure the ISIS topology type. Use the no parameter with this command to set the topology type back to the default type, which is single. Use the following table when changing the method of how TLV encodes and SPF calculates a decision:

Metric-style Command	Wide SPF	Wide TLV	Narrow SPF	Narrow TLV
narrow (default)	OFF	OFF	ON	OFF
narrow transition	ON	OFF	ON	ON
wide	ON	ON	OFF	OFF
wide transition	ON	ON	ON	OFF
transition	ON	ON	ON	ON

Where:

- Wide SPF: Use wide TLVs for SPF calculation.
- Wide TLV: Encode wide TLVs in the LSP.
- Narrow SPF: Use narrow TLVs for SPF calculation.
- Narrow TLV: Encode narrow TLVs in the LSP.

Command Syntax

```
multi-topology (transition|)
multi-topology (level-1|level-1-2|level-2) (transition|)
no multi-topology (transition|)
no multi-topology (level-1|level-1-2|level-2) (transition|)
```

Parameters

`level-1`	Specify to enable multi-topology for level 1.
`level-2`	Specify to enable multi-topology for level 2.
`level-1-2`	Specify to enable multi-topology for levels 1 and 2.
`transition`	Specify to accept and generate both IS-IS IPv6 and multi-topology IPv6 TLVs.

Default

ISIS topology type applies to levels 1 and 2.

Command Mode

Address-family IPv6 mode

Examples

The following example configures the ISIS multi-topology type as transition for levels 1 and 2.

```
ZebOS(config)#router isis bb
ZebOS(config-router)#address-family ipv6 unicast
ZebOS(config-router-af)#multi-topology transition
```

net

Use this command to add a Network Entity Title (NET) for the instance.

On a router running ISIS, a NET can be 8 to 20 bytes in length. The last byte is always the n-selector, and must be zero. The n-selector indicates no transport entity, and means that the packet is for the routing software of the system. The six bytes directly preceding the n-selector are the system ID. The system ID length is a fixed size and cannot be changed. The system ID must be unique throughout each area (Level 1) and throughout the backbone (Level 2).

The bytes preceding the system ID are the area ID, which can be from 1 - 13 bytes in length. By default, a maximum of three NETs per router are allowed with a different area ID but the system ID should be the same for all NETs. You can increase the number of area IDs per system ID with the `max-area-address` command.

Use the `no` parameter to remove the NET.

Command Syntax

```
net NET
no net NET
```

Parameters

`NET`	Specify a network entity title (NET) in 1 to 13 octets (that is, XX.XXXX. ... .XXXX.XX).

Default

By default, ISIS does not configure a NET and routing is not enabled for the interface.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#net 49.0000.0001.0002.0003.00
```

passive-interface

Use this command to suppress routing updates on all interfaces or on a specified interface, which puts the interfaces into passive mode. To advertise passive prefixes in LSP, there is no need to have at an interface configured with ip router isis. Enabling passive interface on an ISIS enabled interface disables ISIS on the interface and makes the interface passive.

Use the no parameter with this command to remove interfaces from passive mode

Command Syntax

```
passive-interface (IFNAME |)
no passive-interface (IFNAME |)
```

Parameters

IFNAME	Indicates an interface name.

Command Mode

Router mode

Examples

The following suppresses routing updates on a specified interface.

```
ZebOS#configure terminal
ZebOS(config)#router isis 100
ZebOS(config-router)#passive-interface eth0

ZebOS(config)#router isis 100
ZebOS(config-router)#no passive-interface eth0
```

prc-interval-exp

Use this command to configure exponential back-off delay between PRC calculations.

Use the no parameter to disable any set exponential back-off delay between PRC calculations.

Command Syntax

```
prc-interval-exp
prc-interval-exp <0-2147483647> <0-2147483647>
no prc-interval-exp
```

Parameters

<0-2147483647>	Set the minimum delay between receiving a change to PRC calculation in milliseconds.
<0-2147483647>	Set the maximum delay between receiving a change to PRC calculation in milliseconds.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis
ZebOS(config-router)#prc-interval-exp 100 10000

ZebOS(config)#router isis
ZebOS(config-router)#no prc-interval-exp
```

protocol-topology

Use this command to configure ISIS Protocol Topology Support.

