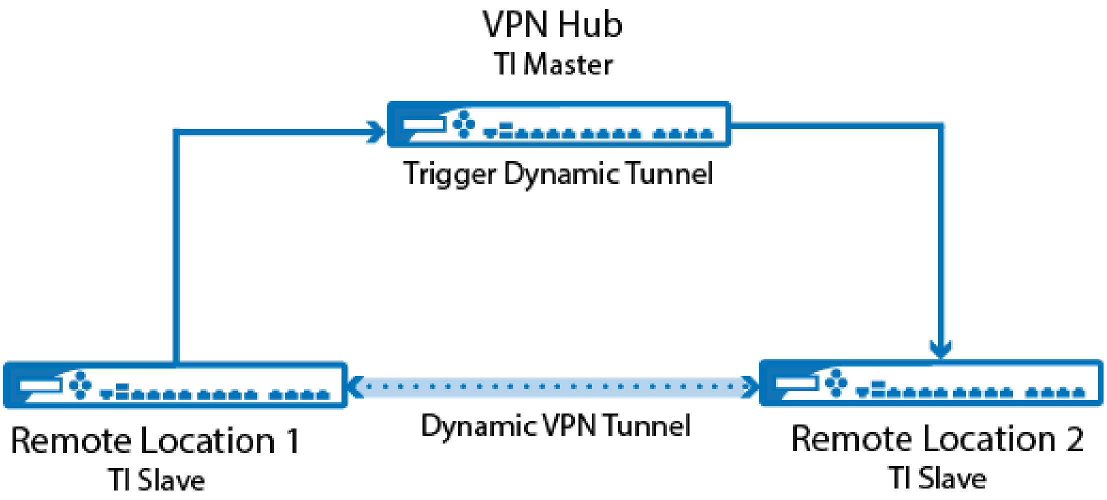
How to Configure Dynamic Mesh VPN

https://campus.barracuda.com/doc/53248647/

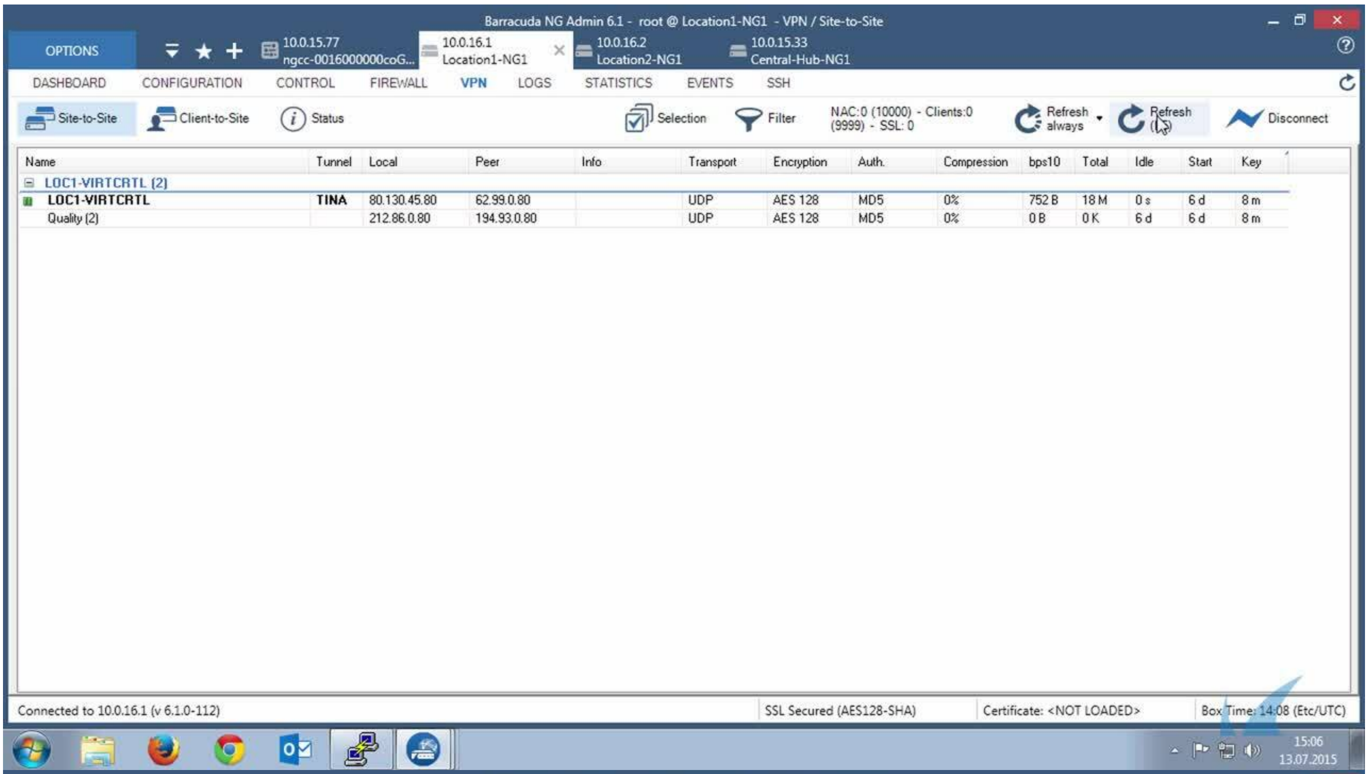
To configure a Dynamic Mesh for managed firewalls, see How to Configure a Dynamic Mesh VPN with the GTI Editor.

Create a Dynamic Mesh network for three or more stand-alone Barracuda NextGen F-Series Firewalls with the central firewall acting as the VPN hub. Every firewall in the VPN Network must be configured to use Dynamic Mesh, and the VPN Hub must be the TI master and use a dynamic-mesh-enabled connection object for the access rule matching the VPN relay traffic. Dynamic Mesh can only be used in combination with TINA Site-to-Site tunnels. IPv6 envelope for the VPN tunnels is not supported.



