eno6/bd0 인터페이스에서 SMF CNDP "network-receive-error" 문제 해결

목차

소개

이 문서에서는 특정 SMF(Session Management Function) CNDP(Cloud Native Deployment Platform)의 컴퓨팅 및 리프 스위치를 식별하고 CEE(Common Execution Environment)에서 보고된 "network-receive-error" 알림을 해결하는 방법에 대해 설명합니다.

문제

"network-receive-error" 알림은 CEE Opcenter Rack2에서 보고됩니다.

```
[lab0200-smf/labceed22] cee# show alerts active summary
NAME UID SEVERITY STARTS AT SOURCE SUMMARY
-------------------------------------------------------------------------------------------------
-----------------------------------------------------
network-receive-error 998c77d6a6a0 major 10-26T00:10:31 lab0200-smf-mas Network interface "bd0"
showing receive errors on hostname lab0200-s...
network-receive-error ea4217bf9d9e major 10-26T00:10:31 lab0200-smf-mas Network interface "bd0"
showing receive errors on hostname lab0200-s...
network-receive-error 97fad40d2a58 major 10-26T00:10:31 lab0200-smf-mas Network interface "eno6"
showing receive errors on hostname lab0200-...
network-receive-error b79540eb4e78 major 10-26T00:10:31 lab0200-smf-mas Network interface "eno6"
showing receive errors on hostname lab0200-...
network-receive-error e3d163ff4012 major 10-26T00:10:01 lab0200-smf-mas Network interface "bd0"
showing receive errors on hostname lab0200-s...
network-receive-error 12a7b5a5c5d5 major 10-26T00:10:01 lab0200-smf-mas Network interface "eno6"
showing receive errors on hostname lab0200-...
```
경고에 대한 [설명은 Ultra Cloud Core Subscriber Microservices Infrastructure Operations](#) Guide를 참조하십시오.

```
Alert: network-receive-errors
Annotations:
Type: Communications Alarm
Summary: Network interface "{{ $labels.device }}" showing receive errors on hostname {{
$labels.hostname }}"
Expression:
|
rate(node_network_receive_errs_total{device!~"veth.+"}[2m]) > 0
For: 2m
Labels:
Severity: major
```

경고문의 출처 확인

CEE labeed22에 로그인하고, bd0 및 eno6 인터페이스에 보고된 "network-receive-error" 알림 세부 사항을 확인하여 노드 및 포드를 식별합니다.

```
[lab0200-smf/labceed22] cee# show alerts active summary
NAME                    UID           SEVERITY  STARTS AT      SOURCE           SUMMARY

--------------------------------------------------------------------------------------------
--------------------------------------------------------------
network-receive-error   3b6a0a7ce1a8  major     10-26T21:17:01  lab0200-smf-mas  Network
interface "bd0" showing receive errors on hostname tpc...
network-receive-error   15abab75c8fc  major     10-26T21:17:01  lab0200-smf-mas  Network
interface "eno6" showing receive errors on hostname tp...
```

show alerts **active detail network-receive-error <UID>**를 실행하여 알림의 세부 정보를 가져옵니다.

이 예에서 두 알림의 소스는 node lab0200-smf-primary-1 pod node-exporter-47xmm입니다.

```
[lab0200-smf/labceed22] cee# show alerts active detail network-receive-error  3b6a0a7ce1a8
alerts active detail network-receive-error 3b6a0a7ce1a8
 severity     major
 type         "Communications Alarm"
 startsAt     2021-10-26T21:17:01.913Z
 source       lab0200-smf-primary-1
 summary      "Network interface \"bd0\" showing receive errors on hostname lab0200-smf-primary-
1\""
 labels       [ "alertname: network-receive-errors" "cluster: lab0200-smf_cee-labceed22"
"component: node-exporter" "controller_revision_hash: 75c4cb979f" "device: bd0" "hostname:
lab0200-smf-primary-1" "instance: 10.192.1.42:9100" "job: kubernetes-pods" "monitor: prometheus"
"namespace: cee-labceed22" "pod: node-exporter-47xmm" "pod_template_generation: 1" "replica:
lab0200-smf_cee-labceed22" "severity: major" ]
 annotations [ "summary: Network interface \"bd0\" showing receive errors on hostname lab0200-
smf-primary-1\"" "type: Communications Alarm" ]

[lab0200-smf/labceed22] cee# show alerts active detail network-receive-error 15abab75c8fc
alerts active detail network-receive-error 15abab75c8fc
 severity     major
 type         "Communications Alarm"
 startsAt     2021-10-26T21:17:01.913Z
 source       lab0200-smf-primary-1
 summary      "Network interface \"eno6\" showing receive errors on hostname lab0200-smf-primary-
1\""
 labels       [ "alertname: network-receive-errors" "cluster: lab0200-smf_cee-labceed22"
"component: node-exporter" "controller_revision_hash: 75c4cb979f" "device: eno6" "hostname:
lab0200-smf-primary-1" "instance: 10.192.1.42:9100" "job: kubernetes-pods" "monitor: prometheus"
"namespace: cee-labceed22" "pod: node-exporter-47xmm" "pod_template_generation: 1" "replica:
```

```
lab0200-smf_cee-labceed22" "severity: major" ]
 annotations [ "summary: Network interface \"eno6\" showing receive errors on hostname lab0200-
smf-primary-1\"" "type: Communications Alarm" ]
```

