

Chapter 12

Summary of IS-IS Configuration Statements

The following sections explain each of the Intermediate System to Intermediate System (IS-IS) configuration statements. The statements are organized alphabetically.

authentication-key

Syntax	authentication-key <i>key</i> ;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	<p>Authentication key (password). Neighboring routers use the password to verify the authenticity of packets sent from this interface. For the key to work, you also must include the authentication-type statement.</p> <p>All routers must use the same password. If you are using the JUNOS IS-IS software with another implementation of IS-IS, the other implementation must be configured to use the same password for the domain, the area, and all interfaces adjacent to the Juniper router.</p>
Default	If you do not include this statement and the authentication-type statement, IS-IS authentication is disabled.
Options	<i>key</i> —Authentication password. The password can be up to 255 characters. Characters can include any ASCII strings. If you include spaces, enclose all characters in quotation marks (" ").
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	authentication-type on page 210, no-authentication-check on page 220

authentication-type

Syntax	authentication-type <i>authentication</i> ;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Enable authentication and specify the authentication scheme for IS-IS. If you enable authentication, you must specify a password by including the authentication-key statement.
Default	If you do not include this statement and the authentication-key statement, IS-IS authentication is disabled.
Options	<p><i>authentication</i>—Authentication scheme:</p> <p>md5—Use HMAC authentication in combination with MD5. HMAC-MD5 authentication is defined in RFC 2104, <i>HMAC: Keyed-Hashing for Message Authentication</i>.</p> <p>simple—Use a simple password for authentication. The password is included in the transmitted packet, making this method of authentication relatively insecure. We recommend that you <i>not</i> use this authentication method.</p>
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	authentication-key on page 209, no-authentication-check on page 220

checksum

Syntax	checksum;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>]
Description	Enable checksum for packets on this interface. Checksum cannot be enabled with MD5 hello authentication on the same interface.
Usage Guidelines	See “Enable Checksum” on page 190.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

csnp-interval

Syntax	csnp-interval (<i>seconds</i> disable);
Hierarchy Level	[edit protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>]
Description	Configure the interval between complete sequence number (CSN) packets on a LAN interface.
Options	disable—Do not send CSN packets on this interface. <i>seconds</i> —Number of seconds between the sending of CSN packets. Range: 1 through 65,535 Default: 10 seconds
Usage Guidelines	See “Configure the CSNP Interval” on page 190.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

disable

Syntax	disable;
Hierarchy Level	[edit protocols isis], [edit protocols isis traffic-engineering], [edit protocols isis interface <i>interface-name</i>], [edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis traffic-engineering], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	Disable IS-IS on the router, on an interface, or on a level. At the [edit protocols isis traffic-engineering] hierarchy level, disable IS-IS support for traffic engineering. Enabling IS-IS on an interface (by including the interface statement at the [edit protocols isis] or the [edit routing-instances <i>routing-instance-name</i> protocols isis] hierarchy level), disabling it (by including the disable statement), and not actually having IS-IS run on an interface (by including the passive statement) are mutually exclusive states.
Default	IS-IS is enabled for Level 1 and Level 2 routers on all interfaces on which an International Organization of Standardization (ISO) protocol family is enabled. IS-IS support for traffic engineering is enabled.
Usage Guidelines	See “IS-IS Overview” on page 181, “Disable IS-IS Support for Traffic Engineering” on page 201, and “Disable IS-IS on the Router” on page 201.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

export

Statement	export [<i>policy-names</i>];
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Apply one or more policies to routes being exported from the routing table into IS-IS.
Options	<i>policy-names</i> —Name of one or more policies.
Usage Guidelines	See “Configure IS-IS Routing Policy” on page 202 and the <i>JUNOS Internet Software Configuration Guide: Policy Framework</i> .
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

external-preference

Syntax	external-preference <i>preference</i> ;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Configure the preference of external routes.
Options	<i>preference</i> —Preference value. Range: 0 through 255 Default: 15 (for Level 1 internal routes), 18 (for Level 2 internal routes), 160 (for Level 1 external routes), 165 (for Level 2 external routes)
Usage Guidelines	See “Configure Route Preferences” on page 192.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	preference on page 224

