# Configure DHCP IPv4 Reservation on FTD Using FlexConfig

## Contents

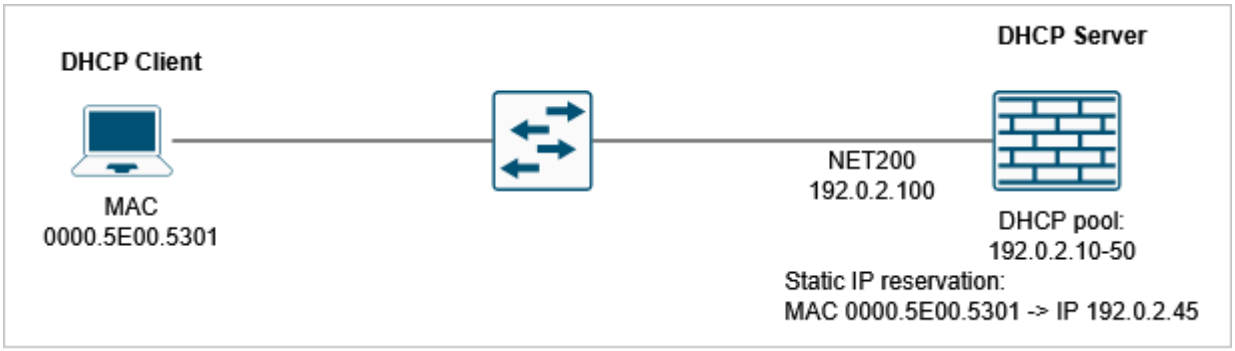
## Issue

- An administrator wants to configure a Firewall Threat Defense (FTD) device as a DHCP server for a workstation and set up a DHCP address reservation for an endpoint device.
- The configuration involves configuring DHCP server for the FTD natively in the Firewall Management Center (FMC) and using FlexConfig to add the DHCP IP reservation.

## Environment

- Firewall Threat Defense (FTD) version 10.x. Other software versions are also affected.
- Firewall Management Center (FMC) 10.x. Other software versions are also affected.

### Topology




The specific DHCP environment includes:

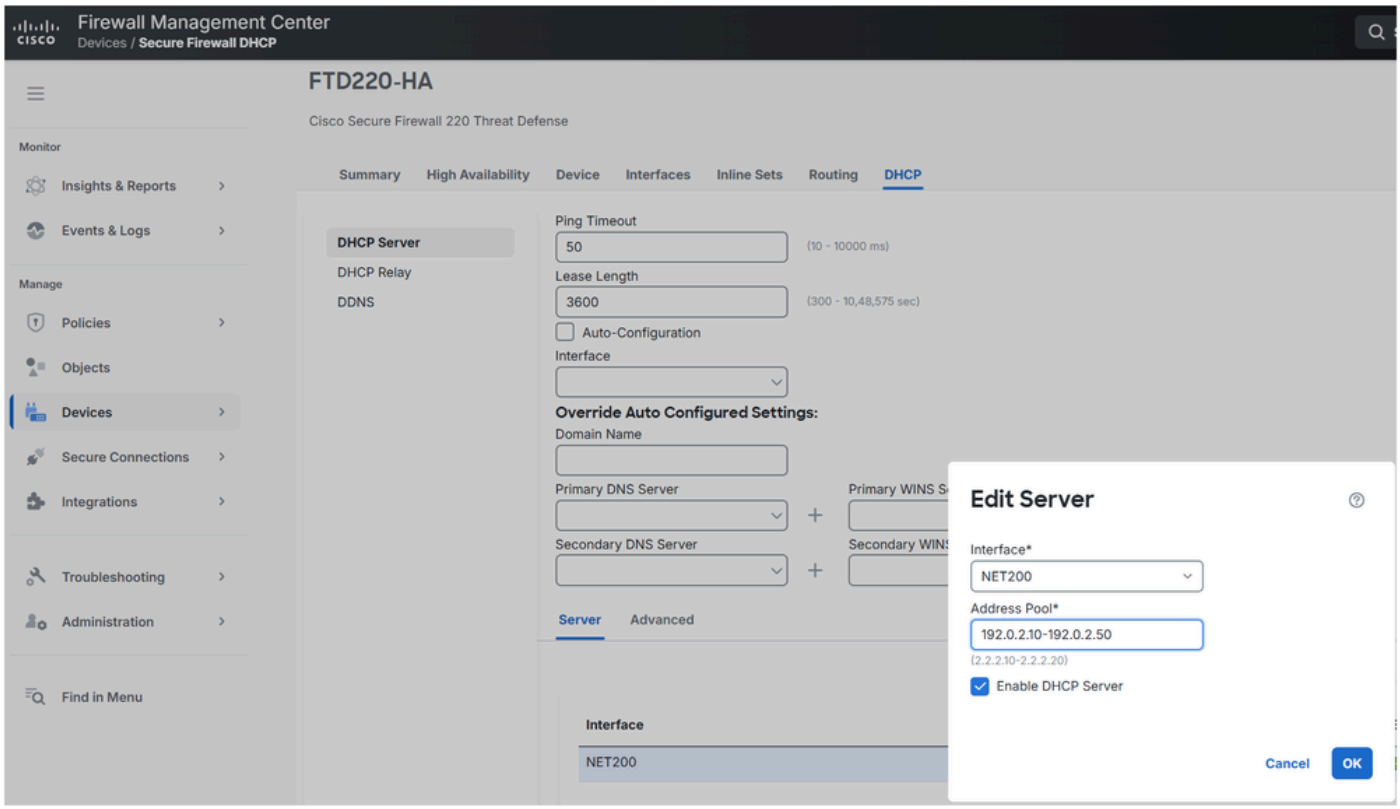
- DHCP server interface is NET200.
- DHCP server pool is 192.0.2.10 - 50.
- Endpoint device with MAC address 0000.5E00.5301. The goal is to reserve IP address 192.0.2.45 for

