PALO ALTO INTERFACE SETUP

Step 1: Log in to the Palo Alto Web Interface

1. Open your browser and navigate to the Palo Alto management GUI using the management IP address (e.g., `https://<management-ip>`).
2. Log in with your credentials:
   - Username: `admin`
   - Password: `<your password>`.

DO NOT WORRY ABOUT VIRTUAL ROUTERS AT THIS STAGE

Step 2: Configure the WAN Interface

1. **Navigate to Interfaces**:
   - Go to **Network > Interfaces**.
2. **Edit `ethernet1/1`**:
   - Click on **ethernet1/1** to edit it.
3. **Assign Zone**:
   - Under the **Zone** field:
     - Click **Add** and create a new zone.
     - Name it `WAN`.
     - Save the zone.
4. **Set IP Address**:
   - Go to the **IPv4** tab.
   - Click **Add** to add an IP address.
   - Set the name PA-WAN
   - Enter the IP address for the WAN interface, `192.168.7.210/24 as shown in figure 3`.(remember this not subnet range, choose without ip conflicts this interface ip address)
   - Click **OK** and **Save**.

Ethernet Interface

Interface Name: ethernet1/1
Comment:
Interface Type: Layer3
Netflow Profile: None

Config | IPv4 | IPv6 | SD-WAN | Advanced

Assign Interface To

Virtual Router: None
Security Zone: WAN

OK Cancel

Ethernet Interface

Interface Name: ethernet1/1
Comment:
Interface Type: Layer3
Netflow Profile: None

Config | **IPv4** | IPv6 | SD-WAN | Advanced

☐ Enable SD-WAN

Type: ◉ Static ○ PPPoE ○ DHCP Client

	IP
☐	PA-WAN

Address

Name: PA-WAN
Description:
Type: IP Netmask — 192.168.7.210/21 Resolve

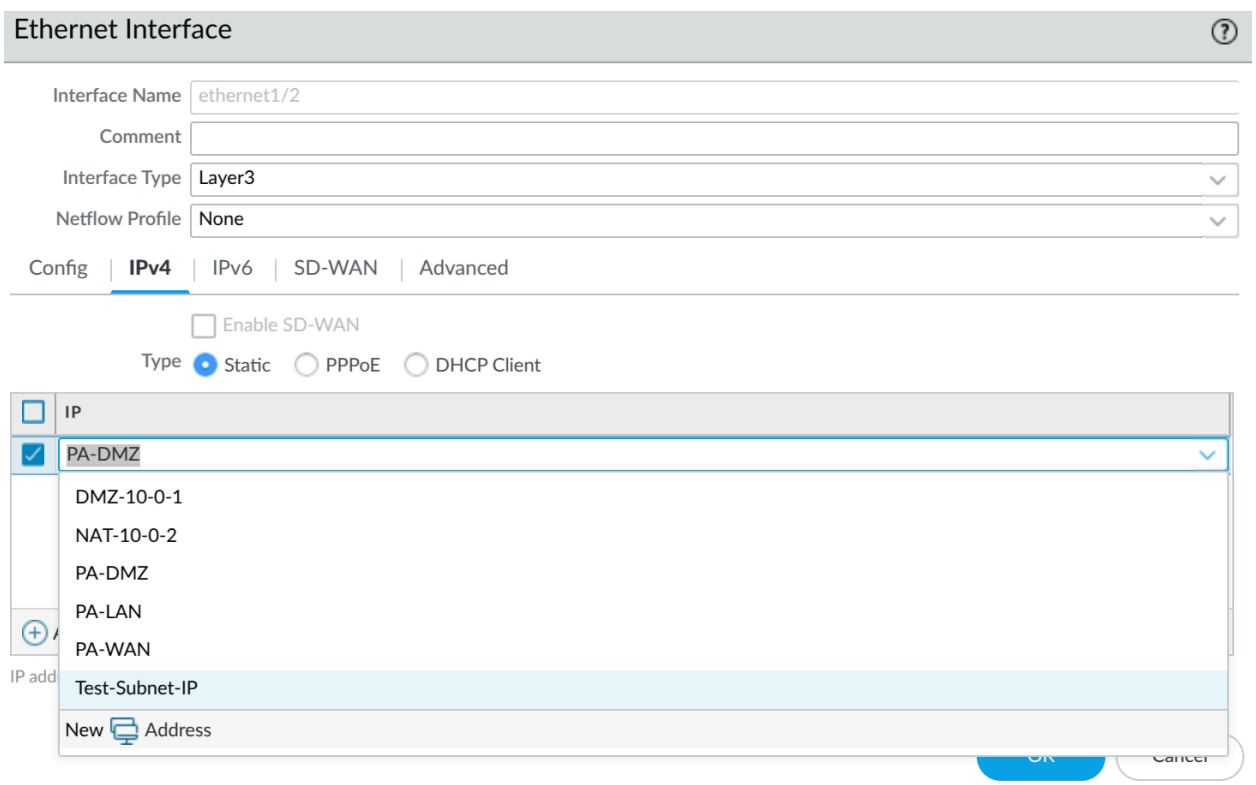
Enter an IP address or a network using the slash notation (Ex. 192.168.80.150 or 192.168.80.0/24). You can also enter an IPv6 address or an IPv6 address with its prefix (Ex. 2001:db8:123:1::1 or 2001:db8:123:1::/64)

Tags:

OK Cancel

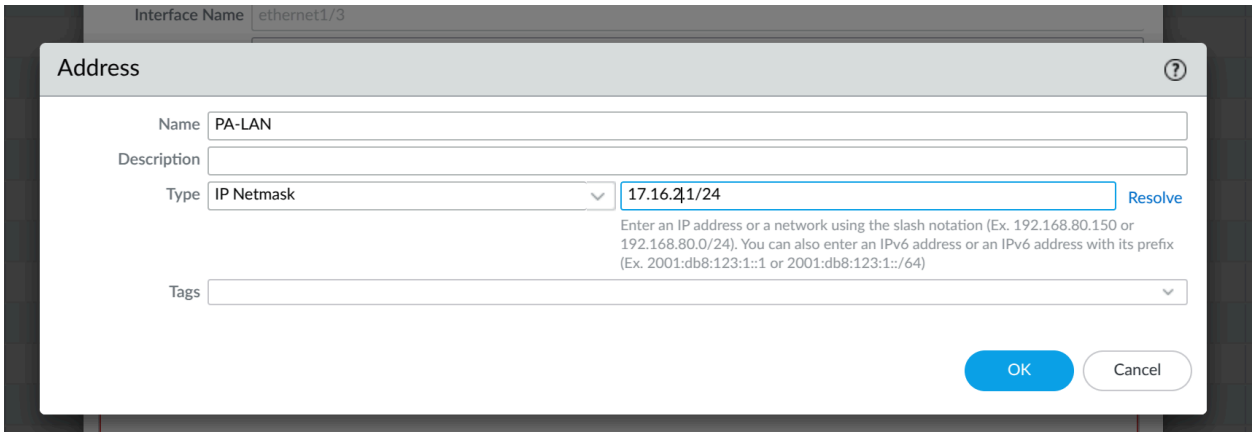
Step 3: Configure the DMZ Interface

1. **Edit the DMZ Interface**:
   - Go back to **Interfaces** and click on the interface you want to configure for DMZ (e.g., `ethernet1/2`).
2. **Assign Zone**:
   - Under the **Zone** field:
     - Click **Add** and create a new zone.
     - Name it `DMZ`.
     - Save the zone.
3. **Set IP Address**:
   - Go to the **IPv4** tab.
   - Click **Add** to add an IP address.
   - **Click 'New address' Set the Name**: `PA-DMZ`.
   - Enter the IP address for the DMZ interface: assigned Interface IP: `17.16.1.1/24`
   - Click **OK** and **Save**.



