Configure Flow Mirroring

For supported software information, click here.

Versa Operating System™ (VOS™) devices support Layer 3 flow mirroring for lawful interception, security forensics, and enhanced data analytics. A VOS device mirrors the packets based on a match criteria, and then it sends the filtered packets to a packet collection device over a physical virtual network interface (vni) or a tunnel virtual interface (tvi). Flow mirroring can mirror any packets, including egress packets (packets sent by the VOS device), ingress packets (packets received by the VOS device), and packets that are transiting the VOS device. You can use the VOS web interface to enable host-bound services for ingress and egress packets.

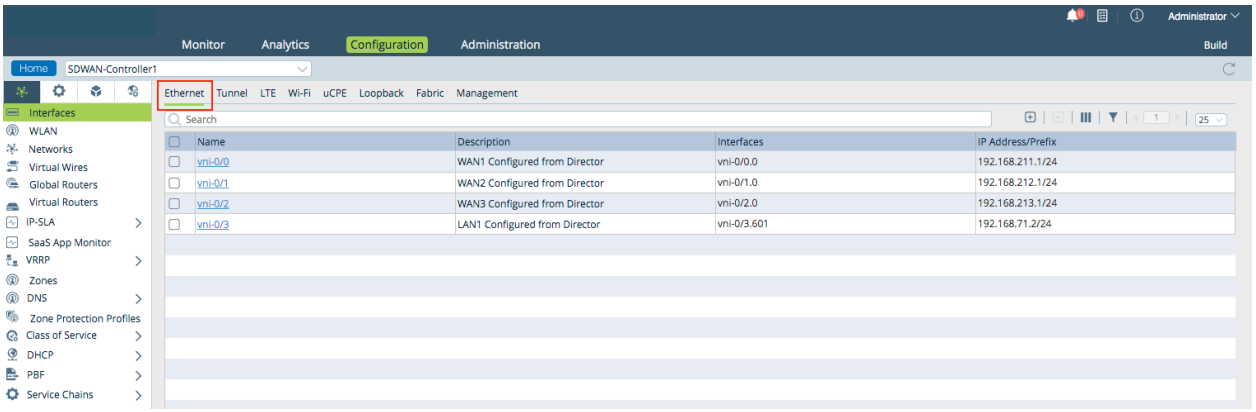
You can configure flow mirroring on an Ethernet interface or on a GRE or an IPsec tunnel.

If the mirror interface is an Ethernet interface, the source and destination MAC addresses in the Layer 2 header are set to the interface's MAC address. To support mirroring of packets that must match certain application or URL categories, packets are replicated and then retained until the application is identified or the URL category is determined.

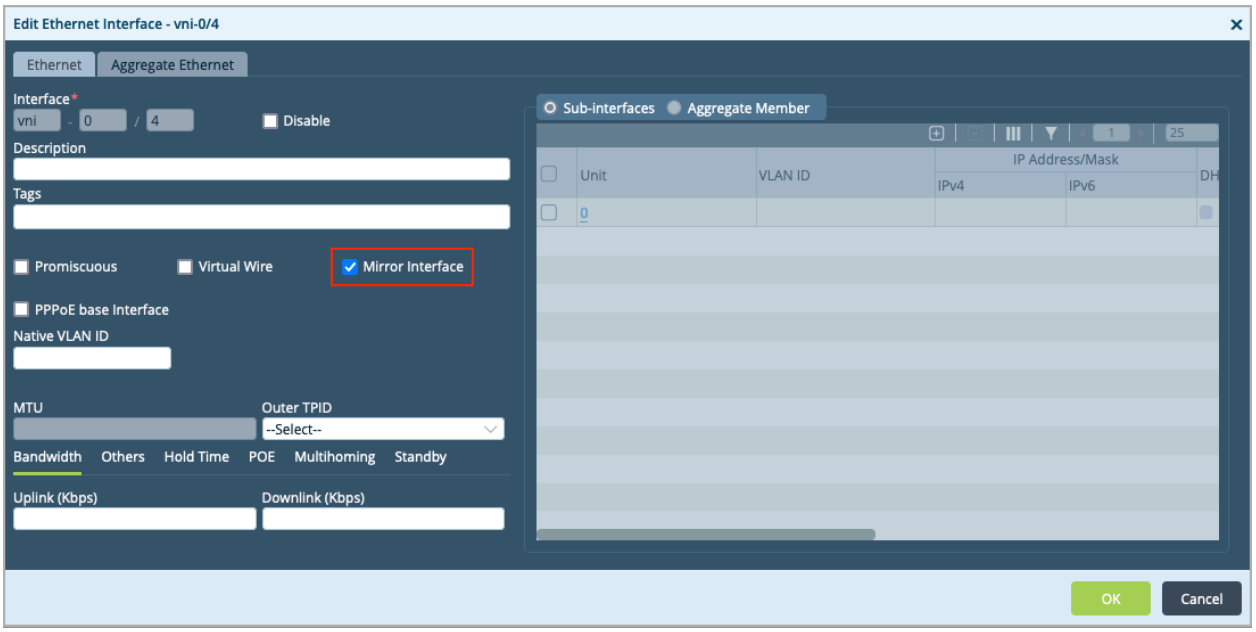
Note that packet mirroring cannot determine the IP address for ingress NATed packets.

Configure Flow Mirroring on an Ethernet Interface

1. In Director view:
    a. Select the Administration tab in the top menu bar.
    b. Select Appliances in the left menu bar.
    c. Select an appliance in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > Interfaces in the left menu bar.
4. Select the Ethernet tab in the horizontal menu bar.

