IS-IS MIB

This feature introduces MIB support for the Intermediate System-to-Intermediate System (IS-IS) link-state routing protocol. IS-IS is used as the link-state routing protocol of choice by major service providers. The IS-IS MIB feature offers service providers an improved capability to continuously monitor the changing state of an IS-IS network by use of MIB objects to gather information relating to protocol parameters and trap notification objects that can signal the occurrence of significant protocol events such as an authentication failure or a mismatch in area addresses between Intermediate Systems (ISs). The protocol information collected by the IS-IS MIB objects and trap objects can be used by the network manager to derive statistics that can help monitor and improve overall network performance.

Prerequisites for IS-IS MIB

- Simple Network Management Protocol (SNMP) must be enabled on the router before notifications (traps) can be configured or before SNMP GET operations can be performed.
- IS-IS must be configured on the router.

Restrictions for IS-IS MIB

- All enhancements that are introduced by this feature are provided only by the Cisco private MIB CISCO-IETF-ISIS-MIB.my.
- The SNMP SET capability will not be supported for any IS-IS MIB objects. Objects with read-create or read-write access are understood to operate only as read-only.
- This feature is not supported for multiple instances of IS-IS.

Information About IS-IS MIB

Cisco IS-IS MIB Table Object Definitions

The IS-IS MIB feature introduces network management support for the IS-IS routing protocol through the use of IS-IS MIB table entries, MIB objects and MIB trap notification objects that comprise the Cisco private MIB CISCO-IETF-ISIS-MIB.my. New CLI has been added to enable SNMP notifications for IS-IS MIB objects. Notifications are provided for errors and other significant event information for the IS-IS network.

For more information on how to configure IS-IS MIB to receive the SNMP notifications, refer to the How to Enable IS-IS MIB, on page 13.

The ciiManAreaAddrEntry table contains the set of area addresses manually configured for the IS. The ciiManAreaAddrEntry table defines the following MIB objects:

- ciiManAreaAddr
- ciiManAreaAddrExistState

The ciiAreaAddrEntry table groups sets of relevant area addresses reported in all Level 1 link-state packets (LSPs) that were generated or received by an IS from other ISs that are reachable through Level 1 routing.

Each entry contains one area address per LSP. The ciiAreaAddrEntry table defines the following MIB object:

- ciiAreaAddr

The ciiSysProtSuppEntry table contains a manually configured set of protocols supported by the IS. The supported protocol types are IPv4, IPv6, and ISO8473. The ciiSysProtSuppEntry table defines the following MIB objects:

- ciiSysProtSuppProtocol
- ciiSysProtSuppExistState

The ciiSummAddrEntry table contains a set of manually configured summary addresses used to form summarized IP TLVs originated by an ISS. This table is useful to combine and modify IP reachability announcements, and also controls leaking of L1 routes into L2. The ciiSummAddrEntry table defines the following MIB objects:

- ciiSummAddressType
- ciiSummAddress
- ciiSummAddrPrefixLen
- ciiSummAddrExistState
- ciiSummAddrMetric
- ciiSummAddrFullMetric

The ciiRedistributeAddrEntry table provides the criteria to decide if a route should be leaked from L2 to L1. When Domain Wide Prefix leaking is enabled (represented by ciiSysL2toL1Leaking), addresses that match the summary mask in the table are announced at L1 by routers. The Cisco MIB implementation also allows

retrieval of routes for masked entries based on configured access lists or route maps. The ciiRedistributeAddrEntry table defines the following MIB objects:

- ciiRedistributeAddrType
- ciiRedistributeAddrAddress
- ciiRedistributeAddrPrefixLen
- ciiRedistributeAddrExistState

The ciiRouterEntry table has one entry for every peer and it tracks the hostnames and Router IDs associated with that peer. The ciiRouterEntry table defines the following MIB objects.

- ciiRouterSysID
- ciiRouterLevel
- ciiRouterHostName
- ciiRouterID

Note The IS-IS MIB defines the ciiRouterLevel object to be the level of the IS. The Cisco implementation interprets the ciiRouterLevel object to be the level of the link-state packet (LSP) in which the hostname (ciiRouterHostName) and router ID (ciiRouterID) were received.