Use the no parameter to enable standard ISIS support.

Command Syntax

```
protocol-topology
no protocol-topology
```

Parameters

None

Default

By default, standard ISIS support (according to ISO 10589 and RFC 1195) is used.

Command Mode

Router mode

Examples

```
ZebOS(config)#router isis bb
ZebOS(config-router)#metric-style wide
ZebOS(config-router)#protocol-topology

ZebOS(config)#router isis bb
ZebOS(config-router)#no protocol-topology
```

redistribute

Use this command to redistribute routes from another protocol into the ISIS routing table.

Use the no parameter to disable this function.

Command Syntax

```
redistribute
redistribute (kernel|connected|static|rip|ospf|bgp) {metric <0-4261412864>|metric-
  type (internal|external)|level-1|level-2|level-1-2|?route-map WORD}
no redistribute (kernel|connected|static|rip|ospf|bgp)
```

Parameters

kernel	Redistribute kernel routes.
connected	Redistribute connected routes.
static	Redistribute static routes.
rip	Redistribute RIP routes.
ospf	Redistribute OSPF routes.
bgp	Redistribute BGP routes.
metric	Specify the metric for redistributed routes.
<0-4261412864>	Specify the IS-IS default metric.
metric-type	Specify the IS-IS exterior metric type for redistributed routes:
internal	Set IS-IS internal metric type.
external	Set IS-IS external metric type.
level-1	IS-IS Level-1 routes.
level-2	IS-IS Level-2 routes.
level-1-2	IS-IS Level-1 and Level-2 routes.
route-map	Specify a Route map reference.
WORD	Specify name of the route-map.

Command Mode

Router mode

Examples

```
ZebOS>ena
ZebOS#con term
Enter configuration commands, one per line.  End with CNTL/Z.
ZebOS(config)#router isis A
ZebOS(config-router)#redistribute bgp metric 12
```

redistribute isis

Use this command to redistribute reachability information from one level to the other level. If an distribute-list name is given with this command for an access list that does not exist, the routes are still redistributed.

Use the no parameter with this command to stop redistribution.

Command Syntax

```
redistribute isis level-1 into level-2
redistribute isis level-2 into level-1
redistribute isis level-1 into level-2 distribute-list WORD
redistribute isis level-2 into level-1 distribute-list WORD
no redistribute isis level-1 into level-2
no redistribute isis level-2 into level-1
```

Parameters

`level-1`	Specify an inter-area route from level-1.
`level-2`	Specify an inter-area routes from level-2.
`into`	Specify a from level-n level into level-m.
`level-1`	Specify an inter-area route into level-1.
`level-2`	Specify an inter-area routes into level-2.
`distribute-list`	Indicate the distributed-list parameter.
`WORD`	Specify the actual selected route.

Default

By default, ISIS redistributes selected L1 routes into L2.-2.

Command Mode

Router mode, Address-family IPv6

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#redistribute isis level-2 into level-1

ZebOS(config)#router isis bb
ZebOS(config-router)#redistribute isis level-2 into level-1 distribute-list
new

ZebOS(config)#router isis bb
ZebOS(config-router)#no redistribute isis level-2 into level-1
```

restart isis graceful

Use this command to force to restart the ISIS router.

Command Syntax

```
restart isis graceful (grace-period <1-65535>|)
```

Parameters

`grace-period`	Specify a grace period in seconds <1-65535>.

Default

By default, the ISIS router is not restarted gracefully.

Command Mode

Privileged Exec mode

Example

```
ZebOS#restart isis graceful grace-period 60
```

restart-timer

Use this command to restart the ISIS timer.

Use the no parameter with this command to negate this command.

Command Syntax

