Configure FTD Clustering on FP9300 (intra-chassis)

Contents

Introduction

This document describes how to configure and verify Cluster Feature on the FPR9300 device.

> **Caution**: The information provided in this document covers the initial installation/configuration of the cluster. This document is not applicable to a unit replacement (Return Material Authorization - RMA) procedure

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

- Cisco Firepower 9300 Security Appliance running 1.1(4.95)
- Firepower Threat Defense (FTD) running 6.0.1 (build 1213)

- FireSIGHT Management Center (FMC) running 6.0.1.1 (build 1023)

Lab completion time: 1 hour.

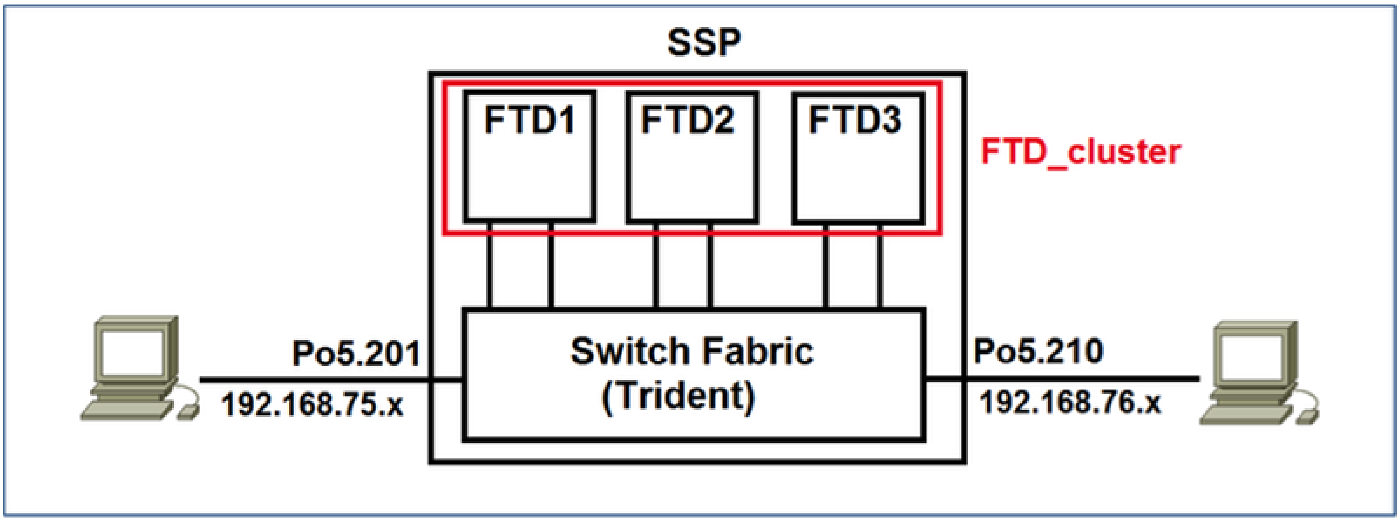
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

- On the FPR9300 with FTD appliance, you can configure intra-chassis Clustering on all supported versions.
- Inter-chassis clustering was introduced in 6.2.
- Port-channel 48 is created as a cluster-control link. For intra-chassis clustering, this link utilizes the Firepower 9300 backplane for cluster communications.
- Individual data interfaces are not supported, with the exception of a management interface.
- Management interface is assigned to all units in the cluster.

Configure

Network Diagram



Task 1. Create Necessary Interfaces for FTD Cluster

Task requirement:

Create a Cluster, a Management interface, and a Port-channel Data interface.

Solution:

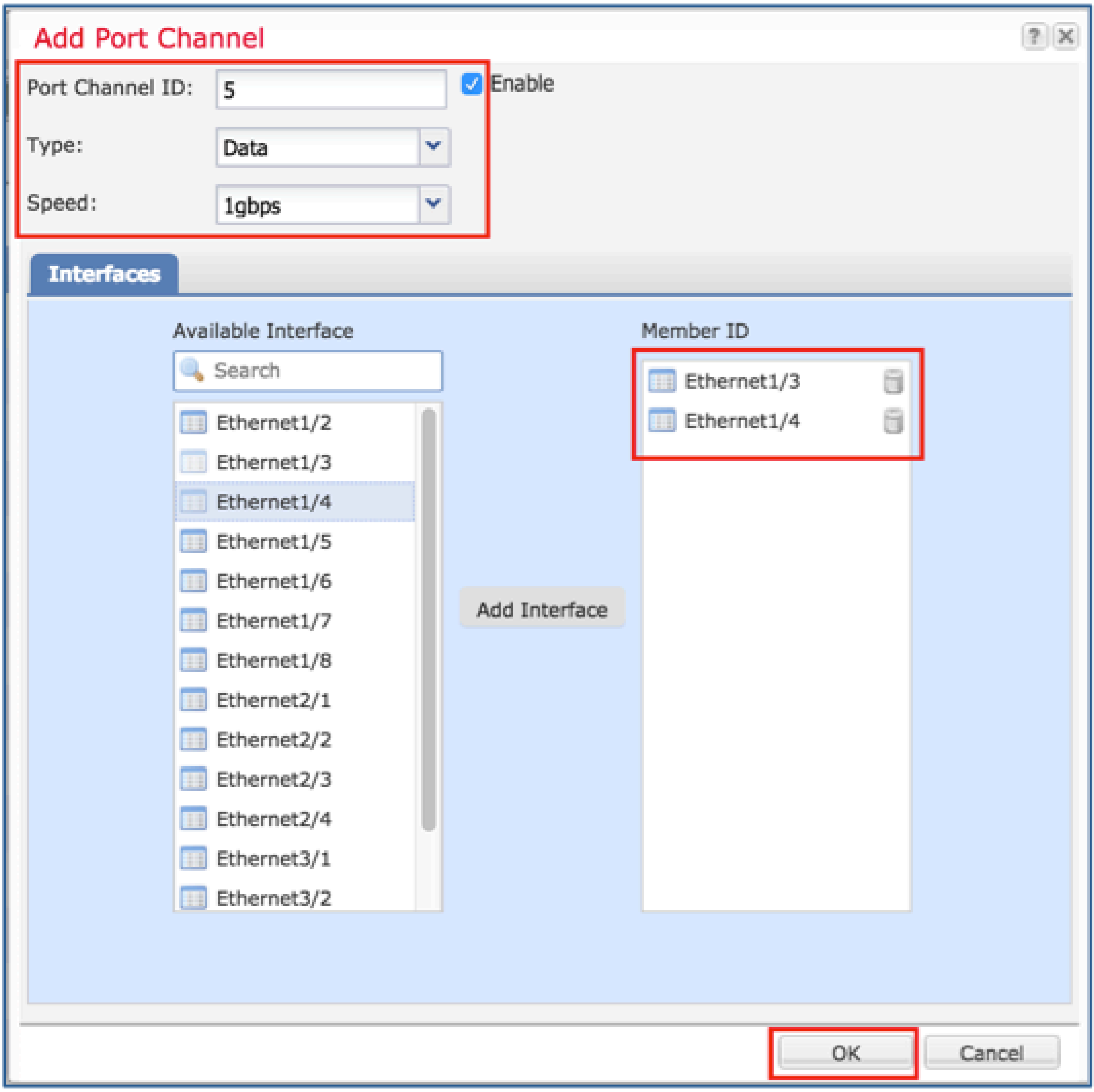
Step 1. Create a Port channel Data interface.

In order to create a new interface, you have to log into FPR9300 Chassis Manager and Navigate to **Interfaces** tab.

Select **Add Port Channel** and create a new Port Channel Interface with these parameters:

Port Channel ID	5
Type	Data
Enable	Yes
Member ID	Ethernet1/3, Ethernet 1/4

Select **OK** to save the configuration as shown in the image.



Add Port Channel

Port Channel ID: 5 ☑ Enable

Type: Data

Speed: 1gbps

Interfaces

Available Interface

Ethernet1/2
Ethernet1/3
Ethernet1/4
Ethernet1/5
Ethernet1/6
Ethernet1/7
Ethernet1/8
Ethernet2/1
Ethernet2/2
Ethernet2/3
Ethernet2/4
Ethernet3/1
Ethernet3/2

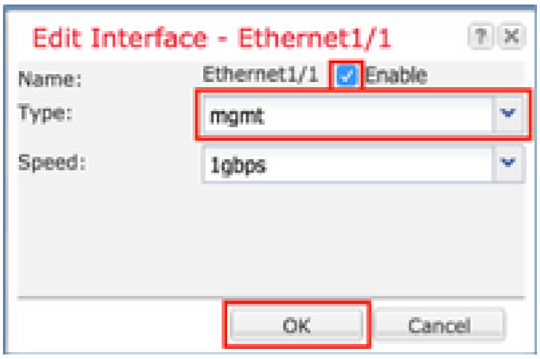
Member ID

Ethernet1/3
Ethernet1/4

Step 2. Create a Management Interface.

On the **Interfaces** tab, choose the interface, click on **Edit** and configure the Management Type interface.

Click **OK** to save the configuration as shown in the image.