The ciiSysLevelEntry table captures level-specific information about the IS. This information includes parameters that control how LSPs are generated, metrics for SPF computation and the decision of whether to perform traffic engineering at this level.

The ciiSysLevelEntry table defines the following MIB objects:

- ciiSysLevelIndex
- ciiSysLevelOrigLSPBuffSize
- ciiSysLevelMinLSPGenInt
- ciiSysLevelOverloadState
- ciiSysLevelSetOverload
- ciiSysLevelSetOverloadUntil
- ciiSysLevelMetricStyle
- ciiSysLevelSPFConsiders
- ciiSysLevelTEEnabled

Note For the ciiSysLevelOverloadState MIB object, the Cisco MIB follows the correct interpretation of IS state transition per the future IETF draft MIB revisions. The draft-ietf-isis-wg-16.txt did not follow the ISO 10589:2002 definition correctly. Per the ISO 10589:2002 definition, the waiting state is defined for low memory resource condition and the overloaded state is enabled by the administrator. Moreover, the Cisco implementation does not support a transition to a waiting state on low memory.

The ciiCircEntry table contains circuit-specific information about each broadcast or point-to-point interface used in this IS-IS. Each entry is associated with a corresponding interface, based on the circuit type (broadcast or point-to-point interfaces). In other words, only interfaces that are configured as broadcast or point-to-point can be polled. The Cisco implementation of the IS-IS MIB does not support the following circuit types: staticIn, staticOut, dA (dynamically assigned). The ciiCircEntry table defines the following MIB objects:

- ciiCircIndex
- ciiCircIfIndex
- ciiCircIfSubIndex
- ciiCircAdminState
- ciiCircExistState
- ciiCircType
- ciiCircExtDomain
- ciiCircLevel
- ciiCircPassiveCircuit
- ciiCircMeshGroupEnabled
- ciiCircMeshGroup
- ciiCircSmallHellos
- ciiCircLastUpTime
- ciiCirc3WayEnabled
- ciiCircExtendedCircID

Note The ciiCircExtDomain MIB table object is not implemented because externalDomain linkage is not supported by Cisco IOS software.

The ciiNextCircIndex object, which is defined outside ciiCircTable, is used to assign a unique index value to the ciiCircIndex through a SET operation. The Cisco MIB implementation does not implement this object because the SET ability currently is not supported, and ciiCircIndex is determined uniquely through data from configured interfaces.

The ciiCircLevelEntry table contains level-specific information about IS-IS circuits. The ciiCircLevelEntry table contains the following MIB objects:

- ciiCircLevelIndex
- ciiCircLevelMetric
- ciiCircLevelWideMetric
- ciiCircLevelISPriority
- ciiCircLevelIDOctet
- ciiCircLevelID
- ciiCircLevelDesIS
- ciiCircLevelHelloMultiplier
- ciiCircLevelHelloTimer
- ciiCircLevelDRHelloTimer
- ciiCircLevelLSPThrottle
- ciiCircLevelMinLSPRetransInt
- ciiCircLevelCSNPInterval
- ciiCircLevelPartSNPInterval

The ciiSystemCounterEntry table has a sequence of entries used to track system-wide events using counters. The ciiSystemCounterEntry table defines the following MIB objects:

- ciiSysStatLevel
- ciiSysStatCorrLSPs
- ciiSysStatAuthTypeFails
- ciiSysStatAuthFails
- ciiSysStatLSPDbaseOloads
- ciiSysStatManAddrDropFromAreas
- ciiSysStatAttmptToExMaxSeqNums
- ciiSysStatSeqNumSkips
- ciiSysStatOwnLSPPurges
- ciiSysStatIDFieldLenMismatches
- ciiSysStatPartChanges
- ciiSysStatSPFRuns
- ciiSysStatLSPErrors

Note The ciiSysStatPartChanges object is not implemented because the ability to detect partition changes currently is not supported by Cisco IOS software.

The ciiCircuitCounterEntry table is used to track system-wide events specific to a circuit and level. The ciiCircuitCounterEntry table defines the following MIB objects:

- ciiCircuitType
- ciiCircAdjChanges
- ciiCircNumAdj
- ciiCircInitFails
- ciiCircRejAdjs
- ciiCircIDFieldLenMismatches
- ciiCircMaxAreaAddrMismatches
- ciiCircAuthTypeFails
- ciiCircAuthFails
- ciiCircLANDesISChanges

Note The ciiCircInitFails MIB object does not return any data because circuit initialization failures are not tracked by Cisco IOS software.

