답변 Firepower eXtensible 운영 체제 (FXOS) FAQ

목차

소개

이 문서에서는 FXOS 플랫폼 관련 FAQ에 대해 설명합니다.

배경 정보

FXOS(Firepower eXtensible Operating System)는 Firepower 또는 보안 방화벽 플랫폼의 기본 운영 체제입니다. 플랫폼에 따라 FXOS는 기능 구성, 섀시 상태 모니터링, 고급 문제 해결 기능 액세스에 사용됩니다.

플랫폼 모드의 Adaptive Secure Appliance 소프트웨어가 포함된 Firepower 4100/9300 및 Firepower 2100의 FXOS는 컨피그레이션 변경을 허용하지만, 특정 기능을 제외한 다른 플랫폼에서는 읽기 전용입니다.

Q. FXOS 시스템에서 Show Tech를 생성하는 방법

버전 2.8.x부터 fprm은 더 이상 사용되지 않습니다. 따라서 FXOS 2.8.x는 섀시 및 블레이드 쇼 기술만 지원합니다.

<#root>

```
KSEC-FPR4115-2-1(local-mgmt)#
```

show tech-support fprm detail

```
WARNING: show tech-support fprm detail command is deprecated.
Please use show tech-support chassis 1 detail command instead.
```

- 섀시: 섀시, 블레이드, 어댑터, BMC(Baseboard Management Controller) 및 CIMC(Cisco Integrated Management Controller)에 대한 로그 파일을 포함합니다.
- module: 논리적 디바이스 ASA(Adaptive Security Appliance) 또는 FTD(Firepower Threat Defense)가 있는 블레이드/모듈에 대한 로그 파일을 포함합니다. 여기에는 appAgent와 같은 구성 요소에 대한 로그가 포함됩니다.

2.8.x 이전 릴리스에서는 FXOS에서 3가지 show tech 출력을 제공합니다. FPRM 번들에는 MIO(Management Input/Output), 즉 수퍼바이저 엔진과 Service Manager에 대한 로그 파일이 포함되어 있습니다

일반적으로 3개의 번들을 모두 생성합니다. show tech-support <option> detail을 사용하여 TAC 분석을 위한 3가지 로그 번들을 생성합니다.

<#root>

```
FPR4140-A# connect local-mgmt
FPR4140-A(local-mgmt)#
```

show tech-support fprm detail

```
FPR4140-A(local-mgmt)#
```

show tech-support chassis 1 detail

```
FPR4140-A(local-mgmt)#
```

show tech-support module 1 detail

- detail 옵션을 지정하지 않으면 화면에 출력이 표시됩니다
- detail 옵션은 tar 파일을 생성합니다

생성된 파일 이름을 확인하려면 다음을 수행합니다.

<#root>

```
FPR4140-A(local-mgmt)#
```

dir techsupport/

```
1 15595520 Apr 09 17:29:10 2017 20170409172722_FPR4140_FPRM.tar
1   962560 Apr 09 17:32:20 2017 20170409172916_FPR4140_BC1_all.tar
1  7014400 Apr 09 18:06:25 2017 Firepower-Module1_04_09_2017_18_05_59.tar
```

CLI에서 번들을 내보내려면

<#root>

```
FPR4140-A(local-mgmt)#

copy workspace:///techsupport/20170409172722_FPR4140_FPRM.tar ftp|tftp|scp|sftp://username@192.168.0.1/
```
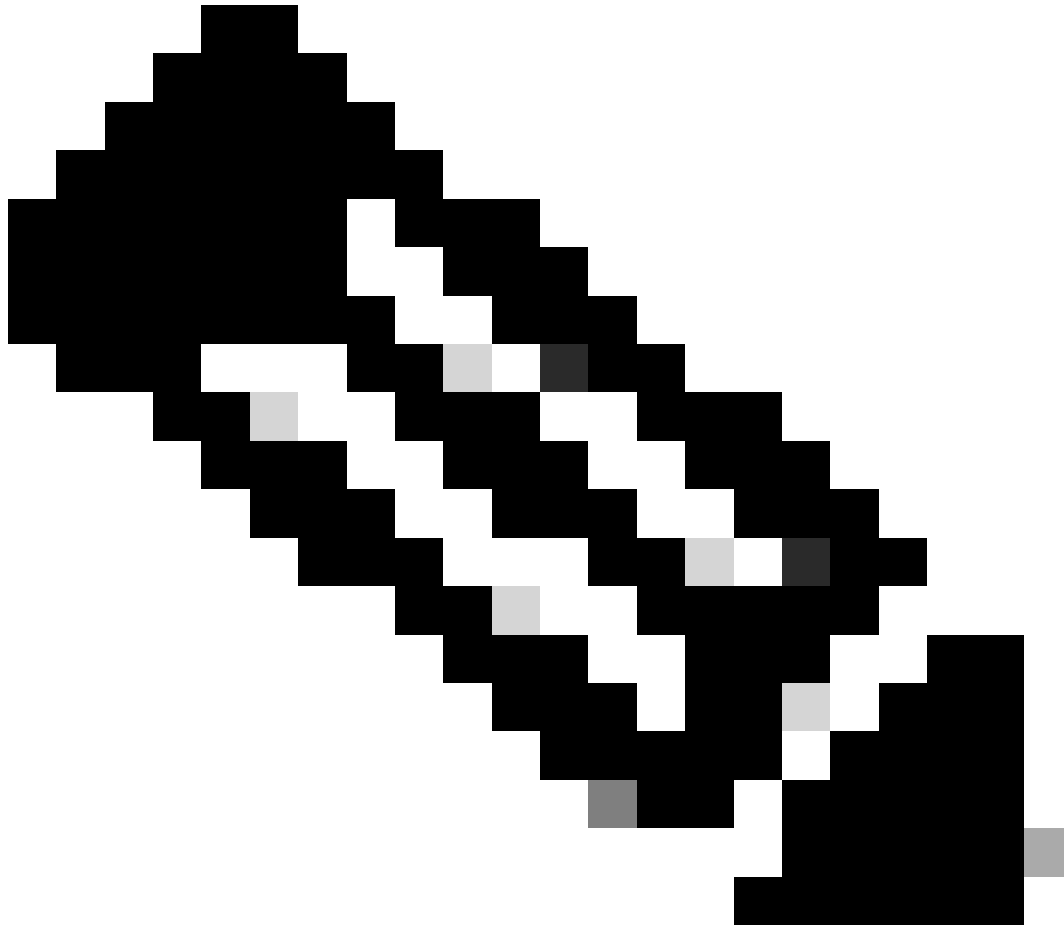
> 참고: FXOS show tech 출력 외에도 ASA 및/또는 FTD와 같은 논리적 디바이스에는 별도의
> show tech 기능이 있습니다. MI(Multi-Instance)의 경우 각 인스턴스에는 별도의 show-tech
> 번들도 있습니다. 마지막으로 FCM에서는 MI show-techs가 지원되지 않습니다

FXOS 2.6부터 FXOS 기술 지원 생성 및 다운로드는 Tools(툴) > Troubleshooting Logs(문제 해결
로그) 아래의 FCM(Firepower 섀시 관리자) UI에서 제공됩니다

FP9300의 경우:
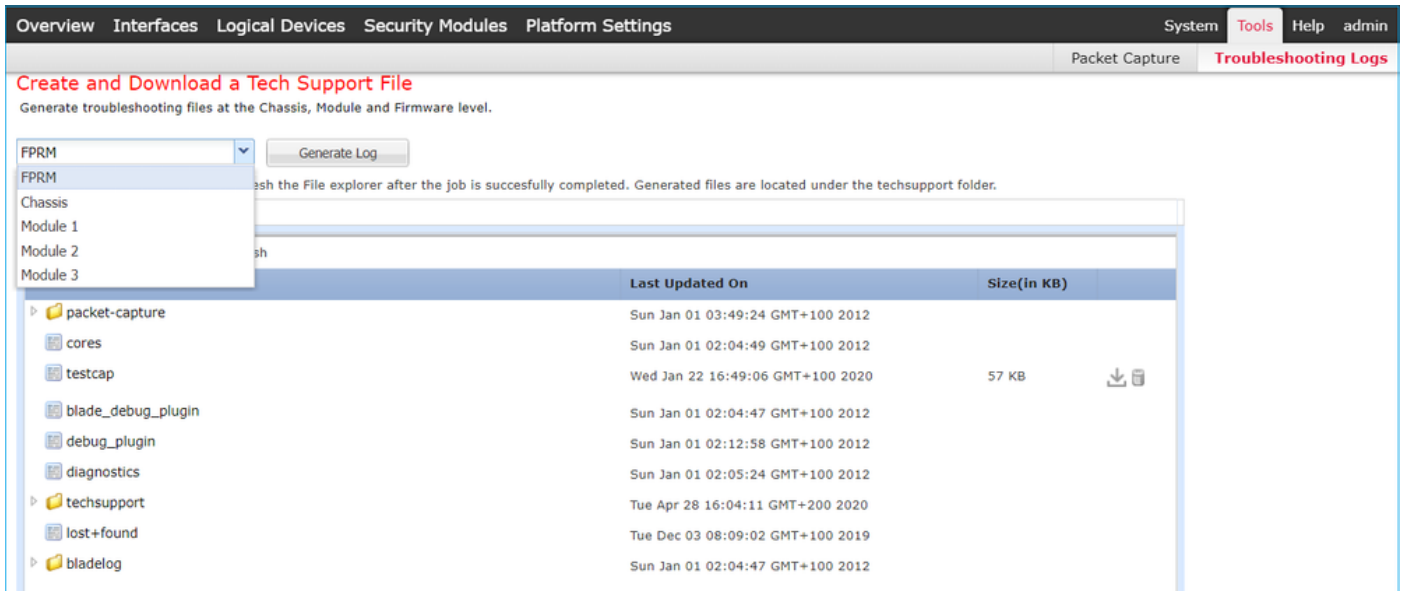
FP41xx의 경우:
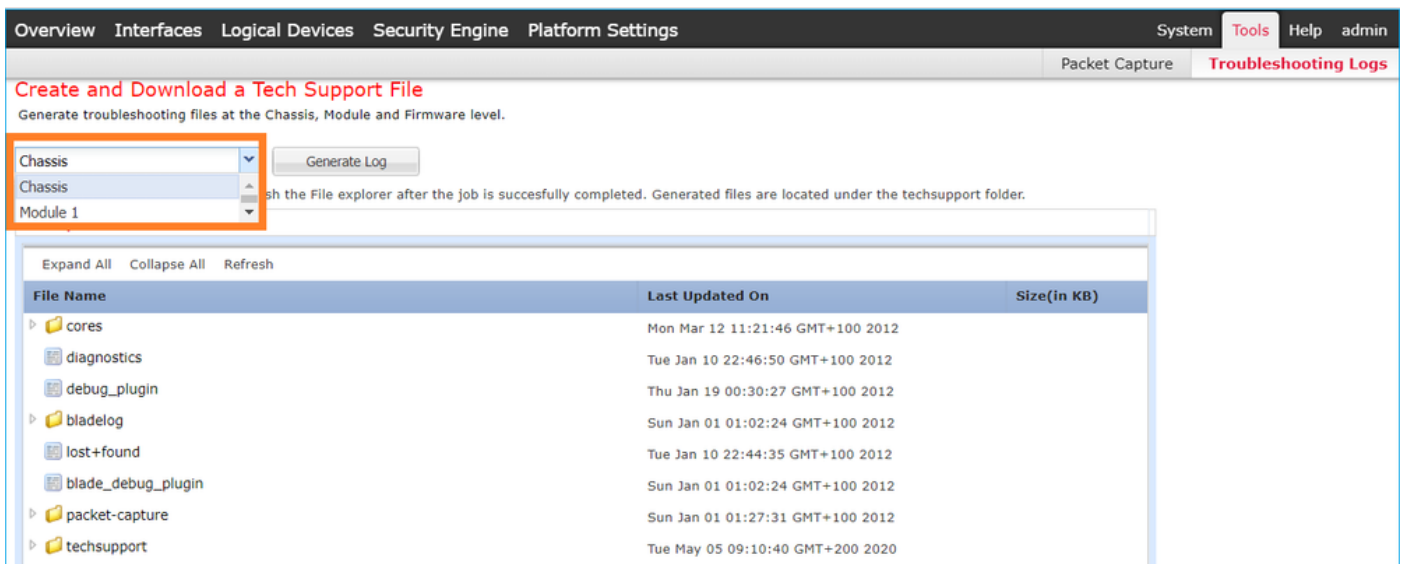
Q. 섀시 관리 IP 주소, 넷마스크 및 게이트웨이를 확인하고 변경하는 방법은?

관리 인터페이스 컨피그레이션을 확인하는 방법에는 몇 가지가 있습니다.

<#root>

FPR4115-2-1#

show fabric-interconnect

Fabric Interconnect:
    ID   OOB IP Addr   OOB Gateway   OOB Netmask   OOB IPv6 Address OOB IPv6 Gateway Prefix Operal

```
---- -------------- --------------- --------------- ---------------- ---------------- ------ ------
A    10.62.184.19   10.62.184.1     255.255.255.0   ::               ::               64     Operal
```

또는

<#root>

FPR4115-2-1#

scope fabric-interconnect a

FPR4115-2-1 /fabric-interconnect #

show

```
Fabric Interconnect:
    ID   OOB IP Addr     OOB Gateway     OOB Netmask     OOB IPv6 Address OOB IPv6 Gateway Prefix Operal
    ---- -------------- --------------- --------------- ---------------- ---------------- ------ ------
    A    10.62.184.19   10.62.184.1     255.255.255.0   ::               ::               64     Operal
FPR4115-2-1 /fabric-interconnect #
```

show detail

```
Fabric Interconnect:
    ID: A
    Product Name: Cisco FPR-4115-SUP
    PID: FPR-4115-SUP
    VID: V01
    Vendor: Cisco Systems, Inc.
    Serial (SN): JAD12345NY6
    HW Revision: 0
    Total Memory (MB): 8074
    OOB IP Addr: 10.62.184.19
    OOB Gateway: 10.62.184.1
    OOB Netmask: 255.255.255.0
    OOB IPv6 Address: ::
    OOB IPv6 Gateway: ::
    Prefix: 64
    Operability: Operable
    Thermal Status: Ok
    Ingress VLAN Group Entry Count (Current/Max): 0/500
    Switch Forwarding Path Entry Count (Current/Max): 14/1021
    Current Task 1:
    Current Task 2:
    Current Task 3:
```

IP 설정을 변경하려면

<#root>

FPR4115-2-1#

scope fabric-interconnect a

FPR4115-2-1 /fabric-interconnect #

```
set out-of-band

  gw       Gw
  ip       Ip
  netmask  Netmask
KSEC-FPR4115-2-1 /fabric-interconnect #

set out-of-band ip 10.62.184.19 netmask 255.255.255.0 gw 10.62.184.1

KSEC-FPR4115-2-1 /fabric-interconnect* #

commit-buffer
```

커밋 정보:

```
FPR4115-2-1 /fabric-interconnect # commit-buffer verify-only   ! verify the change for error
FPR4115-2-1 /fabric-interconnect # commit-buffer               ! commit the change
FPR4115-2-1 /fabric-interconnect # discard-buffer              ! cancel the change
```

자세한 내용은 다음을 참조하십시오.

[Cisco Firepower 4100/9300 FXOS 명령 참조](#)

Q. FXOS Ping 테스트를 실행하는 방법

local-mgmt CLI 범위로 이동하고 ping 명령을 사용합니다.

```
<#root>
FPR4115-2-1#

connect local-mgmt

FPR4115-2-1(local-mgmt)#

ping 10.62.184.1

PING 10.62.184.1 (10.62.184.1) from 10.62.184.19 eth0: 56(84) bytes of data.
64 bytes from 10.62.184.1: icmp_seq=1 ttl=255 time=0.602 ms
64 bytes from 10.62.184.1: icmp_seq=2 ttl=255 time=0.591 ms
64 bytes from 10.62.184.1: icmp_seq=3 ttl=255 time=0.545 ms
64 bytes from 10.62.184.1: icmp_seq=4 ttl=255 time=0.552 ms
```

Q. OOB(Out of Band) 관리 인터페이스의 Mac 주소를 확인하는 방법은 무엇입니까?

local-mgmt CLI 범위로 이동하고 다음 명령을 사용합니다.

<#root>

FPR4115-2-1#

connect local-mgmt

FPR4115-2-1(local-mgmt)#

show mgmt-ip-debug | begin eth0

```
eth0      Link encap:Ethernet  HWaddr 78:bc:1a:e7:a4:11
          inet addr:10.62.184.19  Bcast:10.62.184.255  Mask:255.255.255.0
          inet6 addr: fe80::7abc:1aff:fee7:a411/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3420589 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2551231 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:419362704 (399.9 MiB)  TX bytes:1530147643 (1.4 GiB)
```

Q. OOB(Out of Band) 관리 인터페이스가 작동 중인지 확인하려면 어떻게 해야 합니까?

scope fabric-interconnect a(패브릭 인터커넥트 a) > show(쇼)에서 Operable(작동 가능) 외에 다음 명령을 사용할 수 있습니다.

<#root>

FPR4115-2-1#

connect local-mgmt

FPR4115-2-1(local-mgmt)#

show mgmt-port

```
eth0      Link encap:Ethernet  HWaddr 78:bc:1a:e7:a4:11
          inet addr:10.62.184.19  Bcast:10.62.184.255  Mask:255.255.255.0
          inet6 addr: fe80::7abc:1aff:fee7:a411/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3422158 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2552019 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:419611452 (400.1 MiB)  TX bytes:1530247862 (1.4 GiB)
```

또는 이 명령을 사용할 수 있습니다. Scope(범위) 부분에는 Link UP(링크 업)이 표시됩니다. UP가 다음 줄에 표시됩니다.