Edit Interface - Ethernet1/1

Name: Ethernet1/1 ☑ Enable

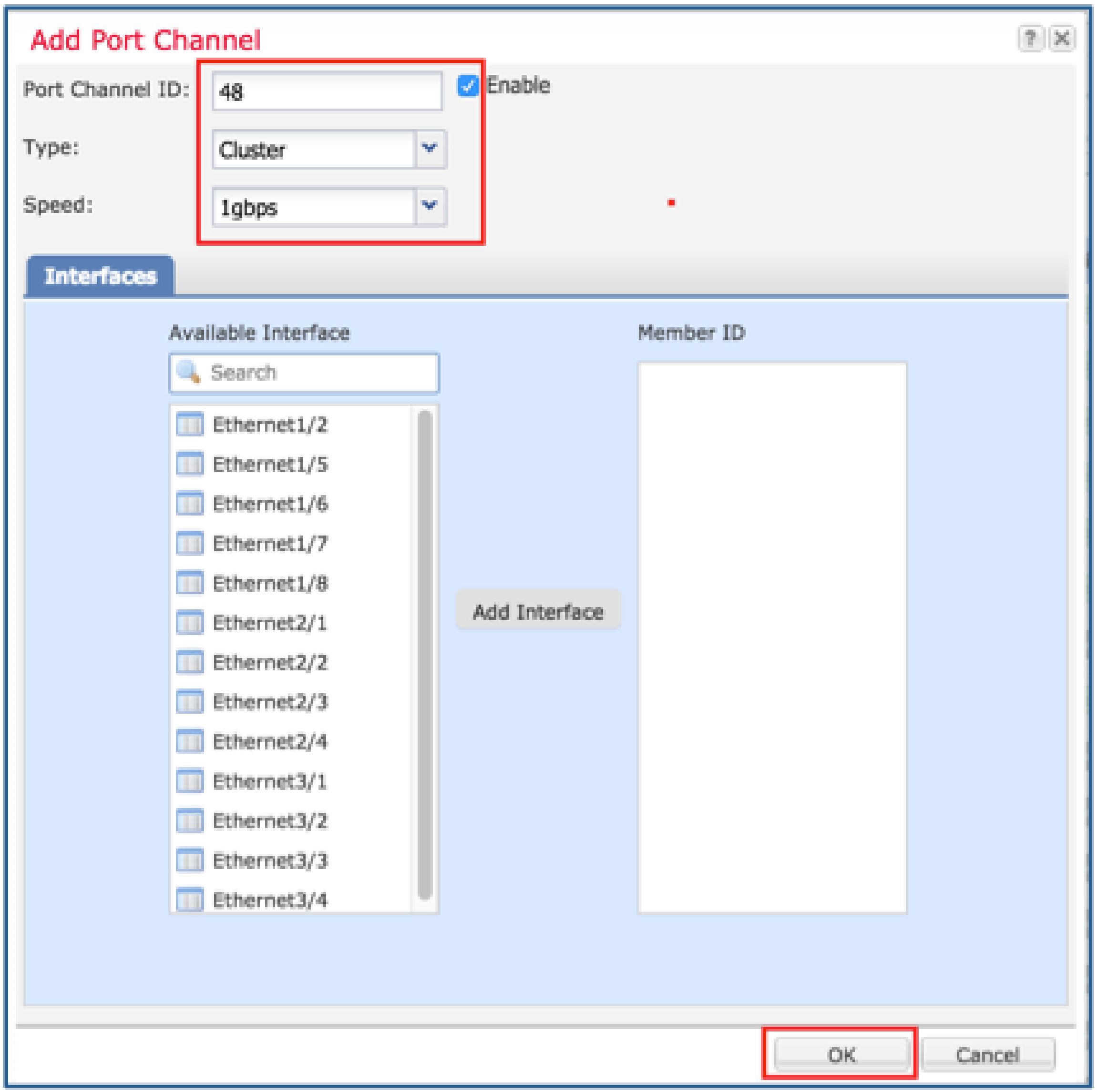
Type: mgmt

Speed: 1gbps

Step 3. Create Cluster-Control Link Interface.

Click on **Add Port Channel** button and create a new Port Channel Interface with these parameters and as shown in the image.

Port Channel ID	48
Type	Cluster
Enable	Yes
Member ID	-



Add Port Channel

Port Channel ID: 48 ☑ Enable

Type: Cluster

Speed: 1gbps

Interfaces

Available Interface

Search

Ethernet1/2
Ethernet1/5
Ethernet1/6
Ethernet1/7
Ethernet1/8
Ethernet2/1
Ethernet2/2
Ethernet2/3
Ethernet2/4
Ethernet3/1
Ethernet3/2
Ethernet3/3
Ethernet3/4

Member ID

Task 2. Create FTD Cluster

Task requirement:

Create an FTD Cluster unit.

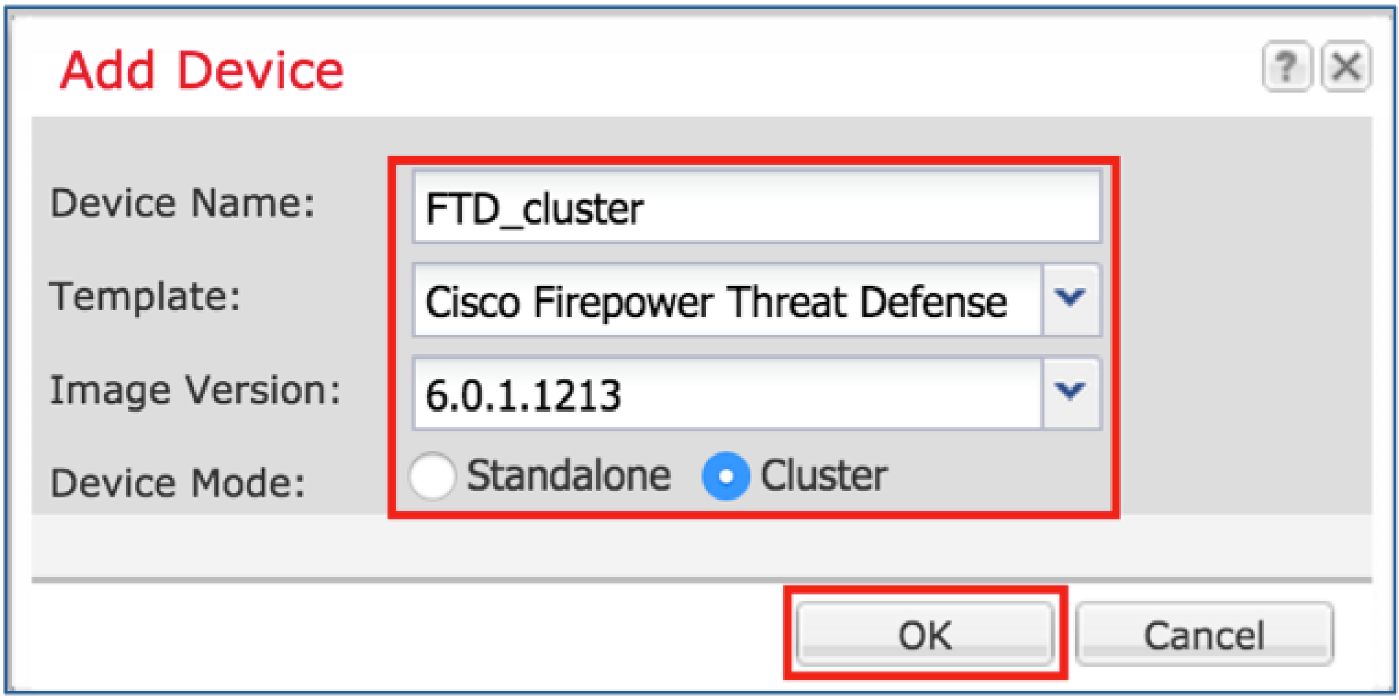
Solution:

Step 1. Navigate to **Logical Devices** and click on **Add Device** button.

Create the FTD Clustering as follows:

Device Name	FTD_cluster
Template	Cisco Firepower Threat Defense
Image Version	6.0.1.1213
Device Mode	Cluster

In order to add the device, click **OK** as shown in the image.



Add Device

Device Name: FTD_cluster

Template: Cisco Firepower Threat Defense

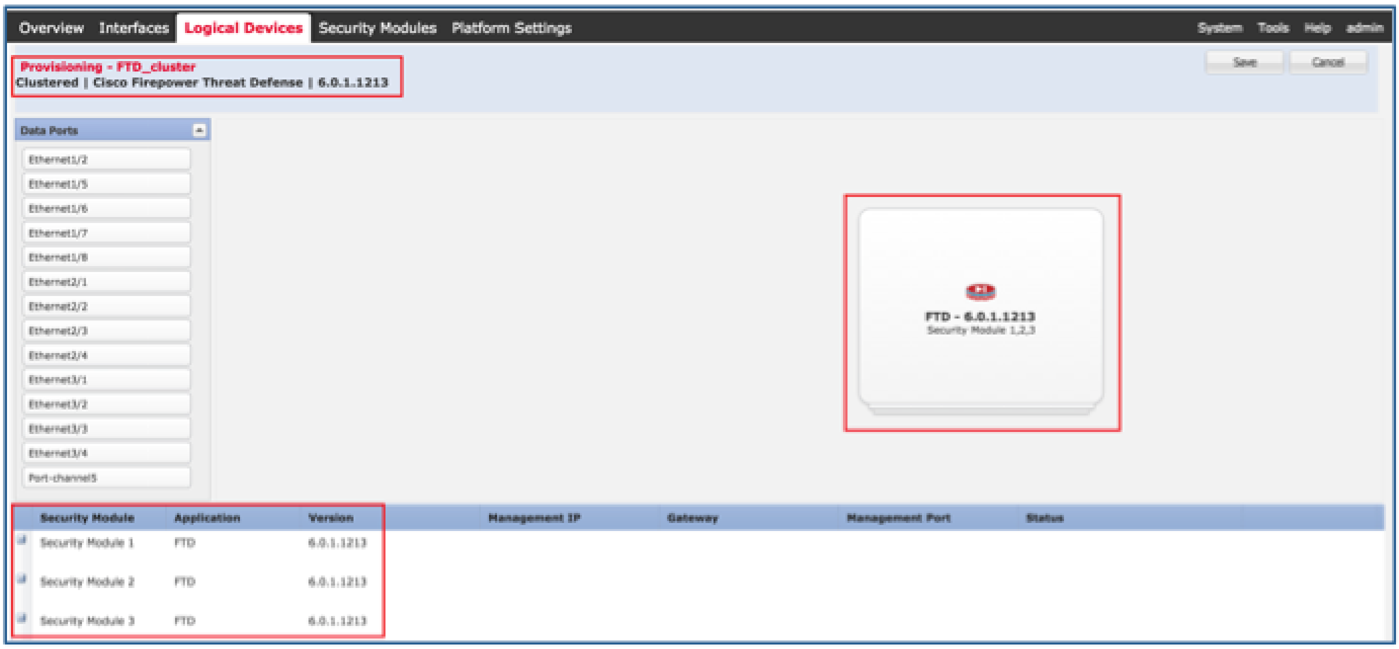
Image Version: 6.0.1.1213

Device Mode: ○ Standalone ● Cluster

Step 2. Configure and deploy FTD Cluster.

After you create an FTD device, you are redirected to the Provisioning- device_name window.

Click on the device icon to start the configuration as shown in the image.

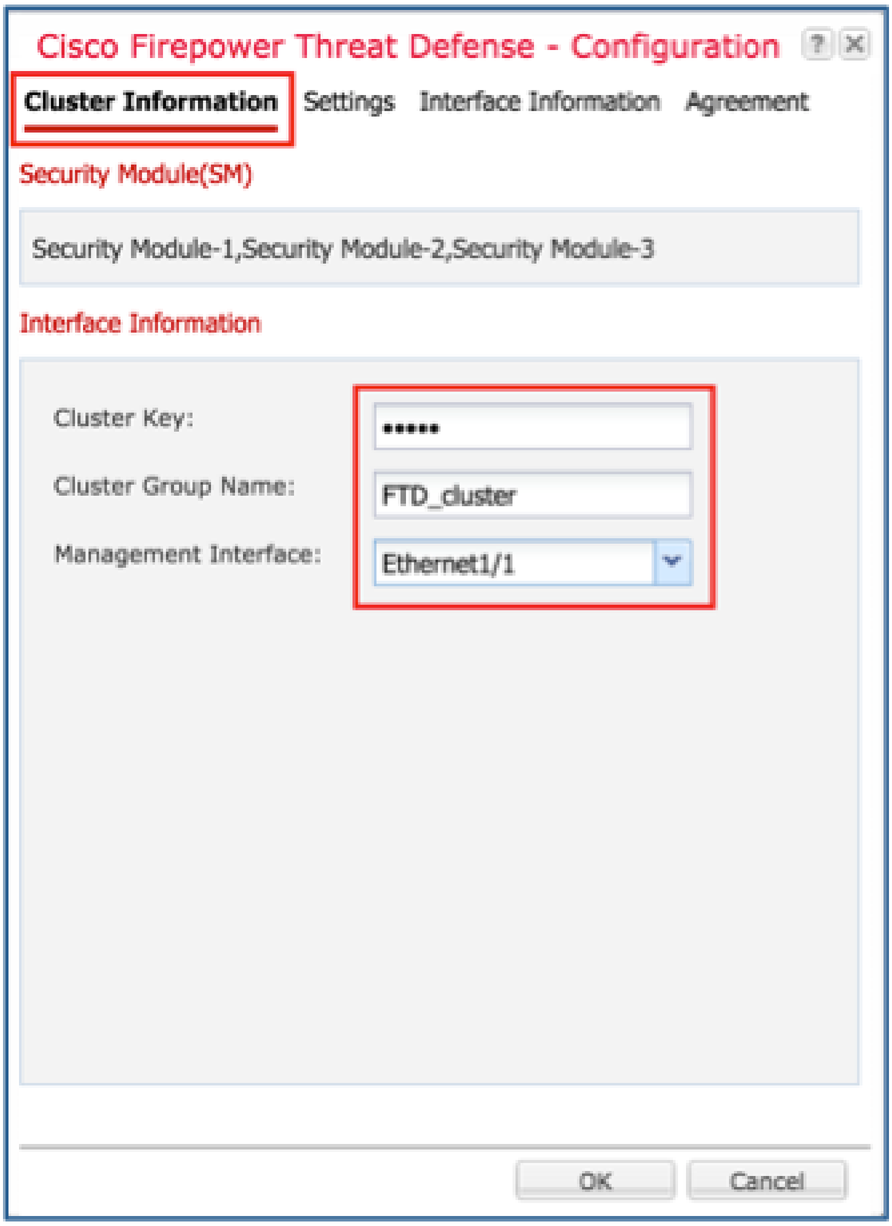


Provisioning - FTD_cluster
Clustered | Cisco Firepower Threat Defense | 6.0.1.1213

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 1	FTD	6.0.1.1213				
Security Module 2	FTD	6.0.1.1213				
Security Module 3	FTD	6.0.1.1213				

Configure the FTD **Cluster Information** tab with these settings and as shown in the image.

