



## IS-IS MIB

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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.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## 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**

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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.

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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**

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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.

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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**

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

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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**

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

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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**

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

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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**

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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.

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- 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**

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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.

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- 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
- ciiRASNPAddress
- ciiRASNPAMask
- ciiRASNPAPrefix
- ciiRAType

**Note**

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

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- 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`
- `ciiIPRASNPAAAddress`
- `ciiIPRASourceType`

**Note**

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The `ciiIPRAType` MIB object does not support manually created IP reachability addresses.

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

The `ciiLSPSummaryEntry` table defines the following MIB objects:

- `ciiLSPLLevel`
- `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**

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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."

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## 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	<b>enable</b>	Enables privileged EXEC mode.

	Command or Action	Purpose
	<p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<p><b>show running-config</b></p> <p><b>Example:</b></p> <pre>Router# show running-config</pre>	<p>Displays the running configuration to determine if an SNMP agent is already running.</p> <ul style="list-style-type: none"> <li>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.</li> </ul>
<b>Step 3</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	<p>Enters global configuration mode.</p>
<b>Step 4</b>	<p><b>snmp-server host</b> <i>{hostname   ip-address}</i> [<b>vrf</b> <i>vrf-name</i>] [<b>traps</b>   <b>informs</b>] [<b>version</b> {<b>1</b>   <b>2c</b>   <b>3</b>}] [<b>auth</b>   <b>noauth</b>   <b>priv</b>]}] <i>community-string</i> [<b>upd-port</b> <i>port</i>] [<i>notification-type</i>]</p> <p><b>Example:</b></p> <pre>Router(config)# snmp-server host 172.16.1.1 traps version 3 mycommunitystring isis</pre>	<p>Specifies the recipient (target host) for IS-IS SNMP notification operations.</p> <ul style="list-style-type: none"> <li>If no <i>notification-type</i> 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 <b>isis</b> keyword as the value for the <i>notification-type</i> argument. (See the example.)</li> </ul>
<b>Step 5</b>	<p><b>end</b></p> <p><b>Example:</b></p> <pre>Router(config)# end</pre>	<p>Ends your configuration sessions and exits global configuration mode.</p>

### 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 15](#). If you want to enable groups of IS-IS traps, refer to the [Enabling IS-IS Error Traps, on page 16](#) 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	<p><code>enable</code></p> <p><b>Example:</b></p> <pre>Router&gt; enable</pre>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<p><code>configure terminal</code></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	<p>Enters global configuration mode.</p>
Step 3	<p><code>snmp-server enable traps isis</code></p> <p><b>Example:</b></p> <pre>Router(config)# snmp-server enable traps isis</pre>	<p>Enables all SNMP notifications defined in the IS-IS MIB.</p> <p><b>Note</b> This step is required only if you wish to enable all IS-IS traps. To enable specific groups of traps, see the <a href="#">Enabling IS-IS Error Traps, on page 16</a> or the <a href="#">Enabling IS-IS State-Change Traps, on page 17</a>. When you enter the <b>no snmp-server enable traps isis</b> command, all IS-IS traps will be disabled.</p>
Step 4	<p><code>no snmp-server enable traps isis [errors <i>[error-type]</i>] [state-change <i>[state-change-type]</i>]</code></p> <p><b>Example:</b></p> <pre>Router(config)# no snmp-server enable traps isis state-change database-overload</pre>	<p>Disables the sending of SNMP notifications for IS-IS state changes.</p> <p><b>Note</b> This step is required only if you wish to disable a particular trap or set of traps. To enable specific groups of traps, see the <a href="#">Enabling IS-IS Error Traps, on page 16</a> or the <a href="#">Enabling IS-IS State-Change Traps, on page 17</a>.</p>
Step 5	<p><code>exit</code></p> <p><b>Example:</b></p> <pre>Router(config)# exit</pre>	<p>Returns to privileged EXEC mode.</p>

	Command or Action	Purpose
<b>Step 6</b>	<b>show running-config</b> [ <i>options</i> ]  <b>Example:</b> 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
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>



	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>snmp-server enable traps isis [errors [error-type]] [state-change [state-change-type]]</b>  <b>Example:</b> Router(config)# snmp-server enable traps isis errors lsp	Enables SNMP notifications for IS-IS errors. <ul style="list-style-type: none"> <li>• When you enter the <b>lsp</b> keyword for the <i>error-type</i>, only the LSP error traps are enabled. (See the <b>snmp-server enable traps isis</b> command in the <i>Cisco IOS IP Routing: ISIS Command Reference</i> for a list of <i>error-type</i> keywords.)</li> </ul>
<b>Step 4</b>	<b>end</b>  <b>Example:</b> 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
<b>Step 1</b>	<b>enable</b>	Enables privileged EXEC mode.

	Command or Action	Purpose
	<b>Example:</b> Router> enable	<ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>snmp-server enable traps isis [state-change [state-change-type]]</b>  <b>Example:</b> Router(config)# snmp-server enable traps isis state-change	Enables SNMP notifications for IS-IS state changes.  <b>Note</b> When the <b>snmp-server enable traps isis state-change</b> command is entered without any of the optional keywords, both IS-IS state change traps are enabled. Entering the <b>no snmp-server enable traps isis state-change</b> command will disable both IS-IS state-change traps.
<b>Step 4</b>	<b>end</b>  <b>Example:</b> 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

- enable
- show running-config [options]

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	<b>Example:</b> Router> enable	<ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>show running-config</b> [ <i>options</i> ]  <b>Example:</b> Router# show running-config   include traps	Displays the contents of the currently running configuration file and includes information about enabled traps. <ul style="list-style-type: none"> <li>• Verifies if the traps have been enabled.</li> </ul>

## 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	<i>Cisco IOS IP Routing: ISIS Command Reference</i>
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 <i>Cisco IOS XE Network Management Configuration Guide, Release 2</i>
SNMP commands: complete command syntax, command mode, command history, defaults, usage guidelines, and examples	<i>Cisco IOS Network Management Command Reference</i>
Cisco IOS master command list, all releases	<a href="#">Cisco IOS Master Command List, All Releases</a>

### 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: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**RFCs**

<b>RFC</b>	<b>Title</b>
IETF draft draft-ietf-isis-wg-mib-16.txt	<i>Management Information Base for IS-IS</i>

**Technical Assistance**

<b>Description</b>	<b>Link</b>
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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## 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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

Table 1: Feature Information for IS-IS MIB

Feature Name	Releases	Feature Information
IS-IS MIB	Cisco IOS XE Release 2.1	<p>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.</p> <p>This feature was introduced on the Cisco ASR 1000 Series Aggregation Services Routers.</p> <p>The following commands were modified by this feature:  <b>snmp-server enable traps isis,</b>  <b>snmp-server host</b></p>