graceful-restart

Syntax	graceful-restart { disable; helper-disable; restart-duration <i>seconds</i> ; }
Hierarchy Level	[edit protocols isis]
Description	Configures graceful restart for IS-IS.
Options	<p>disable—Disable graceful restart.</p> <p>helper-disable—Disable graceful restart helper capability.</p> <p>restart-duration <i>seconds</i>—Configure the time period for restart to last. Range: 1 through 3,600 Default: 90</p>
Usage Guidelines	See “Configure Graceful Restart” on page 87 and “Configure Graceful Restart” on page 199.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>

hello-authentication-key

Syntax	hello-authentication-key <i>key</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>number</i>]
Description	Authentication key (password) for hello packets. Neighboring routers use the password to verify the authenticity of packets sent from an interface. For the key to work, you also must include the hello-authentication-type statement.
Default	By default, hello authentication is not configured on an interface. However, if IS-IS authentication is configured, the hello packets are authenticated using the IS-IS authentication type and password.
Options	<i>key</i> —Authentication password. The password can be up to 255 characters. Characters can include any ASCII strings. If you include spaces, enclose all characters in quotation marks (“ ”).
Usage Guidelines	See “Configure Authentication for Hello Packets” on page 194.
Required Privilege Level	<p>routing—To view this statement in the configuration.</p> <p>routing-control—To add this statement to the configuration.</p>
See Also	authentication-key on page 209, authentication-type on page 210, hello-authentication-type on page 214

hello-authentication-type

Syntax	hello-authentication-type <i>authentication</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>number</i>]
Description	Enable authentication on an interface for hello packets. If you enable authentication on hello packets, you must specify a password by including the hello-authentication-key statement.
Options	<i>authentication</i> —specifies the packet verification type.
Default	By default, hello authentication is not configured on an interface. However, if IS-IS authentication is configured, the hello packets are authenticated using the IS-IS authentication type and password.
Usage Guidelines	See “Configure Authentication for Hello Packets” on page 194.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	authentication-key on page 209, authentication-type on page 210, hello-authentication-key on page 213

hello-interval

Syntax	hello-interval <i>seconds</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	How often the router sends hello packets out of an interface.
Options	<i>seconds</i> —Length of time of hello packets. Range: 1 through 20,000 seconds Default: 3 seconds (for designated intersystem [DIS] routers), 9 seconds (for non-DIS routers)
Usage Guidelines	See “Modify the Hello Interval” on page 195.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	hold-time on page 215

hold-time

Syntax	hold-time <i>seconds</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	How long a neighbor should consider the sending router (this router) to be operative (up). The hold time is advertised in IS-IS hello packets.
Options	<i>seconds</i> —Hold-time value. Range: 3 through 65,535 Default: 9 seconds (for DIS routers), 27 seconds (for non-DIS routers) (three times the default hello interval)
Usage Guidelines	See “Modify the Hold-Time Value” on page 196.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	hello-interval on page 214

ignore-attached-bit

Syntax	ignore-attached-bit;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Ignore the attached bit on IS-IS Level 1 routers. Configuring this statement allows the router to ignore the attached bit on incoming Level 1 LSPs. If the attached bit is ignored, no default route, which points to the router which has set the attached bit, will be installed.
Default	ignore-attached-bit statement is disabled by default.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

interface

Syntax	interface <i>interface-name</i> { disable; checksum; csnp-interval (<i>seconds</i> disable); lsp-interval <i>milliseconds</i> ; mesh-group (<i>value</i> blocked); passive; level <i>level-number</i> { disable; hello-authentication-type <i>authentication</i> ; hello-authentication-key <i>key</i> ; hello-interval <i>seconds</i> ; hold-time <i>seconds</i> ;
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        metric metric;
        passive;
        priority number;
        te-metric metric;
    }
}