Cluster key	cisco
Cluster Group Name	FTD_cluster
Management Interface	Ethernet1/1



Cisco Firepower Threat Defense - Configuration

Cluster Information | Settings | Interface Information | Agreement

Security Module(SM)

Security Module-1,Security Module-2,Security Module-3

Interface Information

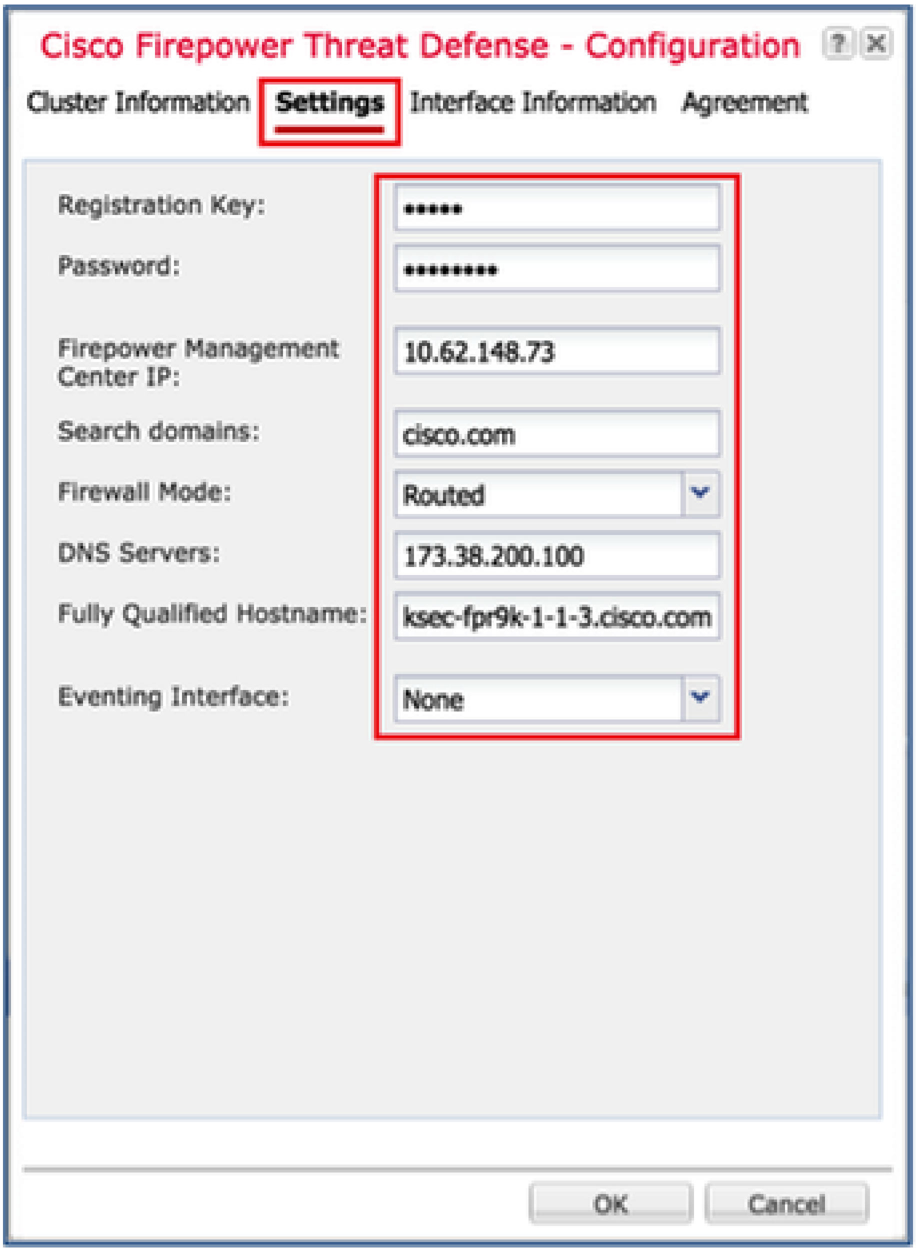
Cluster Key: •••••

Cluster Group Name: FTD_cluster

Management Interface: Ethernet1/1

Configure the FTD **Settings** tab with these settings and as shown in the image.

Registration Key	cisco
Password	Admin123
Firepower Management Center IP	10.62.148.73
Search Domains	cisco.com
Firewall Mode	Routed
DNS Servers	173.38.200.100
Fully Qualified Hostname	ksec-fpr9k-1-1-3.cisco.com
Eventing Interface	None



Cisco Firepower Threat Defense - Configuration

Registration Key: •••••

Password: •••••••••

Firepower Management Center IP: 10.62.148.73

Search domains: cisco.com

Firewall Mode: Routed

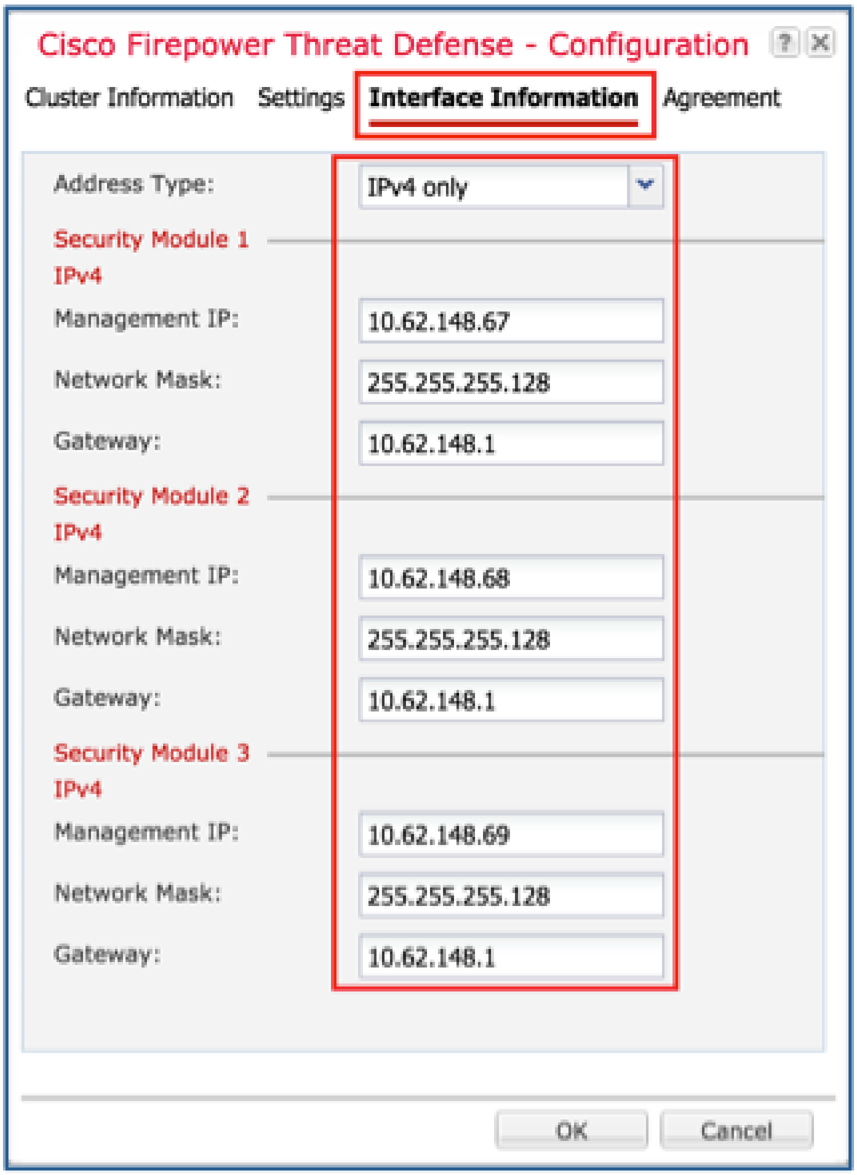
DNS Servers: 173.38.200.100

Fully Qualified Hostname: ksec-fpr9k-1-1-3.cisco.com

Eventing Interface: None

Configure the FTD **Interface Information** tab with these settings and as shown in the image.

