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 *key*;

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

Description 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.

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.

Default If you do not include this statement and the authentication-type statement, IS-IS authentication is disabled.

Options *key*—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 186.

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 208, no-authentication-check on page 219

authentication-type

Syntax authentication-type *authentication*;

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

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 *authentication*—Authentication scheme:

md5—Use HMAC authentication in combination with MD5. HMAC-MD5 authentication is defined in RFC 2104, *HMAC: Keyed-Hashing f or Message Authentication* .

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 *not* use this authentication method.

Usage Guidelines See “Configure IS-IS Authentication” on page 186.

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 207, no-authentication-check on page 219

checksum

Syntax checksum;

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

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 188.

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 (*seconds* | disable);

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

Description Configure the interval between complete sequence number (CSN) packets on a LAN interface.

Options disable—Do not send CSN packets on this interface.

seconds—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 188.

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 *interface-name*],
[edit protocols isis interface *interface-name* level *level-number*],
[edit routing-instances *routing-instance-name* protocols isis],
[edit routing-instances *routing-instance-name* protocols isis traffic-engineering],
[edit routing-instances *routing-instance-name* protocols isis interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols isis interface *interface-name* level *level-number*]

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 *routing-instance-name* 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 179, "Disable IS-IS Support for Traffic Engineering" on page 199, and "Disable IS-IS on the Router" on page 199.

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

export

Statement export [*policy-names*];

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

Description Apply one or more policies to routes being exported from the routing table into IS-IS.

Options *policy-names*—Name of one or more policies.

Usage Guidelines See "Configure IS-IS Routing Policy" on page 200 and the *JUNOS Internet Software Configuration Guide: Policy Framework*.

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 *preference*;

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

Description Configure the preference of external routes.

Options *preference*—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 190.

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 222

graceful-restart

Syntax
```
graceful-restart {
    disable;
    helper-disable;
}
```

Hierarchy Level [edit protocols isis]

Description Configures graceful restart for IS-IS.

Options disable—Disable graceful restart.

helper-disable—Disables graceful restart helper capability.

Usage Guidelines See "Configure Graceful Restart" on page 87 and "Configure Graceful Restart" on page 197.

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

hello-authentication-key

Syntax hello-authentication-key *key*;

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

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 *key*—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 192.

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 207, authentication-type on page 208, hello-authentication-type on page 212

hello-authentication-type

Syntax hello-authentication-type *authentication*;

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

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 *authentication*—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 192.

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 207, authentication-type on page 208, hello-authentication-key on page 211

hello-interval

Syntax hello-interval *seconds*;

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

Description How often the router sends hello packets out of an interface.

Options *seconds*—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 193.

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 213

hold-time

Syntax hold-time *seconds*;

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

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 *seconds*—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 194.

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 213

ignore-attached-bit

Syntax ignore-attached-bit;

Hierarchy Level [edit protocols isis],
[edit routing-instances *routing-instance-name* 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 interface-name {
    disable;
    checksum;
    csnp-interval (seconds | disable);
    lsp-interval milliseconds;
    mesh-group (value | blocked);
    passive;
    level level-number {
        disable;
        hello-authentication-type authentication;
        hello-authentication-key key;
        hello-interval seconds;
        hold-time seconds;
        metric metric;
        passive;
        priority number;
        te-metric metric;
    }
}
```

Hierarchy Level [edit protocols isis],
[edit routing-instances *routing-instance-name* 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 *routing-instance-name* 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 *interface-name*—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 *JUNOS Internet Software Configuration Guide: Interfaces and Class of Service*.

The remaining statements are explained separately in this chapter.

Usage Guidelines See “Configure Interface-Specific Properties” on page 188.

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 *routing-instance-name* 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 185.

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 *name* level *level-number* metric *metric*;

Hierarchy Level [edit protocols isis],
[edit routing-instances *routing-instance-name* 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 *name*—Identifies the label-switched path.

level-number—IS-IS level number.
Value: 1 or 2

metric—Metric value.
Range: 1 through 63, or 1 through 16777215 (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 196.

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 level-number {
    authentication-key key;
    authentication-type type;
    external-preference preference;
    no-csnp-authentication;
    no-hello-authentication;
    no-psnp-authentication;
    preference preference;
    wide-metrics-only;
}
```

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

Description Configure the global-level properties.

Options *level-number*—IS-IS level number.
Value: 1 or 2

The remaining statements are explained separately in this chapter.

Usage Guidelines See “Configure Route Preferences” on page 190.

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 in this chapter.

Usage Guidelines
See “Configure IS-IS Levels on an Interface” on page 190.

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
Default: 100 milliseconds

Usage Guidelines
See “Modify the LSP Interval” on page 195.

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 *seconds*;

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

Description How long an LSP originating from the router should persist in the network. The router sends LSPs often enought so that the LSP lifetime never expires.

Options *seconds*—LSP lifetime.
Range: 350 through 65,535
Default: 1200 seconds

Usage Guidelines See "Modify the LSP Lifetime" on page 196.