Step 4: Configure the LAN Interface

1. **Edit the LAN Interface**:
   - Go back to **Interfaces** and click on the interface you want to configure for LAN (e.g., `ethernet1/3`).
2. **Assign Zone**:
   - Under the **Zone** field:
     - Click **Add** and create a new zone.
     - Name it `LAN`.
     - Save the zone.
3. **Set IP Address**:
   - Go to the **IPv4** tab.
   - Click **Add and then click New address** to add an IP address.
   - **Set the Name**: to `PA-LAN`.
   - Enter the IP address for the LAN interface:
     - Interface IP: `17.16.2.1/24 (subnet is 17.16.2.0/24)`
   - Click **OK** and **Save**.



Step 5: Commit the Configuration

1. After completing the configuration for all interfaces, go to the **Commit** button in the top-right corner.

2. Click **Commit** to save and apply the changes to the Palo Alto firewall. You will link states are up

INTERFACE	INTERFACE TYPE	MANAGEMENT PROFILE	LINK STATE	IP ADDRESS
ethernet1/1	Layer3			PA-WAN
ethernet1/2	Layer3			PA-DMZ
ethernet1/3	Layer3			PA-LAN

ADDING VIRTUAL ROUTERS TO THE INTERFACE

Step 1: Navigate to Virtual Routers

1. **Go to the Network Tab**:
   - In the Palo Alto Web Interface, click **Network** in the left-hand menu.
2. **Locate Virtual Routers**:
   - In the **Routing** section, find and click on **Virtual Routers**.
3. **Add a New Virtual Router**:
   - Click the **Add** button at the bottom of the Virtual Routers page.

WAN INTERFACE

Step 2: Configure the Virtual Router for WAN

2.1 Name the Virtual Router

1. In the **Add Virtual Router** dialog, enter the name for the router:
   - Example: `PA-RT-WAN`.

2.2 Attach the WAN Interface

1. **Go to the General Tab**:
   - Click on the **General** tab within the Virtual Router configuration.
2. **Add the WAN Interface**:
   - Click the **Add** button to attach an interface.
   - Select **ethernet1/1** (or the interface you configured for the WAN zone earlier).
   - Click **OK** to confirm.