노드, 포드, 포트 상태 확인

기본 VIP의 노드 및 포드 검증

K8s Rack2의 Primary VIP에 로그인하여 소스 노드 및 Pod의 상태를 확인합니다.

이 예에서는 둘 다 양호한 상태입니다. 준비 및 실행

```
cloud-user@lab0200-smf-primary-1:~$ kubectl get nodes
NAME                        STATUS    ROLES                 AGE     VERSION
lab0200-smf-primary-1   Ready     control-plane         105d   v1.21.0
lab0200-smf-primary-2   Ready     control-plane   105d   v1.21.0
lab0200-smf-primary-3   Ready     control-plane   105d   v1.21.0
lab0200-smf-worker-1    Ready     <none>                105d    v1.21.0
lab0200-smf-worker-2    Ready     <none>                105d    v1.21.0
lab0200-smf-worker-3    Ready     <none>                105d    v1.21.0
lab0200-smf-worker-4    Ready     <none>                105d    v1.21.0
lab0200-smf-worker-5    Ready     <none>                105d    v1.21.0

cloud-user@lab0200-smf-primary-1:~$ kubectl get pods -A -o wide | grep node-exporter--47xmm
cee-labceed22        node-exporter-47xmm                                      1/1      Running   0
      18d   10.192.1.44        lab0200-smf-primary-1   <none>                <none>
```

K8s 기본 VIP의 포트 검증

bd0 및 eno6 인터페이스가 ip 주소를 사용하여 **작동되는지 확인 | grep eno6** 및 **ip 주소 | grep bd0**.

> **참고:** bd0에 대해 필터가 적용되면 eno6가 출력에 표시됩니다. 그 이유는 SMI Cluster Deployer에서 검증할 수 있는 bd0에서 eno5 및 eno6가 연결된 인터페이스로 구성되기 때문입니다.

```
cloud-user@lab0200-smf-primary-1:~$ ip addr | grep eno6
3: eno6: <BROADCAST,MULTICAST,SECONDARY,UP,LOWER_UP> mtu 1500 qdisc mq primary bd0 state UP
group default qlen 1000

cloud-user@lab0200-smf-primary-1:~$ ip addr | grep bd0
2: eno5: <BROADCAST,MULTICAST,SECONDARY,UP,LOWER_UP> mtu 1500 qdisc mq primary bd0 state UP
group default qlen 1000
3: eno6: <BROADCAST,MULTICAST,SECONDARY,UP,LOWER_UP> mtu 1500 qdisc mq primary bd0 state UP
group default qlen 1000
12: bd0: <BROADCAST,MULTICAST,PRIMARY,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
qlen 1000
13: vlan111@bd0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
qlen 1000
14: vlan112@bd0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
qlen 1000
182: cali7a166bd093d@if4: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1440 qdisc noqueue state UP
group default
```