The ciiPacketCounterEntry table tracks the number of IS-IS packets sent and received over a circuit at one level. At any time, the traffic flow along one direction is recorded. All objects defined in this table are Counter objects. The ciiPacketCounterEntry table defines the following MIB objects:

- ciiPacketCountLevel
- ciiPacketCountDirection
- ciiPacketCountIIHellos
- ciiPacketCountISHellos
- ciiPacketCountESHellos
- ciiPacketCountLSPs
- ciiPacketCountCSNPs
- ciiPacketCountPSNPs
- ciiPacketCountUnknowns

Note The ciiPacketCountISHellos MIB object tracks the number of end system-Intermediate system (ES-IS) hellos only at system granularity and not at per-level or per-circuit.

- The ciiPacketCountESHellos MIB objects tracks the number of end-system (ES) hellos only at system granularity and not at per-level or per-circuit.

- The ciiPacketCountUnknowns MIB object can track only unknown packet types that are received, not those that are sent in any given level.

The ciiISAdjEntry table has one entry associated with every adjacency to an IS (in other words, a table of adjacencies).

However, this object cannot be used to track multiple adjacencies in a LAN, with each adjacency corresponding to a level. Thus the best priority level is selected among the configured objects.

The ciiISAdjEntry table defines the following MIB objects:

- ciiISAdjChanges
- ciiISAdjIndex
- ciiISAdjState
- ciiISAdj3WayState
- ciiISAdjNeighSNPAAddress
- ciiISAdjNeighSysType
- ciiISAdjNeighSysID
- ciiISAdjNbrExtendedCircID
- ciiISAdjUsage
- ciiISAdjHoldTimer
- ciiIsAdjNeighPriority
- ciiISAdjLastUpTime

Note The ciiISAdjChanges MIB object gathers information based on the best priority level that is selected among the configured objects, per the restriction against the software support of multiple adjacencies in a LAN for the ciiISAdjEntry table.

- The ciiISAdjNeighPriority MIB object gathers information based on the best priority level that is selected among the configured objects, per the restriction against the software support of multiple adjacencies in a LAN for the ciiISAdjEntry table.

The ciiISAdjAreaAddrEntry table contains entries for the sets of area addresses of neighboring ISs as reported in received IS-IS Hello protocol data units (PDU)s. The ciiISAdjAreaAddrEntry table defines the following MIB objects:

- ciiISAdjAreaAddrIndex
- ciiISAdjAreaAddress

The ciiISAdjIPAddrEntry table contains entries that are formed by a set of IP addresses of neighboring ISs as reported in received Hello PDUs. The ciiISAdjIPAddrEntry table defines the following MIB objects:

- ciiISAdjIPAddrIndex

- ciiISAdjIPAddrType
- ciiISAdjIPAddrAddress

The ciiISAdjProtSuppEntry table contains information about the protocols supported by neighboring ISs as reported in received Hello PDUs. The ciiISAdjProtSuppEntry table defines the following MIB object:

- ciiISAdjProtSuppProtocol

The ciiRAEntry table records information about a reachable NSAP or address prefix that is manually configured or learned dynamically.

The ciiRAEntry table defines the following MIB objects:

- ciiRAIndex
- ciiRAExistState
- ciiRAAdminState
- ciiRAAddrPrefix
- ciiRAMapType
- ciiRAMetric
- ciiRAMetricType
- ciiRASNPAAddress
- ciiRASNPAMask
- ciiRASNPAPrefix
- ciiRAType

Note The ciiRAMapType MIB Object supports only implicit (null) and explicit mapping types. The extractIDI and extractDSP types are not supported.

- Because the ciiRAMapType MIB Object does not support the extractIDI and extractDSP mapping types, the ciiraSNPAPrefix and ciiRASNPAMask MIB objects will hold no data, as they depend on the unsupported mapping types. The ciiRAMapType and ciiRASNPAMask MIB objects are not implemented.
- The ciiRAType MIB object does not support the manual creation of IP reachability addresses.

