

驗證Firepower模式、例項、高可用性和可擴充性配置

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簡介

本文檔介紹驗證Firepower高可用性和可擴充性配置、防火牆模式和例項部署型別。

背景資訊

高可用性和可擴充性配置、防火牆模式和例項部署型別的驗證步驟顯示在使用者介面(UI)、命令列介面(CLI)、通過REST-API查詢、SNMP以及故障排除檔案中。

必要條件

需求

基本產品知識、REST-API、SNMP。

採用元件

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

本文中的資訊係根據以下軟體和硬體版本：

- Firepower 11xx
- Firepower 21xx
- Firepower 31xx
- Firepower 41xx
- Firepower管理中心(FMC)版本7.1.x
- Firepower可擴充作業系統(FXOS)2.11.1.x
- Firepower裝置管理器(FDM)7.1.x
- Firepower威脅防禦7.1.x
- ASA 9.17.x

驗證高可用性和可擴充性配置

高可用性是指故障切換配置。高可用性或故障轉移設定將兩台裝置連線在一起，以便當其中一台裝置發生故障時，另一台裝置可以接管。

可擴充性是指群集配置。使用群集配置，可以將多個FTD節點組合為一個邏輯裝置。集群提供單個裝置（管理、整合到網路）的所有便利性，以及增加多個裝置的吞吐量和冗餘。

在本文檔中，這些表達式可互換使用：

- 高可用性或故障切換
- 可擴充性或群集

在某些情況下，無法驗證高可用性和可擴充性配置或狀態。例如，FTD獨立組態沒有驗證命令。獨立、故障切換和群集配置模式相互排斥。如果裝置沒有故障切換和群集配置，則認為該裝置在獨立模式下運行。

FMC高可用性

可以使用以下選項驗證FMC高可用性配置和狀態：

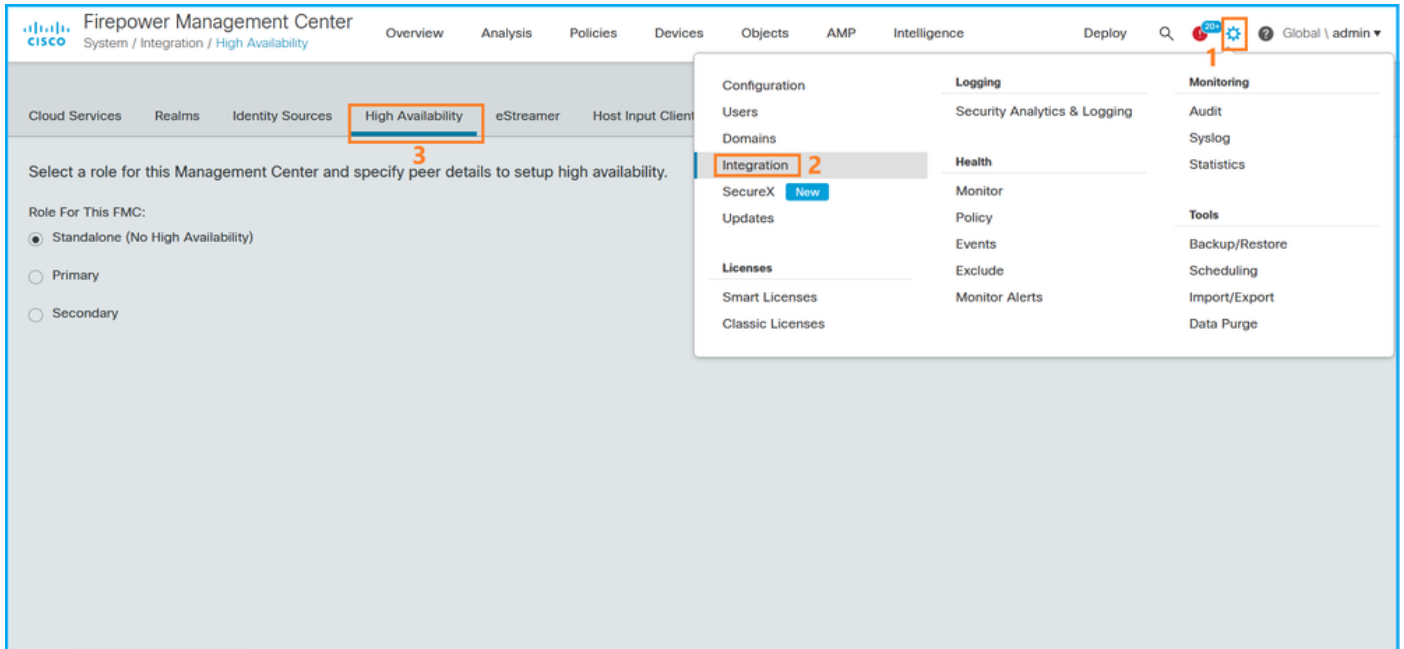
- FMC UI
- FMC CLI
- REST API請求

- FMC故障排除檔案

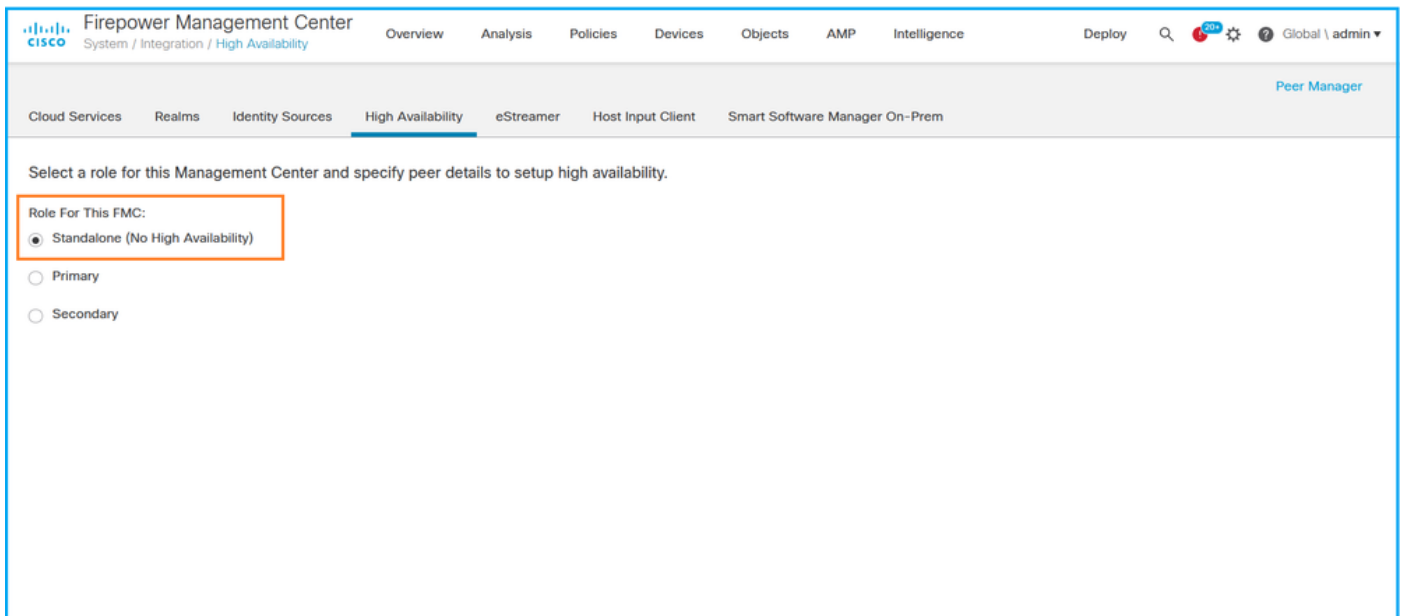
FMC UI

按照以下步驟驗證FMC UI上的FMC高可用性配置和狀態：

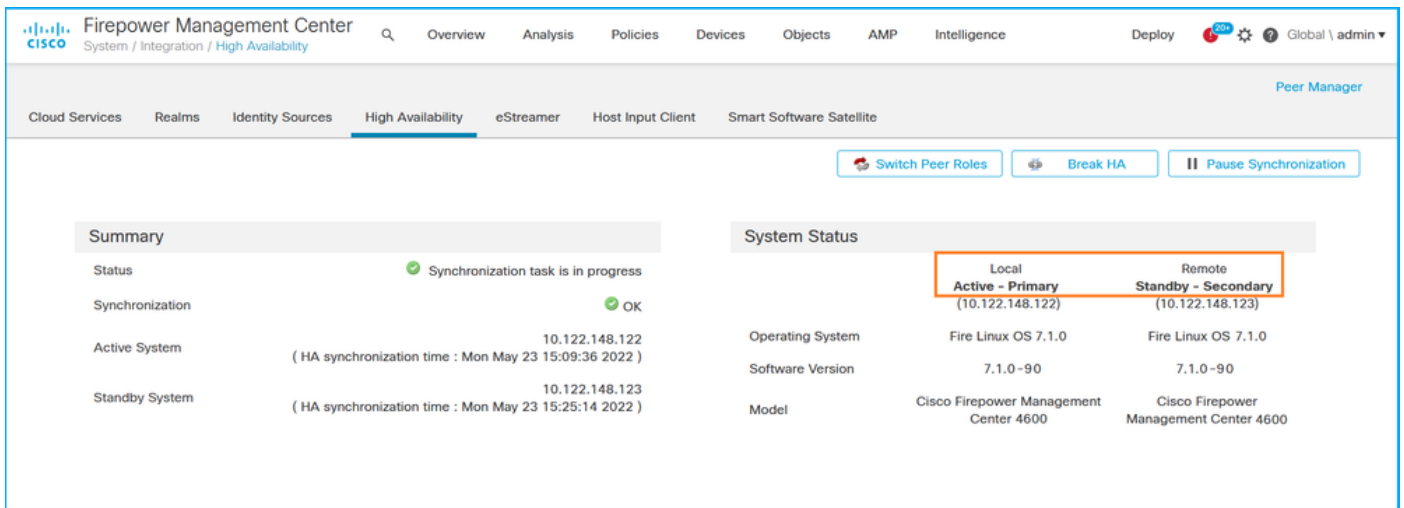
1. 選擇System > Integration > High Availability:



2. 檢查FMC的角色。在這種情況下，未配置高可用性，並且FMC在獨立配置中運行：



如果配置了高可用性，將顯示本地和遠端角色：



FMC CLI

按照以下步驟驗證FMC CLI上的FMC高可用性配置和狀態：

1. 通過SSH或控制檯連線訪問FMC。
2. 運行expert命令，然後運行sudo su 命令：

```
> expert
admin@fmc1:~$ sudo su
Password:
Last login: Sat May 21 21:18:52 UTC 2022 on pts/0
fmc1:/Volume/home/admin#
```

3. 運行troubleshoot_HADC.pl 命令，然後選擇選項1 顯示FMC的HA資訊。如果未配置高可用性，將顯示以下輸出：

```
fmc1:/Volume/home/admin# troubleshoot_HADC.pl
***** Troubleshooting Utility ***** 1 Show HA Info Of FMC
2 Execute Sybase DBPing
3 Show Arbiter Status
4 Check Peer Connectivity
5 Print Messages of AQ Task
6 Show FMC HA Operations History (ASC order)
7 Dump To File: FMC HA Operations History (ASC order)
8 Last Successful Periodic Sync Time (When it completed)
9 Print HA Status Messages
10 Compare active and standby device list
11 Check manager status of standby missing devices
12 Check critical PM processes details
13 Help
0 Exit

*****
Enter choice: 1
HA Enabled: No
```

如果配置了高可用性，將顯示以下輸出：

```
fmc1:/Volume/home/admin# troubleshoot_HADC.pl
***** Troubleshooting Utility *****
1 Show HA Info Of FMC
```

```

2 Execute Sybase DBPing
3 Show Arbiter Status
4 Check Peer Connectivity
5 Print Messages of AQ Task
6 Show FMC HA Operations History (ASC order)
7 Dump To File: FMC HA Operations History (ASC order)
8 Help
0 Exit *****

```

Enter choice: 1

HA Enabled: Yes

This FMC Role In HA: Active - Primary

```

Status out put: vmsDbEngine (system,gui) - Running 29061
In vmsDbEngineStatus(): vmsDbEngine process is running at
/usr/local/sf/lib/perl/5.24.4/SF/Synchronize/HADC.pm line 3471.
Sybase Process: Running (vmsDbEngine, theSybase PM Process is Running)
Sybase Database Connectivity: Accepting DB Connections.
Sybase Database Name: csm_primary
Sybase Role: Active

```

附註：在高可用性配置中，FMC角色可以具有主或輔助角色，以及active或standby狀態。

FMC REST-API

按照以下步驟通過FMC REST-API驗證FMC高可用性和可擴充性配置和狀態。使用REST-API客戶端。在此範例中，使用curl:

1.請求身份驗證令牌：

```

# curl -s -k -v -X POST 'https://192.0.2.1/api/fmc_platform/v1/auth/generatetoken' -H
'Authentication: Basic' -u 'admin:Cisco123' | grep -i X-auth-access-token
... < X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb

```

2.使用此查詢中的令牌查詢全域性域的UUID:

```

# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_platform/v1/info/domain' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
{
  "items": [
    {
      "name": "Global",
      "type": "Domain",
      "uuid": "e276abec-e0f2-11e3-8169-6d9ed49b625f"
    },
    {
      "name": "Global/LAB2",
      "type": "Domain",
      "uuid": "84cc4afe-02bc-b80a-4b09-000000000000"
    },
    {
      "name": "Global/TEST1",
      "type": "Domain",
      "uuid": "ef0cf3e9-bb07-8f66-5c4e-000000000001"
    },
    {
      "name": "Global/TEST2",
      "type": "Domain",
      "uuid": "341a8f03-f831-c364-b751-000000000001"
    }
  ]
},

```

```

"links": {
  "self": "https://192.0.2.1/api/fmc_platform/v1/info/domain?offset=0&limit=25"
},
"paging": {
  "count": 4,
  "limit": 25,
  "offset": 0,
  "pages": 1
}
}