SMI Cluster Deployer의 포트 검증

Cluster Manager VIP에 로그인한 다음 Operations (Ops) Center ops-center-smi-cluster-deployer에 대한 ssh 액세스를 제공합니다.

```
cloud-user@lab-deployer-cm-primary:~$ kubectl get svc -n smi-cm
NAME                                        TYPE        CLUSTER-IP      EXTERNAL-IP
PORT(S)                                                 AGE
cluster-files-offline-smi-cluster-deployer  ClusterIP   10.102.53.184   <none>
8080/TCP                                                110d
iso-host-cluster-files-smi-cluster-deployer ClusterIP   10.102.38.70    172.16.1.102
80/TCP                                                  110d
iso-host-ops-center-smi-cluster-deployer    ClusterIP   10.102.83.54    172.16.1.102
3001/TCP                                                110d
netconf-ops-center-smi-cluster-deployer     ClusterIP   10.102.196.125  10.241.206.65
3022/TCP,22/TCP                                         110d
ops-center-smi-cluster-deployer             ClusterIP   10.102.12.170   <none>
8008/TCP,2024/TCP,2022/TCP,7681/TCP,3000/TCP,3001/TCP   110d
squid-proxy-node-port                       NodePort    10.102.72.168   <none>
3128:32572/TCP                                          110d

cloud-user@lab-deployer-cm-primary:~$ ssh -p 2024 admin@10.102.12.170
admin@10.102.12.170's password:
    Welcome to the Cisco SMI Cluster Deployer on lab-deployer-cm-primary
    Copyright © 2016-2020, Cisco Systems, Inc.
    All rights reserved.
admin connected from 172.16.1.100 using ssh on ops-center-smi-cluster-deployer-5cdc5f94db-bnxqt
[lab-deployer-cm-primary] SMI Cluster Deployer#
```

노드의 클러스터, 노드 기본값, 인터페이스 및 매개변수 모드를 확인합니다. 이 예에서는 lab0200-smf

```
[lab-deployer-cm-primary] SMI Cluster Deployer#  show running-config clusters
clusters lab0200-smf
 environment lab0200-smf-deployer_1
…
 node-defaults initial-boot netplan ethernets eno5
 dhcp4 false
 dhcp6 false
 exit
 node-defaults initial-boot netplan ethernets eno6
 dhcp4 false
 dhcp6 false
 exit
 node-defaults initial-boot netplan ethernets enp216s0f0
 dhcp4 false
 dhcp6 false
 exit
 node-defaults initial-boot netplan ethernets enp216s0f1
 dhcp4 false
 dhcp6 false
 exit
 node-defaults initial-boot netplan ethernets enp94s0f0
 dhcp4 false
 dhcp6 false
 exit
 node-defaults initial-boot netplan ethernets enp94s0f1
 dhcp4 false
 dhcp6 false
 exit
```

```
node-defaults initial-boot netplan bonds bd0
 dhcp4      false
 dhcp6      false
 optional   true
 interfaces [ eno5 eno6 ]
 parameters mode      active-backup
 parameters mii-monitor-interval 100
 parameters fail-over-mac-policy active
 exit
```

기본 VIP에서 인터페이스 bd0 및 eno6의 오류 및/또는 삭제를 확인합니다.

두 인터페이스가 모두 삭제된 경우 UCS 또는 리프 스위치 하드웨어에 하드웨어 문제가 있는지 확인해야 합니다.

```
cloud-user@lab0200-smf-primary-1:~$  ifconfig bd0
bd0: flags=5187<UP,BROADCAST,RUNNING,PRIMARY,MULTICAST>  mtu 1500
        inet6 fe80::8e94:1fff:fef6:53cd  prefixlen 64  scopeid 0x20<link>
        ether 8c:94:1f:f6:53:cd  txqueuelen 1000  (Ethernet)
        RX packets 47035763777  bytes 19038286946282 (19.0 TB)
        RX errors 49541  dropped 845484  overruns 0  frame 49541
        TX packets 53797663096  bytes 32320571418654 (32.3 TB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

cloud-user@lab0200-smf-primary-1:~$  ifconfig eno6
eno6: flags=6211<UP,BROADCAST,RUNNING,SECONDARY,MULTICAST>  mtu 1500
        ether 8c:94:1f:f6:53:cd  txqueuelen 1000  (Ethernet)
        RX packets 47035402290  bytes 19038274391478 (19.0 TB)
        RX errors 49541  dropped 845484  overruns 0  frame 49541
        TX packets 53797735337  bytes 32320609021235 (32.3 TB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

UCS 서버 식별

SMI Cluster Deployer에서 UCS 서버 검증

SMI Cluster Deployer에서 show running-config clusters <cluster name> nodes <node name>을 실행하여 UCS 서버의 CIMC IP 주소를 확인합니다.