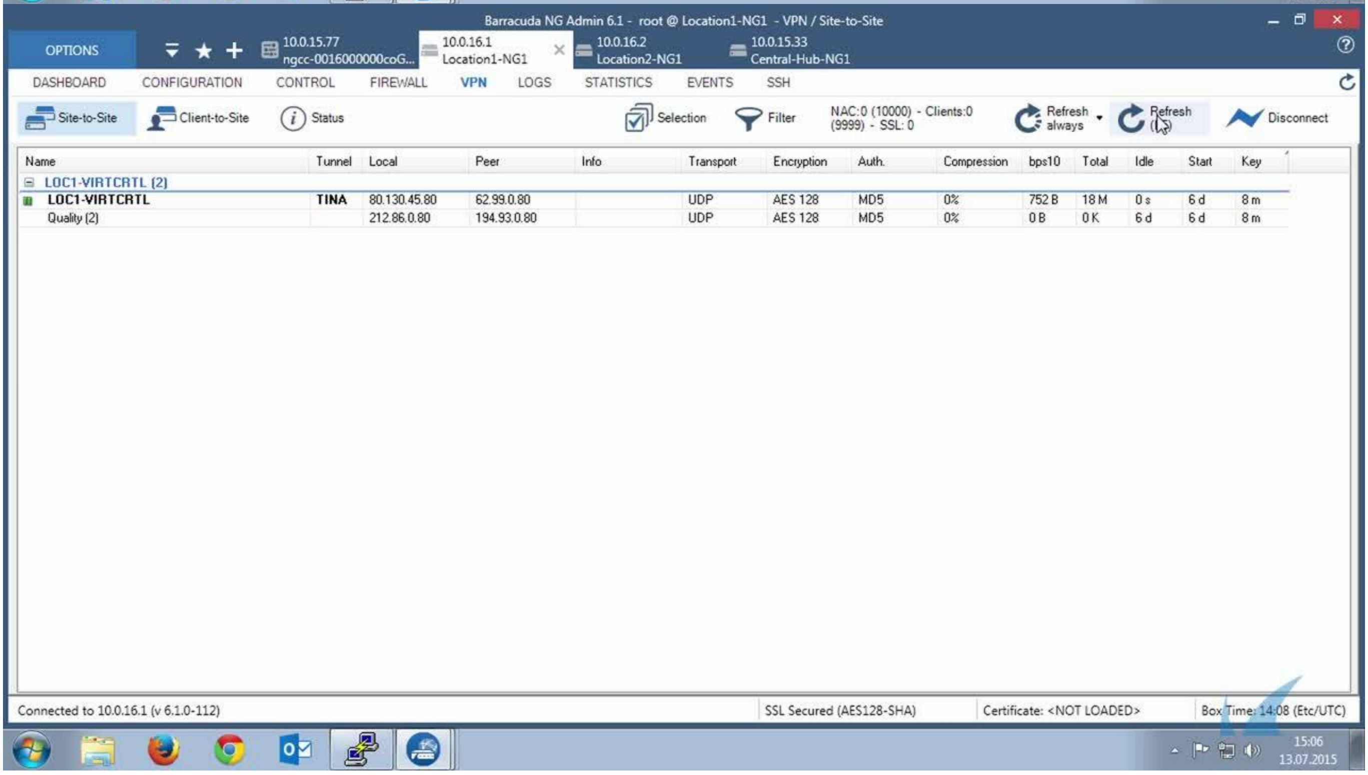
Video

Watch the following video to see a Dynamic Mesh VPN in action:



Name	Tunnel	Local	Peer	Info	Transport	Encryption	Auth.	Compression	bps10	Total	Idle	Start	Key
⊟ LOC1-VIRTCRTL (2)													
LOC1-VIRTCRTL	**TINA**	80.130.45.80	62.99.0.80		UDP	AES 128	MD5	0%	752 B	18 M	0 s	6 d	8 m
Quality (2)		212.86.0.80	194.93.0.80		UDP	AES 128	MD5	0%	0 B	0 K	6 d	6 d	8 m

Connected to 10.0.16.1 (v 6.1.0-112)
SSL Secured (AES128-SHA)
Certificate: <NOT LOADED>
Box Time: 14:08 (Etc/UTC)


Barracuda NG Admin 6.1 - root @ Location1-NG1 - VPN / Site-to-Site

Name	Tunnel	Local	Peer	Info	Transport	Encryption	Auth.	Compression	bps10	Total	Idle	Start	Key
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Connected to 10.0.16.1 (v 6.1.0-112)
SSL Secured (AES128-SHA)
Certificate: <NOT LOADED>
Box Time: 14:08 (Etc/UTC)

Videolink:

https://campus.barracuda.com/

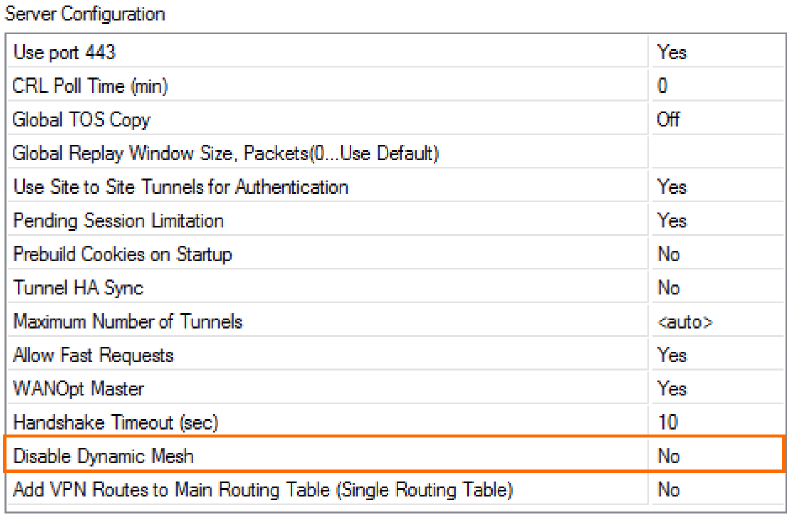
Before You Begin

- Create IPv4 TINA VPN tunnels between all firewalls. For more information, see How to Create a TINA VPN Tunnel between F-Series Firewalls.
- Create access rules for the VPN tunnels. For more information, see How to Create Access Rules for Site-to-Site VPN Access.
- Configure the NextGen Firewall F acting as a VPN hub to forward VPN traffic from one remote firewall to the others.