<#root>

FPR4115-2-1#

```
connect local-mgmt

FPR4115-2-1(local-mgmt)#

show mgmt-ip-debug | begin eth0

eth0      Link encap:Ethernet   HWaddr 78:bc:1a:e7:a4:11
          inet addr:10.62.184.19  Bcast:10.62.184.255  Mask:255.255.255.0
          inet6 addr: fe80::7abc:1aff:fee7:a411/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3420589 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2551231 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:419362704 (399.9 MiB)  TX bytes:1530147643 (1.4 GiB)
```
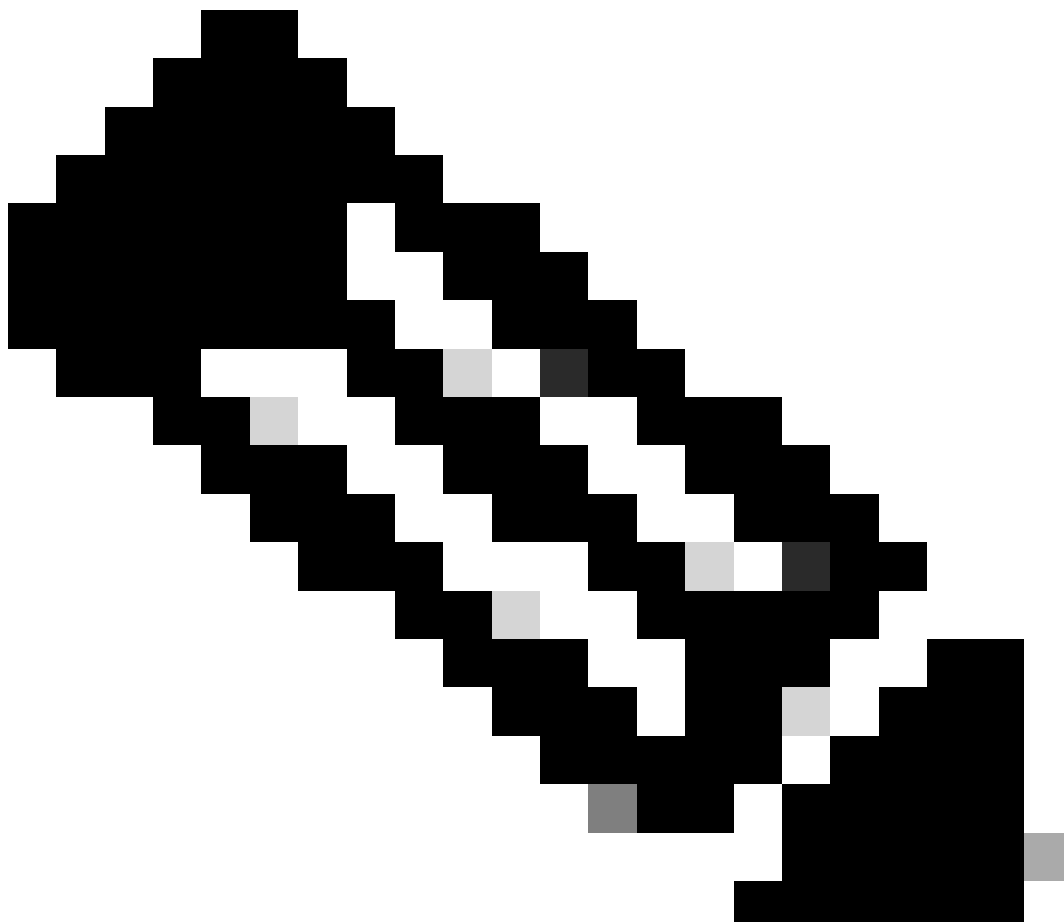
참고: UP 상태는 인터페이스의 관리자 상태입니다. 물리적 케이블 또는 SFP 모듈의 플러그를 뽑아도 상태는 UP로 유지됩니다. 또 다른 중요한 점은 RUNNING 상태이며, 이는 링크가 작동 중임을 의미합니다(라인 프로토콜이 작동 중).

인터페이스의 논리적 상태를 종료하려면

<#root>

FPR4100-3-A(local-mgmt)#

mgmt-port shut

FPR4100-3-A(local-mgmt)#

show mgmt-ip-debug ifconfig | b eth0

```
eth0      Link encap:Ethernet  HWaddr 58:97:BD:B9:76:EB
          inet addr:10.62.148.88  Bcast:10.62.148.127  Mask:255.255.255.128
          BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:3685870 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7068372 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:295216623 (281.5 MiB)  TX bytes:1049391193 (1000.7 MiB)
```

다시 언급하려면

<#root>

FPR4100-3-A(local-mgmt)#

mgmt-port no-shut

FPR4100-3-A(local-mgmt)#

show mgmt-ip-debug ifconfig | b eth0

```
eth0      Link encap:Ethernet  HWaddr 58:97:BD:B9:76:EB
          inet addr:10.62.148.88  Bcast:10.62.148.127  Mask:255.255.255.128
          inet6 addr: fe80::5a97:bdff:feb9:76eb/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:3685885 errors:0 dropped:0 overruns:0 frame:0
          TX packets:7068374 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:295218130 (281.5 MiB)  TX bytes:1049391353 (1000.7 MiB)
```

참고: fxos 모드 아래에 각각 mgmt0 인터페이스가 down 및 Admin down으로 표시되는 show interface brief 및 show interface mgmt 0이 있습니다. 작동이 중지된 경우 이를 참조로 사용하지 마십시오.

<#root>

FPR-4110-A#

connect fxos

FPR-4110-A(fxos)#

show interface brief | include mgmt0

mgmt0   --   down   172.16.171.83   --   1500

FPR-4110-A(fxos)#

show interface mgmt 0

```
mgmt0 is down (Administratively down)
  Hardware: GigabitEthernet, address: 5897.bdb9.212d (bia 5897.bdb9.212d)
  Internet Address is 172.16.171.83/24
```

```
MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA
auto-duplex, auto-speed
EtherType is 0x0000
1 minute input rate 3080 bits/sec 2 packets/sec
1 minute output rate 0 bits/sec 0 packets/sec
Rx
  977 unicast packets 12571 multicast packets 5229 broadcast packets
  18777 input packets 2333662 bytes
Tx
  0 unicast packets 0 multicast packets 0 broadcast packets
  0 output packets 0 bytes
```

fxos 모드에서 show run interface mgmt0을 수행하는 경우 해당 인터페이스 아래에 shutdown force가 적용됩니다. 다시 한 번, 작동 중지되었음을 나타내는 참조로 사용하지 마십시오.

<#root>

FPR4115-2-1(fxos)#

show run interface mgmt0

!Command:

show running-config interface mgmt0

!Time: Tue May 5 14:19:42 2020

version 5.0(3)N2(4.81)

interface mgmt0
  shutdown force
  ip address 10.62.184.19/24

Q. FXOS 라우팅 테이블을 확인하는 방법은 무엇입니까?

OOB(Out of Band) 관리는 기본 게이트웨이 집합에만 종속됩니다. 따라서 선택한 기본 게이트웨이가 시스템에 액세스해야 하는 클라이언트에 대한 연결을 허용하는지 확인합니다. connect fxos에 show ip route vrf all 명령이 있지만, 대역 외 관리에는 사용되지 않습니다.

Q. FXOS ARP 테이블을 확인하는 방법은 무엇입니까?

ARP 테이블은 FXOS CLI에서 표시되지 않습니다. fxos 모드(ethanalyzer)에서 패킷 캡처를 사용하여 ARP를 캡처하거나 관리자로부터 트래픽을 확인할 수도 있습니다.

ARP 패킷을 캡처하는 예입니다. capture-filter를 원하는 것으로 변경할 수 있습니다. 이 필터는 tcpdump 필터와 유사합니다.

<#root>

```
fp9300-A#
```

connect fxos

```
fp9300-A(fxos)#
```

ethanalyzer local interface mgmt capture-filter arp

```
Capturing on eth0
2016-10-14 18:04:57.551221 00:50:56:85:be:44 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.240? Tell 172.
2016-10-14 18:04:57.935562 00:12:80:85:a5:49 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.112? Tell 172.
2016-10-14 18:04:58.167029 00:50:56:85:78:4e -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.205? Tell 172.
2016-10-14 18:04:59.156000 00:50:56:9f:b1:43 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.1? Tell 172.16
2016-10-14 18:04:59.165701 00:50:56:9f:b1:43 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.1? Tell 172.16
2016-10-14 18:04:59.166925 00:50:56:85:78:4e -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.205? Tell 172.
2016-10-14 18:04:59.268168 00:50:56:9f:b1:43 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.151? Tell 0.0.0
2016-10-14 18:05:00.150217 00:50:56:85:78:4e -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.204? Tell 172.
2016-10-14 18:05:00.268369 00:50:56:9f:b1:43 -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.151? Tell 0.0.0
2016-10-14 18:05:01.150243 00:50:56:85:78:4e -> ff:ff:ff:ff:ff:ff ARP Who has 172.16.171.204? Tell 172.
10 packets captured
Program exited with status 0.
fp9300-A(fxos)#
```

또한 캡처를 파일에 저장한 다음 원격 서버로 내보낼 수 있습니다.

<#root>

```
FPR4140-A#
```

connect fxos

```
FPR4140-A(fxos)#
```

ethanalyzer local interface mgmt capture-filter arp limit-captured-frames 0 write workspace:///ARP.pcap

```
FPR4140-A#
```

connect local-mgmt

```
FPR4140-A(local-mgmt)#
```

dir

```
1 23075 Jan 12 13:13:18 2020 ARP.pcap
FPR4140-A(local-mgmt)#
```

copy workspace:///ARP.pcap ftp://anonymous@10.48.40.70/ARP.pcap

Q. FXOS 결함 이벤트를 확인하는 방법은?

show fault 명령을 사용합니다.

<#root>

FPR4115-2-1#

show fault

```
Severity  Code     Last Transition Time     ID      Description
--------- -------- ------------------------ -------- -----------
Major     F0909    2020-04-26T21:19:37.520    554924 default Keyring's certificate is invalid, reason:
Major     F1769    2012-01-19T00:30:02.733    323268 The password encryption key has not been set.
Minor     F1437    2012-01-19T00:30:02.732     32358 Config backup may be outdated
```

심각도를 기준으로 결함을 필터링할 수도 있습니다.

<#root>

FPR4115-2-1#

show fault ?

```
  0-18446744073709551615  ID
  <CR>
  >                       Redirect it to a file
  >>                      Redirect it to a file in append mode
  cause                   Cause
  detail                  Detail
  severity                Severity
  suppressed              Fault Suppressed
  |                       Pipe command output to filter
```

FPR4115-2-1#

show fault severity major

```
Severity  Code     Last Transition Time     ID      Description
--------- -------- ------------------------ -------- -----------
Major     F0909    2020-04-26T21:19:37.520    554924 default Keyring's certificate is invalid, reason:
Major     F1769    2012-01-19T00:30:02.733    323268 The password encryption key has not been set.
```

FXOS UI Overview(FXOS UI 개요) > FAULTS dashboard(FAULTS 대시보드)에서도 동일한 fault가 표시됩니다.
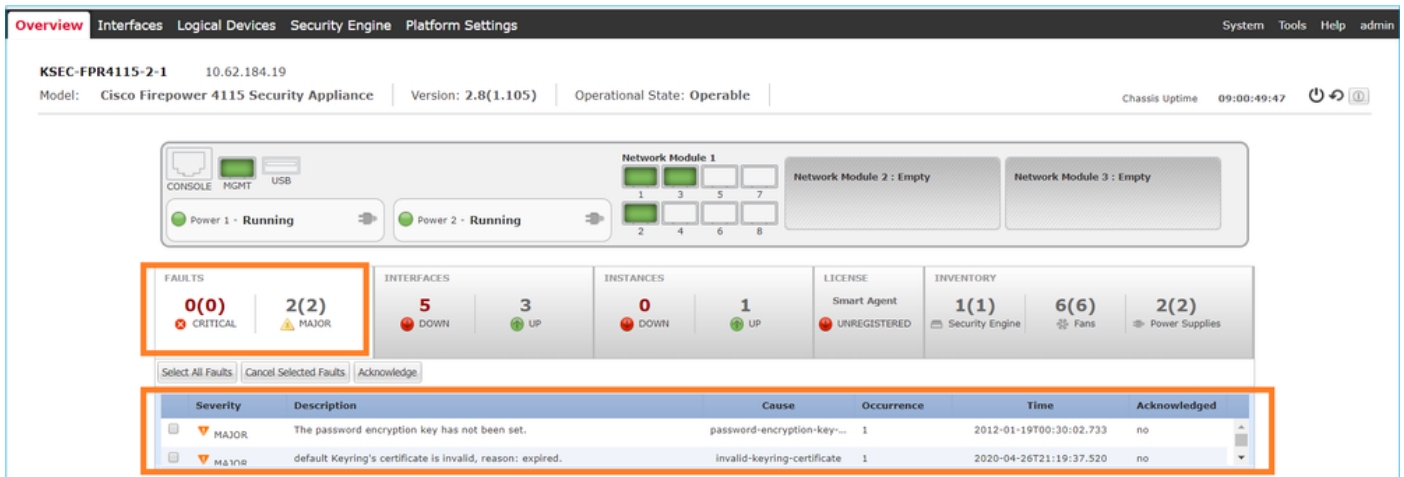
Q. 시스템의 호스트 이름을 변경하는 방법?

시스템 범위 아래에서 set name 명령을 사용합니다.

<#root>

KSEC-FPR4115-2-1#

scope system

KSEC-FPR4115-2-1 /system #

set name new-name

Warning: System name modification changes FC zone name and redeploys them non-disruptively
KSEC-FPR4115-2-1 /system* #

commit-buffer

KSEC-FPR4115-2-1 /system #

exit

new-name#

Q. show server status Output 아래의 "Compute Mismatch"란 무엇입니까?

새로 설치된 보안 모듈을 사용하려면 먼저 승인하고 다시 초기화해야 합니다. 이는 RMA를 통해 유닛을 교체하는 경우에도 마찬가지입니다.

<#root>

FPR9300#

show server status

```
Server  Slot Status                      Overall Status        Discovery
------  -------------------------------- --------------------- ---------
1/1     Mismatch                         Compute Mismatch      Complete
1/2     Equipped                         Ok                    Complete
1/3     Empty
FPR9300#
```

컴퓨팅 불일치로 인해 다음과 같은 결함 이벤트가 발생할 수 있습니다.

```
Service profile ssp-sprof-1 configuration failed due to compute-unavailable,insufficient-resources
```

show service-profile status(서비스 프로파일 상태 표시)에는 모듈이 없는 것처럼 Unassociated(연결되지 않음)가 표시됩니다.

CLI에서 확인하는 단계:

<#root>

scope chassis 1

 acknowledge slot <slot#>

 commit-buffer

또는 Chassis Manager UI를 사용하여 모듈을 승인합니다.
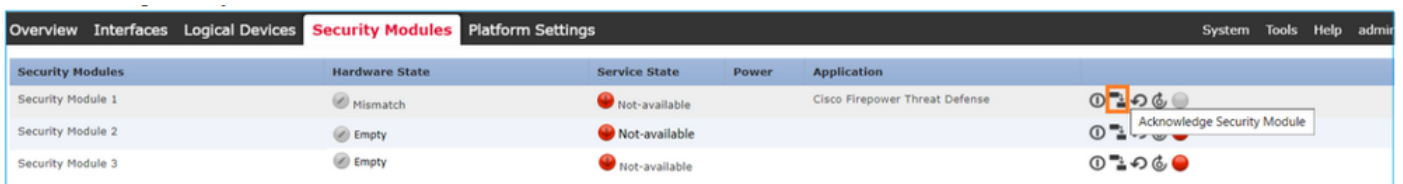
Q. show slot Output에서 "Token Mismatch"는 어떤 의미입니까?

이는 확인 응답을 받은 후 보안 모듈이 아직 다시 초기화되지 않았음을 나타냅니다.

<#root>

FPR9300#

```
scope ssa
```

FPR9300 /ssa #

```
show slot
```

```
Slot:
    Slot ID    Log Level Admin State Operational State
    ---------- --------- ----------- -----------------
    1          Info      Ok          Token Mismatch
    2          Info      Ok          Online
    3          Info      Ok          Not Available
FPR9300 /ssa #
```

CLI를 통한 재초기화 단계:

<#root>

```
scope ssa
scope slot <#>
reinitialize
commit-buffer
```

firepower 41xx에서 이는 SSD가 없거나 결함이 있음을 의미할 수도 있습니다. 범위 서버 1/1의 show inventory storage를 통해 SSD가 여전히 존재하는지 확인합니다.

<#root>

FPR4140-A#

```
scope ssa
```

FPR4140-A /ssa #

```
show slot 1
```

```
Slot:
    Slot ID    Log Level Admin State Oper State
    ---------- --------- ----------- ----------
    1          Info      Ok          Token Mismatch
```

FPR4140-A /ssa #

```
show fault severity critical
```

```
Severity  Code     Last Transition Time     ID       Description
--------- -------- ----------------------- -------- -----------
Critical  F1548    2018-03-11T01:22:59.916    38768 Blade swap detected on slot 1
```

FPR4140-A /ssa #

scope server 1/1

FPR4140-A /chassis/server #

show inventory storage

```
Server 1/1:
    Name:
    User Label:
    Equipped PID: FPR4K-SM-36
    Equipped VID: V01
    Equipped Serial (SN): FLM12345KL6
    Slot Status: Equipped
    Acknowledged Product Name: Cisco Firepower 4100 Series Extreme Performance Security Engine
    Acknowledged PID: FPR4K-SM-36
    Acknowledged VID: V00
    Acknowledged Serial (SN): FLM12345KL6
    Acknowledged Memory (MB): 262144
    Acknowledged Effective Memory (MB): 262144
    Acknowledged Cores: 36
    Acknowledged Adapters: 2
    Motherboard:
        Product Name: Cisco Firepower 4100 Series Extreme Performance Security Engine
        PID: FPR4K-SM-36
        VID: V01
        Vendor: Cisco Systems Inc
        Serial (SN): FLM12345KL6
        HW Revision: 0

        RAID Controller 1:
            Type: SATA
            Vendor: Cisco Systems Inc
            Model: CHORLEYWOOD
            Serial: FLM12345KL6
            HW Revision:
            PCI Addr: 00:31.2
            Raid Support:
            OOB Interface Supported: No
            Rebuild Rate: N/A
            Controller Status: Unknown

            Local Disk 1:
                Vendor:
                Model:
                Serial:
                HW Rev: 0
                Operability: N/A
                Presence: Missing
                Size (MB): Unknown
                Drive State: Unknown
                Power State: Unknown
                Link Speed: Unknown
                Device Type: Unspecified

            Local Disk Config Definition:
                Mode: No RAID
                Description:
                Protect Configuration: No
```

Q. CLI를 통해 표준 시간대, NTP 및 DNS를 설정하려면 어떻게 해야 합니까?

이는 FXOS 플랫폼 설정에서 구성합니다. 이 문서의 지침을 적용합니다. [FXOS 플랫폼 설정.](#)

섀시 시간 설정을 확인하려면

<#root>

KSEC-FPR4115-2-1#

show clock

```
Tue May  5 21:30:55 CEST 2020
KSEC-FPR4115-2-1#
```

show ntp

```
    NTP Overall Time-Sync Status: Time Synchronized
```

모듈 부트 CLI에서 모듈/블레이드 시간을 확인하려면 다음 3가지 명령을 사용합니다.

