

IS-IS 인접성 문제 해결

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소개

이 문서에서는 Cisco IOS® XE 플랫폼용 IS-IS 프로토콜의 문제를 해결하는 방법을 설명합니다.

사전 요구 사항

요구 사항

다음 주제에 대한 지식을 보유하고 있으면 유용합니다.

- 중간 시스템에서 중간 시스템으로(IS-IS)
- Cisco IOS XE

이러한 항목에 대한 자세한 내용은 다음을 참조하십시오.

- [IP 라우팅: ISIS 컨피그레이션 가이드](#)
- [IS-IS 인접성 및 영역 유형 구성](#)

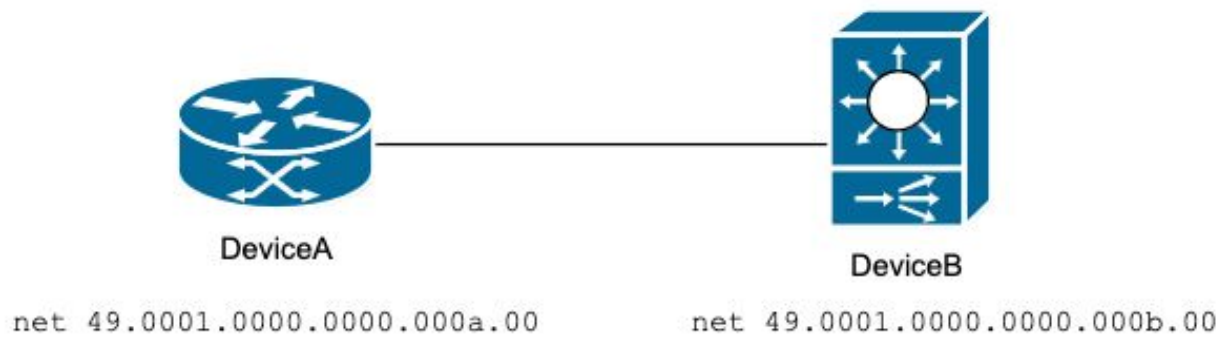
사용되는 구성 요소

이 문서의 정보는 Cisco IOS XE 소프트웨어를 기반으로 합니다.

이 문서의 정보는 특정 랩 환경의 디바이스를 토대로 작성되었습니다. 이 문서에 사용된 모든 디바이스는 초기화된(기본) 컨피그레이션으로 시작되었습니다. 현재 네트워크가 작동 중인 경우 모든 명령의 잠재적인 영향을 미리 숙지하시기 바랍니다.

IS-IS 인접성 중단

이 섹션에서는 IS-IS 다운의 일반적인 문제에 대한 해결책을 제공합니다. 이 네트워크 다이어그램은 예시입니다:



기준 토폴로지

IS-IS가 DeviceA와 DeviceB 사이에 있습니다.

<#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				

문제 진단:

1. 장치 간의 연결을 확인합니다.

<#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. 양쪽의 구성을 검토합니다.

<#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. 인접성이 CLNS(Connectionless Network Service). 디바이스에 연결된 네이버에 대한 요약을 제공합니다.