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Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Configure interface-specific IS-IS properties. To configure more than one interface, include the interface statement multiple times. Enabling IS-IS on an interface (by including the interface statement at the [edit protocols isis] or the [edit routing-instances <i>routing-instance-name</i> protocols isis] hierarchy level), disabling it (by including the disable statement), and not actually having IS-IS run on an interface (by including the passive statement) are mutually exclusive states.
Options	<i>interface-name</i> —Name of an interface. Specify the full interface name, including the physical and logical address components. To configure all interfaces, specify the interface name as all. For details about specifying interfaces, see the <i>JUNOS Internet Software Configuration Guide: Network Interfaces and Class of Service</i> . The remaining statements are explained separately.
Usage Guidelines	See “Configure Interface-Specific Properties” on page 189.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

isis

Syntax	isis { ... }
Hierarchy Level	[edit protocols], [edit routing-instances <i>routing-instance-name</i> protocols]
Description	Enable IS-IS routing on the router or for a routing instance. The isis statement is the one statement you must include in the configuration to run IS-IS on the router or in a routing instance.
Default	IS-IS is disabled on the router.
Usage Guidelines	See “Minimum IS-IS Configuration” on page 187.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

label-switched-path

Syntax	label-switched-path <i>name</i> level <i>level-number</i> metric <i>metric</i> ;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Advertise label-switched paths into IS-IS as point-to-point links. The label-switched path is advertised in the appropriate IS-IS levels as a point-to-point link and contains a local address and a remote address.
Options	<i>name</i> —Identifies the label-switched path. <i>level-number</i> —IS-IS level number. Value: 1 or 2 <i>metric</i> —Metric value. Range: 1 through 63, or 1 through 16,777,215 (if you have configured wide metrics) Default: 10 (for all interfaces except lo0), 0 (for lo0)
Usage Guidelines	See “Advertise Label-Switched Paths into IS-IS” on page 198.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

level

level (Global IS-IS)

Syntax	level <i>level-number</i> { authentication-key <i>key</i> ; authentication-type <i>type</i> ; external-preference <i>preference</i> ; no-csnp-authentication; no-hello-authentication; no-psnp-authentication; preference <i>preference</i> ; wide-metrics-only; }
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Configure the global-level properties.
Options	<i>level-number</i> —IS-IS level number. Value: 1 or 2 The remaining statements are explained separately.
Usage Guidelines	See “Configure Route Preferences” on page 192.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

level (IS-IS interfaces)

Syntax level *level-number* {
 disable;
 hello-authentication-key *key*;
 hello-authentication-type *authentication*;
 hello-interval *seconds*;
 hold-time *seconds*;
 metric *metric*;
 passive;
 priority *number*;
 te-metric *metric*;
 }

Hierarchy Level [edit protocols isis interface *interface-name*],
 [edit routing-instances *routing-instance-name* protocols isis interface *interface-name*]

Description Configure the IS-IS level. You can configure one instance of Level 1 routing and one instance of Level 2 routing on each interface, and you can configure the two levels differently.

Options *level-number*—IS-IS level number.
Value: 1 or 2
Default: The router operates as both a Level 1 and Level 2 router.

The remaining statements are explained separately.

Usage Guidelines See “Configure IS-IS Levels on an Interface” on page 192.

Required Privilege Level routing—To view this statement in the configuration.
 routing-control—To add this statement to the configuration.

lsp-interval

Syntax lsp-interval *milliseconds*;

Hierarchy Level [edit protocols isis interface *interface-name*],
 [edit routing-instances *routing-instance-name* protocols isis interface *interface-name*]

Description Configure the link-state PDU (LSP) interval time.

Options *milliseconds*—Number of milliseconds between the sending of LSPs. Specifying a value of 0 blocks all LSP transmission.
Range: 0 through 65,535 milliseconds
Default: 100 milliseconds

Usage Guidelines See “Modify the LSP Interval” on page 197.

