Configure Hairpin with Firepower Management Center

Contents

Introduction

This document describes the necessary steps to successfully configure Hairpin on a Firepower Threat Defense (FTD) with Firepower Management Center (FMC).

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Firepower Management Center (FMC)
- Firepówer Threat Defense (FTD)

Components Used

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

- Firepower Management Center Virtual 7.2.4.
- Firepower Threat Defense Virtual 7.2.4.

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.

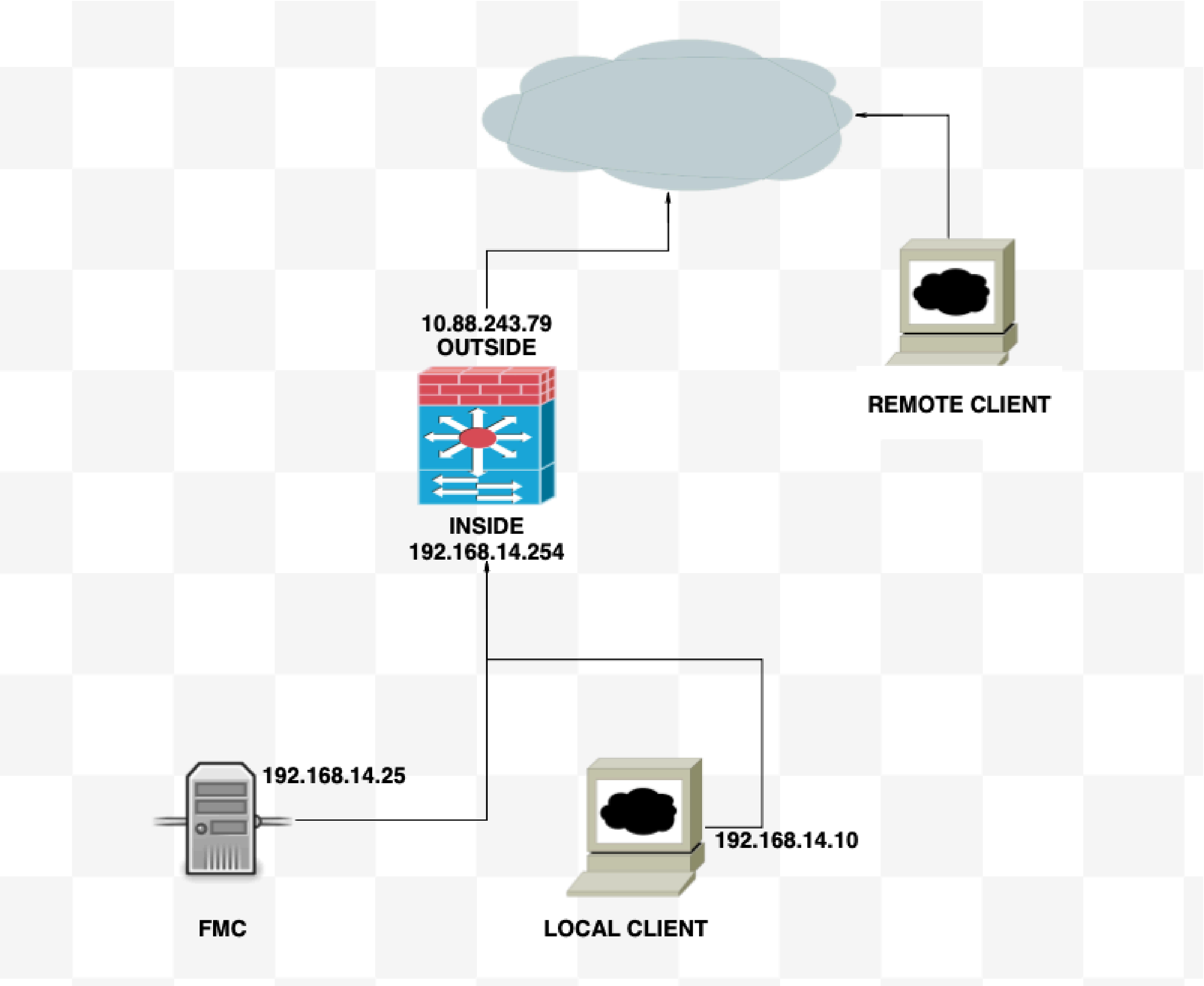
Configure

The term hairpin is used because the traffic from the client makes it to the router (or firewall implementing NAT) and is then turned back like a hairpin to the internal network after translation to access the private IP address of the server.

