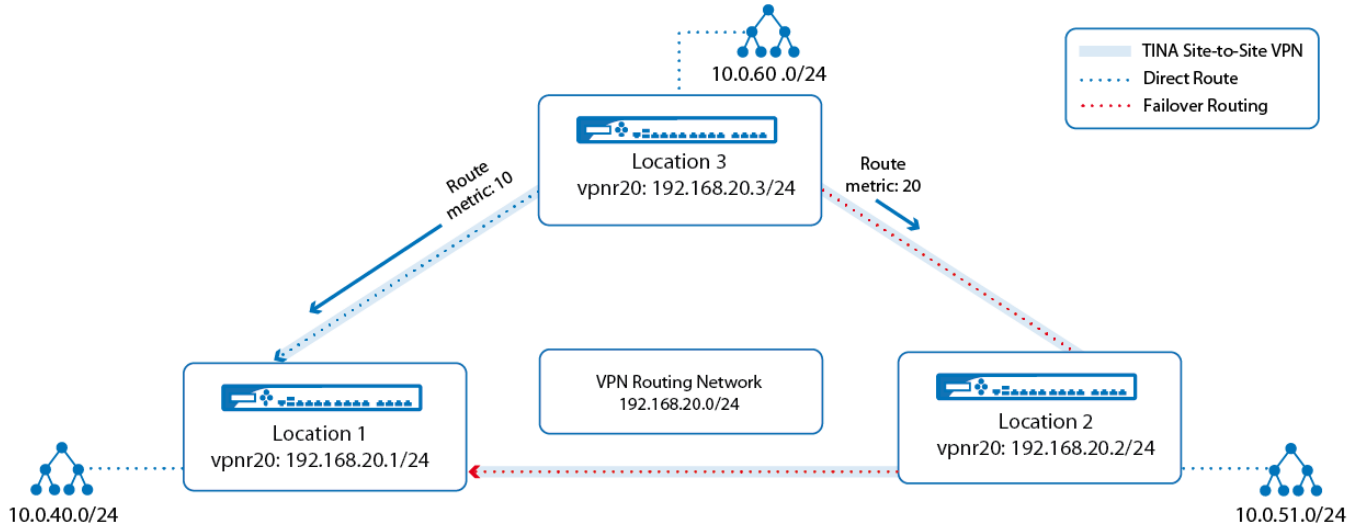
# How to Configure a Routed VPN Network

https://campus.barracuda.com/doc/48203017/

In cases where Traffic Intelligence cannot handle failover scenarios in your VPN network, use a routed VPN network. A routed VPN network uses the IP addresses assigned to the VPNR interface of the TINA VPN tunnels as gateways. This means that the routing table and the assigned route metrics of the routes determine which tunnel is chosen. When a VPN tunnel goes down, the gateway IP address on the other side of the VPN is no longer reachable and the route metric for the failing route is automatically increased to 65556. The backup route with the lower metric now matches and redirects the traffic over the failover route to its destination. As soon as the VPN tunnel is back up, the original route becomes available again, and traffic is sent through the direct VPN tunnel again.




## Before You Begin

- A free subnet (e.g., `192.168.20.0/24`) for the intermediary network is needed.

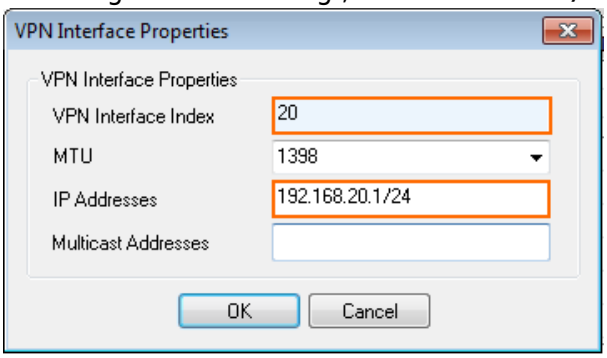
## Step 1. Add a VPN Next Hop Interface to Each Firewall

Add a VPN next hop interface using a /24 subnet (e.g., `192.168.20.0/24`). Use the same VPNR index for each firewall.

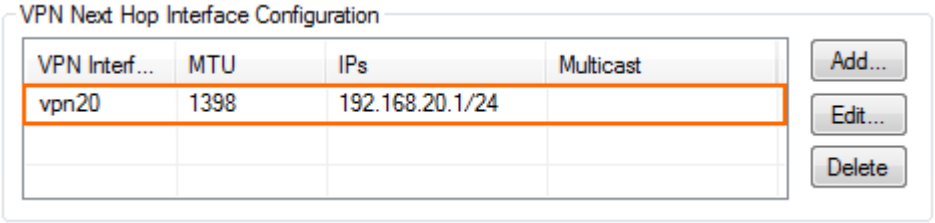
1. Go to **CONFIGURATION** > **Configuration Tree > Box > Virtual Servers > *your virtual server* > Assigned Services > VPN-Service > VPN Settings**.
2. Click **Lock**.
3. In the **Settings** tab, click the **Click here for Server Settings** link. The **Server Settings**

window opens.