```

附註：命令字串的「| python -m json.tool」部分用於以JSON樣式設定輸出格式，並且是可選的。

3.在此查詢中使用全域性域UUID:

```

# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_config/v1/domain/e276abec-e0f2-11e3-8169-6d9ed49b625f/integration/fmchastatuses' -H 'accept: application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool

```

如果未配置高可用性，將顯示以下輸出：

```

{
  "links": {},
  "paging": {
    "count": 0,
    "limit": 0,
    "offset": 0,
    "pages": 0
  }
}

```

如果配置了高可用性，將顯示以下輸出：

```

{
  "items": [
    {
      "fmcPrimary": {
        "ipAddress": "192.0.2.1",
        "role": "Active",
        "uuid": "de7bfc10-13b5-11ec-afaf-a0f8cf9ccb46"
      },
      "fmcSecondary": {
        "ipAddress": "192.0.2.2",
        "role": "Standby",
        "uuid": "a2de9750-4635-11ec-b56d-201c961a3600"
      },
      "haStatusMessages": [
        "Healthy"
      ],
      "id": "de7bfc10-13b5-11ec-afaf-a0f8cf9ccb46",
      "overallStatus": "GOOD",
      "syncStatus": "GOOD",
      "type": "FMCHAStatus"
    }
  ],
  "links": {
    "self": "https://192.0.2.1/api/fmc_config/v1/domain/e276abec-e0f2-11e3-8169-6d9ed49b625f/integration/fmchastatuses?offset=0&limit=25"
  },
}

```

```

    "paging": {
      "count": 1,
      "limit": 25,
      "offset": 0,
      "pages": 1
    }
  }
}

```

FMC故障排除檔案

按照以下步驟驗證FMC高可用性配置和FMC故障排除檔案中的狀態：

1. 開啟故障排除檔案，導航到資料夾<filename>.tar/results-<date>-xxxxxx/command-output
2. 開啟檔案usr-local-sf-bin-troubleshooting_HADC.pl -a.output:

如果未配置高可用性，將顯示以下輸出：

```

# pwd
/var/tmp/results-05-06-2022--199172/command-outputs

# cat "usr-local-sf-bin-troubleshoot_HADC.pl -a.output"
Output of /usr/local/sf/bin/troubleshoot_HADC.pl -a:
$VAR1 = [
    'Mirror Server => csmEng',
    {
      'rcode' => 0,
      'stderr' => undef,
      'stdout' => 'SQL Anywhere Server Ping Utility Version 17.0.10.5745
Type      Property      Value
-----
Database  MirrorRole      NULL
Database  MirrorState     NULL
Database  PartnerState    NULL
Database  ArbiterState    NULL
Server    ServerName      csmEng
Ping database successful.
'
    }
  ];
(system,gui) - Waiting
HA Enabled: No
Sybase Database Name: csmEng
Arbiter Not Running On This FMC.
Not In HA

```

如果配置了高可用性，將顯示以下輸出：

```

# pwd
/var/tmp/results-05-06-2022--199172/command-outputs

# cat "usr-local-sf-bin-troubleshoot_HADC.pl -a.output"
Output of /usr/local/sf/bin/troubleshoot_HADC.pl -a:
Status out put: vmsDbEngine (system,gui) - Running 9399
In vmsDbEngineStatus(): vmsDbEngine process is running at
/usr/local/sf/lib/perl/5.24.4/SF/Synchronize/HADC.pm line 3471.
$VAR1 = [
    'Mirror Server => csm_primary',
    {
      'stderr' => undef,

```



```

'stdout' => 'SQL Anywhere Server Ping Utility Version 17.0.10.5745
Type      Property      Value
-----
Database  MirrorRole     primary
Database  MirrorState    synchronizing
Database  PartnerState   connected
Database  ArbiterState   connected
Server    ServerName     csm_primary
Ping database successful.
',
      'rcode' => 0
    }
  };

```

(system,gui) - Running 8185

...

HA Enabled: Yes

This FMC Role In HA: Active - Primary

Sybase Process: Running (vmsDbEngine, theSybase PM Process is Running)

Sybase Database Connectivity: Accepting DB Connections.

Sybase Database Name: csm_primary

Sybase Role: Active

Sybase Database Name: csm_primary

Arbiter Running On This FMC.

Peer Is Connected

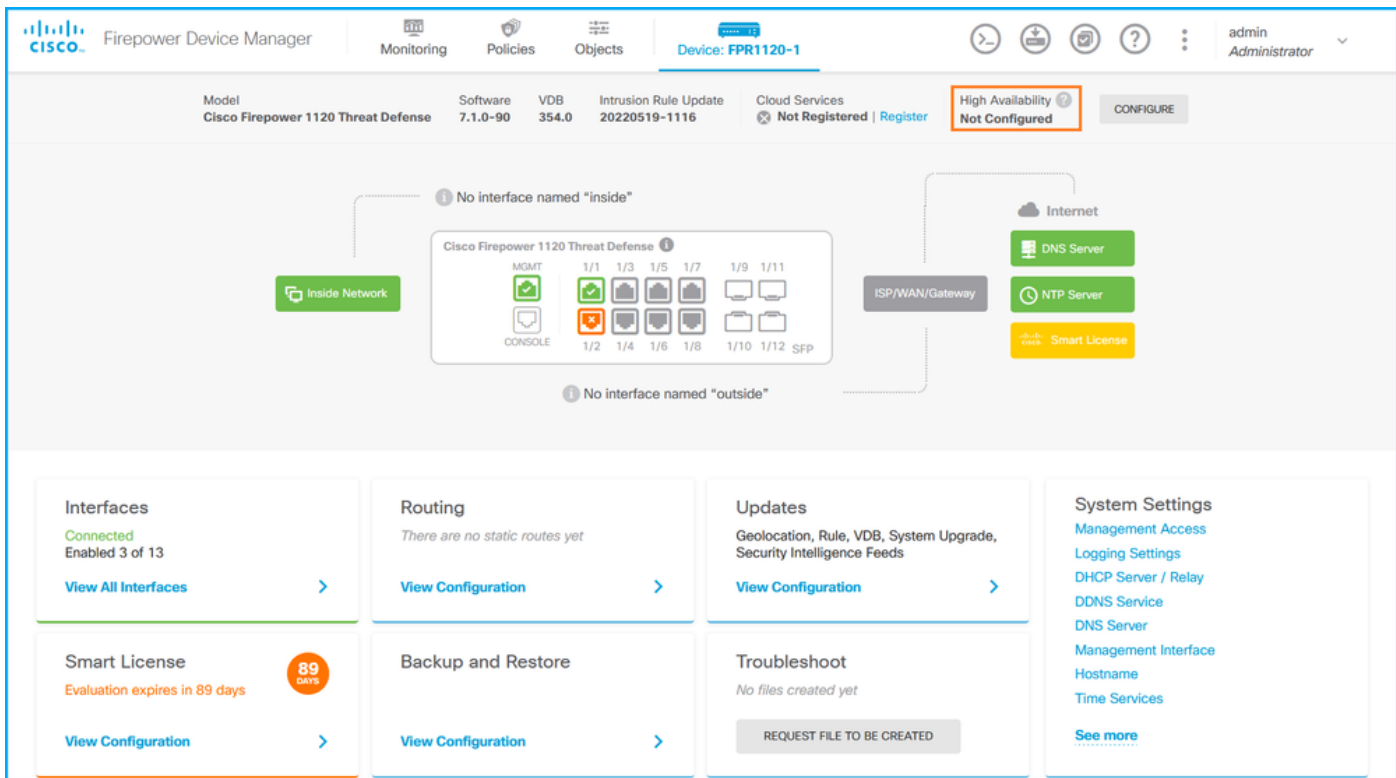
FDM高可用性

可以使用以下選項驗證FDM高可用性配置和狀態：

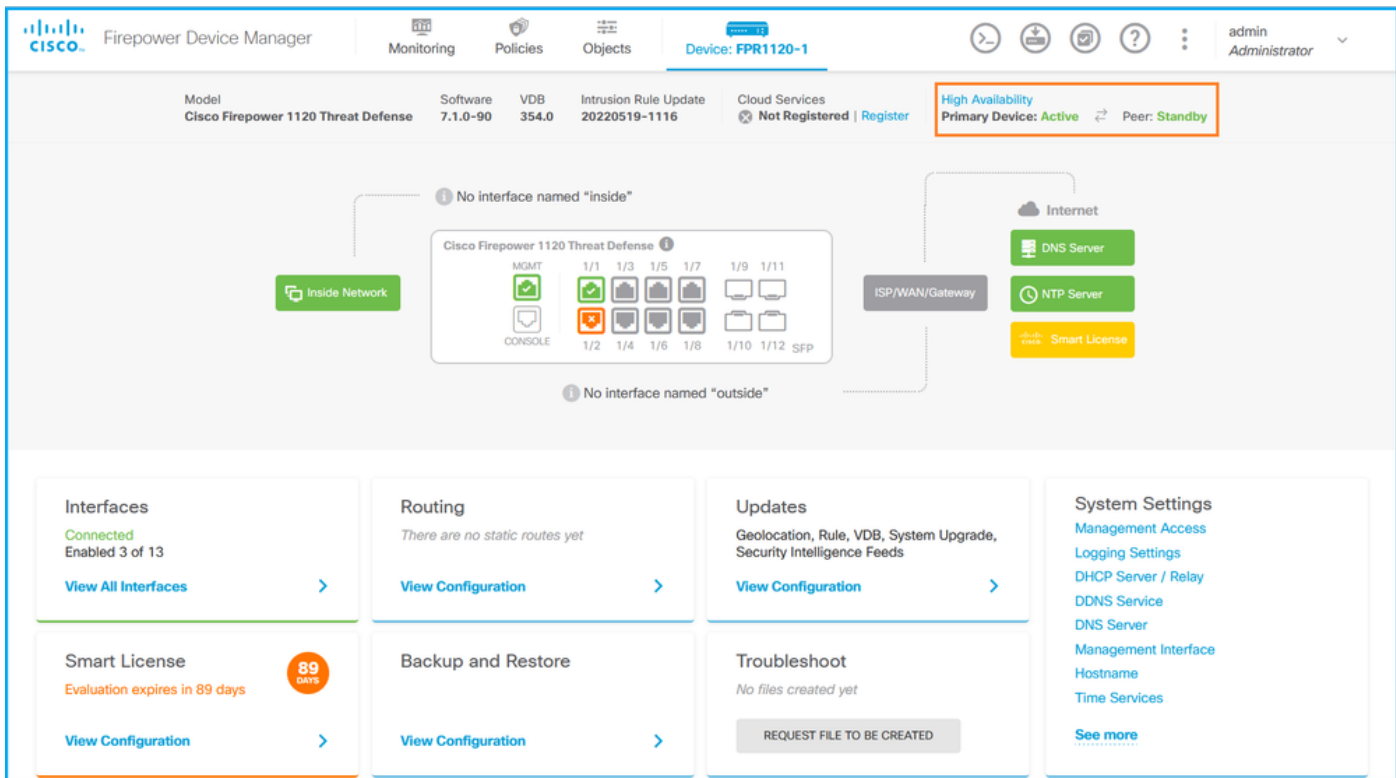
- FDM UI
- FDM REST API請求
- FTD CLI
- FTD SNMP投票
- FTD疑難排解檔案

FDM UI

若要驗證FDM UI上的FDM高可用性配置和狀態，請在主頁上檢查「高可用性」。如果未配置高可用性，則High Availability值為Not Configured:



如果配置了高可用性，將顯示本地和遠端對等裝置故障切換配置和角色：



FDM REST-API

按照以下步驟通過FDM REST-API請求驗證FDM高可用性配置和狀態。使用REST-API客戶端。在此範例中，使用curl:

1. 請求身份驗證令牌：


```
"disabledTimestamp": "",
"id": "default",
"type": "hastatus",
"links": {
  "self": "https://192.0.2.3/api/fdm/v6/devices/default/operational/ha/status/default"
}
}
```

FTD CLI

請按照一節中的步驟操作。

FTD SNMP投票

請按照一節中的步驟操作。

FTD疑難排解檔案

請按照一節中的步驟操作。

FTD高可用性及可擴充性

FTD高可用性及可擴充性組態和狀態可以使用以下選項進行驗證：

- FTD CLI
- FTD SNMP
- FTD疑難排解檔案
- FMC UI
- FMC REST-API
- FDM UI
- FDM REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS機箱show-tech檔案

FTD CLI

請依照以下步驟操作，驗證FTD CLI上的FTD高可用性及可擴充性組態和狀態：

1. 根據平台和部署模式，使用以下選項訪問FTD CLI:

- 直接通過SSH訪問FTD — 所有平台
- 通過**connect ftd**指令，從FXOS主控台CLI(Firepower 1000/2100/3100)進行存取
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：
connect module <x> [console|telnet],其中x是插槽ID，然後**connect ftd [instance]**，其中例項僅與多例項部署相關
- 對於虛擬FTD，直接通過SSH訪問FTD，或透過虛擬機器監控程式或雲使用者介面進行主控台訪問

2.為了驗證FTD容錯移轉組態和狀態，請在CLI上執行show running-config failover和show failover state命令。

如果未配置故障轉移，將顯示以下輸出：

```
> show running-config failover
no failover
>show failover state
                State          Last Failure Reason    Date/Time
This host  -   Secondary
                Disabled      None
Other host  -   Primary
                Not Detected  None
====Configuration State====
====Communication State====
```

如果配置了故障轉移，將顯示以下輸出：

```
> show running-config failover
failover failover lan unit primary
failover lan interface failover-link Ethernet1/1
failover replication http
failover link failover-link Ethernet1/1
failover interface ip failover-link 10.30.34.2 255.255.255.0 standby 10.30.34.3

>show failover state
                State          Last Failure Reason    Date/Time
This host  -   Primary
                Active        None
Other host  -   Secondary
                Standby Ready  Comm Failure          09:21:50 UTC May 22 2022
====Configuration State====
                Sync Done
====Communication State====
                Mac set
```

3.為了驗證FTD集群配置和狀態，請在CLI上運行show running-config cluster和show cluster info命令。

如果未配置集群，將顯示以下輸出：

```
> show running-config cluster
>show cluster info
Clustering is not configured
```