```
restart-timer <5-65535> (level-1|level-1-2|level-2|)
no restart-timer (level-1|level-1-2|level-2|)
no restart-timer <5-65535> (level-1|level-1-2|level-2|)
```

Parameters

`<5-65535>`	Specify the restart timer in seconds
`level-1`	Specify that restart is only for Level-1.
`level-1-2`	Specify that restart is for both Level-1 and Level-2.
`level-2`	Specify that restart is only for Level-2.

Command Mode

Router mode

Example

The following example enables and then disables the restart timer at 555 seconds for a level 2 interface.

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#restart-timer 555 level-2

ZebOS(config)#router isis bb
ZebOS(config-router)#no restart-timer 555 level-2
```

router isis

Use this command to initiate an ISIS routing instance. Initiates ISIS routing instance and enters router configuration mode. Configure at least one NET to start routing. Also, enable particular interface with ip router isis command or ipv6 router isis command.

Use the no parameter with this command to remove an ISIS routing instance.

Command Syntax

```
router isis (WORD|)
no router isis (WORD|)
```

Parameters

WORD	Specify an ISO routing instance tag.

Command Mode

Configure mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router isis New
ZebOS(config-router)#
```

send-lifetime

Use this command to specify the time period during which the authentication key on a key chain can be sent.

Use the no parameter with this command to negate this command.

Command Syntax

```
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> infinite
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> duration <1-2147483646>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> duration <1-2147483646>
no send-lifetime
```

Parameters

`HH:MM:SS`	Specify the start time of accept-lifetime in hours, minutes and seconds.
`<1-31>`	Specify the day of the month to start.
`MONTH`	Specify the month of the year to start as the first three letters of the month, for example, Jan.
`<1993-2035>`	Specify the year to start.
`HH:MM:SS`	Specify the end time of accept-lifetime in hours, minutes and seconds.
`<1-31>`	Specify the day of the month to end.
`MONTH`	Specify the month of the year to end as the first three letters of the month, for example, Jan.
`<1993-2035>`	Specify the year to end.
`duration`	Indicate the duration parameter.
`<1-2147483646>`	Specify the actual end time duration of a key in seconds.
`infinite`	Specify the end time to never expire.

Command Mode

Keychain-key mode

Examples

The following example shows the setting of `send-lifetime` for `key 1` on the key chain named `mychain`:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#send-lifetime 03:03:01 Jan 3 2004 04:04:02 Dec 6
2006
```

set-overload-bit

Use this command to set the overload-bit in self-LSPs. If the overload-bit is set in LSPs, the router is not used as a transit router during SPF calculation. This command causes a router to update its own LSP with the overload bit set and causes the other routers not to use this router as a transit or forwarding router. The router continues to receive LSPs when the overload bit is set. If the `on-startup` option is specified, the router sets the overload bit only at startup, then clears the bit after the specified interval has elapsed. If the `on-startup` option is specified using the `wait-for-bgp` option, the overload bit is setup at startup, then the bit is cleared after the BGP router signals it has finished converging or if the router does not signal it has finished converging in 10 minutes. If there is no BGP process running, the overload bit clears immediately.

If the BGP process is started later than the overload bit is set, the bit clears after the BGP router signals it has finished converging or if the BGP router does not signal it has finished converging in 10 minutes. If the `suppress` option is specified, the router suppresses the redistribution of specified types of reachability data during overload state. The `suppress` option can be used with the `external` or `interlevel` parameters, or both parameters.

Use the `no` parameter to clear the overload-bit from self-LSPs.

Command Syntax

```
set-overload-bit ({suppress (external|interlevel|external interlevel|interlevel
  external)|on-startup (<5-86400>|wait-for-bgp)}|)
no set-overload-bit
```

Parameters

`suppress`	Specify to suppress specific types of IP prefixes.
`external`	Specify to redistribute external reachability (to prevent the IP prefixes learned from other protocols from being advertised).
`interlevel`	Specify to redistribute interlevel reachability.
`on-startup`	Specify an interval in seconds after which the overload state is exited.
`<5-86400>`	Specify the time in seconds to advertise one self as overloaded after reboot.
`wait-for-bgp`	Specify that BGP determines when to unset the overload bit.

Default

By default, no overload-bit is set.