<#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#

각 CLNS 인접 디바이스에 나열된 mac 주소는 로컬 디바이스와 피어링하는 원격 디바이스의 mac 주소입니다.

```
<#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. 매개변수 `show clns interface`
가 피어와 일치하는지 확인하기 위해 명령을 실행합니다.

다음 값과 일치하는지 확인합니다.

- 최대 전송 단위(MTU)
- 회로 유형

디바이스A
<pre><#root> DeviceA# show clns interface TenGigabitEthernet0/0/4 TenGigabitEthernet0/0/4 is up, line protocol is up Attached to: isis Checksums enabled,</pre>

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 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

장치B

<#root>

DeviceB#

show clns interface TwentyFiveGigE1/0/9

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

MTU 9213

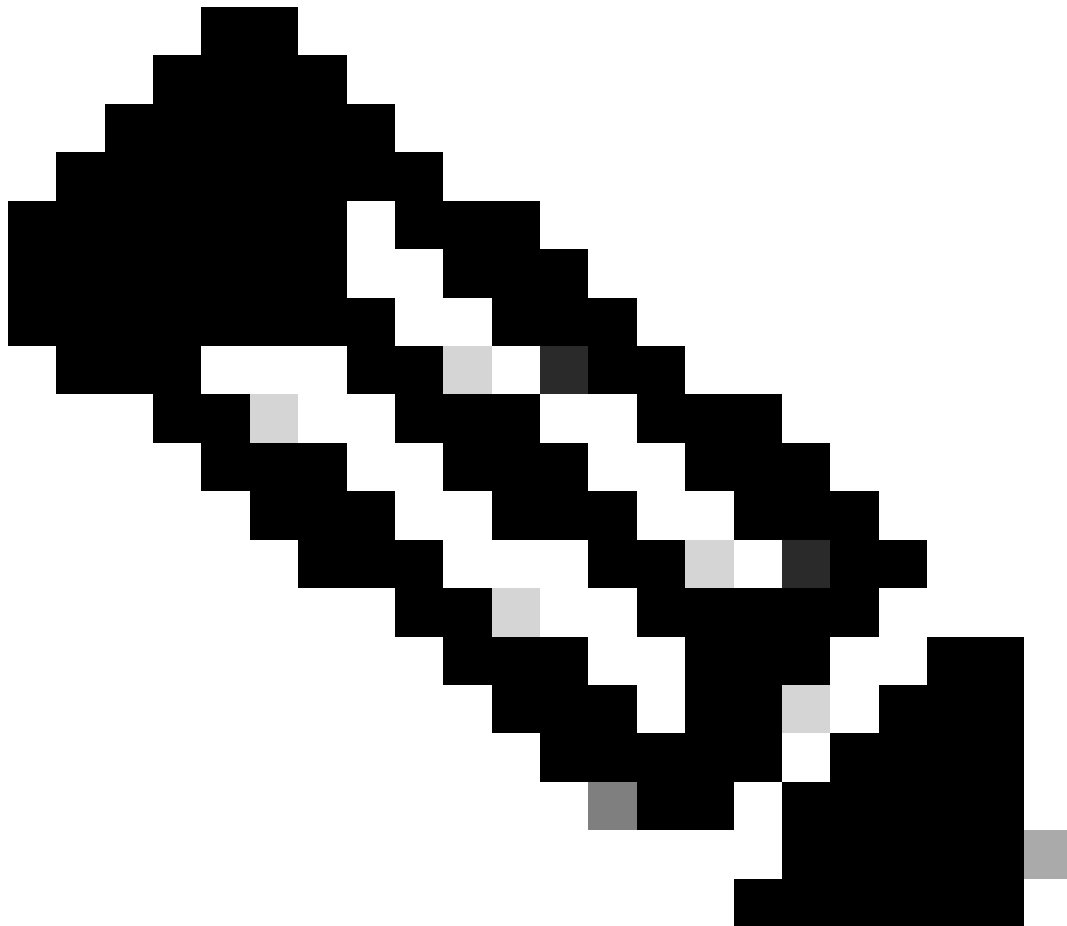
, Encapsulation SAP
ERPDUs enabled, min. interval 10 msec.
CLNS fast switching disabled
CLNS SSE switching disabled
DEC compatibility mode OFF for this interface
Next ESH/ISH in 8 seconds
Routing Protocol: IS-IS

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
```

이 시나리오에서 문제는 MTU 불일치와 관련이 있습니다. `debug isis adj-packets`
원격 피어에 액세스할 수 없는 경우 는 전송 및 수신하는 MTU 값을 표시할 수 있습니다.



참고: 이 명령은 명령이 인쇄되는 경우에만 `show clns interface` 적용됩니다 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
*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
*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
*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
*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
```

<#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 인접성 중단(MTU 불일치 관련 아님)

IS-IS가 다운되고 인터페이스에서 MTU가 일치합니다.

<#root>

DeviceA#

show clns 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. 피어와 일치하는 컨피그레이션을 확인합니다.
- 2. 물리적 인터페이스가 전송 하기에 좋은 상태인지 확인합니다(오류 또는 조명 레벨 문제 없음).
- 3. 피어 간의 연결을 확인합니다(MTU 크기 및 df 비트 추가 ping 테스트).
- 4. 피어 간의 CLNS 네이버를 확인합니다.
- 5. 양쪽 끝이 상태와 함께 동일한 MTU 및 동일한 Circuit-Type을 가지고 있는지 확인합니다.

디바이스A
<#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
장치B
<#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
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 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. 전송 debug isis adj-packet

및 수신된 패킷을 활성화하고 검증합니다.

<#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

*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

*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
```

두 디바이스 모두 전송 중이지만 인접 디바이스로부터 Hello 패킷을 수신하지 않습니다.