Each entry in the ciiIPRAEntry table records information about one IP reachable address manually configured on the IS or learned from another protocol. The ciiIPRAEntry table defines the following MIB objects:

- ciiIPRADestType
- ciiIPRADest
- ciiIPRADestPrefixLen
- ciiIPRANextHopIndex
- ciiIPRANextHopType

- ciiIPRANextHop
- ciiIPRAType
- ciiIPRAExistState
- ciiIPRAAdminState
- ciiIPRAMetric
- ciiIPRAMetricType
- ciiIPRAFullMetric
- ciiIPRASNPAAddress
- ciiIPRASourceType

Note The ciiIpRAType MIB object does not support manually created IP reachability addresses.

The ciiLSPSummaryEntry table (LSP Summary Table) provides LSP summary information.

The ciiLSPSummaryEntry table defines the following MIB objects:

- ciiLSPLevel
- ciiLSPID
- ciiLSPSeq
- ciiLSPZeroLife
- ciiLSPChecksum
- ciiLSPLifetimeRemain
- ciiLSPPDULength
- ciiLSPAttributes

The ciiLSPTLVEntry table provides a complete record of all LSPs as a sequence of {Type, Length, Value} tuples. The ciiLSPTLVEntry table defines the following MIB objects:

- ciiLSPTLVIndex
- ciiLSPTLVSeq
- ciiLSPTLVChecksum
- ciiLSPTLVType
- ciiLSPTLVLen
- ciiLSPTLVValue

Fields that are required for notifications are recorded in the ciiNotificationEntry table. The ciiNotificationEntry table is not meant for query since the MAX-ACCESS clause of the MIB objects is "accessible-for-notify." The information for notifications will be directly provided at the time of event generation. The following MIB

objects are used only in trap notifications where their value is determined and directly based on input parameters for the IS-IS trap generation process.

- ciiPduLspId
- ciiPduFragment
- ciiPduFieldLen
- ciiPduMaxAreaAddress
- ciiPduProtocolVersion
- ciiPduLspSize
- ciiPduOriginatingBufferSize
- ciiPduProtocolsSupported
- ciiAdjState
- ciiErrorOffset
- ciiErrorTLVType
- ciiNotifManualAddress
- ciiNotifIsLevelIndex

Note The MIB objects ciiNotifManualAddress and ciiNotifIsLevelIndex were added separately and are not defined in draft-ietf-isis-wg-mib-16.txt. These have been provided as a replacement for ciiManAreaAddr and ciiSysLevelIndex respectively to be used only in trap notifications. They have a MAX-ACCESS clause of "accessible-for-notify."

Cisco IS-IS MIB Trap Notifications

IS-IS MIB for Generic System-Wide Errors

The following MIB trap objects are for generic, system-wide errors that can occur in the IS-IS network:

- ciiManualAddressDrops--The ciiManualAddressDrops trap is generated when one of the manually configured area addresses assigned to the system is ignored while computing routes.
- ciiAuthenticationFailure--The ciiAuthenticationFailure trap is generated when the authenticating type information field in the PDU received from a circuit is incorrect. This is an edge-triggered notification.
- ciiIDLenMismatch--When an LSP with a different value of SystemID length is received, the ciiIDLenMismatch notification is generated specific to the circuit where the LSP was detected. This is an edge-triggered notification and hence will be generated only once for PDUs received on the same circuit.
- ciiMaxAreaAddressesMismatch--When the value of Maximum Area Addresses is changed in the LSP that is received from a circuit, the ciiMaxAreaAddressesMismatch trap notification is generated. The header of the packet is used to identify the cause of the mismatch in Maximum Area Address. This trap

is an edge-triggered notification and hence will be generated only once for PDUs received on the same circuit.