```
[lab-deployer-cm-primary] SMI Cluster Deployer# show running-config clusters lab0200-smf nodes
primary-1
clusters lab0200-smf
nodes primary-1
 maintenance  false
 host-profile cp-data-r2-sysctl
 k8s node-type        primary
 k8s ssh-ip           10.192.1.42
 k8s sshd-bind-to-ssh-ip true
 k8s node-ip          10.192.1.42
 k8s node-labels smi.cisco.com/node-type oam
 exit
 k8s node-labels smi.cisco.com/node-type-1 proto
 exit
 ucs-server cimc user admin
...
 ucs-server cimc ip-address 172.16.1.62
...
```

```
 exit
```

Active CM을 통해 CIMC IP 주소 172.16.1.62에 SSH를 적용하고 서버 이름을 확인합니다.

이 예에서 서버 이름은 LAB0200-Server8-02입니다.

```
cloud-user@lab-deployer-cm-primary:~$ ssh admin@172.16.1.62
Warning: Permanently added '172.16.1.62' (RSA) to the list of known hosts.
admin@172.16.1.62's password:
LAB0200-Server8-02#
```

> **참고:** CIQ(Customer Information Questionnaire)를 사용할 수 있는 경우 CIQ에서 서버 이름을 확인합니다.

기본 VIP 포트 및 UCS 네트워크 인터페이스 매핑

기본 VIP에서 **ls -la /sys/class/net** 명령으로 eno6의 물리적 인터페이스 이름을 확인합니다. 이 예에서 lscpi를 사용하여 eno6 디바이스를 식별하면 포트 **1d:00.1**을 사용하여 **eno6**을 식별해야 합니다.

```
cloud-user@lab0200-smf-primary-1:~$ ls -la /sys/class/net
total 0
drwxr-xr-x  2 root root     0 Oct 12 06:18 .
drwxr-xr-x 87 root root     0 Oct 12 06:18 ..
lrwxrwxrwx  1 root root     0 Oct 12 06:18 bd0 -> ../../devices/virtual/net/bd0
lrwxrwxrwx  1 root root     0 Oct 12 06:18 bd1 -> ../../devices/virtual/net/bd1
…
lrwxrwxrwx  1 root root     0 Oct 12 06:18 eno5 ->
../../devices/pci0000:17/0000:17:00.0/0000:18:00.0/0000:19:01.0/0000:1b:00.0/0000:1c:00.0/0000:1
d:00.0/net/eno5
lrwxrwxrwx  1 root root     0 Oct 12 06:18 eno6 ->
../../devices/pci0000:17/0000:17:00.0/0000:18:00.0/0000:19:01.0/0000:1b:00.0/0000:1c:00.0/0000:1
d:00.1/net/eno6
```

> **참고:** lspci는 MLOM, SLOM, PCI 등 UCS 서버의 모든 디바이스에 대한 정보를 표시합니다. 디바이스 정보를 사용하여 **ls -la /sys/class/net** 명령 출력에서 인터페이스 **이름과 매핑할** 수 있습니다.

이 예에서 포트 1d:00.1은 MLOM 및 **eno6 인터페이스에** 속합니다. eno5는 1d:00.0 MLOM 포트입니다.

```
cloud-user@lab0200-smf-primary-1:~$ lspci
……
1d:00.0 Ethernet controller: Cisco Systems Inc VIC Ethernet NIC (rev a2)
1d:00.1 Ethernet controller: Cisco Systems Inc VIC Ethernet NIC (rev a2)
3b:00.0 Ethernet controller: Intel Corporation Ethernet Controller 10G X550T (rev 01)
3b:00.1 Ethernet controller: Intel Corporation Ethernet Controller 10G X550T (rev 01)
5e:00.0 Ethernet controller: Intel Corporation Ethernet Controller XL710 for 40GbE QSFP+ (rev
02)
5e:00.1 Ethernet controller: Intel Corporation Ethernet Controller XL710 for 40GbE QSFP+ (rev
02)
d8:00.0 Ethernet controller: Intel Corporation Ethernet Controller XL710 for 40GbE QSFP+ (rev
```

```
02)
d8:00.1 Ethernet controller: Intel Corporation Ethernet Controller XL710 for 40GbE QSFP+ (rev
02)
```

CIMC GUI에서 Primary VIP의 ifconfig 출력에 표시된 **MLOM** MAC 주소와 일치합니다.