Command Mode

Router mode

Example

This example sets overload bit at startup, does not unset the overload bit until BGP converges, suppresses redistribution between levels, and suppresses redistribution from external routing protocols while the overload bit is set.

```
ZebOS(config)#router isis bb
ZebOS(config-router)#set-overload-bit on-startup wait-for-bgp suppress
interlevel external
```

spf-interval-exp

Use this command to set the minimum and maximum hold intervals between Shortest Path First (SPF) calculations.

The `spf-interval-exp` command configures the minimum and maximum interval time between the receipt of a topology change and the calculation of the SPF.

Use the `no` parameter with this command to set the minimum and maximum hold intervals to the default.

Command Syntax

```
spf-interval-exp <0-2147483647> <0-2147483647>
spf-interval-exp (level-1|level-2) <0-2147483647> <0-2147483647>
no spf-interval-exp
```

Parameters

`<0-2147483647>`	Specify the minimum delay between receiving a change to the SPF calculation in milliseconds. The default SPF minimum hold-time interval value is 500 milliseconds.
`<0-2147483647>`	Specify the maximum delay between receiving a change to the SPF calculation in milliseconds. The default SPF maximum hold-time interval value is 50 seconds.
`level-1`	Specify an interval for Level-1 IS.
`level-2`	Specify an interval for Level-2 IS.

Default

By default, ISIS uses 500 milliseconds and 50,000 milliseconds for the minimum and maximum hold intervals, respectively. The values are applied to both level-1 and level-2 if the `level` parameter is omitted.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#spf-interval-exp level-1 600 60000

ZebOS(config)#router isis bb
ZebOS(config-router)#no spf-interval-exp level-1
```

summary-address

Use this command to configure Summary Address to summarize IPv4 reachability information.

Use the no parameter with this command to unconfigure the summary.

Command Syntax

```
summary-address A.B.C.D/M (level-1|level-1-2|level-2|) (metric) (<1-63>|)
no summary-address A.B.C.D/M
```

Parameters

A.B.C.D/M	Specify the IPv4 prefix to be announced.
level-1	Specify the reachability information only for Level-1.
level-1-2	Specify the reachability information for both Level-1 and Level-2.
level-2	Specify the reachability information only for Level-2.
metric	Specify the metric for the summarized address.
<1-63>	Specify the metric. The default is 0.

Default

By default, ISIS does not configure the summary-address. Summary-address is applied to Level-2 IS if level parameter is omitted.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#summary-address 10.10.0.0/16 level-1-2

ZebOS(config)#router isis bb
ZebOS(config-router)#no summary-address 10.10.0.0/16
```

summary-prefix

Use this command to configure the summary prefix to summarize IPv6 reachability information.

Use the no parameter to unconfigure the summary.

Command Syntax

```
summary-prefix X:X::X:X/M (level-1|level-1-2|level-2|) (metric) (<1-63>|)
no summary-prefix X:X::X:X/M
```

Parameters

X:X::X:X/M	Specify the IPv6 prefix to be announced.
level-1	Specify the reachability information only for Level-1.
level-1-2	Specify the reachability information for both Level-1 and Level-2.
level-2	Specify the reachability information only for Level-2.
metric	Specify the metric for the summarized address.
<1-63>	Specify the metric. The default is 0.

Default

By default, ISIS does not configure the summary-prefix. Summary-prefix is applied to Level-2 IS if `level` parameter is omitted.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router isis bb
ZebOS(config-router)#address-family ipv6
ZebOS(config-router-af)#summary-prefix 3ffe:1234::/32 level-1-2

ZebOS(config-router)#address-family ipv6
ZebOS(config-router-af)#no summary-prefix 3ffe:1234::/32
```

CHAPTER 3 IS-IS Show Commands

This chapter provides a description, syntax, and examples of the IS-IS show commands. It includes the following commands:

show clns is-neighbors

Use this command to display all IS neighbor adjacencies.

Command Syntax