IS-IS MIB for LSP-Specific Errors

The following MIB trap objects are for LSP-specific errors that can occur in the IS-IS network:

- ciiCorruptedLSPDetected--When an LSP stored in memory is corrupted, the ciiCorruptedLSPDetected trap is generated.
- ciiAttemptToExceedMaxSequence--The ciiAttemptToExceedMaxSequence trap is generated each time a sequence number on a generated LSP wraps around the 32-bit sequence counter, forcing it to be purged and hence waiting for its reannouncement.
- ciiOwnLSPPurge--The ciiOwnLSPPurge trap is generated when a LSP is received from a circuit with your systemID and zero age.
- ciiSequenceNumberSkip--When an LSP is received without a SystemID or differing contents, the ciiSequenceNumberSkip trap is generated in order to increment the sequence number by 1.
- ciiAuthenticationTypeFailure--When an LSP is received from a circuit filled with a wrong authentication type field, the ciiAuthenticationTypeFailure notification is generated. This is an edge-triggered notification.
- ciiLSPTooLargeToPropagate--When an attempt is made to send an LSP over the circuit with a size greater than dataLinkBlockSize (link-specific parameter for maximum size of a data packet), the ciiLSPTooLargeToPropagate trap is generated indicating that the LSP could not be propagated. This is an edge-triggered notification and will be generated only once for all PDUs received on the same circuit.

Note Cisco IOS software does not support the condition that leads to this event. Therefore, this trap will not be generated.

- ciiOrigLSPBuffSizeMismatch--When an L1 or L2 LSP that has been received from a circuit has a size larger than the local value of ciiOriginatingBufferSize, or when an LSP has been received with the ciiOriginatingBufferSize option and there is a mismatch between local ciiOriginatingBufferSize and value of the PDU option field, this notification is generated. This is an edge-triggered notification and will be generated only once.

Note The originating buffer size TLV that is used to advertise this condition is not currently supported in Cisco IOS software and sufficient information to determine which condition caused the trap is not available. Therefore, this trap will not be generated.

- ciiProtocolsSupportedMismatch--The ciiProtocolsSupportedMismatch trap is generated when a non-pseudonode segment 0 LSP is received that does not have any matching protocols supported. This is an edge-triggered notification.

Note Cisco IOS software does not provide checks in the IS-IS implementation for detecting matching protocols in the case of received PDUs. The generation of the ciiProtocolsSupportedMismatch trap does not indicate a mismatch in protocols supported as specified in the protocol field of the received PDU.

- ciiLSPErrorDetected--The ciiLSPErrorDetected trap is generated to indicate that an LSP with a parse error has been received.

MIB Support for IS-IS Hello PDU-Specific Errors

The following MIB trap objects are for Hello PDU-specific errors that can occur in the IS-IS network:

- ciiVersionSkew--The ciiVersionSkew trap notification is generated when a Hello PDU is received from an IS running a different version of the IS-IS protocol. This is an edge-triggered notification and will be generated once for all PDUs received on the same circuit.
- ciiAreaMismatch--When a Hello PDU is received from an IS that does not share any area address, the ciiAreaMismatch notification is generated. This is an edge-triggered notification and will be generated only once for all PDUs received on the same circuit.
- ciiRejectedAdjacency--When a correct Hello PDU is received from an IS but adjacency is not established, the ciiRejectedAdjacency notification is generated to indicate that adjacency formation was not allowed. This is an edge-triggered notification.

MIB Support for IS-IS Transition State Changes

The following MIB trap objects are used to notify the network manager when a transition state change has occurred for an IS:

- ciiDatabaseOverload--The ciiDatabaseOverload trap object is used to notify the network manager when the system enters or leaves the Overload state.
- ciiAdjacencyChange--When an IS-IS adjacency changes its state to UP or moves out of this state, it causes the ciiAdjacencyChange trap notification to be generated.

You can enable SNMP notifications to be sent when IS-IS errors and mismatches related to invalid field values in PDUs are detected. Errors can be classified as generic (applied to all PDUs), LPS-related, and IS-IS Hello PDU-related. When you enter the **snmp-server enable traps isis errors** command without specifying any of the optional keywords and arguments, all IS-IS traps are enabled. You can enter specific keywords and arguments to enable certain traps. For more information on how to enable specific traps or groups of traps, refer to the **snmp-server enable traps isis**command page.