4. In the **Server Settings** window, click the **Advanced** tab.
5. Next to the **VPN Next Hop Interface Configuration** table, click **Add**.
6. In the **VPN Interface Properties** window, configure the following settings, and then click **OK**.
   1. In the **VPN Interface Index** field, enter a number between `0` and `999`. E.g., `20`
   2. In the **IP Addresses** field, enter a free IP address for the VPN interface IP address, including the subnet. E.g., `192.168.20.1/24`




   3. Click **OK**. The interface is now listed in the **VPN Next Hop Interface Configuration** table.



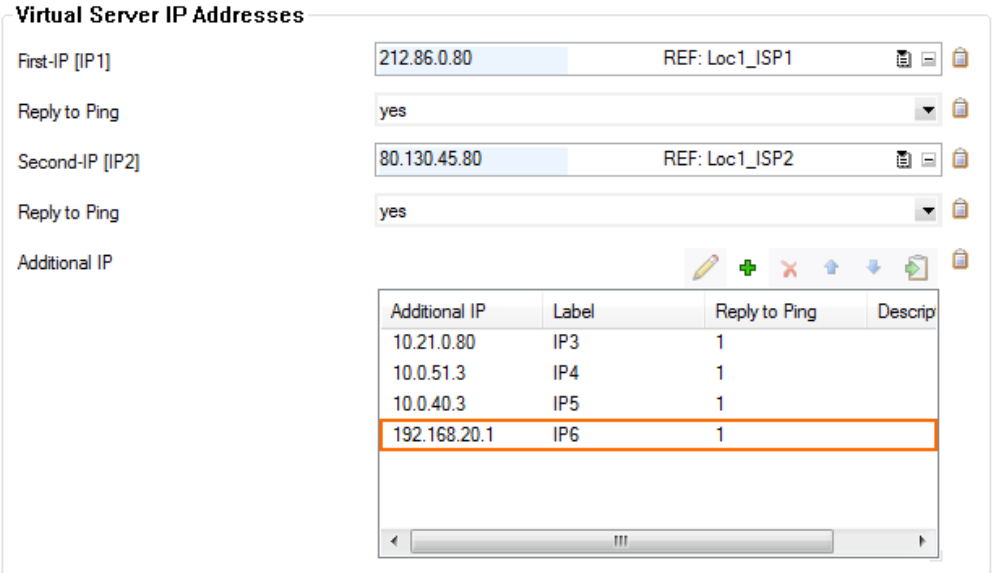

7. In the **Server Settings** window, click **OK**.
8. Click **Send Changes** and **Activate**.

Repeat for each firewall in the VPN network. If possible, use the same VPNR interface index on each firewall.

## Step 2. Add the VPN Next Hop Interface IP Address to the Virtual Server Listening IP Addresses for Each Firewall

Introduce the IP address of the VPN next hop interface as a virtual server IP address on each Firewall.

1. Go to **CONFIGURATION** > **Configuration Tree > Box > Virtual Servers > *your virtual server* > Server Properties** .
2. Click **Lock**.
3. In the **Additional IP** table, click **+** to add the IP address of the VPNR interface.




4. Click **Send Changes** and **Activate**.

Repeat for each firewall in the VPN network.

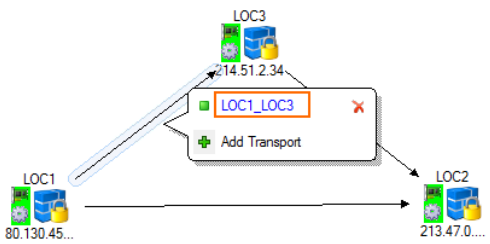
## Step 3. Configure the TINA Site-to-Site VPN Tunnel between the Firewalls

You can configure the VPN tunnels connecting the firewalls using the GTI Editor for managed F-Series Firewalls, or using the Site-to-Site configuration dialog if you are using standalone F-Series Firewalls.

