

Troubleshoot IS-IS Adjacency Issues

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Introduction

This document describes how to troubleshoot IS-IS protocol for Cisco IOS® XE platforms.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Intermediate System to Intermediate System (IS-IS)
- Cisco IOS XE

For more information on these topics, see:

- [IP Routing: ISIS Configuration Guide](#)
- [Configure IS-IS Adjacency and Area Types](#)

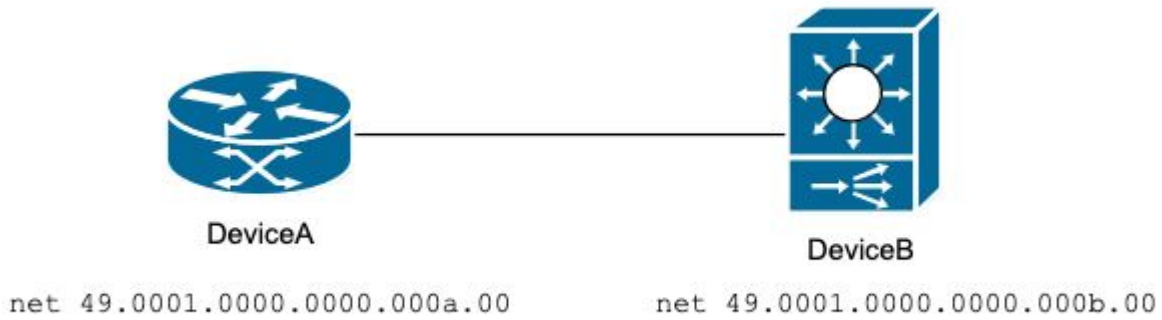
Components Used

The information in this document is based on Cisco IOS XE software.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

IS-IS Adjacency Down

This section provides a solution to the common problem of IS-IS down. This network diagram is used as an example:



Baseline Topology

IS-IS is down between DeviceA and DeviceB.

<#root>

DeviceA#

show isis neighbors detail

System Id	Type	Interface	IP Address	State	Holdtime	Circuit Id
DeviceA#						

<#root>

DeviceB#

show isis neighbors detail

System Id	Type	Interface	IP Address	State	Holdtime	Circuit Id
DeviceA	L1L2	Twe1/0/9	192.0.2.1	DOWN	28	05

Area Address(es): 49.0001
 SNPA: a84f.b1c3.9484
 State Changed: never
 Format: Phase V
 Remote TID: 0
 Local TID: 0
 Interface name: TwentyFiveGigE1/0/9
 Neighbor Circuit Id: 5
 Adj sync: Full

Diagnose the Problem:

1. Validate the connectivity between the devices.

<#root>

DeviceA#

```
ping 192.0.2.2 size 1500 df-bit
```

Type escape sequence to abort.

Sending 5, 1500-byte ICMP Echos to 192.0.2.2, timeout is 2 seconds:

Packet sent with the DF bit set

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

DeviceA#

<#root>

DeviceB#

```
ping 192.0.2.1 size 1500 df-bit
```

Type escape sequence to abort.

Sending 5, 1500-byte ICMP Echos to 192.0.2.1, timeout is 2 seconds:

Packet sent with the DF bit set

!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms

DeviceB#

2. Review the configuration on both sides.

<#root>

DeviceA#

```
show running-config | sec router isis
```

```
ip router isis
router isis
 net 49.0001.0000.0000.000a.00
```

DeviceA#

<#root>

DeviceB#

```
show running-config | sec router isis
```

```
ip router isis
router isis
 net 49.0001.0000.0000.000b.00
```

DeviceB#

3. Validate if the adjacency is up at the Connectionless Network Service (CLNS). This provides a summary of the neighbors connected to your device.

<#root>

DeviceA#

```
show clns neighbors detail
```

```
System Id      Interface      SNPA          State Holdtime  Type Protocol
0000.0000.000B Te0/0/4
6c31.0edb.3b5f
```

```
Up
```

```
257          IS   ES-IS
Area Address(es): 49.0001
```

```
Uptime: 02:02:11
```

```
Interface name: TenGigabitEthernet0/0/4
DeviceA#
```

```
<#root>
```

```
DeviceB#
```

```
show clns neighbors detail
```

```
System Id      Interface      SNPA          State Holdtime  Type Protocol
0000.0000.000A Twe1/0/9
a84f.b1c3.9484
```

```
Down
```

```
20          L1L2 IS-IS
Area Address(es): 49.0001
IP Address(es): 192.0.2.1*
```

```
Uptime: 02:02:09
```

```
NSF capable
Interface name: TwentyFiveGigE1/0/9
DeviceB#
```

