

Verify Firepower Mode, Instance, High Availability, and Scalability Configuration

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Introduction

This document describes the verification of Firepower high availability and scalability configuration, firewall mode, and instance deployment type.

Background Information

The verification steps for the high availability and scalability configuration, firewall mode, and instance deployment type are shown on the user interface (UI), the command-line interface (CLI), via REST-API queries, SNMP, and in the troubleshoot file.

Prerequisites

Requirements

Basic product knowledge, REST-API, SNMP.

Components Used

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

The information in this document is based on these software and hardware versions:

- Firepower 11xx
- Firepower 21xx
- Firepower 31xx
- Firepower 41xx
- Firepower Management Center (FMC) Version 7.1.x
- Firepower eXtensible Operating System (FXOS) 2.11.1.x
- Firepower Device Manager (FDM) 7.1.x
- Firepower Threat Defense 7.1.x
- ASA 9.17.x

Verify High Availability and Scalability Configuration

High availability refers to the failover configuration. High availability or failover setup joins two devices so that if one of the devices fails, the other device can take over.

Scalability refers to the cluster configuration. A cluster configuration lets you group multiple FTD nodes together as a single logical device. A cluster provides all the convenience of a single device (management, integration into a network) and the increased throughput and redundancy of multiple devices.

In this document these expressions are used interchangeably:

- high availability or failover
- scalability or cluster

In some cases, the verification of high availability and scalability configuration or status is not available. For example, there is no verification command for FTD standalone configuration. Standalone, failover, and cluster configuration modes are mutually exclusive. If a device does not have failover and cluster configuration, it is considered to operate in standalone mode.

FMC High Availability

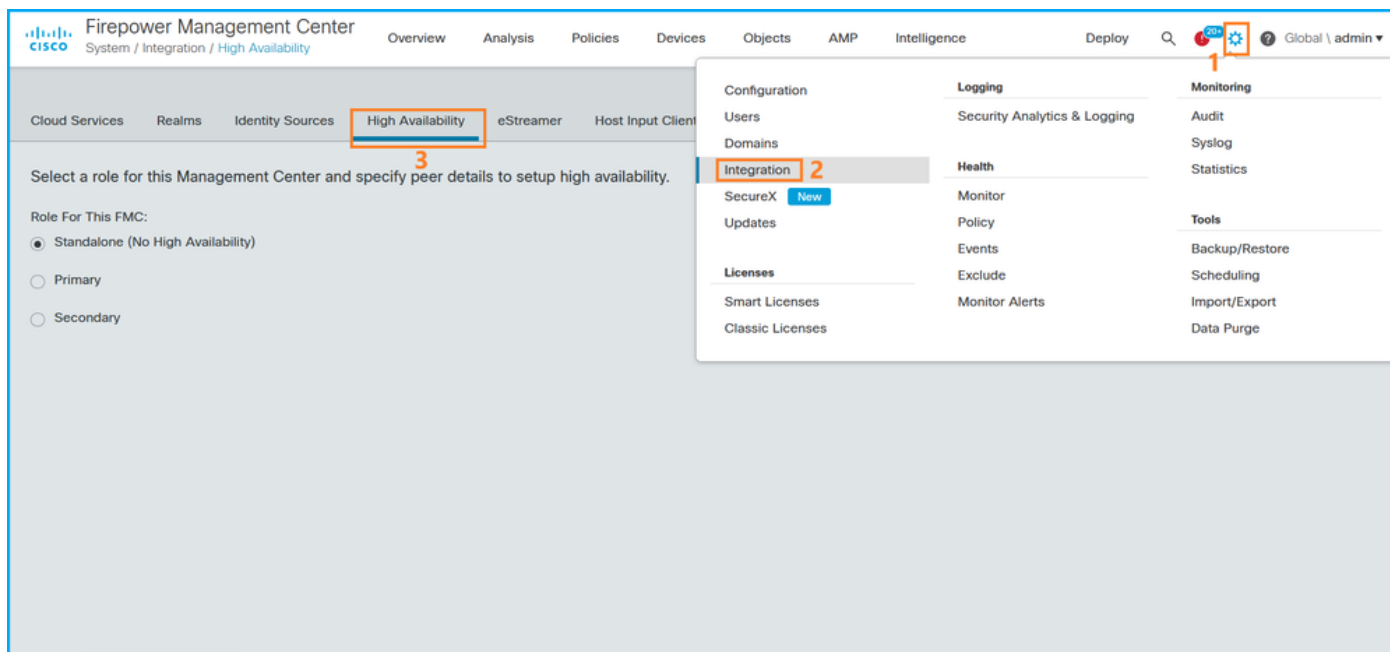
FMC high availability configuration and status can be verified with the use of these options:

- FMC UI
- FMC CLI
- REST API request
- FMC troubleshoot file

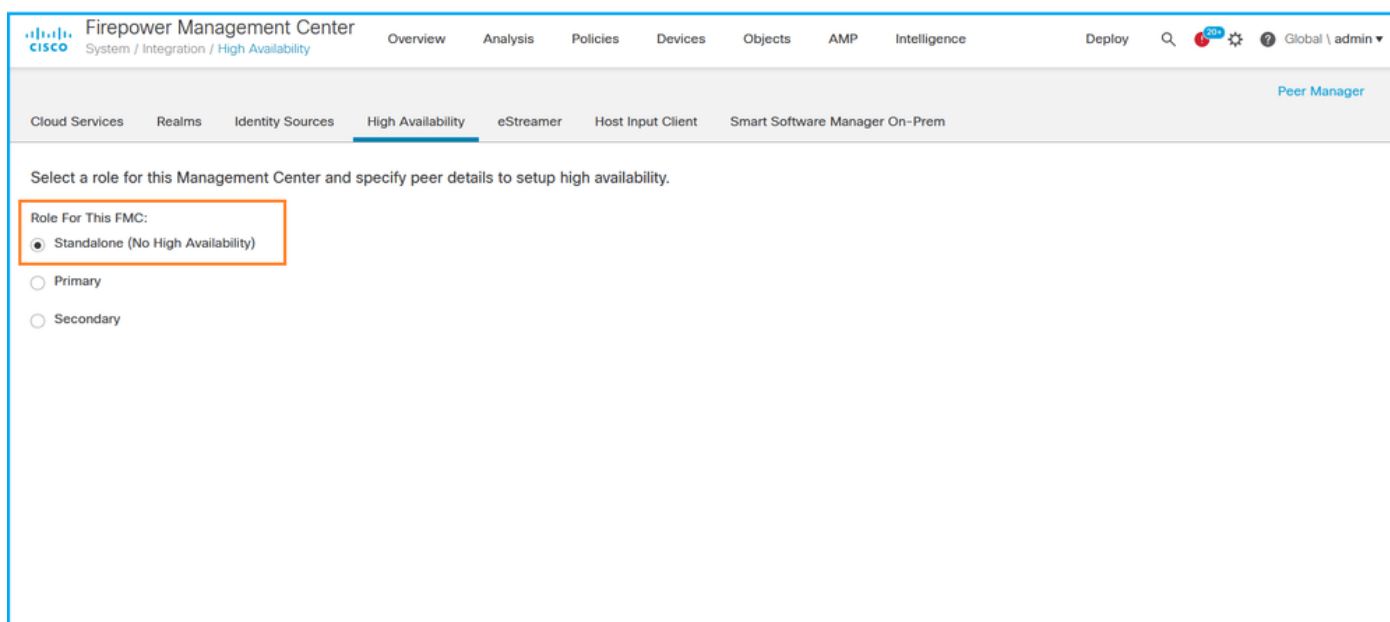
FMC UI

Follow these steps to verify the FMC high availability configuration and status on the FMC UI:

1. Choose **System > Integration > High Availability**:



2. Check the role for the FMC. In this case, high availability is not configured and FMC operates in a standalone configuration:



If high availability is configured, local and remote roles are shown:

Firepower Management Center
System / Integration / High Availability

Overview Analysis Policies Devices Objects AMP Intelligence Deploy Global \ admin

Cloud Services Realms Identity Sources **High Availability** eStreamer Host Input Client Smart Software Satellite Peer Manager

Switch Peer Roles Break HA Pause Synchronization

Summary		System Status	
Status	✓ Synchronization task is in progress	Local Active - Primary (10.122.148.122)	Remote Standby - Secondary (10.122.148.123)
Synchronization	✓ OK	Operating System	Fire Linux OS 7.1.0
Active System	10.122.148.122 (HA synchronization time : Mon May 23 15:09:36 2022)	Software Version	7.1.0-90
Standby System	10.122.148.123 (HA synchronization time : Mon May 23 15:25:14 2022)	Model	Cisco Firepower Management Center 4600

FMC CLI

Follow these steps to verify the FMC high availability configuration and status on the FMC CLI:

1. Access FMC via SSH or console connection.
2. Run the **expert** command and then run the **sudo su** command:

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

3. Run the **troubleshoot_HADC.pl** command and select option **1 Show HA Info Of FMC**. If high availability is not configured, this output is shown:

```
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
```

If high availability is configured, this output is shown:

```
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

Note: In a high availability configuration, the FMC role can have a **primary** or **secondary** role, and **active** or **standby** status.

FMC REST-API

Follow these steps to verify the FMC high availability and scalability configuration and status via FMC REST-API. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

```

# 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. Use the token in this query to find the UUID of the global domain:

```

# 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
}
}

```

Note: The part “| **python -m json.tool**” of the command string is used to format the output in JSON-style and is optional.

3. Use the global domain UUID in this query:

```

# 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

```

If high availability is not configured, this output is shown:

```

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

```

If high availability is configured, this output is shown:

```

{
  "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": "FMCHASStatus"
    }
  ],
  "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 Troubleshoot file

Follow these steps to verify the FMC high availability configuration and status in the FMC troubleshoot file:

1. Open the troubleshoot file and navigate to the folder **<filename>.tar/results-<date>--xxxxxx/command-outputs**

2. Open the file **usr-local-sf-bin-troubleshoot_HADC.pl -a.output**:

If high availability is not configured, this output is shown:

```

# 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

```

If high availability is configured, this output is shown:

```

# 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

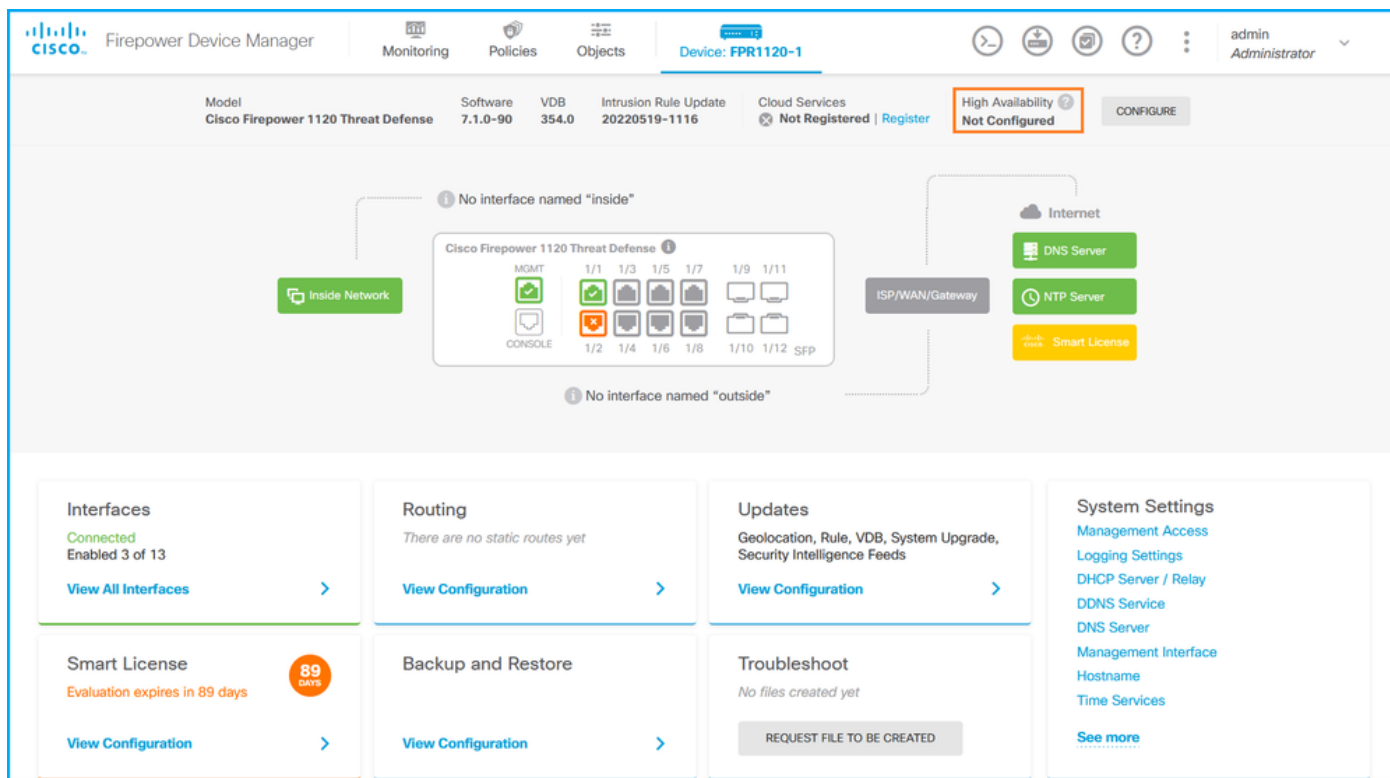
FDM High Availability

FDM high availability configuration and status can be verified with the use of these options:

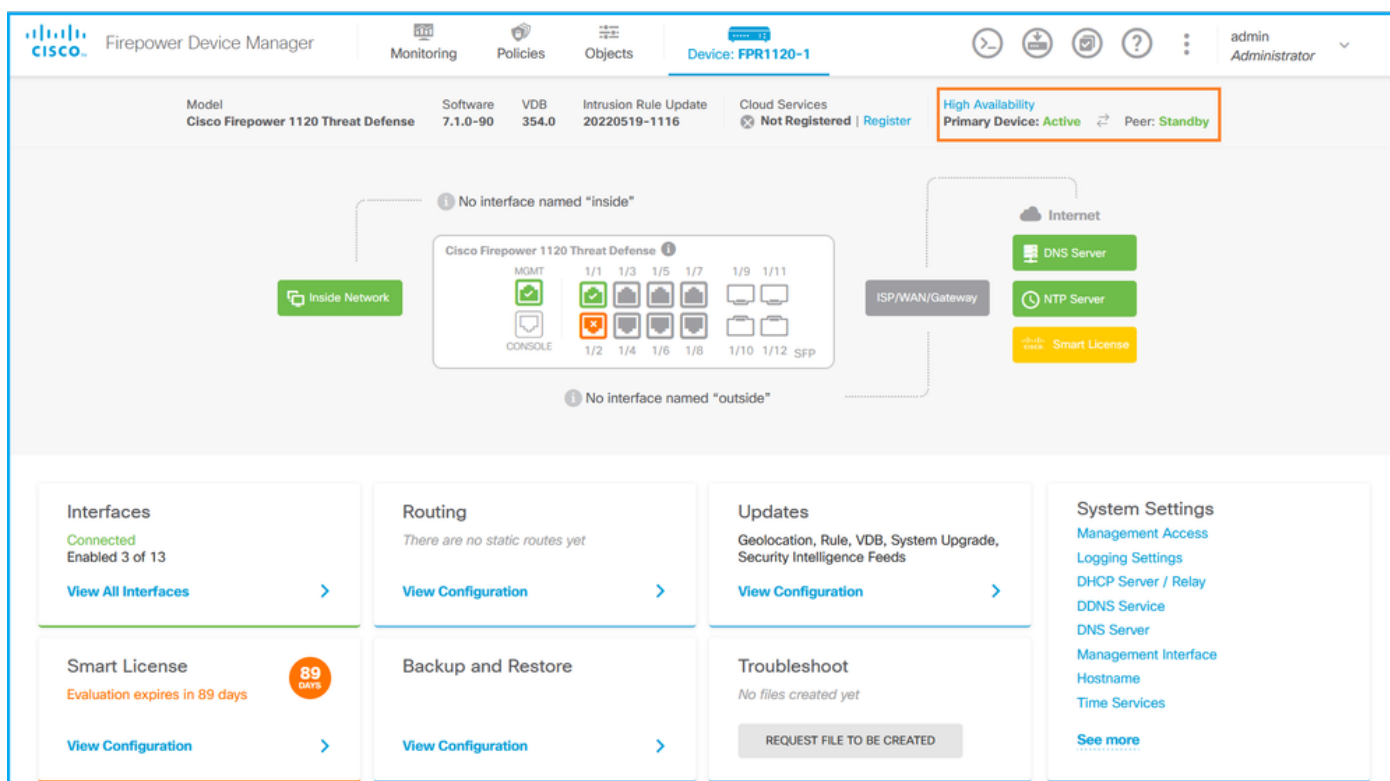
- FDM UI
- FDM REST API request
- FTD CLI
- FTD SNMP Poll
- FTD troubleshoot file

FDM UI

In order to verify the FDM high availability configuration and status on FDM UI, check **High Availability** on the main page. If high availability is not configured, the **High Availability** value is **Not Configured**:



If high availability is configured, the local and remote peer unit failover configuration and roles are shown:



FDM REST-API

Follow these steps to verify the FDM high availability configuration and status via FDM REST-API request. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:


```

    "prev": [],
    "next": [],
    "limit": 10,
    "offset": 0,
    "count": 1,
    "pages": 0
  }
}

```

If high availability is configured, this output is shown:

```

{
  "items": [
    {
      "version": "issgb3rw2lix",
      "name": "HA",
      "nodeRole": "HA_PRIMARY",
      "failoverInterface": {
        "version": "ezzafxo5ccti3",
        "name": "",
        "hardwareName": "Ethernet1/1",
        "id": "8d6c41df-3e5f-465b-8e5a-d336b282f93f",
        "type": "physicalinterface"
      },
      ...
    }
  ]
}

```

3. In order to verify high availability status, use this query:

```

# curl -s -k -X GET -H 'Accept: application/json' -H 'Authorization: Bearer eyJhbGciOiJIUzI1NiJ9.eyJpYXQiOiJlYWRhZWMtZDlhYS0xMWVjLWE5MmEtMjk4YjRjZTUxNmJjIiwibmJmIjozNjUzMjA4NTI4LCJleHAiOiJlYTNmZDA3ZjMtZDgkZS0xMWVjLWE5MmEtYzkyNTUxNDcyNTM0IiwidXNlcjJvbnRlIjoicGFzc3dvcmQlLCJ1c2VybWVjZSI6ImFkbWluIn0.ai3LUbnsLOJTN6exKOANSEG5qTD6L-AND_1V6TbFe6M'
'https://192.0.2.3/api/fdm/v6/devices/default/operational/ha/status/default'

```

If high availability is not configured, this output is shown:

```

{
  "nodeRole" : null,
  "nodeState" : "SINGLE_NODE",
  "peerNodeState" : "HA_UNKNOWN_NODE",
  "configStatus" : "UNKNOWN",
  "haHealthStatus" : "HEALTHY",
  "disabledReason" : "",
  "disabledTimestamp" : null,
  "id" : "default",
  "type" : "hastatus",
  "links" : {
    "self" : "https://192.0.2.3/api/fdm/v6/devices/default/operational/ha/status/default"
  }
}

```

If high availability is configured, this output is shown:

```

{
  "nodeRole": "HA_PRIMARY",
  "nodeState": "HA_ACTIVE_NODE",
  "peerNodeState": "HA_STANDBY_NODE",
  "configStatus": "IN_SYNC",
  "haHealthStatus": "HEALTHY",

```

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

FTD CLI

Follow the steps in the section.

FTD SNMP Poll

Follow the steps in the section.

FTD Troubleshoot file

Follow the steps in the section.