如果已配置集群，則顯示以下輸出：

```
> show running-config cluster
cluster group ftd_cluster1
key *****
local-unit unit-1-1
cluster-interface Port-channel48.204 ip 10.173.1.1 255.255.0.0
priority 9
health-check holdtime 3
health-check data-interface auto-rejoin 3 5 2
health-check cluster-interface auto-rejoin unlimited 5 1
health-check system auto-rejoin 3 5 2
health-check monitor-interface debounce-time 500
site-id 1
```

```
no unit join-acceleration
enable
```

```
> show cluster info
```

```
Cluster ftd_cluster1: On
```

```
Interface mode: spanned
```

```
Cluster Member Limit : 16
```

```
This is "unit-1-1" in state MASTER
```

```
ID          : 0
Site ID     : 1
Version     : 9.17(1)
Serial No.  : FLM1949C5RR6HE
CCL IP      : 10.173.1.1
CCL MAC     : 0015.c500.018f
Module      : FPR4K-SM-24
Resource    : 20 cores / 44018 MB RAM
Last join   : 13:53:52 UTC May 20 2022
Last leave  : N/A
```

```
Other members in the cluster:
```

```
Unit "unit-2-1" in state SLAVE
```

```
ID          : 1
Site ID     : 1
Version     : 9.17(1)
Serial No.  : FLM2108V9YG7S1
CCL IP      : 10.173.2.1
CCL MAC     : 0015.c500.028f
Module      : FPR4K-SM-24
Resource    : 20 cores / 44018 MB RAM
Last join   : 14:02:46 UTC May 20 2022
Last leave  : 14:02:31 UTC May 20 2022
```

附註：master和control角色相同。

FTD SNMP

請依照以下步驟操作，透過SNMP驗證FTD高可用性及可擴充性組態和狀態：

1. 確保已配置並啟用SNMP。有關FDM管理的FTD的資訊，請參閱[在Firepower FDM上配置SNMP並對其進行故障排除](#)。有關FMC管理的FTD的資訊，請參閱[在Firepower NGFW裝置上配置SNMP](#)以瞭解配置步驟。

2. 若要確認FTD容錯移轉組態和狀態，請查詢OID **.1.3.6.1.4.1.9.9.147.1.2.1.1.1**。

如果未配置故障轉移，將顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.5 .1.3.6.1.4.1.9.9.147.1.2.1.1.1
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.4 = STRING: "Failover LAN Interface"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.6 = STRING: "Primary unit"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.7 = STRING: "Secondary unit (this device)"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.4 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.6 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.7 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.4 = STRING: "not Configured"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.6 = STRING: "Failover Off"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.7 = STRING: "Failover Off"
```

如果配置了故障轉移，將顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.5 .1.3.6.1.4.1.9.9.147.1.2.1.1.1
```

```

SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.4 = STRING: "Failover LAN Interface"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.6 = STRING: "Primary unit (this device)" <-- This
device is primary
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.7 = STRING: "Secondary unit"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.4 = INTEGER: 2
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.6 = INTEGER: 9
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.7 = INTEGER: 10
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.4 = STRING: "fover Ethernet1/2"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.6 = STRING: "Active unit" <--
Primary device is active
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.7 = STRING: "Standby unit"

```

3.要驗證群集配置和狀態，請查詢OID 1.3.6.1.4.1.9.9.491.1.8.1。

如果未配置集群，將顯示以下輸出：

```

# snmpwalk -v2c -c cisco123 192.0.2.5 .1.3.6.1.4.1.9.9.491.1.8.1
SNMPv2-SMI::enterprises.9.9.491.1.8.1.1.0 = INTEGER: 0

```

如果已配置但未啟用集群，則顯示以下輸出：

```

# snmpwalk -v2c -c cisco123 -On 192.0.2.7 .1.3.6.1.4.1.9.9.491.1.8.1
.1.3.6.1.4.1.9.9.491.1.8.1.1.0 = INTEGER: 0 <-- Cluster status, disabled
.1.3.6.1.4.1.9.9.491.1.8.1.2.0 = INTEGER: 1
.1.3.6.1.4.1.9.9.491.1.8.1.3.0 = INTEGER: 0 <-- Cluster unit state, disabled
.1.3.6.1.4.1.9.9.491.1.8.1.4.0 = INTEGER: 11
.1.3.6.1.4.1.9.9.491.1.8.1.5.0 = STRING: "ftd_cluster1" <-- Cluster group name
.1.3.6.1.4.1.9.9.491.1.8.1.6.0 = STRING: "unit-1-1" <-- Cluster unit name
.1.3.6.1.4.1.9.9.491.1.8.1.7.0 = INTEGER: 0 <-- Cluster unit ID
.1.3.6.1.4.1.9.9.491.1.8.1.8.0 = INTEGER: 1 <-- Cluster side ID
...

```

如果群集已配置、已啟用且運行正常，則顯示以下輸出：

```

# snmpwalk -v2c -c cisco123 -On 192.0.2.7 .1.3.6.1.4.1.9.9.491.1.8.1
.1.3.6.1.4.1.9.9.491.1.8.1.1.0 = INTEGER: 1 <-- Cluster status, enabled
.1.3.6.1.4.1.9.9.491.1.8.1.2.0 = INTEGER: 1
.1.3.6.1.4.1.9.9.491.1.8.1.3.0 = INTEGER: 16 <-- Cluster unit state, control
unit
.1.3.6.1.4.1.9.9.491.1.8.1.4.0 = INTEGER: 10
.1.3.6.1.4.1.9.9.491.1.8.1.5.0 = STRING: "ftd_cluster1" <-- Cluster group name
.1.3.6.1.4.1.9.9.491.1.8.1.6.0 = STRING: "unit-1-1" <-- Cluster unit name
.1.3.6.1.4.1.9.9.491.1.8.1.7.0 = INTEGER: 0 <-- Cluster unit ID
.1.3.6.1.4.1.9.9.491.1.8.1.8.0 = INTEGER: 1 <-- Cluster side ID
...

```

有關OID描述的詳細資訊，請參閱[CISCO-UNIFIED-FIREWALL-MIB](#)。

FTD疑難排解檔案

請依照以下步驟操作，驗證FTD疑難排解檔案中的FTD高可用性及可擴充性組態和狀態：

1.開啟故障排除檔案，導航到資料夾<filename>-troubleshoot .tar/results-<date>-xxxxxx/command-output。

2.開啟文件usr-local-sf-bin-sfcli.pl show_tech_support asa_lina_cli_util.output:


```
# pwd
/ngfw/var/common/results-05-22-2022--102758/command-outputs
# cat 'usr-local-sf-bin-sfcli.pl show_tech_support_asa_lina_cli_util.output'
```

3.要驗證故障切換配置和狀態，請檢查show failover部分。

如果未配置故障轉移，將顯示以下輸出：

```
----- show failover -----

Failover Off
Failover unit Secondary
Failover LAN Interface: not Configured
Reconnect timeout 0:00:00
Unit Poll frequency 1 seconds, holdtime 15 seconds
Interface Poll frequency 5 seconds, holdtime 25 seconds
Interface Policy 1
Monitored Interfaces 3 of 1292 maximum
MAC Address Move Notification Interval not set
```

如果配置了故障轉移，將顯示以下輸出：

```
----- show failover -----

Failover On
Failover unit Primary
Failover LAN Interface: fover Ethernet1/2 (up)
Reconnect timeout 0:00:00
Unit Poll frequency 1 seconds, holdtime 15 seconds
Interface Poll frequency 5 seconds, holdtime 25 seconds
Interface Policy 1
Monitored Interfaces 1 of 1291 maximum
MAC Address Move Notification Interval not set
failover replication http
Version: Ours 9.17(1), Mate 9.17(1)
Serial Number: Ours FLM2006EN9UR93, Mate FLM2006EQFWAGG
Last Failover at: 13:45:46 UTC May 20 2022

  This host: Primary - Active
    Active time: 161681 (sec)
    slot 0: UCSB-B200-M3-U hw/sw rev (0.0/9.17(1)) status (Up Sys)
      Interface diagnostic (0.0.0.0): Normal (Waiting)
    slot 1: snort rev (1.0) status (up)
    slot 2: diskstatus rev (1.0) status (up)

  Other host: Secondary - Standby Ready
    Active time: 0 (sec)
    slot 0: UCSB-B200-M3-U hw/sw rev (0.0/9.17(1)) status (Up Sys)
      Interface diagnostic (0.0.0.0): Normal (Waiting)
    slot 1: snort rev (1.0) status (up)
    slot 2: diskstatus rev (1.0) status (up)...
```

4.為了驗證FTD集群配置和狀態，請檢查show cluster info部分。

如果未配置集群，將顯示以下輸出：

```
----- show cluster info -----
Clustering is not configured
```

如果已配置並啟用集群，則顯示以下輸出：

```
----- show cluster info -----
```

Cluster ftd_cluster1: On

Interface mode: spanned

Cluster Member Limit : 16

This is "unit-1-1" in state MASTER

ID : 0
Site ID : 1
Version : 9.17(1)
Serial No.: FLM1949C5RR6HE
CCL IP : 10.173.1.1
CCL MAC : 0015.c500.018f
Module : FPR4K-SM-24
Resource : 20 cores / 44018 MB RAM
Last join : 13:53:52 UTC May 20 2022
Last leave: N/A

Other members in the cluster:

Unit "unit-2-1" in state SLAVE

ID : 1
Site ID : 1
Version : 9.17(1)
Serial No.: FLM2108V9YG7S1
CCL IP : 10.173.2.1
CCL MAC : 0015.c500.028f
Module : FPR4K-SM-24
Resource : 20 cores / 44018 MB RAM
Last join : 14:02:46 UTC May 20 2022
Last leave: 14:02:31 UTC May 20 2022

FMC UI

請按照以下步驟驗證FMC UI上的FTD高可用性和可擴充性配置和狀態：

1. 選擇Devices > Device Management:

The screenshot shows the Firepower Management Center (FMC) interface. The top navigation bar includes 'Overview', 'Analysis', 'Policies', 'Devices', 'Objects', 'AMP', and 'Intelligence'. The 'Devices' menu is highlighted with a red box and labeled '1'. A dropdown menu is open under 'Devices', with 'Device Management' highlighted by a red box and labeled '2'. The dropdown menu contains the following items: Device Upgrade, NAT, QoS, Platform Settings, FlexConfig, Certificates, VPN, Site To Site, Remote Access, Dynamic Access Policy, Troubleshooting, Site to Site Monitoring, File Download, Threat Defense CLI, Packet Tracer, and Packet Capture. Below the navigation bar, there is a table of dashboards with columns for Name, admin, No, No, and icons for copy, search, edit, and delete.

Name	admin	No	No	Icons
Access Controlled User Statistics Provides traffic and intrusion event statistics by user				Copy, Search, Edit, Delete
Application Statistics Provides traffic and intrusion event statistics by application				Copy, Search, Edit, Delete
Application Statistics (7.1.0) Provides application statistics	admin	No	No	Copy, Search, Edit, Delete
Connection Summary Provides tables and charts of the activity on your monitored network segment organized by different criteria	admin	No	No	Copy, Search, Edit, Delete
Detailed Dashboard Provides a detailed view of activity on the appliance	admin	No	No	Copy, Search, Edit, Delete
Detailed Dashboard (7.0.0) Provides a detailed view of activity on the appliance	admin	No	No	Copy, Search, Edit, Delete
Files Dashboard Provides an overview of Malware and File Events	admin	No	No	Copy, Search, Edit, Delete
Security Intelligence Statistics Provides Security Intelligence statistics	admin	No	No	Copy, Search, Edit, Delete
Summary Dashboard Provides a summary of activity on the appliance	admin	No	Yes	Copy, Search, Edit, Delete

2. 為了驗證FTD高可用性和可擴充性配置，請檢查High Availability或Cluster標籤。如果兩者都不存在，則FTD在獨立組態中執行：

Name	Model	Version	Chassis	Licenses	Access Control Policy	Group
LAB2 (3)						
ftd_cluster1 (2) Cluster						
10.62.148.188 (Control) Snort 3 10.62.148.188 - Routed	Firepower 4120 with FTD	7.1.0		FP4120-5.443 Security Module - 1 (Container)	Base, Threat	acp1
10.62.148.191 Snort 3 10.62.148.191 - Routed	Firepower 4120 with FTD	7.1.0		KSEC-FPR4100-6.cisco.com.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_ha High Availability						
ftd_ha_1 (Primary, Active) Snort 3 10.62.148.89 - Transparent	Firepower 4150 with FTD	7.1.0		KSEC-FPR4100-3.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_ha_2 (Secondary, Standby) Snort 3 10.62.148.125 - Transparent	Firepower 4150 with FTD	7.1.0		firepower-9300.cisco.com.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_standalone Snort 3 10.62.148.181 - Routed	Firepower 2120 with FTD	7.1.0	N/A		Base, Threat	acp1

3.為了驗證FTD高可用性和可擴充性狀態，請檢查括弧中的單位角色。如果角色不存在，且FTD不屬於集群或故障轉移的一部分，則FTD在獨立配置中運行：

Name	Model	Version	Chassis	Licenses	Access Control Policy	Group
LAB2 (3)						
ftd_cluster1 (2) Cluster						
10.62.148.188 (Control) Snort 3 10.62.148.188 - Routed	Firepower 4120 with FTD	7.1.0		FP4120-5.443 Security Module - 1 (Container)	Base, Threat	acp1
10.62.148.191 Snort 3 10.62.148.191 - Routed	Firepower 4120 with FTD	7.1.0		KSEC-FPR4100-6.cisco.com.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_ha High Availability						
ftd_ha_1 (Primary, Active) Snort 3 10.62.148.89 - Transparent	Firepower 4150 with FTD	7.1.0		KSEC-FPR4100-3.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_ha_2 (Secondary, Standby) Snort 3 10.62.148.125 - Transparent	Firepower 4150 with FTD	7.1.0		firepower-9300.cisco.com.443 Security Module - 1 (Container)	Base, Threat	acp1
ftd_standalone Snort 3 10.62.148.181 - Routed	Firepower 2120 with FTD	7.1.0	N/A		Base, Threat	acp1