7. 각 네이버에 패킷이 전송되는지 확인하기 위해 캡처를 활성화합니다. 캡처가 완료되면 bootflash 또는 플래시로 내보내고 TFTP 서버에 업로드하여 .pcap file 자세한 내용을 확인합니다.

```
<#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

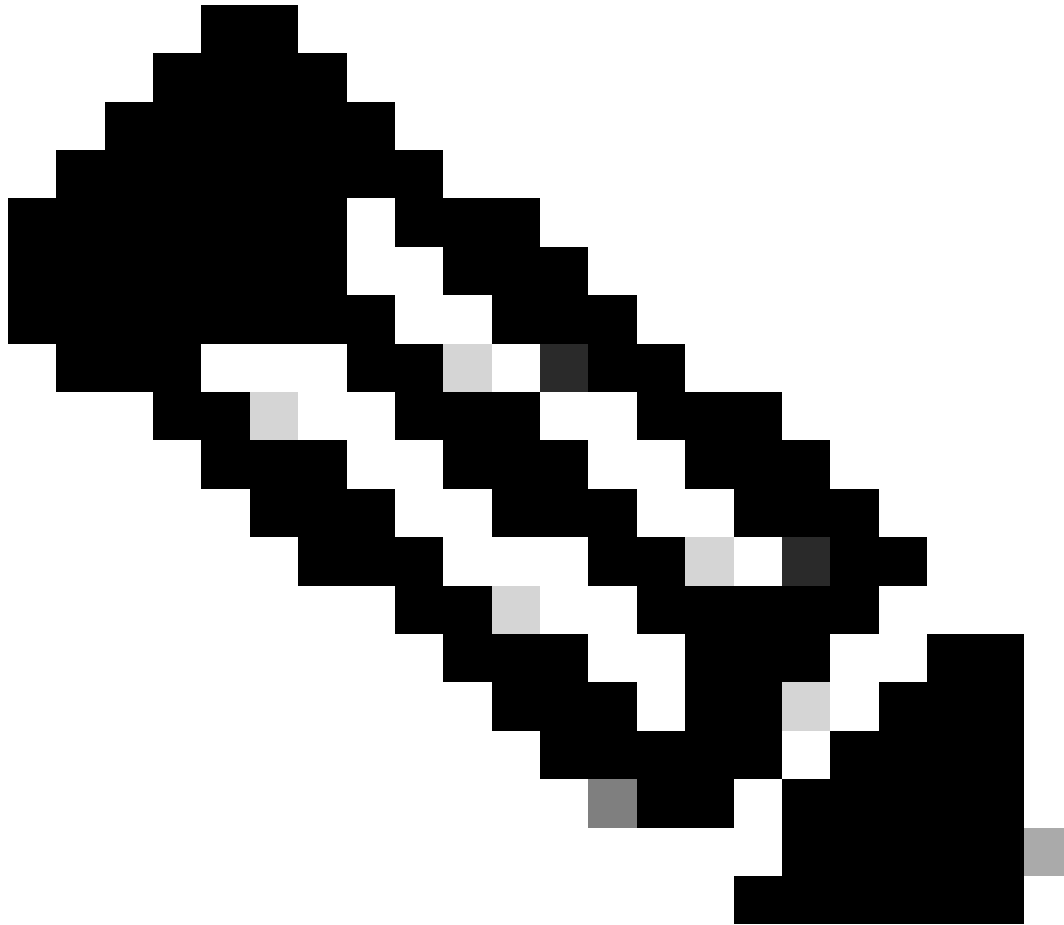
monitor capture cap interface TwentyFiveGigE1/0/9 BOTH < Interface from where send and receive the Hello >

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



참고: Catalyst Cisco IOS XE 스위치의 EPC는 발신 IS-IS Hello만 캡처하고 인그레스 패킷은 캡처하지 않습니다. 대안으로 SPAN 캡처를 사용하는 것이 좋습니다.

이 표에서는 Hello 패킷에 대한 참조를 보여 줍니다.

이름	대상 Mac 주소
모든 L1 IS	0180.c200.0014
모든 L2 IS	0180.c200.0015
모든 IS	09,002억중국위안
모든 ES	09,002b00.0004

8. 내보낸 캡처를 검토하고 인접 디바이스 간에 hello 패킷이 교환되는지 확인합니다.

DeviceA는 시스템 ID를 추가하여 hello 패킷을 전송합니다(빨간색 사각형). 시스템 ID를 사용하여 인접 디바이스로부터 패킷을 수신해야 합니다. 이 캡처에서는 DeviceB가 이러한 패킷을 피어로 전달하지 않음을 알 수 있습니다.

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: 0000.0000.000a
3	2023-07-19 08:32:05.236987	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
4	2023-07-19 08:32:14.076991	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
5	2023-07-19 08:32:23.127984	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a

> 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: 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
- 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)

Hello packet

Source from local interface(MAC)

Destination MAC IS-IS Point to Point

System ID sent to the neighbor

DeviceA ISIS 다운 캡처

DeviceB 캡처는 hello 패킷이 네이버로 전송됨을 보여줍니다(빨간색 사각형). 그러나 마지막 캡처와 마찬가지로, 네이버에서 Hello 패킷을 수신하지 않습니다.

eth.dst == 09:00:2b:00:00:05				
Nr	Time	Source	Destination	seq
1	2023-07-19 09:00:28.028914	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2	2023-07-19 09:00:35.603384	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
3	2023-07-19 09:00:45.386207	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
4	2023-07-19 09:00:54.772284	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b