You can enable IS-IS traps for the following system-wide errors that apply to all PDUs:

- Authentication
- Authentication type
- System ID field length mismatch
- Manually-configured address drop
- Mismatch in maximum area address values

You can enable IS-IS traps for the following errors that apply specifically to IS-IS Hello PDUs:

- Adjacency creation failure
- Mismatch in the area addresses between ISs
- IS-IS protocol version mismatch

You can enable IS-IS traps for the following errors that apply specifically to LSPs:

- Mismatch in LSP and originating buffer size
- Attempt made to exceed a maximum sequence number
- LSP in-memory corruption with an invalid checksum
- Packet parse failure on a receiving circuit
- Protocol-supported mismatch for non-pseudonode LSP
- Invalid attempt to purge a the LSP of a local IS
- Propagation failure caused by an oversized LSP
- A system ID has been configured with a sequence number skip.

How to Enable IS-IS MIB

Configuring the Router to Send SNMP Notifications for IS-IS to a Host

Before you begin

SNMP must be enabled on your network.

SUMMARY STEPS

1. **enable**
2. **show running-config**
3. **configure terminal**
4. **snmp-server host** {*hostname* | *ip-address*} [**vrf** *vrf-name*] [**traps** | **informs**] [**version** {**1** | **2c** | **3** [**auth** | **noauth**| **priv**]}] *community-string* [**upd-port** *port*] [*notification-type*]
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**show running-config** **Example:** `Router# show running-config`	Displays the running configuration to determine if an SNMP agent is already running. • If no SNMP information is displayed, continue with the next step. If any SNMP information is displayed, you can modify the information or change it as needed.
Step 3	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 4	**snmp-server host** {*hostname* | *ip-address*} [**vrf** *vrf-name*] [**traps** | **informs**] [**version** {**1** | **2c** | **3** [**auth** | **noauth**| **priv**]}] *community-string* [**upd-port** *port*] [*notification-type*] **Example:** `Router(config)# snmp-server host 172.16.1.1 traps version 3 mycommunitystring isis`	Specifies the recipient (target host) for IS-IS SNMP notification operations. • If no *notification-type* is specified, all enabled notifications (traps or informs) will be sent to a specified host. If you want to send only IS-IS notifications to the specified host, you can use the optional **isis** keyword as the value for the *notification-type* argument. (See the example.)
Step 5	**end** **Example:** `Router(config)# end`	Ends your configuration sessions and exits global configuration mode.

Examples

The following example configures the router to send SNMP notifications for IS-IS to a host:

```
Router> enable
Router# configure terminal
Router(config)# snmp-server host 172.31.1.1 traps version 3 mycommunity string isis
```

What to Do Next

If you want to globally enable all IS-IS traps, refer to the Enabling All IS-IS Traps, on page 14. If you want to enable groups of IS-IS traps, refer to the and the Enabling IS-IS State-Change Traps, on page 17.

Enabling All IS-IS Traps

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps isis**

4. **no snmp-server enable traps isis** [**errors** [*error-type*]] [**state-change** [*state-change-type*]]
5. **exit**
6. **show running-config** [*options*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server enable traps isis** **Example:** `Router(config)# snmp-server enable traps isis`	Enables all SNMP notifications defined in the IS-IS MIB. **Note** This step is required only if you wish to enable all IS-IS traps. To enable specific groups of traps, see the Enabling IS-IS Error Traps, on page 16 or the Enabling IS-IS State-Change Traps, on page 17. When you enter the **no snmp-server enable traps isis** command, all IS-IS traps will be disabled.
Step 4	**no snmp-server enable traps isis** [**errors** [*error-type*]] [**state-change** [*state-change-type*]] **Example:** `Router(config)# no snmp-server enable traps isis state-change database-overload`	Disables the sending of SNMP notifications for IS-IS state changes. **Note** This step is required only if you wish to disable a particular trap or set of traps. To enable specific groups of traps, see Enabling IS-IS Error Traps, on page 16 or the Enabling IS-IS State-Change Traps, on page 17.
Step 5	**exit** **Example:** `Router(config)# exit`	Returns to privileged EXEC mode.
Step 6	**show running-config** [*options*] **Example:** `Router# show running-config | include traps`	Displays the running configuration to verify which traps have been enabled.

Examples

The following example shows how to globally enable all IS-IS traps:

```
Router> enable
Router# configure terminal
Router(config)# snmp-server enable traps isis
```

What to Do Next

If you do not wish to enable all IS-IS traps, refer to the Enabling IS-IS Error Traps, on page 16 for enabling one or more IS-IS error traps, or refer to the Enabling IS-IS State-Change Traps, on page 17 for enabling one or more IS-IS state-change traps.