附註：在群集的情況下，僅顯示控制單元的角色。

FMC REST API

在這些輸出中，ftd_ha_1、ftd_ha_2、ftd_standalone、ftd_ha、ftc_cluster1是使用者可配置的裝置名。這些名稱不引用實際的高可用性和可擴充性配置或狀態。

請依照以下步驟操作，透過FMC REST-API驗證FTD高可用性及其可擴充性組態和狀態。使用REST-API客戶端。在此範例中，使用curl:

1. 請求身份驗證令牌：

```
# curl -s -k -v -X POST 'https://192.0.2.1/api/fmc_platform/v1/auth/generatetoken' -H
'Authentication: Basic' -u 'admin:Cisco123' | grep -i X-auth-access-token
< X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb
```

2. 標識包含裝置的域。在大多數REST API查詢中，domain 引數是必需的。使用此查詢中的令牌檢
索域清單：

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_platform/v1/info/domain' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
{
  "items":
  [
    {
      "name": "Global",
      "type": "Domain",
      "uuid": "e276abec-e0f2-11e3-8169-6d9ed49b625f"
    },
    {
      "name": "Global/LAB2",
      "type": "Domain",
      "uuid": "84cc4afe-02bc-b80a-4b09-000000000000"
    },
    ...
  ]
}
```

3. 使用域UUID查詢特定裝置記錄和特定裝置UUID:

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords' -H 'accept: application/json' -H 'X-auth-access-token:
5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
{
  "items": [
    {
      "id": "796eb8f8-d83b-11ec-941d-b9083eb612d8",
      "links": {
        "self": "https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8"
      },
      "name": "ftd_ha_1",
      "type": "Device"
    },
    ...
  ]
}
```

4. 為了驗證故障切換配置，請使用以下查詢中步驟3中的域UUID和裝置/容器UUID:

```
# curl -s -k -X GET 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8' -H 'X-auth-access-
token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
...
"containerDetails": {
  "id": "eec3ddfc-d842-11ec-a15e-986001c83f2f",
  "name": "ftd_ha",
  "type": "DeviceHAPair"
},
...
```

5. 為了驗證故障切換狀態，請使用此查詢中步驟4中的域UUID和DeviceHAPair UUID:

```
# curl -s -k -X GET 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/devicehapairs/ftdddevicehapairs/eec3ddfc-d842-11ec-a15e-986001c83f2f' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
```

```
...
  "primaryStatus": {
    "currentStatus": "Active",
    "device": {
      "id": "796eb8f8-d83b-11ec-941d-b9083eb612d8",
      "keepLocalEvents": false,
      "name": "ftd_ha_1"
    }
  },
  "secondaryStatus": {
    "currentStatus": "Standby",
    "device": {
      "id": "e60ca6d0-d83d-11ec-b407-cdc91a553663",
      "keepLocalEvents": false,
      "name": "ftd_ha_2"
    }
  }
}
...
```

6. 為了驗證群集配置，請在此查詢中使用步驟3中的域UUID和裝置/容器UUID:

```
# curl -s -k -X GET 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/devices/devicerecords/3344bc4a-d842-11ec-a995-817e361f7ea5' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
```

```
...
  "containerDetails": {
    "id": "8e6188c2-d844-11ec-bdd1-6e8d3e226370",
    "links": {
      "self": "https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/deviceclusters/ftdddevicecluster/8e6188c2-d844-11ec-bdd1-6e8d3e226370"
    },
    "name": "ftd_cluster1",
    "type": "DeviceCluster"
  },
  ...
```

7. 要驗證群集狀態，請在此查詢中使用步驟6中的域UUID和裝置/容器UUID:

```
# curl -s -k -X GET 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/deviceclusters/ftdddevicecluster/8e6188c2-d844-11ec-bdd1-6e8d3e226370' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
```

```
{
  "controlDevice": {
    "deviceDetails": {
      "id": "3344bc4a-d842-11ec-a995-817e361f7ea5",
      "name": "10.62.148.188",
      "type": "Device"
    }
  },
  "dataDevices": [
    {
      "deviceDetails": {
        "id": "a7ba63cc-d842-11ec-be51-f3efcd7cd5e5",
        "name": "10.62.148.191",
        "type": "Device"
      }
    }
  ],
  "id": "8e6188c2-d844-11ec-bdd1-6e8d3e226370",
```

```
"name": "ftd_cluster1",  
"type": "DeviceCluster"  
}
```

FDM UI

請按照一節中的步驟操作。

FDM REST-API

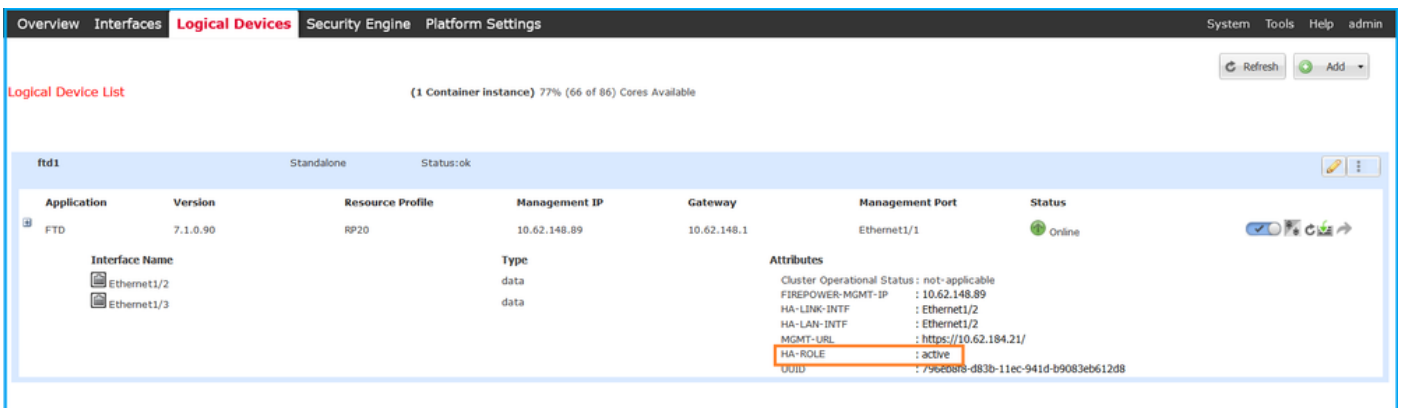
請按照一節中的步驟操作。

FCM UI

FCM UI在Firepower 4100/9300和帶ASA的Firepower 2100平台模式下可用。

按照以下步驟驗證FCM UI上的FTD高可用性和可擴充性狀態：

1.若要確認FTD容錯移轉狀態，請檢查「邏輯裝置」頁面上的HA-ROLE屬性值：



The screenshot shows the 'Logical Device List' in the FCM UI. The device 'ftd1' is in 'Standalone' mode. The 'Attributes' section for the FTD instance shows 'HA-ROLE' as 'active'. The 'Status' is 'Online'.

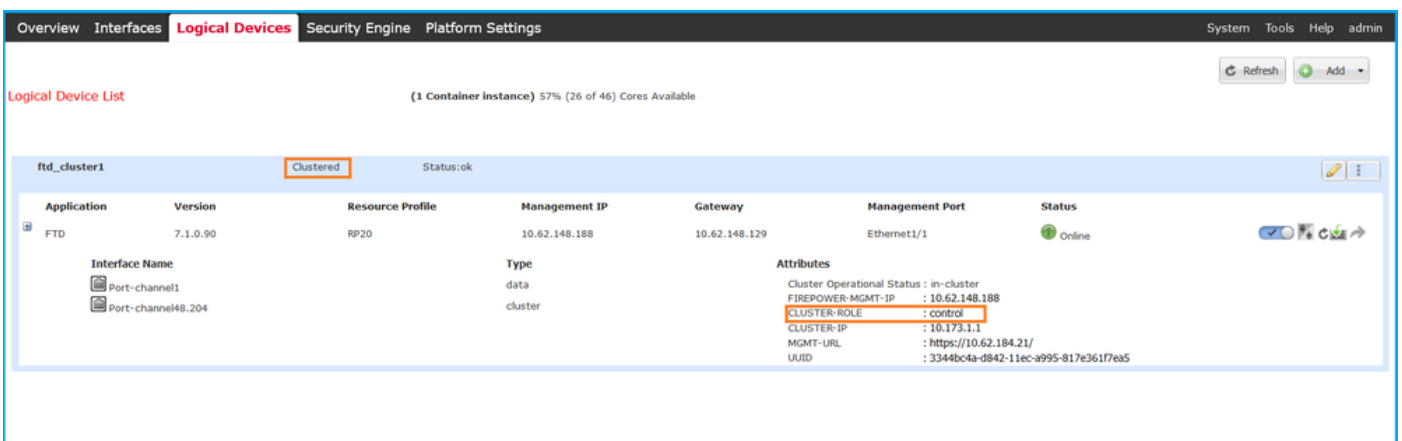
Application	Version	Resource Profile	Management IP	Gateway	Management Port	Status
FTD	7.1.0.90	RP20	10.62.148.89	10.62.148.1	Ethernet1/1	Online

Attributes:

- Cluster Operational Status: not-applicable
- FIREPOWER-MGMT-IP: 10.62.148.89
- HA-LINK-INTF: Ethernet1/2
- HA-LAN-INTF: Ethernet1/2
- MGMT-URL: https://10.62.184.21/
- HA-ROLE: active**
- UUID: 7962086-d83b-11ec-941d-b9083eb612d8

附註：邏輯裝置識別符號旁邊的**Standalone**標籤是指機箱邏輯裝置配置，而不是FTD故障切換配置。

2.要驗證FTD集群配置和狀態，請檢查「邏輯裝置」頁上的**集群**標籤和**CLUSTER-ROLE**屬性值：



The screenshot shows the 'Logical Device List' in the FCM UI. The device 'ftd_cluster1' is in 'Clustered' mode. The 'Attributes' section for the FTD instance shows 'CLUSTER-ROLE' as 'control'. The 'Status' is 'Online'.

Application	Version	Resource Profile	Management IP	Gateway	Management Port	Status
FTD	7.1.0.90	RP20	10.62.148.188	10.62.148.129	Ethernet1/1	Online

Attributes:

- Cluster Operational Status: in-cluster
- FIREPOWER-MGMT-IP: 10.62.148.188
- CLUSTER-ROLE: control**
- CLUSTER-IP: 10.173.1.1
- MGMT-URL: https://10.62.184.21/
- UUID: 3344bc4a-d842-11ec-a995-817e361f7ea5

FXOS CLI

Firepower 4100/9300上提供了FTD高可用性和可擴充性配置以及FXOS CLI上的狀態驗證。

按照以下步驟驗證FXOS CLI上的FTD高可用性及其可擴充性組態和狀態：

1. 建立到機箱的控制檯或SSH連線。

2. 若要確認FTD高可用性狀態，請運行**scope ssa** 命令，然後運行**scope slot <x>**以切換到運行FTD的特定插槽，並運行**show app-instance expand** 命令：

```
firepower # scope ssa
firepower /ssa # scope slot 1
firepower /ssa/slot # show app-instance expand
```

Application Instance:

```
App Name: ftd
Identifier: ftd1
Admin State: Enabled
Oper State: Online
Running Version: 7.1.0.90
Startup Version: 7.1.0.90
Deploy Type: Container
Turbo Mode: No
Profile Name: RP20
Cluster State: Not Applicable
Cluster Role: None
```

App Attribute:

```
App Attribute Key Value
-----
firepower-mgmt-ip 192.0.2.5
ha-lan-intf        Ethernet1/2
ha-link-intf       Ethernet1/2
ha-role           active
mgmt-url           https://192.0.2.1/
uuid               796eb8f8-d83b-11ec-941d-b9083eb612d8
```

...

3. 若要驗證FTD叢集組態和狀態，請執行**scope ssa** 指令，執行**show logical-device <name> detail expand** 指令（其中名稱為邏輯裝置名稱），以及**show app-instance** 指令。檢查特定插槽的輸出：

```
firepower # scope ssa
firepower /ssa # show logical-device ftd_cluster1 detail expand
```

Logical Device:

```
Name: ftd_cluster1
Description:
Slot ID: 1
Mode: Clustered
Oper State: Ok
Template Name: ftd
Error Msg:
Switch Configuration Status: Ok
Sync Data External Port Link State with FTD: Disabled
Current Task:
```

...

```
firepower /ssa # show app-instance
```

```
App Name  Identifier Slot ID  Admin State Oper State  Running Version Startup Version
Deploy Type Turbo Mode Profile Name Cluster State  Cluster Role
```

```
-----
```

ftd	ftd_cluster1 1	Enabled	Online	7.1.0.90	7.1.0.90
Container	No	RP20	In Cluster	Master	

FXOS REST API

Firepower 4100/9300支援FXOS REST-API。

按照以下步驟通過FXOS REST-API請求驗證FTD高可用性和可擴充性配置和狀態。使用REST-API客戶端。在此範例中，使用curl:

1.請求身份驗證令牌：

```
# curl -k -X POST -H 'USERNAME: admin' -H 'PASSWORD: Cisco123' 'https://192.0.2.100/api/login'
{
  "refreshPeriod": "0",
  "token": "3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d"
}
```

2.若要確認FTD容錯移轉狀態，請使用以下查詢中的權杖和插槽ID:

```
# curl -s -k -X GET -H 'Accept: application/json' -H 'token:
3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d'
'https://192.0.2.100/api/slot/1/app-inst'
...
{
  "smAppInstance": [
    {
      "adminState": "enabled",
      "appDn": "sec-svc/app-ftd-7.1.0.90",
      "appInstId": "ftd_001_JAD201200R43VLP1G3",
      "appName": "ftd",
      "clearLogData": "available",
      "clusterOperationalState": "not-applicable",
      "clusterRole": "none",
      "currentJobProgress": "100",
      "currentJobState": "succeeded",
      "currentJobType": "start",
      "deployType": "container",
      "dn": "slot/1/app-inst/ftd-ftd1",
      "errorMsg": "",
      "eventMsg": "",
      "executeCmd": "ok",
      "externallyUpgraded": "no",
      "fsmDescr": "",
      "fsmProgr": "100",
      "fsmRmtInvErrCode": "none",
      "fsmRmtInvErrDescr": "",
      "fsmRmtInvRslt": "",
      "fsmStageDescr": "",
      "fsmStatus": "nop",
      "fsmTry": "0",
      "hotfix": "",
      "identifier": "ftd1",
      "operationalState": "online",
      "reasonForDebundle": "",
      "resourceProfileName": "RP20",
      "runningVersion": "7.1.0.90",
      "smAppAttribute": [
        {
          "key": "firepower-mgmt-ip",
          "rn": "app-attribute-firepower-mgmt-ip",
          "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftd1/app/attribute-firepower-mgmt-ip",
          "value": "192.0.2.5"
        },
        {
          "key": "ha-link-intf",
          "rn": "app-attribute-ha-link-intf",
          "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftd1/app/attribute-ha-link-intf",
          "value": "Ethernet1/2"
        },
        {
          "key": "ha-lan-intf",
          "rn": "app-attribute-ha-lan-intf",
          "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftd1/app/attribute-
```



```

ha-lan-intf",
    "value": "Ethernet1/2"
  },
  {
    "key": "mgmt-url",
    "rn": "app-attribute-mgmt-url",
    "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftdl/app/attribute-
mgmt-url",
    "value": "https://192.0.2.1/"
  },
  {
    "key": "ha-role",
    "rn": "app-attribute-ha-role",
    "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftdl/app/attribute-
ha-role",
    "value": "active"
  },
  {
    "key": "uuid",
    "rn": "app-attribute-uuid",
    "urllink": "https://192.0.2.100/api/slot/1/app/inst/ftd-ftdl/app/attribute-
uuid",
    "value": "796eb8f8-d83b-11ec-941d-b9083eb612d8"
  }
],
...