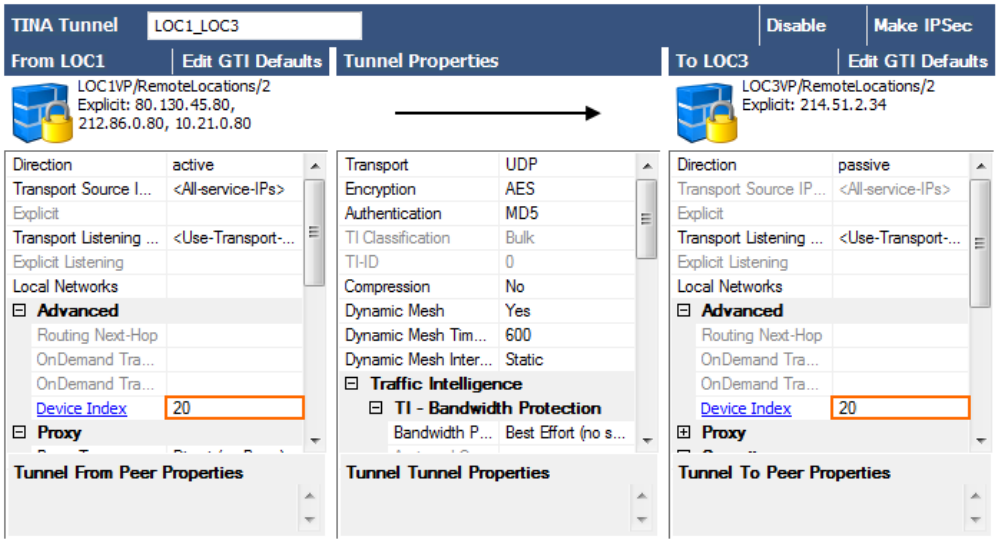
#### In the GTI Editor

Remove the local and remote networks and add the VPN Next Hop interface ID to the VPN tunnels.

1. Go to the global/range/cluster **GTI Editor**.
2. Click **Lock**.
3. Click on the VPN tunnel, and click on the first Transport to edit the VPN tunnel configuration. For more information, see How to Create a VPN Tunnel with the VPN GTI Editor.




4. Remove all **Local Networks** from the remote and local VPN services.
5. Enter the VPN Next Hop interface ID for the remote and local VPN services. E.g., `20`

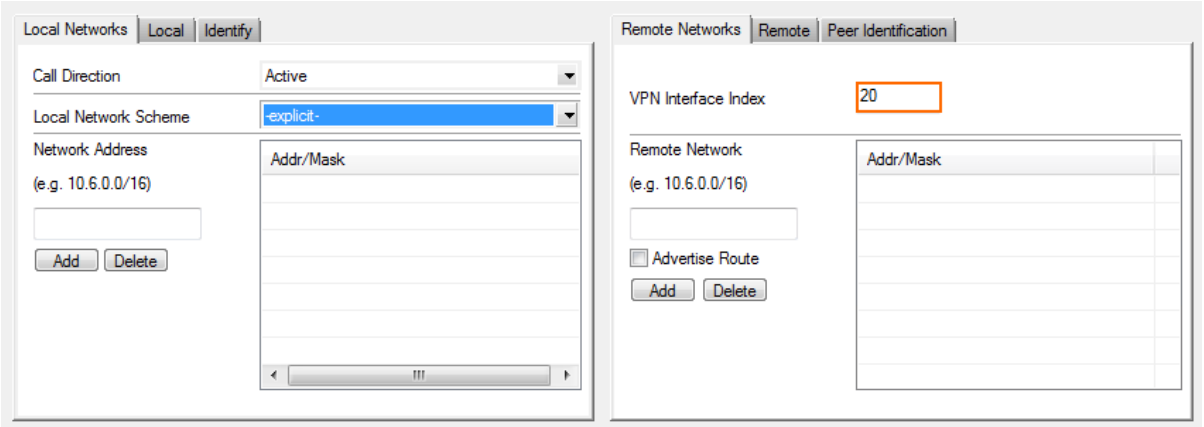



6. Click **OK**.
7. Click **Send Changes** and **Activate**.

#### Stand-alone F-Series Firewalls

Configure a TINA VPN tunnel using the VPN next hop interface between all firewalls.

1. Go to **CONFIGURATION > Configuration Tree > Box > Virtual Servers > *your virtual server* > Assigned Services > VPN-Service > Site to Site**.
2. Click **Lock**.
3. Right-click in the **TINA Tunnels** tab, and select **New TINA tunnel**. The **TINA tunnel** window opens.
4. Enter a **Name**.
5. Configure the **Transport**, **Encryption** and **Authentication** settings as well as the **Local** and **Remote** public IP addresses. For more information, see How to Create a TINA VPN Tunnel between F-Series Firewalls.
6. Leave the **Local** and **Remote Network** empty.
7. In the **Remote Networks** tab, enter the **VPN Interface Index** number that you created in the **VPN Interface Configuration** in step 1. E.g., 20