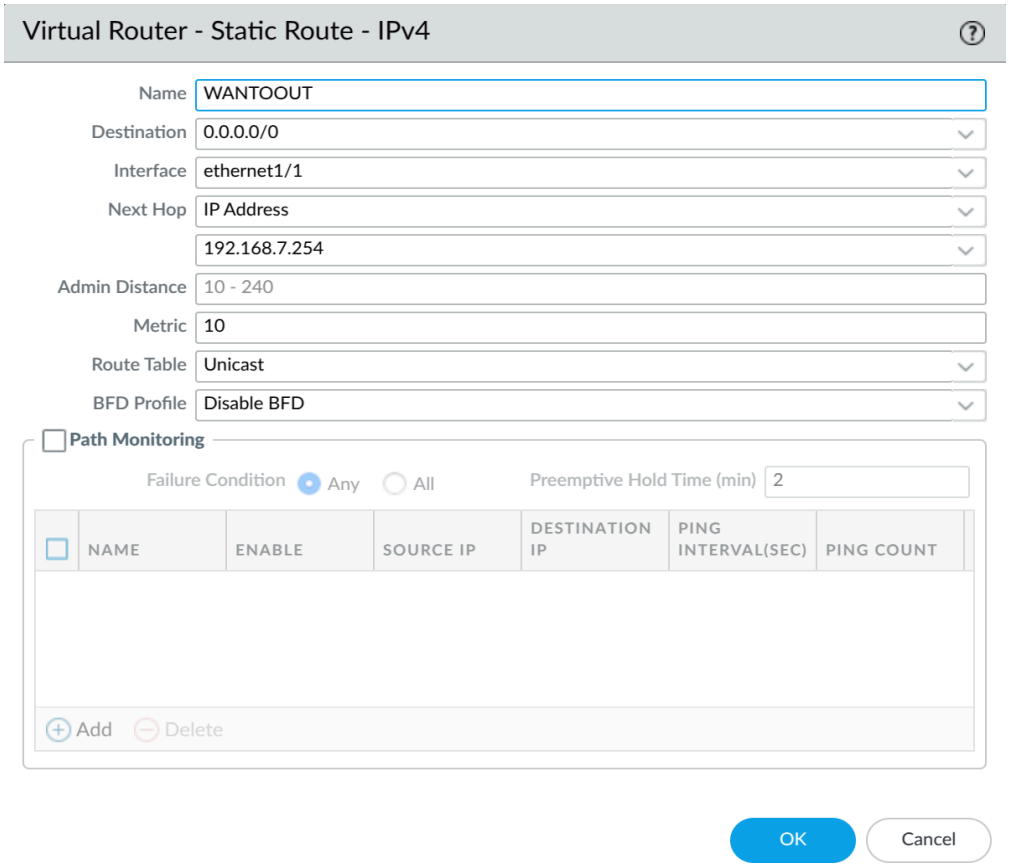
2.3 Save the Configuration

1. Once the interface is added, click **OK** to save and close the Virtual Router configuration.

Step 3: Add Static Routes

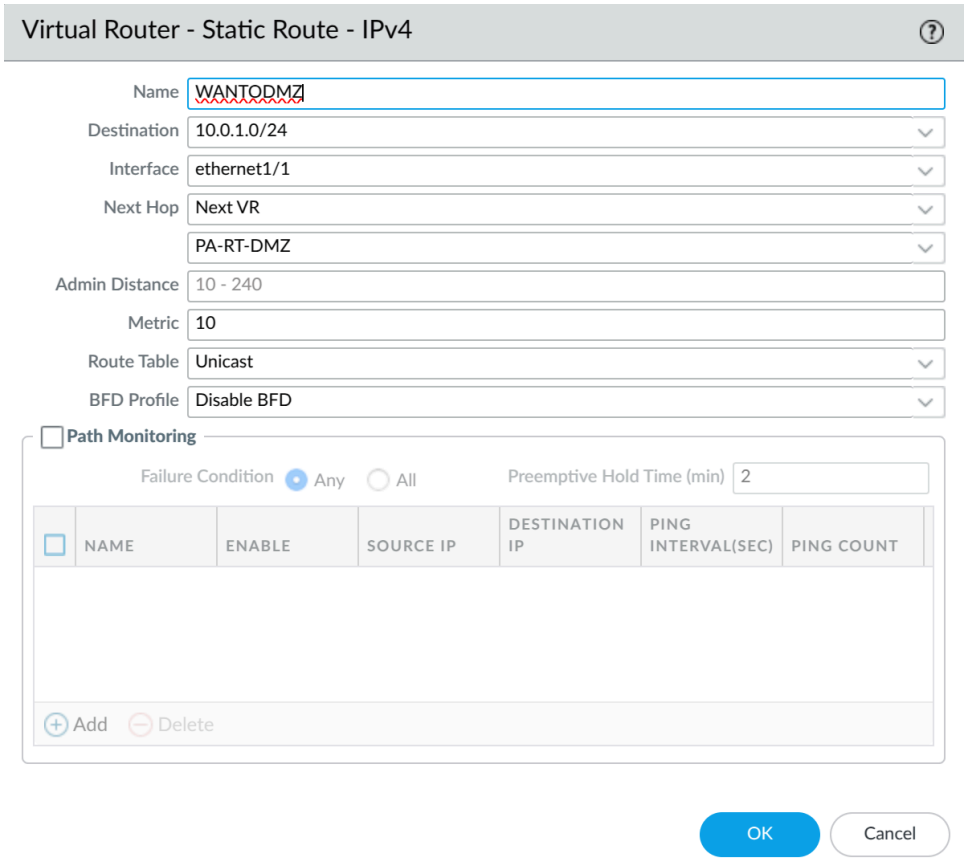
3.1 Create a Default Route for WAN

1. **Open the Virtual Router**:
   - Click on `PA-RT-WAN` in the Virtual Routers list to edit it.
2. **Go to the Static Routes Tab**:
   - Click the **Static Routes** tab in the Virtual Router configuration.
3. **Add a Static Route**:
   - Click **Add** to create a new route.
4. **Configure the Default Route**:
   - **Name**: Enter a descriptive name like `WANTOOUT, this rule is send any traffic to the outside internet, for that we need ip address of default gateway address`.
   - **Destination**: Enter `0.0.0.0/0` (this means all traffic).
   - **Next Hop**:
     - Select **IP Address**.
     - Enter the **default gateway IP address**: `192.168.7.254` (provided in your settings).
   - **Interface**: Select `ethernet1/1` (the WAN interface).because through this the traffic is getting routed
   - Keep the other settings default and click **OK** to save.

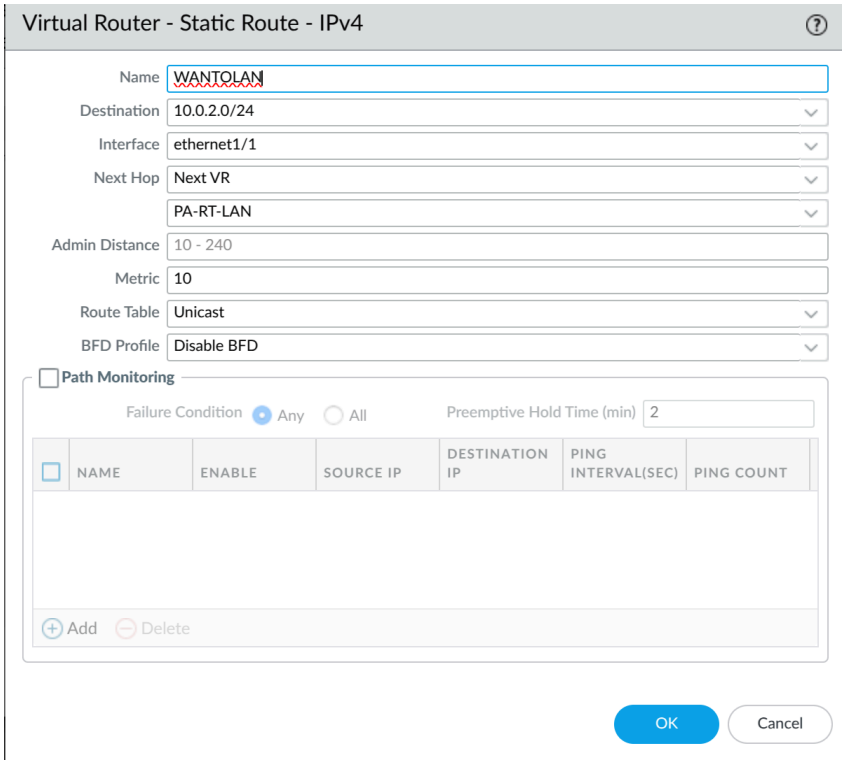


3.2 Add Placeholder Routes for DMZ and LAN

1. **Create a Route for DMZ Traffic**:
   - Click **Add** to create another static route.
   - **Name**: Enter a descriptive name like `DMZ-Route`.
   - **Destination**: Enter `10.0.1.0/24` (this is the subnet for the DMZ zone).
   - **Next Hop**:
     - Select **IP Address** (or leave it as a placeholder if the next VR isn't set up yet).
     - You can leave this blank for now as the DMZ Virtual Router will be configured later.
   - **Interface**: Select `ethernet1/1` (the WAN interface).
   - Click **OK** to save.