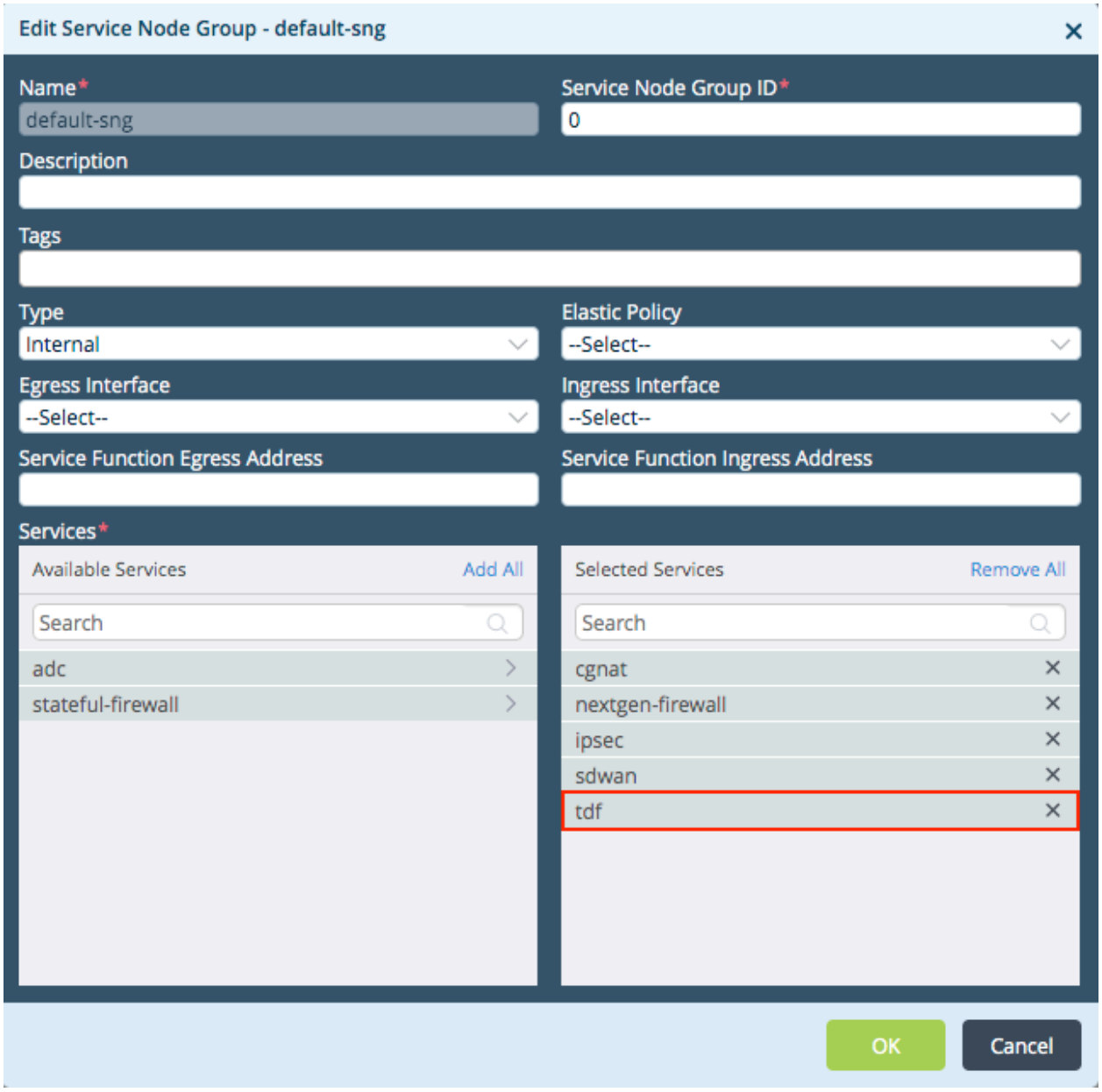


5. Click the Add icon to create a new Ethernet interface for flow mirroring, or select an interface in the main pane to edit an existing Ethernet interface. The Add/Edit Ethernet Interface popup window displays.
6. Select the Ethernet tab.
7. Click Mirror Interface to enable flow mirroring on the Ethernet interface. Note that when you configure an Ethernet interface as a mirror interface, the MTU, Subinterfaces, and Aggregate Member fields are grayed out, and you cannot configure values for these fields. For information configuring other Ethernet interface properties, see Configure Interfaces.



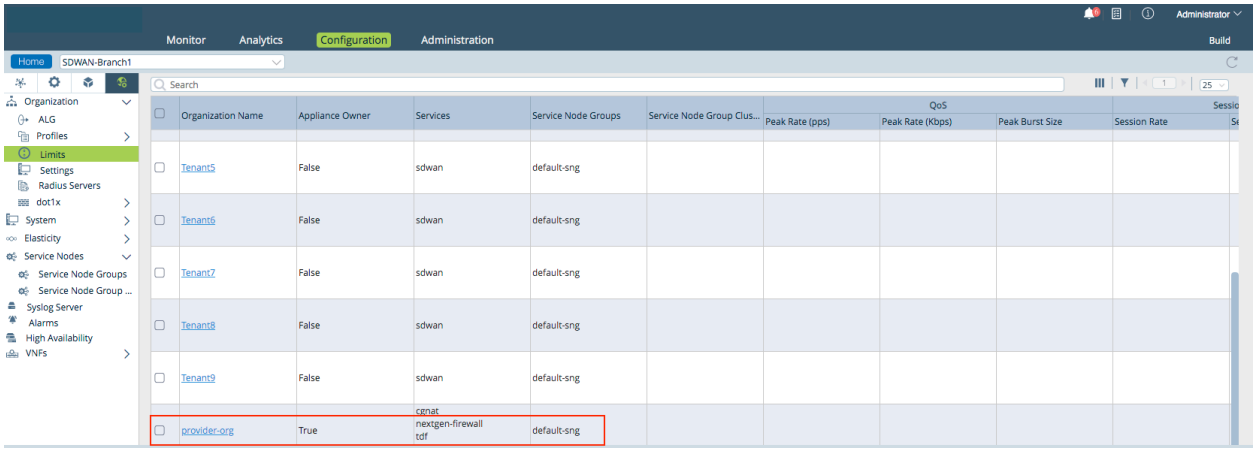
8. Click OK.
9. Select Others > Service Nodes > Service Node Groups in the left menu bar.
10. In the main pane, select default-sng, for the default service node group. The Edit Service Node Group popup window displays.
11. In the Services group of fields, click TDF (for traffic detection function) in the Available Services table to move it to

the Selected Services table.

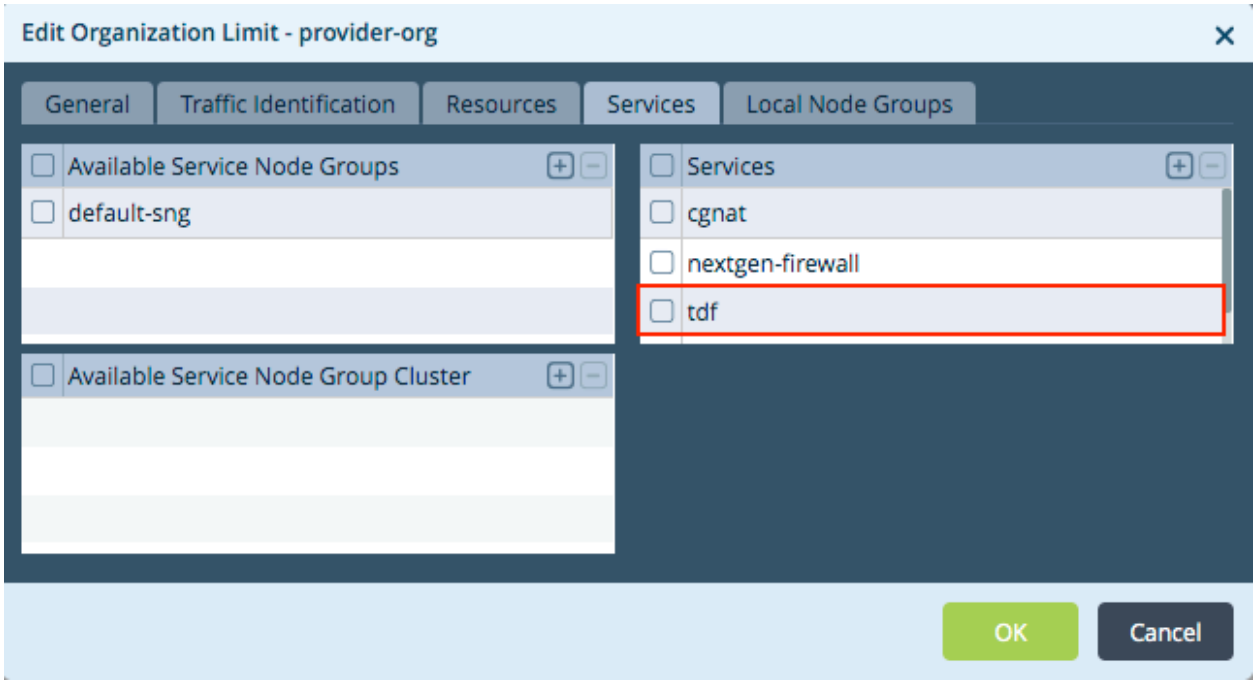


12. Click OK.

13. Select Others > Organization > Limits in the left menu bar.



14. Select an organization in the main pane. You must select an organization whose Appliance Owner field status is True. The Edit Organization Limit popup window displays.