This function is useful for network services like web hosting within a local network, where the users on the local network need to access the internal server using the same URL or IP address that external users would use. It ensures uniform access to resources regardless of whether the request originates from inside or outside the local network.

In this example, an FMC must be accessed through the IP of the external interface of the FTD

Diagram

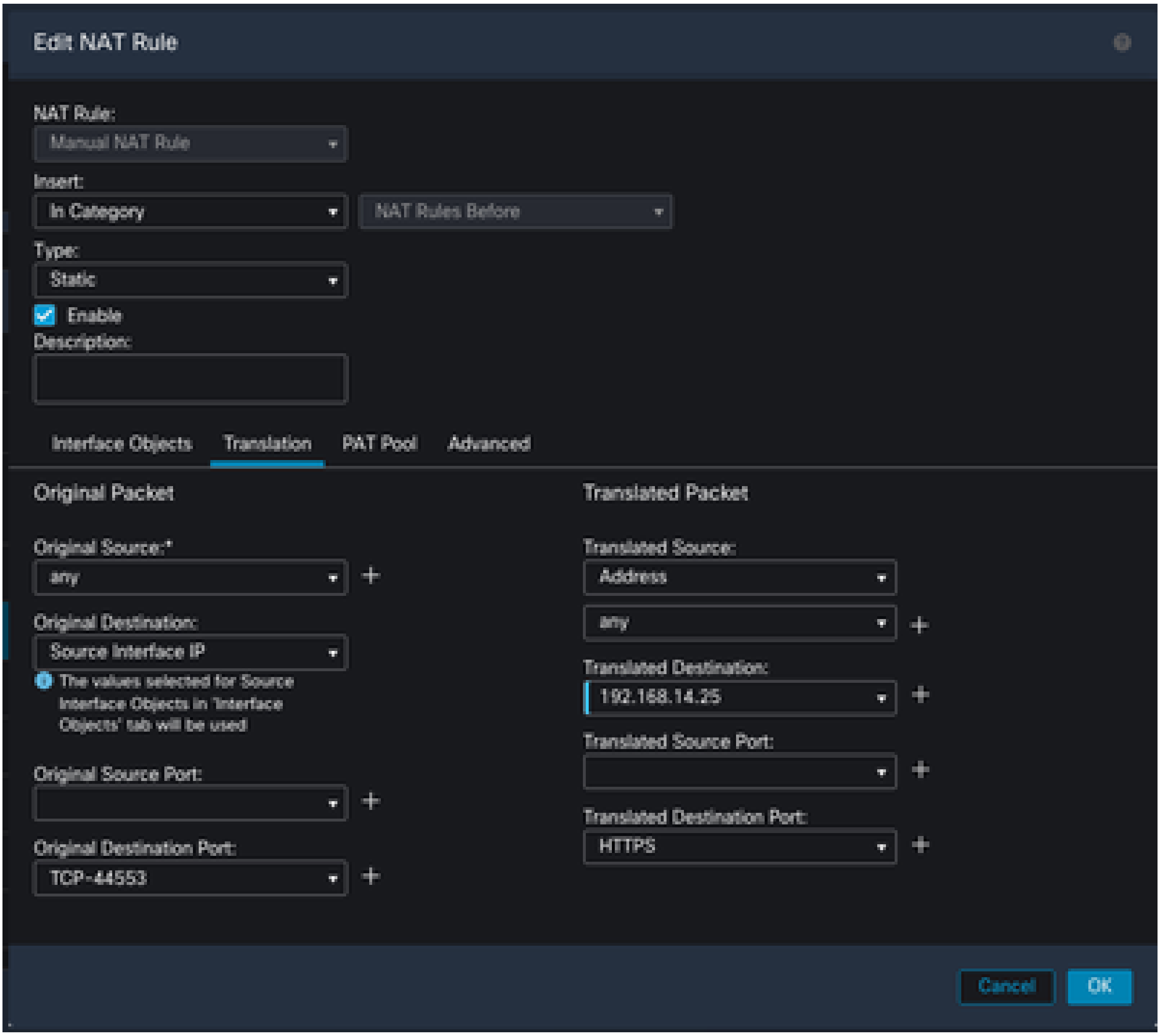


Step 1. Configure Outside-Inside Nat

As the first step, a static NAT must be configured; in this example, the destination IP and destination port are translated using the IP of the Outside interface and the port destination is 44553.

From the FMC navigate to **Device** > **NAT** to create or edit the existing policy, then click the **Add Rule** box.

- NAT Rule: Manual Nat Rule
- Original Source: Any