```
cloud-user@lab0200-smf-primary-1:~$  ifconfig bd0
bd0: flags=5187<UP,BROADCAST,RUNNING,PRIMARY,MULTICAST>  mtu 1500
      inet6 fe80::8e94:1fff:fef6:53cd  prefixlen 64  scopeid 0x20<link>
      ether 8c:94:1f:f6:53:cd  txqueuelen 1000  (Ethernet)
      RX packets 47035763777  bytes 19038286946282 (19.0 TB)
      RX errors 49541  dropped 845484  overruns 0  frame 49541
      TX packets 53797663096  bytes 32320571418654 (32.3 TB)
      TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0


cloud-user@lab0200-smf-primary-1:~$  ifconfig eno6
eno6: flags=6211<UP,BROADCAST,RUNNING,SECONDARY,MULTICAST>  mtu 1500
      ether 8c:94:1f:f6:53:cd  txqueuelen 1000  (Ethernet)
      RX packets 47035402290  bytes 19038274391478 (19.0 TB)
      RX errors 49541  dropped 845484  overruns 0  frame 49541
      TX packets 53797735337  bytes 32320609021235 (32.3 TB)
      TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```
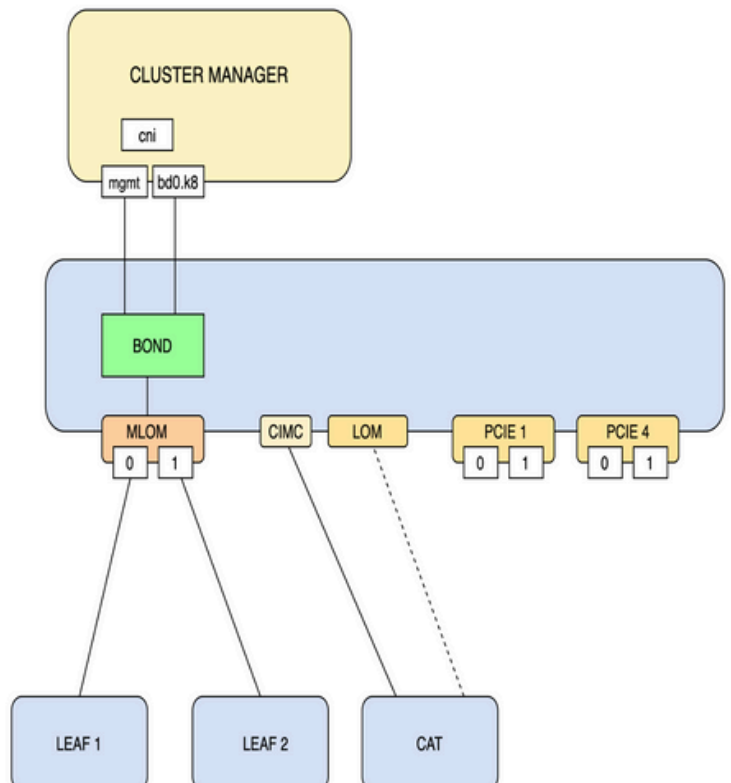
리프 스위치 식별

클러스터 관리자 네트워크에서 이미지에 표시된 것처럼 MLOM(eno5/eno6)은 Leaf 1과 2에 연결됩니다.

　　　참고: Validate(검증)는 CIQ가 사용 가능한 경우 CIQ에서 호스트 이름을 유지합니다.

Leaves에 로그인하고 서버 이름을 grep합니다.

이 예에서 LAB0200-Server8-02 MLOM 및 MLOM 인터페이스는 Leaf1 및 Leaf2의 **인터페이스 Eth1/49**에 연결됩니다.

```
Leaf1# sh int description | inc LAB0200-Server8-02
Eth1/10      eth    40G     PCIE-01-2-LAB0200-Server8-02
Eth1/30      eth    40G     PCIE-02-2-LAB0200-Server8-02
Eth1/49      eth    40G     LAB0200-Server8-02 MLOM-P2


Leaf2# sh int description | inc LAB0200-Server8-02
Eth1/10      eth    40G     PCIE-01-1-LAB0200-Server8-02
Eth1/30      eth    40G     PCIE-02-1-LAB0200-Server8-02
Eth1/49      eth    40G     LAB0200-Server8-02 MLOM-P1
```

솔루션

> **중요:** 모든 이슈는 나름의 분석이 필요하다. Nexus 측에서 오류가 발견되지 않을 경우 UCS 서버 인터페이스에서 오류를 확인합니다.