```
show clns is-neighbors (detail|)
show clns WORD is-neighbors (detail|)
show clns is-neighbors IFNAME (detail|)
show clns WORD is-neighbors IFNAME (detail|)
```

Parameters

WORD	Display information for specified instance.
IFNAME	Display information about a single interface.
detail	Display detailed information for all interfaces.

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#show clns is-neighbors detail
Area ipi:
System Id      Interface   State  Type Priority  Circuit Id
0000.0000.0001 eth1        Up     L1   64        0000.0000.0002.01
                           Up     L2   64        0000.0000.0001.01
  L1  Adjacency ID: 1
  L2  Adjacency ID: 2
  Uptime: 13:52:00
  Area Address(es): 49
  IP Address(es): 40.40.0.3
  Level-1 Protocols Supported: IPv4
  Level-2 Protocols Supported: IPv4
Adjacency advertisement: Advertise
ZebOS#
```

show clns neighbors

Use this command to display IS neighbor adjacencies.

Command Syntax

```
show clns neighbors (detail|)
show clns WORD neighbors (detail|)
show clns neighbors IFNAME (detail|)
show clns WORD neighbors IFNAME (detail|)
```

Parameters

WORD	Show information for specified instance.
IFNAME	Show information about a single interface.
detail	Show detailed information for all interfaces.

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show clns neighbors detail

Area bb:
System Id      Interface   SNPA            State  Holdtime  Type Protocol
0000.0000.0001 eth2        0000.0CFA.F002  Up     22        L2   IS-IS
  Area Address(es): 49.0000
  IP Address(es): 10.10.12.50
  Uptime: 00:10:17
0000.0000.0099 eth2        0003.4797.5E4C  Up     6         L2   IS-IS
  Area Address(es): 00.0001  4900.00
  IP Address(es): 10.10.12.99
  Uptime: 00:10:16
000F.0000.0002 eth2        0006.5B0E.D27D  Up     27        L1   IS-IS
                                           Up     27        L2   IS-IS
  Area Address(es): 49.000f
  IP Address(es): 10.10.12.94
  Uptime: 00:06:15
ZebOS#
```

show cspf lsp

Use this command to display CSPF link-state packet (LSP) information.

Command Syntax

```
show cspf lsp
```

Parameters

None

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show cspf lsp
```

show debugging isis

Use this command to display the status of the debugging of the ISIS system.

Command Syntax

```
show debugging isis
```

Parameters

None

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show debugging isis
Area (null):
System Id      Interface   SNPA                State  Holdtime  Type Protocol
TSUP40#show debugging isis
IS-IS debugging status:
ZebOS#
```

show ip isis igp-shortcut-lsp

Use this command to display the IS-IS IGP shortcut LSP entries.

Command Syntax

```
show ip isis (WORD|) igp-shortcut-lsp
```

Parameters

WORD	Display information for specified instance.

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show ip isis igp-shortcut-lsp
ZebOS#
```

show ip isis route

Use this command to display IS-IS routing table for IPv4.

Command Syntax

```
show ip isis (WORD|) route
```

Parameters

WORD	Display information for specified instance.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ip isis route
Codes: C - connected, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, D - discard, E - external metric
Area ipi:
     Destination         Metric      Next-Hop            Interface
C    10.10.0.0/24        10          --                  eth0
L1   10.10.11.0/24       20          10.10.0.43          eth0
L1   10.10.12.0/24       40          10.10.0.32          eth1
L1   172.16.10.0/24      35          10.10.0.99          eth1
L2   172.16.15.1/32      30          10.10.0.25          eth2
L2   172.16.12.2/32      10          10.10.0.101         eth3
ZebOS#
```

show ip isis route igp-shortcut

Use this command to display the IS-IS IGP shortcut routing table.

Command Syntax

```
show ip isis (WORD|) route igp-shortcut
```

Parameters

WORD	Display information for specified instance.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ip isis new_isis route igp-shortcut
ZebOS#
```

show ip protocols

Use this command to display IP process parameters and statistics.