Required Privilege Level routing—To view this statement in the configuration.
 routing-control—To add this statement to the configuration.

lsp-lifetime

Syntax	lsp-lifetime <i>seconds</i> ;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	How long an LSP originating from the router should persist in the network. The router sends LSPs often enough so that the LSP lifetime never expires.
Options	<i>seconds</i> —LSP lifetime. Range: 350 through 65,535 Default: 1200 seconds
Usage Guidelines	See “Modify the LSP Lifetime” on page 197.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

mesh-group

Syntax	mesh-group (<i>value</i> blocked);
Hierarchy Level	[edit protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>]
Description	Configure an interface to be part of a mesh group, which is a set of fully connected nodes.
Options	<i>value</i> —Number that identifies the mesh group. Range: 1 through 4,294,967,295 (32 bits are allocated to identify a mesh group) blocked—Configure the interface so that it does not flood LSP packets.
Usage Guidelines	See “Configure Mesh Groups” on page 190.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

metric

Syntax	metric <i>metric</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	Metric value for the level.
Options	<i>metric</i> —Metric value. Range: 1 through 63, or 1 through 16,777,215 (if you have configured wide metrics) Default: 10 (for all interfaces except lo0), 0 (for the lo0 interface)
Usage Guidelines	See “Modify the IS-IS Metric” on page 196.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	te-metric on page 227, wide-metrics-only on page 230

multicast-topology

Syntax	multicast-extensions;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Enable multicast extensions.
Default	Multicast extensions disabled.
Usage Guidelines	See “Configure IS-IS Multicast Extensions” on page 204.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-authentication-check

Syntax	no-authentication-check;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Generate authenticated packets, and check the authentication on received packets but do not reject packets that cannot be authenticated.
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	csnp-interval on page 211, hello-authentication-type on page 214

no-csnp-authentication

Syntax	no-csnp-authentication;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Suppress authentication check on complete sequence number PDU (CSNP) packets.
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	csnp-interval on page 211

no-hello-authentication

Syntax	no-hello-authentication;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Suppress authentication check on complete sequence number hello packets.
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	hello-authentication-type on page 214

no-ipv4-routing

Syntax	no-ipv4-routing;
Hierarchy Level	[edit protocols isis, [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Disable Internet Protocol Version 4 (IPv4) routing.
Usage Guidelines	See “Disable IPv4 Routing” on page 201.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-ipv6-routing

Syntax	no-ipv6-routing;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Disable Internet Protocol Version 6 (IPv6) routing.
Usage Guidelines	See “Disable IPv6 Routing” on page 202.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

no-psnp-authentication

Syntax	no-psnp-authentication;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Suppress authentication check on partial sequence number PDU (PSNP) packets.
Usage Guidelines	See “Configure IS-IS Authentication” on page 188.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

overload

Syntax	overload <timeout <i>seconds</i> >;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Configure the local router so that it appears to be overloaded. You might want to do this when you want the router to participate in IS-IS routing, but do not want it to be used for transit traffic. Note that traffic to immediately attached interfaces continues to transit the router.
Option	timeout <i>seconds</i> —Number of seconds at which the overloading is reset. Default: 0 seconds Range: 60 through 1800 seconds
Usage Guidelines	See “Configure the Router to Appear Overloaded” on page 198.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

passive

Syntax	passive;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i>], [edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	Advertise the direct interface addresses on an interface or into a level on the interface without actually running IS-IS on that interface or level. Enabling IS-IS on an interface (by including the interface statement at the [edit protocols isis] or the [edit routing-instances <i>routing-instance-name</i> protocols isis] hierarchy level), disabling it (by including the disable statement), and not actually having IS-IS run on an interface (by including the passive statement) are mutually exclusive states.
Usage Guidelines	See “Advertise Interface Addresses without Running IS-IS” on page 194.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

point-to-point

Syntax	point-to-point;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i>]
Description	Configure an IS-IS interface to behave like a point-to-point connection.
Usage Guidelines	See “Configure Point-to-Point Interfaces” on page 200.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