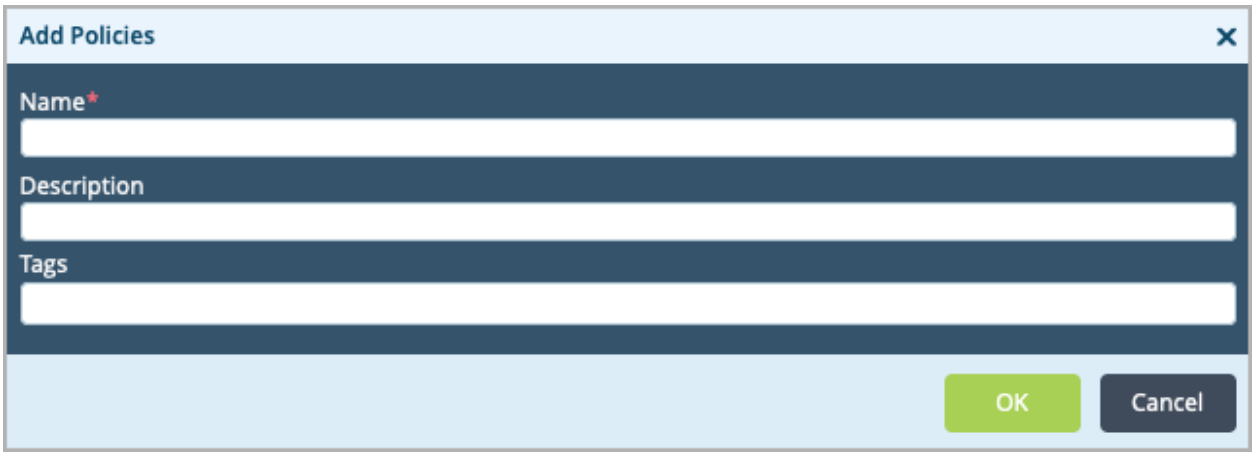


15. Select the Services tab.

16. In the Services field, click the Add icon and add the TDF service.
17. Click OK.

18. Select Services > TDF > Traffic Mirroring Policy in the left menu bar.

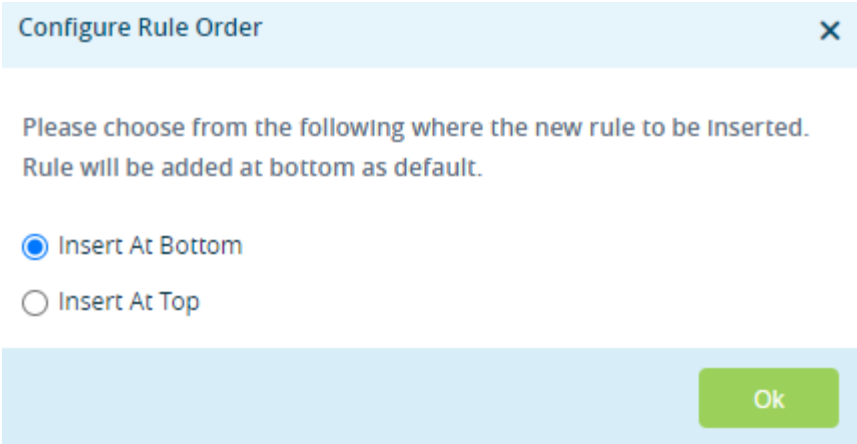
19. Select the Policies tab in the horizontal menu bar, and then click the Add icon. The Add Policies popup window displays. Enter information for the following fields.



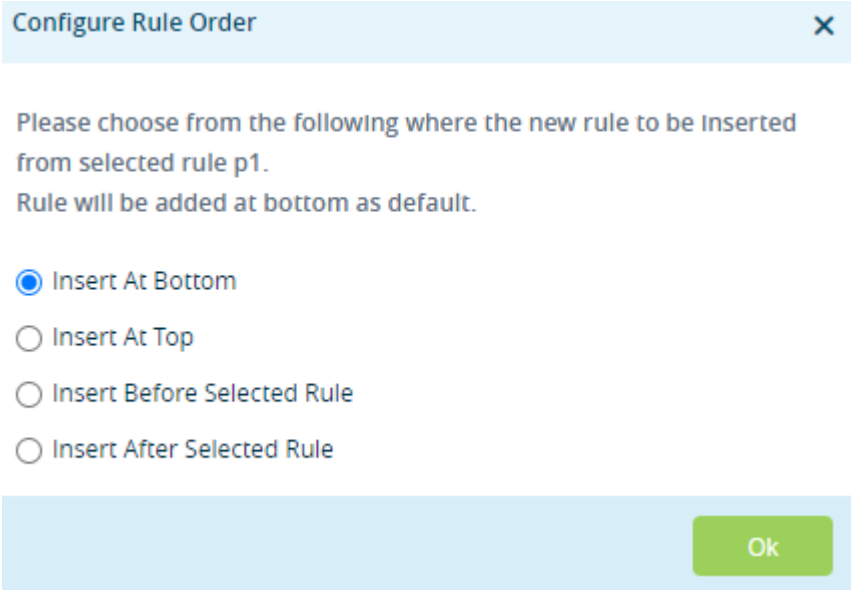
Field	Description
Name (Mandatory)	Enter the name of the traffic-mirroring policy. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the policy. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the policy. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

20. Click OK.

21. Select the Rules tab in the horizontal menu bar, and then click the Add icon. The Add Rules popup window displays.
22. (For Releases 21.2.1 and later.) If you have already added one or more rules, the Configure Rule Order popup window displays.
    a. Select where you want to insert the policy rule, either at the beginning or end of the existing rules.



b. If you select a rule and then click the Add icon, the Configure Rule Order popup window displays the following options:



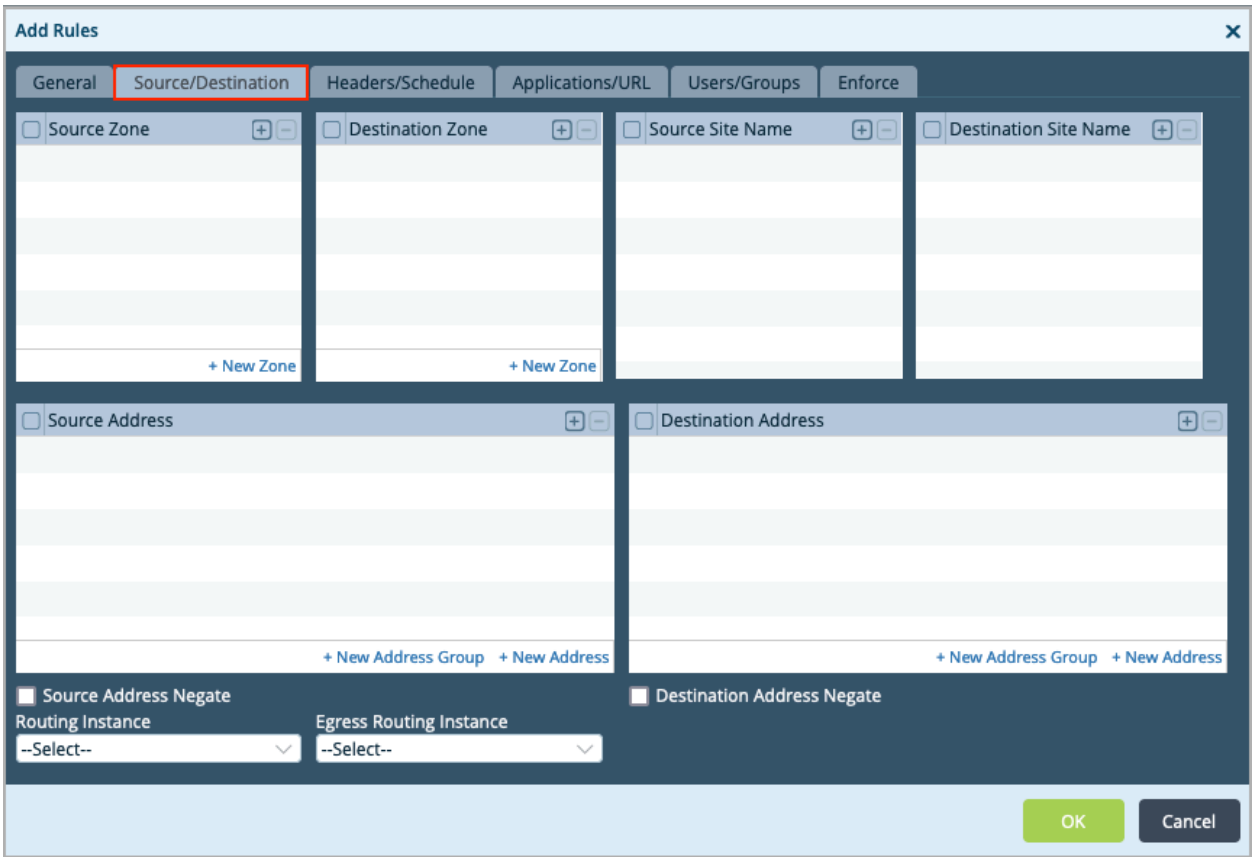
c. Select the order to insert the rule (at the beginning or end bottom of the existing rules, or before or after the selected rule).

d. Click OK. The Add Rule popup window displays.

23. Select the General tab, and enter information for the following fields.

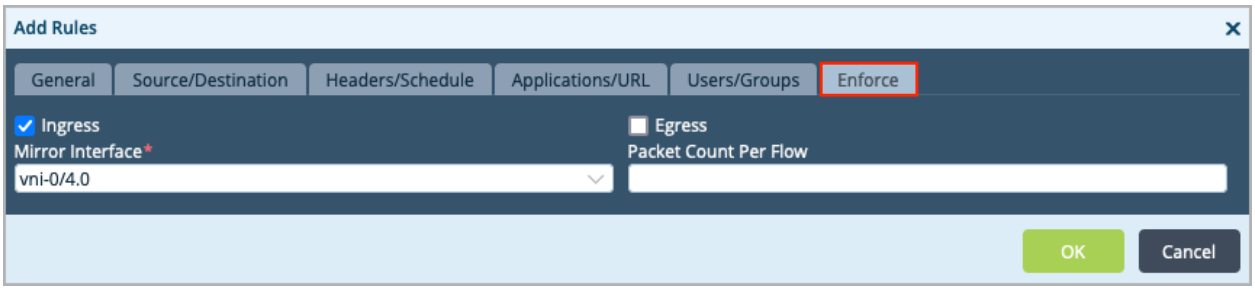
Field	Description
Name (Required)	Enter the name of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the rule. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

22. Select the Source/Destination tab, and enter information for the following fields.



Field	Description
Source Zone	Source zones to which to apply the rule. The rule applies to traffic received from any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Destination Zone	Destination zones to which to apply the rule. The rule applies to traffic sent to any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Source Site Name	Source sites to which to apply the rule. Click the Add icon to add sites.
Destination Site Name	Destination sites to which to apply the rule. Click the Add icon to add sites.
Source Address	Source addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Source Address Negate	Select to apply the rule to any source addresses except the ones in the Source Address field.
Destination Address	Destination addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Destination Address Negate	Select to apply the rule to any destination addresses except the ones in the Destination Address field.
Routing Instance	Select the ingress routing instance to which to apply the rule.
Egress Routing Instance	Select the egress routing instance to which to apply the rule.

23. Click OK.
24. Select the Enforce tab, and enter information for the following fields.



Field	Description
Ingress	Click to mirror ingress traffic on the VOS device. *Default:* Disabled
Egress	Click to mirror the egress traffic on the VOS device. *Default:* Disabled
Mirror Interface	Select the interface on which to mirror the traffic.
Packet Count Per Flow	Enter the number of packets per flow to be mirrored. *Range:* 0 through 4294967295 *Default:* None

25. Select the Headers/Schedule, Applications/URL, and Users/Groups tabs and configure any necessary information.
26. Click OK.

Configure Flow Mirroring on an Ethernet Interface Using the CLI

1. Create a qualifier interface, which acts as a mirror interface. This interface can be a vni, an IPsec, or a GRE interface.

```
admin@Branch1-cli(config)% set interfaces vni-0/4 unit 0 enable true
admin@Branch1-cli(config)% set interfaces vni-0/4 mirror-interface
```

Note: You cannot configure an IP address for this interface, and you cannot assign this interface to any organization or routing interface.

2. Enable the traffic-mirroring service on the VOS device and add the TDF service in an available service node group. Doing this introduces flow mirroring as a new service in the TDF service set.

```
admin@Branch1-cli(config)% set service-node-groups default-sng services tdf
```

3. Configure a traffic-monitoring policy rule in the organizational services:

> admin@Branch5-cli(config)% **set orgs org-services example-org-name1 traffic-mirroring policies** *policy-name* **rules** *rule-name*

4. Create a policy match criteria for the packets to mirror on the mirror interface:

> admin@Branch5-cli(config)% **set orgs org-services example-org-name1 traffic-mirroring policies example-policy1 rules example-rule1 match**

