# FirePOWER Threat Defense 6.2 VPN to Azure (IKEv2)

This document provides a sample configuration for the connection of Cisco FirePOWER Threat Defense (FTD) device to Azure using IKEv2. This example does not use Border Gateway Protocol (BGP).

*Note: IKEv2 on Azure cannot use a Basic Gateway, thus forcing you to use Route-Based VPN. The FTD device creates a Policy-Based VPN. That would ordinarily be an issue, as Policy-Based works off of a Crypto Map, whereas Route-Based does not. This document will show you how to use a Route-Based Azure VPN, and configure a parameter to force Azure to use Policy-Based Traffic Selectors.*

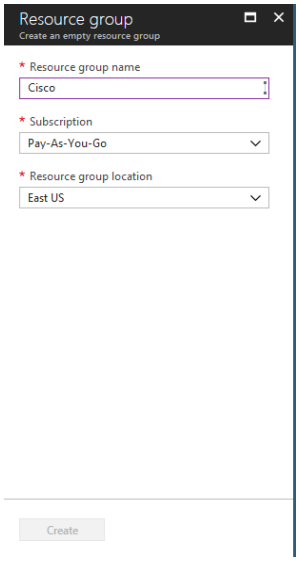
*Note: FirePOWER Management Center (FMC) in Evaluation Mode does not support heavy encryption (AES/3DES) and can only do light encryption (DES). A fully licensed version of the product enables all encryption algorithms.*

***<u>Requirements:</u> Please make sure you have a public IP address to assign to the FTD device.***

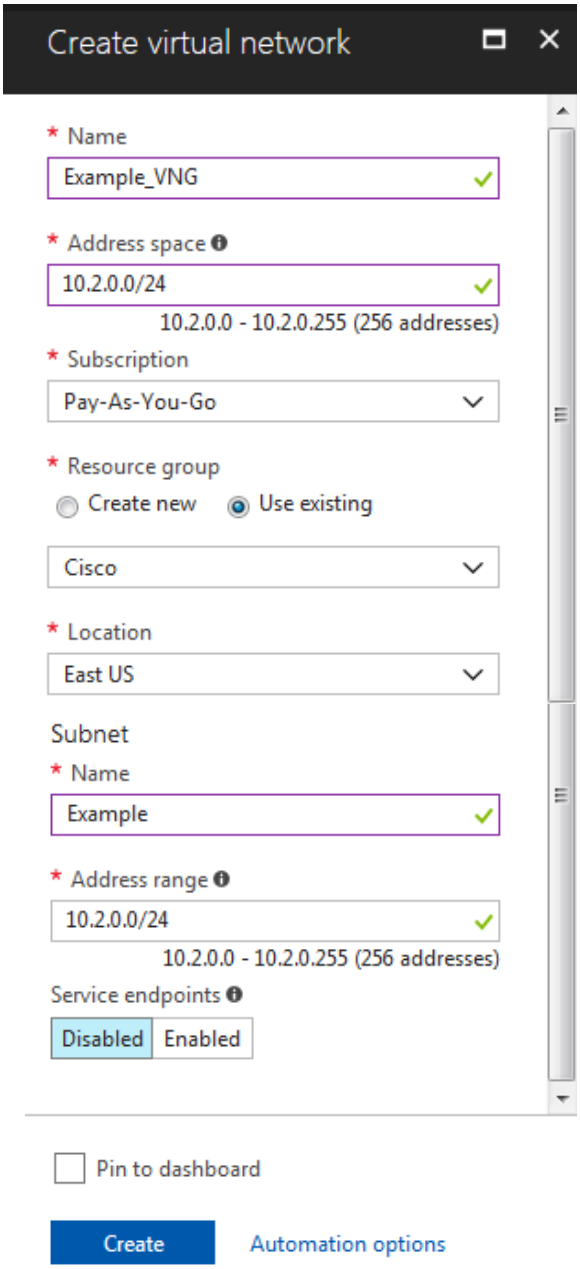
## Configure the Azure Environment

*I configure the Azure portion first since it takes about 30-45 minutes to receive a public IP address. For all steps, open the respective section and click on the Add button in order to create it new.*