Step 1. Enable Dynamic Mesh

Repeat this step on every firewall in the Dynamic Mesh VPN network.

1. Open the **VPN Settings** page (**Configuration > Full Configuration > Box > Virtual Servers >** ***your virtual server*** **> Assigned Services > VPN**).
2. Click **Lock**.
3. Click **Click here for Server Settings**. The **Server Settings** window opens.
4. In the **Server Configuration** section, verify that **Disable Dynamic Mesh** is set to **No**.



Server Configuration

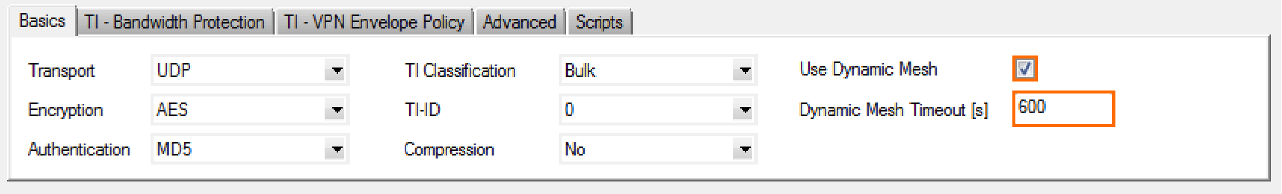
Use port 443	Yes
CRL Poll Time (min)	0
Global TOS Copy	Off
Global Replay Window Size, Packets(0...Use Default)	
Use Site to Site Tunnels for Authentication	Yes
Pending Session Limitation	Yes
Prebuild Cookies on Startup	No
Tunnel HA Sync	No
Maximum Number of Tunnels	<auto>
Allow Fast Requests	Yes
WANOpt Master	Yes
Handshake Timeout (sec)	10
Disable Dynamic Mesh	No
Add VPN Routes to Main Routing Table (Single Routing Table)	No

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

Step 2. Enable Dynamic Mesh for the VPN Tunnels

For each TINA tunnel, edit the TINA VPN tunnel configuration on the VPN hub and the remote firewalls to use Dynamic Mesh.

1. Open the **Site to Site** page (**Configuration > Configuration Tree > Box > Virtual Server > *your virtual server* > Assigned Services > VPN**).
2. Click **Lock**.
3. Double click the Site-to-Site TINA tunnel. The **TINA Tunnel** window opens.
4. Click on the **Advanced** tab.
5. Enable **Use Dynamic Mesh**.
6. (optional) Enter the **Dynamic Mesh Timeout (s)** in seconds. The timeout must be between 5 and 600 seconds.



Transport UDP
Encryption AES
Authentication MD5
TI Classification Bulk
TI-ID 0
Compression No
Use Dynamic Mesh ☑
Dynamic Mesh Timeout [s] 600

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

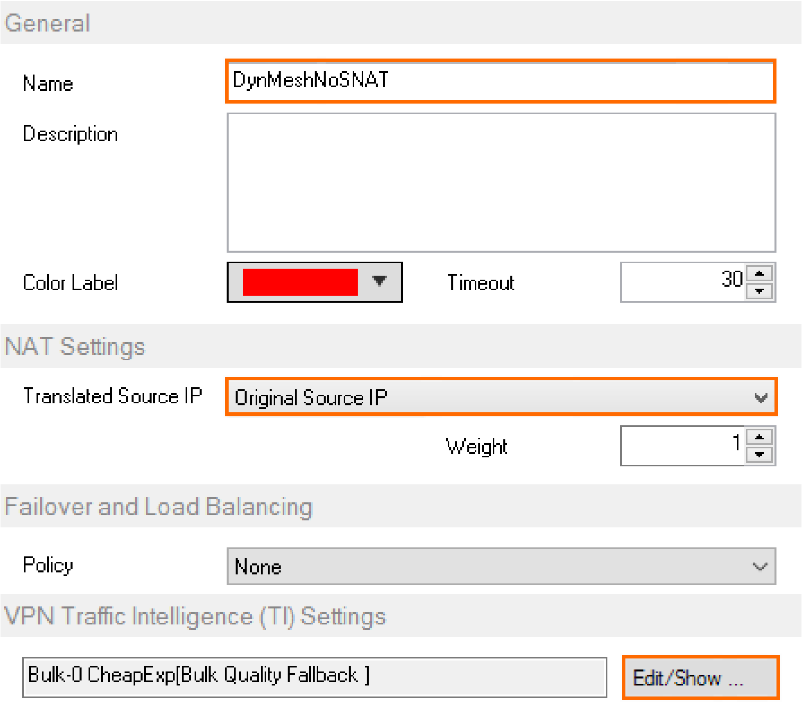
Step 3. Create Three Custom Connection Objects on the VPN Hub

You must create three custom connection objects on the VPN Hub: one that triggers a dynamic tunnel and resets the tunnel timeout, one for traffic going through the dynamic tunnel while not resetting the tunnel timeout, and one for the traffic that should always be relayed through the VPN hub.

Step 3.1 Dynamic Mesh Connection Object TI Master with Idle Timeout Reset

Only connections matching an access rule with the dynamic mesh and TI master options enabled in the TI settings of the custom connection object on the VPN hub will trigger a new dynamic VPN tunnel. All other traffic will continue to go through the VPN hub. The connection objects on the remote units (TI slaves) do not need to be enabled because they are learned automatically from the VPN hub acting as the TI master. For traffic matching access rules using this connection object to keep the dynamic tunnel open, **Prevent tunnel timeout** must be enabled.

1. Go to ***your virtual server* > Assigned Services > Firewall > Forwarding Rules**.
2. In the left menu, click **Connections**.
3. Right-click in the **Connections** and click **New > Connection**.
4. Enter a **Name**. E.g., `DynMeshNoSNAT`
5. Select **Original Source IP**.
6. In the **VPN Traffic Intelligence (TI)Settings** section, click **Edit/Show**. The **TI Settings** window opens.