8. Click **OK**.
9. Click **Send Changes** and **Activate**.

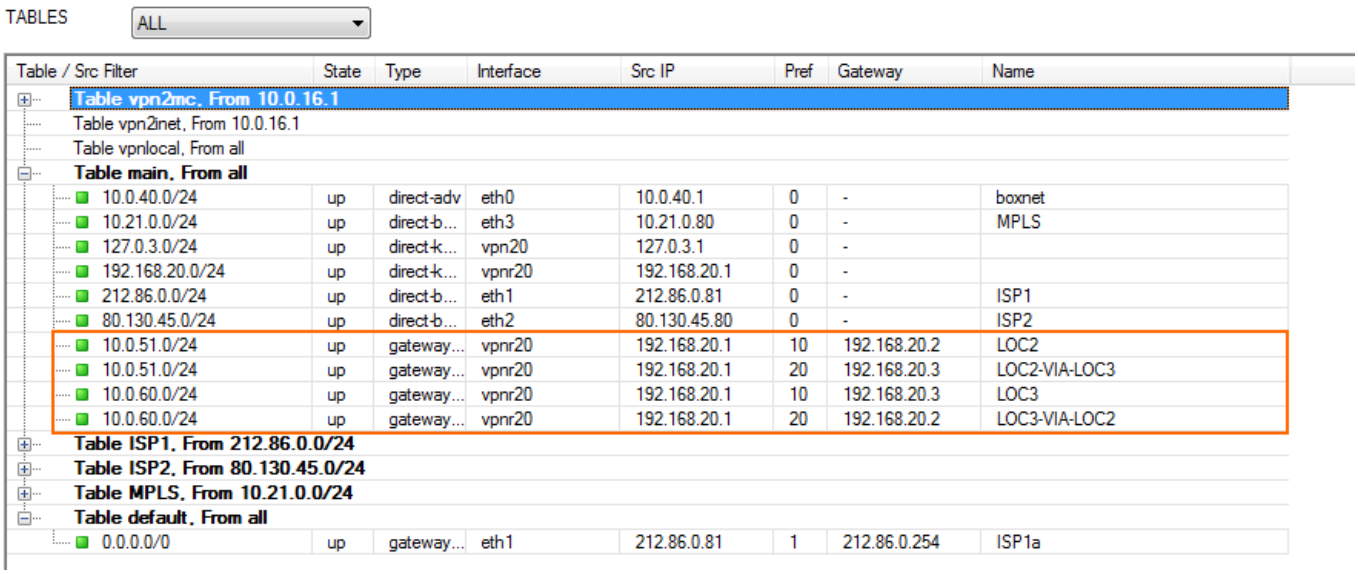
Repeat this step until all three firewalls are connected via a TINA Site-to-Site VPN tunnel with each other.

### Step 3. Configure Gateway Routes for the Location 1 Firewall

Create the following primary and backup gateway routes on the Location 1 firewall. For more information, see How to Configure Gateway Routes

1. Log into the Location 1 firewall.
2. Create a gateway route to Location 3:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.60.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.3`
   - **Metric** – Enter `10`.
3. Create a gateway route to Location 2:
   - **Target Network Address** – Enter the Location 2 network in CIDR format: `10.0.51.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 2 firewall: `192.168.20.2`
   - **Metric** – Enter `10`.
4. Create a backup gateway route to Location 3 via Location 2:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.60.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.2`
   - **Metric** – Enter `20`.
5. Create a backup gateway route to Location2 via Location 3:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.51.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.3`
   - **Metric** – Enter `20`.
6. Activate the network configuration on the Location 3 firewall. For more information, see How to Activate Network Changes.

The Location 1 routing table now includes all gateway routes to reach the remote networks with failover routes in case the VPN tunnel goes down.




| Table / Src Filter | State | Type | Interface | Src IP | Pref | Gateway | Name |
|---|---|---|---|---|---|---|---|
| **Table vpn2mc, From 10.0.16.1** | | | | | | | |
| Table vpn2inet, From 10.0.16.1 | | | | | | | |
| Table vpnlocal, From all | | | | | | | |
| **Table main, From all** | | | | | | | |
| 10.0.40.0/24 | up | direct-adv | eth0 | 10.0.40.1 | 0 | - | boxnet |
| 10.21.0.0/24 | up | direct-b... | eth3 | 10.21.0.80 | 0 | - | MPLS |
| 127.0.3.0/24 | up | direct-k... | vpn20 | 127.0.3.1 | 0 | - | |
| 192.168.20.0/24 | up | direct-k... | vpnr20 | 192.168.20.1 | 0 | - | |
| 212.86.0.0/24 | up | direct-b... | eth1 | 212.86.0.81 | 0 | - | ISP1 |
| 80.130.45.0/24 | up | direct-b... | eth2 | 80.130.45.80 | 0 | - | ISP2 |
| 10.0.51.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 10 | 192.168.20.2 | LOC2 |
| 10.0.51.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 20 | 192.168.20.3 | LOC2-VIA-LOC3 |
| 10.0.60.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 10 | 192.168.20.3 | LOC3 |
| 10.0.60.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 20 | 192.168.20.2 | LOC3-VIA-LOC2 |
| **Table ISP1, From 212.86.0.0/24** | | | | | | | |
| **Table ISP2, From 80.130.45.0/24** | | | | | | | |
| **Table MPLS, From 10.21.0.0/24** | | | | | | | |
| **Table default, From all** | | | | | | | |
| 0.0.0.0/0 | up | gateway... | eth1 | 212.86.0.81 | 1 | 212.86.0.254 | ISP1a |