The mac-addresses listed on each CLNS neighbor are the mac addresses of the remote devices which peer with the local device.

```
<#root>
```

```
DeviceA#
```

```
show interface TenGigabitEthernet0/0/4
```

```
TenGigabitEthernet0/0/4 is up, line protocol is up
Hardware is 8xSFP+, address is
```

```
a84f.b1c3.9484 (bia a84f.b1c3.9484) < mac address appeared on SNPA DeviceB
```

```
Internet address is 192.0.2.1/30
MTU 1500 bytes, BW 10000000 Kbit/sec, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 1/255
```

```
<#root>
```

```
DeviceB#
```

```
show interface TwentyFiveGigE1/0/9
```

```
TwentyFiveGigE1/0/9 is up, line protocol is up (connected)
Hardware is Twenty Five Gigabit Ethernet, address is
```

```
6c31.0edb.3b5f (bia 6c31.0edb.3b5f) < mac address appeared on SNPA DeviceA
```

```
Internet address is 192.0.2.2/30
MTU 9216 bytes, BW 10000000 Kbit/sec, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, loopback not set
```

4. Run the command `show clns interface <interface>` in order to validate if the parameters match with the peer.

Ensure to match these values:

- Maximum Transmission Unit (MTU)
- Circuit Type

DeviceA

```
<#root>
```

```
DeviceA#
```

```
show clns interface TenGigabitEthernet0/0/4
```

```
TenGigabitEthernet0/0/4 is up, line protocol is up
Attached to: isis
Checksums enabled,
```

```
MTU 1497
```

```
, Encapsulation SAP
ERPDU's enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 19 seconds
Routing Protocol: IS-IS
```

```
Circuit Type: level-1-2
```

```
Interface number 0x0, local circuit ID 0x5
Neighbor Extended Local Circuit ID: 0x0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
```

```
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 908 milliseconds

if state DOWN
```

DeviceB

```
<#root>
DeviceB#
show clns interface TwentyFiveGigE1/0/9

TwentyFiveGigE1/0/9 is up, line protocol is up
Attached to: isis
Checksums enabled,
MTU 9213
, Encapsulation SAP
ERPDUs enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 8 seconds
Routing Protocol: IS-IS

Circuit Type: level-1-2

Interface number 0x0, local circuit ID 0xB
Neighbor Extended Local Circuit ID: 0x5
Neighbor System-ID: 0000.0000.000A
P2P retransmit queue size: 0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 2 seconds

if state INIT
```

In this scenario, the problem is related to the MTU mismatch. If the remote peer is not accessible, the `debug isis adj-packets <interface>` can show the MTU value being sent and received.

Note: This applies only when the command `show clns interfaceprints` if state INIT.

```
<#root>
DeviceA#
debug isis adj-packets TenGigabitEthernet 0/0/4
```

```
IS-IS Adjacency related packets debugging is on for router process null
*Jul 18 23:24:16.598: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:16.599: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN,
length 1496 < MTU sent to the neighbor >
```

```
*Jul 18 23:24:25.189: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:25.189: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
*Jul 18 23:24:34.057: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:34.057: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
*Jul 18 23:24:42.866: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:42.866: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
*Jul 18 23:24:51.646: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:51.646: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
*Jul 18 23:24:59.606: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 18 23:24:59.606: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
```

```
<#root>
```

```
DeviceB#
```

```
debug isis adj-packets twentyFiveGigE 1/0/9
```

```
*Jul 18 23:53:22.420: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:INIT,
length 9212 < MTU sent to the neighbor >
```

```
*Jul 18 23:53:22.591: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)
*Jul 18 23:53:22.591: ISIS-Adj: cir type L1L2, cir id 05,
length 1496 < MTU received from neighbor >
```

```
*Jul 18 23:53:22.592: ISIS-Adj: rcvd state DOWN, old state INIT, new state INIT, nbr usable TRUE
*Jul 18 23:53:22.592: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x49000184 Length:5
*Jul 18 23:53:22.592: ISIS-Adj: Nghbr Ckt ID changed: FALSE
*Jul 18 23:53:22.592: ISIS-Adj: newstate:1, state_changed:0, going_up:0, going_down:0
*Jul 18 23:53:22.592: ISIS-Adj: Action = ACCEPT
*Jul 18 23:53:22.592: ISIS-Adj: ACTION_ACCEPT:
...
```

ISIS Adjacency Down (Not MTU Mismatch Related)

IS-IS is down and MTU matches on the interfaces.

```
<#root>
```

```
DeviceA#
```

```
show cns neighbors
```

System Id	Interface	SNPA	State	Holdtime	Type	Protocol
-----------	-----------	------	-------	----------	------	----------

DeviceA#

<#root>

DeviceB#

show clns neighbors

System Id	Interface	SNPA	State	Holdtime	Type	Protocol
-----------	-----------	------	-------	----------	------	----------

DeviceB#

1. Validate the configuration that is matching with the peer.
2. Ensure that the physical interface is in a good condition to transmit (no errors or light levels problem).
3. Check connectivity between peers (ping test adding the MTU size and the df-bit).
4. Validate the CLNS neighbors between the peers.
5. Ensure that both ends have the same MTU and same Circuit-Type along with the state.