preference

Syntax	<code>preference preference;</code>
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Configure the preference of internal routes.
Options	<i>preference</i> —Preference value. Range: 0 through 255 Default: 15 (for Level 1 internal routes), 18 (for Level 2 internal routes), 160 (for Level 1 external routes), 165 (for Level 2 external routes)
Usage Guidelines	See “Configure Route Preferences” on page 192.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	external-preference on page 212

prefix-export-limit

Syntax	<code>prefix-export-limit number;</code>
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Configure a limit to the number of prefixes exported into IS-IS.
Options	<i>number</i> —Prefix limit. Range: 0 through 4,294,967,295
Usage Guidelines	See “Configure Prefix Export Limit” on page 192.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

priority

Syntax	priority <i>number</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	The interface's priority for becoming the designated router. The interface with the highest priority value becomes that level's designated router. The priority value is meaningful only on a multiaccess network. It has no meaning on a point-to-point interface.
Options	<i>number</i> —Priority value. Range: 0 through 127 Default: 64
Usage Guidelines	See “Configure the Priority for Becoming the Designated Router” on page 197.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

reference-bandwidth

Syntax	reference-bandwidth <i>reference-bandwidth</i> ;
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Set the reference bandwidth used in calculating the default interface cost. The cost is calculated using the following formula: $cost = reference\text{-}bandwidth / bandwidth$
Options	<i>reference-bandwidth</i> —Reference bandwidth in bits per second. Default: 10 Mbps Range: 9600 through 1,000,000,000,000
Usage Guidelines	See “Modify the Interface Metric” on page 191.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

rib-group

Syntax	<code>rib-group group-name;</code>
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Install routes learned from IS-IS routing instances into routing tables in the IS-IS routing table group.
Options	<i>group-name</i> —Name of the routing table group.
Usage Guidelines	See “Create Routing Table Groups” on page 79, “Configure How Interface Routes Are Imported into Routing Tables” on page 81, “IS-IS Configuration Guidelines” on page 185, and “Configure BGP Routing Table Groups” on page 412.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

shortcuts

Syntax	<code>shortcuts;</code>
Hierarchy Level	[edit protocols isis traffic-engineering], [edit routing-instances <i>routing-instance-name</i> protocols isis traffic-engineering]
Description	Configure IS-IS to use MPLS label-switched paths (LSPs) as next hops if possible when installing routing information into the inet.3 routing table.
Usage Guidelines	See “Configure Route Preferences” on page 192.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

spf-delay

Syntax	<code>spf-delay milliseconds;</code>
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Configure the shortest path first (SPF) delay.
Options	<i>milliseconds</i> —Number of milliseconds between the detection of a topology change and when the SPF algorithm runs. Range: 50 through 1000 Default: 1000 milliseconds
Usage Guidelines	See “Configure the SPF Delay” on page 199.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

te-metric

Syntax	te-metric <i>metric</i> ;
Hierarchy Level	[edit protocols isis interface <i>interface-name</i> level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis interface <i>interface-name</i> level <i>level-number</i>]
Description	Metric value used by traffic engineering for information injected into the traffic engineering database (TED). The value of the traffic engineering metric does not affect normal IS-IS forwarding.
Options	<i>metric</i> —Metric value. Range: 1 through 16,777,215 Default: Value of the IGP metric
Usage Guidelines	See “Modify the IS-IS Metric” on page 196.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	<i>metric</i> on page 220, <i>wide-metrics-only</i> on page 230