<#root>

Firepower-module1>

show ntp peerstatus

```
      remote            local        st poll reach  delay   offset    disp
=====================================================================
*203.0.113.126   203.0.113.1      2   64   377 0.00006  0.000018 0.02789

remote 203.0.113.126, local 203.0.113.1
hmode client, pmode mode#255, stratum 2, precision -20
leap 00, refid [192.0.2.1], rootdistance 0.19519, rootdispersion 0.17641
ppoll 6, hpoll 6, keyid 0, version 4, association 43834
reach 377, unreach 0, flash 0x0000, boffset 0.00006, ttl/mode 0
timer 0s, flags system_peer, config, bclient, prefer, burst
reference time:      dbef8823.8066c43a  Mon, Dec  5 2016  8:30:59.501
originate timestamp: 00000000.00000000  Mon, Jan  1 1900  2:00:00.000
receive timestamp:   dbefb27d.f914589d  Mon, Dec  5 2016 11:31:41.972
transmit timestamp:  dbefb27d.f914589d  Mon, Dec  5 2016 11:31:41.972
filter delay:  0.00008  0.00006  0.00008  0.00009
               0.00008  0.00008  0.00008  0.00009
filter offset: 0.000028 0.000018 0.000034 0.000036
               0.000033 0.000036 0.000034 0.000041
filter order:  1        2        6        0
               4        5        3        7
offset 0.000018, delay 0.00006, error bound 0.02789, filter error 0.00412


Firepower-module1>
```

show ntp association

```
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
*203.0.113.126   192.0.2.1       2 u   37   64  377    0.062    0.018   0.017


ind assid status  conf reach auth condition  last_event cnt
===========================================================
  1 43834  961d   yes   yes  none  sys.peer              1

associd=43834 status=961d conf, reach, sel_sys.peer, 1 event, popcorn,
srcadr=203.0.113.126, srcport=123, dstadr=203.0.113.1, dstport=123,
leap=00, stratum=2, precision=-20, rootdelay=195.190, rootdisp=176.407,
refid=192.0.2.1,
reftime=dbef8823.8066c43a  Mon, Dec  5 2016  8:30:59.501,
rec=dbefb27d.f91541fc  Mon, Dec  5 2016 11:31:41.972, reach=377,
unreach=0, hmode=3, pmode=4, hpoll=6, ppoll=6, headway=22, flash=00 ok,
keyid=0, offset=0.018, delay=0.062, dispersion=0.778, jitter=0.017,
xleave=0.011,
filtdelay=    0.08    0.06    0.08    0.10    0.08    0.09    0.08    0.10,
filtoffset=   0.03    0.02    0.03    0.04    0.03    0.04    0.03    0.04,
filtdisp=     0.00    0.03    1.04    1.07    2.06    2.09    3.09    3.12


Firepower-module1>
```

show ntp sysinfo

```
associd=0 status=0618 leap_none, sync_ntp, 1 event, no_sys_peer,
version="ntpd 4.2.6p5@1.2349-o Fri Oct  7 17:08:03 UTC 2016 (2)",
processor="x86_64", system="Linux/3.10.62-ltsi-WR6.0.0.27_standard",
leap=00, stratum=3, precision=-23, rootdelay=195.271, rootdisp=276.641,
refid=203.0.113.126,
reftime=dbefb238.f914779b  Mon, Dec  5 2016 11:30:32.972,
clock=dbefb2a7.575931d7  Mon, Dec  5 2016 11:32:23.341, peer=43834, tc=6,
mintc=3, offset=0.035, frequency=25.476, sys_jitter=0.003,
clk_jitter=0.015, clk_wander=0.011

system peer:         203.0.113.126
system peer mode:    client
leap indicator:      00
stratum:             3
precision:           -23
root distance:       0.19527 s
root dispersion:     0.27663 s
reference ID:        [203.0.113.126]
reference time:      dbefb238.f914779b  Mon, Dec  5 2016 11:30:32.972
system flags:        auth monitor ntp kernel stats
jitter:              0.000000 s
stability:           0.000 ppm
broadcastdelay:      0.000000 s
authdelay:           0.000000 s

time since restart:    1630112
time since reset:      1630112
packets received:      157339
packets processed:     48340
current version:       48346
previous version:      0
declined:              0
access denied:         0
bad length or format:  0
```

```
bad authentication:      0
rate exceeded:           0
Firepower-module1>
```

NTP 확인 및 문제 해결에 대한 자세한 내용은 이 문서를 확인하십시오. [Firepower FXOS 어플라이언스에서 NTP(Network Time Protocol) 설정 구성, 확인 및 문제 해결](#)

Q. Smart Licensing 및 HTTP 프록시를 설정하는 방법은?

ASA 논리적 디바이스의 경우 FXOS 섀시에서 스마트 라이센싱이 필요합니다. 자세한 내용은 이 문서를 참조하십시오. [ASA용 라이센스 관리](#)

다음은 라이센스 상태의 샘플 출력입니다.

```
<#root>

FPR4115-2-1#

scope license

FPR4115-2-1 /license #

show license all


Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: BU Production Test
  Virtual Account: TAC-BETA
  Export-Controlled Functionality: Not Allowed
  Initial Registration: SUCCEEDED on Dec 15 14:41:55 2015 PST
  Last Renewal Attempt: SUCCEEDED on Dec 23 09:26:05 2015 PST
  Next Renewal Attempt: Jun 21 07:00:21 2016 PST
  Registration Expires: Dec 23 06:54:19 2016 PST

License Authorization:
  Status: AUTHORIZED on Apr 07 15:44:26 2016 PST
  Last Communication Attempt: SUCCEEDED on Apr 07 15:44:26 2016 PST
  Next Communication Attempt: May 07 15:44:25 2016 PST
  Communication Deadline: Jul 06 15:38:24 2016 PST

License Usage
=============

No licenses in use

Product Information
```

```
===================
UDI: PID:FPR9K-SUP,SN:JAD123456AB

Agent Version
=============
Smart Agent for Licensing: 1.4.1_rel/31
```

또는

<#root>

```
fp9300-A#
```

connect local-mgmt

```
fp9300-A(local-mgmt)#
```

show license all

```
Smart Licensing Status
======================

Smart Licensing is ENABLED

Registration:
  Status: REGISTERED
  Smart Account: Cisco Internal
  Virtual Account: Escalations
  Export-Controlled Functionality: Allowed
  Initial Registration: SUCCEEDED on Feb 10 18:55:08 2016 CST
  Last Renewal Attempt: SUCCEEDED on Oct 09 15:07:25 2016 CST
  Next Renewal Attempt: Apr 07 15:16:32 2017 CST
  Registration Expires: Oct 09 15:10:31 2017 CST

License Authorization:
  Status: AUTHORIZED on Sep 20 07:29:06 2016 CST
  Last Communication Attempt: SUCCESS on Sep 20 07:29:06 2016 CST
  Next Communication Attempt: None  Communication Deadline: None
Licensing HA configuration error:
    No Reservation Ha config error

License Usage
=============

No licenses in use

Product Information
===================
UDI: PID:FPR9K-SUP,SN:JAD190800VU

Agent Version
=============
Smart Agent for Licensing: 1.6.7_rel/95
```

Q. CLI를 통해 Syslog를 구성하는 방법은 무엇입니까?

다음 문서를 확인하십시오.

- [firepower FXOS 어플라이언스에서 Syslog 구성](#)
- [FXOS 구성 가이드: 플랫폼 설정 Syslog](#)

Q. firepower 어플라이언스에서 SNMP를 구성하는 방법

이 문서 확인: [Firepower NGFW 어플라이언스에 SNMP 구성](#)

Q. Chassis Manager에서 사용하는 SSL 인증서를 설치/교체하는 방법은 무엇입니까?

이 문서에서는 FXOS 섀시 [관리자용 신뢰할 수 있는 인증서 설치를 도와 줍니다.](#)

Q. FPR9300 섀시를 통한 트래픽 흐름의 문제를 해결하려면 어떻게 해야 합니까?

다음 문서를 확인하십시오.

- [Firepower 데이터 경로 문제 해결 1단계: 패킷 인그레스](#)
- [Firepower 데이터 경로 문제 해결: 개요](#)
- [Firepower 방화벽 캡처를 분석하여 네트워크 문제를 효과적으로 해결](#)

Q. 섀시 Mac 주소 테이블을 보는 방법

FP41xx 및 FP93xx 플랫폼의 경우 다음 명령을 사용합니다.

<#root>

FPR4115-2-1#

connect fxos

FPR4115-2-1(fxos)#

 show l2-table

```
Ingress      MAC             Vlan Class VlanGrp    Status  Dst
Eth1/1       78bc.1ae7.a45e  101  1     0          present 1
Veth776      78bc.1ae7.a45e  101  1     0          present 1
Po1          0100.5e00.0005  1001 1     0          present 1
Po1          0100.5e00.0006  1001 1     0          present 1
Po1          78bc.1ae7.a44e  1001 1     0          present 1
Po1          ffff.ffff.ffff  1001 63    0          present 1
```

```
FPR4115-2-1(fxos)#
```

show mac address-table

```
Legend:
        * - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC
        age - seconds since first seen,+ - primary entry using vPC Peer-Link
   VLAN     MAC Address     Type     age     Secure NTFY   Ports/SWID.SSID.LID
---------+----------------+-------+---------+------+----+------------------
* 1001    0100.5e00.0005   static    0          F    F   Eth1/1
* 1001    0100.5e00.0006   static    0          F    F   Eth1/1
* 1001    78bc.1ae7.a44e   static    0          F    F   Eth1/1
* 1001    ffff.ffff.ffff   static    0          F    F   Eth1/1
* 101     78bc.1ae7.a45e   static    0          F    F   Eth1/1
* 101     78bc.1ae7.a46f   static    0          F    F   Veth776
* 4047    0015.a501.0100   static    0          F    F   Veth864
* 4047    0015.a501.0101   static    0          F    F   Veth1015
* 4043    78bc.1ae7.b000   static    0          F    F   Eth1/10
* 4043    78bc.1ae7.b00c   static    0          F    F   Eth1/9
* 1       0015.a500.001f   static    0          F    F   Veth887
* 1       0015.a500.002f   static    0          F    F   Veth1018
* 1       0015.a500.01bf   static    0          F    F   Veth905
* 1       0015.a500.01ef   static    0          F    F   Veth1019
```

Q. 섀시 인터페이스 MAC 주소를 보려면 어떻게 해야 합니까?

다음 명령을 사용합니다.

<#root>

```
FPR4115-2-1#
```

connect fxos

```
FPR4115-2-1(fxos)#
```

show interface mac-address

```
--------------------------------------------------------------------------------
Interface              Mac-Address      Burn-in Mac-Address
--------------------------------------------------------------------------------
Ethernet1/1            78bc.1ae7.a417   78bc.1ae7.a418
Ethernet1/2            78bc.1ae7.a417   78bc.1ae7.a419
Ethernet1/3            78bc.1ae7.a417   78bc.1ae7.a41a
Ethernet1/4            78bc.1ae7.a417   78bc.1ae7.a41b
Ethernet1/5            78bc.1ae7.a417   78bc.1ae7.a41c
Ethernet1/6            78bc.1ae7.a417   78bc.1ae7.a41d
Ethernet1/7            78bc.1ae7.a417   78bc.1ae7.a41e
Ethernet1/8            78bc.1ae7.a417   78bc.1ae7.a41f
Ethernet1/9            78bc.1ae7.a417   78bc.1ae7.a420
Ethernet1/10           78bc.1ae7.a417   78bc.1ae7.a421
Ethernet1/11           78bc.1ae7.a417   78bc.1ae7.a422
Ethernet1/12           78bc.1ae7.a417   78bc.1ae7.a423
port-channel1          78bc.1ae7.a417   78bc.1ae7.a41a
port-channel48         78bc.1ae7.a417   0000.0000.0000
```

```
mgmt0                    78bc.1ae7.a411  78bc.1ae7.a411
Vethernet690             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet691             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet692             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet693             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet694             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet695             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet696             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet697             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet698             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet699             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet700             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet774             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet775             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet776             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet777             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet778             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet779             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet861             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet862             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet863             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet864             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet887             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet905             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet906             78bc.1ae7.a417  78bc.1ae7.a417
Vethernet1015            78bc.1ae7.a417  78bc.1ae7.a417
Vethernet1018            78bc.1ae7.a417  78bc.1ae7.a417
Vethernet1019            78bc.1ae7.a417  78bc.1ae7.a417
Vethernet1020            78bc.1ae7.a417  78bc.1ae7.a417
Vethernet1021            78bc.1ae7.a417  78bc.1ae7.a417
```

Q. FXOS Supervisor(MIO)에서 비밀번호 복구를 수행하는 방법은 무엇입니까?

FP41xx 및 FP9300의 비밀번호 복구 절차는 다음 문서를 참조하십시오. [Firepower 9300/4100 Series 어플라이언스의 비밀번호 복구 절차](#)

Q. ASA 또는 FTD 논리적 디바이스에서 비밀번호 복구를 수행하는 방법은 무엇입니까?

논리적 디바이스 비밀번호를 재설정하려면 디바이스를 다시 부트스트랩해야 합니다. 부트스트랩 재해 복구 프로세스에서는 다음 항목 중 하나를 변경할 수 있습니다.

- ASA/FTD 관리 IP - IP, 넷마스크, 게이트웨이, IPv6, 접두사 길이
- ASA 비밀번호
- FTD 등록 키, 비밀번호, FMC IP, 도메인 검색, 방화벽 모드, DNS 서버, FQDN
- ASA 클러스터 IP 풀, 넷마스크, 게이트웨이, 접두사 길이, 가상 IP
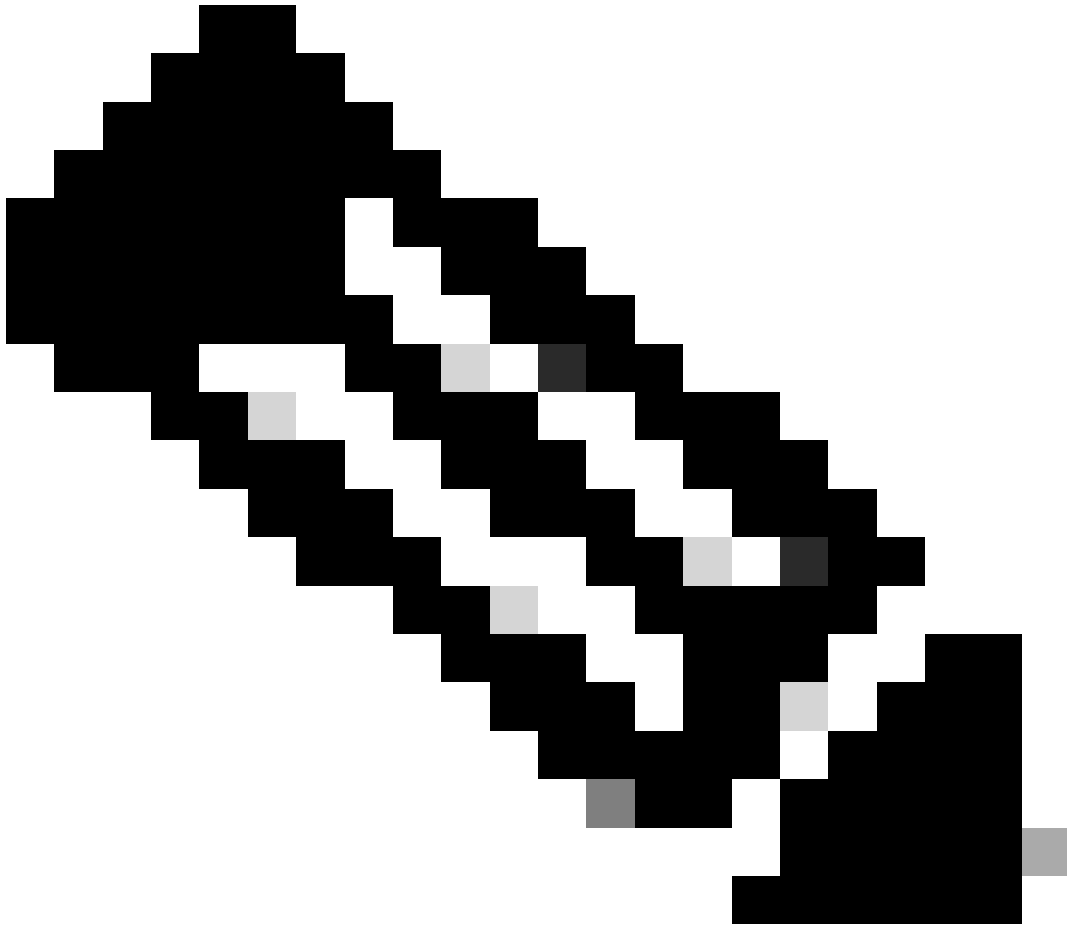
참고: 부트스트랩 복구 프로세스는 논리적 디바이스 재로드가 필요하므로 MW(유지 관리 기간)에서 실행해야 합니다

예 1

FXOS UI를 사용하여 논리적 디바이스의 부트스트랩 설정을 수정할 수 있습니다. Logical Devices(논리적 디바이스) 탭, Edit a device(디바이스 수정)로 이동합니다.

비밀번호를 설정합니다.

이 메시지를 저장하면 다음 메시지가 나타납니다.

Bootstrap Settings Update Confirmation

Updating the bootstrap settings from the Firepower Chassis Manager is for disaster recovery only; we recommend that you instead change bootstrap settings in the application. To update the bootstrap settings from the Firepower Chassis Manager, click **Restart Now**: the old bootstrap configuration will be overwritten, and the application will restart. Or click **Restart Later** so you can manually restart the application at a time of your choosing and apply the new bootstrap settings (**Logical Devices > Restart**).

Note: For FTD, if you change the management IP address, be sure to change the device IP address in **FMC (Devices > Device Management > Device** tab **> Management** area). This task is not required if you specified the NAT ID instead of the device IP address in FMC.

Restart Now   Restart Later   Cancel

예 2

다음은 ASA enable password change/recovery의 예입니다.

<#root>

FP4110-A#

scope ssa

FP4110-A /ssa #

show logical-device

```
Logical Device:
    Name       Description  Slot ID    Mode       Oper State               Templa
    ---------- -----------  ---------- ---------- ------------------------ ------
    asa                     1          Standalone Ok                       asa
```

FP4110-A /ssa #

scope logical-device asa

FP4110-A /ssa/logical-device #

scope mgmt-bootstrap asa

FP4110-A /ssa/logical-device/mgmt-bootstrap #

show config

```
 enter mgmt-bootstrap asa
    create bootstrap-key-secret PASSWORD
 !      set value
    exit
    enter ipv4 1 default
        set gateway 172.16.171.1
        set ip 172.16.171.226 mask 255.255.255.0
```

```
     exit
 exit
```

FP4110-A /ssa/logical-device/mgmt-bootstrap #

enter bootstrap-key-secret PASSWORD

FP4110-A /ssa/logical-device/mgmt-bootstrap/bootstrap-key-secret #

set value

```
Value:   <enter new enable password in here>
Warning: Bootstrap changes are not automatically applied to app-instances. To apply the changes, please
```

FP4110-A /ssa/logical-device/mgmt-bootstrap/bootstrap-key-secret* #

commit-buffer

FP4110-A /ssa/logical-device/mgmt-bootstrap/bootstrap-key-secret #

top

FP4110-A#

scope ssa

FP4110-A /ssa #

scope slot 1

FP4110-A /ssa/slot #

scope app-instance asa

FP4110-A /ssa/slot/app-instance #

clear-mgmt-bootstrap

```
Warning: Clears the application management bootstrap. Application needs to be restarted for this action
FP4110-A /ssa/slot/app-instance* #
```

commit-buffer

FP4110-A /ssa/slot/app-instance #

restart

FP4110-A /ssa/slot/app-instance* #

commit-buffer

ASA에 연결하기 전에 ASA가 온라인 상태인지 확인하고 새 enable 비밀번호를 사용합니다.

```
<#root>

FP4110-A /ssa/slot/app-instance #

show


Application Instance:
    App Name    Admin State Oper State      Running Version Startup Version Profile Name Cluster State
    ---------- ----------- --------------- --------------- --------------- ------------ ---------------
    asa         Enabled     Online          9.9.1.76        9.9.1.76                     Not Applicable
FP4110-A /ssa/slot/app-instance #
```

Q. FXOS 사용자(예: admin)의 현재 비밀번호를 변경하려면 어떻게 해야 합니까?

다음 절차를 따르십시오.

```
<#root>

FP4110-1-A#

scope security

FP4110-1-A /security #

show local-user

User Name       First Name      Last name
--------------- --------------- ---------
admin
FP4110-1-A /security #

enter local-user admin

FP4110-1-A /security/local-user #

set password

Enter a password:
Confirm the password:
FP4110-1-A /security/local-user* #

commit-buffer

FP4110-1-A /security/local-user #
```
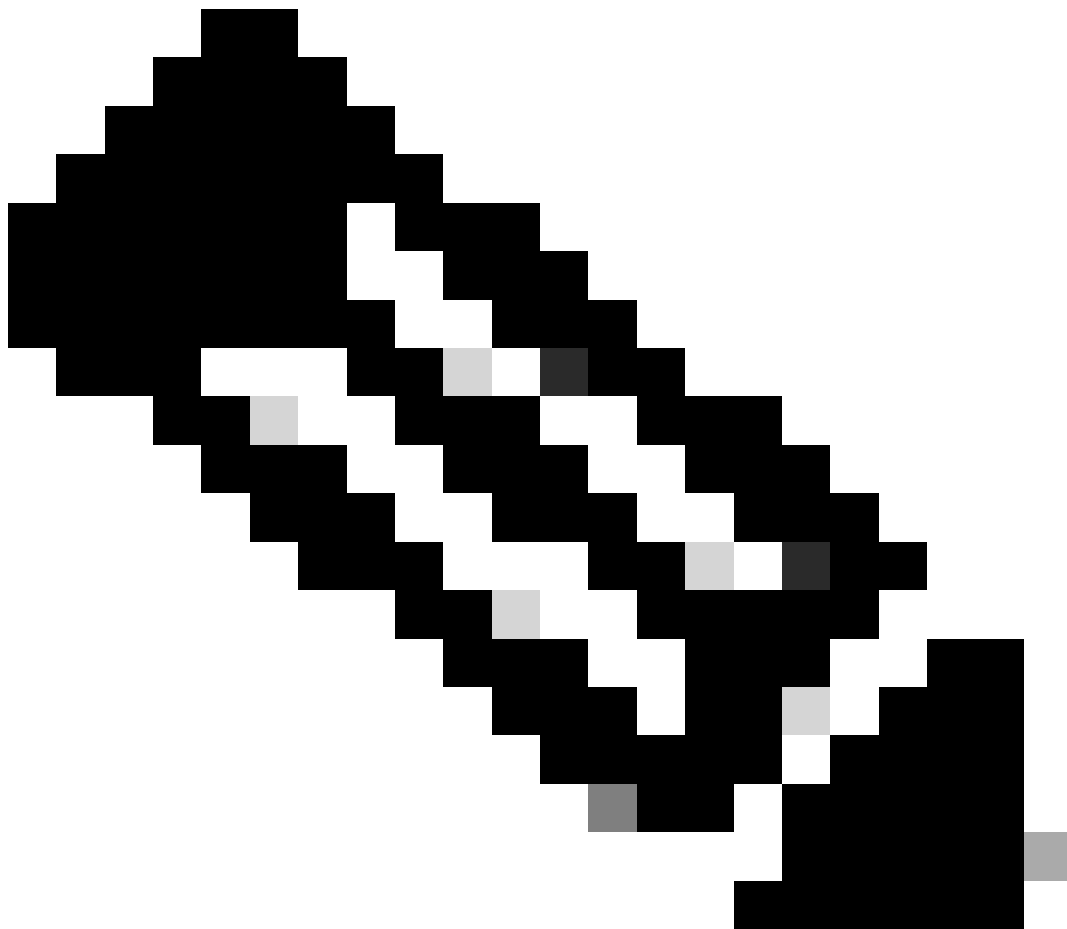
Q. FXOS를 다운그레이드하려면 어떻게 해야 합니까?