> Frame 1: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits) on interface /tmp/epc_ws/wif_to_ts_pipe, id 0	
✓ IEEE 802.3 Ethernet > Destination: DEC-MAP-(or-OSI?)-Intermediate-System-Hello? (09:00:2b:00:00:05) > Source: Cisco_db:3b:5f (6c:31:0e:db:3b:5f) Length: 1499	Hello packet Source MAC address (local interface) Destination MAC IS-IS Point to Point
> 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 HELLO11 = Circuit type: Level 1 and 2 (0x3) 0000 00.. = Reserved: 0x00 SystemID {Sender of PDU}: 0000.0000.000b Holding timer: 30 PDU length: 1496 Local circuit ID: 11 > 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)	

DeviceB ISIS 다운 캡처

이 시나리오의 문제는 hello 패킷 전송을 허용하지 않는 중간 디바이스 때문입니다. 유사한 상황을 관찰하여 추가 트러블슈팅이 필요한 경우 Cisco TAC 케이스를 여십시오.

IS-IS 인접성이 불안정함

이 절에서는 IS-IS 플랩의 일반적인 문제에 대한 해결책을 제공합니다.

문제 진단:

IS-IS는 DeviceA와 DeviceB 간에 불안정합니다.

<#root>

DeviceA#

show logging

Jul 19 15:05:03.623:

%CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold time expired

Jul 19 15:05:15.075: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new ad
Jul 19 15:07:04.575: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold
Jul 19 15:07:15.759: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new ad
Jul 19 15:09:04.983: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold
Jul 19 15:09:14.835: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Up, new ad

<#root>

DeviceB#

show logging

Jul 19 15:05:02.316:

%CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold time expired

Jul 19 15:05:18.191: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjace
Jul 19 15:07:09.280: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold tim
Jul 19 15:07:18.876: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjace
Jul 19 15:09:06.080: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Down, hold tim