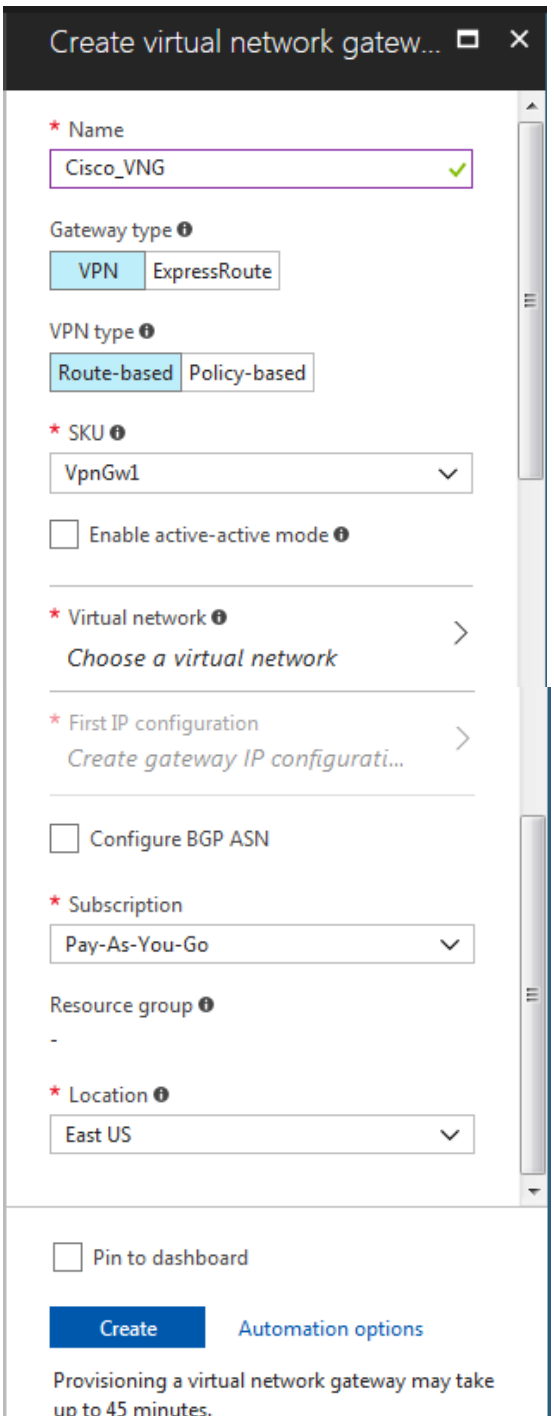
1. Create a New Resource Group (For this example I have named mine **Cisco)**



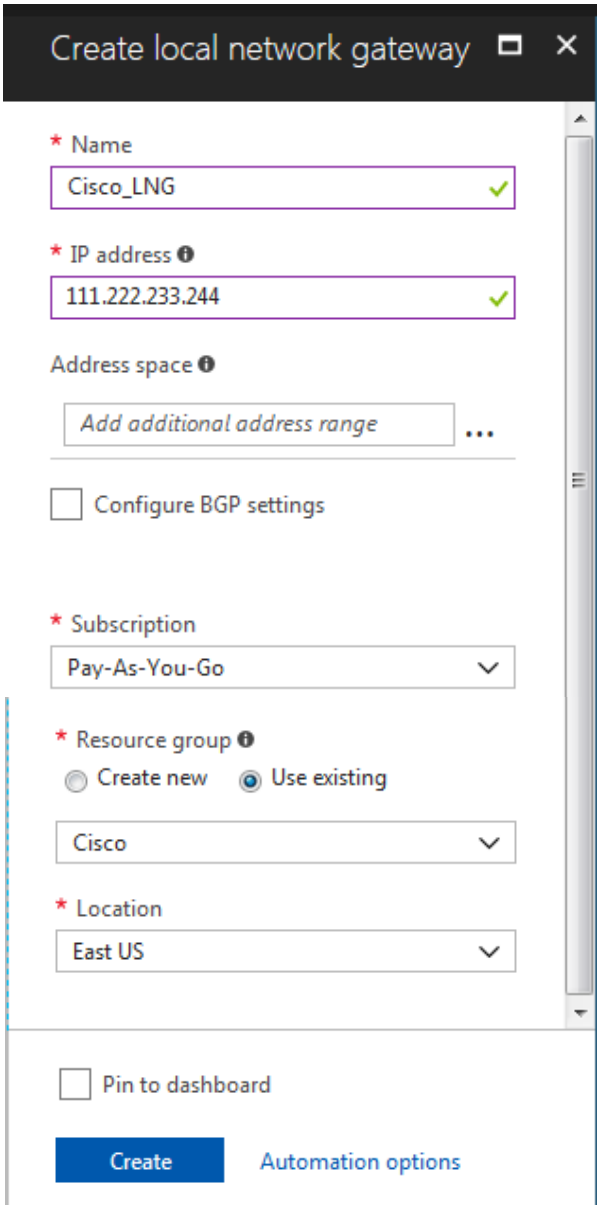
2. Create a new Virtual Network
    a. **Name:** (Example_VNG) A name of your liking, although something to identify it easily would probably be desired.
    b. **Address Space:** As Desired
        i. ***P****lease note: this is what would be considered your Protected Networks on the Azure side when you configure the FTD Appliance.*
    c. **Resource Group:** (Cisco) *As created in Step 1*
    d. **Subnet**
        i. **Name:** As Desired
        ii. **Address Range:** Must fit within *Address Space (can be smaller subnet)*
    e. Click **Create**