FXOS 이미지 다운그레이드는 공식적으로 지원되지 않습니다. Cisco에서 지원하는 유일한 FXOS 이미지 다운그레이드 방법은 디바이스의 전체 이미지를 다시 생성하는 것입니다. 이 내용은 Firepower 4100/9300 업그레이드 경로에 설명되어 있습니다

Q. ASA 논리적 디바이스를 다운그레이드/업그레이드하려면 어떻게 해야 합니까?

Chassis Manager를 통해 ASA 버전을 다운그레이드/업그레이드하려면: [논리적 디바이스의 이미지 버전 업데이트](#)

CLI를 통해 변경하려면 다음 컨피그레이션 가이드 섹션을 사용하십시오. [논리적 디바이스의 이미지 버전 업데이트](#)

참고: CLI에서 commit-buffer를 실행하면 모듈이 다시 시작됩니다. 마찬가지로 섀시 관리자도 ok를 누르면 모듈이 재시작됩니다. 수동으로 다시 시작할 필요가 없습니다.

Q. CLI를 통해 FXOS 업그레이드 상태를 확인하는 방법?

모든 구성 요소가 Ready(준비) 상태가 되면 업그레이드가 완료됩니다.

<#root>

FP9300#

scope system

FP9300 /system #

show firmware monitor

FPRM:
    Package-Vers: 2.0(1.37)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.0(1.23)
    Upgrade-Status: Upgrading

Chassis 1:
    Server 1:
        Package-Vers: 2.0(1.23)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.0(1.23)
        Upgrade-Status: Upgrading

기타 유용한 명령

<#root>

FP9300 /firmware/auto-install #

show fsm status

FP9300 /firmware/auto-install #

show fsm status expand

Q. FXOS CLI에서 논리적 디바이스를 다시 로드하는 방법은 무엇입니까?

FCM UI를 사용하는 것이 좋습니다. 어떤 이유로든 UI에 액세스할 수 없는 경우 다음 명령을 사용합니다.

<#root>

#

scope chassis 1

```
/chassis #

scope server 1/1


/chassis/server #

reset ?


  hard-reset-immediate  Perform an immediate hard reset


  hard-reset-wait       Wait for the completion of any pending management oper


/chassis/server #

commit-buffer
```

Q. FXOS 섀시 가동 시간 및 마지막 다시 로드 이유를 확인하는 방법

FXOS 가동 시간 확인은 FXOS 역추적이 있는 경우에 유용합니다. UI(FCM) 또는 CLI에서 FXOS를 볼 수 있습니다.

<#root>

FPR9K-1-A#

connect fxos

FPR9K-1-A(fxos)#

show system uptime

```
System start time: Sun Sep 25 09:57:19 2016
System uptime: 28 days, 9 hours, 38 minutes, 14 seconds
Kernel uptime: 28 days, 9 hours, 38 minutes, 41 seconds
Active supervisor uptime: 28 days, 9 hours, 38 minutes, 14 seconds
```

또한 마지막 다시 로드 이유를 확인하려면 다음 명령을 사용합니다.

<#root>

FPR9K-1-A(fxos)#

show system reset-reason

```
----- reset reason for Supervisor-module 1 (from Supervisor in slot 1) ---
1) At 212883 usecs after Fri Oct 21 22:34:35 2016
 Reason: Kernel Panic
 Service:
 Version: 5.0(3)N2(3.02)

2) At 106690 usecs after Thu May 26 16:07:38 2016
 Reason: Reset Requested by CLI command reload
 Service:
 Version: 5.0(3)N2(3.02)
```

FPR2100 업타임의 경우 다음을 수행합니다.

1. 'show tech-support fprm detail' 번들 다운로드

2. 번들의 내용을 추출합니다.

3. tmp/inventory_manager.xml 파일을 확인합니다.

가동 시간을 초 단위로 표시하는 항목이 있습니다.

<#root>

tmp/inventory_manager.xml:

<uptime>151</uptime>

Q. FXOS에서 사용 가능한 디스크 공간을 확인하는 방법은?

'workspace'라고도 함:

<#root>

FPR9K-1-A#

connect local-mgmt

FPR9K-1-A(local-mgmt)#

dir

```
1       29 Sep 25 09:56:22 2016 blade_debug_plugin
1       19 Sep 25 09:56:22 2016 bladelog
1       16 Aug 05 15:41:05 2015 cores
1  2841476 Apr 26 14:13:12 2016 d
2     4096 Dec 01 10:09:11 2015 debug_plugin/
```

```
1        31 Aug 05 15:41:05 2015 diagnostics
1  2842049 Feb 23 03:26:38 2016 dp
1 18053120 Feb 23 11:10:19 2016 fpr9k-1-0-sam_logs_all.tar
1 18176000 Feb 23 11:10:43 2016 fpr9k-1-1-sam_logs_all.tar
1 19302400 Feb 23 11:11:07 2016 fpr9k-1-2-sam_logs_all.tar
1 16312320 Feb 23 11:06:53 2016 fpr9k-1-3-sam_logs_all.tar
1  2841476 Feb 22 18:47:00 2016 fxos-dplug.5.0.3.N2.3.13.67g.gSSA
2     4096 Aug 05 15:38:58 2015 lost+found/
1       25 Dec 01 11:11:50 2015 packet-capture
1 18493440 Feb 23 10:44:51 2016 sam_logs_all.tar
2     4096 Sep 14 11:23:11 2016 techsupport/

Usage for workspace://
4032679936 bytes total
324337664 bytes used
3503489024 bytes free
```

<#root>

FPR9K-1-A(local-mgmt)#

dir volatile:/

```
1 66 Oct 27 08:17:48 2016 xmlout_5816

Usage for volatile://
251658240 bytes total
4096 bytes used
251654144 bytes free
```

부트 플래시 여유 공간을 확인합니다. 이 출력에는 Workspace 크기 및 사용량도 표시됩니다.

<#root>

FPR9K-1-A#

scope fabric-interconnect a

FPR9K-1-A /fabric-interconnect #

show storage

```
Storage on local flash drive of fabric interconnect:
    Partition       Size (MBytes)    Used Percentage
    ---------------- ---------------- ---------------
    bootflash       106490           9
    opt             3870             2
    spare           5767             1
    usbdrive        Nothing          Empty
    workspace       3845             9
```
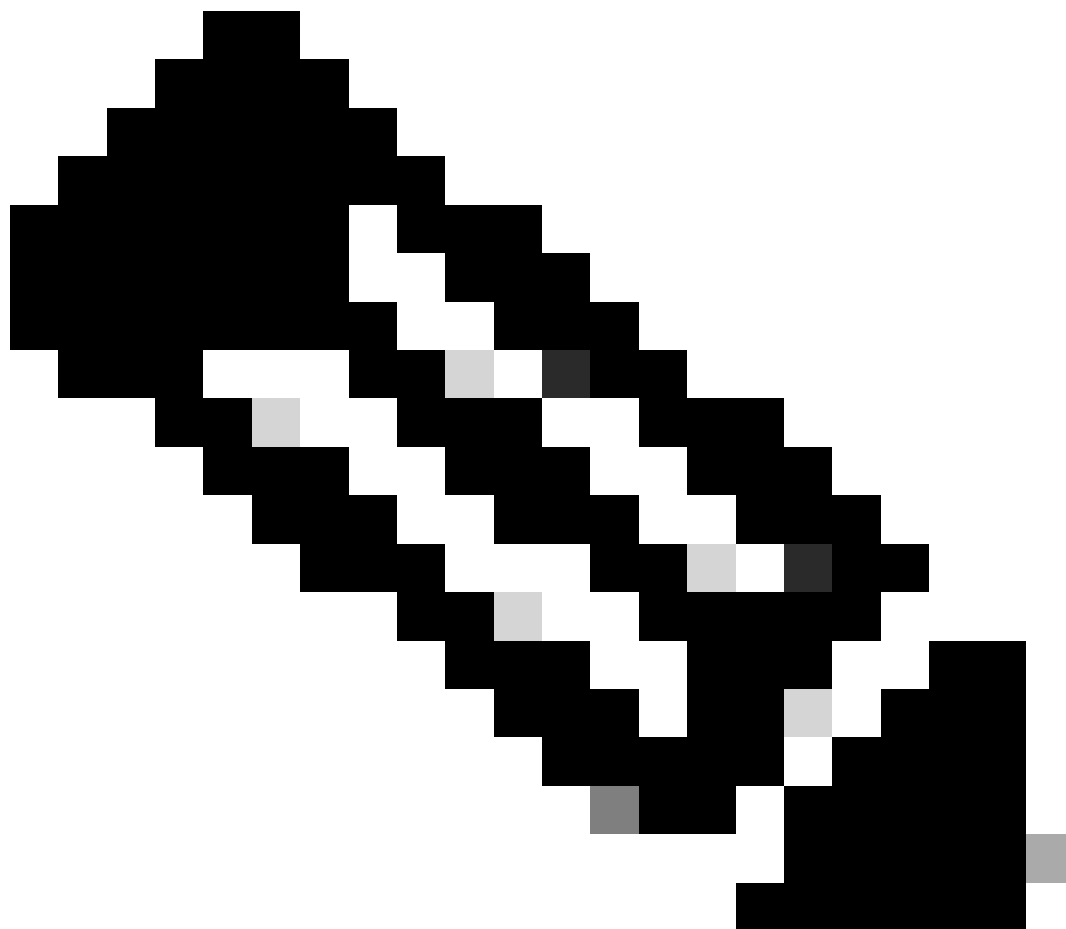
Q. FXOS의 구성을 공장 기본값으로 재설정하려면 어떻게 해야 합니까?

다음 명령을 사용합니다.

<#root>

FPR9K-1-A#

connect local-mgmt

FPR9K-1-A(local-mgmt)#

erase configuration

참고: 시스템이 재부팅되고 관리 IP 주소를 포함하여 전체 컨피그레이션이 지워집니다. 따라서 콘솔이 연결되어 있는지 확인합니다. 시스템이 재부팅되면 설정 애플리케이션이 실행되고 관리 컨피그레이션 정보를 다시 입력할 수 있습니다.

예

<#root>

FPR9K-1#

connect local-mgmt

FPR9K-1(local-mgmt)#

erase configuration

All configurations are erased and system must reboot. Are you sure? (yes/no):

yes

```
Removing all the configuration. Please wait....
/bin/rm: cannot remove directory `/bootflash/sysdebug//tftpd_logs': Device or resource busy
sudo: cannot get working directory
sudo: cannot get working directory
Configurations are cleaned up. Rebooting....
...
System is coming up ... Please wait ...
System is coming up ... Please wait ...
2016 Oct 28 06:31:00  %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Starting bcm_attach - bcm_usd
System is coming up ... Please wait ...
2016 Oct 28 06:31:06  %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Finished bcm_attach... - bcm_usd
2016 Oct 28 06:31:07  %$ VDC-1 %$ %USER-0-SYSTEM_MSG: Enabling Filter on CPU port  - bcm_usd
System is coming up ... Please wait ...
2016 Oct 28 06:31:11 switch %$ VDC-1 %$ %VDC_MGR-2-VDC_ONLINE: vdc 1 has come online
System is coming up ... Please wait ...
nohup: appending output to `nohup.out'
        ---- Basic System Configuration Dialog ----
  This setup utility guides you through the basic configuration of
  the system. Only minimal configuration including IP connectivity to
  the Fabric interconnect and its clustering mode is performed through these steps.
  Type Ctrl-C at any time to abort configuration and reboot system.
  To back track or make modifications to already entered values,
  complete input till end of section and answer no when prompted
  to apply configuration.
  You have chosen to setup a new Security Appliance. Continue? (y/n):
```

Q. FXOS CLI에서 논리적 디바이스의 부트스트랩 컨피그레이션(할당된 인터페이스, 버전 등)을 확인하는 방법은 무엇입니까?

```
<#root>

FPR4100-3-A#

scope ssa

FPR4100-3-A /ssa #

show configuration

 scope ssa
     enter logical-device FTD4150-3 ftd 1 standalone
         enter external-port-link Ethernet16_ftd Ethernet1/6 ftd
             set decorator ""
             set description ""
             set port-name Ethernet1/6
         exit
         enter external-port-link Ethernet17_ftd Ethernet1/7 ftd
             set decorator ""
             set description ""
             set port-name Ethernet1/7
         exit
         enter external-port-link Ethernet18_ftd Ethernet1/8 ftd
             set decorator ""
             set description ""
             set port-name Ethernet1/8
         exit
         enter mgmt-bootstrap ftd
             enter bootstrap-key DNS_SERVERS
                 set value 192.0.2.100
             exit
             enter bootstrap-key FIREPOWER_MANAGER_IP
                 set value 10.62.148.57
             exit
             enter bootstrap-key FIREWALL_MODE
                 set value routed
             exit
             enter bootstrap-key FQDN
                 set value FTD4150-3.lab.com
             exit
             enter bootstrap-key SEARCH_DOMAINS
                 set value lab.com
             exit
             enter bootstrap-key-secret PASSWORD
 !           set value
             exit
             enter bootstrap-key-secret REGISTRATION_KEY
 !           set value
             exit
             enter ipv4 1 firepower
                 set gateway 10.62.148.1
                 set ip 10.62.148.89 mask 255.255.255.128
             exit
         exit
         set description ""
         set res-profile-name ""
     exit
     scope slot 1
         enter app-instance ftd
             enable
             set startup-version 6.0.1.1213
         exit
         set log-level info
     exit
```

```
    scope app asa 9.12.4.12
        set-default
    exit
    scope app ftd 6.0.1.1213
        accept-license-agreement
        set-default
    exit
 exit
```

이 값은 다음과 같습니다.

모든 FXOS 컨피그레이션을 보려면 'all' 키워드를 추가합니다(출력은 여러 페이지 길이임).