- Original Destination: Source Interface IP
- Original Destination Port: 44553
- Translated Destination**:** 192.168.14.25
- Translated Destination Port: 443



Edit NAT Rule

NAT Rule: Manual NAT Rule

Insert: In Category | NAT Rules Before

Type: Static

☑ Enable

Description:

Interface Objects | Translation | PAT Pool | Advanced

Original Packet

Original Source:* any

Original Destination: Source Interface IP

The values selected for Source Interface Objects in 'Interface Objects' tab will be used

Original Source Port:

Original Destination Port: TCP-44553

Translated Packet

Translated Source: Address

any

Translated Destination: 192.168.14.25

Translated Source Port:

Translated Destination Port: HTTPS

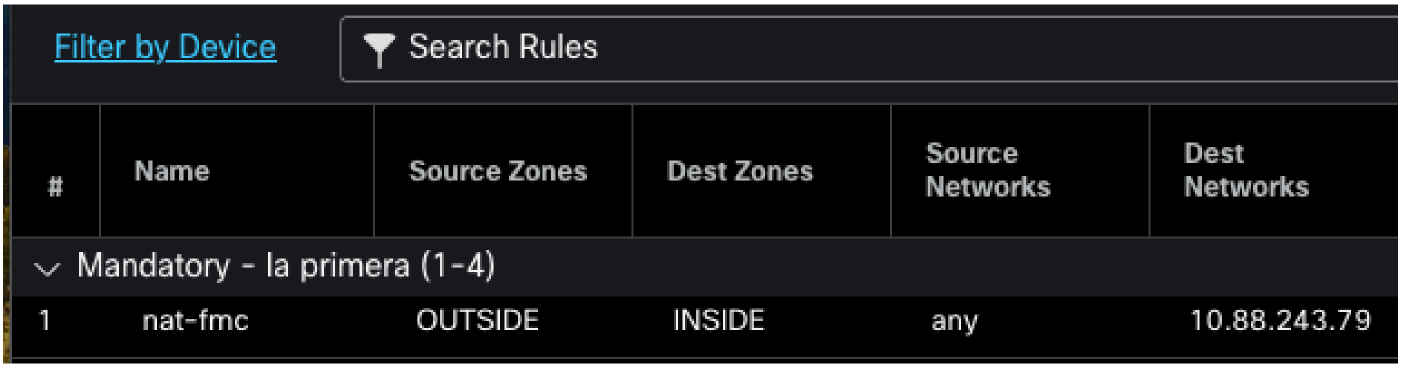
Configure the policy. Navigate to **Policies** > **Access Control** to create or edit the existing policy, then click the **Add Rule** box.