Address Type	IPv4 Only
Security Module 1	
Management IP	10.62.148.67
Network Mask	255.255.255.128
Gateway	10.62.148.1
Security Module 2	
Management IP	10.62.148.68
Network Mask	255.255.255.128
Gateway	10.62.148.1
Security Module 3	
Management IP	10.62.148.69
Network Mask	255.255.255.128
Gateway	10.62.148.1



Address Type: IPv4 only

Security Module 1

IPv4

Management IP: 10.62.148.67

Network Mask: 255.255.255.128

Gateway: 10.62.148.1

Security Module 2

IPv4

Management IP: 10.62.148.68

Network Mask: 255.255.255.128

Gateway: 10.62.148.1

Security Module 3

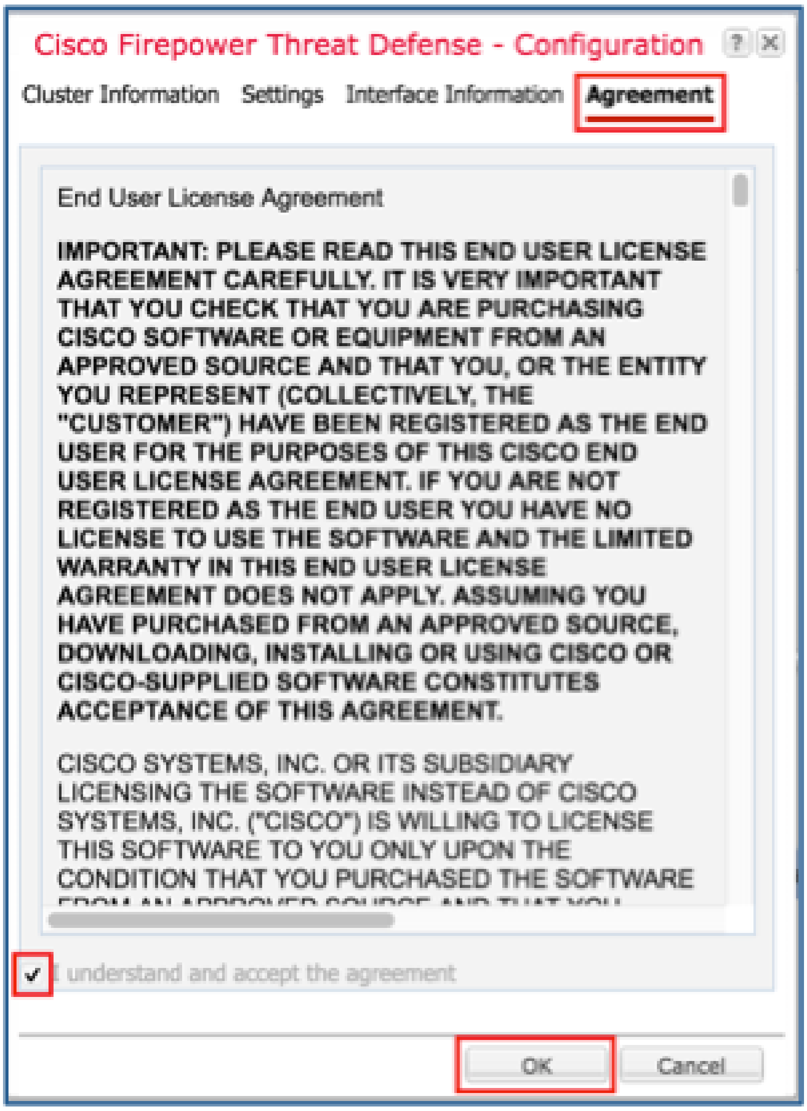
IPv4

Management IP: 10.62.148.69

Network Mask: 255.255.255.128

Gateway: 10.62.148.1

Accept the Agreement on the **Agreement** tab and click **OK** as shown in the image.



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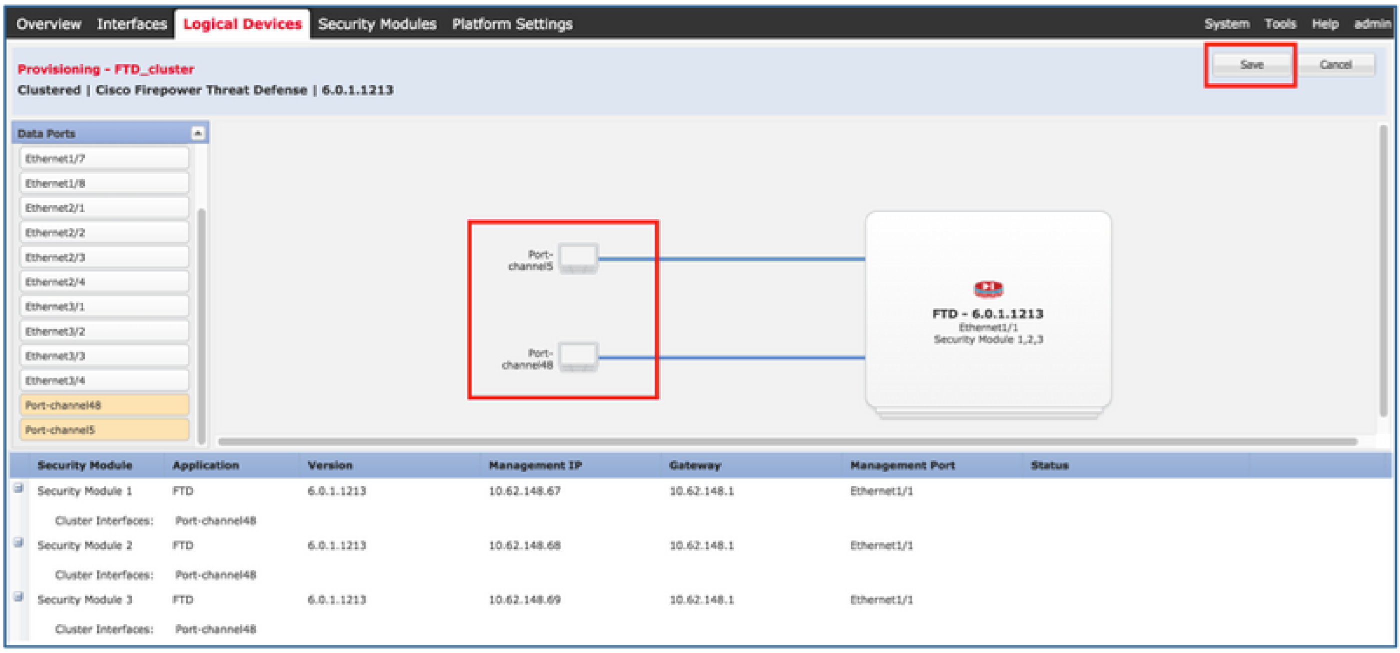
☑ I understand and accept the agreement

Step 3. Assign Data Interfaces to FTD.

Expand the Data Ports area and click on each interface you want to assign to FTD. After completion, select **Save** to create an FTD cluster as shown in the image.



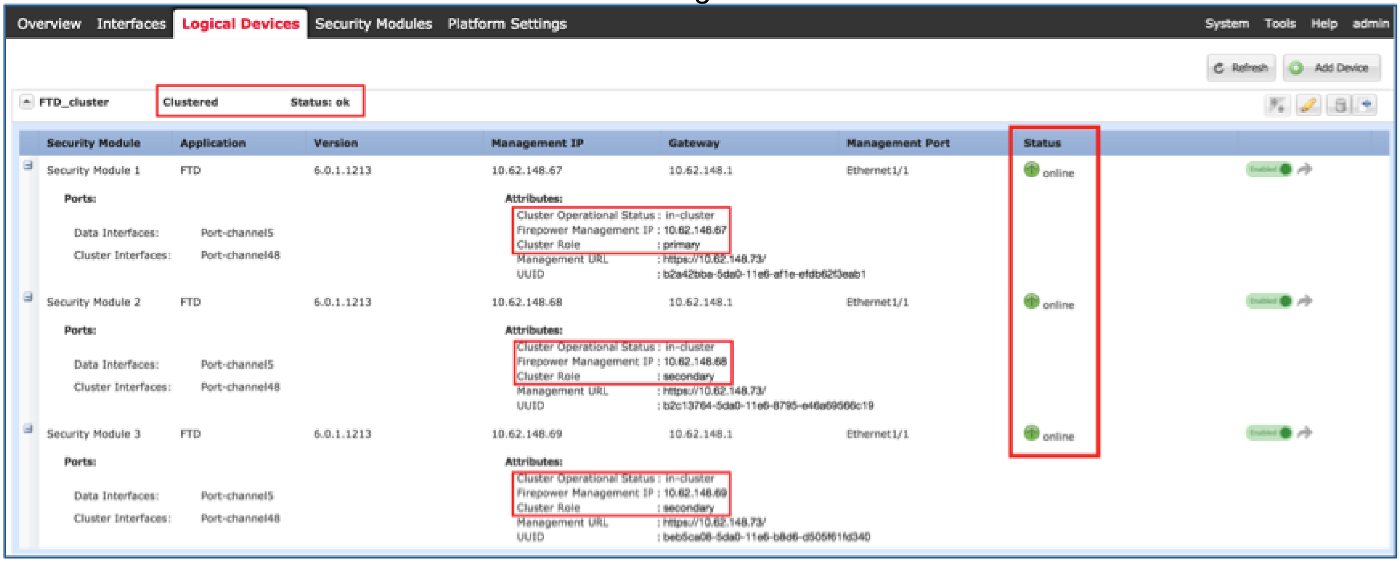
Provisioning - FTD_cluster
Clustered | Cisco Firepower Threat Defense | 6.0.1.1213

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 1	FTD	6.0.1.1213	10.62.148.67	10.62.148.1	Ethernet1/1	
Cluster Interfaces:	Port-channel48					
Security Module 2	FTD	6.0.1.1213	10.62.148.68	10.62.148.1	Ethernet1/1	
Cluster Interfaces:	Port-channel48					
Security Module 3	FTD	6.0.1.1213	10.62.148.69	10.62.148.1	Ethernet1/1	
Cluster Interfaces:	Port-channel48					

Wait for a few minutes for the cluster to be deployed, after which the master unit election occurs.

Verification:

- From the FPR9300 GUI as shown in the image.



FTD_cluster   Clustered   Status: ok

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 1	FTD	6.0.1.1213	10.62.148.67	10.62.148.1	Ethernet1/1	online
Security Module 2	FTD	6.0.1.1213	10.62.148.68	10.62.148.1	Ethernet1/1	online
Security Module 3	FTD	6.0.1.1213	10.62.148.69	10.62.148.1	Ethernet1/1	online

Security Module 1

```
Ports:
  Data Interfaces:      Port-channel5
  Cluster Interfaces:   Port-channel48

Attributes:
  Cluster Operational Status : in-cluster
  Firepower Management IP : 10.62.148.67
  Cluster Role               : primary
  Management URL             : https://10.62.148.73/
  UUID                       : b2a42bba-5da0-11e6-af1e-efdb62f3eab1
```

Security Module 2

```
Ports:
  Data Interfaces:      Port-channel5
  Cluster Interfaces:   Port-channel48

Attributes:
  Cluster Operational Status : in-cluster
  Firepower Management IP : 10.62.148.68
  Cluster Role               : secondary
  Management URL             : https://10.62.148.73/
  UUID                       : b2c13764-5da0-11e6-8795-e46a69566c19
```

Security Module 3

```
Ports:
  Data Interfaces:      Port-channel5
  Cluster Interfaces:   Port-channel48

Attributes:
  Cluster Operational Status : in-cluster
  Firepower Management IP : 10.62.148.69
  Cluster Role               : secondary
  Management URL             : https://10.62.148.73/
  UUID                       : beb5ca08-5da0-11e6-b8d6-d505f61fd340
```

- From the FPR9300 CLI

```
FPR9K-1-A#
FPR9K-1-A# scope ssa
FPR9K-1-A /ssa # show app-instance
Application Name     Slot ID    Admin State     Operational State    Running Version Startup
Version Cluster Oper State
-------------------- ---------- --------------- -------------------- --------------- -----------
---- ------------------
ftd                  1          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
ftd                  2          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
ftd                  3          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
```