Command Syntax

```
show ip protocols
show ip protocols isis
```

Parameters

None

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ip protocols
ZebOS#
```

show ipv6 isis route

Use this command to display the IS-IS routing table for IPv6.

Command Syntax

```
show ipv6 isis (WORD|) route
```

Parameters

WORD	Display information for specified instance.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ipv6 isis route
Codes: C - connected, L1 - IS-IS level-1, L2 - IS-IS level-2
       ia - IS-IS inter area, D - discard, E - external metric
Area ipi:
C    3ffe:1234:1::/48 [10]
      via ::, eth0
C    3ffe:1234:2::/48 [10]
      via ::, eth0
C    3ffe:1234:3::/48 [10]
      via ::, eth0
L1   3ffe:5678:3::/48 [20]
      via fe80::203:47ff:fe4c:776e, eth0
L1   3ffe:5678:101::/48 [20]
      via fe80::203:47ff:fe4c:776e, eth0
```

show ipv6 isis topology

Use this command to display the IS-IS topology for IPv6.

Command Syntax

```
show ipv6 isis topology (l1|l2|level-1|level-2|)
show ipv6 isis WORD topology (l1|l2|level-1|level-2|)
```

Parameters

WORD	Display information for specified instance.
l1	IS-IS level-1 SPF topology.
l2	IS-IS level-2 SPF topology.
level-1	IS-IS level-1 SPF topology.
level-2	IS-IS level-2 SPF topology.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ipv6 isis topology

Area bb:
IS-IS paths to level-1 routers
System Id            Metric     Next-Hop             Interface   SNPA
000F.0000.0001       --
000F.0000.0002       10         000F.0000.0002       eth2
0006.5B0E.D27D

IS-IS paths to level-2 routers
System Id            Metric     Next-Hop             Interface   SNPA
0000.0000.0001       10         0000.0000.0001       eth2
0000.0CFA.F002
0000.0000.0099       10         0000.0000.0099       eth2
0003.4797.5E4C
0001.0002.0003       20         0000.0000.0099       eth2
0003.4797.5E4C
000F.0000.0001       --
000F.0000.0002       10         000F.0000.0002       eth2
0006.5B0E.D27D
ZebOS#
```

show ipv6 protocols isis

Use this command to display IPv6 process parameters and statistics.

Command Syntax

```
show ipv6 protocols isis
```

Parameters

None

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show ipv6 protocols isis
Routing Protocol is "isis 1 "
 Redistributing:
  Area Address(es):
Distance : (default is 115)

ZebOS#
```

show isis counter

Use this command to display the IS-IS system counter entry MIBs.

Command Syntax

```
show isis counter
```

Parameters

None

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show isis counterArea new:
IS-IS Level-1 isisSystemCounterEntry:
  isisSysStatCorrLSPs: 0
  isisSysStatAuthTypeFails: 0
  isisSysStatAuthFails: 0
  isisSysStatLSPDbaseOloads: 0
  isisSysStatManAddrDropFromAreas: 0
  isisSysStatAttmptToExMaxSeqNums: 0
  isisSysStatSeqNumSkips: 0
  isisSysStatOwnLSPPurges: 0
  isisSysStatIDFieldLenMismatches: 0
  isisSysStatMaxAreaAddrMismatches: 0
  isisSysStatPartChanges: 0
  isisSysStatSPFRuns: 0
  isisSysStatPRCRuns: 0

IS-IS Level-2 isisSystemCounterEntry:
  isisSysStatCorrLSPs: 0
  isisSysStatAuthTypeFails: 0
  isisSysStatAuthFails: 0
  isisSysStatLSPDbaseOloads: 0
  isisSysStatManAddrDropFromAreas: 0
  isisSysStatAttmptToExMaxSeqNums: 0
  isisSysStatSeqNumSkips: 0
  isisSysStatOwnLSPPurges: 0
  isisSysStatIDFieldLenMismatches: 0
  isisSysStatMaxAreaAddrMismatches: 0
  isisSysStatPartChanges: 0
  isisSysStatSPFRuns: 0
  isisSysStatPRCRuns: 0
ZebOS#
```

show isis database

Use this command to display detailed link state database information.

Command Syntax