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 (*value* | blocked);

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

Description Configure an interface to be part of a mesh group, which is a set of fully connected nodes.

Options *value*—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 189.

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

metric

Syntax metric *metric*;

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

Description Metric value for the level.

Options *metric*—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 194.

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 225, wide-metrics-only on page 228

multicast-topology

Syntax multicast-extensions;

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

Description Enable multicast extensions.

Default Multicast extensions disabled.

Usage Guidelines See "Configure IS-IS Multicast Extensions" on page 202.

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 *routing-instance-name* 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 186.

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 209, hello-authentication-type on page 212

no-csnp-authentication

Syntax no-csnp-authentication;

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

Description Suppress authentication check on complete sequence number PDU (CSNP) packets.

Usage Guidelines See "Configure IS-IS Authentication" on page 186.

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 209

no-hello-authentication

Syntax no-hello-authentication;

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

Description Suppress authentication check on complete sequence number hello packets.

Usage Guidelines See "Configure IS-IS Authentication" on page 186.

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 212

no-ipv4-routing

Syntax no-ipv4-routing;

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

Description Disables Internet Protocol Version 4 (IPv4) routing.

Usage Guidelines See "Disable IPv4 Routing" on page 199.

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 *routing-instance-name* protocols isis]

Description Disables Internet Protocol Version 6 (IPv6) routing.

Usage Guidelines See “Disable IPv6 Routing” on page 200.

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 *level-number*],
[edit routing-instances *routing-instance-name* protocols isis level *level-number*]

Description Suppress authentication check on partial sequence number PDU (PSNP) packets.

Usage Guidelines See “Configure IS-IS Authentication” on page 186.

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

overload

Syntax overload <timeout *seconds*>;

Hierarchy Level [edit protocols isis],
[edit routing-instances *routing-instance-name* 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 *seconds*—Number of seconds at which the overloading is reset.
Range: 60 through 1800 seconds
Default: 0 seconds

Usage Guidelines See “Configure the Router to Appear Overloaded” on page 197.

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 *interface-name*],
[edit protocols isis interface *interface-name* level *level-number*],
[edit routing-instances *routing-instance-name* protocols isis interface *interface-name*],
[edit routing-instances *routing-instance-name* protocols isis interface *interface-name* level *level-number*]

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 *routing-instance-name* 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 192.

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

preference

Syntax preference *preference*;

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

Description Configure the preference of internal routes.

Options *preference*—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 190.

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 210

priority

Syntax priority *number*;

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

Description The interface 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 *number*—Priority value.
Range: 0 through 127
Default: 64

Usage Guidelines See "Configure the Priority for Becoming the Designated Router" on page 195.

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 *reference-bandwidth*;

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

Description Set the reference bandwidth used in calculating the default interface cost. The cost is calculated using the following formula:

cost = reference-bandwidth / bandwidth

Options *reference-bandwidth*—Reference bandwidth in bits per second.
Default: 10 Mbps—If the reference bandwidth is not configured.

Usage Guidelines See "Modify the Interface Metric" on page 189.

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

rib-group

Syntax rib-group *group-name*;

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

Description Install routes learned from IS-IS routing instances into routing tables in the IS-IS routing table group.

Options *group-name*—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 183, and “Configure BGP Routing Table Groups” on page 407.

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

shortcuts

Syntax shortcuts;

Hierarchy Level [edit protocols isis traffic-engineering],
[edit routing-instances *routing-instance-name* 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 190.

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

spf-delay

Syntax spf-delay *milliseconds*;

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

Description Configure the shortest path first (SPF) delay.

Options *milliseconds*—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 197.

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 *metric*;

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

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 *metric*—Metric value.
Range: 1 through 16,777,215
Default: 10 (for all interfaces except lo0), 0 (for lo0 interface)

Usage Guidelines See "Modify the IS-IS Metric" 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 metric on page 219, wide-metrics-only on page 228

traceoptions

Syntax
```
traceoptions {
    file name <replace> <size size> <files number> <no-stamp>
        <(world-readable | no-world-readable)>;
    flag flag <flag-modifier> <disable>;
}
```

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

Description Configure IS-IS protocol-level tracing options.

To specify more than one tracing operation, include multiple flag statements.

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 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.

file *name*—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 /var/log. We recommend that you place IS-IS tracing output in the file isis-log.

files *number*—(Optional) Maximum number of trace files. When a trace file named *trace-file* reaches its maximum size, it is renamed *trace-file*.0, then *trace-file*.1, and so on, until the maximum number of trace files is reached. Then, the oldest trace file is overwritten.

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

Range: 2 through 1000 files
Default: 2 files

flag—Tracing operation to perform. To specify more than one flag, include multiple flag statements.

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: *x*k to specify KB, *x*m to specify MB, or *x*g 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 "}" on page 202.

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 *routing-instance-name* 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 198.

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 *level-number*],
[edit routing-instances *routing-instance-name* protocols isis level *level-number*]

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 190.

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 225