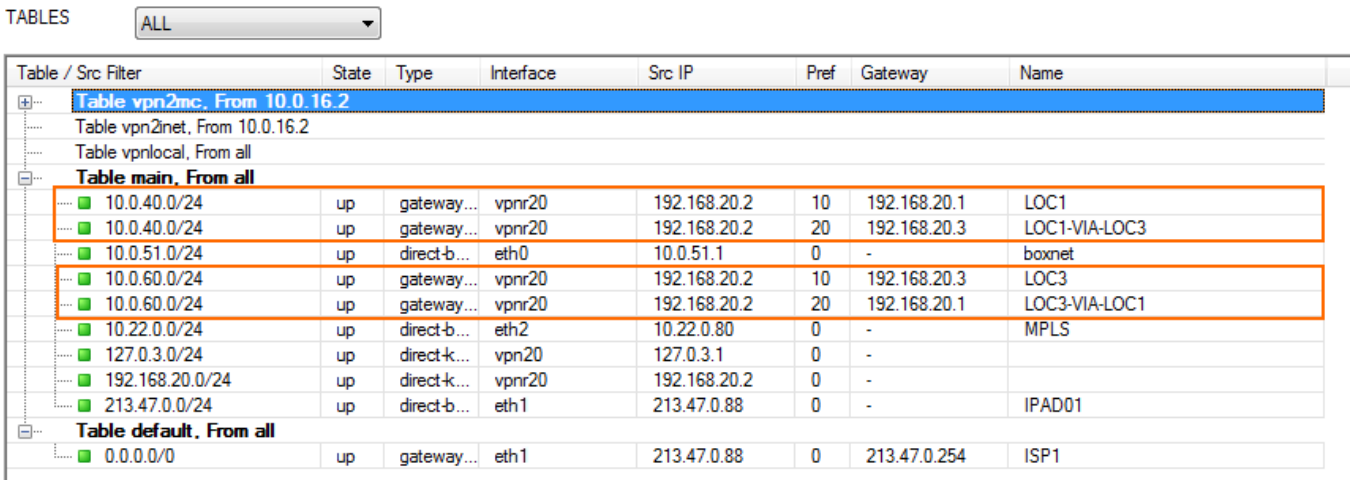
## Step 4. Configure Gateway Routes for the Location 2 Firewall

Create the following primary and backup gateway routes on the Location 1 firewall. For more information, see How to Configure Gateway Routes

1. Log into the Location 2 firewall.
2. Create a gateway route to Location 3:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.60.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.3`
   - **Metric** – Enter `10`.
3. Create a gateway route to Location 1:
   - **Target Network Address** – Enter the Location 2 network in CIDR format: `10.0.15.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 2 firewall: `192.168.20.1`
   - **Metric** – Enter `10`.
4. Create a backup gateway route to Location 3 via Location 1:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.51.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.1`
   - **Metric** – Enter `20`.

5. Create a backup gateway route to Location1 via Location 3:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.15.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.3`
   - **Metric** – Enter `20`.
6. Activate the network configuration on the Location 3 firewall. For more information, see How to Activate Network Changes.

The Location 2 routing table now includes all gateway routes to reach the remote networks with failover routes in case the VPN tunnel goes down.