<#root>

FPR4100-3-A /ssa #

show configuration all

Q. FXOS 인터페이스의 상태(포트 유형, 상태)를 확인하려면 어떻게 해야 합니까?

<#root>

```
FPR4100-3-A#

scope eth-uplink


FPR4100-3-A /eth-uplink #

scope fabric a


FPR4100-3-A /eth-uplink/fabric #

show interface


Interface:
    Port Name        Port Type           Admin State Oper State       State Reason
    ---------------  ------------------  ----------- ----------------  ------------
    Ethernet1/1      Data                Disabled    Admin Down        Administratively down
    Ethernet1/2      Data                Disabled    Admin Down        Administratively down
    Ethernet1/3      Data                Disabled    Admin Down        Administratively down
    Ethernet1/4      Data                Disabled    Sfp Not Present   Unknown
    Ethernet1/5      Data                Disabled    Admin Down        Administratively down
    Ethernet1/6      Data                Enabled     Up
    Ethernet1/7      Mgmt                Enabled     Up
    Ethernet1/8      Data                Enabled     Up
FPR4100-3-A /eth-uplink/fabric #
```
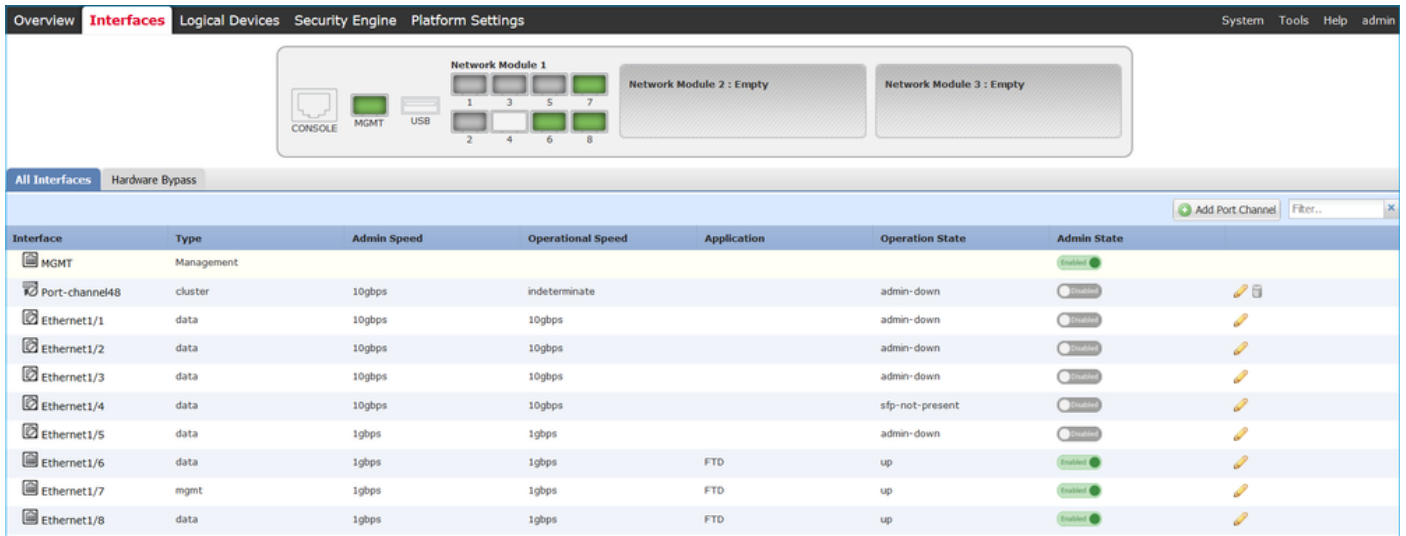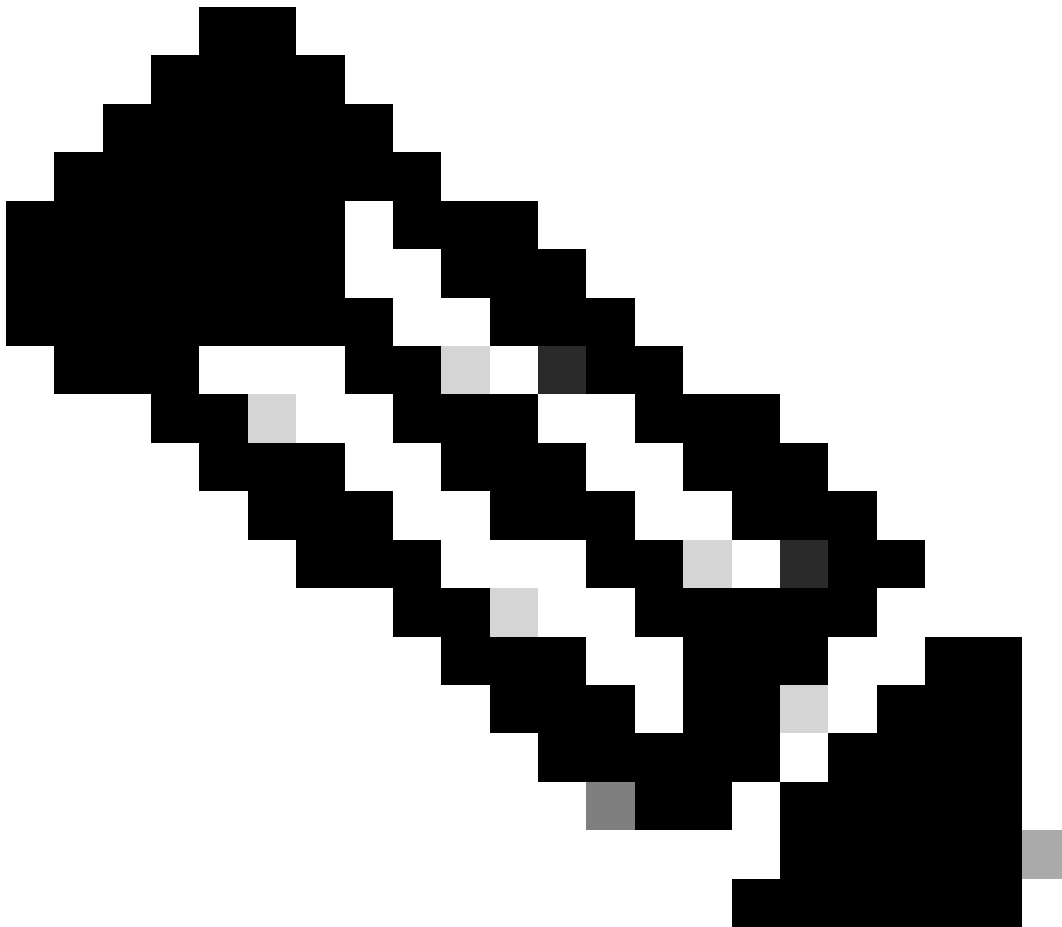
이 값은 다음과 같습니다.

Q. 섀시의 CPU 및 메모리 사용률을 확인하는 방법은 무엇입니까?

<#root>

FPR9K-2-A#

```
connect fxos

FPR9K-2-A(fxos)#

show system resources

Load average:   1 minute: 1.60   5 minutes: 1.30   15 minutes: 1.15
Processes   :   967 total, 1 running
CPU states  :   1.8% user,   1.1% kernel,   97.1% idle
Memory usage:   16326336K total,   4359740K used,   11966596K free
```

참고: 동일한 모델에 속한 두 개의 디바이스에서도 출력에 표시되는 합계가 다를 수 있습니다. 특히, 합계는 자유 명령 출력에서 가져오며, 이는 다시 /proc/meminfo에서 가져옵니다.

메모리를 확인하려면

<#root>

FPR4100-8-A /fabric-interconnect #

show detail

```
Fabric Interconnect:
    ID: A
    Product Name: Cisco FPR-4140-SUP
    PID: FPR-4140-SUP
    VID: V02
    Vendor: Cisco Systems, Inc.
    Serial (SN): FLM12345KL6
    HW Revision: 0
    Total Memory (MB): 8074
    OOB IP Addr: 10.62.148.196
    OOB Gateway: 10.62.148.129
    OOB Netmask: 255.255.255.128
    OOB IPv6 Address: ::
    OOB IPv6 Gateway: ::
    Prefix: 64
    Operability: Operable
    Thermal Status: Ok
    Current Task 1:
    Current Task 2:
    Current Task 3:
```

프로세스당 메모리 사용률 확인(RES = 물리적 메모리)을 확인하려면 다음을 수행합니다.

<#root>

FPR4100-2-A-A#

connect local-mgmt

FPR4100-2-A-A(local-mgmt)#

show processes

```
Cpu(s):  8.0%us,  4.2%sy,  3.9%ni, 83.8%id,  0.0%wa,  0.0%hi,  0.1%si,  0.0%st
Mem:   8267648k total,  3866552k used,  4401096k free,      288k buffers
Swap:        0k total,        0k used,        0k free,  1870528k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 5024 root      -2   0  354m 114m  34m R   43  1.4  7976:51 /isan/bin/bcm_usd
 1096 root      20   0 10352 3992 3332 S    0  0.0  0:00.28 sshd: admin@pts/1
 1140 root      20   0  117m  78m  53m S    0  1.0  0:00.42 /isan/bin/ucssh --ucs-mgmt -p admin
 1856 root      20   0  2404  632  512 S    0  0.0  2:29.32 /nuova/bin/cmcmon -f /etc/cmcmon.conf
 1859 root      20   0 23804 1932 1532 S    0  0.0  1427:47 dmserver -F
 1860 root      20   0  2244  472  404 S    0  0.0  0:00.01 /sbin/hotplug2 --persistent --set-rules-fi
 1861 root      20   0 57116  10m 6552 S    0  0.1  7:28.76 /isan/sbin/sysmgr -V
 1864 root      20   0 14044 4136 1072 S    0  0.1  1:06.19 rsyslogd -c3 -i/var/run/rsyslogd.pid
 4909 root      20   0  3568 1100  876 S    0  0.0  0:00.48 /isan/sbin/xinetd -syslog local7 -loop 250
 4911 root      20   0 58232  12m 6152 S    0  0.2 18:39.24 /isan/sbin/syslogd -d -n -m 0 -r
 4912 root      20   0 20076 3532 2368 S    0  0.0  0:00.02 /isan/bin/sdwrapd
 4913 root      21   1  2756  300  192 S    0  0.0  0:00.04 /usr/sbin/in.tftpd -l -c -s /bootflash
 4914 root      20   0 58312  17m 8724 S    0  0.2 13:45.34 /isan/bin/pfm
 4937 root      20   0  2208  332  272 S    0  0.0  0:00.01 /sbin/klogd -2 -x -c 1
 4939 root      20   0 26692 4656 3620 S    0  0.1  0:24.01 /isan/bin/vshd
...
```

팁:
1. show process memory 출력을 수집합니다.
2. Linux 시스템의 파일에 출력을 붙여넣습니다(cat > top.log).
3. RES 열을 기준으로 파일을 정렬합니다.

GB, MB 등을 보여줍니다

<#root>

mzafeiro@MZAFEIRO-JA2YS:$

```
cat top.log | sort -V -k 6

 1954 root       20    0 1645m 1.6g 1372 S  0.0 20.7 793:32.99 dmserver
 7556 root       20    0  207m 9.8m 6184 S  0.0  0.1  73:52.25 udld
 5563 root       20    0  333m 9.8m 7032 S  0.0  0.1   5:08.65 cdpd
 5523 root       20    0  327m 103m  28m S  0.0  1.3   0:12.38 afm
24040 daemon     23    3  592m 115m  33m S  0.0  1.5  74:56.57 httpd
 5329 root       -2    0  384m 132m  29m S  9.4  1.7 27130:09 bcm_usd
 5317 root       20    0  401m 150m  35m S  0.0  1.9  33:19.05 fwm
 5625 root       24    4  450m 179m  35m S  0.0  2.3 275:38.25 svc_sam_statsAG
 5614 root       23    3  495m 247m  54m S  0.0  3.2 355:59.95 svc_sam_dme
21688 root       20    0  2672 1080  880 S  0.0  0.0   3:15.29 ntpd
 8819 root       35   15  2408 1084  748 R  5.6  0.0   0:00.06 top
```


Q. 섀시 인터페이스 트랜시버 유형을 확인하는 방법은?

firepower 4100/9300에서 다음 명령을 사용합니다.

<#root>

FPR9K-2-A#

connect fxos

FPR9K-2-A(fxos)#

show interface e1/3 transceiver details

```
Ethernet1/3
    transceiver is present
    type is 1000base-T
    name is CISCO-METHODE
    part number is SP7041-R
    revision is
    serial number is FLM12345KL6
    nominal bitrate is 1300 MBit/sec
    Link length supported for copper is 100 m
    cisco id is --
    cisco extended id number is 4

DOM is not supported
```

FPR9K-2-A(fxos)#

파이버의 경우 출력은 다음과 같습니다.

<#root>

FPR4100-1-A(fxos)#

```
 show interface e1/1 transceiver details
```

```
Ethernet1/1
    transceiver is present
    type is 10Gbase-SR
    name is CISCO-JDSU
    part number is PLRXPL-SC-S43-CS
    revision is 1
    serial number is FLM12345KL6
    nominal bitrate is 10300 MBit/sec
    Link length supported for 50/125um OM2 fiber is 82 m
    Link length supported for 62.5/125um fiber is 26 m
    Link length supported for 50/125um OM3 fiber is 300 m
    cisco id is --
    cisco extended id number is 4

    Calibration info not available
```

firepower 1000/2100에서 다음 명령을 사용합니다.

<#root>

FPR2100#

```
scope fabric-interconnect
```

FPR2100 /fabric-interconnect #

```
show inventory expand detail | egrep ignore-case "Port|Xcvr"
```

```
...
        Slot 1 Port 13:
            Xcvr: 10 Gbase SR
            Xcvr Model: PLRXPL-SC-S43-C
            Xcvr Vendor: Cisco Systems, Inc.
            Xcvr Serial: ABCD1234
        Slot 1 Port 14:
            Xcvr: 10 Gbase SR
            Xcvr Model: PLRXPL-SC-S43-C
            Xcvr Vendor: Cisco Systems, Inc.
            Xcvr Serial: VWXY1234
        Slot 1 Port 15:
            Xcvr: Non Present
            Xcvr Model:
            Xcvr Vendor:
```

```
        Xcvr Serial:
    Slot 1 Port 16:
        Xcvr: Non Present
        Xcvr Model:
        Xcvr Vendor:
        Xcvr Serial:
```

Q. 모듈/블레이드/서버/Netmod 정보(HW 유형/PID/SN/메모리/코어 등)를 확인하는 방법은?

이 명령은 섀시 및 모듈(netmod)의 제품 ID(PID) 및 일련 번호(SN)를 표시합니다

<#root>

FP4110-7-A#

connect fxos

FP4110-7-A(fxos)#

show inventory

```
NAME: "Chassis", DESCR: "Firepower 41xx Security Appliance"
PID: FPR-4110-SUP      , VID: V02 , SN: FLM12345KL6  <--- Chassis SN

NAME: "Module 1", DESCR: "Firepower 41xx Supervisor"
PID: FPR-4110-SUP      , VID: V02 , SN: FLM12345KL6  <--- Embedded module on FPR4100

NAME: "Module 3", DESCR: "Firepower 6x10G FTW SFP+ SR NM"
PID: FPR-NM-6X10SR-F   , VID: V00 , SN: FLM12345KL6  <--- FTW Netmode SN
```

FPR4110에는 네트워크 모듈용 슬롯 2개(2 및 3)가 있으며, 이 예의 디바이스에는 슬롯 3에 FTW netmod가 설치되어 있습니다.

<#root>

FPR9K-1-A#

scope chassis 1

FPR9K-1-A /chassis #

show inventory server

```
Chassis 1:
    Servers:
        Server 1/1:
            Equipped Product Name: Cisco Firepower 9000 Series High Performance Security Module
            Equipped PID: FPR9K-SM-36
```

```
        Equipped VID: V01
        Equipped Serial (SN): FLM12345KL6
        Slot Status: Equipped
        Acknowledged Product Name: Cisco Firepower 9000 Series High Performance Security Module
        Acknowledged PID: FPR9K-SM-36
        Acknowledged VID: V01
        Acknowledged Serial (SN): FLM12345KL6
        Acknowledged Memory (MB): 262144
        Acknowledged Effective Memory (MB): 262144
        Acknowledged Cores: 36
        Acknowledged Adapters: 2

    Server 1/2:
        Equipped Product Name: Cisco Firepower 9000 Series High Performance Security Module
        Equipped PID: FPR9K-SM-36
        Equipped VID: V01
        Equipped Serial (SN): FLM12345KL6
        Slot Status: Equipped
        Acknowledged Product Name: Cisco Firepower 9000 Series High Performance Security Module
        Acknowledged PID: FPR9K-SM-36
        Acknowledged VID: V01
        Acknowledged Serial (SN): FLM12345KL6
        Acknowledged Memory (MB): 262144
        Acknowledged Effective Memory (MB): 262144
        Acknowledged Cores: 36
        Acknowledged Adapters: 2

    Server 1/3:
        Equipped Product Name: Cisco Firepower 9000 Series High Performance Security Module
        Equipped PID: FPR9K-SM-36
        Equipped VID: V01
        Equipped Serial (SN): FLM12345KL6
        Slot Status: Equipped
        Acknowledged Product Name: Cisco Firepower 9000 Series High Performance Security Module
        Acknowledged PID: FPR9K-SM-36
        Acknowledged VID: V01
        Acknowledged Serial (SN): FLM12345KL6
        Acknowledged Memory (MB): 262144
        Acknowledged Effective Memory (MB): 262144
        Acknowledged Cores: 36
        Acknowledged Adapters: 2
```

서버 1/1 = 모듈/블레이드 1

서버 1/2 = 모듈/블레이드 2

서버 1/3 = 모듈/블레이드 3

FPR41xx 모델 PID:

- FPR4K-SM-12 = FPR4110
- FPR4K-SM-24 = FPR4120
- FPR4K-SM-36 = FPR4140
- FPR4K-SM-44 = FPR4150
- FPR4K-SM-24S = FPR4115
- FPR4K-SM-32S = FPR4125

- FPR4K-SM-44S = FPR4145

범위 서버 <chassis-id/blade-id>에서 다른 정보를 얻을 수도 있습니다.

```
<#root>

FP9300-A#

scope server 1/1


FP9300-A /chassis/server #

show inventory


  <CR>
  >         Redirect it to a file
  >>        Redirect it to a file in append mode
  adapter  Adapter
  bios     Bios
  board    Board
  cpu      Cpu
  detail   Detail
  expand   Expand
  memory   Memory
  mgmt     Mgmt
  storage  Storage
  |         Pipe command output to filter


FP9300-A /chassis/server #

show inventory storage


Server 1/1:
    Name:
    User Label:
    Equipped PID: FPR9K-SM-36
    Equipped VID: V01
    Equipped Serial (SN): FLM12345PBD
    Slot Status: Equipped
    Acknowledged Product Name: Cisco Firepower 9000 Series High Performance Security Module
    Acknowledged PID: FPR9K-SM-36
    Acknowledged VID: 01
    Acknowledged Serial (SN): FLM67890PBD
    Acknowledged Memory (MB): 262144
    Acknowledged Effective Memory (MB): 262144
    Acknowledged Cores: 36
    Acknowledged Adapters: 2
    Motherboard:
        Product Name: Cisco Firepower 9000 Series High Performance Security Module
        PID: FPR9K-SM-36
        VID: V01
        Vendor: Cisco Systems Inc
        Serial (SN): FLM12345KL6
        HW Revision: 0

        RAID Controller 1:
            Type: SAS
```

```
Vendor: Cisco Systems Inc
Model: UCSB-MRAID12G
Serial: FLM12345KL6
HW Revision: C0
PCI Addr: 01:00.0
Raid Support: RAID0, RAID1
OOB Interface Supported: Yes
Rebuild Rate: 30
Controller Status: Optimal

Local Disk 1:
    Product Name:
    PID:
    VID:
    Vendor: TOSHIBA
    Model: PX02SMF080
    Vendor Description:
    Serial: FLM12345KL6
    HW Rev: 0
    Block Size: 512
    Blocks: 1560545280
    Operability: Operable
    Oper Qualifier Reason: N/A
    Presence: Equipped
    Size (MB): 761985
    Drive State: Online
    Power State: Active
    Link Speed: 12 Gbps
    Device Type: SSD

Local Disk 2:
    Product Name:
    PID:
    VID:
    Vendor: TOSHIBA
    Model: PX02SMF080
    Vendor Description:
    Serial: FLM12345KL6
    HW Rev: 0
    Block Size: 512
    Blocks: 1560545280
    Operability: Operable
    Oper Qualifier Reason: N/A
    Presence: Equipped
    Size (MB): 761985
    Drive State: Online
    Power State: Active
    Link Speed: 12 Gbps
    Device Type: SSD

Local Disk Config Definition:
    Mode: RAID 1 Mirrored
    Description:
    Protect Configuration: Yes

Virtual Drive 0:
    Type: RAID 1 Mirrored
    Block Size: 512
    Blocks: 1560545280
    Operability: Operable
    Presence: Equipped
    Size (MB): 761985
```
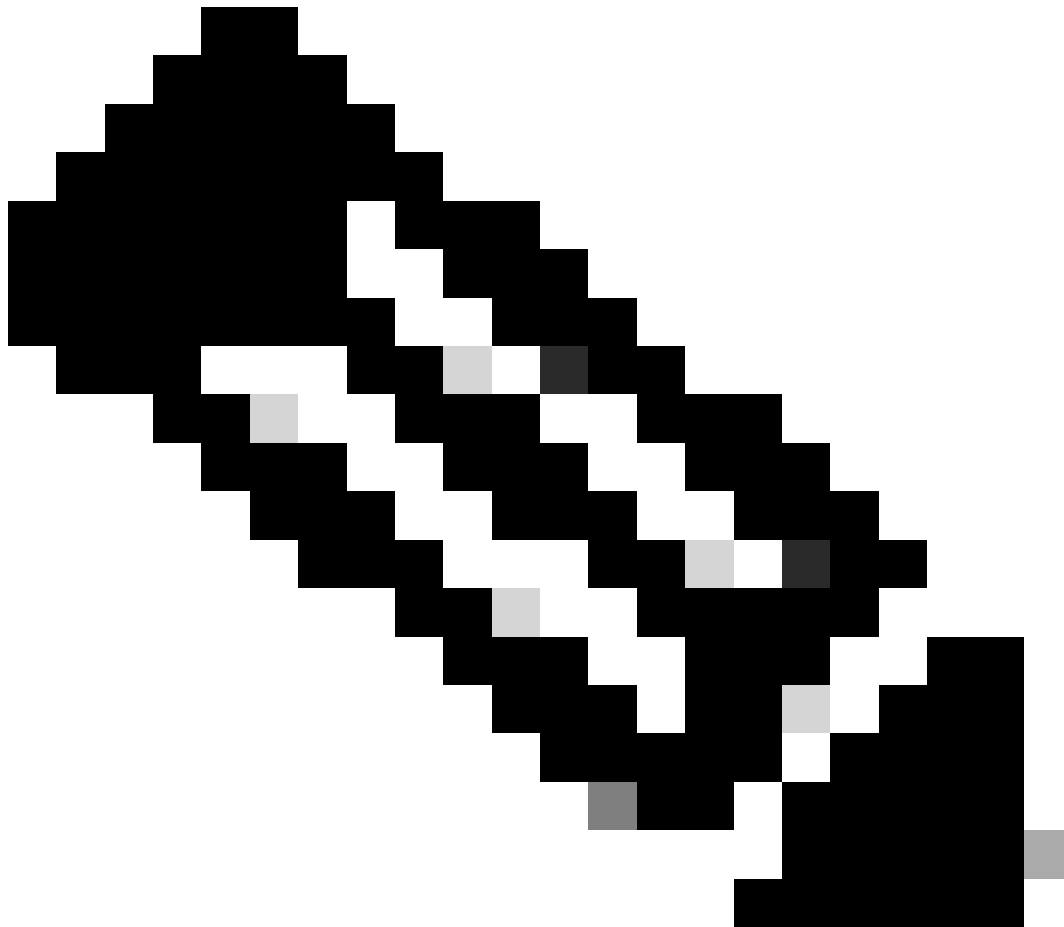
```
            Lifecycle: Allocated
            Drive State: Optimal
            Strip Size (KB): 64
            Access Policy: Read Write
            Read Policy: Normal
            Configured Write Cache Policy: Write Through
            Actual Write Cache Policy: Write Through
            IO Policy: Direct
            Drive Cache: No Change
            Bootable: True
FP9300-A /chassis/server #
```


참고: FP41xx 플랫폼의 경우 RAID를 사용하지 않으므로 show inventory storage에 Controller Status(컨트롤러 상태)가 Unknown(알 수 없음)으로 표시됩니다. RAID가 아닌 주된 이유는 두 번째 SSD가 FTD 논리적 디바이스에서 MSP(Malware Storage Pack)와 같은 다른 기능에 사용되기 때문입니다.