Enabling IS-IS Error Traps

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps isis** [**errors** [*error-type*]] [**state-change** [*state-change-type*]]
4. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server enable traps isis** [**errors** [*error-type*]] [**state-change** [*state-change-type*]] **Example:** `Router(config)# snmp-server enable traps isis errors lsp`	Enables SNMP notifications for IS-IS errors. • When you enter the **lsp** keyword for the *error-type*, only the LSP error traps are enabled. (See the **snmp-server enable traps isis** command in the *Cisco IOS IP Routing: ISIS Command Reference* for a list of *error-type* keywords.)
Step 4	**end** **Example:** `Router(config)# end`	Ends your configuration sessions and exits global configuration mode.

Examples

The following example shows how to enable only the IS-IS traps related to authentication errors:

```
Router> enable
Router# configure terminal
Router(config)# snmp-server enable traps isis errors authentication
```

Enabling IS-IS State-Change Traps

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **snmp-server enable traps isis** [**state-change** [*state-change-type*]]
4. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**snmp-server enable traps isis** [**state-change** [*state-change-type*]] **Example:** `Router(config)# snmp-server enable traps isis state-change`	Enables SNMP notifications for IS-IS state changes. **Note** When the **snmp-server enable traps isis state-change**command is entered without any of the optional keywords, both IS-IS state change traps are enabled. Entering the **no snmp-server enable traps isis state-change**command will disable both IS-IS state-change traps.
Step 4	**end** **Example:** `Router(config)# end`	Ends your configuration sessions and exits global configuration mode.

Examples

The following example shows how to enable only the IS-IS traps related to adjacency transition state changes:

```
Router> enable
Router# configure terminal
Router(config)# snmp-server enable traps isis state-change adjacency
```

Verifying IS-IS MIB Traps on the Router

SUMMARY STEPS

1. **enable**
2. **show running-config** [*options*]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show running-config** [*options*] **Example:** `Router# show running-config | include traps`	Displays the contents of the currently running configuration file and includes information about enabled traps. • Verifies if the traps have been enabled.

Configuration Examples for IS-IS MIB

Example Enabling and Verifying IS-IS Error Traps

The following example enables all IS-IS error traps:

```
Router(config)# snmp-server enable traps isis
Router(config)# end
```

The **show running-config** command is entered to verify that the traps are enabled:

```
Router# show running-config | include traps
snmp-server enable traps isis
```

Example Enabling and Verifying IS-IS State Change Traps

The following example shows how to enable the ciiDatabaseOverload and ciiManualAddressDrops traps:

```
Router(config)# snmp-server enable traps isis state-change database-overload
Router(config)# snmp-server enable traps isis errors manual-address-drop
Router(config)# end
```

The **show running-config** command is entered to verify that these traps are enabled:

```
Router# show running-config | include traps
snmp-server enable traps isis state-change database-overload
snmp-server enable traps isis errors manual-address-drop
```

Where to Go Next

To configure features to improve IS-IS network convergence times and scalability, complete the optional tasks in one or more of the following modules:

- "Setting Best Practice Parameters for IS-IS Fast Convergence"
- "Reducing Failure Detection Times in IS-IS Networks"
- "Reducing Alternate-Path Calculation Times in IS-IS Networks"

Additional References

Related Documents

Related Topic	Document Title
IS-IS commands: complete command syntax, command mode, defaults, command history, usage guidelines, and examples	*Cisco IOS IP Routing: ISIS Command Reference*
Overview of Cisco IS-IS conceptual information with links to all the individual IS-IS modules	"Integrated IS-IS Routing Protocol Overview"
SNMP configuration	"Configuring SNMP Support" section of the *Cisco IOS XE Network Management Configuration Guide*, Release 2
SNMP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	*Cisco IOS Network Management Command Reference*
Cisco IOS master command list, all releases	Cisco IOS Master Command List, All Releases

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

MIBs

MIB	MIBs Link
CISCO-IETF-ISIS-MIB.my	To locate and download MIBs for selected platforms, Cisco IOS XE software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
IETF draft draft-ietf-isis-wg-mib-16.txt	*Management Information Base for IS-IS*

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IS-IS MIB

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.