```
show isis database
show isis database (detail|verbose)
show isis database (detail|verbose) WORD
show isis database (detail|verbose) WORD (l1|l2|level-1|level-2)
show isis database (detail|verbose) (l1|l2|level-1|level-2)
show isis database (detail|verbose) (l1|l2|level-1|level-2) WORD
show isis database WORD
show isis database WORD (l1|l2|level-1|level-2)
show isis database WORD (l1|l2|level-1|level-2) (detail|verbose)
show isis database WORD (detail|verbose)
show isis database WORD (detail|verbose) (l1|l2|level-1|level-2)
show isis database (l1|l2|level-1|level-2)
show isis database (l1|l2|level-1|level-2) (detail|verbose)
show isis database (l1|l2|level-1|level-2) (detail|verbose) WORD
show isis database (l1|l2|level-1|level-2) WORD
show isis database (l1|l2|level-1|level-2) WORD (detail|verbose)
```

Parameters

`detail`	IS-IS link state database detailed information.
`verbose`	IS-IS link state database detailed information.
`WORD`	LSPID in the form of XXXX.XXXX.XXXX.XX-XX.
`l1`	IS-IS level-1 link state database.
`l2`	IS-IS level-2 link state database.
`level-1`	IS-IS level-1 link state database.
`level-2`	IS-IS level-2 link state database.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show isis database detail
Area bb:
IS-IS Level-1 Link State Database:
LSPID                 LSP Seq Num  LSP Checksum  LSP Holdtime      ATT/P/OL
000F.0000.0001.00-00* 0x00000007   0xE15E        1188              1/0/0
  Area Address: 49.000F
  NLPID:        0xCC
```

```
  IP Address:   10.10.12.97
  Metric: 10         IP 10.10.12.0 255.255.255.0
  Metric: 10         IS 000F.0000.0001.02
000F.0000.0001.02-00* 0x00000003   0x3C66        1026              1/0/0
  Metric:  0         IS 000F.0000.0001.00
  Metric:  0         IS 000F.0000.0002.00
000F.0000.0002.00-00  0x00000003   0x8C4B        1025              1/0/0
  Area Address: 49.000F
  NLPID:        0xCC
  Hostname:     isisd@redhat
  IP Address:   10.10.12.94
  Metric: 10         IP 10.10.12.0 255.255.255.0
  Metric: 10         IS 000F.0000.0001.02
ZebOS#
```

show isis interface

Use this command to display detailed interface information.

Command Syntax

```
show isis interface
show isis interface IFNAME
show isis interface counter
```

Parameters

IFNAME	Display the name of interface.
counter	Display the interface counters.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS>show isis interface
VTYSH-68#show isis interface
lo is up, line protocol is up
  IS-IS not enabled on this interface
sdla0 is down, line protocol is down
  IS-IS not enabled on this interface
eth0 is up, line protocol is up
  IS-IS not enabled on this interface
eth1 is up, line protocol is up
  Routing Protocol: IS-IS (1)
    Circuit Type: level-1-2
    Local circuit ID 0x01
    IP interface address:
      10.10.10.10/24
    IPv6 interface address:
      fe80::204:76ff:fec8:28cc/10
    Level-1 Metric: 10/10, Priority: 64, Circuit ID: 0000.0000.0068.01
    Number of active level-1 adjacencies: 0
    Level-2 Metric: 10/10, Priority: 64, Circuit ID: 0000.0000.0068.01
    Number of active level-2 adjacencies: 0
    Next IS-IS LAN Level-1 Hello in 2 seconds
    Next IS-IS LAN Level-2 Hello in 2 seconds
eth2 is up, line protocol is up
  IS-IS not enabled on this interface
sit0 is down, line protocol is down
  IS-IS not enabled on this interface
ZebOS>
```

show isis tag database

Use this command to display detailed link state database information for a routing area.

Command Syntax