5. Create a policy action criteria to define the action to take when packets match the match criteria:

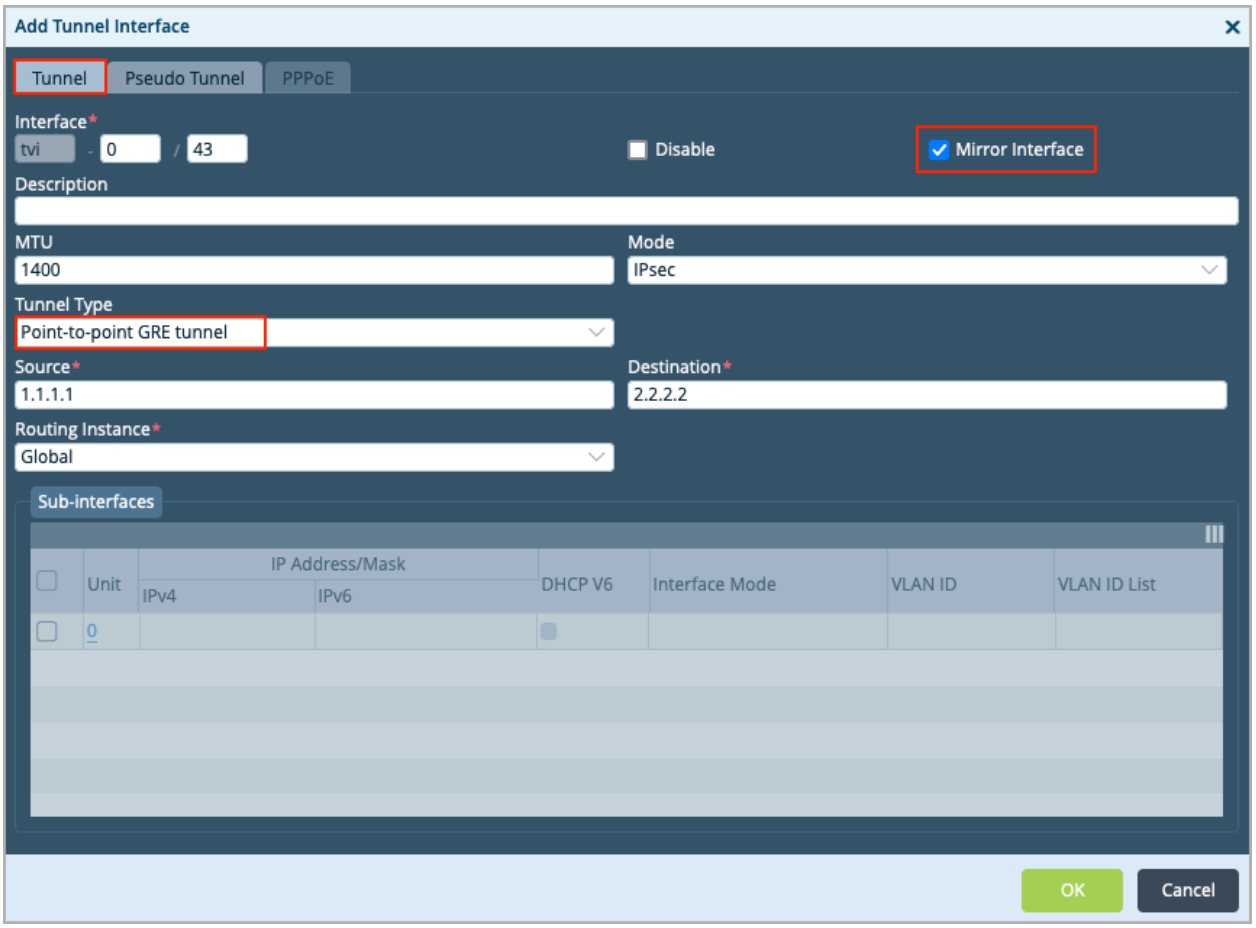
> admin@Branch5-cli(config)% **set orgs org-services example-org-name1 traffic-mirroring policies example-policy1 rules example-rule1 set**

Configure Flow Mirroring over a GRE Tunnel

This section describes how to configure flow mirroring over a GRE tunnel. Flow mirroring over a GRE tunnel adds the following fields to the packet header:

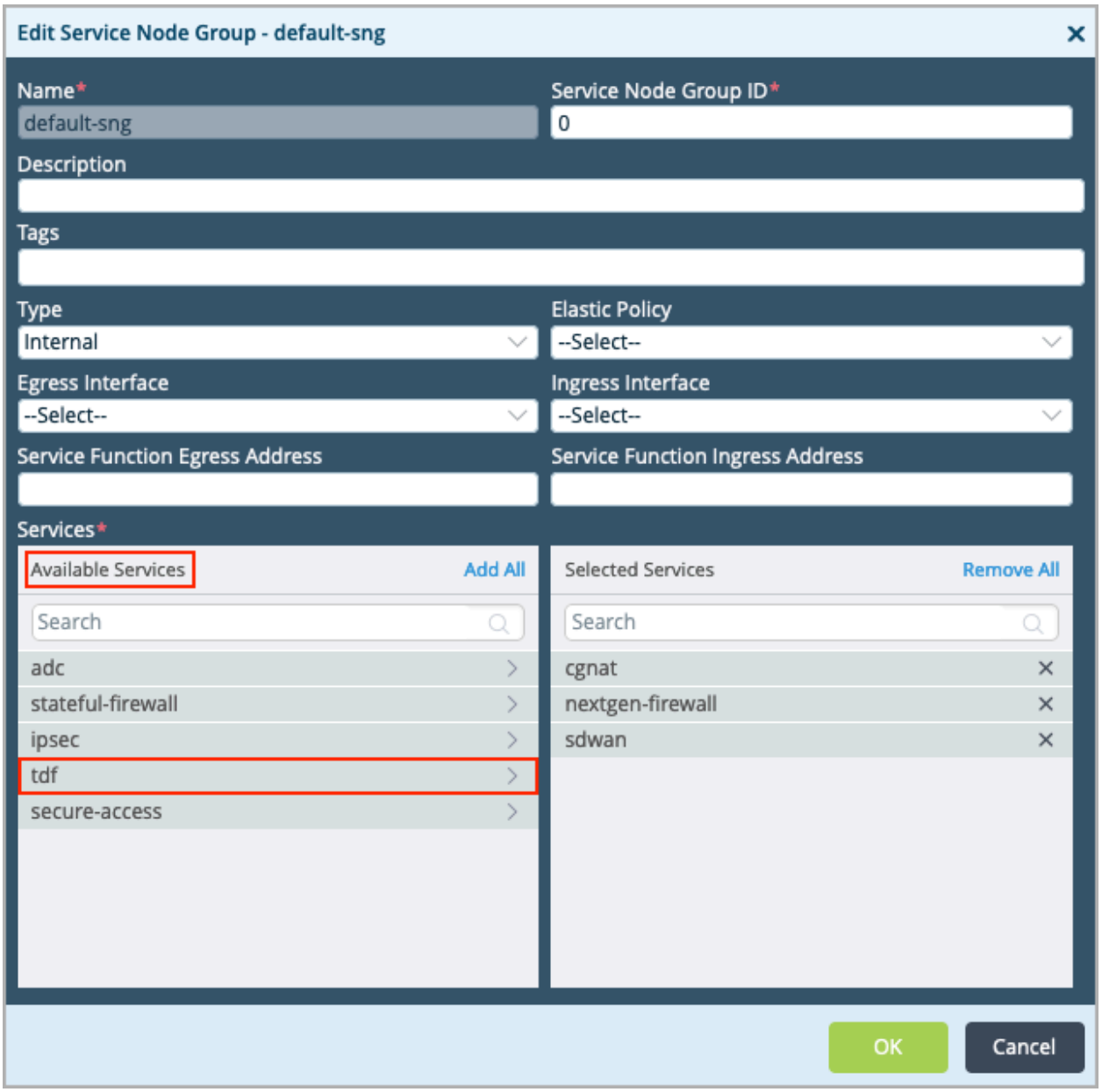
Outer MAC	Outer IP Header	GRE	Mirrored IP/IPv6 Packets

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Select a device in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > Interfaces > Tunnel in the left menu bar.
4. Click the Add icon. The Add Tunnel Interface popup window displays.
5. Select the Tunnel tab, and then click Mirror Interface to enable flow mirroring on the tunnel. In the Tunnel Type field, select Point-To-Point GRE Tunnel.