Q. FXOS GUI 및 CLI에서 ASA 또는 FTD 이미지를 삭제하는 방법 ?

FCM GUI에서:

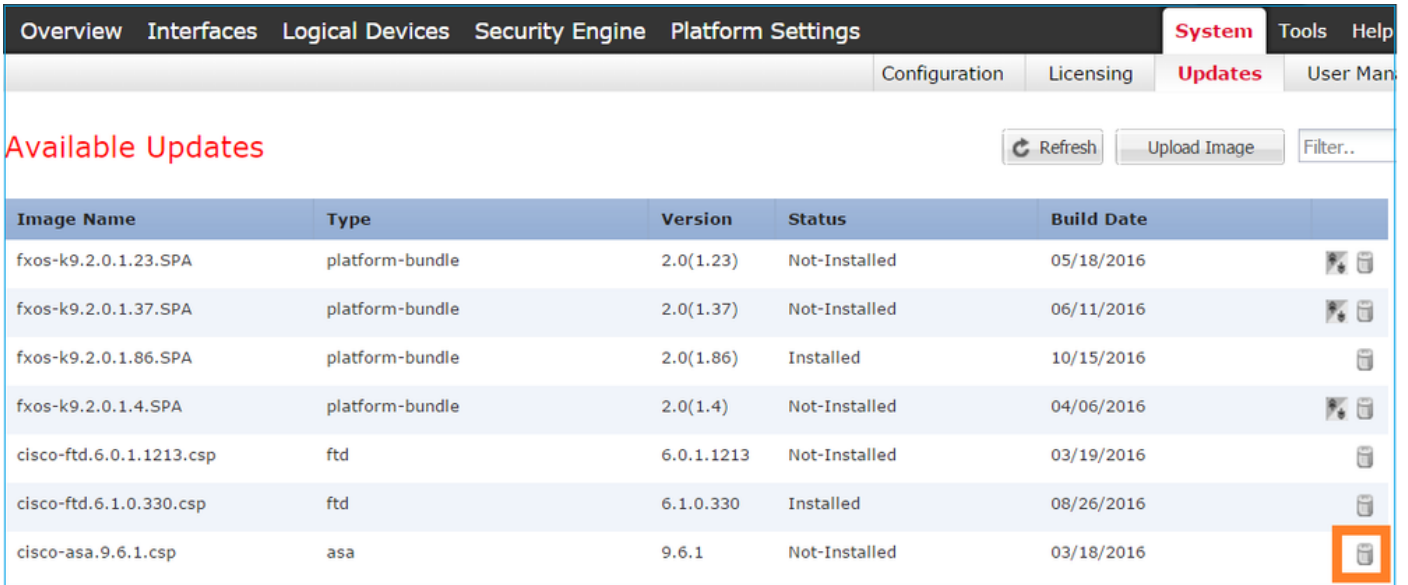GUI에서 삭제하려면 System(시스템) > Updates(업데이트)로 이동하여 이미지를 삭제합니다.

Overview	Interfaces	Logical Devices	Security Engine	Platform Settings			System	Tools	Help

			Configuration	Licensing	**Updates**	User Man

Available Updates

Image Name	Type	Version	Status	Build Date	
fxos-k9.2.0.1.23.SPA	platform-bundle	2.0(1.23)	Not-Installed	05/18/2016	🗑
fxos-k9.2.0.1.37.SPA	platform-bundle	2.0(1.37)	Not-Installed	06/11/2016	🗑
fxos-k9.2.0.1.86.SPA	platform-bundle	2.0(1.86)	Installed	10/15/2016	🗑
fxos-k9.2.0.1.4.SPA	platform-bundle	2.0(1.4)	Not-Installed	04/06/2016	🗑
cisco-ftd.6.0.1.1213.csp	ftd	6.0.1.1213	Not-Installed	03/19/2016	🗑
cisco-ftd.6.1.0.330.csp	ftd	6.1.0.330	Installed	08/26/2016	🗑
cisco-asa.9.6.1.csp	asa	9.6.1	Not-Installed	03/18/2016	🗑

FXOS CLI에서

```
<#root>

FPR4100#

scope ssa

FPR4100 /ssa #

show app


Application:
    Name    Version     Description Author     Deploy Type CSP Type    Is Default App
    ------  ----------  ----------- ---------- ----------- ----------- --------------
    asa     9.6.1       N/A         cisco      Native      Application Yes
    ftd     6.0.1.1213  N/A         cisco      Native      Application No
    ftd     6.1.0.330   N/A         cisco      Native      Application Yes
FPR4100 /ssa #

delete app asa 9.6.1

FPR4100 /ssa* #

commit

FPR4100 /ssa #
```

```
show app

Application:
   Name       Version     Description Author     Deploy Type CSP Type    Is Default App
   ---------- ----------  ----------- ---------- ----------- ----------- --------------
   ftd        6.0.1.1213  N/A         cisco      Native      Application No
   ftd        6.1.0.330   N/A         cisco      Native      Application Yes
```

Q. CLI에서 FXOS 버전을 확인하는 방법은 무엇입니까?
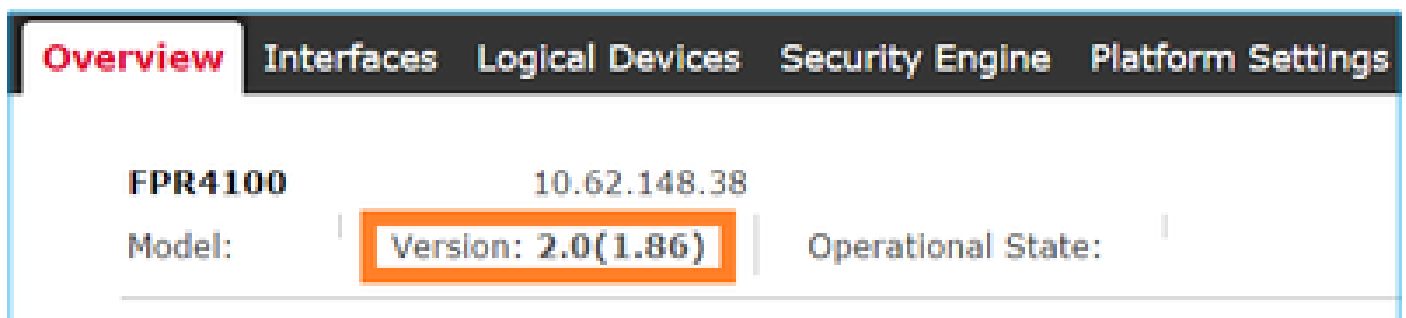
이 작업을 수행하는 몇 가지 방법이 있습니다.

방법 1

<#root>

FPR4100#

show fabric-interconnect firmware

```
Fabric Interconnect A:
    Running-Kern-Vers: 5.0(3)N2(4.01.65)
    Running-Sys-Vers: 5.0(3)N2(4.01.65)
    Package-Vers: 2.0(1.86)
    Startup-Kern-Vers: 5.0(3)N2(4.01.65)
    Startup-Sys-Vers: 5.0(3)N2(4.01.65)
    Act-Kern-Status: Ready
    Act-Sys-Status: Ready
    Bootloader-Vers:
```

이는 FCM GUI에서 볼 수 있는 것과 동일합니다.

2단계

<#root>

FP4145-1#

show version

```
Version: 2.6(1.192)
Startup-Vers: 2.6(1.192)
```

Q. FXOS에서 인터페이스 MTU를 확인하는 방법은?

firepower 4100/9300 섀시는 기본적으로 점보 프레임을 지원합니다. 다음 명령을 사용하여 인터페이스 MTU를 확인할 수 있습니다.

<#root>

FPR9K-1-A#

connect fxos


```
FPR9K-1-A(fxos)# show hardware internal bcm-usd info phy-info all
+----------------+-------------------------------------------------------------+
| port phy info                                                                |
+----------------+-------------------------------------------------------------+
          front-port :   1          asic-port : 125       sfp installed : yes
              enable : ena              speed : 1G               autoneg :  on
           interface : (10)XFI         duplex: half            linkscan : sw
            pause_tx : 0x0           pause_rx : 0x0
```

max frame : 9216

```
        local_advert : 0x20      remote_advert : 0x420      port_40g_enable : 0
         local_fault : 0x1        remote_fault : 0x0
       xcvr sfp type : (1)PHY_SFP_1G_COPPER
TSC4 registers:
         txfir(0xc252):0x0000       txdrv(0xc017):0x0000        lane(0x9003):0x1b1b
Asic 56846 Registers
     signal_detect(1.0x81d0):0x0000       link_status(1.0x81d1):0x0000
       rx_link_state(1.0x0):0x0000       pcs_rx_tx_fault(1.0x0008):0x0000
       pcs_block_status_0x20(1.0x20) :0x0000
       pcs_block_status_0x21(1.0x021) : 0x0000
        transmitter_reg(1.0x8000):0x0000       micro_ver(1.0x81f0):0x0000
```

또는 fxos 명령 셸에서 MTU를 선택합니다.

<#root>

KSEC-FPR4112-4#

connect fxos

KSEC-FPR4112-4(fxos)#

show interface ethernet 1/1

```
Ethernet1/1 is up
 Dedicated Interface
  Hardware: 1000/10000 Ethernet, address: 14a2.a02f.07c0 (bia 14a2.a02f.07c0)
  Description: U: Uplink
```

MTU 9216 bytes

```
, BW 1000000 Kbit, DLY 10 usec
```

Q. 설치된 애플리케이션을 확인하는 방법은 무엇입니까?

섀시 CLI에서 명령 범위 ssa를 사용한 다음 show slot expand detail을 사용합니다.

동일한 정보는 섀시 show tech bundle 내의 sam_techsupportinfo 파일에서 찾을 수 있습니다.

<#root>

`scope ssa`
`show slot expand detail`

```
Slot:
    Slot ID: 1
    Log Level: Info
    Admin State: Ok
    Operational State: Online
    Disk State: Ok
    Clear Log Data: Available

    Application Instance:
        Application Name: asa
        Admin State: Enabled
        Operational State: Online
        Running Version: 9.6.2
        Startup Version: 9.6.2
        Hotfixes:
        Externally Upgraded: No
        Cluster Oper State: Not Applicable
        Current Job Type: Start
        Current Job Progress: 100
        Current Job State: Succeeded
        Clear Log Data: Available
        Error Msg:
        Current Task:

        App Attribute:
            App Attribute Key: mgmt-ip
            Value: 0.0.0.0

            App Attribute Key: mgmt-url
            Value: https://0.0.0.0/

        Heartbeat:
            Last Received Time: 2017-03-15T10:25:02.220
            Heartbeat Interval: 1
```

```
        Max Number of Missed heartbeats Permitted: 3

    Resource:
        Allocated Core NR: 46
        Allocated RAM (KB): 233968896
        Allocated Data Disk (KB): 20971528
        Allocated Binary Disk (KB): 174964
        Allocated Secondary Disk (KB): 0

Heartbeat:
    Last Received Time: 2017-03-15T10:25:00.447
    Heartbeat Interval: 5
    Max Number of Missed heartbeats Permitted: 3

Monitor:
    OS Version: 9.6(1.150)
    CPU Total Load 1 min Avg: 48.110001
    CPU Total Load 5 min Avg: 48.110001
    CPU Total Load 15 min Avg: 48.110001
    Memory Total (KB): 264377600
    Memory Free (KB): 236835112
    Memory Used (KB): 27542488
    Memory App Total (KB): 233968896
    Disk File System Count: 5
    Blade Uptime: up 1 day,  6:56
    Last Updated Timestamp: 2017-03-15T10:24:10.306

    Disk File System:
        File System: /dev/sda1
        Mount Point: /mnt/boot
        Disk Total (KB): 7796848
        Disk Free (KB): 7694456
        Disk Used (KB): 102392

        File System: /dev/sda2
        Mount Point: /opt/cisco/config
        Disk Total (KB): 1923084
        Disk Free (KB): 1734420
        Disk Used (KB): 90976

        File System: /dev/sda3
        Mount Point: /opt/cisco/platform/logs
        Disk Total (KB): 4805760
        Disk Free (KB): 4412604
        Disk Used (KB): 149036

        File System: /dev/sda5
        Mount Point: /var/data/cores
        Disk Total (KB): 48061320
        Disk Free (KB): 43713008
        Disk Used (KB): 1906892

        File System: /dev/sda6
        Mount Point: /opt/cisco/csp
        Disk Total (KB): 716442836
        Disk Free (KB): 714947696
        Disk Used (KB): 1495140
```

Q. FXOS CLI에서 포트 채널 구성을 확인하는 방법은 무엇입니까?

포트 채널 확인 명령

확인 1

현재 섀시에 구성된 포트 채널을 확인하려면 다음을 수행합니다.

<#root>

FPR9K-1-A#

connect fxos


```
FPR9K-1-A(fxos)# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        S - Switched    R - Routed
        U - Up (port-channel)
        M - Not in use. Min-links not met
--------------------------------------------------------------------------------
Group Port-       Type    Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
11    Po11(SU)    Eth     LACP      Eth1/4(P)    Eth1/5(P)
15    Po15(SD)    Eth     LACP      Eth1/6(D)
48    Po48(SU)    Eth     LACP      Eth1/2(P)    Eth1/3(P)
```


확인 2

논리적 디바이스에 할당된 포트 채널을 확인하려면

<#root>

FPR9K-1-A#

scope ssa

FPR9K-1-A /ssa #

show configuration

```
 scope ssa
     enter logical-device ftd_682021968 ftd "1,2,3" clustered
         enter cluster-bootstrap
             set chassis-id 1
             set ipv4 gateway 0.0.0.0
             set ipv4 pool 0.0.0.0 0.0.0.0
             set ipv6 gateway ::
             set ipv6 pool :: ::
             set virtual ipv4 0.0.0.0 mask 0.0.0.0
```

```
                    set virtual ipv6 :: prefix-length ""
  !                 set key
                    set mode spanned-etherchannel
                    set name 682021968
                    set site-id 0
              exit
              enter external-port-link Ethernet11_ftd Ethernet1/1 ftd
                    set decorator ""
                    set description ""
                    set port-name Ethernet1/1
              exit
              enter external-port-link PC11_ftd Port-channel11 ftd
                    set decorator ""
                    set description ""
                    set port-name Port-channel11
              exit
              enter external-port-link PC48_ftd Port-channel48 ftd
                    set decorator ""
                    set description ""
                    set port-name Port-channel48
              exit
```

확인 3

포트당 포트 채널 트래픽 통계를 확인하려면

<#root>

FPR9K-1-A(fxos)#

show port-channel traffic interface port-channel 11

```
ChanId      Port Rx-Ucst Tx-Ucst Rx-Mcst Tx-Mcst Rx-Bcst Tx-Bcst
------ --------- ------- ------- ------- ------- ------- -------
    11    Eth1/4  62.91%    0.0%  58.90%  49.99% 100.00%    0.0%
    11    Eth1/5  37.08%    0.0%  41.09%  50.00%    0.0%    0.0%
```

확인 4

특정 Port-Channel의 세부사항을 확인하려면

<#root>

FPR9K-1-A(fxos)#

show port-channel database interface port-channel 11

```
port-channel11
    Last membership update is successful
    2 ports in total, 2 ports up
    First operational port is Ethernet1/4
    Age of the port-channel is 0d:20h:26m:27s
    Time since last bundle is 0d:18h:29m:07s
    Last bundled member is Ethernet1/5
    Ports:   Ethernet1/4    [active ] [up] *
```

```
            Ethernet1/5      [active ] [up]
```

확인 5

로컬 LACP 시스템 ID를 확인하려면

<#root>

FPR9K-1-A(fxos)#

show lacp system-identifier

32768,b0-aa-77-2f-81-bb

확인 6

LACP 상태 플래그와 함께 업스트림 디바이스의 LACP 시스템 ID를 확인하려면 다음을 수행합니다.