Source Zone: Outside

Destination Zone: Inside

Source Network: Any

Destination Network: 10.88.243.79



Filter by Device | Search Rules

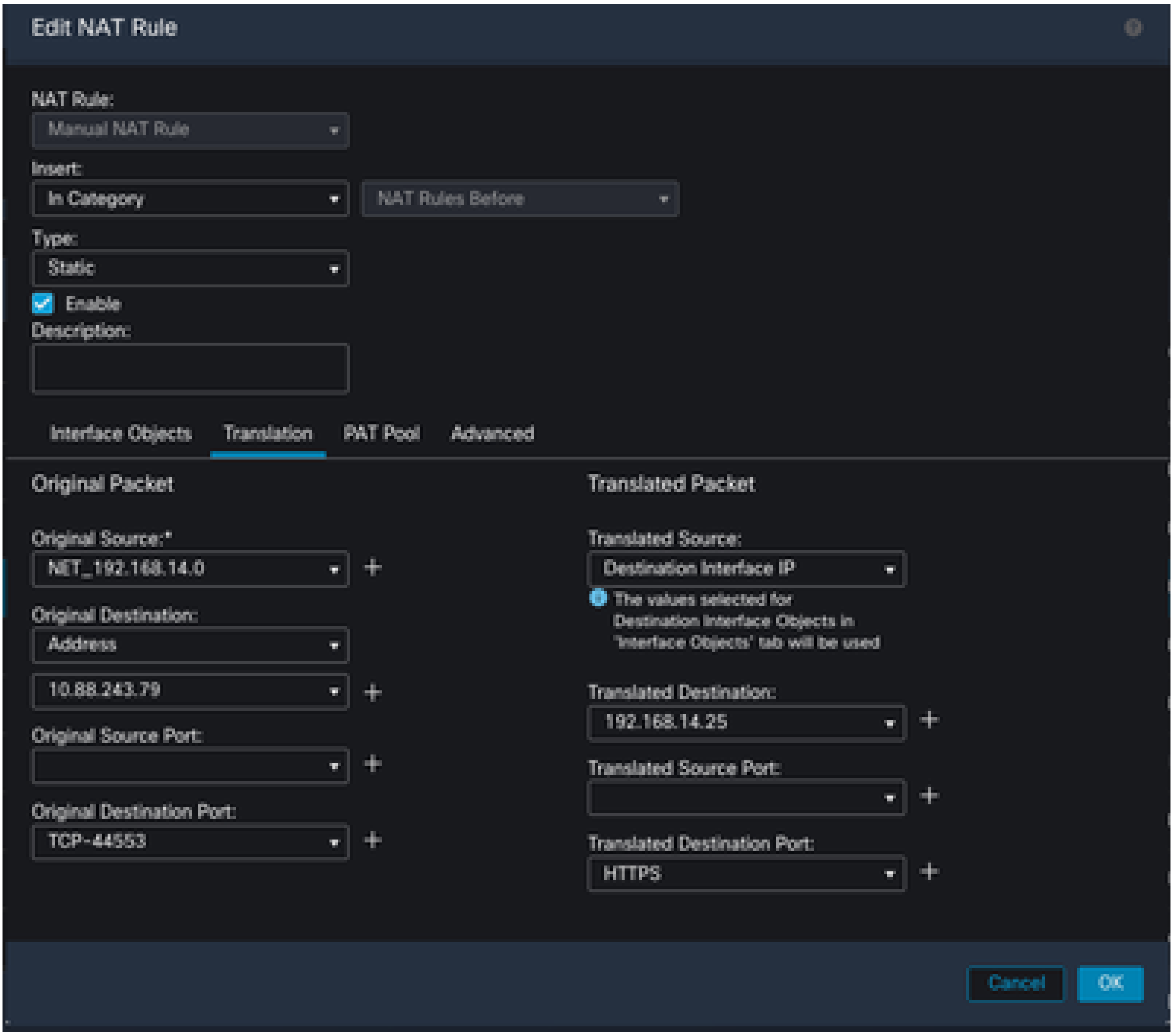
#	Name	Source Zones	Dest Zones	Source Networks	Dest Networks
Mandatory - la primera (1-4)					
1	nat-fmc	OUTSIDE	INSIDE	any	10.88.243.79

Step 2. Configure Inside-Inside Nat (Hairpin)

As the second step, a static NAT must be configured from Inside to Inside; in this example, the destination IP and destination port are translated using an object with the IP of the outside interface and the destination port is 44553.