this endpoint.

# Resolution

## DHCP Server Configuration

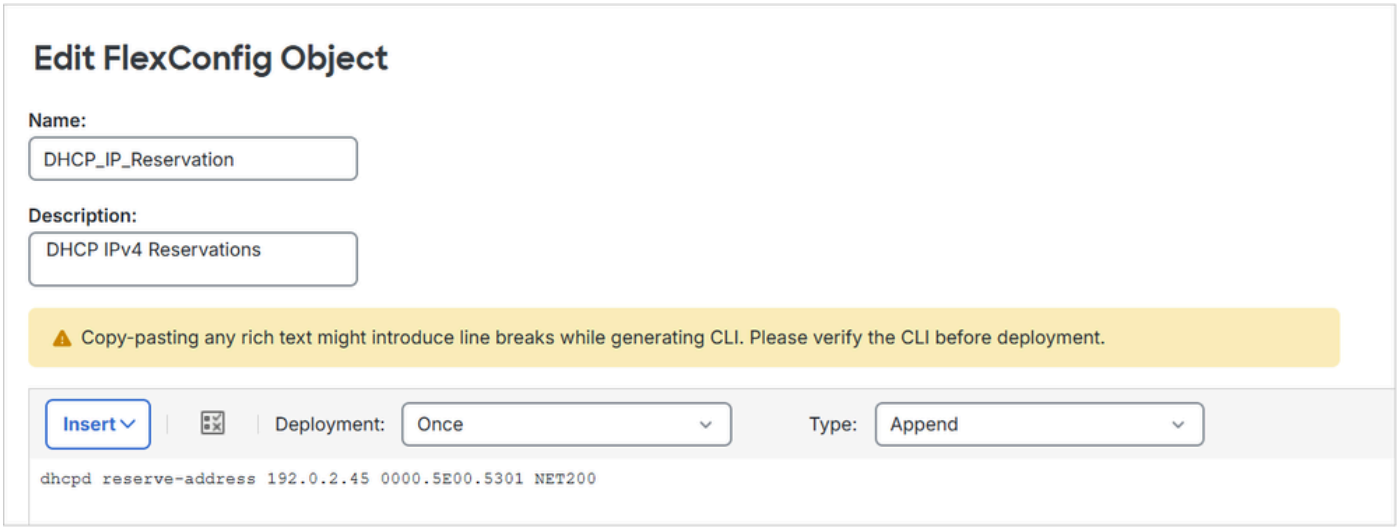
The pool 192.0.2.10 - 50 is configured on FTD interface NET200:




## FlexConfig Configuration

For the DHCP IP address reservation use FlexConfig:

- **Deployment Type:** Set to "Once".
- **Configuration Type:** Set to "Append" (this is the default). "Prepend" can be also used.




## Configuration Validation

The deployed configuration:

<#root>

device#

**show run dhcpd**

```
dhcpd address 192.0.2.10-192.0.2.50 NET200
dhcpd enable NET200
dhcpd reserve-address 192.0.2.45 0000.5E00.5301 NET200
```

## Background Operation

To capture the DHCP packets use these commands:

<#root>

device#

**capture CAPI interface NET200 match udp any any eq bootpc**

device#

**capture CAPI interface NET200 match udp any any eq bootps**

- The DHCP client listens on UDP port 68.
- The DHCP server listens on UDP port 67.