<#root>

FPR9K-1-A(fxos)#

show lacp neighbor

```
Flags:  S - Device is sending Slow LACPDUs F - Device is sending Fast LACPDUs
        A - Device is in Active mode     P - Device is in Passive mode
port-channel11 neighbors
Partner's information
            Partner              Partner                    Partner
Port        System ID            Port Number     Age        Flags
Eth1/4      32768,4-62-73-d2-65-0  0x118         66828      FA

            LACP Partner         Partner                    Partner
            Port Priority        Oper Key                   Port State
            32768                0xb                        0x3d

Partner's information
            Partner              Partner                    Partner
Port        System ID            Port Number     Age        Flags
Eth1/5      32768,4-62-73-d2-65-0  0x119         66826      FA

            LACP Partner         Partner                    Partner
            Port Priority        Oper Key                   Port State
            32768                0xb                        0x3d
```

확인 7

포트 채널 이벤트 기록을 확인하려면

<#root>

```
FPR9K-1-A(fxos)#

show port-channel internal event-history all

Low Priority Pending queue: len(0), max len(1) [Thu Apr  6 11:07:48 2017]
High Priority Pending queue: len(0), max len(16) [Thu Apr  6 11:07:48 2017]
PCM Control Block info:
pcm_max_channels         : 4096
pcm_max_channel_in_use   : 48
pc count                 : 3
hif-pc count             : 0
Max PC Cnt               : 104
Load-defer timeout       : 120
====================================================
PORT CHANNELS:
2LvPC PO in system : 0

port-channel11
channel      : 11
bundle       : 65535
ifindex      : 0x1600000a
admin mode   : active
oper mode    : active
fop ifindex  : 0x1a003000
nports    : 2
active    : 2
pre cfg   : 0
ltl       : 0x0 (0)
lif       : 0x0
iod       : 0x78 (120)
global id : 3
flag      : 0
lock count : 0
num. of SIs: 0
ac mbrs    : 0 0
lacp graceful conv disable   : 0
lacp suspend indiv disable   : 1
pc min-links                 : 1
pc max-bundle                : 16
pc max active members        : 32
pc is-suspend-minlinks       : 0
port load defer enable       : 0
lacp fast-select-hot-standby disable   : 0
ethpm bundle lock count : 0
bundle res global id    : 2
Members:
Ethernet1/4 [bundle_no = 0]
Ethernet1/5 [bundle_no = 0]
port-channel external lock:
Lock Info: resource [eth-port-channel 11]
  type[0] p_gwrap[(nil)]
      FREE @ 246108 usecs after Wed Apr  5 14:18:10 2017
  type[1] p_gwrap[(nil)]
      FREE @ 436471 usecs after Wed Apr  5 16:15:30 2017
  type[2] p_gwrap[(nil)]
      FREE @ 436367 usecs after Wed Apr  5 16:15:30 2017
0x1600000a
internal (ethpm bundle) lock:
Lock Info: resource [eth-port-channel 11]
  type[0] p_gwrap[(nil)]
      FREE @ 246083 usecs after Wed Apr  5 14:18:10 2017
  type[1] p_gwrap[(nil)]
      FREE @ 610546 usecs after Wed Apr  5 16:19:04 2017
```

```
  type[2] p_gwrap[(nil)]
      FREE @ 610437 usecs after Wed Apr  5 16:19:04 2017
0x1600000a


>>>>FSM: <eth-port-channel 11> has 194 logged transitions<<<<<

1) FSM:<eth-port-channel 11> Transition at 557291 usecs after Wed Apr  5 16:04:27 2017
   Previous state: [PCM_PC_ST_WAIT_REL_RESRC]
   Triggered event: [PCM_PC_EV_REL_RESRC_DONE]
   Next state: [PCM_PC_ST_INIT]

2) FSM:<eth-port-channel 11> Transition at 49036 usecs after Wed Apr  5 16:07:18 2017
   Previous state: [PCM_PC_ST_INIT]
   Triggered event: [PCM_PC_EV_L2_CREATE]
   Next state: [PCM_PC_ST_WAIT_CREATE]

3) FSM:<eth-port-channel 11> Transition at 49053 usecs after Wed Apr  5 16:07:18 2017
   Previous state: [PCM_PC_ST_WAIT_CREATE]
   Triggered event: [PCM_PC_EV_L2_CREATED]
   Next state: [PCM_PC_ST_CREATED]
```

확인 8

Debug lacp all은 매우 큰 출력을 생성합니다.

<#root>

FPR9K-1-A(fxos)#

debug lacp all

```
2017 Jul 11 10:42:23.854160 lacp: lacp_pkt_parse_pdu(569): lacp_pkt_parse_pdu: got packet from actorpor
2017 Jul 11 10:42:23.854177 lacp: lacp_pkt_compute_port_params(1163): Ethernet1/3(0x1a002000): pa aggre
2017 Jul 11 10:42:23.854190 lacp: lacp_pkt_compute_port_params(1170): p_el=(8000, 2-0-0-0-0-1, 136, 800
2017 Jul 11 10:42:23.854198 lacp: lacp_pkt_compute_port_params(1172): p_el_pkt=(8000, 2-0-0-0-0-1, 136,
2017 Jul 11 10:42:23.854207 lacp: lacp_utils_get_obj_type_from_ifidx(390): lacp_utils_get_obj_type_from
2017 Jul 11 10:42:23.854218 lacp: Malloc in fu_fsm_event_new@../utils/fsmutils/fsm.c[5317]-ty[1]0x9bf71
2017 Jul 11 10:42:23.854228 lacp: lacp_utils_cr_fsm_event(572): Called from lacp_utils_create_fsm_event
2017 Jul 11 10:42:23.854237 lacp: Malloc in fu_fsm_event_pair_new@../utils/fsmutils/fsm.c[5327]-ty[2]0x
2017 Jul 11 10:42:23.854248 lacp: fu_fsm_execute_all: match_msg_id(0), log_already_open(0)
2017 Jul 11 10:42:23.854257 lacp: Malloc in fu_fsm_event_new@../utils/fsmutils/fsm.c[5317]-ty[1]0x9bf71
2017 Jul 11 10:42:23.854268 lacp: fu_fsm_execute: (Ethernet1/3)
2017 Jul 11 10:42:23.854275 lacp:     current state [LACP_ST_PORT_MEMBER_COLLECTING_AND_DISTRIBUTING_EN
2017 Jul 11 10:42:23.854283 lacp:     current event [LACP_EV_PARTNER_PDU_IN_SYNC_COLLECT_ENABLED_DISTRI
2017 Jul 11 10:42:23.854291 lacp:     next state    [FSM_ST_NO_CHANGE]
2017 Jul 11 10:42:23.854304 lacp: lacp_proto_get_state(969): IF Ethernet1/3(0x1a002000): end PartnerEnd
2017 Jul 11 10:42:23.854314 lacp: lacp_proto_record_pdu(2266): Recording PDU for LACP pkt on IF Etherne
2017 Jul 11 10:42:23.854325 lacp: lacp_proto_set_state(900): IF Ethernet1/3(0x1a002000): Set end ActorEn
2017 Jul 11 10:42:23.854335 lacp: lacp_proto_get_state(969): IF Ethernet1/3(0x1a002000): end PartnerEnd
2017 Jul 11 10:42:23.854344 lacp: lacp_proto_update_ntt(2211): updateNTT called for IF Ethernet1/3(0x1a
2017 Jul 11 10:42:23.854355 lacp: lacp_proto_get_state(969): IF Ethernet1/3(0x1a002000): end ActorEnd(1
2017 Jul 11 10:42:23.854362 lacp: lacp_timer_start_w_chgd_time(681): lacp_timer_start_w_chgd_time: star
2017 Jul 11 10:42:23.854377 lacp: lacp_timer_start(637): Timer Started: Timer_Arg ([rid type IF-Rid: if
2017 Jul 11 10:42:23.854386 lacp: lacp_timer_start(638): Timer period=15 seconds
2017 Jul 11 10:42:23.854396 lacp: Free ptr in fu_fsm_execute@../utils/fsmutils/fsm.c[1091] for addr 0x9
2017 Jul 11 10:42:23.854408 lacp: fu_fsm_execute_all: done processing event LACP_EV_PARTNER_PDU_IN_SYNC
2017 Jul 11 10:42:23.854419 lacp: fu_mts_drop ref 0x9bf7320 opc 90117
```

```
2017 Jul 11 10:42:23.854434 lacp: fu_fsm_execute_all: MTS_OPC_NET_L2_RX_DATA_HDR(msg_id 2623696) droppe
2017 Jul 11 10:42:23.854445 lacp: fu_fsm_engine_post_event_processing
2017 Jul 11 10:42:23.854453 lacp:  end of while in fu_fsm_engine
2017 Jul 11 10:42:23.854461 lacp: fu_handle_process_hot_plugin_msg: Entered the function line 143
2017 Jul 11 10:42:23.854468 lacp: begin fu_fsm_engine: line[2357]
2017 Jul 11 10:42:24.361501 lacp: lacp_pkt_encode_pdu_helper(770): lacp_pkt_encode_pdu_helper: pkt_len=
2017 Jul 11 10:42:24.361530 lacp: lacp_pkt_encode_pdu_helper(797): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361542 lacp: lacp_debug_wrapper_tl(1718): Executing [mcecm_api_is_pc_mcec]
2017 Jul 11 10:42:24.361551 lacp: lacp_debug_wrapper_tl(1718): input: if_index = [0x16000000]
2017 Jul 11 10:42:24.361559 lacp: lacp_debug_wrapper_tl(1718): Executing [mcecm_cache_is_pc_mcec]
2017 Jul 11 10:42:24.361568 lacp: lacp_debug_wrapper_tl(1718): output:0
2017 Jul 11 10:42:24.361589 lacp: lacp_pkt_encode_pdu_helper(842): 0x1a002000: Set short_timeout to per
2017 Jul 11 10:42:24.361599 lacp: lacp_pkt_encode_pdu_helper(879): lacp_pkt_encode_pdu_helper: actor-po
2017 Jul 11 10:42:24.361612 lacp: lacp_pkt_encode_pdu_helper(906): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361624 lacp: lacp_pkt_encode_pdu_helper(910): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361636 lacp: lacp_net_tx_data(206): lacp_net_tx_data: Sending buffer with length 1
2017 Jul 11 10:42:24.361648 lacp: lacp_net_tx_data(215): 01 01 01 14 ffff
2017 Jul 11 10:42:24.361658 lacp: lacp_net_tx_data(215): ffff
2017 Jul 11 10:42:24.361668 lacp: lacp_net_tx_data(215): 00 00 00 02 14 ffff
2017 Jul 11 10:42:24.361678 lacp: lacp_net_tx_data(215): ffff
2017 Jul 11 10:42:24.361689 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361700 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361710 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361721 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110 A
2017 Jul 11 10:42:24.361753 lacp: lacp_proto_get_state(969): IF Ethernet1/3(0x1a002000): end PartnerEnd
2017 Jul 11 10:42:24.361764 lacp: lacp_proto_restart_tx_timer(1802): lacp_proto_restart_tx_timer: got e
2017 Jul 11 10:42:24.361773 lacp: lacp_proto_restart_tx_timer(1825): lacp_proto_restart_tx_timer: flag
2017 Jul 11 10:42:24.361782 lacp: lacp_timer_start_w_chgd_time(681): lacp_timer_start_w_chgd_time: start
2017 Jul 11 10:42:24.361798 lacp: lacp_timer_start(637): Timer Started: Timer_Arg ([rid type IF-Rid: if
2017 Jul 11 10:42:24.361807 lacp: lacp_timer_start(638): Timer period=1 seconds
2017 Jul 11 10:42:24.361820 lacp: lacp_pkt_encode_pdu_helper(770): lacp_pkt_encode_pdu_helper: pkt_len=
2017 Jul 11 10:42:24.361833 lacp: lacp_pkt_encode_pdu_helper(797): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361841 lacp: lacp_debug_wrapper_tl(1718): Executing [mcecm_api_is_pc_mcec]
2017 Jul 11 10:42:24.361849 lacp: lacp_debug_wrapper_tl(1718): input: if_index = [0x16000000]
2017 Jul 11 10:42:24.361857 lacp: lacp_debug_wrapper_tl(1718): Executing [mcecm_cache_is_pc_mcec]
2017 Jul 11 10:42:24.361865 lacp: lacp_debug_wrapper_tl(1718): output:0
2017 Jul 11 10:42:24.361879 lacp: lacp_pkt_encode_pdu_helper(842): 0x1a003000: Set short_timeout to per
2017 Jul 11 10:42:24.361888 lacp: lacp_pkt_encode_pdu_helper(879): lacp_pkt_encode_pdu_helper: actor-po
2017 Jul 11 10:42:24.361899 lacp: lacp_pkt_encode_pdu_helper(906): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361910 lacp: lacp_pkt_encode_pdu_helper(910): lacp_pkt_encode_pdu_helper: if_idx=E
2017 Jul 11 10:42:24.361920 lacp: lacp_net_tx_data(206): lacp_net_tx_data: Sending buffer with length 1
2017 Jul 11 10:42:24.361930 lacp: lacp_net_tx_data(215): 01 01 01 14 ffff
2017 Jul 11 10:42:24.361940 lacp: lacp_net_tx_data(215): ffff
2017 Jul 11 10:42:24.361950 lacp: lacp_net_tx_data(215): 00 00 00 02 14 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361960 lacp: lacp_net_tx_data(215): 00 00 00 00 00 03 10 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361971 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361981 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.361991 lacp: lacp_net_tx_data(215): 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 0
2017 Jul 11 10:42:24.362001 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110 A
2017 Jul 11 10:42:24.362022 lacp: lacp_proto_get_state(969): IF Ethernet1/4(0x1a003000): end PartnerEnd
2017 Jul 11 10:42:24.362032 lacp: lacp_proto_restart_tx_timer(1802): lacp_proto_restart_tx_timer: got e
2017 Jul 11 10:42:24.362042 lacp: lacp_proto_restart_tx_timer(1825): lacp_proto_restart_tx_timer: flag
2017 Jul 11 10:42:24.362050 lacp: lacp_timer_start_w_chgd_time(681): lacp_timer_start_w_chgd_time: start
2017 Jul 11 10:42:24.362062 lacp: lacp_timer_start(637): Timer Started: Timer_Arg ([rid type IF-Rid: if
```

팁

피어에서 LACP 패킷을 수신하는지 확인합니다. 예를 들어 Ethernet1/3 인터페이스는 LACP 패킷을
수신하지만 Ethernet1/4는 다음을 수신하지 않습니다.

```
2017 Jul 11 10:42:25.641920 lacp: lacp_net_get_pkt_info(746): Packet received on phy_if_idx Ethernet1/3
2017 Jul 11 10:42:25.641937 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
```

확인 9

이 출력에서 인터페이스 Ethernet1/4는 Port-Channel의 멤버이지만 개별 모드(스위치 측에서 일시 중단)에 있습니다.

<#root>

ciscofcm01-A(fxos)#

show lacp internal event-history interface ethernet 1/4

```
>>>>FSM: <Ethernet1/4> has 549 logged transitions<<<<<

1) FSM:<Ethernet1/4> Transition at 385779 usecs after Wed Jul  5 13:13:03 2017
   Previous state: [LACP_ST_PORT_IS_DOWN_OR_LACP_IS_DISABLED]
   Triggered event: [LACP_EV_CLNUP_PHASE_II]
   Next state: [LACP_ST_PORT_IS_DOWN_OR_LACP_IS_DISABLED]

2) FSM:<Ethernet1/4> Transition at 955546 usecs after Wed Jul  5 13:13:03 2017
   Previous state: [LACP_ST_PORT_IS_DOWN_OR_LACP_IS_DISABLED]
   Triggered event: [LACP_EV_LACP_ENABLED_AND_PORT_UP]
   Next state: [LACP_ST_DETACHED_LAG_NOT_DETERMINED]

3) FSM:<Ethernet1/4> Transition at 962224 usecs after Wed Jul  5 13:13:10 2017
   Previous state: [LACP_ST_DETACHED_LAG_NOT_DETERMINED]
   Triggered event: [LACP_EV_RECEIVE_PARTNER_PDU_TIMED_OUT]
   Next state: [FSM_ST_NO_CHANGE]

4) FSM:<Ethernet1/4> Transition at 963838 usecs after Wed Jul  5 13:13:13 2017
   Previous state: [LACP_ST_DETACHED_LAG_NOT_DETERMINED]
   Triggered event: [LACP_EV_RECEIVE_PARTNER_PDU_TIMED_OUT]
   Next state: [FSM_ST_NO_CHANGE]

5) FSM:<Ethernet1/4> Transition at 964002 usecs after Wed Jul  5 13:13:13 2017
   Previous state: [LACP_ST_DETACHED_LAG_NOT_DETERMINED]
   Triggered event: [LACP_EV_RECEIVE_PARTNER_PDU_TIMED_OUT_II_INDIVIDUAL]
   Next state: [LACP_ST_INDIVIDUAL_OR_DEFAULT]

6) FSM:<Ethernet1/4> Transition at 735923 usecs after Wed Jul  5 13:13:36 2017
   Previous state: [LACP_ST_INDIVIDUAL_OR_DEFAULT]
   Triggered event: [LACP_EV_UNGRACEFUL_DOWN]
   Next state: [LACP_ST_PORT_IS_DOWN_OR_LACP_IS_DISABLED]
```

확인 10

이 출력에서 Ethernet1/3 인터페이스는 작동하며 PortChannel1의 멤버이지만 Ethernet1/4는 PortChannel1의 멤버입니다. Ethernet1/3은 (tx) 패킷을 전송하고 (rx) 패킷을 수신하지만, Ethernet1/4는 (rx)만 전송하고 tx는 수신하지 않습니다.

<#root>

```
ciscofcm01-A(fxos)#
```

debug lacp pkt

```
ciscofcm01-A(fxos)# 2017 Jul 11 11:04:05.278736 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a00
2017 Jul 11 11:04:05.602855 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:05.983134 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:06.249929 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:06.602815 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:06.992812 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:07.163780 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:07.602814 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:08.002817 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:08.102006 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:08.612810 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:09.002811 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:09.091937 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:09.622810 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:10.002807 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:10.004411 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:10.632806 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:10.854094 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
2017 Jul 11 11:04:11.002789 lacp: lacp_net_tx_data(247): Ethernet1/4(0x1a003000): Tx LACP PDU len: 110
2017 Jul 11 11:04:11.642807 lacp: lacp_net_tx_data(247): Ethernet1/3(0x1a002000): Tx LACP PDU len: 110
2017 Jul 11 11:04:11.714199 lacp: lacp_net_process_rx_data(480): Ethernet1/3(0x1a002000): Rx LACP PDU l
```

자세한 내용은 다음 문서를 참조하십시오.

Q. Show Tech 결과에서 FXOS 번들 버전을 찾는 방법은 무엇입니까?

방법 1

FPRM tar 파일에서 FPRM_A_TechSupport.tar.gz 파일의 내용을 추출합니다. 그런 다음 sam_techsupportinfo 파일을 열고 Package-Verse를 검색합니다.