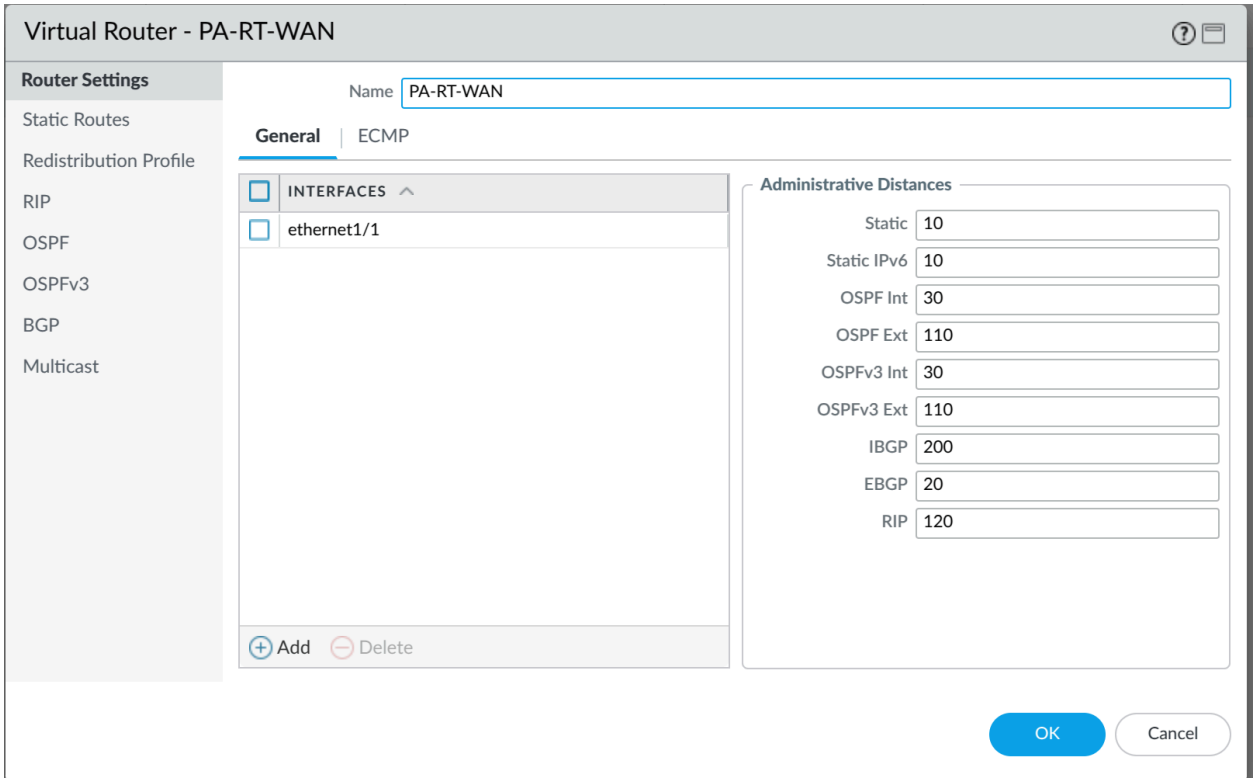


2. **Create a Route for LAN Traffic**:
    - Click **Add** again to create another static route.
    - **Name**: Enter a descriptive name like `LAN-Route`.
    - **Destination**: Enter `10.0.2.0/24` (this is the subnet for the LAN zone).
    - **Next Hop**:
        - Select **IP Address** (or leave it as a placeholder if the next VR isn't set up yet).
        - You can leave this blank for now as the LAN Virtual Router will be configured later.
    - **Interface**: Select `ethernet1/1` (the WAN interface).
    - Click **OK** to save.



Step 4: Commit the Configuration

1. **Commit Changes**:
   - After adding the routes, click the **Commit** button in the top-right corner of the web interface.
   - Monitor the progress to ensure the commit is successful.



DMZ INTERFACE

Step 5: Configure the Virtual Router for the DMZ Interface

5.1 Add a New Virtual Router

1. **Navigate to Virtual Routers**:
   - Go to **Network > Virtual Routers** in the Palo Alto Web Interface.
2. **Add a New Virtual Router**:
   - Click the **Add** button.
3. **Name the Virtual Router**:
   - Enter the name **PA-RT-DMZ** to identify it as the DMZ Virtual Router.

5.2 Attach the DMZ Interface

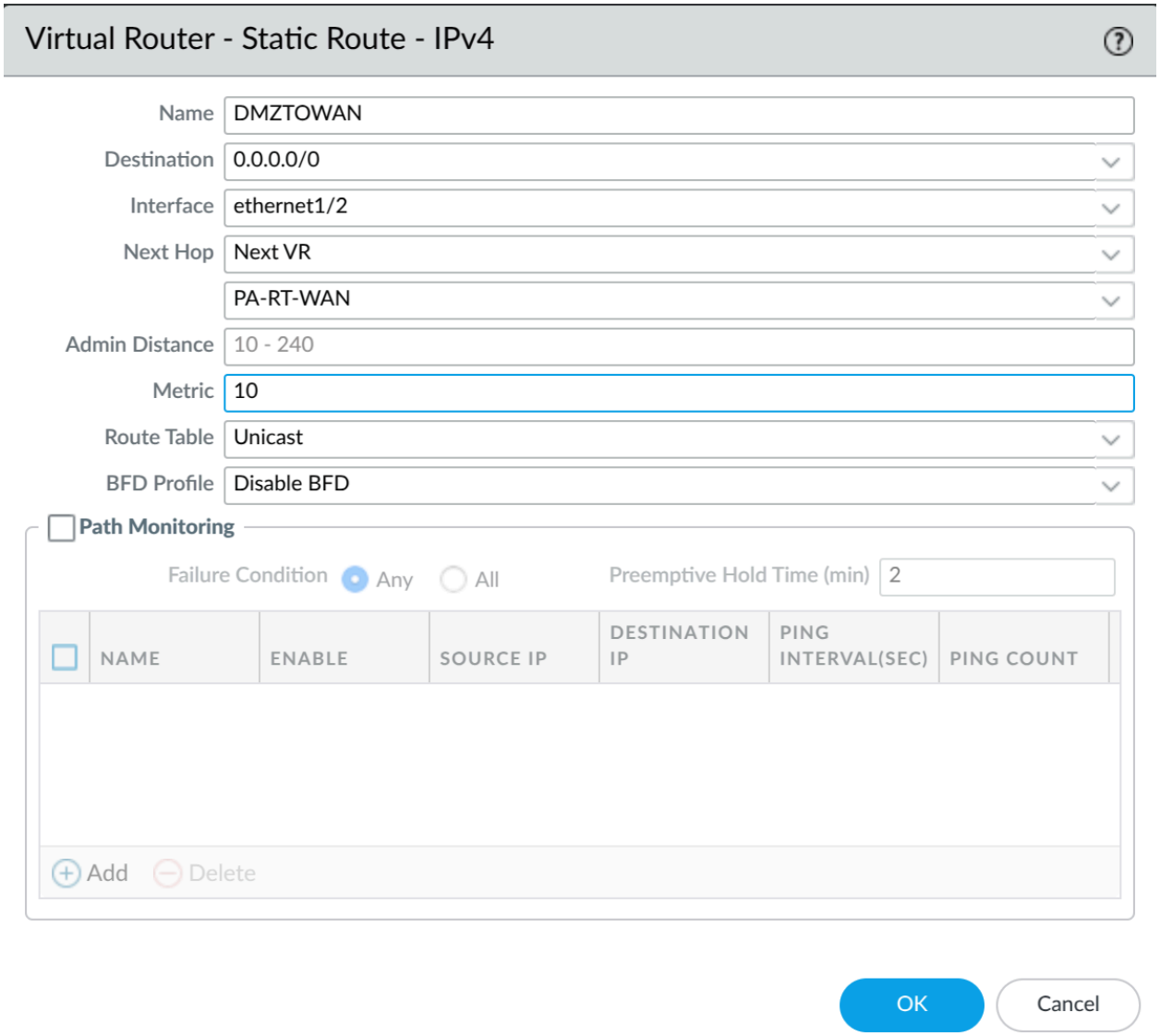
1. **Go to the General Tab**:
   - In the Virtual Router configuration, click the **General** tab.
2. **Add the DMZ Interface**:
   - Click **Add** in the interface section.
   - Select **ethernet1/2** (this is the interface you configured earlier for the DMZ zone).

3. **Save the Configuration**:
    - Click **OK** to save the Virtual Router configuration.