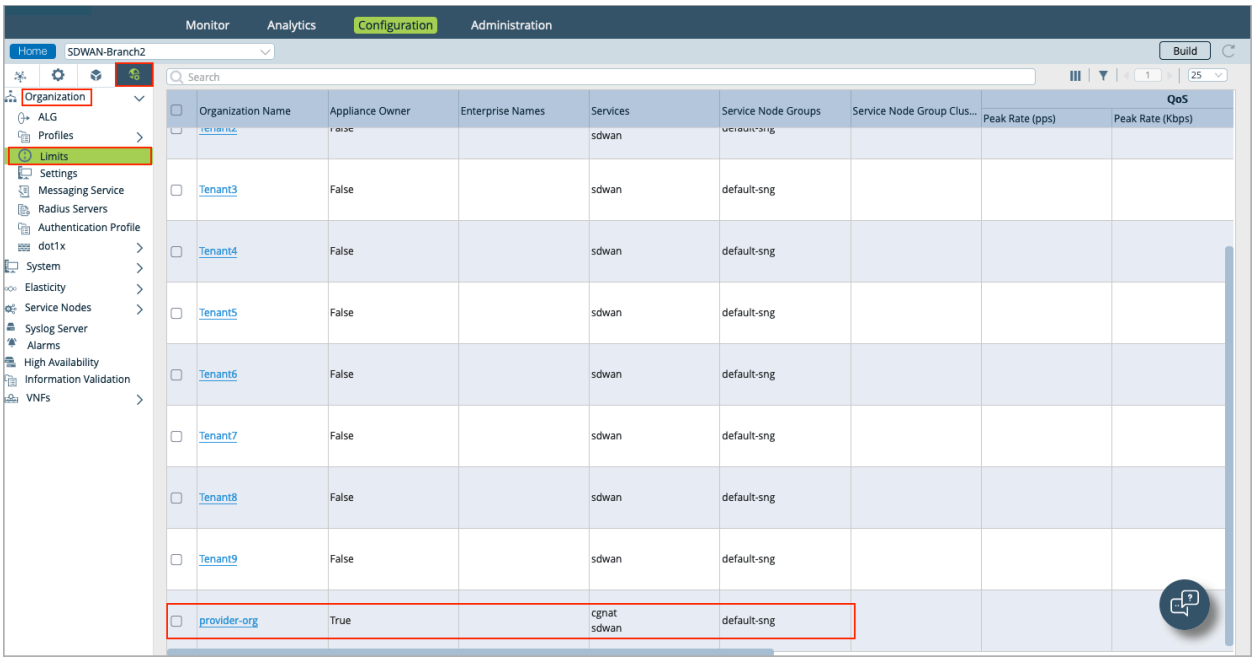
6. Click OK.

7. Select Others > Service Nodes > Service Node Groups in the left menu bar.
8. Select default-sng in the main pane. The Edit Service Node Group popup window displays.
9. In the Services group of fields, click TDF in the Available Services table to move it to the Selected Services table.

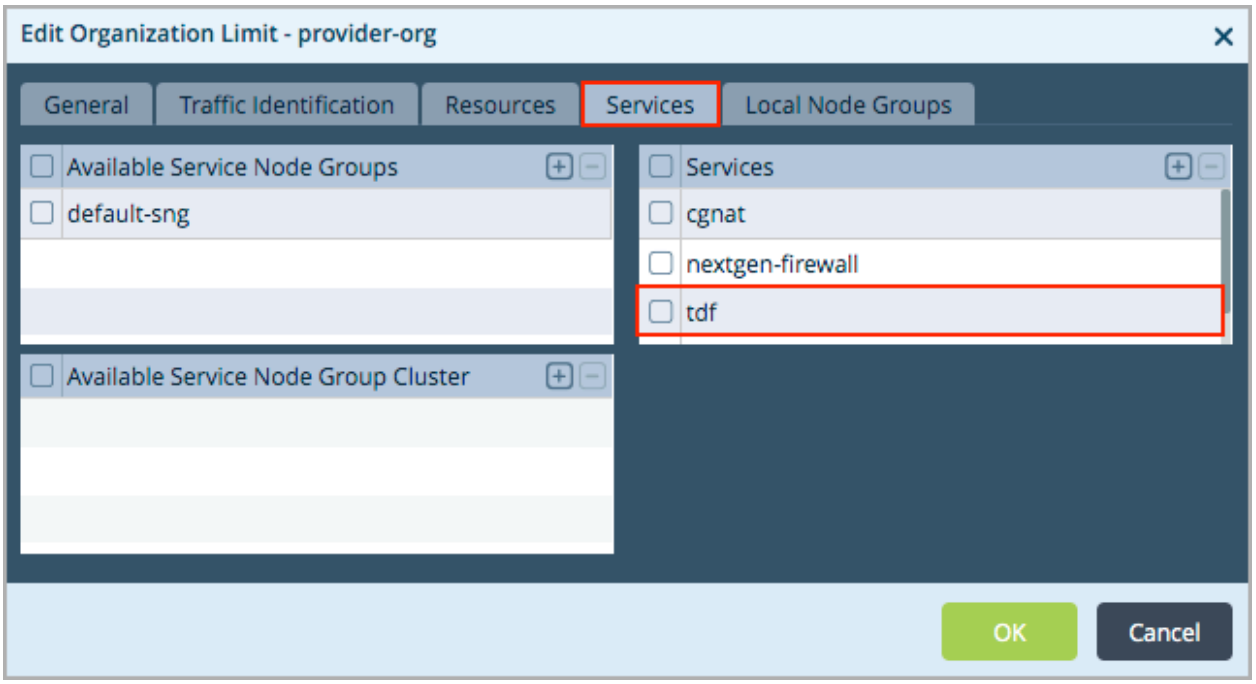


10. Click OK.

11. Select Others > Organization > Limits in the left menu bar.



12. Select an organization in the main pane. You must select an organization whose Appliance Owner field status is True. The Edit Organization Limit popup window displays.



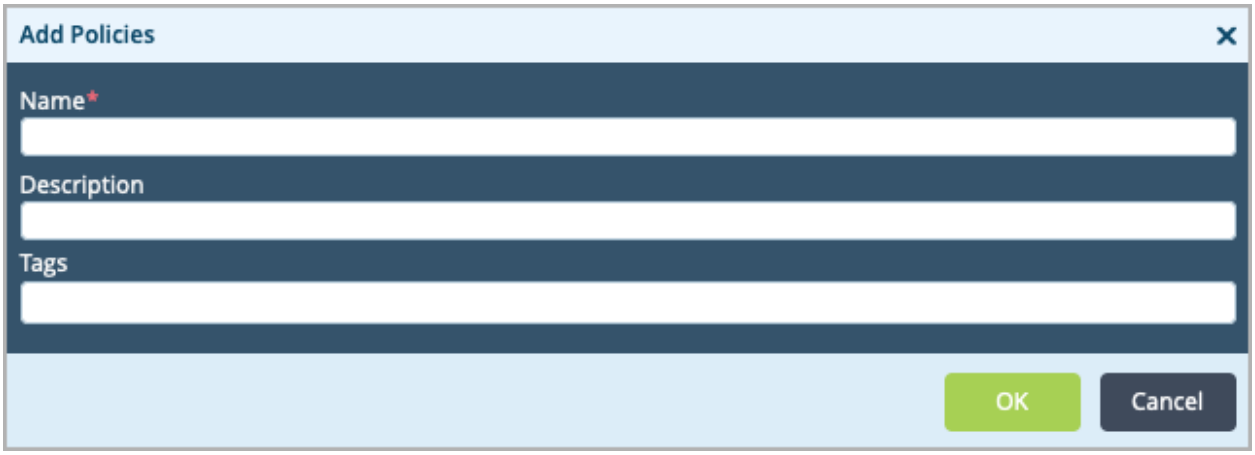
13. Select the Services tab.