```

3. 要驗證FTD集群配置，請在此查詢中使用邏輯裝置識別符號：

```

# curl -s -k -X GET -H 'Accept: application/json' -H 'token:
3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d'
'https://192.0.2.102/api/ld/ftd_cluster1'
{
  "smLogicalDevice": [
    {
      "description": "",
      "dn": "ld/ftd_cluster1",
      "errorMsg": "",
      "fsmDescr": "",
      "fsmProgr": "100",
      "fsmRmtInvErrCode": "none",
      "fsmRmtInvErrDescr": "",
      "fsmRmtInvRslt": "",
      "fsmStageDescr": "",
      "fsmStatus": "nop",
      "fsmTaskBits": "",
      "fsmTry": "0",
      "ldMode": "clustered",
      "linkStateSync": "disabled",
      "name": "ftd_cluster1",
      "operationalState": "ok",
      "slotId": "1",
      "smClusterBootstrap": [
        {
          "cclNetwork": "10.173.0.0",
          "chassisId": "1",
          "gatewayv4": "0.0.0.0",
          "gatewayv6": ":::",
          "key": "",
          "mode": "spanned-etherchannel",
          "name": "ftd_cluster1",
          "netmaskv4": "0.0.0.0",
          "poolEndv4": "0.0.0.0",
          "poolEndv6": ":::",
          "poolStartv4": "0.0.0.0",
          "poolStartv6": ":::",
          "prefixLength": "",
          "rn": "cluster-
bootstrap",
          "siteId": "1",
          "supportCclSubnet":
"supported",
          "updateTimestamp": "2022-05-20T13:38:21.872",
          "urllink": "https://192.0.2.101/api/ld/ftd_cluster1/cluster-bootstrap",
          "virtualIPv4": "0.0.0.0",
          "virtualIPv6": ":::"
        }
      ], ...
    }
  ]
}

```

4.要驗證FTD集群狀態，請使用以下查詢：

```
# curl -s -k -X GET -H 'Accept: application/json' -H 'token:
3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d'
'https://192.0.2.102/api/slot/1/app-inst'
{
  "smAppInstance": [
    {
      "adminState": "enabled",
      "appDn": "sec-svc/app-ftd-7.1.0.90",
      "appInstId": "ftd_001_JAD19500BABIYA30058",
      "appName": "ftd",
      "clearLogData": "available",
      "clusterOperationalState": "in-cluster",
      "clusterRole": "master",
      "currentJobProgress": "100",
      "currentJobState": "succeeded",
      "currentJobType": "start",
      "deployType": "container",
      "dn": "slot/1/app-inst/ftd-ftd_cluster1",
      "errorMsg": "",
      "eventMsg": "",
      "executeCmd": "ok",
      "externallyUpgraded": "no",
      "fsmDescr": "",
      "fsmProgr": "100",
      "fsmRmtInvErrCode": "none",
      "fsmRmtInvErrDescr": "",
      "fsmRmtInvRslt": "",
      "fsmStageDescr": "",
      "fsmStatus": "nop",
      "fsmTry": "0",
      "hotfix": "",
      "identifier": "ftd_cluster1",
      "operationalState": "online",
      "reasonForDebundle": "",
      "resourceProfileName": "RP20",
      "runningVersion": "7.1.0.90",
      ...
    }
  ]
}
```

FXOS機箱show-tech檔案

FTD高可用性及可擴充性組態和狀態可在Firepower 4100/9300機箱show-tech檔案中驗證。

按照以下步驟驗證FXOS機箱show-tech檔案中的高可用性和可擴充性配置和狀態：

1. 對於FXOS 2.7及更高版本，請在
<name>_BC1_all.tar/FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar中開啟
sam_techsupportinfo 檔案

對於早期版本，請在FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar中開啟
sam_techsupportinfo 文件。

2. 為了驗證故障轉移狀態，請檢查「show slot expand detail」一節中特定插槽下的ha-role屬性值：

```
# pwd
/var/tmp/20220313201802_F241-01-11-FPR-2_BC1_all/FPRM_A_TechSupport/
# cat sam_techsupportinfo
```

...

``show slot expand detail``

Slot:

Slot ID: 1

Log Level: Info

Admin State: Ok

Oper State: Online

Disk Format State: Ok

Disk Format Status: 100%

Clear Log Data: Available

Error Msg:

Application Instance:

App Name: ftd

Identifier: ftd1

Admin State: Enabled

Oper State: Online

Running Version: 7.1.0.90

Startup Version: 7.1.0.90

Deploy Type: Container

Turbo Mode: No

Profile Name: RP20

Hotfixes:

Externally Upgraded: No

Cluster State: Not Applicable

Cluster Role: None

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: firepower-mgmt-ip

Value: 10.62.148.89

App Attribute Key: ha-lan-intf

Value: Ethernet1/2

App Attribute Key: ha-link-intf

Value: Ethernet1/2

App Attribute Key: ha-role

Value: active

App Attribute Key: mgmt-url

Value: https://10.62.184.21/

3.為了驗證FTD叢集組態，請檢查「`show logical-device detail expand`」一節中特定插槽下的**Mode**屬性值:

``show logical-device detail expand``

Logical Device:

Name: ftd_cluster1

Description:

Slot ID: 1

Mode: Clustered

Oper State: Ok

Template Name: ftd

Error Msg:

Switch Configuration Status: Ok

Sync Data External Port Link State with FTD: Disabled
Current Task:

Cluster Bootstrap:

Name of the cluster: ftd_cluster1
Mode: Spanned Etherchannel
Chassis Id: 1
Site Id: 1
Key:
Cluster Virtual IP: 0.0.0.0
IPv4 Netmask: 0.0.0.0
IPv4 Gateway: 0.0.0.0
Pool Start IPv4 Address: 0.0.0.0
Pool End IPv4 Address: 0.0.0.0
Cluster Virtual IPv6 Address: ::
IPv6 Prefix Length:
IPv6 Gateway: ::
Pool Start IPv6 Address: ::
Pool End IPv6 Address: ::
Last Updated Timestamp: 2022-05-20T13:38:21.872
Cluster Control Link Network: 10.173.0.0

...

4.為了驗證FTD集群狀態，請檢查「show slot expand detail」部分中特定插槽下的**集群狀態**和**集群角色屬性值**:

```
`show slot expand detail`
```

Slot:

Slot ID: 1

Log Level: Info
Admin State: Ok
Oper State: Online
Disk Format State: Ok
Disk Format Status:
Clear Log Data: Available
Error Msg:

Application Instance:

App Name: ftd
Identifier: ftd_cluster1
Admin State: Enabled
Oper State: Online
Running Version: 7.1.0.90
Startup Version: 7.1.0.90
Deploy Type: Native
Turbo Mode: No
Profile Name:
Hotfixes:
Externally Upgraded: No
Cluster State: In Cluster
Cluster Role: Master
Current Job Type: Start
Current Job Progress: 100
Current Job State: Succeeded
Clear Log Data: Available
Error Msg:
Current Task:

ASA高可用性和可擴充性

可以使用以下選項驗證ASA高可用性和可擴充性配置和狀態：

- ASA CLI
- ASA SNMP輪詢
- ASA show-tech檔案
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS機箱show-tech檔案

ASA CLI

按照以下步驟驗證ASA CLI上的ASA高可用性和可擴充性配置：

1. 根據平台和部署模式，使用以下選項訪問ASA CLI:

- 在裝置模式下直接通過telnet/SSH訪問Firepower 1000/3100和Firepower 2100上的ASA
- 在平台模式下從Firepower 2100上的FXOS控制檯CLI訪問，並使用**connect asa** 命令連線到ASA
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：
connect module <x> [console|telnet]，其中x是插槽ID，然後連接asa
- 對於虛擬ASA，直接通過SSH訪問ASA，或者通過虛擬機器監控程式或雲UI進行控制檯訪問

2. 為了驗證ASA故障切換配置和狀態，請在ASA CLI上運行**show running-config failover**和**show failover state**命令。

如果未配置故障轉移，將顯示以下輸出：

```
asa# show running-config failover
no failover
asa# show failover state

```

	State	Last Failure Reason	Date/Time
This host -	Secondary		
	Disabled	None	
Other host -	Primary		
	Not Detected	None	

```
====Configuration State===
====Communication State==
```

如果配置了故障轉移，將顯示以下輸出：

```
asa# show running-config failover
failover failover lan unit primary
failover lan interface failover-link Ethernet1/1
failover replication http
failover link failover-link Ethernet1/1
failover interface ip failover-link 10.30.35.2 255.255.255.0 standby 10.30.35.3

# show failover state

```

	State	Last Failure Reason	Date/Time
This host -	Primary		
	Active	None	
Other host -	Secondary		

```
====Configuration State====
```

```
Sync Done
```

```
====Communication State====
```

```
Mac set
```

3.為了驗證ASA群集配置和狀態，請在CLI上運行**show running-config cluster**和**show cluster info**命令。

如果未配置集群，將顯示以下輸出：

```
asa# show running-config cluster
```

```
asa# show cluster info
```

```
Clustering is not configured
```

如果已配置集群，則顯示以下輸出：

```
asa# show running-config cluster
```

```
cluster group asa_cluster1
```

```
key *****
```

```
local-unit unit-1-1
```

```
cluster-interface Port-channel48.205 ip 10.174.1.1 255.255.0.0
```

```
priority 9
```

```
health-check holdtime 3
```

```
health-check data-interface auto-rejoin 3 5 2
```

```
health-check cluster-interface auto-rejoin unlimited 5 1
```

```
health-check system auto-rejoin 3 5 2
```

```
health-check monitor-interface debounce-time 500
```

```
site-id 1
```

```
no unit join-acceleration
```

```
enable
```

```
asa# show cluster info
```

```
Cluster asa_cluster1: On
```

```
Interface mode: spanned
```

```
Cluster Member Limit : 16
```

```
This is "unit-1-1" in state MASTER
```

```
ID : 0
```

```
Site ID : 1
```

```
Version : 9.17(1)
```

```
Serial No.: FLM2949C5232IT
```

```
CCL IP : 10.174.1.1
```

```
CCL MAC : 0015.c500.018f
```

```
Module : FPR4K-SM-24
```

```
...
```

ASA SNMP

按照以下步驟通過SNMP驗證ASA高可用性和可擴充性配置：

1. 確保已配置並啟用SNMP。

2. 為了驗證故障切換配置和狀態輪詢OID **.1.3.6.1.4.1.9.9.147.1.2.1.1.1**。

如果未配置故障轉移，將顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.10 .1.3.6.1.4.1.9.9.147.1.2.1.1.1
```

```
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.4 = STRING: "Failover LAN Interface"
```

```
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.6 = STRING: "Primary unit"
```

```
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.7 = STRING: "Secondary unit (this device)"
```

```
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.4 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.6 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.7 = INTEGER: 3
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.4 = STRING: "not Configured"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.6 = STRING: "Failover Off"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.7 = STRING: "Failover Off"
```

如果配置了故障轉移，將顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.10 .1.3.6.1.4.1.9.9.147.1.2.1.1.1
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.4 = STRING: "Failover LAN Interface"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.6 = STRING: "Primary unit (this device)" <--
This device is primary
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.2.7 = STRING: "Secondary unit"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.4 = INTEGER: 2
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.6 = INTEGER: 9
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.3.7 = INTEGER: 10
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.4 = STRING: "fover Ethernet1/2"
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.6 = STRING: "Active unit" <--
Primary device is active
SNMPv2-SMI::enterprises.9.9.147.1.2.1.1.1.4.7 = STRING: "Standby unit"
```

3.為了驗證群集配置和狀態，請查詢OID 1.3.6.1.4.1.9.9.491.1.8.1。

如果未配置集群，將顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 192.0.2.12 .1.3.6.1.4.1.9.9.491.1.8.1
SNMPv2-SMI::enterprises.9.9.491.1.8.1.1.0 = INTEGER: 0
```

如果已配置但未啟用集群，則顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.12 .1.3.6.1.4.1.9.9.491.1.8.1
.1.3.6.1.4.1.9.9.491.1.8.1.1.0 = INTEGER: 0 <-- Cluster status, disabled
.1.3.6.1.4.1.9.9.491.1.8.1.2.0 = INTEGER: 1
.1.3.6.1.4.1.9.9.491.1.8.1.3.0 = INTEGER: 0 <-- Cluster unit state, disabled
.1.3.6.1.4.1.9.9.491.1.8.1.4.0 = INTEGER: 11
.1.3.6.1.4.1.9.9.491.1.8.1.5.0 = STRING: "asa_cluster1" <-- Cluster group name
.1.3.6.1.4.1.9.9.491.1.8.1.6.0 = STRING: "unit-1-1" <-- Cluster unit name
.1.3.6.1.4.1.9.9.491.1.8.1.7.0 = INTEGER: 0 <-- Cluster unit ID
.1.3.6.1.4.1.9.9.491.1.8.1.8.0 = INTEGER: 1 <-- Cluster side ID
...
```