From the FMC navigate to **Device** > **NAT** to edit the existing policy, then click **the Add Rule** box.

- NAT Rule: Manual Nat Rule
- Original Source: 192.168.14.0/24
- Original Destination: Address 10.88.243.79
- Original Destination Port: 44553
- Translated Source: Destination Interface IP
- Translated Destination**:** 192.168.14.25
- Translated Destination Port: 443



Edit NAT Rule

NAT Rule: Manual NAT Rule

Insert: In Category | NAT Rules Before

Type: Static

☑ Enable

Description:

Original Packet

Original Source:* NET_192.168.14.0

Original Destination: Address

10.88.243.79

Original Source Port:

Original Destination Port: TCP-44553

Translated Packet

Translated Source: Destination Interface IP

The values selected for Destination Interface Objects in 'Interface Objects' tab will be used

Translated Destination: 192.168.14.25

Translated Source Port:

Translated Destination Port: HTTPS

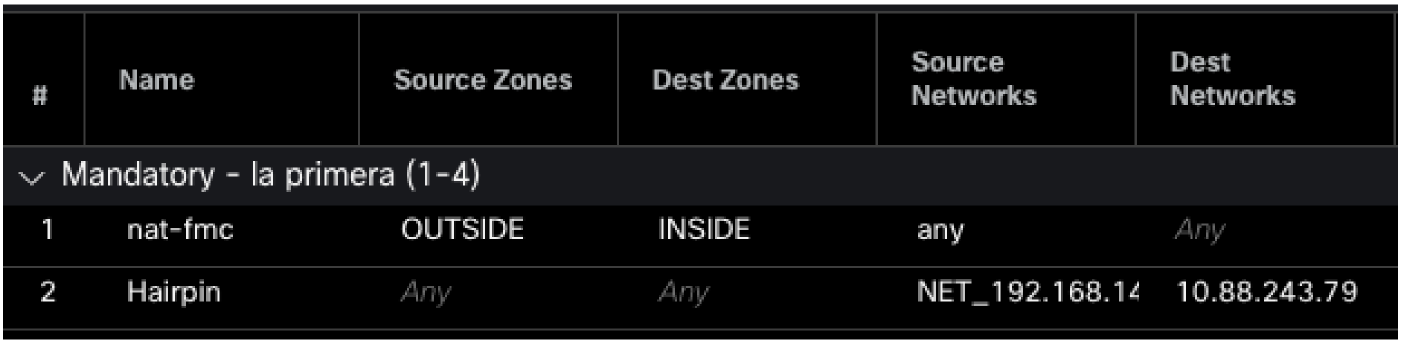
Configure the policy. Navigate to **Policies > Access Control** to edit the existing policy, then click the **Add Rule** box.