14. In the Services field, click the Add icon and add the TDF service.

15. Click OK.

16. Select Services > TDF > Traffic Mirroring Policy in the left menu bar.

17. Select the Policies tab in the horizontal menu bar, and click the Add icon. The Add Policies popup window displays. Enter information for the following fields.

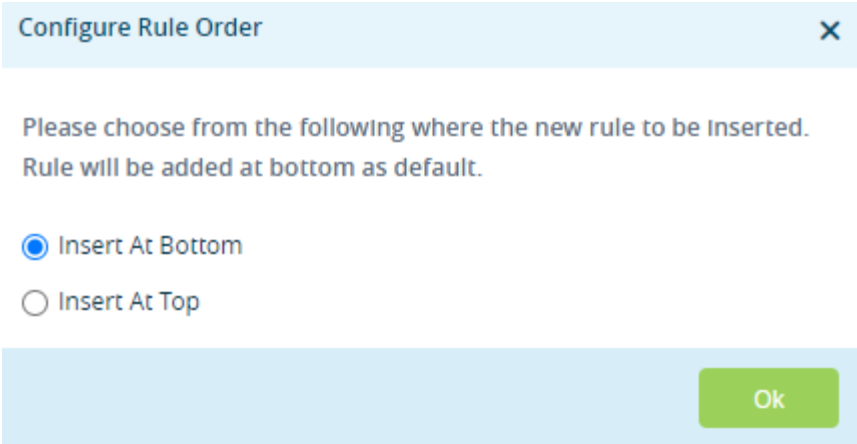


Field	Description
Name (Required)	Enter a name of the traffic-mirroring policy. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the policy. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the policy. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

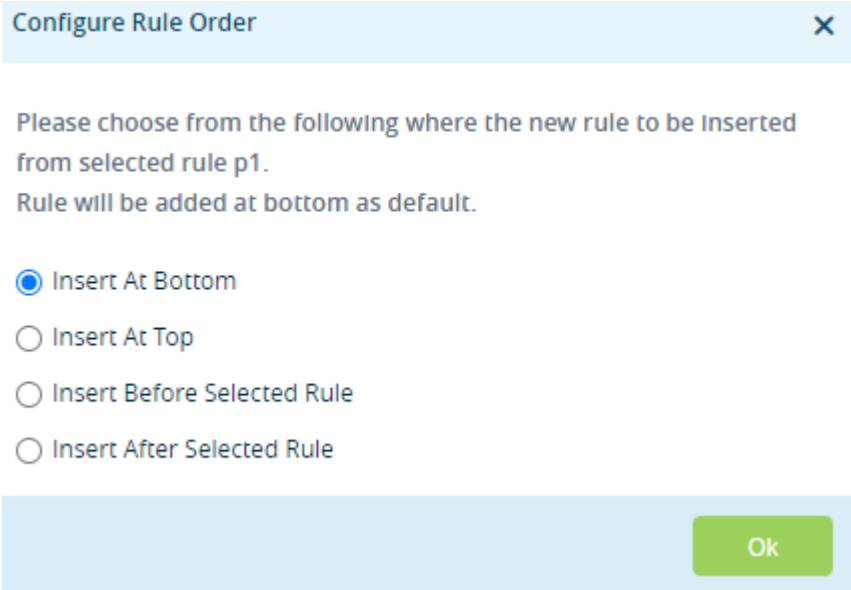
18. Click OK.

19. Select the Rules tab in the horizontal menu bar, and click the Add icon. The Add Rules popup window displays.

20. (For Releases 21.2.1 and later.) If you have already added one or more rules, the Configure Rule Order popup window displays.
    a. Select where you want to insert the policy rule, either at the beginning or end of the existing rules.



b. If you select a rule and then click the Add icon, the Configure Rule Order popup window displays the following options:



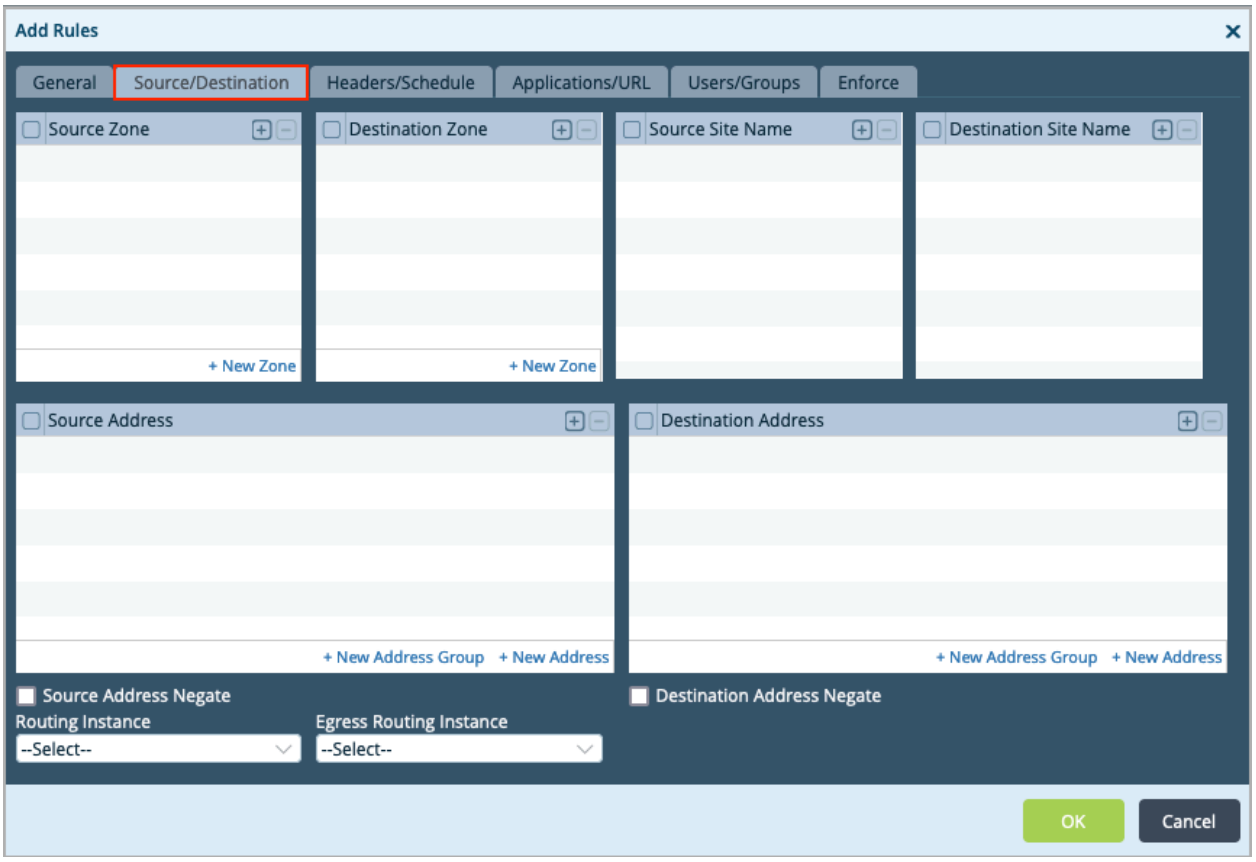
c. Select the order to insert the rule (at the beginning or end bottom of the existing rules, or before or after the selected rule).

d. Click OK. The Add Rule popup window displays.