DeviceA

<#root>

DeviceA#

show clns interface TenGigabitEthernet 0/0/4

TenGigabitEthernet0/0/4 is up, line protocol is up
Attached to: isis
Checksums enabled,

MTU 1497

, Encapsulation SAP
ERPDUs enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 41 seconds
Routing Protocol: IS-IS

Circuit Type: level-1-2

Interface number 0x0, local circuit ID 0x5
Neighbor Extended Local Circuit ID: 0x0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 2 seconds

if state DOWN

DeviceB


```

<#root>
DeviceB#
show clns interface twentyFiveGigE 1/0/9

TwentyFiveGigE1/0/9 is up, line protocol is up
Attached to: isis
Checksums enabled,

MTU 1497

, Encapsulation SAP
ERPDU enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 42 seconds
Routing Protocol: IS-IS

Circuit Type: level-1-2

Interface number 0x0, local circuit ID 0xB
Neighbor Extended Local Circuit ID: 0x0
P2P retransmit queue size: 0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 5 seconds

if state DOWN

```

6. Enable `debug isis adj-packet <interface>` and validate the packets that are sent and received.

```

<#root>
DeviceA#
debug isis adj-packets TenGigabitEthernet 0/0/4

IS-IS Adjacency related packets debugging is on for router process null
*Jul 19 13:32:52.788: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 19 13:32:52.788: ISIS-Adj:

Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1496

*Jul 19 13:33:00.708: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 19 13:33:00.709: ISIS-Adj:

Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1496

*Jul 19 13:33:09.726: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 19 13:33:09.726: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1
*Jul 19 13:33:18.376: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 19 13:33:18.376: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1

```

```
*Jul 19 13:33:26.132: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
*Jul 19 13:33:26.132: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1496
DeviceA#
```

```
<#root>
```

```
DeviceB#
```

```
debug isis adj-packets TwentyFiveGigE1/0/9
```

```
IS-IS Adjacency related packets debugging is on for router process null
```

```
*Jul 19 14:01:32.125: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
*Jul 19 14:01:32.125: ISIS-Adj:
```

```
Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496
```

```
*Jul 19 14:01:40.005: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
*Jul 19 14:01:40.005: ISIS-Adj:
```

```
Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496
```

```
*Jul 19 14:01:49.602: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
*Jul 19 14:01:49.602: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496
*Jul 19 14:01:58.284: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
*Jul 19 14:01:58.284: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496
```

Both devices are sending, but they do not receive the Hello Packet from their neighbors.

7. Enable a capture in order to validate that the packets are sent to each neighbor. Once the capture is complete, export it to the bootflash or flash as a.pcap file and upload it to a TFTP server for more details.

```
<#root>
```

```
DeviceA#
```

```
show monitor cap cap parameter
```

```
monitor capture cap interface TenGigabitEthernet0/0/4 BOTH < Interface from where send and receive the packets >
  monitor capture cap control-plane IN < Packets to be process and generated by the CPU >
  monitor capture cap access-list TAC < ACL for capture only the IS-IS packets >
  monitor capture cap buffer size 10
  monitor capture cap limit pps 1000
```

```
DeviceA#
```

```
show access-list TAC
```

```
Extended MAC access list TAC
  permit host
```

```
a84f.b1c3.9484
```

```
host
```

```
0900.2b00.0005 < Local MAC address towards the IS-IS Hello >
```

```

    permit host
6c31.0edb.3b5f host 0900.2b00.0005 < Remote MAC address towards the IS-IS Hello >

<#root>
DeviceB#
show monitor capture cap parameter

monitor capture cap interface TwentyFiveGigE1/0/9 BOTH < Interface from where send and receive the Hello >

monitor capture cap control-plane BOTH < Packets to be process and generated by the CPU >

monitor capture
cap match any < match all the packets on the switch >

monitor capture cap buffer size 10

```

Note: EPC at Catalyst Cisco IOS XE switches only captures outgoing IS-IS hellos and not the ingress packets. As an alternative, SPAN captures are recommended.

Reference to the Hello Packets is shown in this table.