3. Create a VPN Gateway (Virtual Network Gateway)
    a. **Name:** As Desired
    b. **Gateway Type:** VPN
    c. **VPN Type:** Route-Based
    d. **SKU:** Anything but "*Basic*"
        i. *"VpnGw1"* is being used for this example.
    e. **Virtual Network:** Select the VNet you created in Step 2
    f. **Location:** East US (eastus) Pick your closest location



4. Create a Local Network Gateway
    a. **Name**: As Desired
    b. **IP Address**: Public IP Address of your local network gateway (Firewall)
        i. This is the address provided by your ISP that we required in the very beginning.
    c. **Address Space**: Private/Local Subnet
        i. Subnet behind the physical on premise device. (NOT Azure Environment)
    d. **Resource Group**: Cisco (or whichever group you created in Step 1)
    e. **Location**: East US



## Azure PowerShell Portion

You have to declare the following variables (VNG, LNG, and IPsec Policy) to leverage inside the single command you need to run, in order to enable the Policy-Based Traffic Selectors (even though we are still in a Route-Based VPN, as created in Step 3).

*NOTE: If you lose your PowerShell connection or you do not commit to completing steps 5-8 immediately, you will lose the variables you declared and will have to start over prior to running the Step 8 command.*

*Note: I am using the fully licensed FMC, therefore, I am going to use AES. If you are using an evaluation license, you must use DES and not AES. You may use the Encryption Algorithms of your liking aside from that limitation*

5. Declare your IPSec Policy Variable ($ipsec)

```
PS Azure:\> $ipsec = New-AzureRmIpsecPolicy –IkeEncryption AES256 -
IkeIntegrity SHA256 –DhGroup    DHGroup24 –IpsecEncryption AES256 –
IpsecIntegrity SHA256 –PfsGroup PFS24 –SALifeTimeSeconds     3600 –
SADataSizeKilobytes 1024000000
```

6. Declare your VNG ($vng) Variable
    a. The name that you will use will be the same VNG you created in Step 3 (Cisco_VNG in my case). Must be typed EXACTLY as seen in Azure portal.

```
PS Azure:\> $vng = Get-AzureRmVirtualNetworkGateway –Name Cisco_VNG  -
ResourceGroupName  Cisco
```