Jul 19 15:09:17.948: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9) Up, new adjace

1. 피어 간의 연결을 확인합니다(MTU 크기 및 df 비트가 설정된 ping 테스트).
2. 물리적 인터페이스의 전송 상태가 양호한지 확인합니다(오류 또는 표시등 문제 없음).
3. CLNS 인접 디바이스가 명령을 사용하여 트래픽을 서로 전송하는지 **show clns traffic interface** 확인합니다.

<#root>

DeviceA#

show clns traffic interface TenGigabitEthernet0/0/4

CLNS: Time since last clear: 00:01:57
CLNS & ISIS Output: 3, Input: 21
Dropped Protocol not enabled on interface: 0
CLNS Local: 0, Forward: 0

Interface TenGigabitEthernet0/0/4:

IS-IS: Time since last clear: 00:01:57

IS-IS: Level-1 Hellos (sent/rcvd): 0/0

IS-IS: Level-2 Hellos (sent/rcvd): 0/0

IS-IS: PTP Hellos (sent/rcvd): 15/11 < DeviceA sends hello packets and receives less than its sends

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): 1/1

IS-IS: Level-2 CSNPs (sent/rcvd): 1/1

IS-IS: Level-1 PSNPs (sent/rcvd): 1/1

IS-IS: Level-2 PSNPs (sent/rcvd): 1/1

IS-IS: Level-1 DR Elections: 0

IS-IS: Level-2 DR Elections: 0

<#root>

DeviceB#

show clns traffic interface TwentyFiveGigE1/0/9

CLNS: Time since last clear: 00:00:27

CLNS queue depth: 0/100, drops: 0, highest: 2

CLNS & ISIS Output: 1, Input: 14

Dropped Protocol not enabled on interface: 0

CLNS Local: 0, Forward: 0

Interface TwentyFiveGigE1/0/9:

IS-IS: Time since last clear: 00:00:27

IS-IS: Level-1 Hellos (sent/rcvd): 0/0

IS-IS: Level-2 Hellos (sent/rcvd): 0/0

IS-IS: PTP Hellos (sent/rcvd): 4/5 < DeviceB, sends and receives a couple of hellos in comparison v

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): 1/1

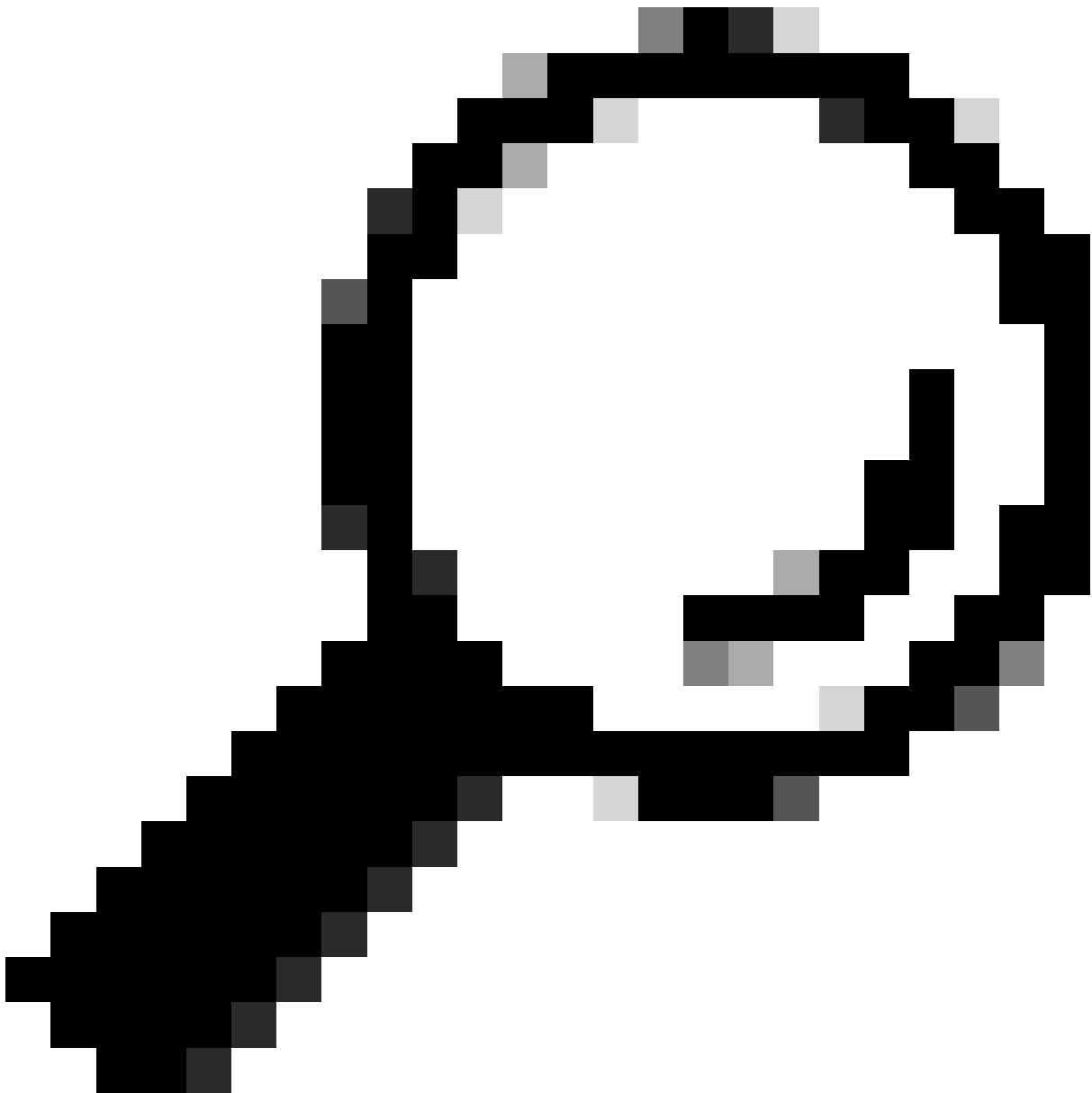
IS-IS: Level-2 CSNPs (sent/rcvd): 1/1

IS-IS: Level-1 PSNPs (sent/rcvd): 1/1

IS-IS: Level-2 PSNPs (sent/rcvd): 1/1

IS-IS: Level-1 DR Elections: 0

IS-IS: Level-2 DR Elections: 0



팁: 이 명령 `clsns traffic`은 IS-IS 레벨 및 IS-IS 네트워크 유형을 기반으로 IS-IS Hello를 표시합니다.

4. 인접 디바이스 간 `debug ISIS adj-packets`
에 어떤 패킷이 교환되는지 확인하려면 활성화합니다.