Name	Destination Mac address
All L1 ISs	0180.c200.0014
All L2 ISs	0180.c200.0015
All ISs	0900.2b00.0005
All ESs	0900.2b00.0004

8. Review the exported capture and ensure that the hello packets are exchanged between neighbors.

DeviceA sends the hello packets adding their system ID (red square). It is expected to receive a packet from its neighbor with its system ID. In this capture, you can appreciate that DeviceB does not forward these packets to the peer.

eth.dst == 09:00:2b:00:00:05

Nr	Time	Source	Destination	seq
1	2023-07-19 08:31:55.703958	Cisco_c3:94:84	DEC-MAP-(or-OSI?)-...	P2P HELLO, System-ID: 0000
3	2023-07-19 08:32:05.236987	Cisco_c3:94:84	DEC-MAP-(or-OSI?)-...	P2P HELLO, System-ID: 0000
4	2023-07-19 08:32:14.076991	Cisco_c3:94:84	DEC-MAP-(or-OSI?)-...	P2P HELLO, System-ID: 0000
5	2023-07-19 08:32:23.127984	Cisco_c3:94:84	DEC-MAP-(or-OSI?)-...	P2P HELLO, System-ID: 0000

> Frame 3: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits)

- IEEE 802.3 Ethernet
 - > Destination: DEC-MAP-(or-OSI?)-Intermediate-System-Hello? (09:00:2b:00:00:05) Source from Destination
 - > Source: Cisco_c3:94:84 (a8:4f:b1:c3:94:84)
 - Length: 1499
- Logical-Link Control
- ISO 10589 ISIS InTRA Domain Routeing Information Exchange Protocol
 - Intradomain Routing Protocol Discriminator: ISIS (0x83)
 - Length Indicator: 20
 - Version/Protocol ID Extension: 1
 - ID Length: 0
 - 000. = Reserved: 0x0
 - ...1 0001 = PDU Type: P2P HELLO (17)
 - Version: 1
 - Reserved: 0
 - Maximum Area Addresses: 0
- ISIS HELLO
 -11 = Circuit type: Level 1 and 2 (0x3)
 - 0000 00.. = Reserved: 0x00
 - SystemID {Sender of PDU}: 0000.0000.000a System ID sent to the neighbor
 - Holding timer: 30
 - PDU length: 1496
 - Local circuit ID: 5
 - > Restart Signaling (t=211, l=3)
 - > Point-to-point Adjacency State (t=240, l=5)
 - > Protocols Supported (t=129, l=1)
 - > Area address(es) (t=1, l=4)
 - > IP Interface address(es) (t=132, l=4)
 - > Padding (t=8, l=255)
 - > Padding (t=8, l=255)
 - > Padding (t=8, l=255)
 - > Padding (t=8, l=255)
 - > Padding (t=8, l=255)
 - > Padding (t=8, l=162)

DeviceA ISIS Down Capture

DeviceB capture shows that the hello packets are sent to its neighbor (red square). However, similar to the last capture, it does not receive the Hello packets from its neighbor.

DeviceB ISIS Down Capture

< IS-IS sends hellos to the neighbor and receives a response from DeviceA >

```
Jul 19 18:59:07.887: ISIS-Adj: L2 adj count 0
Jul 19 18:59:08.422: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
Jul 19 18:59:08.422: ISIS-Adj:
```

Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496

```
Jul 19 18:59:16.144: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x0 Length:5
Jul 19 18:59:16.144: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:DOWN, length 1496
Jul 19 18:59:19.001: ISIS-Adj:
```

Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)

```
Jul 19 18:59:19.001: ISIS-Adj: cir type L2, cir id 05, length 1496
Jul 19 18:59:19.001: ISIS-Adj:
```

RCV:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x49000184 Length:5

```
Jul 19 18:59:19.001: ISIS-Adj: Nghbr Ckt ID changed: TRUE
Jul 19 18:59:19.001: ISIS-Adj: newstate:1, state_changed:1, going_up:0, going_down:0
Jul 19 18:59:19.001: ISIS-Adj: Action = GOING UP, new type = L2
```

< DeviceB declares that the adjacency is UP and starts to establish the session >

```
Jul 19 18:59:19.001: ISIS-Adj: New serial adjacency
Jul 19 18:59:19.001: ISIS-Adj:
```

rcvd state DOWN, old state DOWN, new state INIT, nbr usable TRUE

```
Jul 19 18:59:19.002: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 19 18:59:19.002: ISIS-Adj:
```

Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:INIT, length 1496

```
Jul 19 18:59:19.004: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)
Jul 19 18:59:19.004: ISIS-Adj: cir type L2, cir id 05, length 1496
Jul 19 18:59:19.004: ISIS-Adj:
```

rcvd state INIT, old state INIT, new state UP, nbr usable TRUE

```
Jul 19 18:59:19.004: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:59:19.004: ISIS-Adj: Nghbr Ckt ID changed: FALSE
Jul 19 18:59:19.004: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000B
Jul 19 18:59:19.004: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0xB
Jul 19 18:59:19.004: ISIS-Adj: newstate:0, state_changed:1, going_up:1, going_down:0
Jul 19 18:59:19.004: ISIS-Adj: Action = GOING UP, new type = L2
Jul 19 18:59:19.004: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9)
```

Up, new adjacency

5. Enable a capture in order to validate that the packets are sent to each neighbor. Once the capture is complete, export the capture to the bootflash as a .pcap file and upload it to a TFTP server for more details.