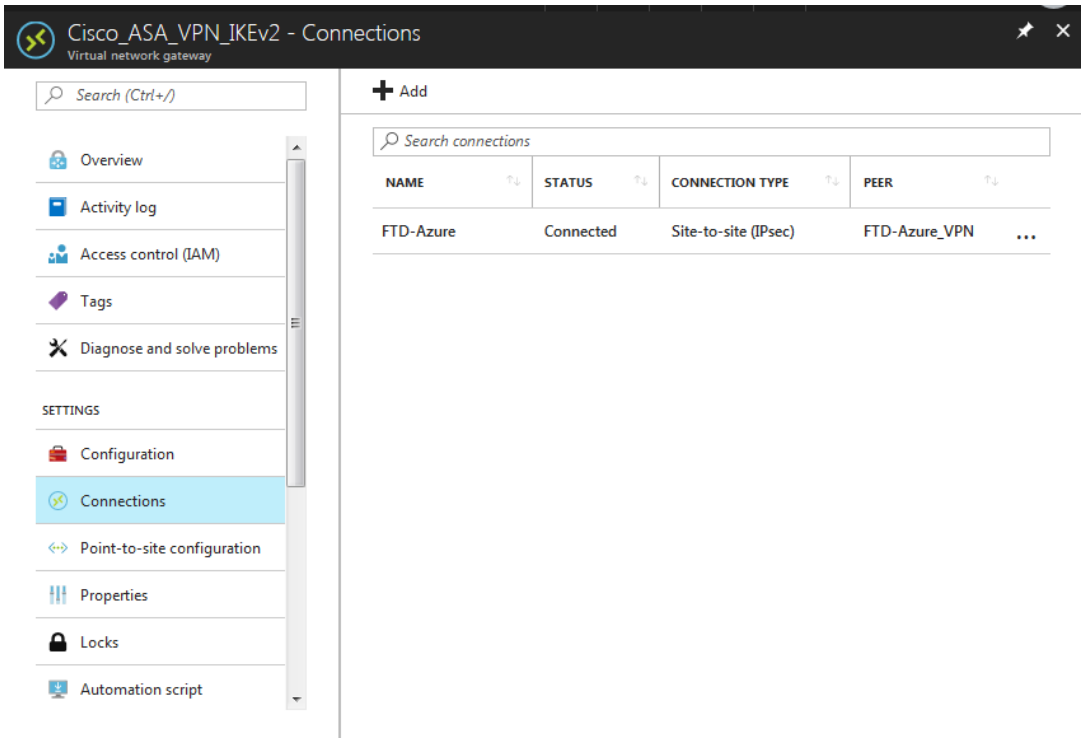
7. Declare your LNG ($lng) Variable

```
PS Azure:\> $lng = Get-AzureRmLocalNetworkGateway –Name Cisco_VNG  -
ResourceGroupName Cisco
```

8. Create the VNG Connection

```
PS Azure:\> New-AzureRmVirtualNetworkGatewayConnection -Name (As Desired) -
ResourceGroupName Cisco -VirtualNetworkGateway1 $vng -LocalNetworkGateway2
$lng -Location eastus -ConnectionType IPsec -IpsecPolicies $ipsec
-UsePolicyBasedTrafficSelectors $True -SharedKey 'cisco123'
```

9. Once this command has been completed, you can verify that it created the VNG Connection by clicking on connections on the left hand side under the VNG menu itself.
    a. *It will not say Connected under Status at this point as the VPN will not yet be established*