General

Name: DynMeshNoSNAT

Description:

Color Label: 🟥

Timeout: 30

NAT Settings

Translated Source IP: Original Source IP

Weight: 1

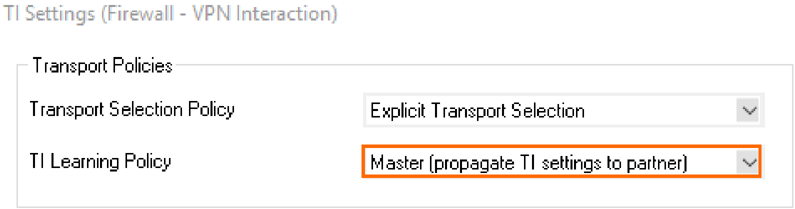
Failover and Load Balancing

Policy: None

VPN Traffic Intelligence (TI) Settings

Bulk-0 CheapExp[Bulk Quality Fallback]

7. Set the **TI Learning Policy** to **Master (propagate TI settings to partner)**.



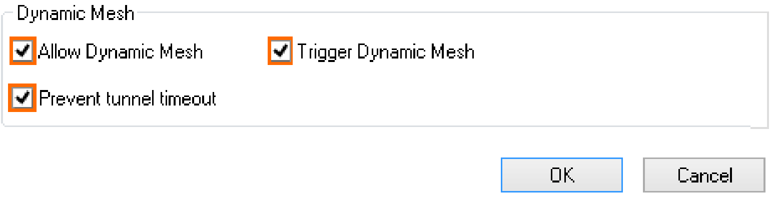
TI Settings (Firewall - VPN Interaction)

Transport Policies

Transport Selection Policy: Explicit Transport Selection

TI Learning Policy: Master (propagate TI settings to partner)

8. In the **Dynamic Mesh** section, enable **Allow Dynamic Mesh** and **Trigger Dynamic Mesh**.
9. Enable **Prevent tunnel timeout**.



Dynamic Mesh

☑ Allow Dynamic Mesh ☑ Trigger Dynamic Mesh

☑ Prevent tunnel timeout

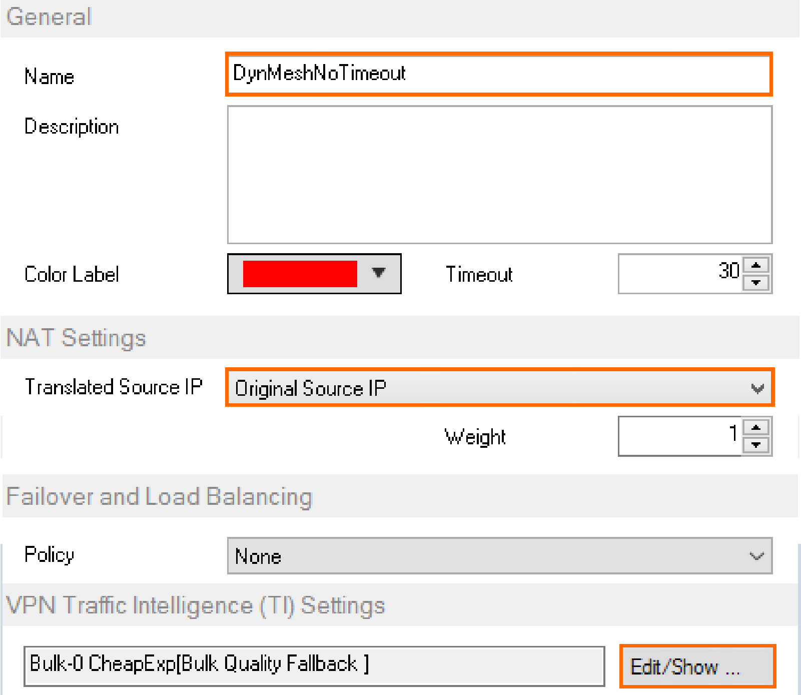
10. Click **OK**.
11. Click **OK**.
12. Click **Send Changes** and **Activate**.

Step 3.2 Dynamic Mesh Connection Object TI Master with no Idle Timeout Reset

Only connections matching an access rule with the dynamic mesh and TI master options enabled in the TI settings of the custom connection object on the VPN hub will trigger a new dynamic VPN tunnel. All other traffic will continue to go through the VPN hub. The connection objects on the remote units (TI slaves) do not need to be enabled because they are learned automatically from the VPN hub acting as the TI master.

1. Go to ***your virtual server*** **> Assigned Services > Firewall > Forwarding Rules**.

2. In the left menu, click **Connections**.
3. Right-click in the **Connections** and click **New > Connection**.
4. Enter a **Name**. E.g., `DynMeshNoTimeout`
5. Select **Original Source IP**.
6. In the **VPN Traffic Intelligence (TI)Settings** section, click **Edit/Show**. The **TI Settings** window opens.



General

Name: DynMeshNoTimeout

Description:

Color Label: 🟥

Timeout: 30

NAT Settings

Translated Source IP: Original Source IP

Weight: 1

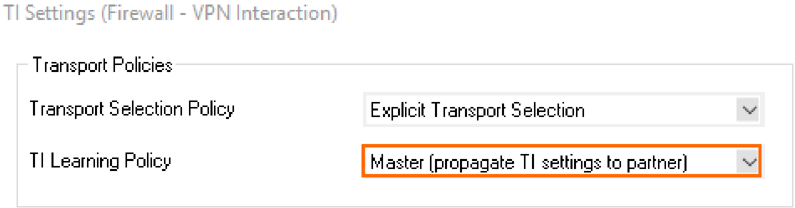
Failover and Load Balancing

Policy: None

VPN Traffic Intelligence (TI) Settings

Bulk-0 CheapExp[Bulk Quality Fallback]

7. Set the **TI Learning Policy** to **Master (propagate TI settings to partner)**.



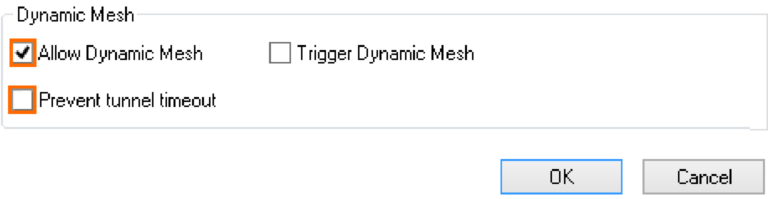
TI Settings (Firewall - VPN Interaction)