<#root>

FPR4140-A#

show fabric-interconnect firmware

```
Fabric Interconnect A:
    Running-Kern-Vers: 5.0(3)N2(4.11.74)
    Running-Sys-Vers: 5.0(3)N2(4.11.74)
    Package-Vers: 2.1(1.77)
    Startup-Kern-Vers: 5.0(3)N2(4.11.74)
    Startup-Sys-Vers: 5.0(3)N2(4.11.74)
    Act-Kern-Status: Ready
    Act-Sys-Status: Ready
    Bootloader-Vers:
```

2단계

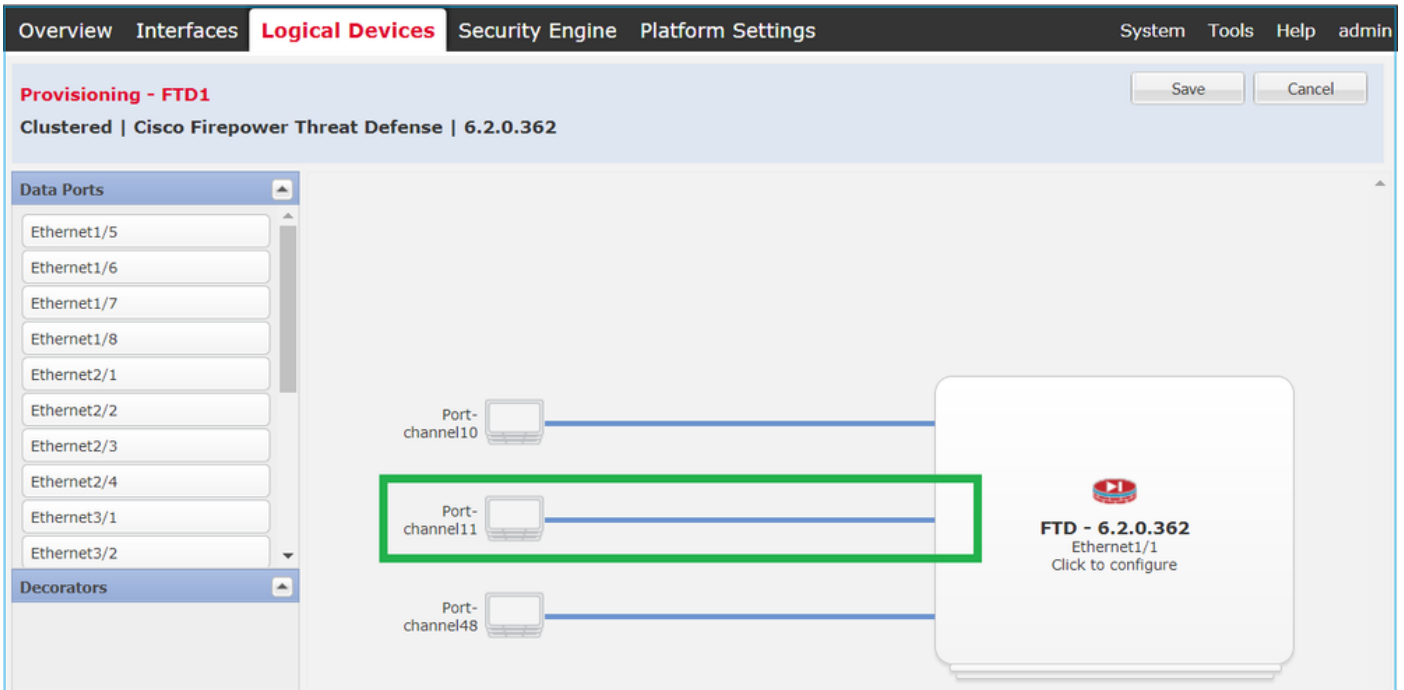FPM tar 파일에서 FPRM_A_TechSupport.tar.gz 파일의 내용을 추출합니다. 그런 다음 /var/sysmgr/sam_logs/svc_sam_dme.log 파일을 열고 aInPlatformVersion 키워드를 검색합니다.

Q. MIO는 어떻게 인터페이스 정보(추가/제거)를 블레이드 애플리케이션(FTD, ASA)에 전파합니까?

MIO 앱 에이전트 구성 요소를 사용합니다.

예를 들어 MIO에서 새 포트 채널이 FTD에 할당되는 경우

FTD app-agent debug는 다음을 보여줍니다.

<#root>

firepower#

debug app-agent 255

```
appagent : part 0 : ftd_001_JAD19500BAB0Z690F2.interfaceMapping.update
appagent : part 1 : ssp-xml:3
appagent : part 2 : 7
appagent : part 3 : appAG
appagent : part 4 : <interfaceMappingConfigUpdateRequest><interfaceMapping action="insert"><externalPor
<bladeVNIC>22</bladeVNIC></internalPort></interfaceMapping></interfaceMappingConfigUpdateRequest>
appagent : Process the request message
appagent : It is an update request command
appagent : Invoke request msg handler for cmd interfaceMapping.update
appagent : Processing InterfaceMapping Update Message
appagent : Creating Interface Mapping Structure.
appagent : Processing the tag externalPort.
appagent : =============================
appagent : PortName=Port-channel11
appagent : ftw capability=0
appagent : no available ftw peers
appagent : cleaning external_port_ftw_peers_t
appagent : Sending Response message for Interface Mapping update Message
appagent : Send response message to appAG
```

```
appagent : resp_msg->cmdName =appAG.interfaceMapping.update
appagent : resp_msg->content_version =ssp-xml:3
appagent : resp_msg->msgId =7
appagent : resp_msg->statuscode =100
appagent : resp_msg->data =<interfaceMappingConfigUpdateResponse>
  <response>
    <code>100</code>
    <message>Request success</message>
  </response>
</interfaceMappingConfigUpdateResponse>
appagent : part 0 : ftd_001_JAD19500BAB0Z690F2.interfaceStatus.update
appagent : part 1 : ssp-xml:3
appagent : part 2 : 8
appagent : part 3 : appAG
appagent : part 4 : <interfaceStatusUpdateRequest><interface><interfaceName>Port-channel11</interfaceNam
appagent : Process the request message
appagent : It is an update request command
appagent : Invoke request msg handler for cmd interfaceStatus.update
appagent : Processing Interface Status Update Request.
appagent : The Fxos version is 2.1.1 or newer
appagent : Parsing interface status update request message for FXOS > 211
appagent : Parsing Interface Status Req.
appagent : Interface Status Successfully Updated.
appagent : Sending Response for Interface Status Update Request
appagent : Send response message to appAG
appagent : resp_msg->cmdName =appAG.interfaceStatus.update
appagent : resp_msg->content_version =ssp-xml:3
appagent : resp_msg->msgId =8
appagent : resp_msg->statuscode =100
appagent : resp_msg->data =<interfaceStatusUpdateResponse>
  <response>
    <code>100</code>
    <message>Request success</message>
  </response>
</interfaceStatusUpdateResponse>
```

Q. Firepower 섀시의 RMA의 경우 어떤 일련 번호(SN)를 사용해야 합니까?

firepower 섀시에는 여러 SN이 있습니다. RMA 요청에 사용된 것은 다음 출력에서 가져올 수 있습니다.

<#root>

```
FP4120-5-A#

scope chassis 1

FP4120-5-A /chassis # show inventory
Chassis    PID              Vendor            Serial (SN) HW Revision
---------- ---------------- ----------------- ----------- -----------
         1 FPR-4120-K9      Cisco Systems Inc FLM12345KL6 0
```

또는:

<#root>

FP4120-5-A#

connect local-mgmt

FP4120-5-A(local-mgmt)#

show license all

Smart Licensing Status
=====================

Smart Licensing is ENABLED

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: Not Allowed

License Authorization:
  Status: No Licenses in Use

License Usage
=============

No licenses in use

Product Information
==================

UDI: PID:FPR-4120-SUP,SN:JAD19500BAB

또는:

<#root>

FP4120-5-A#

scope license

FP4120-5-A /license #

show license all

Smart Licensing Status
=====================

Smart Licensing is ENABLED

Registration:
  Status: UNREGISTERED
  Export-Controlled Functionality: Not Allowed

License Authorization:
  Status: No Licenses in Use

```
License Usage
=============

No licenses in use

Product Information
===================

UDI: PID:FPR-4120-SUP,SN:JAD19500BAB
```

Q. 서로 다른 2개의 FXOS 섀시 간에 SSD1을 교체할 수 있습니까?

간단히 말해 no입니다. SSD1에는 애플리케이션 이미지(예: FTD 또는 ASA)가 포함됩니다. SSD1을 섀시에서 꺼낸 다음 다른 섀시에 꽂으면 모듈이 UP되지 않으며 다음과 같은 오류가 나타납니다.

중요 F1548 2017-11-08T11:36:40.095 427280 블레이드 스왑이 슬롯 1에서 탐지됨

Severity	Description	Cause	Occurrence	Time	Acknowledged
❌ CRITICAL	Blade swap detected on slot 1	blade-swap	1	2017-11-08T11:36:40.095	no

보안 모듈 이미지 불일치

서버 1/1에 로컬 디스크 1이 없습니다.

| ▼ MAJOR | Local disk 1 missing on server 1/1 | equipment-missing | 2 | 2017-11-08T10:40:43.122 | no |

Q. 섀시 전력 소비량은 어떻게 확인합니까?

FXOS 2.2.1 버전에서처럼 show environment summary 명령을 사용할 수 있습니다.

<#root>

FPR4100-1 /chassis #

show environment summary

```
Chassis INFO :
    Total Power Consumption: 440.000000
    Inlet Temperature (C): 21.000000
    CPU Temperature (C): 39.000000
    Last updated Time: 2018-07-01T09:39:55.157

    PSU 1:
        Type: AC
        Input Feed Status: Ok
        12v Output Status: Ok
        Overall Status: Operable
    PSU 2:
        Type: AC
        Input Feed Status: N/A
        12v Output Status: N/A
        Overall Status: Removed

    FAN 1
        Fan Speed RPM (RPM): 12110
        Speed Status: Ok
        Overall Status: Operable
    FAN 2
        Fan Speed RPM (RPM): 12110
        Speed Status: Ok
        Overall Status: Operable
    FAN 3
        Fan Speed RPM (RPM): 12100
        Speed Status: Ok
        Overall Status: Operable
```

추가 정보 확인:

[섀시 상태 모니터링](#)

Q. 부트로더 버전을 확인하는 방법은?

<#root>

FPR-4110-7-A#

scope chassis 1

FPR-4110-7-A /chassis #

scope server 1

FPR-4110-7-A /chassis/server #

scope adapter 1

FPR-4110-7-A /chassis/server/adapter #

show version detail

Adapter 1:

```
Running-Vers: 5.3(1.91)
Package-Vers: 2.3(1.88)
Update-Status: Ready
Activate-Status: Ready
Bootloader-Update-Status: Ready
Startup-Vers: 5.3(1.91)
Backup-Vers: 5.3(1.48)
Bootloader-Vers: MF-111-234949
```

Q. 부트로더를 업그레이드하려면 어떻게 해야 합니까?

FXOS 2.3.1.58 이상 설치 후, 시스템에 보안 어플라이언스에서 어댑터 펌웨어 업그레이드가 필요하다는 중대한 결함이 표시될 수 있습니다.

```
Critical F1715 2017-05-11T11:43:33.121 339561 Adapter 1 on Security Module 1 requires a critical firmwa
```

부트로더 업그레이드 절차는 다음 링크에서 설명합니다.
https://www.cisco.com/c/en/us/td/docs/security/firepower/fxos/fxos231/release/notes/fxos231_rn.html#pgfl
173826

부트로더를 업그레이드하는 동안 아래의 오류가 발생하면 'force' 옵션을 사용할 수 있습니다.

```
<#root>

FPR-4110-7-A#

scope chassis 1


FPR-4110-7-A /chassis #

scope server 1


FPR-4110-7-A /chassis/server #

scope adapter 1/1/1


FPR-4110-7-A /chassis/server/adapter #

show image


Name Type Version
-------------------------------------------------- ------------------- -------
fxos-m83-8p40-cruzboot.4.0.1.62.bin Adapter Boot 4.0(1.62)
fxos-m83-8p40-vic.4.0.1.51.bin Adapter 4.0(1.51)
fxos-m83-8p40-vic.5.3.1.2.bin Adapter 5.3(1.2)
fxos-m83-8p40-vic.5.3.1.48.bin Adapter 5.3(1.48)
fxos-m83-8p40-vic.5.3.1.91.bin Adapter 5.3(1.91)
FPR-4110-7-A /chassis/server/adapter #
```

```
update boot-loader 4.0(1.62)
```

```
Warning: Please DO NOT reboot blade or chassis during uprgade, otherwise, it may cause adapter UNUSABLE
After upgrade completed, blade must be power cycled automatically
FPR-4110-7-A /chassis/server/adapter* #
```

```
commit-buffer
```

```
Error: Update failed: [This adaptor is not applicable for boot-loader upgrade.]
```

Q. 절대 SSH 시간 초과를 비활성화하는 방법

이 기능은 랩 테스트 및 트러블슈팅 중에 유용합니다. 이 절대 시간 초과는 0이 아닌 보안 모범 사례
이므로 사용자 환경에서 일시적으로 수행되는 경우 주의해야 합니다.

```
<#root>
```

```
FPR-4115-A#
```

```
scope security
```

```
FPR-4115-A /security #
```

```
scope default-auth
```

```
FPR-4115-A /security/default-auth #
```

```
show detail
```

```
Default authentication:
Admin Realm: Local
Operational Realm: Local
Web session refresh period(in secs): 600
Idle Session timeout(in secs) for web, ssh, telnet sessions: 3600
```

```
Absolute Session timeout(in secs) for web, ssh, telnet sessions: 3600
```

```
Serial Console Idle Session timeout(in secs): 3600
Serial Console Absolute Session timeout(in secs): 3600
Admin Authentication server group:
Operational Authentication server group:
Use of 2nd factor: No
```

```
FPR-4115-A /security/default-auth #
```

```
set absolute-session-timeout 0
```

```
FPR-4115-A /security/default-auth* #
```

```
commit-buffer
```

```
FPR-4115-A /security/default-auth #

show detail


Default authentication:
Admin Realm: Local
Operational Realm: Local
Web session refresh period(in secs): 600
Idle Session timeout(in secs) for web, ssh, telnet sessions: 3600

Absolute Session timeout(in secs) for web, ssh, telnet sessions: 0


Serial Console Idle Session timeout(in secs): 3600
Serial Console Absolute Session timeout(in secs): 3600
Admin Authentication server group:
Operational Authentication server group:
Use of 2nd factor: No
```

Q. 섀시 수퍼바이저(컨트롤 플레인)로 향하는 LACP 패킷을 캡처하는 방법은 무엇입니까?

Firepower 4100/9300 섀시 수퍼바이저(컨트롤 플레인)로 향하는 LACP 패킷은 특정 패킷의 데이터 섹션 내부에 캡슐화되며, ethanalyzer 명령을 사용하여 내부 인바운드-hi 인터페이스에서 캡처할 수 있습니다. LACP PDU 바이트는 값이 01 80 C2 00 00 02(IEEE 802.3 Slow_Protocols_Multicast 주소)인 바이트부터 데이터 섹션이 끝날 때까지 포함됩니다.


```
<#root>
firepower#

connect fxos


...
firepower(fxos)#

ethanalyzer local interface inbound-hi limit-captured-frames 10000 limit-frame-size 9000 detail

Capturing on 'eth4'

Frame 1: 188 bytes on wire (1504 bits), 188 bytes captured (1504 bits) on interface 0
    Interface id: 0 (eth4)
        Interface name: eth4
    Encapsulation type: Ethernet (1)
    Arrival Time: Dec  5, 2023 09:16:06.736180828 UTC
    [Time shift for this packet: 0.000000000 seconds]
    Epoch Time: 1701767766.736180828 seconds
    [Time delta from previous captured frame: 0.000000000 seconds]
    [Time delta from previous displayed frame: 0.000000000 seconds]
    [Time since reference or first frame: 0.000000000 seconds]
    Frame Number: 1
    Frame Length: 188 bytes (1504 bits)
    Capture Length: 188 bytes (1504 bits)
    [Frame is marked: False]
    [Frame is ignored: False]
```

```
     [Protocols in frame: eth:ethertype:vlan:ethertype:data]
Ethernet II, Src: 02:10:18:a3:4f:f5 (02:10:18:a3:4f:f5), Dst: 58:97:bd:b9:36:4e (58:97:bd:b9:36:4e)
    Destination: 58:97:bd:b9:36:4e (58:97:bd:b9:36:4e)
        Address: 58:97:bd:b9:36:4e (58:97:bd:b9:36:4e)
        .... ..0. .... .... .... .... = LG bit: Globally unique address (factory default)
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Source: 02:10:18:a3:4f:f5 (02:10:18:a3:4f:f5)
        Address: 02:10:18:a3:4f:f5 (02:10:18:a3:4f:f5)
        .... ..1. .... .... .... .... = LG bit: Locally administered address (this is NOT the factory de
        .... ...0 .... .... .... .... = IG bit: Individual address (unicast)
    Type: 802.1Q Virtual LAN (0x8100)
802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 4048
000. .... .... .... = Priority: Best Effort (default) (0)
    ...0 .... .... .... = DEI: Ineligible
    .... 1111 1101 0000 = ID: 4048
    Type: Unknown (0xde08)

Data (170 bytes)
0000  b8 50 20 04 00 00 00 00 00 00 00 00 00 00 81 00   .P .............
0010  00 00 00 00 00 04 09 04 cd 00 00 00 00 00 00 00   ................
0020  00 00 00 00 00 00 00 00 00 00 00 00 00 00

01 80   ...............


0030

c2 00 00 02 58 97 bd b9 36 51 88 09 01 01 01 14   ....X...6Q......


0040

80 00 58 97 bd b9 36 4d 00 28 80 00 00 44 3f 00   ..X...6M.(...D?.


0050

00 00 02 14 80 00 00 17 df d6 ec 00 00 33 80 00   .............3..


0060

02 2c 3d 00 00 00 03 10 00 00 00 00 00 00 00 00   .,=............


0070

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................


0080

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................


0090

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00   ................


00a0

00 00 00 00 00 00 00 00 00 00   ..........

    Data: b8502004000000000000000000008100000000000040904...
```

16진수 덤프는 온라인 툴을 사용하여 PCAP로 변환할 수 있습니다.

Q. SSD 정보를 찾는 방법은?

섀시 수퍼바이저 내부 SSD 정보는 [FN72077](#)의 해결 방법/솔루션, 1단계에서 언급된 모든 FXOS 버전에서 사용할 수 있습니다.

```
<#root>

KSEC-FPR4112-4 #

scope chassis 1


KSEC-FPR4112-4 /chassis #

show sup version detail


SUP FIRMWARE:
    ROMMON:
        Running-Vers: 1.0.15
        Package-Vers: 1.0.18
        Activate-Status: Ready
        Upgrade Status: SUCCESS
    FPGA:
        Running-Vers: 2.00
        Package-Vers: 1.0.18
        Activate-Status: Ready
    SSD:


 Running-Vers: MU03



Model: Micron_M500IT_MTFDDAT128MBD
```

보안 엔진(블레이드) SSD:

```
<#root>

KSEC-FPR4112-4#

show server storage detail


Server 1/1:
<output skipped>
        RAID Controller 1:
            Type: SATA
            Vendor: Cisco Systems Inc
            Model: FPR4K-PT-01
            Serial: JAD260508TZ
```

```
            HW Revision:
            PCI Addr: 00:31.2
            Raid Support:
            OOB Interface Supported: No
            Rebuild Rate: N/A
            Controller Status: Unknown
```

Local Disk 1:

Vendor: INTEL

       Model: SSDSC2KG48

       Serial: PHYG109603PA480BGN

       HW Rev: 0

       Operability: Operable

       Presence: Equipped

       Size (MB): 400000

       Drive State: Online

       Power State: Active

       Link Speed: 6 Gbps

Device Type: SSD

Local Disk 2:

  Vendor: INTEL

       Model: SSDSC2KG96

       Serial: PHYG143301JG960CGN

```
        HW Rev: 0

        Operability: Operable


        Presence: Equipped



  Size (MB): 800000


        Drive State: Online


        Power State: Active


        Link Speed: 6 Gbps



Device Type: SSD


        Local Disk Config Definition:
            Mode: No RAID
            Description:
            Protect Configuration: No
```

Q. FXOS(Internal Switch) 캡처를 구성하는 방법

Configure [and Verify Secure Firewall and Monitoring(보안 방화벽 및 Firepower 내부 스위치 캡처 구성 및 확인) 문서를 참조하십시오](#).

참조

- [Cisco Firepower 4100/9300 FXOS Secure Firewall Chassis Manager 컨피그레이션 가이드, 2.14(1)](#)
- [Cisco Secure FXOS for Firepower 4100/9300 CLI 컨피그레이션 가이드, 2.14(1)](#)
- [Cisco Firepower 4100/9300 FXOS 명령 참조](#)
- [보안 방화벽 및 Firepower 내부 스위치 캡처 구성 및 확인](#)