- From the LINA (ASA) CLI

```
firepower# show cluster info
Cluster FTD_cluster: On
    Interface mode: spanned
    This is "unit-1-1" in state MASTER
        ID        : 0
        Version   : 9.6(1)
        Serial No.: FLM19216KK6
        CCL IP    : 127.2.1.1
        CCL MAC   : 0015.c500.016f
        Last join : 21:51:03 CEST Aug 8 2016
        Last leave: N/A
Other members in the cluster:
    Unit "unit-1-3" in state SLAVE
        ID        : 1
        Version   : 9.6(1)
        Serial No.: FLM19206H7T
        CCL IP    : 127.2.1.3
        CCL MAC   : 0015.c500.018f
        Last join : 21:51:05 CEST Aug 8 2016
        Last leave: N/A
    Unit "unit-1-2" in state SLAVE
```

```
        ID        : 2
        Version   : 9.6(1)
        Serial No.: FLM19206H71
        CCL IP    : 127.2.1.2
        CCL MAC   : 0015.c500.019f
        Last join : 21:51:30 CEST Aug 8 2016
        Last leave: N/A

firepower# cluster exec show cluster interface-mode
cluster interface-mode spanned


unit-1-3:*************************************************************
cluster interface-mode spanned


unit-1-2:*************************************************************
cluster interface-mode spanned
firepower#

firepower# cluster exec show cluster history
==========================================================================
From State           To State             Reason
==========================================================================
21:49:25 CEST Aug 8 2016
DISABLED             DISABLED             Disabled at startup

21:50:18 CEST Aug 8 2016
DISABLED             ELECTION             Enabled from CLI

21:51:03 CEST Aug 8 2016
ELECTION             MASTER_POST_CONFIG   Enabled from CLI

21:51:03 CEST Aug 8 2016
MASTER_POST_CONFIG   MASTER               Master post config done and waiting for ntfy

==========================================================================


unit-1-3:*************************************************************
==========================================================================
From State           To State             Reason
==========================================================================
21:49:44 CEST Aug 8 2016
DISABLED             DISABLED             Disabled at startup

21:50:37 CEST Aug 8 2016
DISABLED             ELECTION             Enabled from CLI

21:50:37 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:41 CEST Aug 8 2016
ONCALL               ELECTION            Received cluster control message

21:50:41 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:46 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:46 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message
```

```
21:50:51 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:51 CEST Aug 8 2016
ELECTION             ONCALL                Received cluster control message

21:50:56 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:56 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:01 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:01 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:04 CEST Aug 8 2016
ONCALL               SLAVE_COLD          Received cluster control message

21:51:04 CEST Aug 8 2016
SLAVE_COLD           SLAVE_APP_SYNC       Client progression done

21:51:05 CEST Aug 8 2016
SLAVE_APP_SYNC       SLAVE_CONFIG         Slave application configuration sync done

21:51:17 CEST Aug 8 2016
SLAVE_CONFIG         SLAVE_BULK_SYNC       Configuration replication finished

21:51:29 CEST Aug 8 2016
SLAVE_BULK_SYNC       SLAVE                 Configuration replication finished

==========================================================================


unit-1-2:*************************************************************
==========================================================================
From State           To State             Reason
==========================================================================
21:49:24 CEST Aug 8 2016
DISABLED             DISABLED             Disabled at startup

21:50:16 CEST Aug 8 2016
DISABLED             ELECTION             Enabled from CLI

21:50:17 CEST Aug 8 2016
ELECTION              ONCALL               Received cluster control message

21:50:21 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:21 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:26 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:26 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:31 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message
```

```
21:50:31 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:36 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:36 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:41 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:41 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:46 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:46 CEST Aug 8 2016
ELECTION             ONCALL                Received cluster control message

21:50:51 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:51 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:50:56 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:50:56 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:01 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:01 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:06 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:06 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:12 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:12 CEST Aug 8 2016
ELECTION              ONCALL               Received cluster control message

21:51:17 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:17 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:22 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:22 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message
```

```
21:51:27 CEST Aug 8 2016
ONCALL               ELECTION             Received cluster control message

21:51:27 CEST Aug 8 2016
ELECTION             ONCALL               Received cluster control message

21:51:30 CEST Aug 8 2016
ONCALL               SLAVE_COLD          Received cluster control message

21:51:30 CEST Aug 8 2016
SLAVE_COLD           SLAVE_APP_SYNC       Client progression done

21:51:31 CEST Aug 8 2016
SLAVE_APP_SYNC       SLAVE_CONFIG         Slave application configuration sync done

21:51:43 CEST Aug 8 2016
SLAVE_CONFIG         SLAVE_BULK_SYNC       Configuration replication finished

21:51:55 CEST Aug 8 2016
SLAVE_BULK_SYNC       SLAVE                 Configuration replication finished

==========================================================================
firepower#
```

Task 3. Register FTD Cluster to FMC

Task requirement:

Add the logical devices to the FMC and then group them into a cluster.

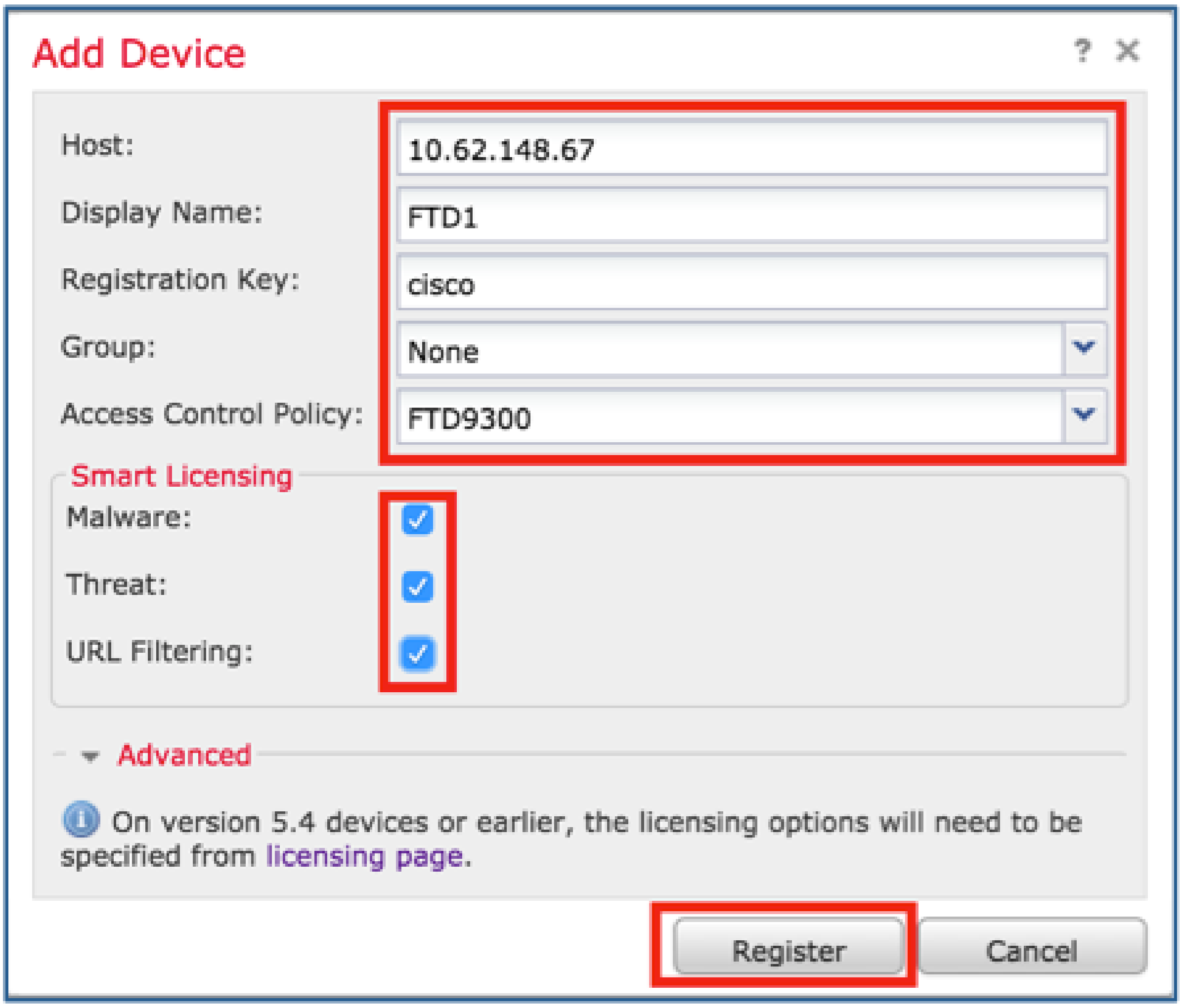
Solution:

Step 1. Add Logical Devices to the FMC. As from FMC version 6.3, you must register only one FTD device (recommended to be the Master). The rest of the FTDs are auto-discovered by the FMC.

Log into the FMC and navigate to **Devices > Device Management** tab and click **Add Device**.

Add the first logical device with the settings as mentioned in the image.

Click on **Register** to start registration.



Add Device

Host: 10.62.148.67

Display Name: FTD1

Registration Key: cisco

Group: None

Access Control Policy: FTD9300

Smart Licensing

Malware: ☑

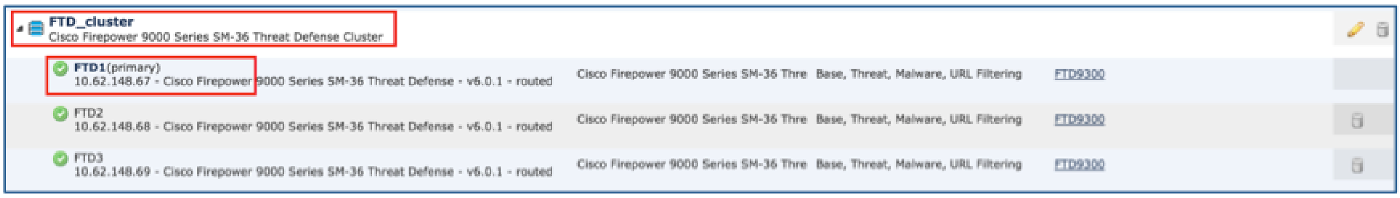
Threat: ☑

URL Filtering: ☑

Advanced

On version 5.4 devices or earlier, the licensing options will need to be specified from licensing page.

Verification is as shown in the image.



FTD_cluster Cisco Firepower 9000 Series SM-36 Threat Defense Cluster			
FTD1(primary) 10.62.148.67 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300
FTD2 10.62.148.68 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300
FTD3 10.62.148.69 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300

Task 4. Configure Port-Channel Sub-Interfaces on FMC

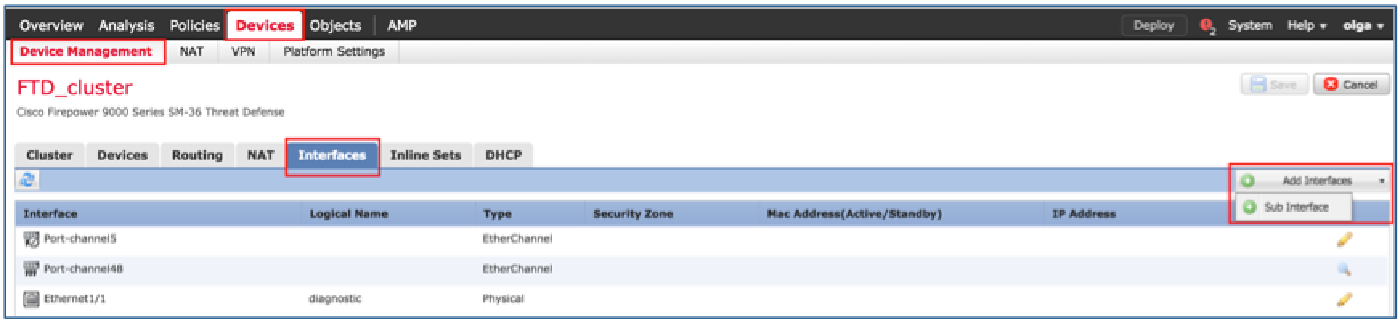
Task requirement:

Configure sub-interfaces for the Port-channel Data interface.