FTD High Availability and Scalability

FTD high availability and scalability configuration and status can be verified with the use of these options:

- FTD CLI
- FTD SNMP
- FTD troubleshoot file
- FMC UI
- FMC REST-API
- FDM UI
- FDM REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS chassis show-tech file

FTD CLI

Follow these steps to verify the FTD high availability and scalability configuration and status on the FTD CLI:

1. Use these options to access the FTD CLI in accordance with the platform and deployment mode:

- Direct SSH access to FTD - all platforms
- Access from the FXOS console CLI (Firepower 1000/2100/3100) via command **connect ftd**
- Access from the FXOS CLI via commands (Firepower 4100/9300):
connect module <x> [console|telnet], where x is the slot ID, and then **connect ftd [instance]**, where the instance is relevant only for multi-instance deployment

- For virtual FTDs, direct SSH access to FTD, or console access from the hypervisor or cloud UI

2. In order to verify the FTD failover configuration and status, run the **show running-config failover** and **show failover state** commands on the CLI.

If the failover is not configured, this output is shown:

```
> 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==
```

If the failover is configured, this output is shown:

```
> 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. In order to verify the FTD cluster configuration and status, run the **show running-config cluster** and **show cluster info** commands on the CLI.

If the cluster is not configured, this output is shown:

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

If the cluster is configured, this output is shown:

```
> 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
```

Note: The **master** and **control** roles are the same.

FTD SNMP

Follow these steps to verify the FTD high availability and scalability configuration and status via SNMP:

1. Ensure that SNMP is configured and enabled. For FDM-managed FTD, refer to [Configure and troubleshoot SNMP on Firepower FDM](#) for configuration steps. For FMC-managed FTD, refer to [Configure SNMP on Firepower NGFW Appliances](#) for configuration steps.
2. In order to verify the FTD failover configuration and status, poll the OID **.1.3.6.1.4.1.9.9.147.1.2.1.1.1**.

If the failover is not configured, this output is shown:

```
# 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"

If the failover is configured, this output is shown:

```
# 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. To verify the cluster configuration and status, poll the OID **1.3.6.1.4.1.9.9.491.1.8.1**.

If the cluster is not configured, this output is shown:

```
# 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
```

If the cluster is configured, but not enabled, this output is shown:

```
# 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
...
```

If the cluster is configured, enabled and operationally up, this output is shown:

```
# 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
...
```

For more information about the OID descriptions refer to the [CISCO-UNIFIED-FIREWALL-MIB](#).

FTD Troubleshoot file

Follow these steps to verify the FTD high availability and scalability configuration and status in the FTD troubleshoot file:

1. Open the troubleshoot file and navigate to the folder **<filename>-troubleshoot .tar/results-<date>--xxxxxx/command-outputs**.

2. Open the file **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. In order to verify the failover configuration and status, check the **show failover** section.

If the failover is not configured, this output is shown:

```
----- 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
```

If the failover is configured, this output is shown:

```
----- 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. In order to verify the FTD cluster configuration and status, check the **show cluster info** section.

If the cluster is not configured, this output is shown:

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

Clustering is not configured

If the cluster is configured and enabled, this output is shown:

----- 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

Follow these steps to verify the FTD high availability and scalability configuration and status on the FMC UI:

1. Choose **Devices > Device Management**:

Firepower Management Center Overview / Dashboards / Management

Overview Analysis Policies **1 Devices** Objects AMP Intelligence Deploy 🔍 ⚙️ ? Global \ admin

2 Device Management

- Device Upgrade
- NAT
- QoS
- Platform Settings
- FlexConfig
- Certificates

VPN

- Site To Site
- Remote Access
- Dynamic Access Policy
- Troubleshooting
- Site to Site Monitoring

Troubleshoot

- File Download
- Threat Defense CLI
- Packet Tracer
- Packet Capture

Create Dashboard

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

2. In order to verify the FTD high availability and scalability configuration, check the labels **High Availability** or **Cluster**. If neither exists, then the FTD runs in a standalone configuration:

Firepower Management Center Devices / Device Management Overview Analysis Policies **Devices** Objects AMP Deploy 🔍 ⚙️ ? LAB2 \ admin

View By: Domain

All (5) ● Error (0) ● Warning (0) ● Offline (0) ● Normal (5) ● Deployment Pending (0) ● Upgrade (0) ● Snort 3 (5)

Deployment History

Search Device Add

Collapse All

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. In order to verify the FTD high availability and scalability status, check the unit role in parenthesis. If a role does not exist and the FTD is not part of a cluster or failover, then FTD runs in a standalone configuration:

Firepower Management Center

Devices / Device Management

Overview

Analysis

Policies

Devices

Objects

AMP

Deploy

Q

200

LAB2 \ admin

View By: Domain

Deployment History

All (5)

Error (0)

Warning (0)

Offline (0)

Normal (5)

Deployment Pending (0)

Upgrade (0)

Snort 3 (5)

Search Device

Add

Collapse All

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

Note: In the case of a cluster, only the role of the **control** unit is shown.

FMC REST API

In these outputs, **ftd_ha_1**, **ftd_ha_2**, **ftd_standalone**, **ftd_ha**, **ftc_cluster1** are user-configurable device names. These names do not refer to the actual high availability and scalability configuration or status.

Follow these steps to verify the FTD high availability and scalability configuration and status via FMC REST-API. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

```
# 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. Identify the domain that contains the device. In most of the REST API queries the **domain** parameter is mandatory. Use the token in this query to retrieve the list of domains:

```
# 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. Use the domain UUID to query the specific **devicerecords** and the specific device 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. In order to verify the failover configuration, use the domain UUID and the device/container UUID from Step 3 in this query:

```

# 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. In order to verify the failover status, use the domain UUID and the DeviceHAPair UUID from Step 4 in this query:

```

# 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. In order to verify the cluster configuration, use the domain UUID and the device/container UUID from Step 3 in this query:

```
# 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. In order to verify the cluster status, use the domain UUID and the device/container UUID from Step 6 in this query:

```
# 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

Follow the steps in the section.

FDM REST-API

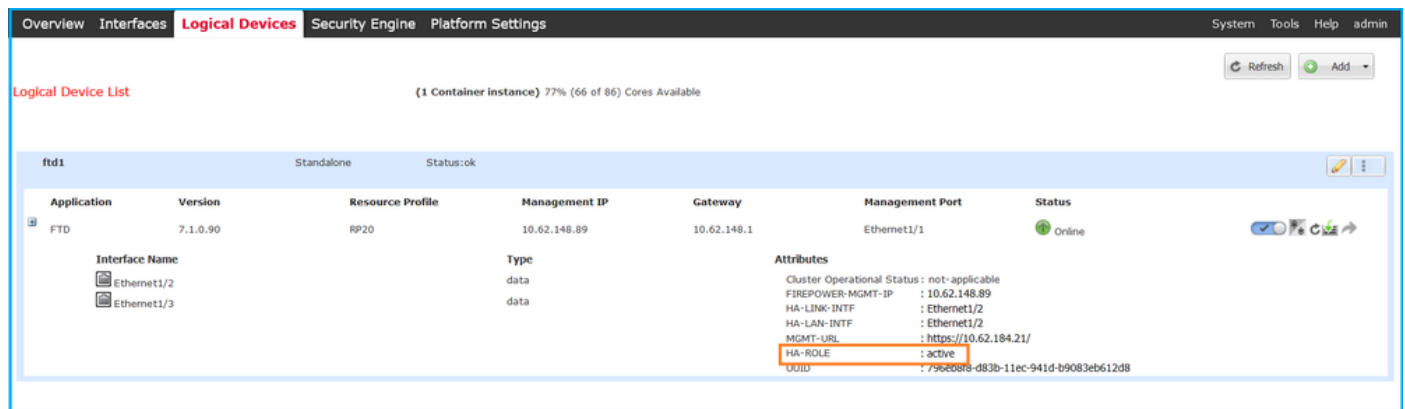
Follow the steps in the section.