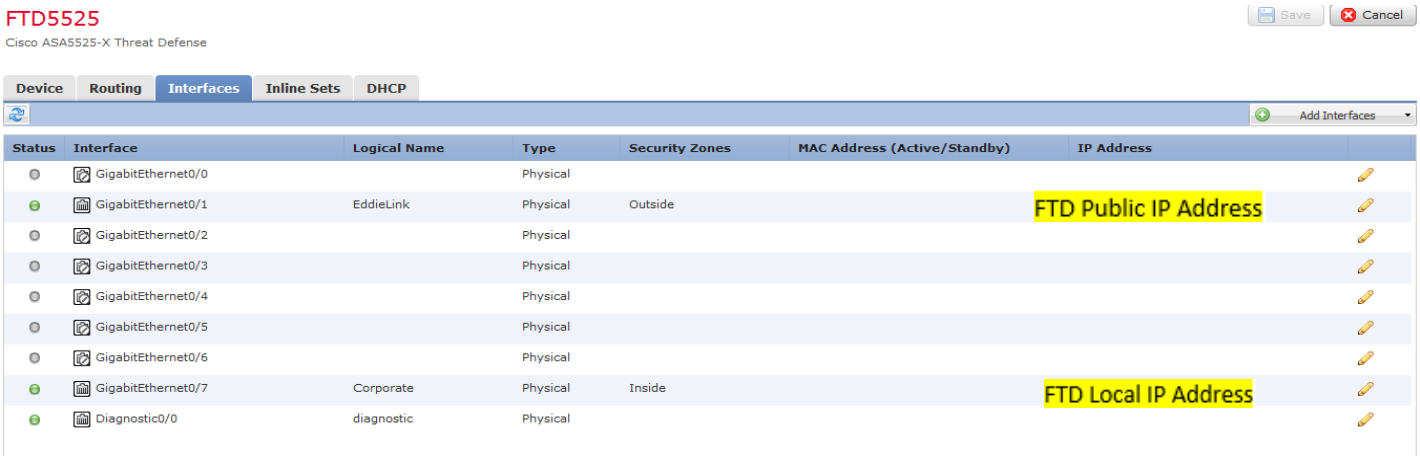



10. Please proceed to the FMC as you are finished with the Azure portion.

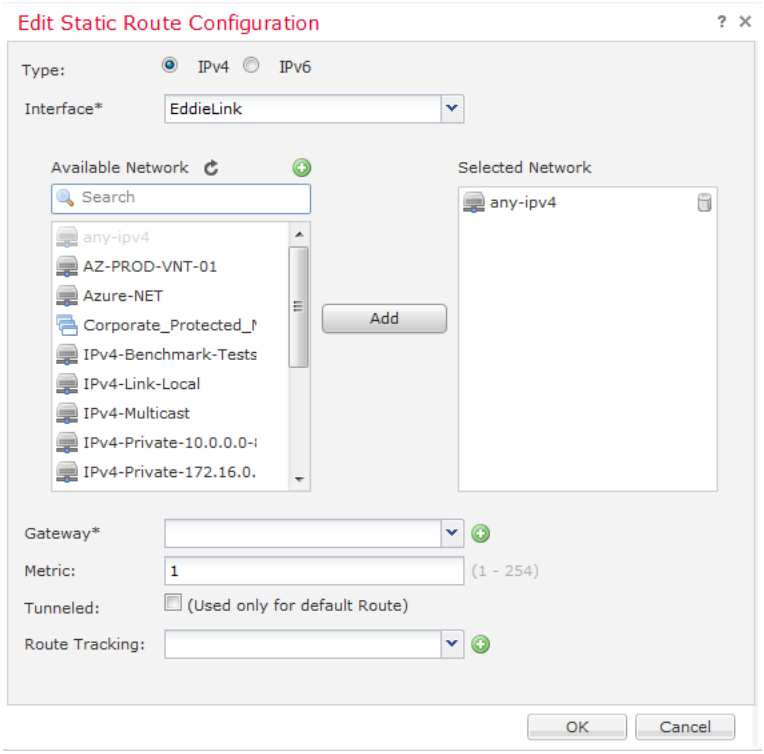
## Configure the FTD Device via the FMC

*I am assuming that your FTD device is already connected to your FMC at this point. We will only do basic configuration to get the VPN up and running.*

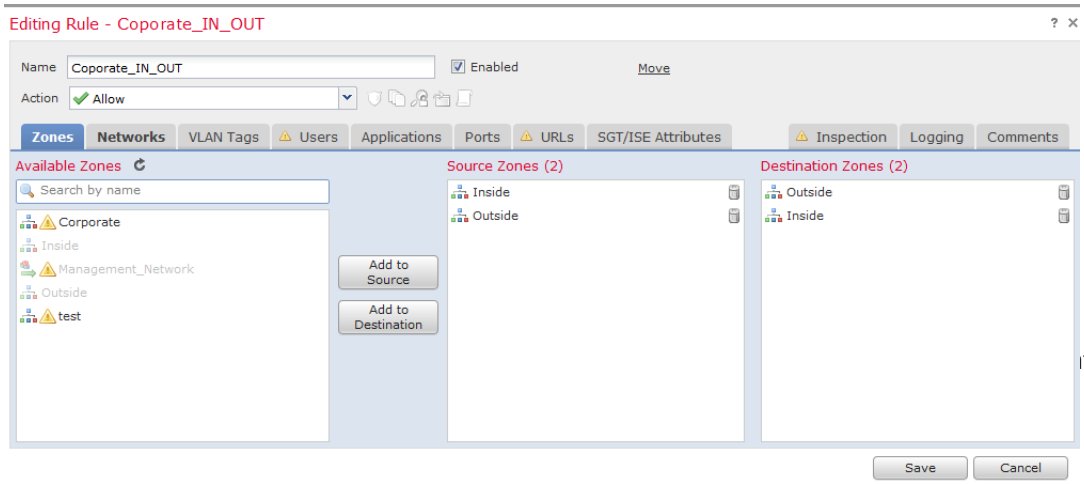
11. Enable inside and outside interfaces with IP addressing scheme
    a. This is where you use the FTD Public IP address from the requirements on the Outside interface.
    b. The Inside Interface can be any private IP addressing you desire.