DeviceA receives a packet from DeviceB (19:15.05) after this packet is received. DeviceA sends its corresponding hello without any reply from the neighbor until it reaches the hold time expired which is 30 seconds by default (red square).

This is when this router declares the adjacency down. After this period, DeviceB sends its hello and is received by DeviceA and these packets are exchanged with no problem (green square).

eth.dst == 09:00:2b:00:00:05				
Nr	Time	Source	Destination	seq
1	19:14:48.784947	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2	19:14:49.664958	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
3	19:14:57.201985	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
4	19:14:57.520969	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
5	19:15:05.147987	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
6	19:15:06.439964	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
7	19:15:16.015990	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
8	19:15:25.153983	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
9	19:15:32.868943	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:15:35.149986	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:15:45.071987	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:15:51.718956	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:15:51.720955	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:15:51.721947	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:15:51.722954	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:15:51.723961	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:00.949947	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:01.164984	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:08.904951	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:09.835955	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:16.435966	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:19.244982	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:23.987940	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:28.034986	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:33.752951	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:37.050992	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:41.765951	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:44.948940	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:49.618956	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:16:53.623960	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:16:58.815952	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:17:01.182989	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	19:17:08.310973	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	19:17:09.463965	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a

- > Frame 5: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits)
- > IEEE 802.3 Ethernet
- > Logical-Link Control
- > ISO 10589 ISIS InTRA Domain Routeing Information Exchange Protocol
- > ISIS HELLO

ISIS unstable DeviceA

Capture from DeviceB is similar to the symptom from the peer. The device does not receive the hello packets from its neighbor. The last packet is sent from DeviceB with no reply from DeviceA until it reaches the 30 seconds hold timer. This switch considers the adjacency down. After this failure, the switch receives the hello from DeviceA and starts the neighborhood.

eth.dst == 09:00:2b:00:00:05				
Nr	Time	Source	Destination	seq

IS-IS is unstable between DeviceA and DeviceB. The protocol encounters random flaps.

```
<#root>
```

```
DeviceA#
```

```
show logging
```

```
Jul 21 10:03:38.633: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold time 0
Jul 21 10:05:10.272: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new adjacency
Jul 21 10:33:41.528: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold time 0
Jul 21 10:35:07.979: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new adjacency
Jul 21 11:03:42.442: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold time 0
Jul 21 11:05:08.469: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new adjacency
```

```
<#root>
```

```
DeviceB#
```

```
show logging
```

```
Jul 21 10:03:44.535: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time 0
Jul 21 10:05:13.281: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjacency
Jul 21 10:33:38.408: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time 0
Jul 21 10:35:10.989: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjacency
Jul 21 11:03:39.291: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time 0
Jul 21 11:05:11.479: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjacency
```

When the problem occurs, ensure to proceed with these actions:

1. Validate that the configuration matches with the peer.
2. Ensure that the physical interface is in a good condition to transmit (no errors or light levels problem).
3. ~~Check connectivity between peers (ping test with MTU size and the df-bit set).~~

Tip: It is not easy to troubleshoot these kinds of issues due to the condition of the random flaps. In order to tackle this situation, consider using scripts to run the necessary commands and continue to troubleshoot.

4. Proceed to configure a monitor capture with an Access-list in order to be more specific on the troubleshooting.

5. Disable the logging console and enable the debug isis adj-packets <interface>.

```
<#root>
```

```
DeviceA(config)#
```

```
no logging console
```



```
DeviceA(config)#exit
DeviceA#
debug isis adj-packets TenGigabitEthernet0/0/4
```

6. Enable the packet capture on the equipment and activate it.

```
<#root>
```

```
DeviceA#
```

```
show monitor capture cap parameter
```

```
monitor capture cap interface TenGigabitEthernet0/0/4 BOTH
monitor capture cap control-plane IN
monitor capture cap
```

```
access-list TAC > match only the packets allowed on the ACL
```

```
monitor capture cap buffer size 100
```

```
circular > when the capture reaches the size of 100 MB this overwrite the previous information.
```

```
monitor capture cap limit pps 1000
```

```
DeviceA#
```

```
show access-lists TAC
```

```
Extended MAC access list TAC
permit
```

```
host a84f.b1c3.9484 host 0900.2b00.0005 < Local MAC address towards the IS-IS Hello >
```

```
permit
```

```
host 6c31.0edb.3b5f host 0900.2b00.0005 < Remote MAC address towards the IS-IS Hello >
```

```
DeviceA#monitor capture cap start
```