Step 6: Add Static Routes for DMZ

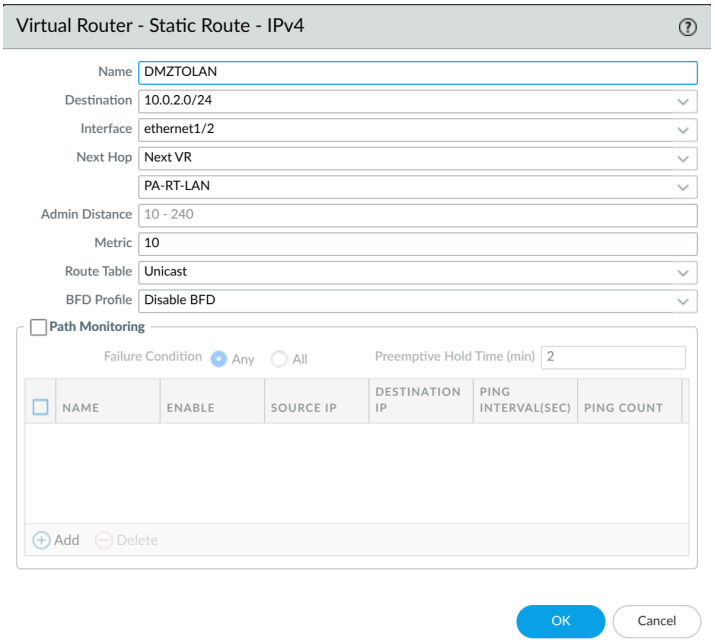
6.1 Add Default Route for DMZ to WAN

1. **Open the PA-RT-DMZ Virtual Router**:
    - Click on `PA-RT-DMZ` in the Virtual Routers list to edit it.
2. **Go to the Static Routes Tab**:
    - Click the **Static Routes** tab in the Virtual Router configuration.
3. **Add a Static Route for DMZ to WAN**:
    - **Click Add** to create a new static route.
    - **Name**: Enter a descriptive name like `DMZTOWAN`.
    - **Destination**: Enter `0.0.0.0/0` (to route all traffic).
    - **Next Hop**:
        - Select **Next Virtual Router**.
        - Choose **PA-RT-WAN** (the Virtual Router configured for the WAN interface).
    - Click **OK** to save the route.



6.2 Add Route for DMZ to LAN

1. **Add a Static Route for DMZ to LAN**:
   - Click **Add** again to create another static route.
   - **Name**: Enter a descriptive name like `DMZTOLAN`.
   - **Destination**: Enter `10.0.2.0/24` (the LAN subnet).
   - **Next Hop**:
     - Select **Next Virtual Router**.
     - Choose **PA-RT-LAN** (the Virtual Router to be configured later for the LAN interface).
   - Click **OK** to save the route.



Step 7: Commit the Configuration

1. **Commit Changes**:
    - After adding the routes, click the **Commit** button at the top-right corner of the web interface

LAN INTERFACE

Step 8: Configure the Virtual Router for the LAN Interface

8.1 Add a New Virtual Router

1. **Navigate to Virtual Routers**:
    - Go to **Network > Virtual Routers** in the Palo Alto Web Interface.
2. **Add a New Virtual Router**:
    - Click the **Add** button.
3. **Name the Virtual Router**:
    - Enter the name **PA-RT-LAN** to identify it as the LAN Virtual Router.

8.2 Attach the LAN Interface

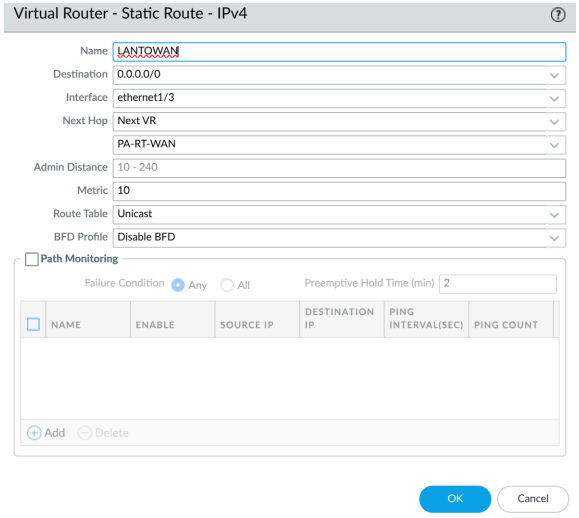
1. **Go to the General Tab**:
    - In the Virtual Router configuration, click the **General** tab.

2. **Add the LAN Interface**:
    - Click **Add** in the interface section.
    - Select **ethernet1/3** (this is the interface you configured earlier for the LAN zone).
3. **Save the Configuration**:
    - Click **OK** to save the Virtual Router configuration.

Step 9: Add Static Routes for LAN

9.1 Add Default Route for LAN to WAN

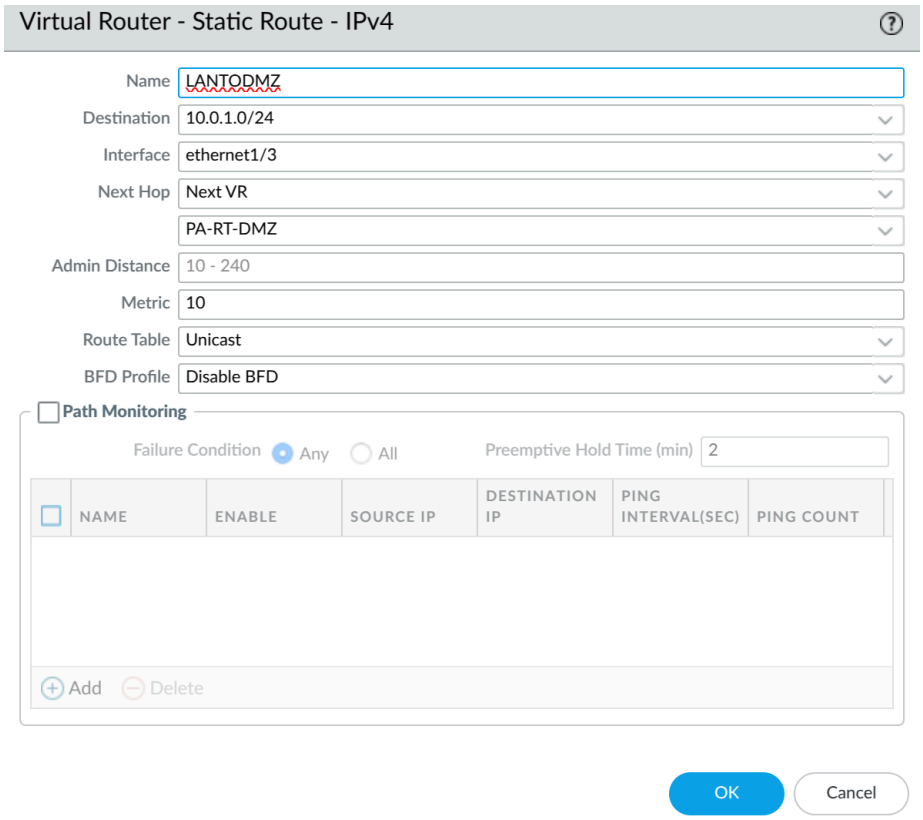
1. **Open the PA-RT-LAN Virtual Router**:
    - Click on `PA-RT-LAN` in the Virtual Routers list to edit it.
2. **Go to the Static Routes Tab**:
    - Click the **Static Routes** tab in the Virtual Router configuration.
3. **Add a Static Route for LAN to WAN**:
    - **Click Add** to create a new static route.
    - **Name**: Enter a descriptive name like `LANTOWAN`.
    - **Destination**: Enter `0.0.0.0/0` (to route all traffic from LAN to the internet or other external networks).
    - **Next Hop**:
        - Select **Next Virtual Router**.
        - Choose **PA-RT-WAN** (the Virtual Router configured for the WAN interface).
    - Click **OK** to save the route.