FCM UI

FCM UI is available on Firepower 4100/9300 and Firepower 2100 with ASA in platform mode.

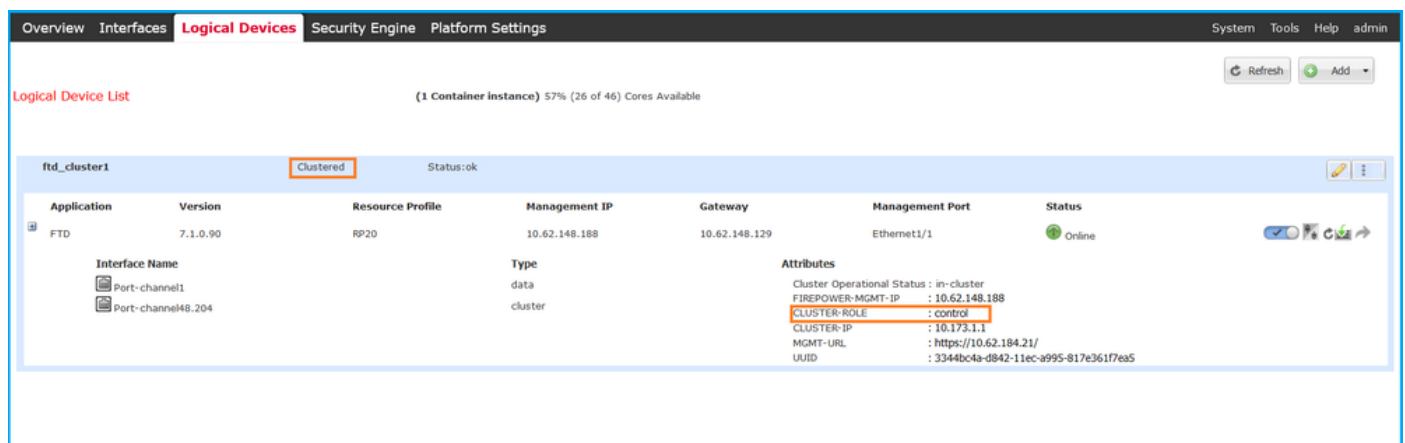
Follow these steps to verify the FTD high availability and scalability status on the FCM UI:

1. In order to verify the FTD failover status, check the **HA-ROLE** attribute value on the Logical Devices page:



Note: The **Standalone** label next to the logical device identifier refers to the chassis logical device configuration, not the FTD failover configuration.

2. In order to verify the FTD cluster configuration and status, check the **Clustered** label and the **CLUSTER-ROLE** attribute value on the Logical Devices page:



FXOS CLI

The FTD high availability and scalability configuration and status verification on the FXOS CLI are available on Firepower 4100/9300.

Follow these steps to verify the FTD high availability and scalability configuration and status on the FXOS CLI:

1. Establish a console or SSH connection to the chassis.
2. In order to verify the FTD high availability status, run the **scope ssa** command, then run **scope slot <x>** to switch to the specific slot where the FTD runs and run the **show app-instance expand** command:

```
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. In order to verify the FTD cluster configuration and status, run the **scope ssa** command, run the **show logical-device <name> detail expand** command, where the name is the logical device name, and the **show app-instance** command. Check the output for a specific slot:

```
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

FXOS REST-API is supported on Firepower 4100/9300.

Follow these steps to verify the FTD high availability and scalability configuration and status via FXOS REST-API request. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

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

2. In order to verify the FTD failover status, use the token and the slot ID in this query:

```
# 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-ftd1/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. In order to verify the FTD cluster configuration, use the logical device identifier in this query:

```

# 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. In order to verify the FTD cluster status, use this query:

```

# 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 Chassis show-tech file

The FTD high availability and scalability configuration and status can be verified in the Firepower 4100/9300 chassis show-tech file.

Follow these steps to verify the high availability and scalability configuration and status in the FXOS chassis show-tech file:

1. For FXOS versions 2.7 and later, open the file **sam_techsupportinfo** in **<name>_BC1_all.tar/FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar**

For earlier versions, open the file **sam_techsupportinfo** in **FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar**.

2. In order to verify the failover status, check the value of the **ha-role** attribute value under the specific slot in the **`show slot expand detail`** section:

```

# 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. In order to verify the FTD cluster configuration, check the value of the **Mode** attribute value under the specific slot in the **`show logical-device detail expand`** section:

`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. In order to verify the FTD cluster status, check the value of the **Cluster State** and **Cluster Role** attribute values under the specific slot in the ``show slot expand detail`` section:

```
`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 High Availability and Scalability

ASA high availability and scalability configuration and status can be verified with the use of these options:

- ASA CLI
- ASA SNMP poll
- ASA show-tech file
- FCM UI

- FXOS CLI
- FXOS REST-API
- FXOS chassis show-tech file

ASA CLI

Follow these steps to verify the ASA high availability and scalability configuration on the ASA CLI:

1. Use these options to access the ASA CLI in accordance with the platform and deployment mode:
 - Direct telnet/SSH access to ASA on Firepower 1000/3100 and Firepower 2100 in appliance mode
 - Access from FXOS console CLI on Firepower 2100 in platform mode and connect to ASA via the **connect asa** command
 - Access from FXOS CLI via commands (Firepower 4100/9300):
connect module <x> [console|telnet], where x is the slot ID, and then **connect asa**
 - For virtual ASA, direct SSH access to ASA, or console access from the hypervisor or cloud UI

2. In order to verify the ASA failover configuration and status, run the **show running-config failover** and **show failover state** commands on the ASA CLI.

If the failover is not configured, this output is shown:

```
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==
```

If the failover is configured, this output is shown:

```
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		
	Standby Ready	Comm Failure	19:42:22 UTC May 21 2022

```
====Configuration State===
    Sync Done
====Communication State===
    Mac set
```

3. In order to verify the ASA cluster configuration and status, run the **show running-config cluster** and **show cluster info** commands on the CLI.