7. Configure the Embedded Event Manager (EEM) on the Cisco device. Once the issue triggers the syslog pattern, this generates logs that are stored on the flash as a .txt file. Proceed to upload them to a TFTP server for more information.

```
<#root>
```

```
DeviceA#
```

```
show running-config | sec event
```

```
event manager applet ISIS_Flap authorization bypass
```

```
event syslog pattern "%CLNS-5-ADJCHANGE:.*hold time expired"
```

```
action 1.0 syslog msg "ISIS down Please wait - capturing the traffic"
action 1.1 cli command "enable"
action 1.2 cli command "show clns interface ten0/0/4 | append bootflash:ISIS_DeviceA.txt"
action 1.3 cli command "show clns traffic interface tenGigabitEthernet 0/0/4 |
```

```
append bootflash:ISIS_DeviceA.txt"
```

```
action 2.0 cli command "show logging | append bootflash:debug_DeviceA.txt"
action 2.1 cli command "undebug all"
action 2.2 cli command "monitor capture cap stop"
action 3.0 cli command "end"
```

For switches to append the logs it is necessary to use the

```
append flash:<document.txt>
```

, as example:

```
event manager applet ISIS_Flap authorization bypass
event syslog pattern "%CLNS-5-ADJCHANGE:.*hold time expired"
action 1.0 syslog msg "ISIS down Please wait - capturing the traffic"
action 1.1 cli command "enable"
action 1.2 cli command "show clns interface ten0/0/4 | append
```

```
flash:ISIS_DeviceB.txt"
```

```
<snip>
```

```
action 3.0 cli command "end"
```

8. Once the issue triggers, proceed to export the capture on the bootflash/flash and ensure that the .txt files are stored properly in the same location.

```
<#root>
```

```
DeviceA#
```

```
monitor capture cap export bootflash:ISIS_DeviceA.pcap
```

```
Exported Successfully
```

```
DeviceA#
```

```
dir bootflash:*.txt
```

```
Directory of bootflash:/*.txt
```

```
Directory of bootflash:/
```

```
 19  -rw-          6048  Jul 22 2023 13:33:40 +00:00
```

```
ISIS_DeviceA.txt
```

```
 20  -rw-        103153  Jul 22 2023 13:33:40 +00:00
```

```
debug_DeviceA.txt
```

```
26975526912 bytes total (20527607808 bytes free)
```

DeviceB#

```
monitor capture cap export location flash:ISIS_DeviceB.pcap
```

Exported Successfully

DeviceB#

```
dir bootflash:*.txt
```

Directory of bootflash:/*.txt

Directory of bootflash:/

```
356939 -rw-          660  Jul 22 2023 13:33:42 +00:00
```

```
  ISIS_DeviceB.txt
```

```
356943 -rw-       103283  Jul 22 2023 13:33:42 +00:00
```

```
 debug_DeviceB.txt
```

9. Upload the files to a TFTP server in order to compare the logs between devices.

<#root>

DeviceA#

```
copy bootflash:ISIS_DeviceA.txt tftp:
```

Address or name of remote host []?

< TFTP IP address >

Destination filename [

```
ISIS_DeviceA.txt
```

]?

<This name appears on the TFTP server>

!!

18144 bytes copied in 0.095 secs (190989 bytes/sec)

10. Compare the captures and logs in order to validate if the packets are sent and received from both routers.

Analysis of the IS-IS logs:

- Both IS-IS interfaces are configured with the same network type L1-L2.
- The Interfaces state (if state DOWN) shows that both interfaces do not receive the hello packet.
- IS-IS: PTP Hellos has a mismatch in the packets sent and received. While DeviceA sends 205 packets and receives 199 from the peer, DeviceB has 202 out of 202. This indicates that the transport is not reliable.