Solution:

Step 1. From the FMC GUI, select **FTD_cluster Edit** button.

Navigate to Interfaces tab and click on the **Add Interfaces > Sub Interface** as shown in the image.



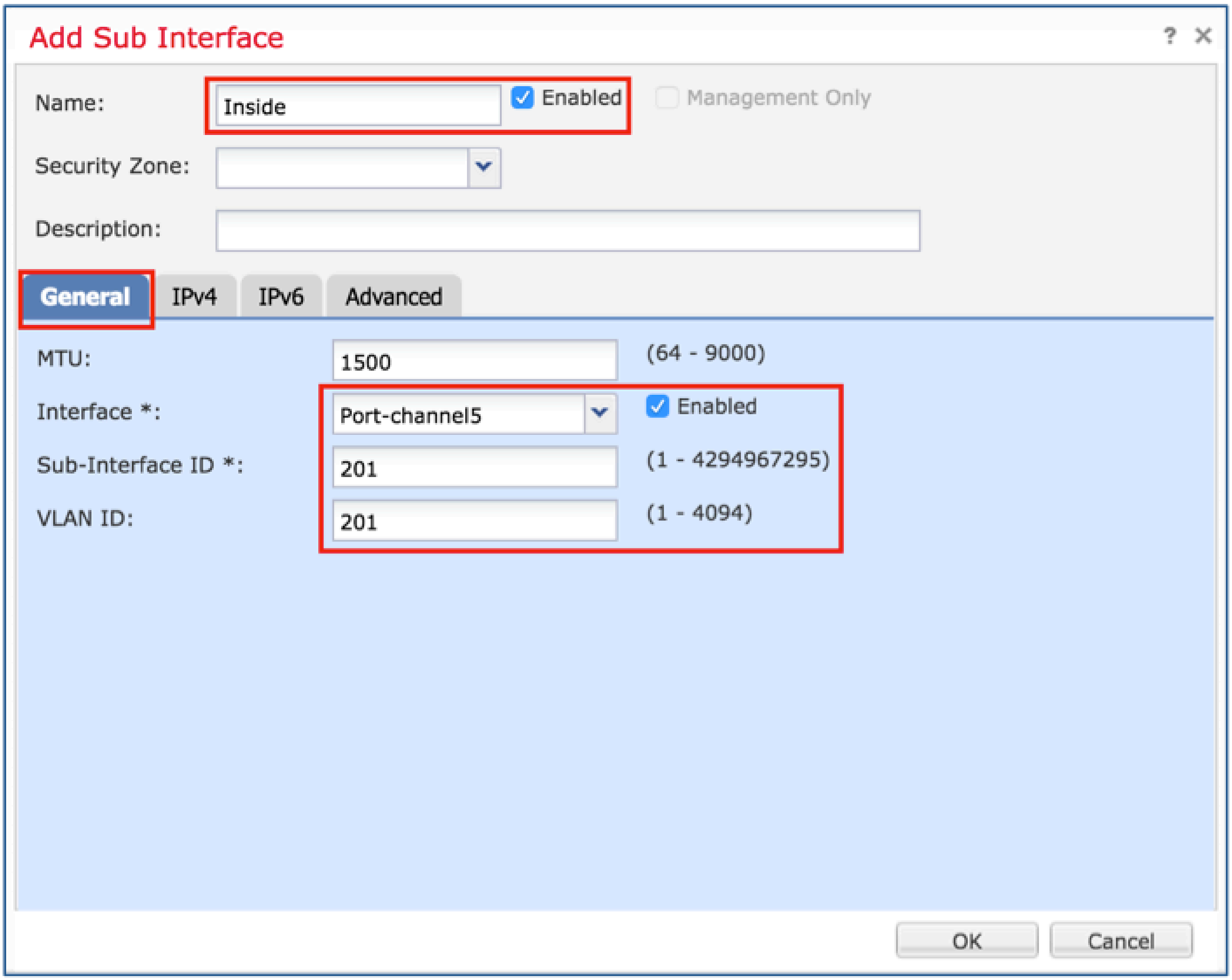
FTD_cluster

Cisco Firepower 9000 Series SM-36 Threat Defense

Interface	Logical Name	Type	Security Zone	Mac Address(Active/Standby)	IP Address
Port-channel5		EtherChannel			
Port-channel48		EtherChannel			
Ethernet1/1	diagnostic	Physical			

Configure the first sub-interface with these details. Select **OK** to apply the changes and as shown in the images.

Name	Inside
General tab	
Interface	Port-channel5
Sub-interface ID	201
VLAN ID	201
IPv4 tab	
IP Type	Use Static IP
IP Address	192.168.75.10/24



Name: Inside ☑ Enabled □ Management Only

Security Zone:

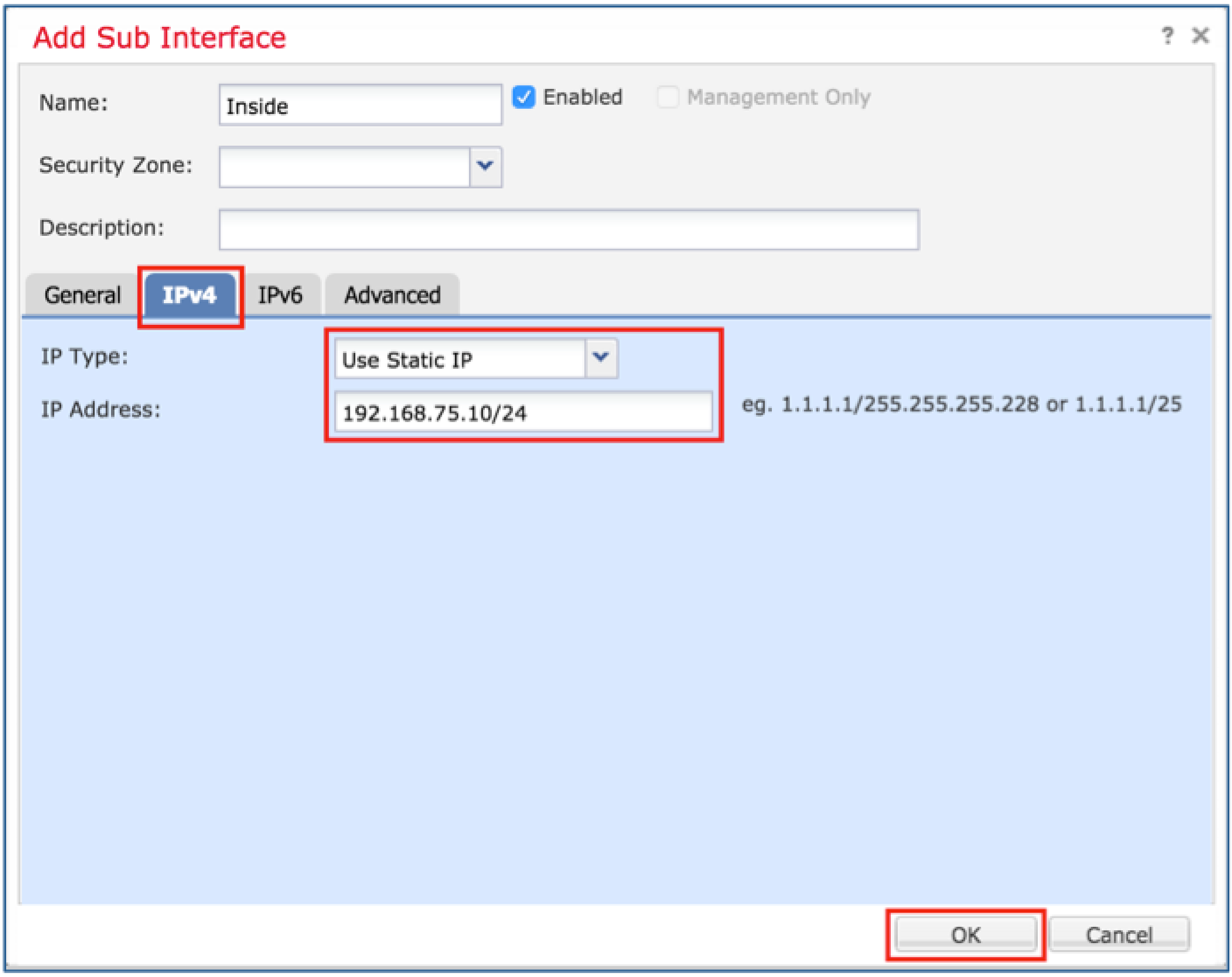
Description:

MTU: 1500 (64 - 9000)

Interface *: Port-channel5 ☑ Enabled

Sub-Interface ID *: 201 (1 - 4294967295)

VLAN ID: 201 (1 - 4094)

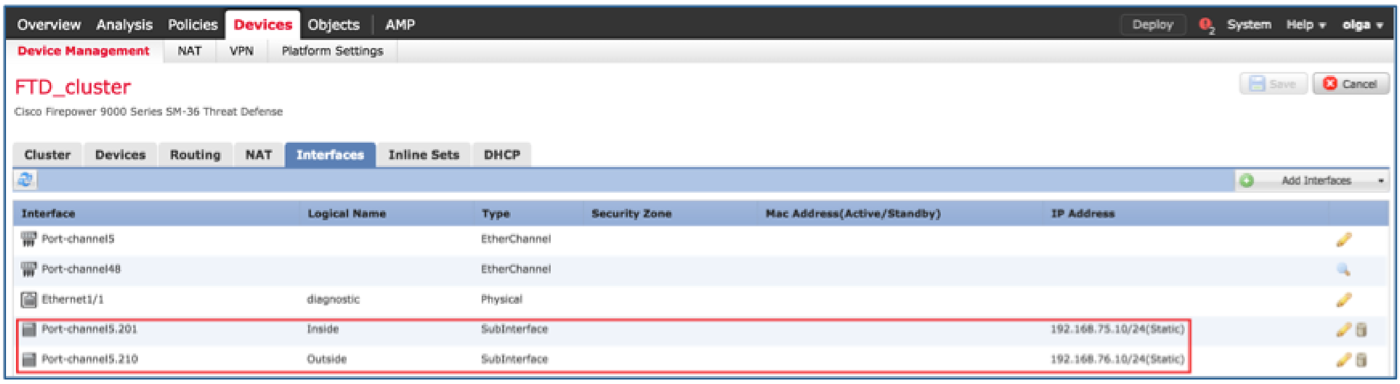


Configure the second sub-interface with these details.

Name	Outside
General tab	
Interface	Port-channel5
Sub-interface ID	210
VLAN ID	210
IPv4 tab	
IP Type	Use Static IP
IP Address	192.168.76.10/24

Click **OK** to create the sub-interface. Click **Save** and then **Deploy** changes to the FTD_cluster as shown in the image.

Verification:



FTD_cluster

Cisco Firepower 9000 Series SM-36 Threat Defense

Interface	Logical Name	Type	Security Zone	Mac Address(Active/Standby)	IP Address
Port-channel5		EtherChannel			
Port-channel48		EtherChannel			
Ethernet1/1	diagnostic	Physical			
Port-channel5.201	Inside	SubInterface			192.168.75.10/24(Static)
Port-channel5.210	Outside	SubInterface			192.168.76.10/24(Static)

Task 5. Verify Basic Connectivity

Task requirement:

Create a capture and check the connectivity between two VMs.