| Table / Src Filter | State | Type | Interface | Src IP | Pref | Gateway | Name |
|---|---|---|---|---|---|---|---|
| **Table vpn2mc, From 10.0.16.2** | | | | | | | |
| Table vpn2inet, From 10.0.16.2 | | | | | | | |
| Table vpnlocal, From all | | | | | | | |
| **Table main, From all** | | | | | | | |
| 10.0.40.0/24 | up | gateway... | vpnr20 | 192.168.20.2 | 10 | 192.168.20.1 | LOC1 |
| 10.0.40.0/24 | up | gateway... | vpnr20 | 192.168.20.2 | 20 | 192.168.20.3 | LOC1-VIA-LOC3 |
| 10.0.51.0/24 | up | direct-b... | eth0 | 10.0.51.1 | 0 | - | boxnet |
| 10.0.60.0/24 | up | gateway... | vpnr20 | 192.168.20.2 | 10 | 192.168.20.3 | LOC3 |
| 10.0.60.0/24 | up | gateway... | vpnr20 | 192.168.20.2 | 20 | 192.168.20.1 | LOC3-VIA-LOC1 |
| 10.22.0.0/24 | up | direct-b... | eth2 | 10.22.0.80 | 0 | - | MPLS |
| 127.0.3.0/24 | up | direct-k... | vpn20 | 127.0.3.1 | 0 | - | |
| 192.168.20.0/24 | up | direct-k... | vpnr20 | 192.168.20.2 | 0 | - | |
| 213.47.0.0/24 | up | direct-b... | eth1 | 213.47.0.88 | 0 | - | IPAD01 |
| **Table default, From all** | | | | | | | |
| 0.0.0.0/0 | up | gateway... | eth1 | 213.47.0.88 | 0 | 213.47.0.254 | ISP1 |

## Step 5. Configure Gateway Routes for the Location 3 Firewall

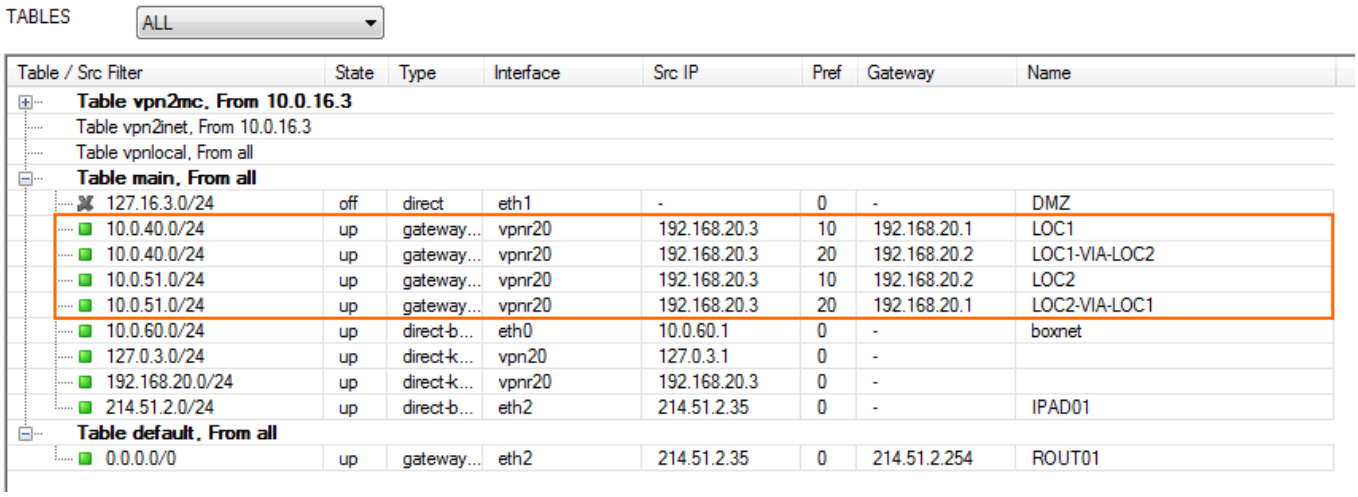
Create the following primary and backup gateway routes on the Location 3 firewall. For more information, see How to Configure Gateway Routes

1. Log into the Location 3 firewall.
2. Create a gateway route to Location 1:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.15.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.1`
   - **Metric** – Enter `10`.
3. Create a gateway route to Location 2:
   - **Target Network Address** – Enter the Location 2 network in CIDR format: `10.0.51.0/24`

- **Route Type** – Select **gateway**.
- **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 2 firewall: `192.168.20.2`
- **Metric** – Enter `10`.

4. Create a backup gateway route to Location 1 via Location 2:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.15.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.2`
   - **Metric** – Enter `20`.
5. Create a backup gateway route to location 2 via location 1:
   - **Target Network Address** – Enter the Location 3 network in CIDR format: `10.0.51.0/24`
   - **Route Type** – Select **gateway**.
   - **Gateway** – Enter the IP address assigned to the VPNR interface of the Location 3 firewall: `192.168.20.1`
   - **Metric** – Enter `20`.
6. Activate the network configuration on the Location 3 firewall. For more information, see How to Activate Network Changes.

The Location 3 routing table now includes all gateway routes to reach the remote networks with failover routes in case the VPN tunnel goes down.