```
<#root>
```

```
DeviceA#
```

```
show isis adj-packets TenGigabitEthernet0/0/4
```

```
< Hellos sent to the DeviceB with no response >
```

Jul 19 18:58:34.779: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:58:34.779: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 19 18:58:42.719: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:58:42.719: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 19 18:58:50.430: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:58:50.430: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496
Jul 19 18:58:58.356: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:58:58.356: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 1496

< IS-IS declares the protocol down >

Jul 19 18:59:01.879: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4)
Down, hold time expired

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

Jul 19 18:59:01.879: ISIS-Adj: L2 adj count 0
Jul 19 18:59:07.724: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
Jul 19 18:59:07.724: ISIS-Adj:

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

Jul 19 18:59:15.894: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0x0 Length:5
Jul 19 18:59:15.894: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:DOWN, length 1496
Jul 19 18:59:15.896: ISIS-Adj:

Rec serial IIH from 6c31.0edb.3b5f (TenGigabitEthernet0/0/4)

Jul 19 18:59:15.896: ISIS-Adj: cir type L2, cir id 0B, length 1496
Jul 19 18:59:15.896: ISIS-Adj:

RCV:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15

Jul 19 18:59:15.896: ISIS-Adj: Nghbr Ckt ID changed: TRUE
Jul 19 18:59:15.896: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000A
Jul 19 18:59:15.896: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0x5
Jul 19 18:59:15.896: ISIS-Adj: newstate:1, state_changed:1, going_up:0, going_down:0
Jul 19 18:59:15.896: ISIS-Adj: Action = GOING UP, new type = L2

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

Jul 19 18:59:15.896: ISIS-Adj: New serial adjacency
Jul 19 18:59:15.896: ISIS-Adj:

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

Jul 19 18:59:15.898: ISIS-Adj: SND:3way Adj. Local Ckt ID:0x5 Nghbr Ckt ID:0xB Length:15
Jul 19 18:59:15.898: ISIS-Adj:

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

Jul 19 18:59:15.900: ISIS-Adj: Rec serial IIH from 6c31.0edb.3b5f (TenGigabitEthernet0/0/4)
Jul 19 18:59:15.900: ISIS-Adj: cir type L2, cir id 0B, length 1496
Jul 19 18:59:15.900: ISIS-Adj:

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

Jul 19 18:59:15.900: ISIS-Adj: RCV:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15

Jul 19 18:59:15.900: ISIS-Adj: Nghbr Ckt ID changed: FALSE
Jul 19 18:59:15.900: ISIS-Adj: received Neighbor System-ID (must be our) 0000.0000.000A
Jul 19 18:59:15.900: ISIS-Adj: received Neighbor ext.circuit ID (must be our) 0x5
Jul 19 18:59:15.900: ISIS-Adj: newstate:0, state_changed:1, going_up:1, going_down:0
Jul 19 18:59:15.900: ISIS-Adj: Action = GOING UP, new type = L2
Jul 19 18:59:15.900: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4)

Up, new adjacency

<#root>

DeviceB#

debug isis adj-packets TwentyFiveGigE1/0/9

< Hello sent to the DeviceA with no response >

Jul 19 18:58:44.105: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 19 18:58:44.105: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 19 18:58:51.814: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 19 18:58:51.814: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496
Jul 19 18:58:59.768: ISIS-Adj: SND:3way Adj. Local Ckt ID:0xB Nghbr Ckt ID:0x5 Length:15
Jul 19 18:58:59.768: ISIS-Adj: Sending serial IIH on TwentyFiveGigE1/0/9, 3way state:UP, length 1496

< IS-IS declares the protocol down >

Jul 19 18:59:07.886: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceA (TwentyFiveGigE1/0/9)

Down, hold time expired

< 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. 패킷이 각 네이버로 전송되는지 검증하려면 캡처를 활성화합니다. 캡처가 완료되면 캡처를 bootflash로 내보내고 TFTP 서버에 업로드하여 .pcap file 자세한 내용을 확인합니다.

DeviceA는 이 패킷을 수신한 후 DeviceB(19:15.05)로부터 패킷을 수신합니다. DeviceA는 기본적으로 30초(빨간색 사각형)로 만료된 보류 시간에 도달할 때까지 인접 디바이스의 응답 없이 해당 hello를 보냅니다.

이 라우터가 인접성을 낮게 선언하는 경우입니다. 이 기간이 지나면 DeviceB가 hello를 전송하고 DeviceA에서 수신되며 이러한 패킷은 아무런 문제 없이 교환됩니다(녹색 사각형).

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
	19:17:10.705954	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 불안정한 디바이스A

DeviceB에서 캡처하는 것은 피어의 증상과 유사합니다. 디바이스는 인접 디바이스로부터 hello 패킷을 수신하지 않습니다. 마지막 패킷은 30초 보류 타이머에 도달할 때까지 DeviceB에서 DeviceA의 응답 없이 전송됩니다. 이 스위치는 인접성을 낮춘 것으로 간주합니다. 이 실패 후 스위치는 DeviceA로부터 hello를 수신하고 네이버십을 시작합니다.

eth.dst == 09:00:2b:00:00:05				
Nr	Time	Source	Destination	seq
4	01:11:27.332388	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
5	01:11:27.894819	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:11:34.859121	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:11:35.738192	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:11:43.274969	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:11:43.594020	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:11:51.221556	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:11:52.513395	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:11:59.401211	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:08.669824	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:17.078248	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:22.514746	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:31.351461	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:37.791466	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:37.793033	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:12:37.794384	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:37.794895	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:12:37.796641	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:47.022577	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:47.237364	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:12:54.976460	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:12:55.908343	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:02.507283	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:13:05.317018	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:10.059795	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:13:14.106249	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:19.824557	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:13:23.122303	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:27.837176	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:13:31.019915	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:35.690382	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
	01:13:39.695453	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
	01:13:44.887023	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b

```

> Frame 32: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits) on interface \Device\NPF_{D6BBE860-9886-4A6C-BDD5-8E2837C66FB0}, id 0
> IEEE 802.3 Ethernet
> Logical-Link Control
> ISO 10589 ISIS InTRA Domain Routeing Information Exchange Protocol
> ISIS HELLO

```

ISIS 불안정한 디바이스B

이것으로 전송에 문제가 있으며 패킷이 손실되는 이유를 검토해야 합니다.

IS-IS 인접성 불안정함(임의 폴랩)

IS-IS는 DeviceA와 DeviceB 간에 불안정합니다. 프로토콜에서 임의 폴랩이 발생합니다.

<#root>

DeviceA#

show logging