Solution:

Step 1. Create captures on all cluster units.

Navigate to LINA (ASA) CLI of Master unit and create captures for the Inside and Outside interfaces.

```
firepower#
firepower# cluster exec capture capi interface inside match icmp any any
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************
firepower#
firepower# cluster exec capture capo interface outside match icmp any any
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************
firepower#
```

Verification:

```
firepower# cluster exec show capture
unit-1-1(LOCAL):******************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match icmp any any


unit-1-3:*************************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
```

```
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match icmp any any


unit-1-2:*************************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match icmp any any
firepower#
```

Step 2. Do the ping test from the VM1 to VM2.

Do the test with 4 packets. Check the capture output after the test:

```
firepower# cluster exec show capture
unit-1-1(LOCAL):******************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match icmp any any


unit-1-3:*************************************************************
capture capi type raw-data interface Inside [Capturing - 752 bytes]
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 752 bytes]
  match icmp any any


unit-1-2:*************************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
  match icmp any any
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match icmp any any
firepower#
```

Run the command in order to check capture output on the specific unit:

```
firepower# cluster exec unit unit-1-3 show capture capi

8 packets captured

   1: 12:58:36.162253       802.1Q vlan#201 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   2: 12:58:36.162955       802.1Q vlan#201 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   3: 12:58:37.173834       802.1Q vlan#201 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   4: 12:58:37.174368       802.1Q vlan#201 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   5: 12:58:38.187642       802.1Q vlan#201 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   6: 12:58:38.188115       802.1Q vlan#201 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   7: 12:58:39.201832       802.1Q vlan#201 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   8: 12:58:39.202321       802.1Q vlan#201 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
8 packets shown

firepower# cluster exec unit unit-1-3 show capture capo

8 packets captured
```

```
   1: 12:58:36.162543       802.1Q vlan#210 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   2: 12:58:36.162894       802.1Q vlan#210 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   3: 12:58:37.174002       802.1Q vlan#210 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   4: 12:58:37.174307       802.1Q vlan#210 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   5: 12:58:38.187764       802.1Q vlan#210 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   6: 12:58:38.188085       802.1Q vlan#210 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
   7: 12:58:39.201954       802.1Q vlan#210 P0 192.168.75.100 > 192.168.76.100: icmp: echo
request
   8: 12:58:39.202290       802.1Q vlan#210 P0 192.168.76.100 > 192.168.75.100: icmp: echo reply
8 packets shown
firepower#
```

After you finish this task, delete the captures with the next command:

```
firepower# cluster exec no capture capi
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************

firepower# cluster exec no capture capo
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************
```

Step 3. Download a file from VM2 to VM1.

VM1 was pre-configured as an FTP server, VM2 as an FTP client.

Create new captures with these:

```
firepower# cluster exec capture capi interface inside match ip host 192.168.75.100 host
192.168.76.100
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************

firepower# cluster exec capture capo interface outside match ip host 192.168.775.100 host
192.168.76.100
unit-1-1(LOCAL):******************************************************


unit-1-3:*************************************************************


unit-1-2:*************************************************************
```

Download the file from VM2 to VM1, with the use of FTP client.

Check the **show conn** output:

```
firepower# cluster exec show conn all
unit-1-1(LOCAL):*****************************************************
20 in use, 21 most used
Cluster:
fwd connections: 0 in use, 2 most used
dir connections: 0 in use, 52 most used
centralized connections: 0 in use, 6 most used

TCP Outside  192.168.76.100:49175 Inside  192.168.75.100:21, idle 0:00:32, bytes 665, flags
UIOeN
UDP cluster  255.255.255.255:49495 NP Identity Ifc  127.2.1.1:49495, idle 0:00:00, bytes
17858058, flags -
TCP cluster  127.2.1.3:10844 NP Identity Ifc  127.2.1.1:38296, idle 0:00:33, bytes 5496, flags
UI
…….
TCP cluster  127.2.1.3:59588 NP Identity Ifc  127.2.1.1:10850, idle 0:00:33, bytes 132, flags UO


unit-1-3:************************************************************
12 in use, 16 most used
Cluster:
fwd connections: 0 in use, 4 most used
dir connections: 1 in use, 10 most used
centralized connections: 0 in use, 0 most used

TCP Outside  192.168.76.100:49175 Inside  192.168.75.100:21, idle 0:00:34, bytes 0, flags  y
TCP cluster  127.2.1.1:10851 NP Identity Ifc  127.2.1.3:48493, idle 0:00:52, bytes 224, flags UI
……..
TCP cluster  127.2.1.1:64070 NP Identity Ifc  127.2.1.3:10847, idle 0:00:11, bytes 806, flags UO


unit-1-2:************************************************************
12 in use, 15 most used
Cluster:
fwd connections: 0 in use, 2 most used
dir connections: 0 in use, 3 most used
centralized connections: 0 in use, 0 most used

TCP cluster  127.2.1.1:10851 NP Identity Ifc  127.2.1.2:64136, idle 0:00:53, bytes 224, flags UI
……..
TCP cluster  127.2.1.1:15859 NP Identity Ifc  127.2.1.2:10847, idle 0:00:11, bytes 807, flags UO
```

Show capture output:

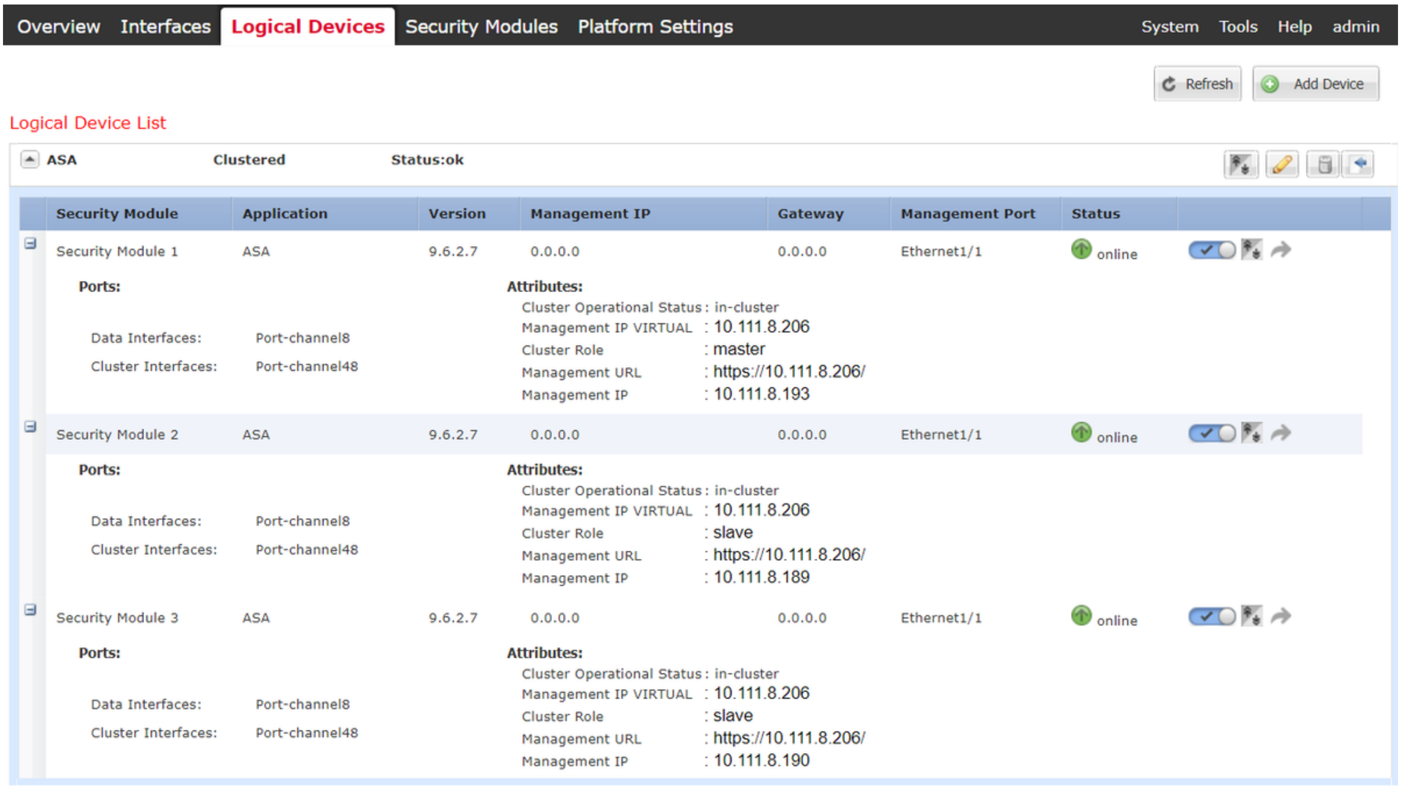
```
firepower# cluster exec show cap
unit-1-1(LOCAL):*****************************************************
capture capi type raw-data interface Inside [Buffer Full - 523954 bytes]
  match ip host 192.168.75.100 host 192.168.76.100
capture capo type raw-data interface Outside [Buffer Full - 524028 bytes]
  match ip host 192.168.75.100 host 192.168.76.100


unit-1-3:************************************************************
capture capi type raw-data interface Inside [Buffer Full - 524062 bytes]
  match ip host 192.168.75.100 host 192.168.76.100
capture capo type raw-data interface Outside [Buffer Full - 524228 bytes]
  match ip host 192.168.75.100 host 192.168.76.100
```

```
unit-1-2:*************************************************************
capture capi type raw-data interface Inside [Capturing - 0 bytes]
  match ip host 192.168.75.100 host 192.168.76.100
capture capo type raw-data interface Outside [Capturing - 0 bytes]
  match ip host 192.168.75.100 host 192.168.76.100
```

Cluster Capture from Chassis Manager UI

In the following image you can see a 3-unit cluster on FPR9300 with 2 Port-Channels (8 and 48). The logical devices are ASAs, but in the case of FTD will be the same concept.The important thing to remember is that although there are **3 cluster units**, from capture point of view there is only **one logical device**:



Logical Device List

ASA Clustered Status:ok

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 1	ASA	9.6.2.7	0.0.0.0	0.0.0.0	Ethernet1/1	online

Ports:

Data Interfaces: Port-channel8

Cluster Interfaces: Port-channel48

Attributes:

Cluster Operational Status : in-cluster
Management IP VIRTUAL : 10.111.8.206
Cluster Role : master
Management URL : https://10.111.8.206/
Management IP : 10.111.8.193

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 2	ASA	9.6.2.7	0.0.0.0	0.0.0.0	Ethernet1/1	online

Ports:

Data Interfaces: Port-channel8

Cluster Interfaces: Port-channel48

Attributes:

Cluster Operational Status : in-cluster
Management IP VIRTUAL : 10.111.8.206
Cluster Role : slave
Management URL : https://10.111.8.206/
Management IP : 10.111.8.189

Security Module	Application	Version	Management IP	Gateway	Management Port	Status
Security Module 3	ASA	9.6.2.7	0.0.0.0	0.0.0.0	Ethernet1/1	online