12. Create a basic route
    a. **Interface**: The Outside Interface
    b. **Selected network:** any-ipv4
    c. **Gateway:** Next hop




13. Create a "PermitAll" ACL
    *Do not judge my typo! ☺(Coporate)*
    a. **Action**: Allow
    b. **Source Zones:** *Outside* (Do not Add Inside)
    c. **Destinations Zones:** *Inside (Do not Add Outside)*

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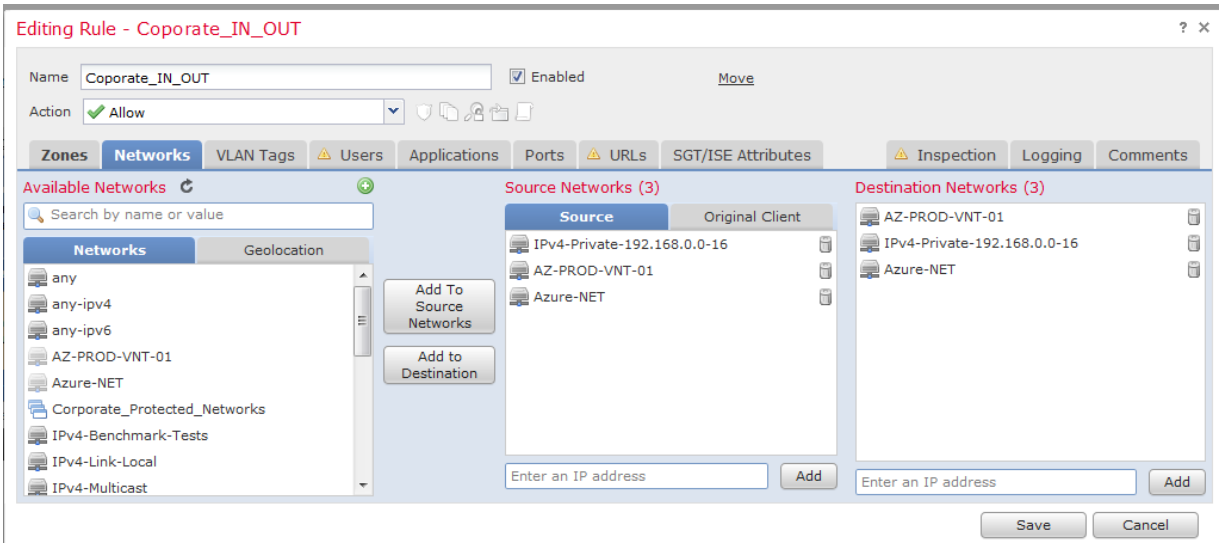
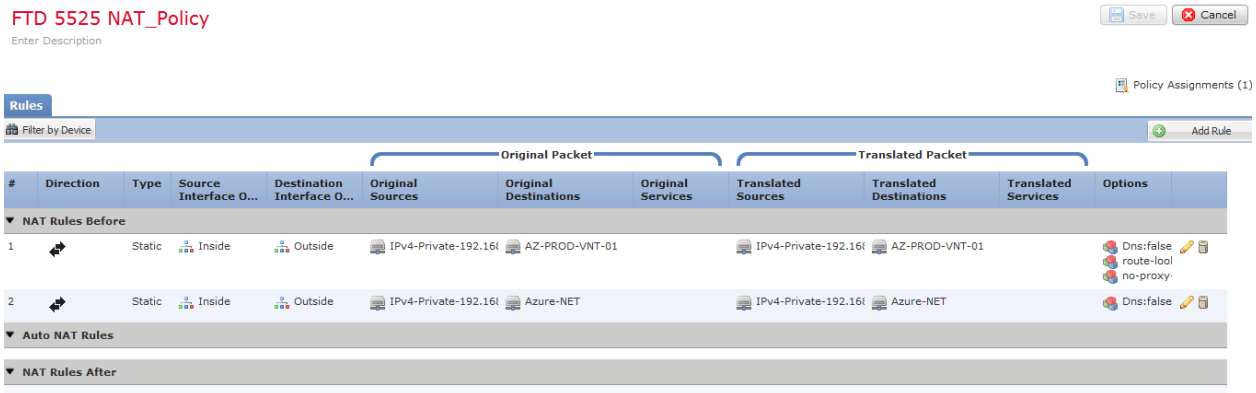



e. Under Networks:
   i. Source IP: Azure Address Space
   ii. Destination IP:
f. Click '**Save**"
   i. Make sure the policy is assigned to device under Policy Assignments.