Source Zone: Any

Destination Zone: Any

Source Network: 192.168.14.0/24

Destination Network: 10.88.243.79

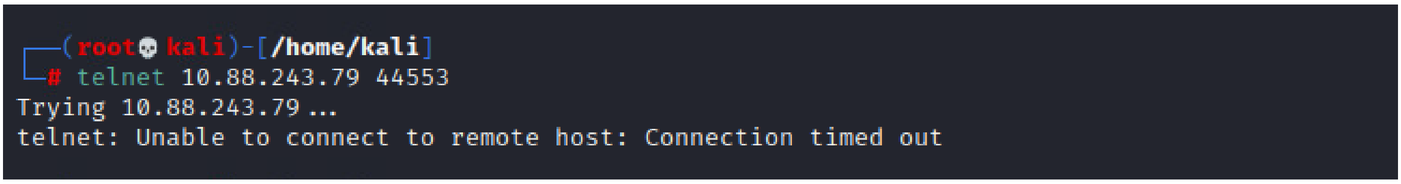


#	Name	Source Zones	Dest Zones	Source Networks	Dest Networks
Mandatory - la primera (1-4)					
1	nat-fmc	OUTSIDE	INSIDE	any	Any
2	Hairpin	Any	Any	NET_192.168.14	10.88.243.79

Verify

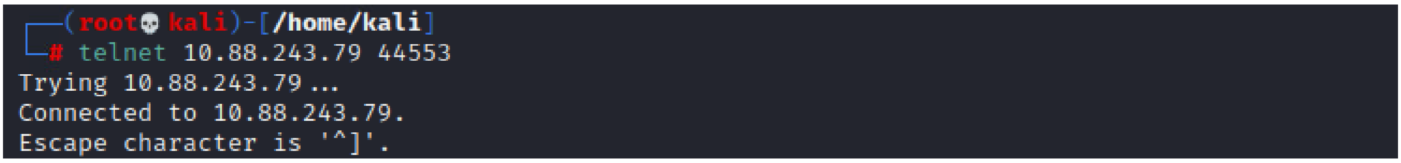
From the local client, do a telnet with destination IP and destination port:

If this error message "telnet unable to connect to remote host: Connection timed out" prompt, something went wrong at some point during the configuration.



```
┌──(root💀kali)-[/home/kali]
└─# telnet 10.88.243.79 44553
Trying 10.88.243.79 ...
telnet: Unable to connect to remote host: Connection timed out
```

But if it says Connected, the configuration was successful.



```
┌──(root💀kali)-[/home/kali]
└─# telnet 10.88.243.79 44553
Trying 10.88.243.79 ...
Connected to 10.88.243.79.
Escape character is '^]'.
```

Troubleshoot

If you are experiencing issues with Network Address Translation (NAT), use this step-by-step guide to troubleshoot and resolve common issues.

Step 1: NAT Rules Configuration Check

- Review NAT Rules: Ensure all NAT rules are correctly configured in FMC. Check that the source and destination IP addresses, as well as ports, are accurate.
- Interface Assignment: Confirm that both the source and destination interfaces are correctly assigned in the NAT rule. Incorrect mapping can cause traffic not to be translated or routed properly.
- NAT Rule Priority: Verify that the NAT rule is placed at the top of any other rule that can match the same traffic. Rules in FMC are processed in sequential order, so a rule placed higher up has precedence.

Step 2: Access Control Rules (ACL) Verification

- Review ACLs: Check the Access Control Lists to make sure they are appropriate for permitting NAT traffic. ACLs must be configured to recognize the translated IP addresses.
- Rules Order: Make sure the access control list is in the correct order. Like NAT rules, ACLs are processed from top to bottom, and the first rule that matches the traffic is the one that is applied.
- Traffic Permissions: Verify that an appropriate access control list exists to allow traffic from the internal network to the translated destination. If a rule is missing or incorrectly configured, the desired traffic could be blocked.

Step 3: Additional Diagnostics

- Use Diagnostic Tools: Utilize the diagnostic tools available in FMC to monitor and debug the traffic passing through the device. This includes viewing real-time logs and connection events.
- Restart Connections: In some cases, existing connections cannot recognize changes made to NAT rules or ACLs until they are restarted. Consider clearing existing connections to force new rules to be applied.

From LINA:

<#root>

```
firepower#

 clear xlate
```

- Verify Translation: Use commands like **show xlate** and **show nat** on the command line if you are working with FTD devices to verify that NAT translations are being performed as expected.

From LINA:

<#root>

```
firepower#

 show nat
```

<#root>

```
firepower#

 show xlate
```