如果群集已配置、已啟用且運行正常，則顯示以下輸出：

```
# snmpwalk -v2c -c cisco123 -On 192.0.2.12 .1.3.6.1.4.1.9.9.491.1.8.1
.1.3.6.1.4.1.9.9.491.1.8.1.1.0 = INTEGER: 1 <-- Cluster status, enabled
.1.3.6.1.4.1.9.9.491.1.8.1.2.0 = INTEGER: 1
.1.3.6.1.4.1.9.9.491.1.8.1.3.0 = INTEGER: 16 <-- Cluster unit state, control unit
.1.3.6.1.4.1.9.9.491.1.8.1.4.0 = INTEGER: 10
.1.3.6.1.4.1.9.9.491.1.8.1.5.0 = STRING: "asa_cluster1" <-- Cluster group name
.1.3.6.1.4.1.9.9.491.1.8.1.6.0 = STRING: "unit-1-1" <-- Cluster unit name
.1.3.6.1.4.1.9.9.491.1.8.1.7.0 = INTEGER: 0 <-- Cluster unit ID
.1.3.6.1.4.1.9.9.491.1.8.1.8.0 = INTEGER: 1 <-- Cluster side ID
...
```

有關OID描述的詳細資訊，請參閱[CISCO-UNIFIED-FIREWALL-MIB](#)。

ASA show-tech檔案

1. 要驗證ASA故障切換配置和狀態，請檢查show failover 部分。

如果未配置故障轉移，將顯示以下輸出：

```
----- show failover -----  
  
Failover Off  
Failover unit Secondary  
Failover LAN Interface: not Configured  
Reconnect timeout 0:00:00  
Unit Poll frequency 1 seconds, holdtime 15 seconds  
Interface Poll frequency 5 seconds, holdtime 25 seconds  
Interface Policy 1  
Monitored Interfaces 3 of 1292 maximum  
MAC Address Move Notification Interval not set
```

如果配置了故障轉移，將顯示以下輸出：

```
----- show failover -----  
  
Failover On  
Failover unit Primary  
Failover LAN Interface: fover Ethernet1/2 (up)  
Reconnect timeout 0:00:00  
Unit Poll frequency 1 seconds, holdtime 15 seconds  
Interface Poll frequency 5 seconds, holdtime 25 seconds  
Interface Policy 1  
Monitored Interfaces 1 of 1291 maximum  
MAC Address Move Notification Interval not set  
failover replication http  
Version: Ours 9.17(1), Mate 9.17(1)  
Serial Number: Ours FLM2006EN9AB11, Mate FLM2006EQZY02  
Last Failover at: 13:45:46 UTC May 20 2022  
    This host: Primary - Active  
        Active time: 161681 (sec)  
        slot 0: UCSB-B200-M3-U hw/sw rev (0.0/9.17(1)) status (Up Sys)  
    Other host: Secondary - Standby Ready  
        Active time: 0 (sec)  
        slot 0: UCSB-B200-M3-U hw/sw rev (0.0/9.17(1)) status (Up Sys)  
...
```

2. 若要驗證群集配置和狀態，請檢查show cluster info 部分。

如果未配置集群，將顯示以下輸出：

```
----- show cluster info -----  
Clustering is not configured
```

如果已配置並啟用集群，則顯示以下輸出：

```
----- show cluster info -----  
Cluster asa_cluster1: On  
    Interface mode: spanned  
Cluster Member Limit : 16  
    This is "unit-1-1" in state MASTER  
        ID          : 0  
        Site ID    : 1  
        Version    : 9.17(1)  
        Serial No.: FLM2949C5232IT
```


CCL IP : 10.174.1.1
CCL MAC : 0015.c500.018f
Module : FPR4K-SM-24

...

FCM UI

請按照一節中的步驟操作。

FXOS CLI

請按照一節中的步驟操作。

FXOS REST-API

請按照一節中的步驟操作。

FXOS機箱show-tech檔案

請按照一節中的步驟操作。

驗證防火牆模式

FTD防火牆模式

防火牆模式是指路由或透明防火牆配置。

可以使用以下選項驗證FTD防火牆模式：

- FTD CLI
- FTD show-tech
- FMC UI
- FMC REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS機箱show-tech檔案

附註： FDM不支援透明模式。

FTD CLI

執行以下步驟驗證FTD CLI上的FTD防火牆模式：

1. 根據平台和部署模式，使用以下選項訪問FTD CLI:

- 直接通過SSH訪問FTD — 所有平台
- 通過**connect ftd**指令，從FXOS主控台CLI(Firepower 1000/2100/3100)進行存取
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：

connect module <x> [console|telnet]，其中x是插槽ID，然後

連線ftd [例項],其中例項僅與多例項部署相關。

- 對於虛擬FTD，直接通過SSH訪問FTD，或透過虛擬機器監控程式或雲使用者介面進行主控台訪問

2.若要驗證防火牆模式，請在CLI上執行show firewall命令：

```
> show firewall
Firewall mode: Transparent
```

FTD疑難排解檔案

執行以下步驟驗證FTD疑難排解檔案中的FTD防火牆模式：

1.開啟故障排除檔案，導航到資料夾<filename>-troubleshoot .tar/results-<date>—xxxxxx/command-output。

2.開啟文件usr-local-sf-bin-sfcli.pl show_tech_support asa_lina_cli_util.output:

```
# pwd
/ngfw/var/common/results-05-22-2022--102758/command-outputs
# cat 'usr-local-sf-bin-sfcli.pl show_tech_support asa_lina_cli_util.output'
```

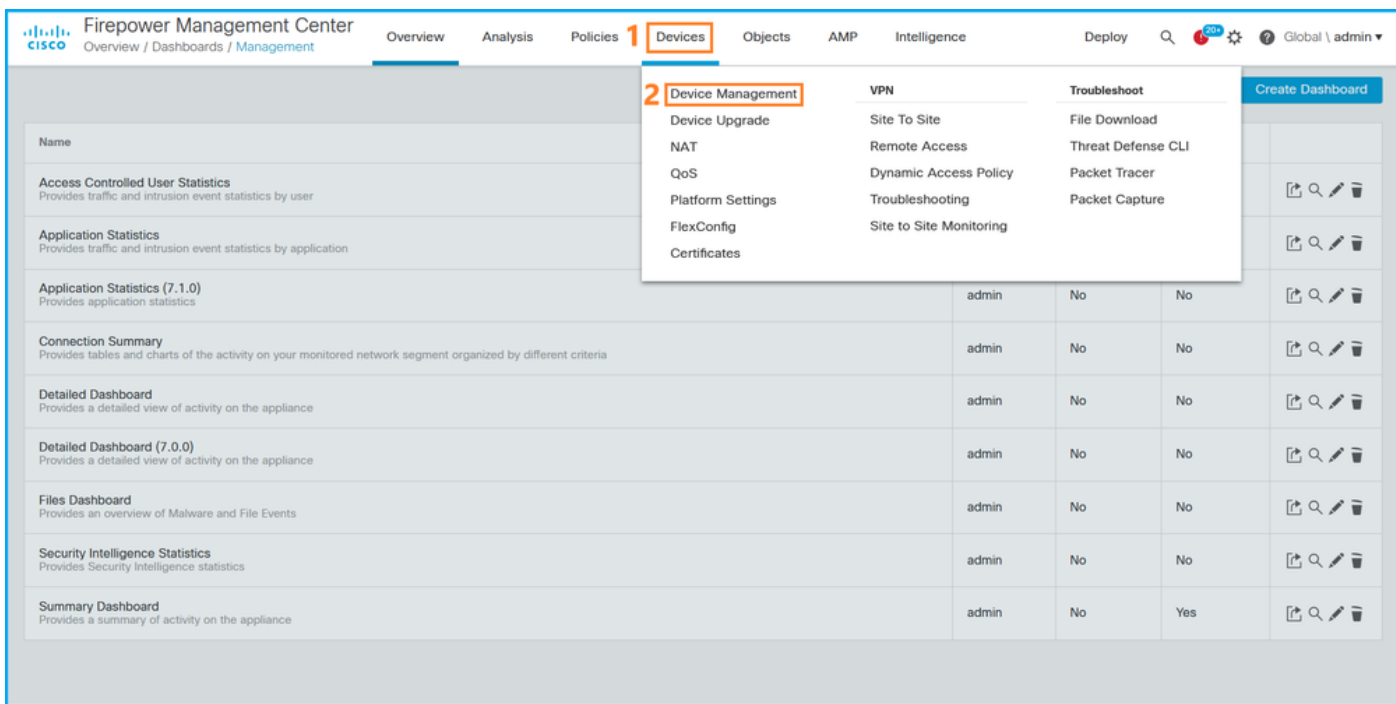
3.若要確認FTD防火牆模式，請檢查show firewall 一節：

```
----- show firewall -----
Firewall mode: Transparent
```

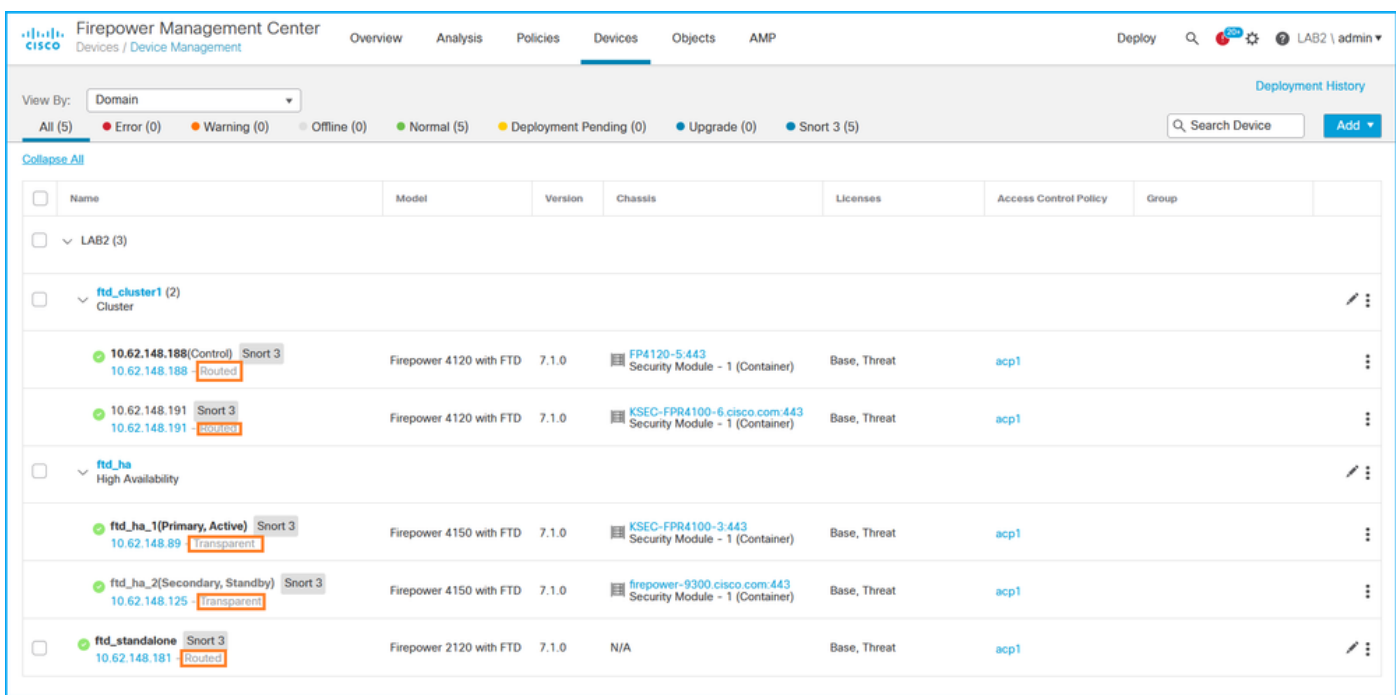
FMC UI

按照以下步驟驗證FMC UI上的FTD防火牆模式：

1.選擇Devices > Device Management:



2. 檢查Routed或Transparent標籤：



FMC REST-API

請依照以下步驟操作，透過FMC REST-API驗證FTD防火牆模式。使用REST-API客戶端。在此範例中，使用curl:

1. 請求身份驗證令牌：

```
# curl -s -k -v -X POST 'https://192.0.2.1/api/fmc_platform/v1/auth/generatetoken' -H
'Authentication: Basic' -u 'admin:Cisco123' | grep -i X-auth-access-token
< X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb
```

2. 標識包含裝置的域。在大多數REST API查詢中，domain 引數是必需的。使用此查詢中的令牌檢索域清單：

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_platform/v1/info/domain' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
{
  "items":
  [
    {
      "name": "Global",
      "type": "Domain",
      "uuid": "e276abec-e0f2-11e3-8169-6d9ed49b625f"
    },
    {
      "name": "Global/LAB2",
      "type": "Domain",
      "uuid": "84cc4afe-02bc-b80a-4b09-000000000000"
    },
    ...
  ]
}
```

3.使用域UUID查詢特定裝置記錄和特定裝置UUID:

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords' -H 'accept: application/json' -H 'X-auth-access-token:
5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
{
  "items": [
    {
      "id": "796eb8f8-d83b-11ec-941d-b9083eb612d8",
      "links": {
        "self": "https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8"
      },
      "name": "ftd_ha_1",
      "type": "Device"
    },
    ...
  ]
}
```