traceoptions

Syntax	<pre> traceoptions { file <i>name</i> <replace> <size <i>size</i>> <files <i>number</i>> <no-stamp> <(world-readable no-world-readable)>; flag <i>flag</i> < <i>flag-modifier</i>> < disable> ; } </pre>
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	<p>Configure IS-IS protocol-level tracing options.</p> <p>To specify more than one tracing operation, include multiple flag statements.</p>
Default	The default IS-IS protocol-level tracing options are those inherited from the routing protocols traceoptions statement included at the [edit routing-options] hierarchy level.
Options	<p>disable—(Optional) Disable the tracing operation. You can use this option to disable a single operation when you have defined a broad group of tracing operations, such as all.</p> <p>file <i>name</i>—Name of the file to receive the output of the tracing operation. Enclose the name within quotation marks. All files are placed in the directory <code>/var/log</code>. We recommend that you place IS-IS tracing output in the file <code>isis-log</code>.</p> <p>files <i>number</i>—(Optional) Maximum number of trace files. When a trace file named <i>trace-file</i> reaches its maximum size, it is renamed <i>trace-file.0</i>, then <i>trace-file.1</i>, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten.</p> <p>If you specify a maximum number of files, you also must specify a maximum file size with the <code>size</code> option.</p> <p>Range: 2 through 1000 files Default: 2 files</p> <p><i>flag</i>—Tracing operation to perform. To specify more than one flag, include multiple flag statements.</p>

IS-IS Tracing Flags

csn—Complete sequence number PDU (CSNP) packets

error—Errored IS-IS packets

hello—Hello packets

lsp—Link-state PDU packets

lsp-generation—Link-state PDU generation packets

packets—All IS-IS protocol packets

psn—Partial sequence number PDU (PSNP) packets

spf—Shortest-path-first calculations

Global Tracing Flags

all—All tracing operations

general—A combination of the normal and route trace operations

normal—All normal operations, including adjacency changes

Default: If you do not specify this option, only unusual or abnormal operations are traced.

policy—Policy operations and actions

route—Routing table changes

state—State transitions

task—Interface transactions and processing

timer—Timer usage

flag-modifier—(Optional) Modifier for the tracing flag. You can specify one or more of these modifiers:

detail—Detailed trace information

receive—Packets being received

send—Packets being transmitted

no-stamp—(Optional) Do not place timestamp information at the beginning of each line in the trace file.

Default: If you omit this option, timestamp information is placed at the beginning of each line of the tracing output.

no-world-readable—(Optional) Disallow any user to read the log file.

replace—(Optional) Replace an existing trace file if there is one.

Default: If you do not include this option, tracing output is appended to an existing trace file.

size *size*—(Optional) Maximum size of each trace file, in kilobytes (KB), megabytes (MB), or gigabytes (GB). When a trace file named *trace-file* reaches this size, it is renamed *trace-file.0*. When the *trace-file* again reaches its maximum size, *trace-file.0* is renamed *trace-file.1* and *trace-file* is renamed *trace-file.0*. This renaming scheme continues until the maximum number of trace files is reached. Then, the oldest trace file is overwritten.

If you specify a maximum file size, you also must specify a maximum number of trace files with the *files* option.

Syntax: *xk* to specify KB, *xm* to specify MB, or *xg* to specify GB

Range: 10 KB through the maximum file size supported on your system

Default: 1 MB

world-readable—(Optional) Allow any user to read the log file.

Usage Guidelines See “Trace IS-IS Protocol Traffic” on page 206.

Required Privilege Level routing and trace—To view this statement in the configuration.
routing-control and trace-control—To add this statement to the configuration.

traffic-engineering

Syntax	traffic-engineering { disable; shortcuts; }
Hierarchy Level	[edit protocols isis], [edit routing-instances <i>routing-instance-name</i> protocols isis]
Description	Configure traffic engineering properties for IS-IS.
Default	IS-IS traffic engineering support is enabled.
Usage Guidelines	See “Configure IS-IS Traffic Engineering Attributes” on page 200.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.

wide-metrics-only

Statement	wide-metrics-only;
Hierarchy Level	[edit protocols isis level <i>level-number</i>], [edit routing-instances <i>routing-instance-name</i> protocols isis level <i>level-number</i>]
Description	Configure IS-IS to generate metric values greater than 63 on a per IS-IS level basis.
Usage Guidelines	See “Enable Wide Metrics for Traffic Engineering” on page 191.
Required Privilege Level	routing—To view this statement in the configuration. routing-control—To add this statement to the configuration.
See Also	te-metric on page 227