Transport Policies

Transport Selection Policy: Explicit Transport Selection

TI Learning Policy: Master (propagate TI settings to partner)

8. In the **Dynamic Mesh** section, enable **Allow Dynamic Mesh**.
9. Disable **Prevent tunnel timeout**.



Dynamic Mesh

☑ Allow Dynamic Mesh ☐ Trigger Dynamic Mesh

☐ Prevent tunnel timeout

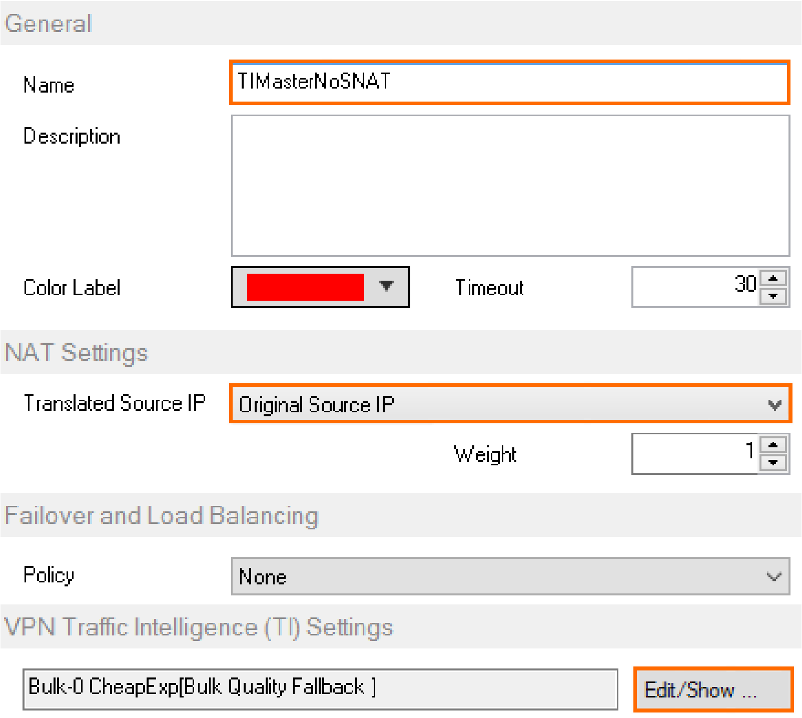
10. Click **OK**.
11. Click **OK**.
12. Click **Send Changes** and **Activate**.

Step 3.3. Create a TI Master Connection Object for the VPN Hub

For all services that should not go through the VPN tunnel, use a custom connection object with the **TI**

Learning Policy set to **Master**. Traffic matching an access rule that uses this connection object will not trigger a dynamic tunnel. Instead, it continues to go through the VPN hub.

1. Go to ***your virtual server*** **> Assigned Services > Firewall > Forwarding Rules**.
2. In the left menu, click **Connections**.
3. Right-click in the **Connections** and click **New > Connection**.
4. Enter a **Name**. E.g., `TIMasterNoSNAT`
5. Select **Original Source IP**.
6. In the **VPN Traffic Intelligence (TI)Settings** section, click **Edit/Show.** The **TI Settings** window opens.



General

Name: TIMasterNoSNAT

Description:

Color Label: 🟥

Timeout: 30

NAT Settings

Translated Source IP: Original Source IP

Weight: 1

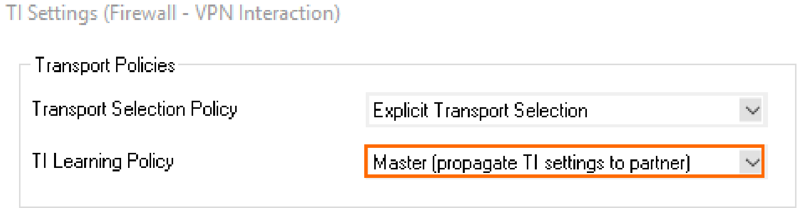
Failover and Load Balancing

Policy: None

VPN Traffic Intelligence (TI) Settings

Bulk-0 CheapExp[Bulk Quality Fallback]

7. Set the **TI Learning Policy** to **Master (propagate TI settings to partner)**.



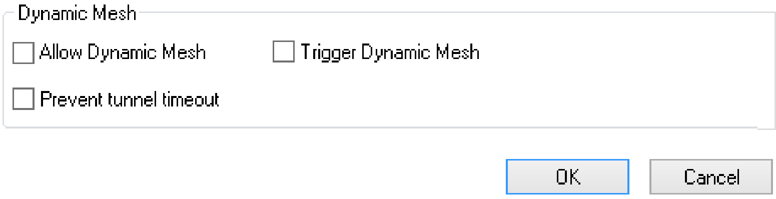
TI Settings (Firewall - VPN Interaction)

Transport Policies

Transport Selection Policy: Explicit Transport Selection

TI Learning Policy: Master (propagate TI settings to partner)