```

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

```

<#root>

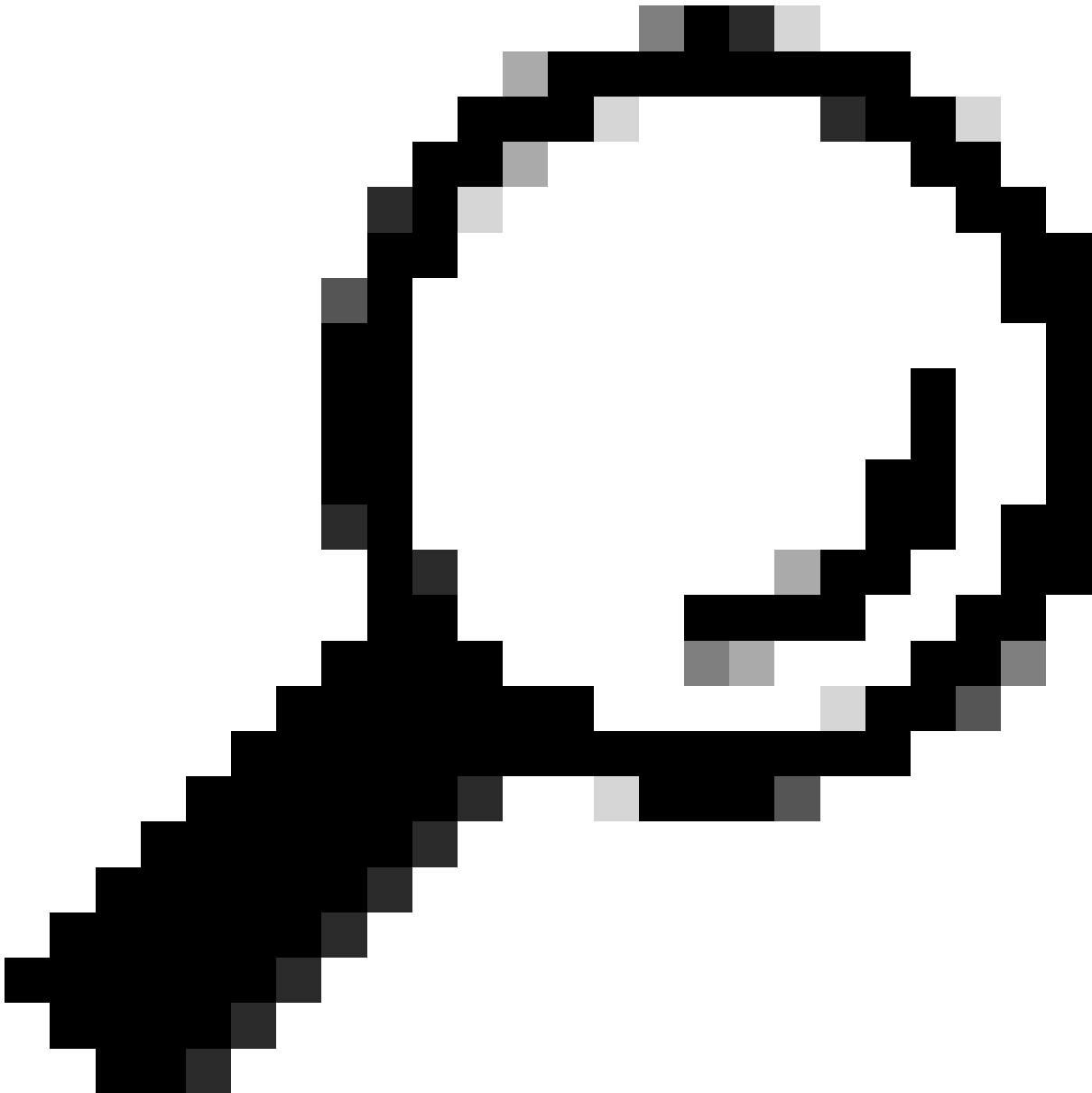
DeviceB#

show logging

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

문제가 발생하면 다음 작업을 진행해야 합니다.

1. 컨피그레이션이 피어와 일치하는지 확인합니다.
 2. 물리적 인터페이스가 전송 하기에 좋은 상태인지 확인합니다(오류 또는 조명 레벨 문제 없음).
 3. 피어 간의 연결을 확인합니다(MTU 크기 및 df 비트가 설정된 ping 테스트).
-



팁: 무작위 폴랩 상태로 인해 이러한 종류의 문제를 해결하는 것은 쉽지 않습니다. 이 상황을 해결하려면 스크립트를 사용하여 필요한 명령을 실행하고 트러블슈팅을 계속하십시오.

4. 문제 해결에 대한 자세한 내용을 보려면 Access-list를 사용하여 모니터 캡처를 구성합니다.

5. 로깅 콘솔을 비활성화하고 `debug isis adj-packets`를 활성화합니다.

```
<#root>
```

```
DeviceA(config)#
```

```
no logging console
```

```
DeviceA(config)#exit
```

```
DeviceA#
```

```
debug isis adj-packets TenGigabitEthernet0/0/4
```

6. 장비에서 패킷 캡처를 활성화하고 활성화합니다.

```
<#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. Cisco 장치에 EEM(Embedded Event Manager)을 구성합니다. 문제가 syslog 패턴을 트리거하면 플래시에 파일로 저장된 로그가.txt 생성됩니다. 자세한 내용을 보려면 계속해서 TFTP 서버에 업로드 하십시오.

<#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:

, 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"

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

8. 문제가 발생하면 bootflash/flash에서 캡처를 내보내고 파일이 동일한 위치에.txt 제대로 저장되었는지 확인합니다.

<#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. 장치 간 로그를 비교하기 위해 TFTP 서버에 파일을 업로드합니다.

<#root>

DeviceA#

copy bootflash:ISIS_DeviceA.txt tftp:

Address or name of remote host []?

< TFTP IP address >

Destination filename [

ISIS_DeviceA.txt

]?

!!