9.2 Add Route for LAN to DMZ

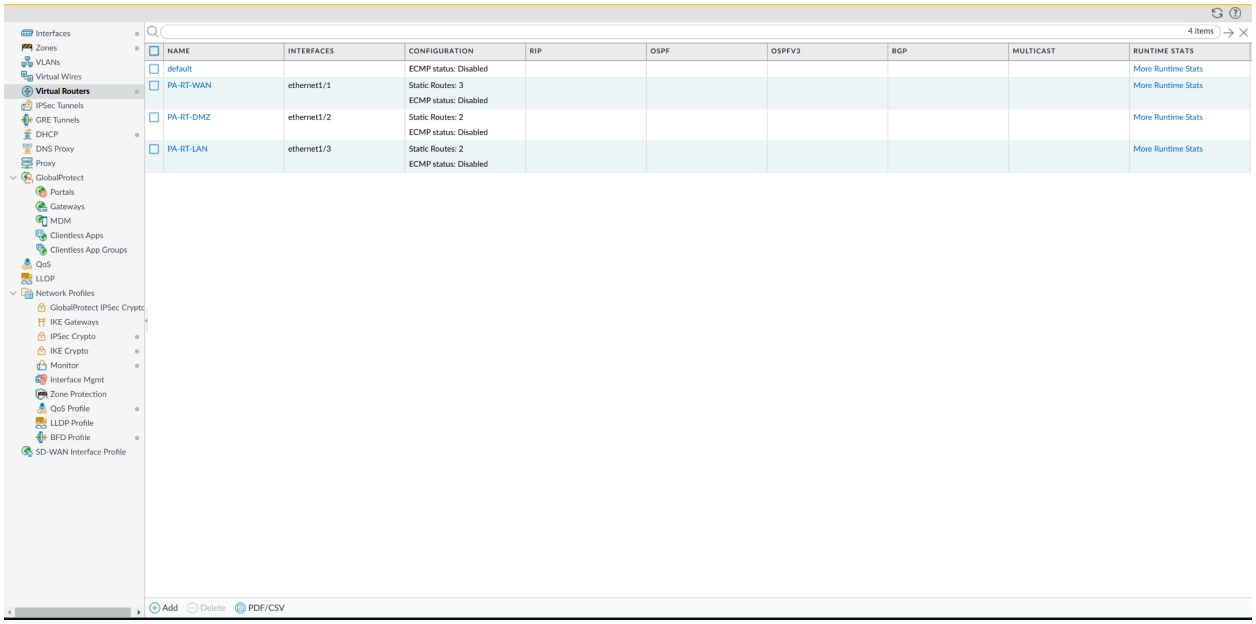
1. **Add a Static Route for LAN to DMZ**:

- Click **Add** again to create another static route.
- **Name**: Enter a descriptive name like `LANTODMZ`.
- **Destination**: Enter `10.0.1.0/24` (the DMZ subnet).
- **Next Hop**:
  - Select **Next Virtual Router**.
  - Choose **PA-RT-DMZ** (the Virtual Router configured for the DMZ interface).
- Click **OK** to save the route.



Step 10: Commit the Configuration

1. **Commit Changes**:
   - After adding the routes, click the **Commit** button at the top-right corner of the web interface.



ADDING NAT RULES SO THAT TRAFFIC GOES FROM INSIDE TO OUTSIDE

Why We Need NAT Rules

Network Address Translation (NAT) is essential for allowing internal (private) network traffic to communicate with external (public) networks. In this setup:

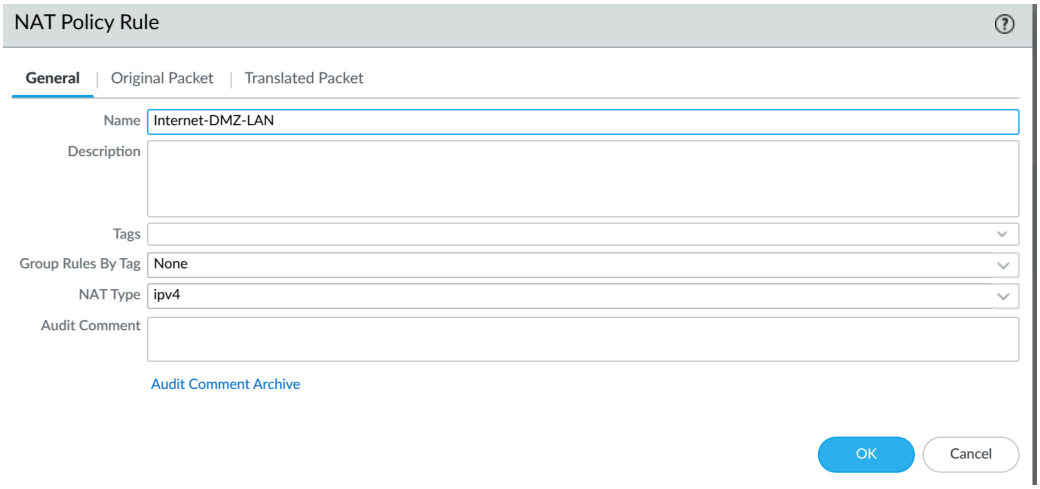
1. **Private IPs (LAN and DMZ)**: Internal IP ranges (e.g., `10.0.1.0/24` and `10.0.2.0/24`) are not routable over the internet.
2. **Translation to Public IP**: NAT translates internal private IP addresses to a public IP address associated with the WAN interface, allowing traffic to reach the internet.
3. **Dynamic IP and Port NAT**: Ensures that each internal connection is mapped to a unique combination of IP and port, enabling multiple devices to share a single public IP.

Step-by-Step Guide for Creating a NAT Rule

Step 1: Navigate to NAT Rules

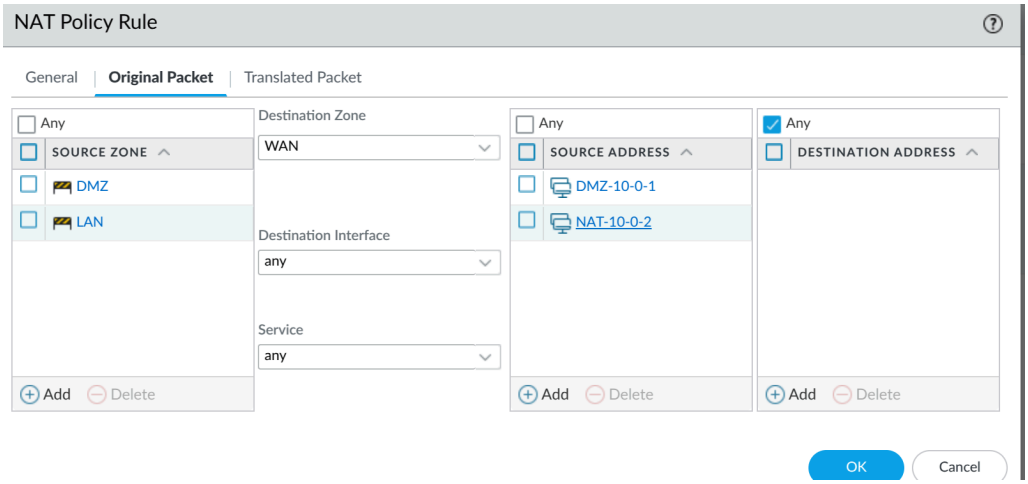
1. **Open the Palo Alto Web Interface**:
    - Log in to the Palo Alto GUI.
2. **Go to NAT**:
    - Navigate to **Policies > NAT** in the left-hand menu.