If the cluster is not configured, this output is shown:

```
asa# show running-config cluster
asa# show cluster info
Clustering is not configured
```

If the cluster is configured, this output is shown:

```
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

Follow these steps to verify the ASA high availability and scalability configuration via SNMP:

1. Ensure that SNMP is configured and enabled.
2. In order to verify the failover configuration and status poll the OID **.1.3.6.1.4.1.9.9.147.1.2.1.1.1**.

If the failover is not configured, this output is shown:

```
# 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"
```

If the failover is configured, this output is shown:

```
# 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. In order to verify the cluster configuration and status, poll the OID **1.3.6.1.4.1.9.9.491.1.8.1**.

If the cluster is not configured, this output is shown:

```
# 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
```

If the cluster is configured, but not enabled, this output is shown:

```
# 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
...
```

If the cluster is configured, enabled and operationally up, this output is shown:

```
# 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
...
```

For more information about the OID descriptions refer to the [CISCO-UNIFIED-FIREWALL-MIB](#).

ASA show-tech file

1. In order to verify the ASA failover configuration and status, check the **show failover** section.

If the failover is not configured, this output is shown:

```
----- 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
```

If the failover is configured, this output is shown:

```
----- 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. In order to verify the cluster configuration and status, check the **show cluster info** section.

If the cluster is not configured, this output is shown:

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

Clustering is not configured

If the cluster is configured and enabled, this output is shown:

```
----- 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
```

...

FCM UI

Follow the steps in the section.

FXOS CLI

Follow the steps in the section.

FXOS REST-API

Follow the steps in the section.

FXOS Chassis show-tech file

Follow the steps in the section.

Verify the Firewall mode

FTD Firewall mode

The firewall mode refers to a routed or transparent firewall configuration.

The FTD firewall mode can be verified with the use of these options:

- FTD CLI
- FTD show-tech
- FMC UI
- FMC REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS chassis show-tech file

Note: FDM does not support transparent mode.

FTD CLI

Follow these steps to verify the FTD firewall mode on the FTD CLI:

1. Use these options to access the FTD CLI in accordance with the platform and deployment mode:

- Direct SSH access to FTD - all platforms
- Access from the FXOS console CLI (Firepower 1000/2100/3100) via command **connect ftd**
- Access from the FXOS CLI via commands (Firepower 4100/9300):

connect module <x> [console|telnet], where x is the slot ID, and then

connect ftd [instance], where the instance is relevant only for multi-instance deployment.

- For virtual FTDs, direct SSH access to FTD, or console access from the hypervisor or cloud UI

2. In order to verify the firewall mode, run the **show firewall** command on the CLI:

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

FTD Troubleshoot file

Follow these steps to verify the FTD firewall mode in the FTD troubleshoot file:

1. Open the troubleshoot file and navigate to the folder **<filename>-troubleshoot .tar/results-<date>--xxxxxx/command-outputs**.
2. Open the file **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. In order to verify the FTD firewall mode, check the **show firewall** section:

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

FMC UI

Follow these steps to verify the FTD firewall mode on the FMC UI:

1. Choose **Devices > Device Management**:

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

2. Check the labels **Routed** or **Transparent**:

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 - Transparent	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	

FMC REST-API

Follow these steps to verify the FTD firewall mode via FMC REST-API. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

```
# 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. Identify the domain that contains the device. In most of the REST API queries the **domain** parameter is mandatory. Use the token in this query to retrieve the list of domains:

```
# 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. Use the domain UUID to query the specific **devicerecords** and the specific device 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. Use the domain UUID and the device/container UUID from Step 3 in this query, and check the value of **ftdMode**:

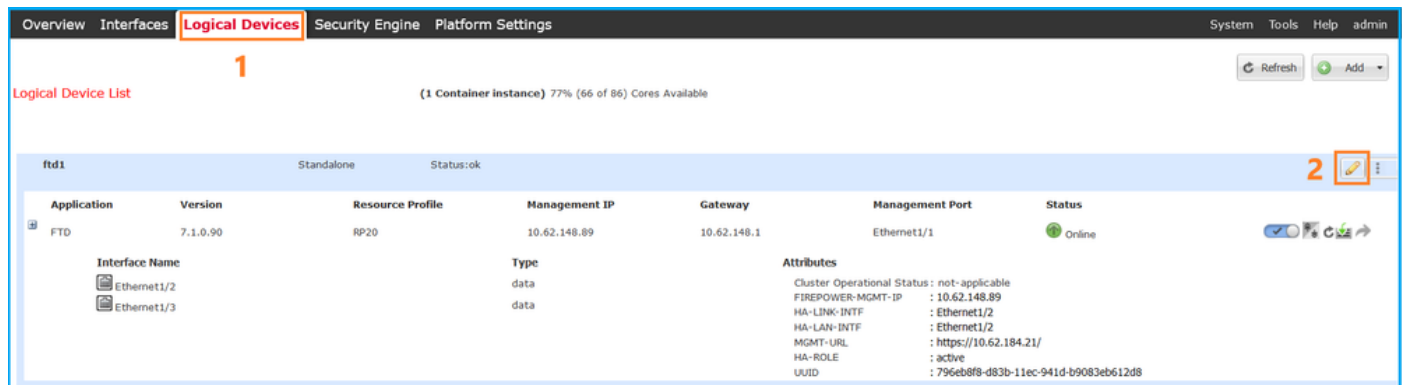
```
# curl -s -k -X 'GET' 'https://192.0.2.1./api/fmc_config/v1/domain/84cc4afe-02bc-b80a-4b09-
000000000000/devices/devicerecords/796eb8f8-d83b-11ec-941d-b9083eb612d8' -H 'accept:
application/json' -H 'X-auth-access-token: 5d817ef7-f12f-4dae-b0c0-cd742d3bd2eb' | python -m
json.tool
...
{
  "accessPolicy":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