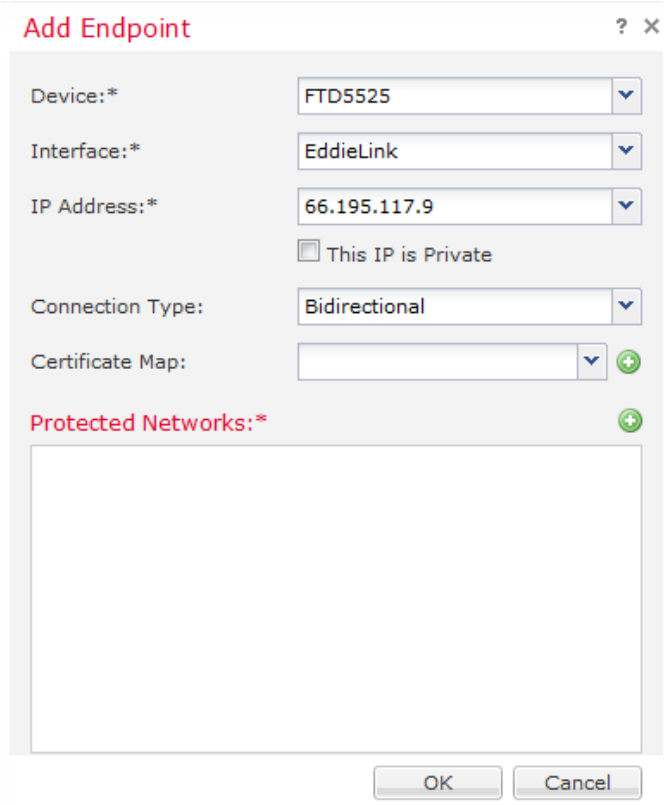
14. Create a NAT exemption Rule
    a. **Source Interface:** Inside
    b. **Destination Outside:** Outside
    c. **Original Sources:** Private IP Addresses (Local Environment)
    d. **Original Destinations:** Azure's Virtual Network Address Space, not Range
    e. **Translated Sources:** Private IP Addresses (Local Environment)
    f. **Translated Destinations:** Azure's Virtual Network Address Space, not Range




15. Create a Site-to-Site VPN Connection
    a. Click on **Add VPN** -> **Firepower Threat Defense Device**
       i. **Topology Name:** As Desired

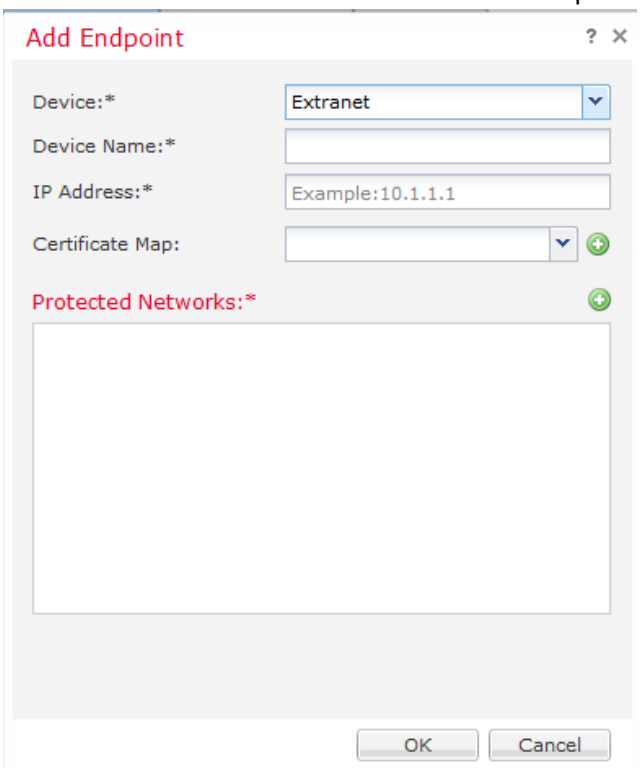
ii. **Network Topology:** Point-to-Point
iii. **IKE Version:** IKEv2

b. Click on Plus sign next to Node A
   i. **Device: <***Choose your FTD Device> (FTD5525 in my case)*
   ii. **Interface:** (Outside FTD Interface)
   iii. **IP Address:** Public IP address assigned to Outside Interface
   iv. **Protected Networks:** Local Network on FTD Side
   v. **Connection Type:** Leave as Bidirectional (You need to play both Initiatior & Responder role)