시나리오에서 문제는 LAB0200-Server8-02 MLOM eno6에 연결된 Leaf1 **int eth1/49**의 링크 실패와 관련된 것입니다.

UCS 서버의 유효성을 검사했지만 하드웨어 문제를 찾지 못했습니다. MLOM 및 포트의 상태가 양호합니다.

Leaf1에서 TX 출력 오류가 발생했습니다.

```
Leaf1# sh int Eth1/49
Ethernet1/49 is up
admin state is up, Dedicated Interface
 Hardware: 10000/40000/100000 Ethernet, address: e8eb.3437.48ca (bia e8eb.3437.48ca)
 Description: LAB0200-Server8-02 MLOM-P2
 MTU 9216 bytes, BW 40000000 Kbit , DLY 10 usec
 reliability 255/255, txload 1/255, rxload 1/255
 Encapsulation ARPA, medium is broadcast
 Port mode is trunk
 full-duplex, 40 Gb/s, media type is 40G
 Beacon is turned off
 Auto-Negotiation is turned on  FEC mode is Auto
 Input flow-control is off, output flow-control is off
 Auto-mdix is turned off
 Rate mode is dedicated
 Switchport monitor is off
 EtherType is 0x8100
 EEE (efficient-ethernet) : n/a
   admin fec state is auto, oper fec state is off
 Last link flapped 5week(s) 6day(s)
 Last clearing of "show interface" counters never
 12 interface resets
 Load-Interval #1: 30 seconds
   30 seconds input rate 162942488 bits/sec, 26648 packets/sec
   30 seconds output rate 35757024 bits/sec, 16477 packets/sec
   input rate 162.94 Mbps, 26.65 Kpps; output rate 35.76 Mbps, 16.48 Kpps
 Load-Interval #2: 5 minute (300 seconds)
   300 seconds input rate 120872496 bits/sec, 22926 packets/sec
```

```
  300 seconds output rate 54245920 bits/sec, 17880 packets/sec
  input rate 120.87 Mbps, 22.93 Kpps; output rate 54.24 Mbps, 17.88 Kpps
 RX
  85973263325 unicast packets  6318912 multicast packets  55152 broadcast packets
  85979637389 input packets  50020924423841 bytes
  230406880 jumbo packets  0 storm suppression bytes
  0 runts  0 giants  0 CRC  0 no buffer
  0 input error  0 short frame  0 overrun  0 underrun  0 ignored
  0 watchdog  0 bad etype drop  0 bad proto drop  0 if down drop
  0 input with dribble  0 input discard
  0 Rx pause
 TX
  76542979816 unicast packets  88726302 multicast packets  789768 broadcast packets
  76632574981 output packets  29932747104403 bytes
  3089287610 jumbo packets
  79095 output error  0 collision  0 deferred  0 late collision
  0 lost carrier  0 no carrier  0 babble  0 output discard
  0 Tx pause
```

"network-receive-error" 알림이 int eth1/49 Leaf1에서 케이블 교체와 함께 **해결되었습니다**.

마지막 인터페이스 링크 실패가 케이블 교체 직전에 보고되었습니다.

```
2021 Nov 17 07:36:48 TPLF0201 %BFD-5-SESSION_STATE_DOWN: BFD session 1090519112 to neighbor
10.22.101.1 on interface Vlan2201 has gone down. Reason: Control
Detection Time Expired.
2021 Nov 17 07:37:30 TPLF0201 %BFD-5-SESSION_STATE_DOWN: BFD session 1090519107 to neighbor
10.22.101.2 on interface Vlan2201 has gone down. Reason: Control
Detection Time Expired.
2021 Nov 18 05:09:12 TPLF0201 %ETHPORT-5-IF_DOWN_LINK_FAILURE: Interface Ethernet1/48 is down
(Link failure)
```

경고는 케이블 교체 후 labeed22의 eno6/bd0에서 지워집니다.

```
[lab0200-smf/labceed22] cee# show alerts active summary
NAME UID SEVERITY STARTS AT SOURCE SUMMARY
-------------------------------------------------------------------------------------------
----------------------------------------------------------
watchdog a62f59201ba8 minor 11-02T05:57:18 System This is an alert meant to ensure that the
entire alerting pipeline is functional. This ale...
```