4.在此查詢中使用步驟3中的域UUID和裝置/容器UUID，並檢查ftdMode的值：

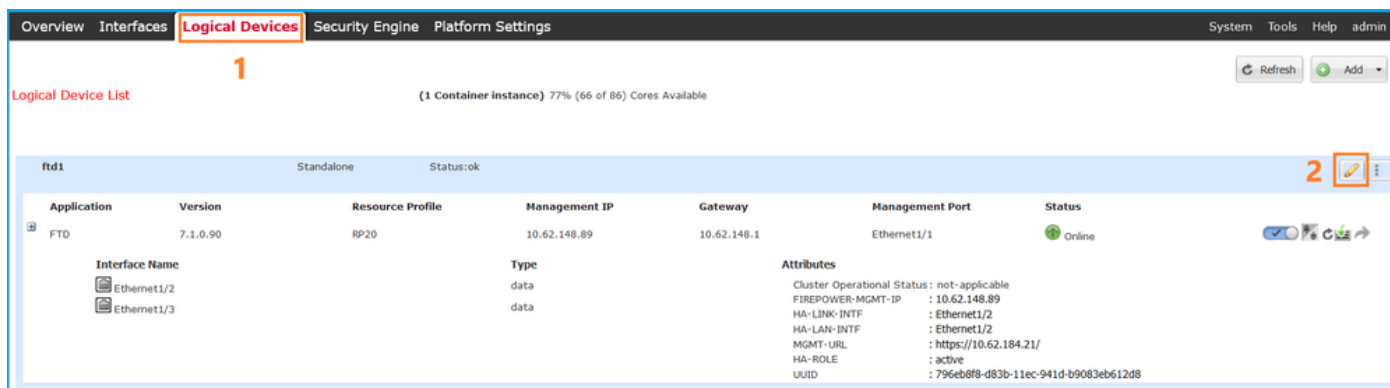
```
# curl -s -k -X 'GET' 'https://192.0.2.1./api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
...
{
  "accessPolicy": {
    "id": "00505691-3a23-0ed3-0006-536940224514",
    "name": "acpl",
    "type": "AccessPolicy"
  },
  "advanced": {
    "enableOGS": false
  },
  "description": "NOT SUPPORTED",
  "ftdMode": "ROUTED",
  ...
}
```

FCM UI

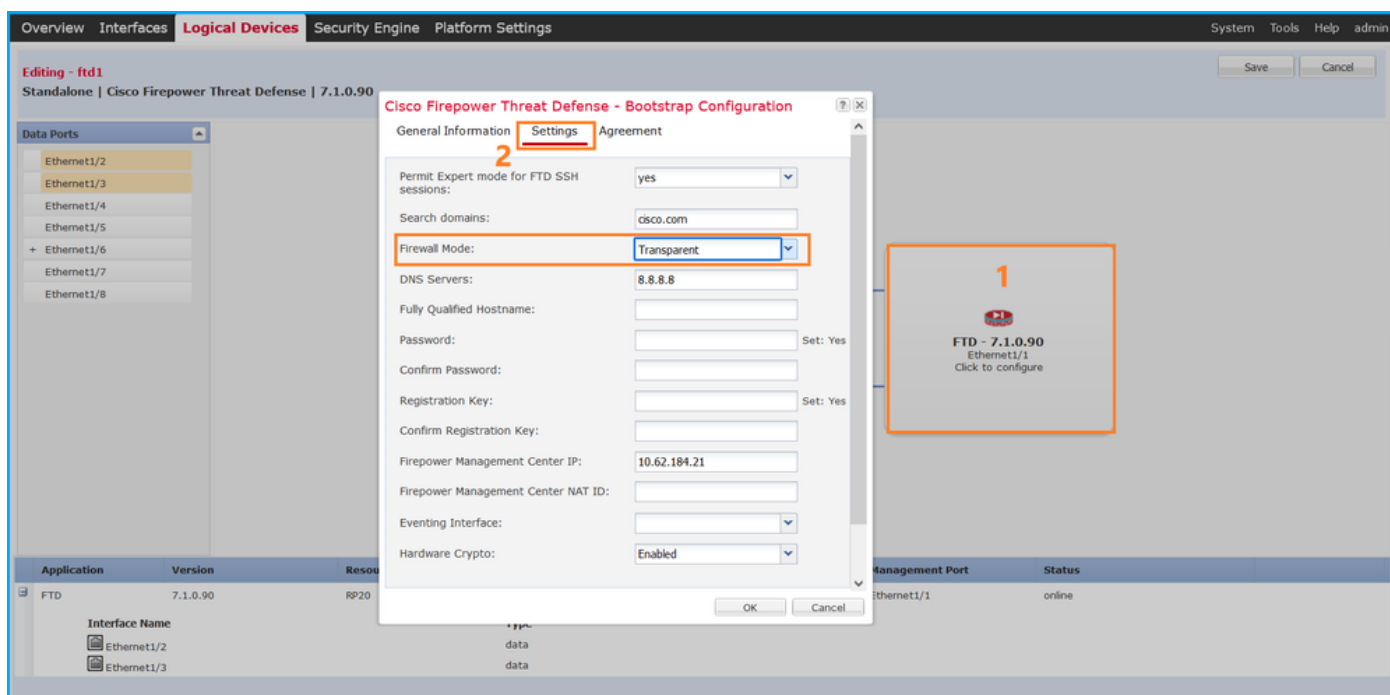
您可以在Firepower 4100/9300上驗證FTD的防火牆模式。

按照以下步驟驗證FCM UI上的FTD防火牆模式：

1.在Logical Devices (邏輯裝置) 頁面上編輯邏輯裝置：



2.按一下應用程式圖示，然後在「設定」頁籤中選中防火牆模式：



FXOS CLI

您可以在Firepower 4100/9300上驗證FTD的防火牆模式。

請依照以下步驟在FXOS CLI上驗證FTD防火牆模式：

1. 建立到機箱的控制檯或SSH連線。
2. 切換到作用域sa，然後切換到特定的邏輯裝置，運行show mgmt-bootstrap expand 命令，並檢查FIREWALL_MODE屬性值：

```
firepower# scope ssa
firepower /ssa # scope logical-device ftd_cluster1
firepower /ssa/logical-device # show mgmt-bootstrap expand
```

```
Management Configuration:
  App Name: ftd
```

Secret Bootstrap Key:

```
Key Value
-----
PASSWORD
REGISTRATION_KEY
```

IP v4:

Slot ID	Management Sub Type	IP Address	Netmask	Gateway	Last Updated Timestamp
1	Firepower	10.62.148.188	255.255.255.128	10.62.148.129	2022-05-20T13:50:06.238

Bootstrap Key:

```
Key Value
-----
DNS_SERVERS 192.0.2.250
FIREPOWER_MANAGER_IP 10.62.184.21
FIREWALL_MODE routed
PERMIT_EXPERT_MODE yes
SEARCH_DOMAINS cisco.com
```

...

FXOS REST API

Firepower 4100/9300支援FXOS REST-API。

請依照以下步驟操作，透過FXOS REST-API要求驗證FTD防火牆模式。使用REST-API客戶端。在此範例中，使用curl:

1. 請求身份驗證令牌：

```
# curl -k -X POST -H 'USERNAME: admin' -H 'PASSWORD: Cisco123'
https://192.0.2.100/api/ld/ftd_cluster1
{
  "refreshPeriod": "0",
  "token": "3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d"
}
```

2. 使用此查詢中的邏輯裝置識別符號並檢查FIREWALL_MODE鍵的值：

```
# curl -s -k -X GET -H 'Accept: application/json' -H 'token:
3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d'
https://192.0.2.100/api/ld/ftd_cluster1
...
  {
    "key": "FIREWALL_MODE",
    "rn": "key-FIREWALL_MODE",
    "updateTimestamp": "2022-05-20T13:28:37.093",
    "urllink": "https://192.0.2.100/api/ld/ftd_cluster1/mgmt-
bootstrap/ftd/key/FIREWALL_MODE",
    "value": "routed"
  },
...
```

FXOS機箱show-tech檔案

FTD的防火牆模式可在Firepower 4100/9300的show-tech檔案中驗證。

按照以下步驟驗證FXOS機箱show-tech檔案中的FTD防火牆模式：

1. 對於FXOS 2.7及更高版本，請在<name>_BC1_all.tar/
FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar中開啟sam_techsupportinfo 檔案
對於早期版本，請在FPRM_A_TechSupport.tar.gz/ FPRM_A_TechSupport.tar中開啟
sam_techsupportinfo 檔案。

2. 檢查特定識別符號和插槽下的show logical-device detail expand部分：

```
# pwd
/var/tmp/20220313201802_F241-01-11-FPR-2_BC1_all/FPRM_A_TechSupport/

# cat sam_techsupportinfo
...
`show logical-device detail expand`
Logical Device:      Name: ftd_cluster1
  Description:
    Slot ID: 1
  Mode: Clustered
  Oper State: Ok
  Template Name: ftd
  Error Msg:
  Switch Configuration Status: Ok
  Sync Data External Port Link State with FTD: Disabled
  Current Task:
...
  Bootstrap Key:
    Key: DNS_SERVERS
    Value: 192.0.2.250
    Last Updated Timestamp: 2022-05-20T13:28:37.093

    Key: FIREPOWER_MANAGER_IP
    Value: 10.62.184.21
    Last Updated Timestamp: 2022-05-20T13:28:37.093

    Key: FIREWALL_MODE
    Value: routed
    Last Updated Timestamp: 2022-05-20T13:28:37.093
...
```

ASA防火牆模式

可以使用以下選項驗證ASA防火牆模式：

- ASA CLI
- ASA show-tech
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS機箱show-tech檔案

ASA CLI

按照以下步驟驗證ASA CLI上的ASA防火牆模式：

1. 根據平台和部署模式，使用以下選項訪問ASA CLI:

- 在裝置模式下直接通過telnet/SSH訪問Firepower 1000/3100和Firepower 2100上的ASA
- 在平台模式下從Firepower 2100上的FXOS控制檯CLI訪問，並使用**connect asa** 命令連線到ASA
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：
connect module <x> [console|telnet]，其中x是插槽ID，然後連接asa
- 對於虛擬ASA，直接通過SSH訪問ASA，或者通過虛擬機器監控程式或雲UI進行控制檯訪問

2.在CLI上執行**show firewall**命令：

```
asa# show firewall
Firewall mode: Routed
```

ASA show-tech檔案

要驗證ASA防火牆模式，請檢查**show firewall** 部分：

```
----- show firewall -----
Firewall mode: Routed
```

FCM UI

請按照一節中的步驟操作。

FXOS CLI

請按照一節中的步驟操作。

FXOS REST-API

請按照一節中的步驟操作。

FXOS機箱show-tech檔案

請按照一節中的步驟操作。

驗證例項部署型別

有兩種應用程式例項部署型別：

- 本機例項 — 本機例項使用安全模組/引擎的所有資源（CPU、RAM和磁碟空間），因此您只能安裝一個本機例項。
- 容器例項 — 容器例項使用安全模組/引擎的資源子集。只有FMC管理的FTD支援多例項功能；asa或由FDM管理的FTD不支援此功能。

只有Firepower 4100/9300上的FTD支援容器模式例項組態。

可以使用以下選項驗證例項部署型別：

- FTD CLI
- FTD顯示技術
- FMC UI
- FMC REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS機箱show-tech檔案

FTD CLI

請依照以下步驟操作，驗證FTD CLI上的FTD執行個體部署型別：

1. 根據平台和部署模式，使用以下選項訪問FTD CLI:

- 直接通過SSH訪問FTD — 所有平台
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：

`connect module <x> [console|telnet]`,其中x是插槽ID，然後`connect ftd [instance]`，其中例項僅與多例項部署相關。

2. 運行`show version system`命令，並檢查包含字串**SSP Slot Number**的行。如果此行存在**Container**，則FTD會在容器模式下執行：

```
> show version system
-----[ firepower ]-----
Model                : Cisco Firepower 4120 Threat Defense (76) Version 7.1.0 (Build 90)
UUID                 : 3344bc4a-d842-11ec-a995-817e361f7ea5
VDB version          : 346
-----

Cisco Adaptive Security Appliance Software Version 9.17(1)
SSP Operating System Version 2.11(1.154)

Compiled on Tue 30-Nov-21 18:38 GMT by builders
System image file is "disk0:/fxos-lfbff-k8.2.11.1.154.SPA"
Config file at boot was "startup-config"

firepower up 2 days 19 hours
Start-up time 3 secs

SSP Slot Number: 1 (Container)
...
```

FTD疑難排解檔案

請依照以下步驟操作，驗證FTD疑難排解檔案中的FTD例項部署型別：

1. 開啟疑難排解檔案並導覽至`<filename>-troubleshoot.tar/results-<date>-xxxxxx/command-output`資料夾。
2. 開啟文件`usr-local-sf-bin-sfcli.pl show_tech_support asa_lina_cli_util.output`:

```
# pwd
```

```
/ngfw/var/common/results-05-22-2022--102758/command-outputs
```

```
# cat 'usr-local-sf-bin-sfcli.pl show_tech_support asa_lina_cli_util.output'
```

3. 檢查包含字串SSP Slot Number的行。如果此行存在Container，則FTD會在容器模式下執行：

```
-----[ firepower ]-----  
Model                : Cisco Firepower 4120 Threat Defense (76) Version 7.1.0 (Build 90)  
UUID                 : 3344bc4a-d842-11ec-a995-817e361f7ea5  
VDB version          : 346  
-----
```

```
Cisco Adaptive Security Appliance Software Version 9.17(1)  
SSP Operating System Version 2.11(1.154)
```

```
Compiled on Tue 30-Nov-21 18:38 GMT by builders  
System image file is "disk0:/fxos-lfbff-k8.2.11.1.154.SPA"  
Config file at boot was "startup-config"
```

```
firepower up 2 days 19 hours  
Start-up time 3 secs
```

```
SSP Slot Number: 1 (Container)
```

```
...
```

FMC UI

按照以下步驟驗證FMC UI上的FTD例項部署型別：

1. 選擇Devices > Device Management:

The screenshot shows the Cisco Firepower Management Center (FMC) interface. The 'Devices' menu is open, and 'Device Management' is selected. The main dashboard area displays a list of dashboards with columns for Name, admin, No, and Yes, and a 'Create Dashboard' button.