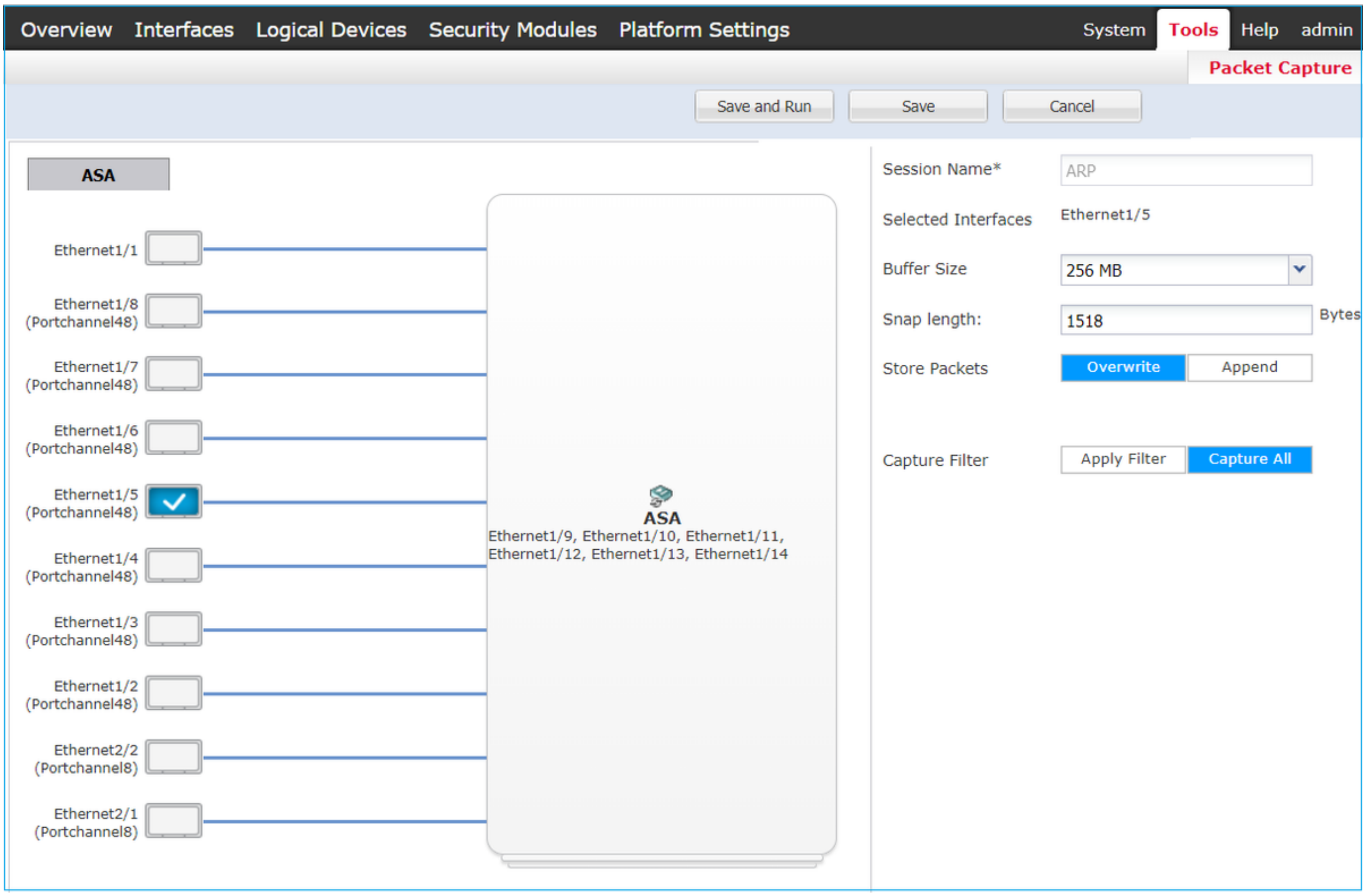
Ports:

Data Interfaces: Port-channel8

Cluster Interfaces: Port-channel48

Attributes:

Cluster Operational Status : in-cluster
Management IP VIRTUAL : 10.111.8.206
Cluster Role : slave
Management URL : https://10.111.8.206/
Management IP : 10.111.8.190


Overview
Interfaces
Logical Devices
Security Modules
Platform Settings
System
Tools
Help
admin
Packet Capture
Save and Run
Save
Cancel
ASA
Ethernet1/1
Ethernet1/8 (Portchannel48)
Ethernet1/7 (Portchannel48)
Ethernet1/6 (Portchannel48)
Ethernet1/5 (Portchannel48)
Ethernet1/4 (Portchannel48)
Ethernet1/3 (Portchannel48)
Ethernet1/2 (Portchannel48)
Ethernet2/2 (Portchannel8)
Ethernet2/1 (Portchannel8)
ASA
Ethernet1/9, Ethernet1/10, Ethernet1/11, Ethernet1/12, Ethernet1/13, Ethernet1/14

Session Name* ARP

Selected Interfaces Ethernet1/5

Buffer Size 256 MB

Snap length: 1518 Bytes

Store Packets Overwrite Append

Capture Filter Apply Filter Capture All

Task 6. Delete a Slave Device from the Cluster

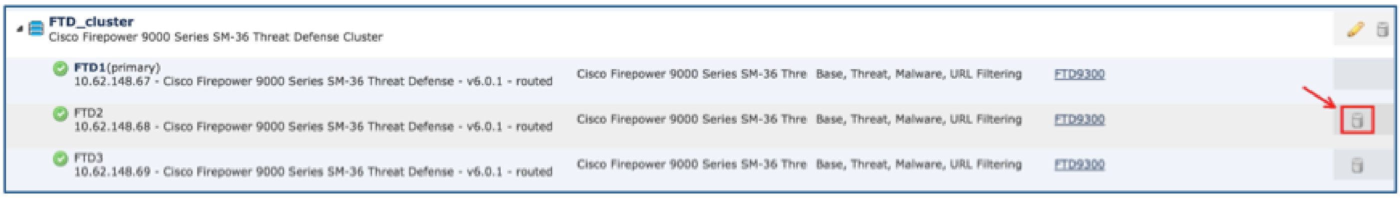
Task requirement:

Log into the FMC and delete the Slave unit from the cluster.

Solution:

Step 1. Log into the FMC and navigate to **Device > Device Management**.

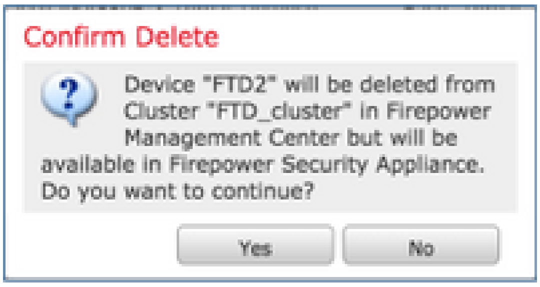
Click the trash icon next to the Slave unit as shown in the image.



FTD_cluster
Cisco Firepower 9000 Series SM-36 Threat Defense Cluster

FTD1(primary) 10.62.148.67 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300
FTD2 10.62.148.68 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300
FTD3 10.62.148.69 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed	Cisco Firepower 9000 Series SM-36 Thre	Base, Threat, Malware, URL Filtering	FTD9300

The confirmation window appears. Select **Yes** to confirm as shown in the image.

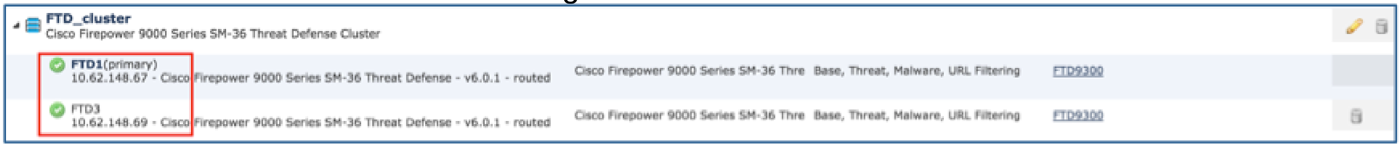


Confirm Delete

Device "FTD2" will be deleted from Cluster "FTD_cluster" in Firepower Management Center but will be available in Firepower Security Appliance. Do you want to continue?

Verification:

- From the FMC as shown in the image.



FTD_cluster
Cisco Firepower 9000 Series SM-36 Threat Defense Cluster

FTD1(primary)
10.62.148.67 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed | Cisco Firepower 9000 Series SM-36 Thre | Base, Threat, Malware, URL Filtering | FTD9300

FTD3
10.62.148.69 - Cisco Firepower 9000 Series SM-36 Threat Defense - v6.0.1 - routed | Cisco Firepower 9000 Series SM-36 Thre | Base, Threat, Malware, URL Filtering | FTD9300

- From the FXOS CLI.

```
FPR9K-1-A# scope ssa
FPR9K-1-A /ssa # show app-instance
Application Name     Slot ID    Admin State     Operational State    Running Version Startup
Version Cluster Oper State
-------------------- ---------- --------------- -------------------- --------------- -----------
---- ------------------
ftd                  1          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
ftd                  2          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
ftd                  3          Enabled         Online               6.0.1.1213      6.0.1.1213
In Cluster
```

- From the LINA (ASA) CLI.

```
firepower# show cluster info
Cluster FTD_cluster: On
    Interface mode: spanned
    This is "unit-1-1" in state MASTER
        ID        : 0
        Version   : 9.6(1)
        Serial No.: FLM19216KK6
        CCL IP    : 127.2.1.1
        CCL MAC   : 0015.c500.016f
        Last join : 21:51:03 CEST Aug 8 2016
        Last leave: N/A
Other members in the cluster:
    Unit "unit-1-3" in state SLAVE
        ID        : 1
        Version   : 9.6(1)
        Serial No.: FLM19206H7T
        CCL IP    : 127.2.1.3
        CCL MAC   : 0015.c500.018f
        Last join : 21:51:05 CEST Aug 8 2016
        Last leave: N/A
    Unit "unit-1-2" in state SLAVE
        ID        : 2
        Version   : 9.6(1)
        Serial No.: FLM19206H71
        CCL IP    : 127.2.1.2
        CCL MAC   : 0015.c500.019f
        Last join : 21:51:30 CEST Aug 8 2016
        Last leave: N/A
firepower#
```

Note: The device was unregistered from the FMC but it is still a cluster member on the FPR9300.

Verify

Use this section in order to confirm that your configuration works properly.

Verification is completed and covered in individual tasks.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

- All versions of the Cisco Firepower Management Center configuration guide can be found here:

https://www.cisco.com/c/en/us/td/docs/security/firepower/roadmap/firepower-roadmap.html#id_47280.

- All versions of the FXOS Chassis Manager and CLI configuration guides can be found here:

https://www.cisco.com/c/en/us/td/docs/security/firepower/fxos/roadmap/fxos-roadmap.html#pgfId-121950.

- Cisco Global Technical Assistance Center (TAC) strongly recommends this visual guide for in-depth practical knowledge on Cisco Firepower Next Generation Security Technologies, including the ones mentioned in this article:

http://www.ciscopress.com/title/9781587144806.

- For all Configuration and Troubleshooting TechNotes that pertains to Firepower technologies.

https://www.cisco.com/c/en/us/support/security/defense-center/tsd-products-support-series-home.html.

- Technical Support & Documentation - Cisco Systems