3. **Add a New NAT Rule**:
    - Click **Add** at the bottom of the NAT Rules list.
4. **Name the NAT Rule**:
    - In the **General Tab**, give the NAT rule a descriptive name, such as `Inside-to-Outside`.
    - Select **Type** as **IPv4** (default setting).



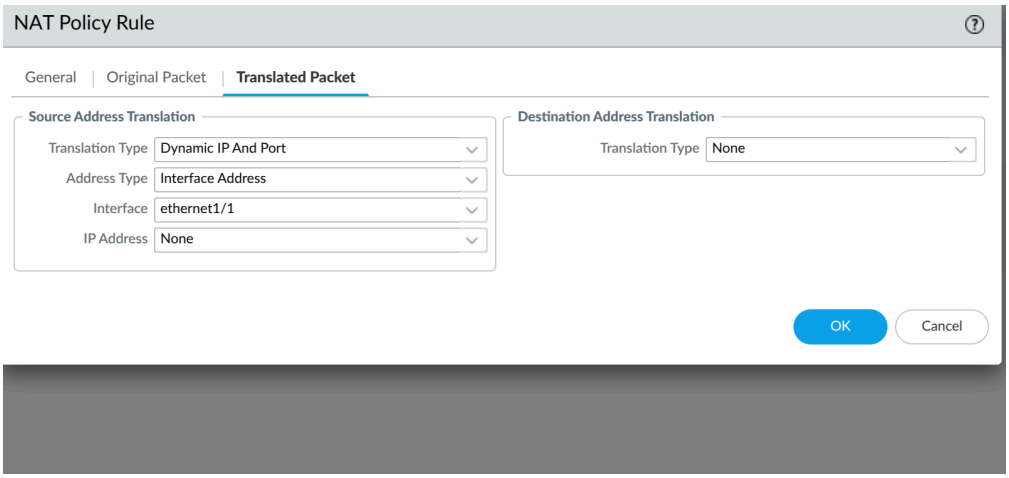
Step 2: Configure the Original Packet

1. **Go to the Original Packet Tab**:
    - This section defines the source and destination zones for the traffic to be translated.
2. **Configure Source Zones**:
    - Click **Add** to include:
        - **DMZ** (zone for `ethernet1/2` with subnet `10.0.1.0/24`).
        - **LAN** (zone for `ethernet1/3` with subnet `10.0.2.0/24`).
3. **Configure Destination Zone**:
    - Set the **Destination Zone** to **WAN** (zone for `ethernet1/1`).
4. **Set Destination Interface**:
    - Leave the **Destination Interface** as **Any** (default setting, allowing flexibility).
5. **Add Source Addresses**:
    - Add the following source subnets:
        - **DMZ**: `10.0.1.0/24`
        - **LAN**: `10.0.2.0/24`



Step 3: Configure the Translated Packet

1. **Go to the Translated Packet Tab**:
   - This section defines how the source IP and port will be translated.
2. **Translation Type**:
   - Select **Dynamic IP and Port**.
   - This setting ensures that multiple internal devices can share a single external IP by using different ports.
3. **Attach the WAN Interface**:
   - Select the **WAN interface** (e.g., `ethernet1/1`).
   - This tells the firewall to use the IP address of the WAN interface for NAT.



Step 4: Save and Commit

1. **Save the NAT Rule**:
   - Click **OK** to save the NAT rule configuration.
2. **Commit Changes**:
   - Click the **Commit** button at the top-right corner of the web interface.

ADDING SECURITY POLICY

Allow Traffic from LAN to WAN

1. **Create the Policy**:
   - Navigate to **Policies > Security** in the Palo Alto Web Interface.
   - Click **Add** to create a new policy.
2. **Name the Policy**:
   - Name it something meaningful, like **Allow-LAN-to-WAN**.
3. **Source Zone**:
   - In the **Source** tab:
     - Add the **LAN Zone** (e.g., `ethernet1/3`).
4. **Destination Zone**:
   - In the **Destination** tab:
     - Add the **WAN Zone** (e.g., `ethernet1/1`).
5. **Source Address**:
   - Use **Any** or specify the subnet, e.g., `10.0.2.0/24` (LAN subnet).
6. **Destination Address**:
   - Use **Any**, as this is for outbound internet traffic.
7. **Application**:
   - Select **Any** to allow all applications or specify common ones like `HTTP`, `HTTPS`, `DNS`, etc.
8. **Action**:
   - Set the action to **Allow**.
9. **Save and Commit**:
   - Save the policy and commit the changes.

Allow Traffic from DMZ to WAN

1. **Create the Policy**:
   - Navigate to **Policies > Security** and click **Add**.
2. **Name the Policy**:
   - Name it something like **Allow-DMZ-to-WAN**.
3. **Source Zone**:
   - In the **Source** tab:
     - Add the **DMZ Zone** (e.g., `ethernet1/2`).
4. **Destination Zone**:
   - In the **Destination** tab:
     - Add the **WAN Zone** (e.g., `ethernet1/1`).
5. **Source Address**:
   - Use **Any** or specify the DMZ subnet, e.g., `10.0.1.0/24`.
6. **Destination Address**:
   - Use **Any`, as this is for outbound internet traffic.

7. **Application**:
    - Select **Any** to allow all applications or restrict it to necessary ones (e.g., web services, email).
8. **Action**:
    - Set the action to **Allow**.
9. **Save and Commit**:
    - Save the policy and commit the changes

Allow Traffic from LAN to DMZ

1. **Create the Policy**:
    - Navigate to **Policies > Security** and click **Add**.
2. **Name the Policy**:
    - Name it something like **Allow-LAN-to-DMZ**.
3. **Source Zone**:
    - In the **Source** tab:
        - Add the **LAN Zone** (e.g., `ethernet1/3`).
4. **Destination Zone**:
    - In the **Destination** tab:
        - Add the **DMZ Zone** (e.g., `ethernet1/2`).
5. **Source Address**:
    - Specify the LAN subnet, e.g., `10.0.2.0/24`.
6. **Destination Address**:
    - Specify the DMZ subnet, e.g., `10.0.1.0/24`.
7. **Application**:
    - Select **Any** or limit to specific services (e.g., SSH, HTTP, etc.).
8. **Action**:
    - Set the action to **Allow**.
9. **Save and Commit**:
    - Save the policy and commit the changes.