Name	admin	No	Yes
Access Controlled User Statistics Provides traffic and intrusion event statistics by user			
Application Statistics Provides traffic and intrusion event statistics by application			
Application Statistics (7.1.0) Provides application statistics	admin	No	No
Connection Summary Provides tables and charts of the activity on your monitored network segment organized by different criteria	admin	No	No
Detailed Dashboard Provides a detailed view of activity on the appliance	admin	No	No
Detailed Dashboard (7.0.0) Provides a detailed view of activity on the appliance	admin	No	No
Files Dashboard Provides an overview of Malware and File Events	admin	No	No
Security Intelligence Statistics Provides Security Intelligence statistics	admin	No	No
Summary Dashboard Provides a summary of activity on the appliance	admin	No	Yes

2. 檢查Chassis列。如果行中存在Container，則FTD會在容器模式下運行。

Name	Model	Version	Chassis	Licenses	Access Control Policy	Group
LAB2 (3)						
ftd_cluster1 (2) Cluster						
10.62.148.188 (Control) Snort 3 10.62.148.188 - Routed	Firepower 4120 with FTD	7.1.0	FP4120-5-443 Security Module - 1 (Container)	Base, Threat	acp1	
10.62.148.191 Snort 3 10.62.148.191 - Routed	Firepower 4120 with FTD	7.1.0	KSEC-FPR4100-6.cisco.com:443 Security Module - 1 (Container)	Base, Threat	acp1	
ftd_ha High Availability						
ftd_ha_1(Primary, Active) Snort 3 10.62.148.89 - Transparent	Firepower 4150 with FTD	7.1.0	KSEC-FPR4100-3-443 Security Module - 1 (Container)	Base, Threat	acp1	
ftd_ha_2(Secondary, Standby) Snort 3 10.62.148.125 - Transparent	Firepower 4150 with FTD	7.1.0	firepower-9300.cisco.com:443 Security Module - 1 (Container)	Base, Threat	acp1	

FMC REST-API

請按照以下步驟通過FMC REST-API驗證FTD例項部署型別。使用REST-API客戶端。在此範例中，使用curl:

1. 請求身份驗證令牌：

```
# curl -s -k -v -X POST 'https://192.0.2.1/api/fmc_platform/v1/auth/generatetoken' -H
'Authentication: Basic' -u 'admin:Cisco123' | grep -i X-auth-access-token
< X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb
```

2. 標識包含裝置的域。在大多數REST API查詢中，domain 引數是必需的。使用此查詢中的令牌檢索域清單：

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_platform/v1/info/domain' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
{
  "items":
  [
    {
      "name": "Global",
      "type": "Domain",
      "uuid": "e276abec-e0f2-11e3-8169-6d9ed49b625f"
    },
    {
      "name": "Global/LAB2",
      "type": "Domain",
      "uuid": "84cc4afe-02bc-b80a-4b09-000000000000"
    }
  ],
  ...
}
```

3. 使用域UUID查詢特定裝置記錄和特定裝置UUID:

```
# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords' -H 'accept: application/json' -H 'X-auth-access-token:
5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
{
  "items": [
```

```

{
  "id": "796eb8f8-d83b-11ec-941d-b9083eb612d8",
  "links": {
    "self": "https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8"
  },
  "name": "ftd_ha_1",
  "type": "Device"
},
...

```

4. 使用此查詢中步驟3中的域UUID和裝置/容器UUID，並檢查isMultiInstance的值：

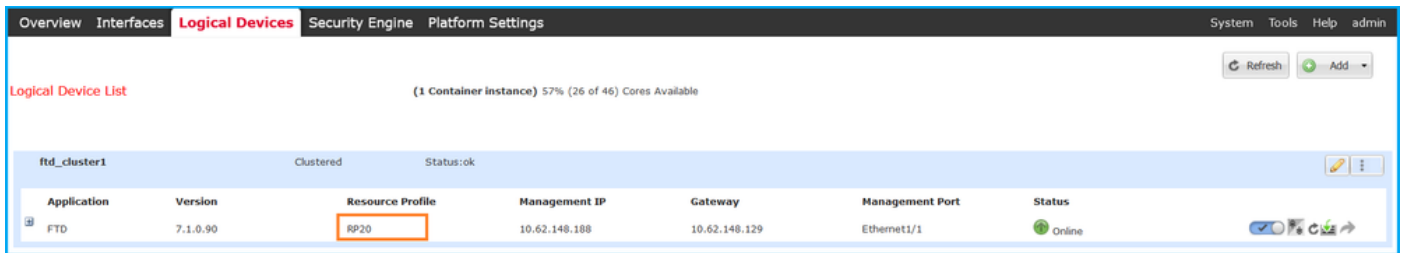
```

# curl -s -k -X 'GET' 'https://192.0.2.1/api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8' -H 'accept: application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m json.tool
...
    "name": "ftd_cluster1",
    "isMultiInstance": true,
...

```

FCM UI

若要驗證FTD執行個體部署型別，請檢查「邏輯裝置」中「資源設定檔」屬性的值。如果值不為空，則FTD在容器模式下執行：



FXOS CLI

按照以下步驟驗證FXOS CLI上的FTD例項部署型別：

1. 建立到機箱的控制檯或SSH連線。
2. 切換到scope ssa，然後運行show app-instance命令，然後根據插槽和識別符號檢查特定FTD的Deploy Type列：

```

firepower # scope ssa
firepower /ssa # show app-instance
App Name      Identifier Slot ID      Admin State Oper State      Running Version Startup Version
Deploy Type   Turbo Mode Profile Name Cluster State   Cluster Role
-----
ftd           ftd_cluster1 1           Enabled      Online           7.1.0.90      7.1.0.90
Container     No            RP20           In Cluster   Master

```

FXOS REST API

按照以下步驟通過FXOS REST-API請求驗證FTD例項部署型別。使用REST-API客戶端。在此範例

中，使用curl:

1. 請求身份驗證令牌：

```
# curl -k -X POST -H 'USERNAME: admin' -H 'PASSWORD: Cisco123' 'https://10.62.148.88/api/login'
{
  "refreshPeriod": "0",
  "token": "3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d"
}
```

2. 在此查詢中指定令牌、插槽ID，並檢查deployType的值：

```
# curl -s -k -X GET -H 'Accept: application/json' -H 'token:
3dba916cdfb850c204b306a138cde9659ba997da4453cdc0c37ffb888816c94d'
https://192.0.2.100/api/slot/1/app-inst
... {
  "smAppInstance": [
    {
      "adminState": "enabled",
      "appDn":
"sec-svc/app-ftd-7.1.0.90",
      "appInstId": "ftd_001_JAD201200R43VLP1G3",
      "appName": "ftd",
      "clearLogData": "available",
      "clusterOperationalState": "not-applicable",
      "clusterRole": "none",
      "currentJobProgress": "100",
      "currentJobState": "succeeded",
      "currentJobType": "start",
      "deployType": "container",
      ...
    }
  ]
}
```

FXOS機箱show-tech檔案

按照以下步驟驗證FXOS機箱show-tech檔案中的FTD防火牆模式：

1. 對於FXOS 2.7及更高版本，請在<name>_BC1_all.tar/

FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar中開啟sam_techsupportinfo 檔案

對於早期版本，請在FPRM_A_TechSupport.tar.gz/ FPRM_A_TechSupport.tar中開啟sam_techsupportinfo 檔案。

2. 檢查特定插槽的「show slot expand detail」部分和識別符號:

```
# pwd
/var/tmp/20220313201802_F241-01-11-FPR-2_BC1_all/FPRM_A_TechSupport/
```

```
# cat sam_techsupportinfo
```

```
...
```

```
`show slot expand detail`
```

```
Slot:
```

```
Slot ID: 1
```

```
Log Level: Info
```

```
Admin State: Ok
```

```
Oper State: Online
```

```
Disk Format State: Ok
```

```
Disk Format Status: 100%
```

```
Clear Log Data: Available
```

```
Error Msg:
```

```
Application Instance:
```

```
App Name: ftd
```

```
Identifier: ftd_cluster1
```

```
Admin State: Enabled
```

```
Oper State: Online
```

Running Version: 7.1.0.90

Startup Version: 7.1.0.90

Deploy Type: Container

驗證ASA情景模式

ASA支援單情景和多情景模式。FTD不支援多內容模式。

可以使用以下選項驗證上下文型別：

- ASA CLI
- ASA show-tech

ASA CLI

按照以下步驟驗證ASA CLI上的ASA情景模式：

1. 根據平台和部署模式，使用以下選項訪問ASA CLI:

- 在裝置模式下直接通過telnet/SSH訪問Firepower 1000/3100和Firepower 2100上的ASA
- 在平台模式下從Firepower 2100上的FXOS控制檯CLI訪問，並使用**connect asa** 命令連線到ASA
- 通過命令(Firepower 4100/9300)從FXOS CLI訪問：
connect module <x> [console|telnet]，其中x是插槽ID，然後連接**asa**

- 對於虛擬ASA，直接通過SSH訪問ASA，或者通過虛擬機器監控程式或雲UI進行控制檯訪問

2. 在CLI上執行**show mode**命令：

```
ASA# show mode
Security context mode: multiple
```

```
ASA# show mode
Security context mode: single
```

ASA show-tech檔案

按照以下步驟驗證ASA show-tech檔案中的ASA情景模式：

1. 檢查show-tech檔案中的**show context detail**部分。在這種情況下，由於存在多個上下文，因此情景模式是多情景模式：

```
----- show context detail -----

Context "system", is a system resource
Config URL: startup-config
Real Interfaces:
Mapped Interfaces: Ethernet1/1, Ethernet1/10, Ethernet1/11,
  Ethernet1/12, Ethernet1/13, Ethernet1/14, Ethernet1/15,
  Ethernet1/16, Ethernet1/2, Ethernet1/3, Ethernet1/4, Ethernet1/5,
  Ethernet1/6, Ethernet1/7, Ethernet1/8, Ethernet1/9, Ethernet2/1,
  Ethernet2/2, Ethernet2/3, Ethernet2/4, Ethernet2/5, Ethernet2/6,
  Ethernet2/7, Ethernet2/8, Internal-Data0/1, Internal-Data1/1,
```

```
Management1/1
Class: default, Flags: 0x00000819, ID: 0
```

Context "admin", has been created

```
Config URL: disk0:/admin.cfg
Real Interfaces: Ethernet1/1, Ethernet1/2, Management1/1
Mapped Interfaces: Ethernet1/1, Ethernet1/2, Management1/1
Real IPS Sensors:
Mapped IPS Sensors:
Class: default, Flags: 0x00000813, ID: 1
```

Context "null", is a system resource

```
Config URL: ... null ...
Real Interfaces:
Mapped Interfaces:
Real IPS Sensors:
Mapped IPS Sensors:
Class: default, Flags: 0x00000809, ID: 507
```

使用ASA驗證Firepower 2100模式

具備ASA的Firepower 2100可以在以下模式之一運行：

- 平台模式 — 在FXOS中配置基本操作引數和硬體介面設定。這些設定包括介面管理狀態更改、EtherChannel配置、NTP、映像管理等。FCM Web介面或FXOS CLI可用於FXOS配置。
- 裝置模式 (預設) — 裝置模式允許使用者配置ASA中的所有策略。FXOS CLI僅提供高級命令。

使用以下選項驗證採用ASA的Firepower 2100模式：

- ASA CLI
- FXOS CLI
- FXOS show-tech

ASA CLI

按照以下步驟驗證在ASA CLI上使用ASA的Firepower 2100模式：

1. 使用telnet/SSH訪問Firepower 2100上的ASA。
2. 在CLI上執行**show fxos mode**命令：

```
ciscoasa(config)# show fxos mode
Mode is currently set to platform
```

裝置模式：

```
ciscoasa(config)# show fxos mode
Mode is currently set to appliance
```

附註：在多情景模式下，**system**或**admin**情景中提供**show fxos mode**命令。

FXOS CLI

按照以下步驟在FXOS CLI上使用ASA驗證Firepower 2100模式：

1.使用telnet/SSH訪問Firepower 2100上的ASA。

2.運行connect fxos命令：

```
ciscoasa/admin(config)# connect fxos
Configuring session.
.
Connecting to FXOS.
...
Connected to FXOS. Escape character sequence is 'CTRL-^X'.
```

附註：在多情景模式下，connect fxos命令在admin情景中可用。

3.運行show fxos-mode命令：

```
firepower-2140# show fxos mode
Mode is currently set to platform
```

裝置模式：

```
firepower-2140#show fxos mode
Mode is currently set to appliance
```

FXOS show-tech檔案

按照以下步驟驗證FXOS機箱show-tech檔案中的ASA的Firepower 2100模式：

1.開啟<name>_FPRM.tar.gz/<name>_FPRM.tar中的tech_support_brief檔案

2.檢查「show fxos-mode」部分：

```
# pwd
/var/tmp/fp2k-1_FPRM/
# cat tech_support_brief
...
`show fxos-mode`
Mode is currently set to platform
```

裝置模式：

```
# pwd
/var/tmp/fp2k-1_FPRM/
# cat tech_support_brief
...
`show fxos-mode`
Mode is currently set to appliance
```

已知的問題

思科錯誤ID [CSCwb94424](#) ENH:新增CLISH命令以驗證FMC HA配置

思科錯誤ID [CSCvn31622](#) ENH:新增FXOS SNMP OID以輪詢邏輯裝置和應用例項配置

思科錯誤ID [CSCwb97767](#) ENH:新增OID以驗證FTD例項部署型別

思科錯誤ID [CSCwb97772](#) ENH:在Firepower 2100上的ASA的show-tech中包括「show fxos mode」輸出

思科錯誤ID [CSCwb97751](#) 無法使用OID 1.3.6.1.4.1.9.9.491.1.6.1.1進行透明防火牆模式驗證

相關資訊

- [安全防火牆管理中心REST API快速入門手冊7.1版](#)
- [在Firepower NGFW裝置上配置SNMP](#)
- [Cisco Firepower威脅防禦REST API指南](#)
- [Cisco FXOS REST API參考](#)
- [Cisco ASA相容性](#)
- [Firepower 1000/2100和安全防火牆3100 ASA和FXOS捆綁版本](#)
- [捆綁元件](#)
- [Firepower檔案生成故障排除過程](#)
- [Cisco Firepower 2100入門指南](#)
- [思科Firepower威脅防禦相容性指南](#)