DHCP debugs:

<#root>

```
device#
```

**debug dhcpd event 255**

```
debug dhcpd event enabled at level 255
device#
```

**debug dhcpd packet 255**

```
debug dhcpd packet enabled at level 255
```

**Note:** Use debugs with caution!

Debug output during the IP address assignment:

<#root>

```
DHCPD/RA:  Server msg received, fip=ANY, fport=0 on NET200 interface
DHCPD:
```

**DHCPDISCOVER received from client 0100.5056.885f.d1 on interface NET200.**

```
DHCPD:IP 248.57.222.26 ARP entry removed from the cache
DHCPD: send ping pkt to 192.0.2.45
DHCPD: ping got no response for ip: 192.0.2.45
DHCPD:
```

**MAC 0000.5E00.5301 is reserved for IP 192.0.2.45, allocating it**

```
DHCPD: Add binding 192.0.2.45 to radix tree
DHCPD/RA: Binding successfully added to hash table
dhcpd_create_automatic_binding() adding NP rule for client 192.0.2.45
DHCPD:
```

**assigned IP address 192.0.2.45 to client 0100.5056.885f.d1.**

```
DHCPD:
```

**Sending DHCPOFFER to client 0100.5056.885f.d1 (192.0.2.45).**

```
DHCPD: Total # of raw options copied to outgoing DHCP message is 0.
DHCPD/RA: creating ARP entry (192.0.2.45, 0000.5E00.5301).
DHCPD: unicasting BOOTREPLY to client 0000.5E00.5301(192.0.2.45).
DHCPD/RA:  Server msg received, fip=ANY, fport=0 on NET200 interface
DHCPD: DHCPDISCOVER received from client 0100.5056.885f.d1 on interface NET200.
DHCPD: Sending DHCPOFFER to client 0100.5056.885f.d1 (192.0.2.45).
DHCPD: Total # of raw options copied to outgoing DHCP message is 0.
DHCPD/RA: creating ARP entry (192.0.2.45, 0000.5E00.5301).
DHCPD: unicasting BOOTREPLY to client 0000.5E00.5301(192.0.2.45).
DHCPD/RA:  Server msg received, fip=ANY, fport=0 on NET200 interface
DHCPD: DHCPDISCOVER received from client 0100.5056.885f.d1 on interface NET200.
DHCPD: Sending DHCPOFFER to client 0100.5056.885f.d1 (192.0.2.45).
DHCPD: Total # of raw options copied to outgoing DHCP message is 0.
DHCPD/RA: creating ARP entry (192.0.2.45, 0000.5E00.5301).
DHCPD: unicasting BOOTREPLY to client 0000.5E00.5301(192.0.2.45).
DHCPD/RA:  Server msg received, fip=ANY, fport=0 on NET200 interface
DHCPD: DHCPREQUEST received from client 0100.5056.885f.d1.
DHCPD: Extracting client address from the message
DHCPD: State = DHCPS_REBOOTING
DHCPD: State = DHCPS_REQUESTING
DHCPD: Client 0100.5056.885f.d1 specified it's address 192.0.2.45
DHCPD: Client is on the correct network
DHCPD:
```

**Client accepted our offer**

```
DHCPD:
```

**Client and server agree on address 192.0.2.45**

```
DHCPD: Renewing client 0100.5056.885f.d1 lease
DHCPD: Client lease can be renewed
DHCPD: Sending DHCPACK to client 0100.5056.885f.d1 (192.0.2.45).
DHCPD: Including FQDN option name 'DESKTOP-VQ7968K' rcode1=0, rcode2=0 flags=0x0
DHCPD: Total # of raw options copied to outgoing DHCP message is 0.
DHCPD/RA: creating ARP entry (192.0.2.45, 0000.5E00.5301).
DHCPD: unicasting BOOTREPLY to client 0000.5E00.5301(192.0.2.45).
```

Verification of the DHCP binding:

<#root>

```
device#
```

**show dhcpd binding**

```
IP address       Client Identifier        Lease expiration        Type
```

```
192.0.2.45


0100.005e.0053.01

           3589 seconds    Automatic
```

# Cause

- FMC does not natively support the configuration of DHCP IP address reservation. Thus, FlexConfig has to be used to configure the IP address reservation.
- Related enhancement defect: Cisco bug ID CSCwn24229.

# Related Content

- https://www.cisco.com/c/en/us/td/docs/security/asa/asa-cli-reference/A-H/asa-command-ref-A-H/m_dh-dm.html#wp1603069952
- https://bst.cloudapps.cisco.com/bugsearch/bug/CSCwn24229
- Cisco Technical Support & Downloads