FCM UI

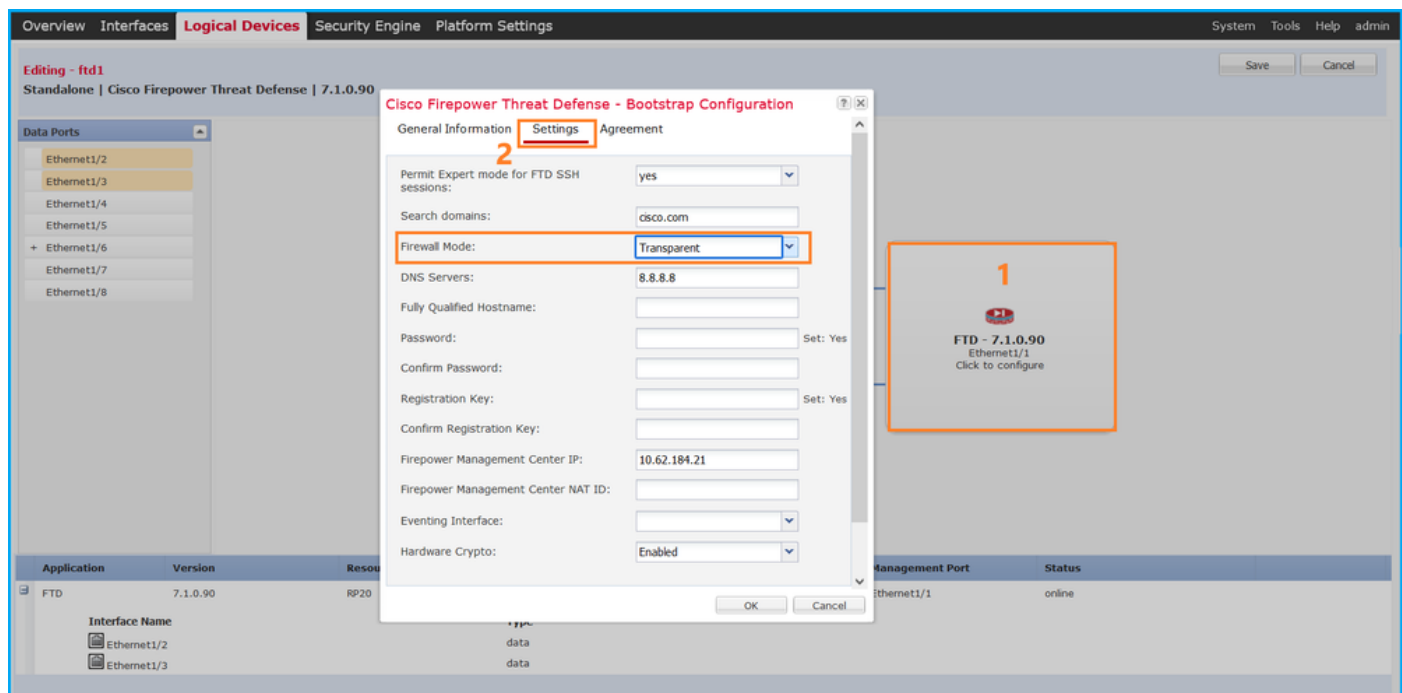
The firewall mode can be verified for FTD on Firepower 4100/9300.

Follow these steps to verify the FTD firewall mode on the FCM UI:

1. Edit the logical device on the **Logical Devices** page:



2. Click on the application icon, and check the **Firewall Mode** in the **Settings** tab:



FXOS CLI

The firewall mode can be verified for FTD on Firepower 4100/9300.

Follow these steps to verify the FTD firewall mode on the FXOS CLI:

1. Establish a console or SSH connection to the chassis.
2. Switch to the **scope ssa**, then switch to the specific **logical-device**, run the **show mgmt-bootstrap expand** command, and check the **FIREWALL_MODE** attribute value:

```
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

FXOS REST-API is supported on Firepower 4100/9300.

Follow these steps to verify the FTD firewall mode via FXOS REST-API request. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

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

2. Use the logical device identifier in this query and check the value of the **FIREWALL_MODE** key:

```
# 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 Chassis show-tech file

The firewall mode for FTD can be verified in the show-tech file of Firepower 4100/9300.

Follow these steps to verify the FTD firewall mode in the FXOS chassis show-tech file:

1. For FXOS versions 2.7 and later, open the file **sam_techsupportinfo** in **<name>_BC1_all.tar/ FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar**

For earlier versions, open the file **sam_techsupportinfo** in **FPRM_A_TechSupport.tar.gz/ FPRM_A_TechSupport.tar**.

2. Check the **`show logical-device detail expand`** section under the specific identifier and the slot:

```
# 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 Firewall mode

The ASA firewall mode can be verified with the use of these options:

- ASA CLI
- ASA show-tech
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS chassis show-tech file

ASA CLI

Follow these steps to verify the ASA firewall mode on the ASA CLI:

1. Use these options to access the ASA CLI in accordance with the platform and deployment mode:
 - Direct telnet/SSH access to ASA on Firepower 1000/3100 and Firepower 2100 in appliance mode
 - Access from FXOS console CLI on Firepower 2100 in platform mode and connect to ASA via the **connect asa** command
 - Access from FXOS CLI via commands (Firepower 4100/9300):
connect module <x> [console|telnet], where x is the slot ID, and then **connect asa**
 - For virtual ASA, direct SSH access to ASA, or console access from the hypervisor or cloud UI

2. Run the **show firewall** command on the CLI:

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

ASA show-tech file

In order to verify ASA firewall mode, check the **show firewall** section:

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

FCM UI

Follow the steps in the section.

FXOS CLI

Follow the steps in the section.

FXOS REST-API

Follow the steps in the section.

FXOS Chassis show-tech file

Follow the steps in the section.

Verify Instance Deployment type

There are 2 application instance deployment types:

- Native instance - A native instance uses all the resources (CPU, RAM, and disk space) of the security module/engine, so you can only install one native instance.

- Container instance - A container instance uses a subset of resources of the security module/engine. Multi-instance capability is only supported for the FTD managed by FMC; it is not supported for the ASA or the FTD managed by FDM.

Container mode instance configuration is supported only for FTD on Firepower 4100/9300.

The instance deployment type can be verified with the use of these options:

- FTD CLI
- FTD Show-tech
- FMC UI
- FMC REST-API
- FCM UI
- FXOS CLI
- FXOS REST-API
- FXOS chassis show-tech file

FTD CLI

Follow these steps to verify the FTD instance deployment type on the FTD CLI:

1. Use these options to access the FTD CLI in accordance with the platform and deployment mode:

- Direct SSH access to FTD - all platforms
- Access from the FXOS CLI via commands (Firepower 4100/9300):

connect module <x> [console|telnet], where x is the slot ID, and then **connect ftd [instance]**, where the instance is relevant only for multi-instance deployment.

2. Run the **show version system** command and check the line with the string **SSP Slot Number**. If the **Container** exists in this line, the FTD runs in a container mode:

```
> 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 Troubleshoot file

Follow these steps to verify the FTD instance deployment type in the FTD troubleshoot file:

1. Open the troubleshoot file and navigate to the folder **<filename>-troubleshoot .tar/results-<date>--xxxxxx/command-outputs**.
2. Open the file **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. Check the line with the string **SSP Slot Number**. If the **Container** exists in this line, the FTD runs in a container mode:

```
-----[ 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

Follow these steps to verify the FTD instance deployment type on the FMC UI:

1. Choose **Devices > Device Management**:

Firepower Management Center Overview / Dashboards / Management

Overview Analysis Policies **1 Devices** Objects AMP Intelligence Deploy 🔍 ⚙️ ? Global \ admin

2 Device Management

- Device Upgrade
- NAT
- QoS
- Platform Settings
- FlexConfig
- Certificates
- VPN
- Site To Site
- Remote Access
- Dynamic Access Policy
- Troubleshooting
- Site to Site Monitoring
- Troubleshoot
- File Download
- Threat Defense CLI
- Packet Tracer
- Packet Capture

Name	Model	Version	Chassis	Licenses	Access Control Policy	Group
Access Controlled User Statistics						
Application Statistics						
Application Statistics (7.1.0)						
Connection Summary						
Detailed Dashboard						
Detailed Dashboard (7.0.0)						
Files Dashboard						
Security Intelligence Statistics						
Summary Dashboard						

2. Check the **Chassis** column. If the **Container** exists in the line, then FTD runs in container mode.

Firepower Management Center Overview / Dashboards / Management

Overview Analysis Policies **Devices** Objects AMP Deploy 🔍 ⚙️ ? LAB2 \ admin

View By: Domain

All (5) Error (0) Warning (0) Offline (0) Normal (5) Deployment Pending (0) Upgrade (0) Snort 3 (5)

Deployment History

Search Device Add

Collapse All

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

FMC REST-API

Follow these steps to verify the FTD instance deployment type via FMC REST-API. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

```
# 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. Identify the domain that contains the device. In most of the REST API queries the **domain** parameter is mandatory. Use the token in this query to retrieve the list of domains:

```
# 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. Use the domain UUID to query the specific **devicerecords** and the specific device 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. Use the domain UUID and the device/container UUID from Step 3 in this query and check the value of **isMultiInstance**:

```
# 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

In order to verify the FTD instance deployment type, check the value of the **Resource Profile** attribute in Logical Devices. If the value is not empty, then the FTD runs in container mode:

Overview Interfaces Logical Devices Security Engine Platform Settings							System Tools Help admin
Logical Device List							Refresh Add
(1 Container Instance) 57% (26 of 46) Cores Available							
ftd_cluster1 Clustered Status:ok							
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	

FXOS CLI

Follow these steps to verify the FTD instance deployment type on the FXOS CLI:

1. Establish a console or SSH connection to the chassis.
2. Switch to the **scope ssa** and run the **show app-instance** command, then check the **Deploy Type** column of the specific FTD based on the slot and the identifier:

```
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

Follow these steps to verify the FTD instance deployment type via an FXOS REST-API request. Use a REST-API client. In this example, **curl** is used:

1. Request an authentication token:

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

2. Specify the token, the slot ID in this query, and check the value of **deployType**:

```
# 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 Chassis show-tech file

Follow these steps to verify the FTD firewall mode in the FXOS chassis show-tech file:

1. For FXOS versions 2.7 and later, open the file **sam_techsupportinfo** in **<name>_BC1_all.tar/ FPRM_A_TechSupport.tar.gz/FPRM_A_TechSupport.tar**

For earlier versions, open the file **sam_techsupportinfo** in **FPRM_A_TechSupport.tar.gz/ FPRM_A_TechSupport.tar**.

2. Check the **`show slot expand detail`** section for the specific slot and the identifier:

```
# 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
```

Verify ASA Context mode

ASA supports single and multi-context modes. FTD does not support multi-context mode.

The context type can be verified with the use of these options:

- ASA CLI
- ASA show-tech

ASA CLI

Follow these steps to verify the ASA context mode on the ASA CLI:

1. Use these options to access the ASA CLI in accordance with the platform and deployment mode:
 - Direct telnet/SSH access to ASA on Firepower 1000/3100 and Firepower 2100 in appliance mode
 - Access from FXOS console CLI on Firepower 2100 in platform mode and connect to ASA via the **connect asa** command

- Access from FXOS CLI via commands (Firepower 4100/9300):
connect module <x> [console|telnet], where x is the slot ID, and then **connect asa**

- For virtual ASA, direct SSH access to ASA, or console access from the hypervisor or cloud UI

2. Run the **show mode** command on the CLI:

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

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

ASA show-tech file

Follow these steps to verify the ASA context mode in the ASA show-tech file:

1. Check the **show context detail** section in the show-tech file. In this case, the context mode is multiple since there are multiple contexts:

----- 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
```

Verify the Firepower 2100 mode with ASA

Firepower 2100 with ASA can run in one of these modes:

- Platform mode - basic operating parameters and hardware interface settings are configured in FXOS. These settings include interfaces admin state change, EtherChannel configuration,

NTP, image management, and more. FCM web interface or FXOS CLI can be used for FXOS configuration.

- Appliance mode (the default) - Appliance mode allows users to configure all policies in the ASA. Only advanced commands are available from the FXOS CLI.

Firepower 2100 mode with ASA be verified with the use of these options:

- ASA CLI
- FXOS CLI
- FXOS show-tech

ASA CLI

Follow these steps to verify the Firepower 2100 mode with ASA on the ASA CLI:

1. Use telnet/SSH to access the ASA on Firepower 2100.
2. Run the **show fxos mode** command on the CLI:

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

Appliance mode:

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

Note: In multi-context mode, the **show fxos mode** command is available in the **system** or the **admin** context.

FXOS CLI

Follow these steps to verify the Firepower 2100 mode with ASA on the FXOS CLI:

1. Use telnet/SSH to access the ASA on Firepower 2100.
2. Run the **connect fxos** command:

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

Note: In multi-context mode, the **connect fxos** command is available in the **admin** context.

3. Run the **show fxos-mode** command:

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

Appliance mode:

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

FXOS show-tech file

Follow these steps to verify the Firepower 2100 mode with ASA in the FXOS chassis show-tech file:

1. Open file **tech_support_brief** in **<name>_FPRM.tar.gz/<name>_FPRM.tar**
2. Check the **`show fxos-mode`** section:

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

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

Known Issues

Cisco bug ID [CSCwb94424](#) ENH: Add a CLISH command for FMC HA configuration verification

Cisco bug ID [CSCvn31622](#) ENH: Add FXOS SNMP OIDs to poll logical device and app-instance configuration

Cisco bug ID [CSCwb97767](#) ENH: Add OID for verification of FTD instance deployment type

Cisco bug ID [CSCwb97772](#) ENH: Include output of 'show fxos mode' in show-tech of ASA on Firepower 2100

Cisco bug ID [CSCwb97751](#) OID 1.3.6.1.4.1.9.9.491.1.6.1.1 for transparent firewall mode verification is not available

Related Information

- [Secure Firewall Management Center REST API Quick Start Guide, Version 7.1](#)
- [Configure SNMP on Firepower NGFW Appliances](#)

- [Cisco Firepower Threat Defense REST API Guide](#)
- [Cisco FXOS REST API Reference](#)
- [Cisco ASA Compatibility](#)
- [Firepower 1000/2100 and Secure Firewall 3100 ASA and FXOS Bundle Versions](#)
- [Bundled Components](#)
- [Firepower Troubleshoot File Generation Procedures](#)
- [Cisco Firepower 2100 Getting Started Guide](#)
- [Cisco Firepower Threat Defense Compatibility Guide](#)