8. Verify all checkboxes in the **Dynamic Mesh** section are disabled.



Dynamic Mesh

☐ Allow Dynamic Mesh ☐ Trigger Dynamic Mesh

☐ Prevent tunnel timeout

9. Click **OK**.
10. Click **OK**.
11. Click **Send Changes** and **Activate**.

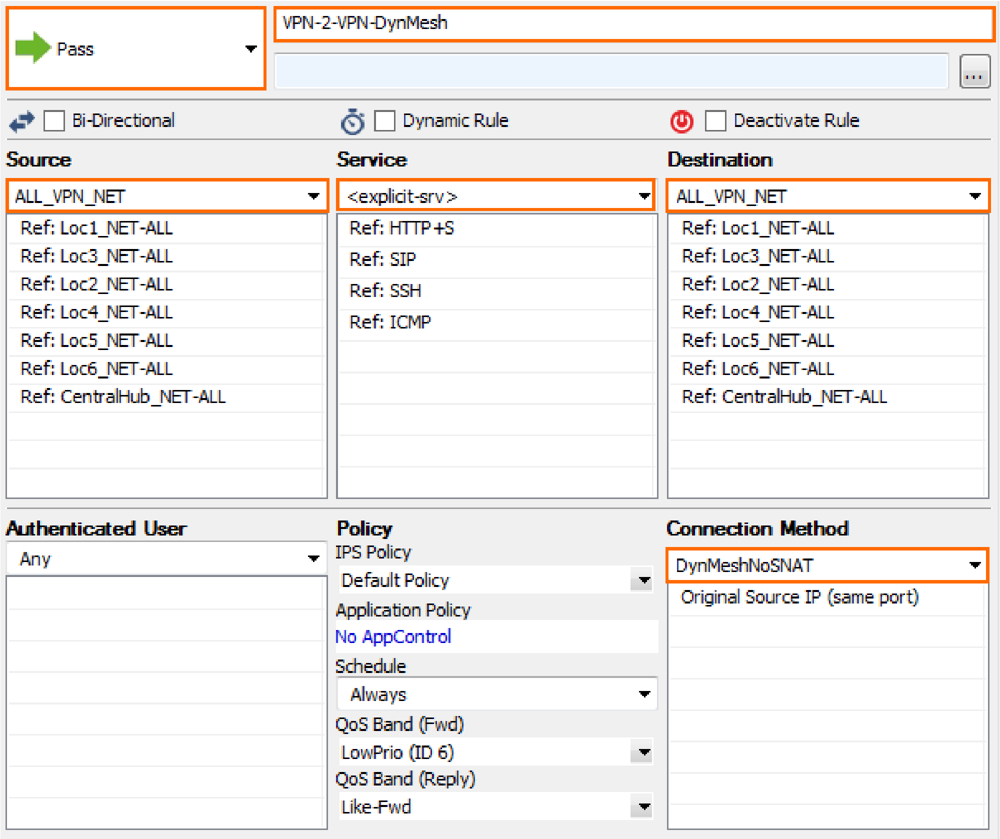
Step 4. Create Three Access Rules on the VPN Hub

Create an access rule that triggers the dynamic tunnel and another that relays the rest of the traffic.

Step 4.1. Create an Access Rule on the VPN Hub to Trigger a Dynamic Tunnel

Create an access rule on the VPN hub that will trigger a dynamic tunnel.

- **Action** – Select **PASS**.
- **Source** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Service** – Select the services that should trigger a dynamic tunnel.
- **Destination** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Connection Method** – Select the **DynMeshNoSNAT** custom connection object created in step 3.1.



Pass
VPN-2-VPN-DynMesh

☐ Bi-Directional ☐ Dynamic Rule ☐ Deactivate Rule

Source
ALL_VPN_NET
Ref: Loc1_NET-ALL
Ref: Loc3_NET-ALL
Ref: Loc2_NET-ALL
Ref: Loc4_NET-ALL
Ref: Loc5_NET-ALL
Ref: Loc6_NET-ALL
Ref: CentralHub_NET-ALL

Service
<explicit-srv>
Ref: HTTP+S
Ref: SIP
Ref: SSH
Ref: ICMP

Destination
ALL_VPN_NET
Ref: Loc1_NET-ALL
Ref: Loc3_NET-ALL
Ref: Loc2_NET-ALL
Ref: Loc4_NET-ALL
Ref: Loc5_NET-ALL
Ref: Loc6_NET-ALL
Ref: CentralHub_NET-ALL

Authenticated User
Any

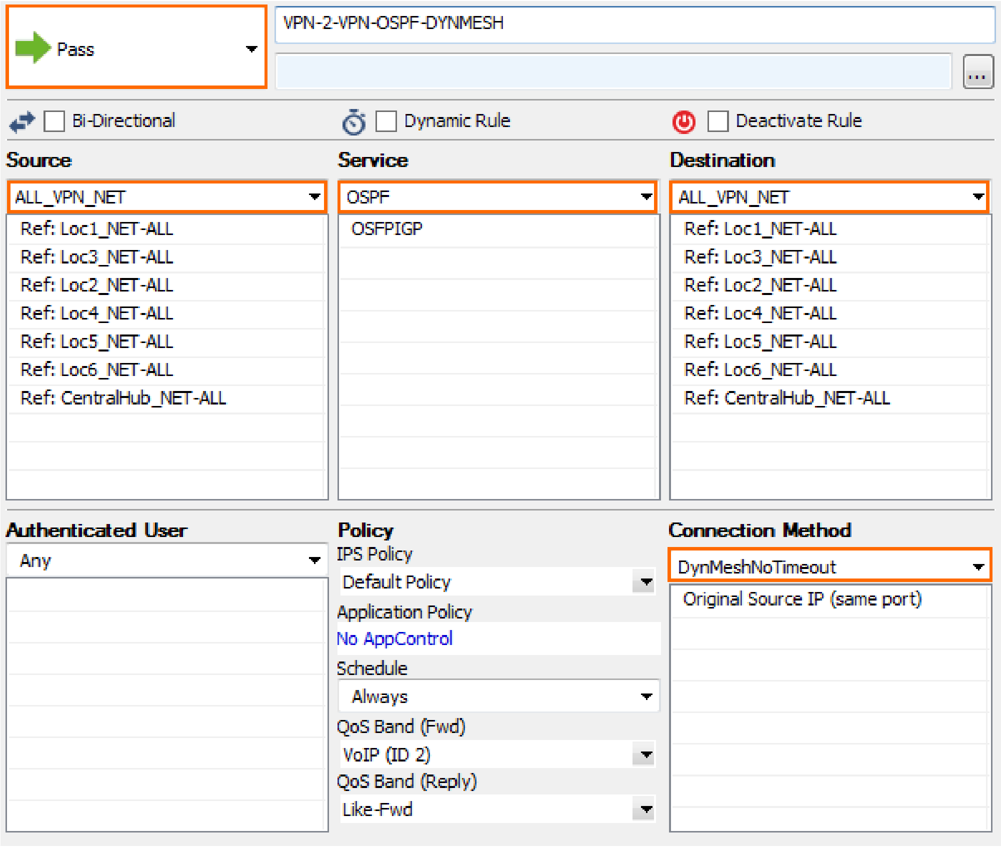
Policy
IPS Policy: Default Policy
Application Policy: No AppControl
Schedule: Always
QoS Band (Fwd): LowPrio (ID 6)
QoS Band (Reply): Like-Fwd

Connection Method
DynMeshNoSNAT
Original Source IP (same port)

Step 4.2. Create an Access Rule on the VPN Hub to Trigger a Dynamic Tunnel without Resetting the Idle Timeout of the Dynamic Tunnel

Create an access rule on the VPN hub that will trigger a dynamic tunnel.