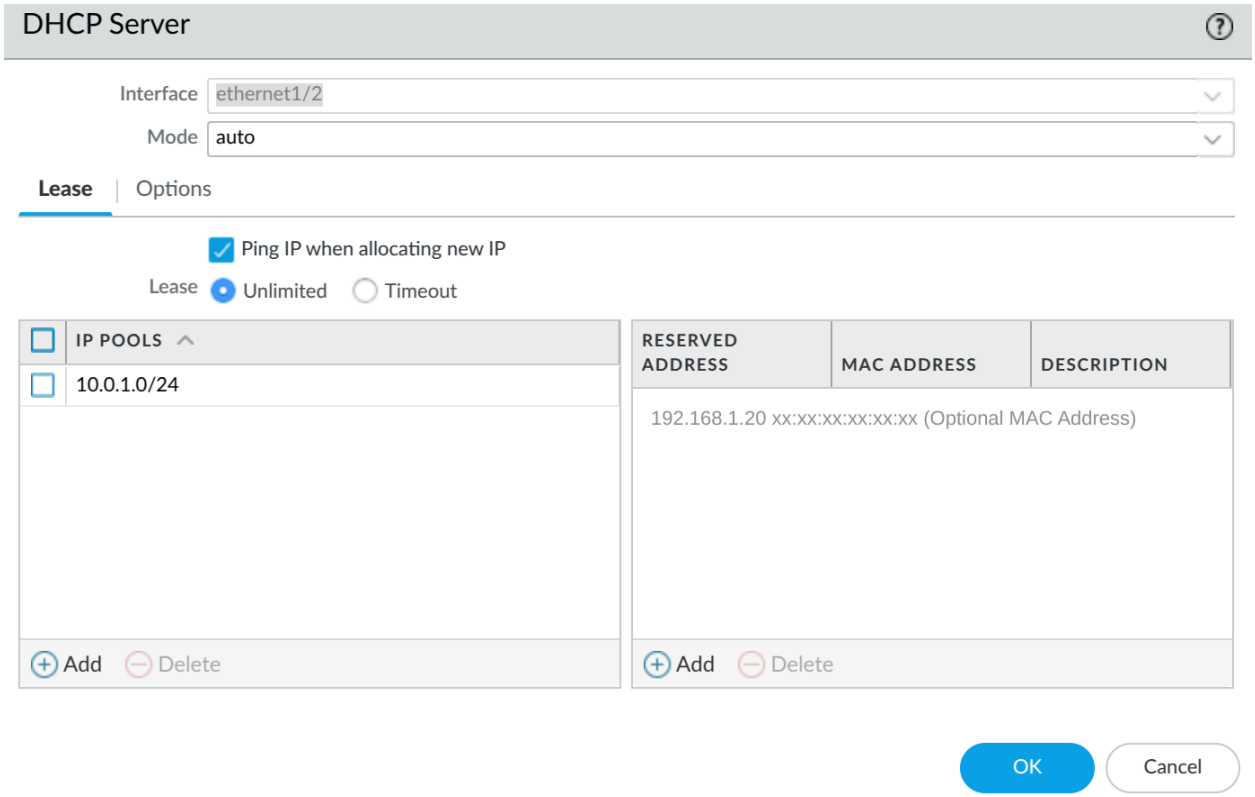
DHCP

Step 1: Attach the DHCP Server to an Interface

1. **Select the Interface**:
    - In the DHCP configuration window, choose the interface where the DHCP server will be active (e.g., `ethernet1/2` for LAN or DMZ).
2. **Enable DHCP**:
    - Check the box to **Enable DHCP** on this interface.

Step 2: Configure the DHCP IP Pool

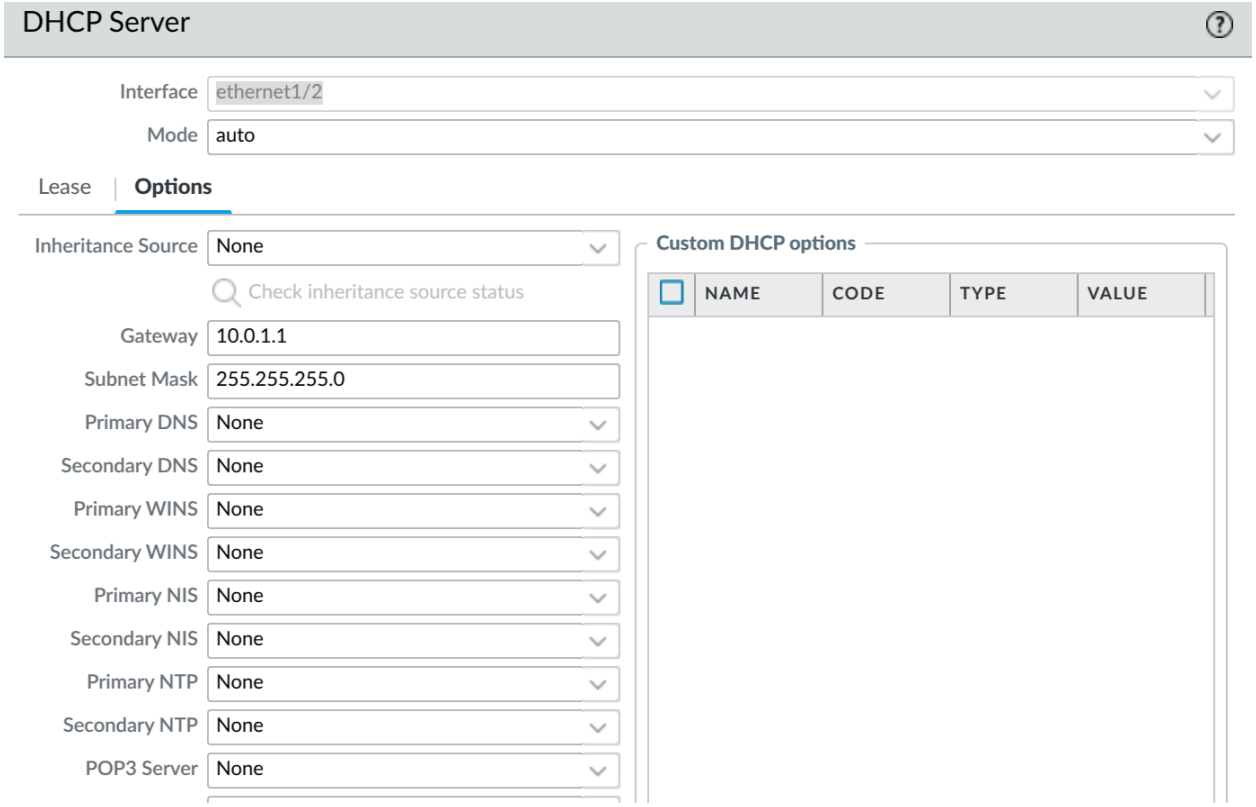
1. **Set the IP Pool Range**:
   - Specify the range of IP addresses or subnet mask as shown, the DHCP server will assign ip addresses



Step 3: Configure DHCP Options

1. **Click on the Options Tab**:
   - Define additional parameters for devices receiving IPs from this DHCP server.
2. **Set the Gateway**:
   - Enter the **default gateway**:
     - Example: `10.0.1.1`.
3. **Set the Subnet Mask**:
   - Enter the **subnet mask**:
     - Example: `255.255.255.0`.
4. **DNS Servers (Optional)**:
   - Add **Primary and Secondary DNS servers**:
     - Example:
       - **Primary DNS**: `8.8.8.8`.

        - **Secondary DNS**: `8.8.4.4`.
5. **Save the Configuration**:
    - Click **OK** to save your settings.



Step 4: Commit and Verify

1. **Commit Changes**:
    - Click the **Commit** button in the top-right corner of the Palo Alto Web Interface to apply the configuration.
2. **Monitor DHCP Assignments**:
    - Go to **Monitor > DHCP Leases** to check active DHCP leases and verify that devices are receiving IPs from the configured poo