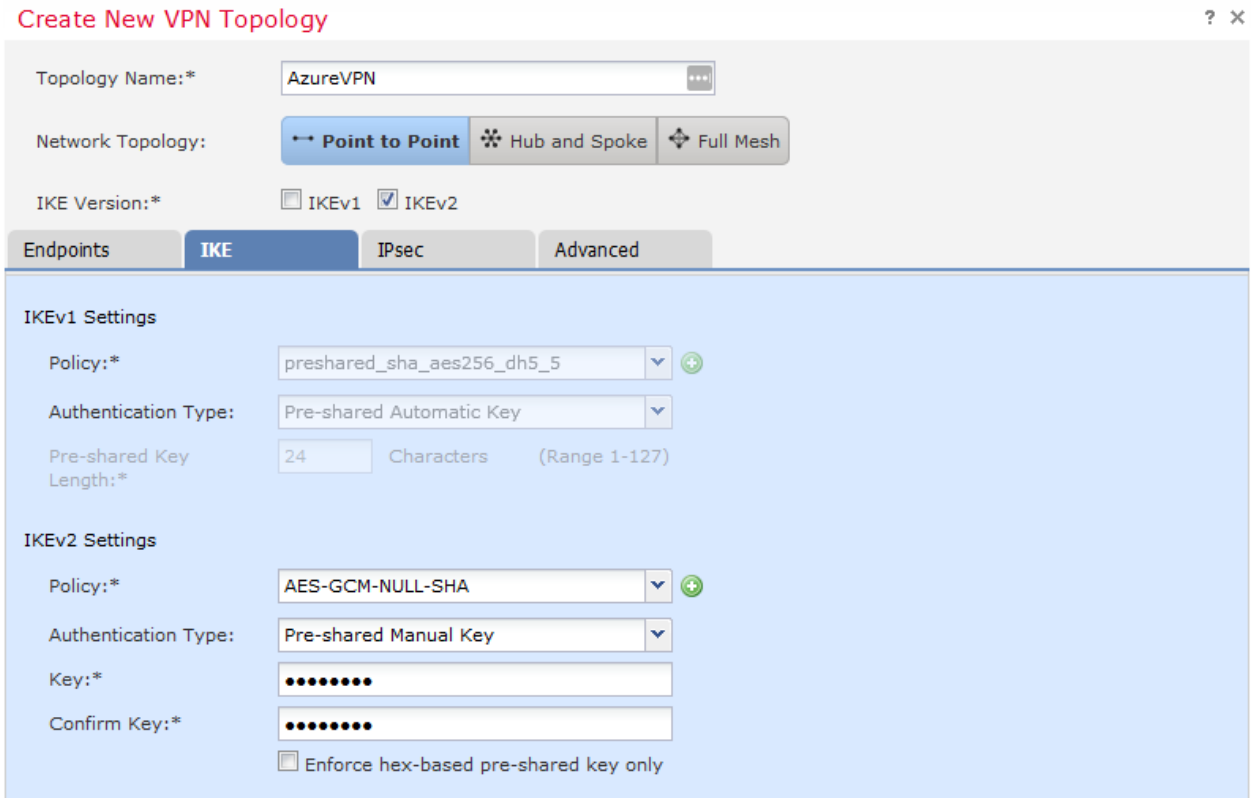



a. Click on Plus sign next to Node B
   i. **Device:** Extranet
   ii. **Device Name:** As Desired
   iii. **IP Address:** Public IP assigned to Azure VNG (hoping it's been 45 minutes by this point and you have been assigned an IP address)

iv. **Protected Networks:** Virtual Network Address Space (declared in Step 2)




16. Configure IKEv2 Settings
    a. **Policy:** Click on Plus sign
        i. **Integrity:** AES256
        ii. **Encryption:** SHA256
        iii. **PRF Algorithm:** SHA256
        iv. **Diffie-Hellman Group:** 24
        v. **Lifetime:** 28800
    b. **Authentication Type:** Pre-Shared Manual Key
    c. **Key:** I used cisco123 (hopefully you use something a little bit more secure)




17. Configure IPSec Settings
    a. **IKEv2 Mode**: Tunnel
    b. **Transform Sets**: Create a new set with AES256/SHA256
    c. **Lifetime Duration**: 3600
    d. **Lifetime Size**: 1024000000
    e. **Perfect Forward Secrecy (PFS) Checkbox**: Check and select the Modulus Group 24 which was specified in your PowerShell '$ipsec' Policy.
18. Deploy configuration out to device
    a. Wait until deployment to device is completed prior to continuing
19. While in CLI enter the system support diagnostic-cli command
20. Check both phases by entering the command line interface of your FTD device and running your show commands
21. ISAKMP keepalives not supported by Azure, turn off on FMC.