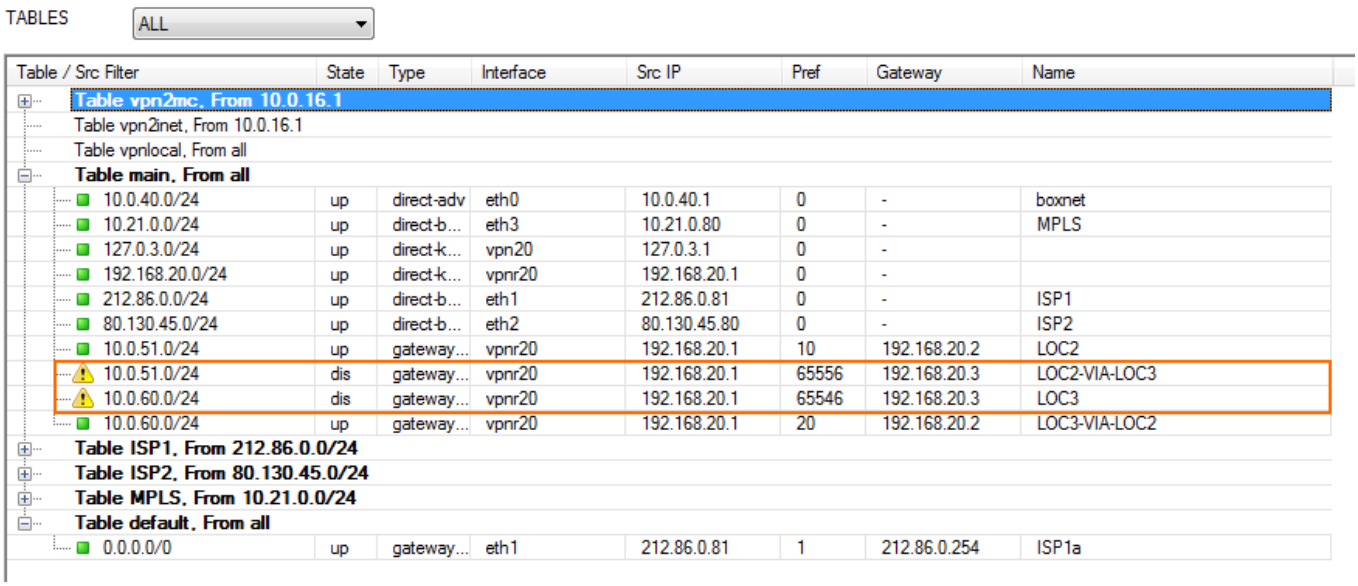



| Table / Src Filter | State | Type | Interface | Src IP | Pref | Gateway | Name |
|---|---|---|---|---|---|---|---|
| **Table vpn2mc, From 10.0.16.3** | | | | | | | |
| Table vpn2inet, From 10.0.16.3 | | | | | | | |
| Table vpnlocal, From all | | | | | | | |
| **Table main, From all** | | | | | | | |
| 127.16.3.0/24 | off | direct | eth1 | - | 0 | - | DMZ |
| 10.0.40.0/24 | up | gateway... | vpnr20 | 192.168.20.3 | 10 | 192.168.20.1 | LOC1 |
| 10.0.40.0/24 | up | gateway... | vpnr20 | 192.168.20.3 | 20 | 192.168.20.2 | LOC1-VIA-LOC2 |
| 10.0.51.0/24 | up | gateway... | vpnr20 | 192.168.20.3 | 10 | 192.168.20.2 | LOC2 |
| 10.0.51.0/24 | up | gateway... | vpnr20 | 192.168.20.3 | 20 | 192.168.20.1 | LOC2-VIA-LOC1 |
| 10.0.60.0/24 | up | direct-b... | eth0 | 10.0.60.1 | 0 | - | boxnet |
| 127.0.3.0/24 | up | direct-k... | vpn20 | 127.0.3.1 | 0 | - | |
| 192.168.20.0/24 | up | direct-k... | vpnr20 | 192.168.20.3 | 0 | - | |
| 214.51.2.0/24 | up | direct-b... | eth2 | 214.51.2.35 | 0 | - | IPAD01 |
| **Table default, From all** | | | | | | | |
| 0.0.0.0/0 | up | gateway... | eth2 | 214.51.2.35 | 0 | 214.51.2.254 | ROUT01 |

## Monitoring

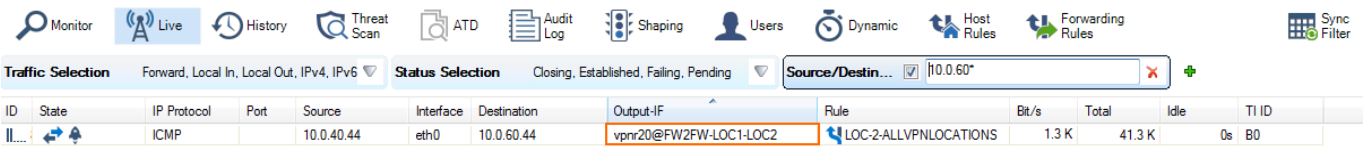
The VPN tunnels are now monitored like all other gateway routes. When a tunnel goes down, the VPNR interface IP address of the remote firewall is no longer reachable and the gateway route metric is automatically increased to 65556. Traffic will then use the backup route with the lower

metric to reach the destination through the other VPN tunnel. Go to **CONTROL > Network** to see the routing table.