- **Action** – Select **PASS**.
- **Source** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Service** – Select the services that should go through the dynamic tunnel if it is up, otherwise go through the VPN Hub.
- **Destination** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Connection Method** – Select the **DynMeshNoTimeout** custom connection object created in Step 3.2.



Pass

VPN-2-VPN-OSPF-DYNMESH

☐ Bi-Directional ☐ Dynamic Rule ☐ Deactivate Rule

Source	Service	Destination
ALL_VPN_NET	OSPF	ALL_VPN_NET
Ref: Loc1_NET-ALL	OSFPIGP	Ref: Loc1_NET-ALL
Ref: Loc3_NET-ALL		Ref: Loc3_NET-ALL
Ref: Loc2_NET-ALL		Ref: Loc2_NET-ALL
Ref: Loc4_NET-ALL		Ref: Loc4_NET-ALL
Ref: Loc5_NET-ALL		Ref: Loc5_NET-ALL
Ref: Loc6_NET-ALL		Ref: Loc6_NET-ALL
Ref: CentralHub_NET-ALL		Ref: CentralHub_NET-ALL

Authenticated User: Any

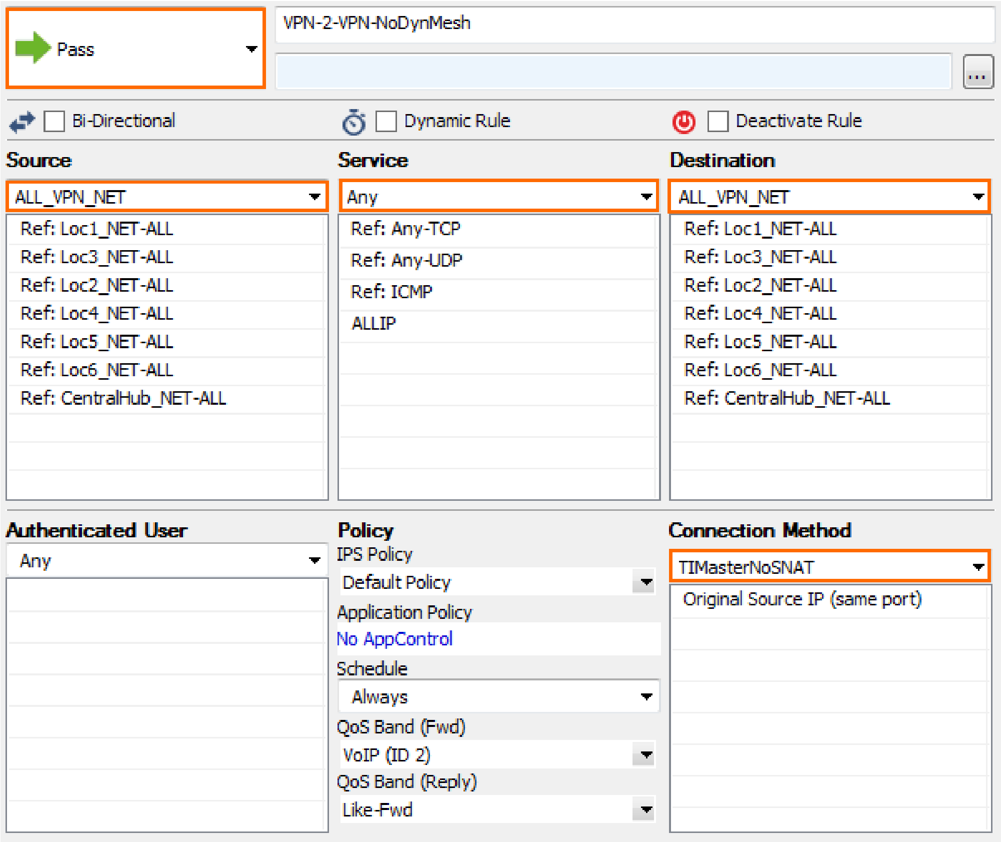
Policy
IPS Policy: Default Policy
Application Policy: No AppControl
Schedule: Always
QoS Band (Fwd): VoIP (ID 2)
QoS Band (Reply): Like-Fwd

Connection Method: DynMeshNoTimeout
Original Source IP (same port)

Step 4.3. VPN Relaying without Triggering a Dynamic Tunnel

Create an access rule on the VPN hub that allows the remote firewalls to send traffic to other remote firewalls through the VPN hub. Place this access rule below the rule triggering the dynamic tunnels.

- **Action** – Select **PASS**.
- **Source** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Service** – Select **Any**.
- **Destination** – Enter all **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Connection Method** – Select the **TIMasterNoSNAT** custom connection object created in Step 3.3.