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

10. 두 라우터에서 패킷이 전송 및 수신되는지 확인하기 위해 캡처와 로그를 비교합니다.

IS-IS 로그 분석:

- 두 IS-IS 인터페이스는 모두 동일한 네트워크 유형 L1-L2로 구성됩니다.
- Interfaces 상태(DOWN 상태인 경우)는 두 인터페이스가 hello 패킷을 수신하지 않음을 보여줍니다.
- IS-IS: PTP Hello에서 전송 및 수신된 패킷이 일치하지 않습니다. DeviceA가 205개의 패킷을 전송하고 피어에서 199개를 수신하는 동안 DeviceB는 202개 중 202개를 수신합니다. 이는 전송을 신뢰할 수 없음을 나타냅니다.

<#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

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

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

다음 단계는 디버그와 캡처를 비교하는 것입니다.

<#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 time 30
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 30

Jul 22 19:18:06.579: ISIS-Adj: L1 adj count 0

Jul 22 19:18:06.579: ISIS-Adj: L2 adj count 0

IS-IS 디버그 로그 분석:

- DeviceA가 hello 패킷을 전송하고(7월 22일 19:17:24), DeviceB가 이 패킷에 응답하고(7월 22일 19:17:25), DeviceA가 이 응답을 수신합니다(7월 22일 19:17:31).

디바이스A

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)

장치B

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)

- DeviceA는 다른 hello 패킷을 전송하고(7월 22일 19시 17분 33초), DeviceB는 hello 패킷을 전송하고(7월 22일 19시 17분 34초) 2초 후에 피어에서 패킷을 수신합니다.

디바이스A

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

장치B

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)

- DeviceA가 DeviceB에서 보낸 패킷을 수신하지 않는 기간 동안 프로토콜은 30초 후에 자신을 아래로 선언합니다.

디바이스A

```
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 149
Jul 22 19:18:01.475: ISIS-Adj: Sending serial IIH on TenGigabitEthernet0/0/4, 3way state:UP, length 149
Jul 22 19:18:01.685: %CLNS-5-ADJCHANGE: ISIS: Adjacency to DeviceB (TenGigabitEthernet0/0/4) Down, hold
```

- DeviceB가 해당 피어에서 패킷을 수신하지 않습니다. 기본 보류 기간이 지나면 이 프로토콜은 자동으로 다운됩니다.

장치B

```
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 tim
```

캡처 분석:

DeviceA는 DeviceB에서 패킷을 수신하지만, 이 라우터가 피어에서 마지막으로 수신하는 패킷은 13분 17.31입니다. 그러면 DeviceA가 Hello 패킷을 보냅니다

피어에서 아무런 응답 없이

eth.dst == 09:00:2b:00:00:05				
Nr	Time	Source	Destination	seq
2023-07-22	13:15:35.638959	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:15:43.516971	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:15:44.531970	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:15:51.320982	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:15:52.786946	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:15:59.511966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:02.646954	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:09.329969	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:10.505970	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:17.169989	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:19.943936	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:25.480962	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:28.851945	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:34.616957	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:38.643963	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:42.579956	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:47.501972	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:50.839952	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:16:55.382975	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:16:59.049985	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:04.634961	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:17:07.215976	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:14.446967	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:17:15.226978	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:22.740958	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:17:24.928937	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:31.684962	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	13:17:33.626966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:42.671962	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:17:52.007995	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	13:18:01.474966	Cisco_c3:94:84	DEC-MAP-(or-OSI?)...	P2P HELLO, System-ID: 0000.0000.000a

> 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 임의 폴랩 장치A

DeviceB 캡처는 유사한 조건을 보여주며, 스위치는 피어에서 마지막 hello 패킷을 수신하지만, DeviceB는 응답 없이 hello 패킷을 전송하기 시작합니다.

eth.dst == 09:00:2b:00:00:05				
Nr	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
2023-07-22	19:13:06.443750	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:11.981159	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:13:15.351570	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:21.116502	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:13:25.143430	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:29.080123	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:13:34.001185	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:37.340177	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:13:41.882512	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:45.549749	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:13:51.134064	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:13:53.715223	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:14:00.945408	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:01.725783	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:14:09.240033	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:11.428283	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:14:18.183708	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:20.125427	Cisco_c3:94:84	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000a
2023-07-22	19:14:26.817279	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:35.204661	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:43.794273	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
2023-07-22	19:14:50.126106	Cisco_db:3b:5f	DEC-MAP-(or-OSI?)--	P2P HELLO, System-ID: 0000.0000.000b
> Frame 1971: 1513 bytes on wire (12104 bits), 1513 bytes captured (12104 bits) on interface \Device\NPF_{D6BBE860-9886-4A6C-BDD5-8E2837C66FB0}, id 0 > IEEE 802.3 Ethernet > Destination: DEC-MAP-(or-OSI?)-Intermediate-System-Hello? (09:00:2b:00:00:05) > 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 > ISIS HELLO				

ISIS 불안정한 디바이스B

내보낸 캡처에서는 Hello 패킷이 피어 간에 전달되지 않습니다. 이 문제는 운송과 관련이 있는 것으로 보입니다.

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