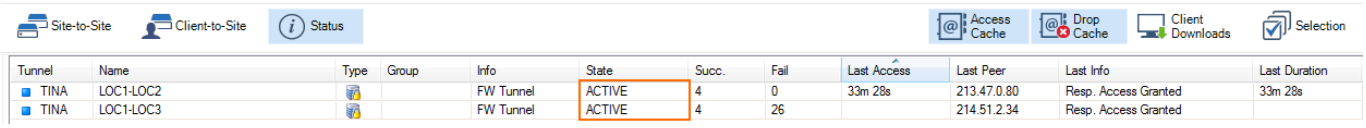

| Table / Src Filter | State | Type | Interface | Src IP | Pref | Gateway | Name |
|---|---|---|---|---|---|---|---|
| **Table vpn2mc, From 10.0.16.1** | | | | | | | |
| Table vpn2inet, From 10.0.16.1 | | | | | | | |
| Table vpnlocal, From all | | | | | | | |
| **Table main, From all** | | | | | | | |
| 10.0.40.0/24 | up | direct-adv | eth0 | 10.0.40.1 | 0 | - | boxnet |
| 10.21.0.0/24 | up | direct-b... | eth3 | 10.21.0.80 | 0 | - | MPLS |
| 127.0.3.0/24 | up | direct-k... | vpn20 | 127.0.3.1 | 0 | - | |
| 192.168.20.0/24 | up | direct-k... | vpnr20 | 192.168.20.1 | 0 | - | |
| 212.86.0.0/24 | up | direct-b... | eth1 | 212.86.0.81 | 0 | - | ISP1 |
| 80.130.45.0/24 | up | direct-b... | eth2 | 80.130.45.80 | 0 | - | ISP2 |
| 10.0.51.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 10 | 192.168.20.2 | LOC2 |
| 10.0.51.0/24 | dis | gateway... | vpnr20 | 192.168.20.1 | 65556 | 192.168.20.3 | LOC2-VIA-LOC3 |
| 10.0.60.0/24 | dis | gateway... | vpnr20 | 192.168.20.1 | 65546 | 192.168.20.3 | LOC3 |
| 10.0.60.0/24 | up | gateway... | vpnr20 | 192.168.20.1 | 20 | 192.168.20.2 | LOC3-VIA-LOC2 |
| **Table ISP1, From 212.86.0.0/24** | | | | | | | |
| **Table ISP2, From 80.130.45.0/24** | | | | | | | |
| **Table MPLS, From 10.21.0.0/24** | | | | | | | |
| **Table default, From all** | | | | | | | |
| 0.0.0.0/0 | up | gateway... | eth1 | 212.86.0.81 | 1 | 212.86.0.254 | ISP1a |

Go to **FIREWALL > Live** to see which VPN tunnel is used.




| ID | State | IP Protocol | Port | Source | Interface | Destination | Output-IF | Rule | Bit/s | Total | Idle | TI ID |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ICMP | | 10.0.40.44 | eth0 | 10.0.60.44 | vpnr20@FW2FW-LOC1-LOC2 | LOC-2-ALLVPNLOCATIONS | 1.3 K | 41.3 K | 0s | B0 |

Go to **VPN > Status** to see if the VPN tunnels are up.




| Tunnel | Name | Type | Group | Info | State | Succ. | Fail | Last Access | Last Peer | Last Info | Last Duration |
|---|---|---|---|---|---|---|---|---|---|---|---|
| TINA | LOC1-LOC2 | | | FW Tunnel | ACTIVE | 4 | 0 | 33m 28s | 213.47.0.80 | Resp. Access Granted | 33m 28s |
| TINA | LOC1-LOC3 | | | FW Tunnel | ACTIVE | 4 | 26 | | 214.51.2.34 | Resp. Access Granted | |

## Figures

1. vpn_routing.png
2. routed_VPN_01.png
3. routed_VPN_02.png
4. routed_VPN_03.png
5. routed_VPN_GTI_00.png
6. routed_VPN_GTI_01.png
7. routed_VPN_04.png
8. routed_VPN_05.png
9. routed_VPN_06.png
10. routed_VPN_07.png
11. routed_VPN_08.png
12. routed_VPN_09.png
13. routed_VPN_10.png