Pass

VPN-2-VPN-NoDynMesh

☐ Bi-Directional ☐ Dynamic Rule ☐ Deactivate Rule

Source

ALL_VPN_NET

Ref: Loc1_NET-ALL
Ref: Loc3_NET-ALL
Ref: Loc2_NET-ALL
Ref: Loc4_NET-ALL
Ref: Loc5_NET-ALL
Ref: Loc6_NET-ALL
Ref: CentralHub_NET-ALL

Service

Any

Ref: Any-TCP
Ref: Any-UDP
Ref: ICMP
ALLIP

Destination

ALL_VPN_NET

Ref: Loc1_NET-ALL
Ref: Loc3_NET-ALL
Ref: Loc2_NET-ALL
Ref: Loc4_NET-ALL
Ref: Loc5_NET-ALL
Ref: Loc6_NET-ALL
Ref: CentralHub_NET-ALL

Authenticated User

Any

Policy

IPS Policy: Default Policy
Application Policy: No AppControl
Schedule: Always
QoS Band (Fwd): VoIP (ID 2)
QoS Band (Reply): Like-Fwd

Connection Method

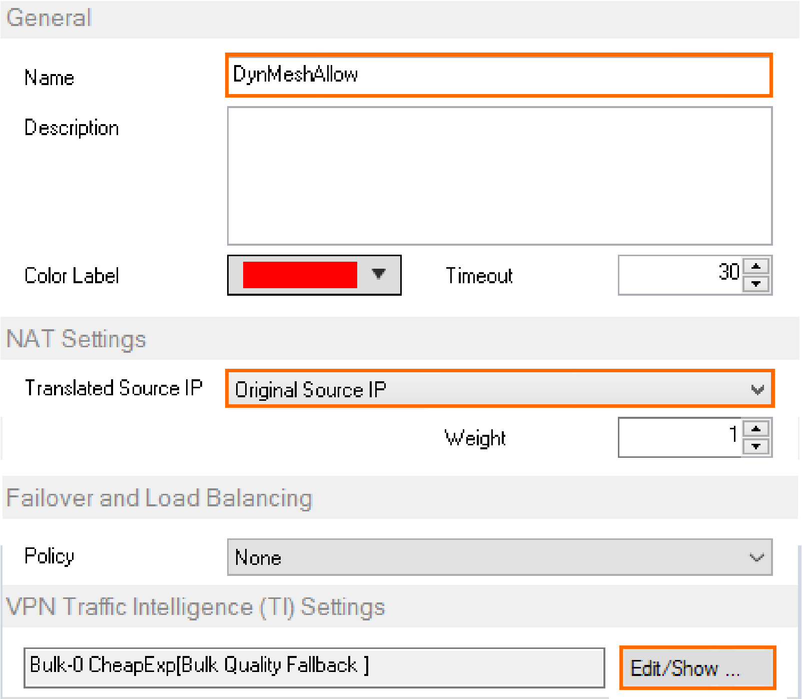
TIMasterNoSNAT

Original Source IP (same port)

Step 5. Create Custom Connection Objects on the Remote Firewalls

On every remote firewall in the Dynamic Mesh VPN network, create a TI Slave connection object to allow dynamic mesh.

1. Go to ***your virtual server*** **> Assigned Services > Firewall > Forwarding Rules**.
2. In the left menu, click **Connections**.
3. Right-click in the **Connections** and click **New > Connection**.
4. Enter a **Name**. E.g., `DynMeshAllow`
5. Select **Original Source IP**.
6. In the **VPN Traffic Intelligence (TI)Settings** section, click **Edit/Show**. The **TI Settings** window opens.



General

Name: DynMeshAllow

Description:

Color Label: 🟥 ▼

Timeout: 30

NAT Settings

Translated Source IP: Original Source IP

Weight: 1

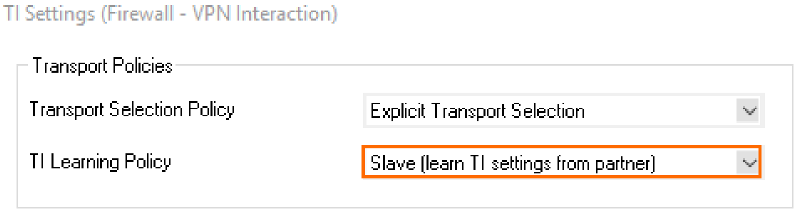
Failover and Load Balancing

Policy: None

VPN Traffic Intelligence (TI) Settings

Bulk-0 CheapExp[Bulk Quality Fallback]

7. Set the **TI Learning Policy** to **Slave (learn TI settings from partner)**.



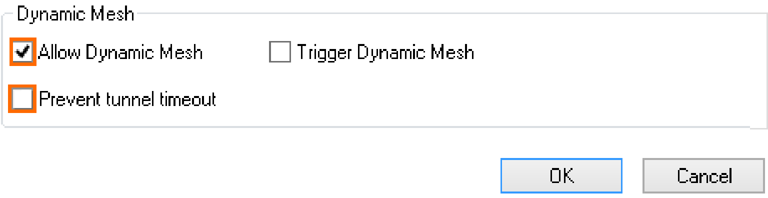
TI Settings (Firewall - VPN Interaction)

Transport Policies

Transport Selection Policy: Explicit Transport Selection

TI Learning Policy: Slave (learn TI settings from partner)

8. In the **Dynamic Mesh** section, enable **Allow Dynamic Mesh**.



Dynamic Mesh

☑ Allow Dynamic Mesh ☐ Trigger Dynamic Mesh

☐ Prevent tunnel timeout

9. Click **OK**.
10. Click **OK**.
11. Click **Send Changes** and **Activate**.

Step 6. Modify the VPN Access Rule on the Remote Firewalls

On every remote firewall, create or modify the access rule that allows traffic through the dynamic tunnel. Apply the connection object to allow dynamic mesh.

- **Action** – Select **PASS**.
- **Bi-Directional** – Select the check box to apply the rule in both directions.
- **Source** – Enter all local networks used for the VPN tunnel.

- **Service** – Select the services that should go through the dynamic tunnel if it is up, otherwise go through the VPN hub.
- **Destination** – Enter the **Local Networks** for all remote firewalls and the **Local Networks** for the VPN hub.
- **Connection Method** – Select the **DynMeshAllow** custom connection object created in Step 5.

You now have a dynamic mesh VPN network that automatically creates dynamic VPN tunnels when traffic matches an access rule using a dynamic-mesh-enabled connection object. Go to **VPN > Site-to-Site** to see all dynamic tunnels on the remote firewalls or on the VPN hub. Dynamic tunnels are terminated automatically after no traffic has passed through them for the **Dynamic Mesh Timeout** defined in the **Site-to-Site** configuration for each tunnel.

Figures