<#root>

DeviceA

TenGigabitEthernet0/0/4 is up, line protocol is up
Attached to: isis
Checksums enabled, MTU 1497, Encapsulation SAP
ERPDUs enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 30 seconds
Routing Protocol: IS-IS

Circuit Type: level-1-2

Interface number 0x0, local circuit ID 0x5
Neighbor Extended Local Circuit ID: 0x0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceA.05
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 574 milliseconds

if state DOWN

CLNS: Time since last clear: 00:29:37
CLNS & ISIS Output: 33, Input: 241
Dropped Protocol not enabled on interface: 0
CLNS Local: 0, Forward: 0

<snip>

Interface TenGigabitEthernet0/0/4:
IS-IS: Time since last clear: 00:29:37
IS-IS: Level-1 Hellos (sent/rcvd): 0/0
IS-IS: Level-2 Hellos (sent/rcvd): 0/0

IS-IS: PTP Hellos (sent/rcvd): 205/199
IS-IS: Level-1 LSPs flooded (sent/rcvd): 2/2
IS-IS: Level-2 LSPs flooded (sent/rcvd): 2/2

IS-IS: Level-1 CSNPs (sent/rcvd): 0/0
IS-IS: Level-2 CSNPs (sent/rcvd): 0/0
IS-IS: Level-1 PSNPs (sent/rcvd): 2/2
IS-IS: Level-2 PSNPs (sent/rcvd): 2/2
IS-IS: Level-1 DR Elections: 0
IS-IS: Level-2 DR Elections: 0

DeviceB

TwentyFiveGigE1/0/9 is up, line protocol is up
Attached to: isis
Checksums enabled, MTU 1497, Encapsulation SAP
ERPDUs enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 20 seconds
Routing Protocol: IS-IS

Circuit Type: level-1-2

Interface number 0x0, local circuit ID 0xB
Neighbor Extended Local Circuit ID: 0x0
P2P retransmit queue size: 0
Level-1 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-1 IPv6 Metric: 10
Number of active level-1 adjacencies: 0
Level-2 Metric: 10, Priority: 64, Circuit ID: DeviceB.0B
Level-2 IPv6 Metric: 10
Number of active level-2 adjacencies: 0
Next IS-IS Hello in 7 seconds

if state DOWN

CLNS: Time since last clear: 00:29:34
CLNS queue depth: 0/100, drops: 0, highest: 1
CLNS & ISIS Output: 34, Input: 243
Dropped Protocol not enabled on interface: 0
CLNS Local: 0, Forward: 0

<snip>

Interface TwentyFiveGigE1/0/9:
IS-IS: Time since last clear: 00:29:34
IS-IS: Level-1 Hellos (sent/rcvd): 0/0
IS-IS: Level-2 Hellos (sent/rcvd): 0/0

IS-IS: PTP Hellos (sent/rcvd): 202/202
IS-IS: Level-1 LSps flooded (sent/rcvd): 2/2
IS-IS: Level-2 LSps flooded (sent/rcvd): 2/2

IS-IS: Level-1 CSNPs (sent/rcvd): 0/0
IS-IS: Level-2 CSNPs (sent/rcvd): 0/0
IS-IS: Level-1 PSNPs (sent/rcvd): 2/2
IS-IS: Level-2 PSNPs (sent/rcvd): 2/2
IS-IS: Level-1 DR Elections: 0
IS-IS: Level-2 DR Elections: 0

The next step is to compare the debugs and captures.

<#root>

DeviceA

```
Jul 22 19:17:24.929: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:24.929: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:17:31.685: ISIS-Adj: Rec serial IIH from 6c31.0edb.3b5f (TenGigabitEthernet0/0/4)

Jul 22 19:17:31.685: ISIS-Adj: cir type L1L2, cir id 0B, length 1496
Jul 22 19:17:31.685: ISIS-Adj: rcvd state UP, old state UP, new state UP, nbr usable TRUE
Jul 22 19:17:31.685: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:17:31.685: ISIS-Adj: Nghbr Ckt ID changed: FALSE
Jul 22 19:17:31.685: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000A
```

Jul 22 19:17:31.685: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0x5
Jul 22 19:17:31.685: ISIS-Adj: newstate:0, state_changed:0, going_up:0, going_down:0
Jul 22 19:17:31.685: ISIS-Adj: Action = ACCEPT
Jul 22 19:17:31.685: ISIS-Adj: ACTION_ACCEPT:

Jul 22 19:17:33.626: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:33.627: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:17:42.671: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:42.672: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496

Jul 22 19:17:52.008: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:52.008: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:18:01.475: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:18:01.475: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496

Jul 22 19:18:01.685: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold

Jul 22 19:18:01.685: ISIS-Adj: L1 adj count 0
Jul 22 19:18:01.685: ISIS-Adj: L2 adj count 0

DeviceB

Jul 22 19:17:25.693: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15

Jul 22 19:17:25.693: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496

Jul 22 19:17:27.882: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)

Jul 22 19:17:27.882: ISIS-Adj: cir type L1L2, cir id 05, length 1496
Jul 22 19:17:27.882: ISIS-Adj: rcvd state UP, old state UP, new state UP, nbr usable TRUE
Jul 22 19:17:27.882: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:27.882: ISIS-Adj: Nghbr Ckt ID changed: FALSE
Jul 22 19:17:27.882: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000B
Jul 22 19:17:27.882: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0xB
Jul 22 19:17:27.882: ISIS-Adj: newstate:0, state_changed:0, going_up:0, going_down:0
Jul 22 19:17:27.882: ISIS-Adj: Action = ACCEPT
Jul 22 19:17:27.882: ISIS-Adj: ACTION_ACCEPT:

Jul 22 19:17:34.637: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15

Jul 22 19:17:34.637: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496

Jul 22 19:17:36.579: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)

Jul 22 19:17:36.579: ISIS-Adj: cir type L1L2, cir id 05, length 1496
Jul 22 19:17:36.579: ISIS-Adj: rcvd state UP, old state UP, new state UP, nbr usable TRUE
Jul 22 19:17:36.579: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:36.579: ISIS-Adj: Nghbr Ckt ID changed: FALSE
Jul 22 19:17:36.579: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000B
Jul 22 19:17:36.579: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0xB
Jul 22 19:17:36.579: ISIS-Adj: newstate:0, state_changed:0, going_up:0, going_down:0
Jul 22 19:17:36.579: ISIS-Adj: Action = ACCEPT
Jul 22 19:17:36.579: ISIS-Adj: ACTION_ACCEPT:

Jul 22 19:17:43.270: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15

```
Jul 22 19:17:43.271: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496

Jul 22 19:17:51.658: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:17:51.658: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 22 19:18:00.248: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:18:00.248: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 22 19:18:06.579: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time 0
Jul 22 19:18:06.579: ISIS-Adj: L1 adj count 0
Jul 22 19:18:06.579: ISIS-Adj: L2 adj count 0
```

Analysis of IS-IS debug logs:

- DeviceA sends a hello packet (Jul 22 19:17:24), DeviceB responds to this packet (Jul 22 19:17:25), DeviceA receives this response (Jul 22 19:17:31).

DeviceA

```
Jul 22 19:17:24.929: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:24.929: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:17:31.685: ISIS-Adj: Rec serial IIH from 6c31.0edb.3b5f (TenGigabitEthernet0/0/4)
```

DeviceB

```
Jul 22 19:17:25.693: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:17:25.693: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 22 19:17:27.882: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)
```

- DeviceA sends another hello packet (Jul 22 19:17:33), DeviceB sends its hello packet (Jul 22 19:17:34), and two seconds later receives the packet from its peer.

DeviceA

```
Jul 22 19:17:33.626: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:33.627: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
```

DeviceB

```
Jul 22 19:17:34.637: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:17:34.637: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 22 19:17:36.579: ISIS-Adj: Rec serial IIH from a84f.b1c3.9484 (TwentyFiveGigE1/0/9)
```

- During the period that DeviceA does not receive the packet sent by DeviceB, the protocol declares itself down after 30 seconds.

DeviceA

```
Jul 22 19:17:42.671: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 22 19:17:42.672: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:18:01.475: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 22 19:18:01.685: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold
```

- DeviceB does not receive any packet from its peer. After the default hold time period, this protocol declares itself down.

DeviceB

```
Jul 22 19:17:43.270: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 22 19:17:43.271: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
<snip>
Jul 22 19:18:06.579: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time
```

Captures analysis:

DeviceA receives packets from DeviceB, but the last packet that this router receives from the peer is at minute 13:17.31. Then DeviceA sends Hello packets without any response from the peer.

eth.dst == 09:00:2b:00:00:05

Nc	Time	Source	Destination	seq
	2023-07-22 13:15:35.638959	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:15:43.516971	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:15:44.531970	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:15:51.320982	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:15:52.786946	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:15:59.511966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:02.646954	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:09.329969	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:10.505970	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:17.169989	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:19.943936	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:25.480962	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:28.851945	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:34.616957	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:38.643963	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:42.579956	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:47.501972	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:50.839952	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:16:55.382975	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:16:59.049985	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:04.634961	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:17:07.215976	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:14.446967	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:17:15.226978	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:22.740958	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:17:24.928937	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:31.684962	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 13:17:33.626966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:42.671962	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:17:52.007995	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 13:18:01.474966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b

- > Frame 679: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits)
- > IEEE 802.3 Ethernet
- > Logical-Link Control
- > ISO 10589 ISIS InTRA Domain Routeing Information Exchange Protocol
- > ISIS HELLO

ISIS Random Flaps DeviceA

DeviceB capture shows a similar condition, the switch receives the last hello packet from its peer, however, DeviceB starts to send its hello packets with no response.

eth.dst == 09:00:2b:00:00:05

Nc	Time	Source	Destination	seq
	2023-07-22 19:12:55.830021	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
	2023-07-22 19:12:57.006588	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
	2023-07-22 19:13:03.670751	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a