```
show isis WORD database
show isis WORD database (detail|verbose)
show isis WORD database (detail|verbose) WORD
show isis WORD database (detail|verbose) WORD (l1|l2|level-1|level-2)
show isis WORD database (detail|verbose) (l1|l2|level-1|level-2)
show isis WORD database (detail|verbose) (l1|l2|level-1|level-2) WORD
show isis WORD database WORD
show isis WORD database WORD (l1|l2|level-1|level-2)
show isis WORD database WORD (l1|l2|level-1|level-2) (detail|verbose)
show isis WORD database WORD (detail|verbose)
show isis WORD database WORD (detail|verbose) (l1|l2|level-1|level-2)
show isis WORD database (l1|l2|level-1|level-2)
show isis WORD database (l1|l2|level-1|level-2) (detail|verbose)
show isis WORD database (l1|l2|level-1|level-2) (detail|verbose) WORD
show isis WORD database (l1|l2|level-1|level-2) WORD (detail|verbose)
show isis WORD database (l1|l2|level-1|level-2) WORD
```

Parameters

WORD	Routing area tag.
detail	IS-IS link state database detailed information.
verbose	IS-IS link state database detailed information.
WORD	LSPID in the form of XXXX.XXXX.XXXX.XX-XX.
l1	IS-IS level-1 link state database.
l2	IS-IS level-2 link state database.
level-1	IS-IS level-1 link state database.
level-2	IS-IS level-2 link state database.

Command Mode

Exec mode, Privileged exec mode

Example

```
ZebOS#show isis Area-1 database
Area Area-1:
IS-IS Level-1 Link State Database:
LSPID                 LSP Seq Num  LSP Checksum  LSP Holdtime      ATT/P/OL
000F.0000.0001.00-00* 0x00000007   0xE15E        1188              1/0/0
  Area Address: 49.000F
```

```
  NLPID:        0xCC
  IP Address:   10.10.12.97
  Metric: 10         IP 10.10.12.0 255.255.255.0
  Metric: 10         IS 000F.0000.0001.02
000F.0000.0001.02-00* 0x00000003   0x3C66        1026              1/0/0
  Metric:  0         IS 000F.0000.0001.00
  Metric:  0         IS 000F.0000.0002.00
000F.0000.0002.00-00  0x00000003   0x8C4B        1025              1/0/0
  Area Address: 49.000F
  NLPID:        0xCC
  Hostname:     isisd@redhat
  IP Address:   10.10.12.94
  Metric: 10         IP 10.10.12.0 255.255.255.0
  Metric: 10         IS 000F.0000.0001.02
ZebOS#
```

show isis topology

Use this command to display data about IS-IS topology.

Command Syntax

```
show isis topology (l1|l2|level-1|level-2|)
show isis WORD topology (l1|l2|level-1|level-2|)
```

Parameters

WORD	Display information for specified instance.
l1	Display the path to all level-1 routers in the area.
l2	Display the path to all level-2 routers in the domain.
level-1	Display the path to all level-1 routers in the area.
level-2	Display the path to all level-2 routers in the domain.

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show isis topology

Area bb:
IS-IS paths to level-1 routers
System Id            Metric     Next-Hop             Interface   SNPA
000F.0000.0001       --
000F.0000.0002       10         000F.0000.0002       eth2
0006.5B0E.D27D

IS-IS paths to level-2 routers
System Id            Metric     Next-Hop             Interface   SNPA
0000.0000.0001       10         0000.0000.0001       eth2
0000.0CFA.F002
0000.0000.0099       10         0000.0000.0099       eth2
0003.4797.5E4C
0001.0002.0003       20         0000.0000.0099       eth2
0003.4797.5E4C
000F.0000.0001       --
000F.0000.0002       10         000F.0000.0002       eth2
0006.5B0E.D27D
ZebOS#
```

show running-config interface isis

Use this command to display the ISIS interface configuration.

Command Syntax

```
show running-config interface IFNAME isis
```

Parameters

IFNAME	Interface name.

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS#show running-config interface eth0 isis
!
interface eth0
 isis tag 500 level-1
!
```

show running-config router isis

Use this command to display the ISIS router configuration.

Command Syntax

```
show running-config router isis
```

Parameters

None

Command Mode

Exec mode, Privileged Exec mode

Example

```
ZebOS(config-router)#show running-config router isis
!
router isis
!
```

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