21. Select the General tab, and enter information for the following fields.

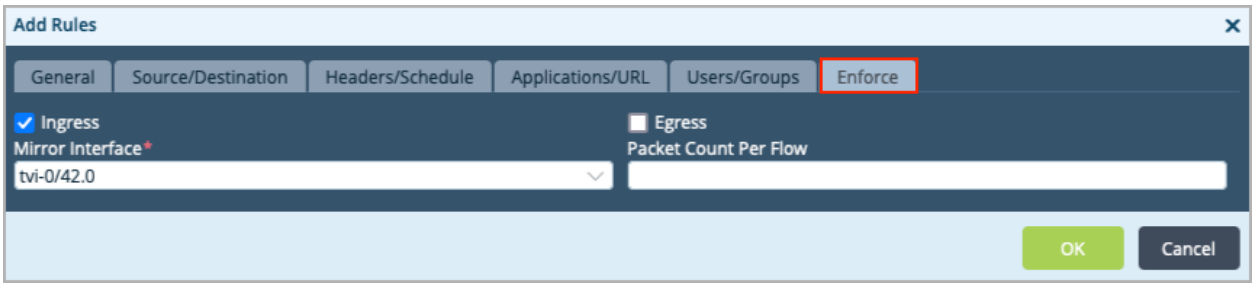
Field	Description
Name (Required)	Enter the name of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the rule. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

22. Select the Source/Destination tab, and enter information for the following fields.



Field	Description
Source Zone	Source zones to which to apply the rule. The rule applies to traffic received from any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Destination Zone	Destination zones to which to apply the rule. The rule applies to traffic sent to any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Source Site Name	Source sites to which to apply the rule. Click the Add icon to add sites.
Destination Site Name	Destination sites to which to apply the rule. Click the Add icon to add sites.
Source Address	Source addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Source Address Negate	Select to apply the rule to any source addresses except the ones in the Source Address field. Destination Address
Destination Address	Destination addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Destination Address Negate	Select to apply the rule to any destination addresses except the ones in the Destination Address field.
Routing Instance	Select the ingress routing instance to which to apply the rule.
Egress Routing Instance	Select the egress routing instance to which to apply the rule.

23. Click OK.
24. Select the Enforce tab, and enter information for the following fields.



Field	Description
Ingress	Select to mirror ingress traffic on the VOS device. *Default:* Disabled
Egress	Select to mirror the egress traffic on the VOS device. *Default:* Disabled
Mirror Interface	Select the interface on which to mirror the traffic.
Packet Count Per Flow	Enter the number of packets per flow to be mirrored. *Range:* 0 through 4294967295 *Default:* None

25. Select the Headers/Schedule, Applications/URL, and Users/Groups tabs and configure any necessary information.
26. Click OK.

Configure Flow Mirroring over a GRE Tunnel Using the CLI

1. Create a GRE tunnel to use for flow mirroring:

```
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/3 unit 0 enable true
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/3 mirror-interface
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/3 type gre tunnel source 1.1.1.1 destination 2.
2.2.2
```

2. Enable the traffic-mirroring service on the VOS device, and add the TDF service in an available service node group. Doing this introduces flow mirroring as a new service in the TDF service set.

```
admin@Branch1-cli(config)% set service-node-groups default-sng services tdf
```

3. Configure a traffic-monitoring policy rule in an organization service:

```
admin@Branch5-cli(config)% set orgs org-services example-org-name1 traffic-mirroring policies
policy-name rules rule-name
```

4. Create policy match criteria for the packets to mirror on the mirror interface:

> admin@Branch5-cli(config)% **set orgs org-services example-org-name1 traffic-mirroring policies example-policy1 rules example-rule1 match**

5. Create policy action criteria to define the action to take when packets match the match criteria:

> admin@Branch5-cli(config)% **set orgs org-services example-org-name1 traffic-mirroring policies example-policy1 rules example-rule1 set**

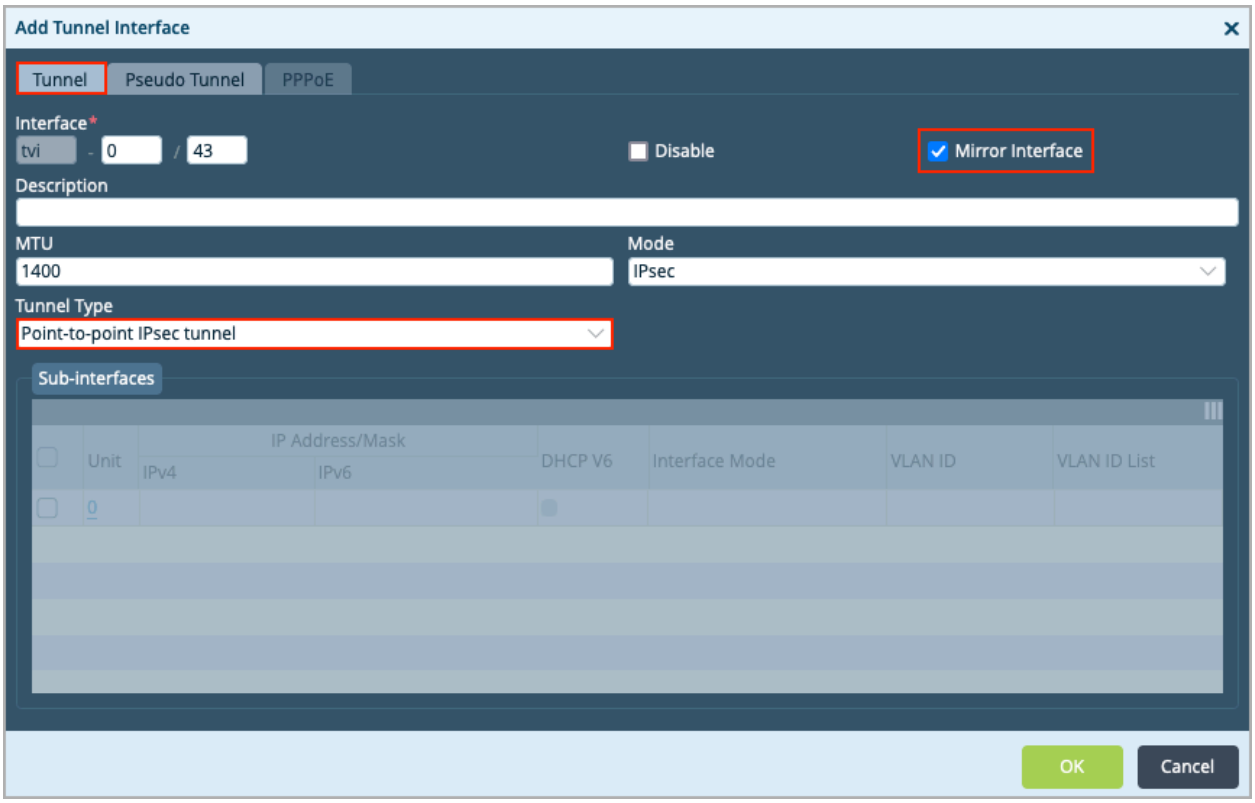
Configure Flow Mirroring over an IPsec Tunnel

This section describes how to configure the flow mirroring over an IPSec tunnel. Flow mirroring over an IPSec tunnel adds the following fields to the packet header:

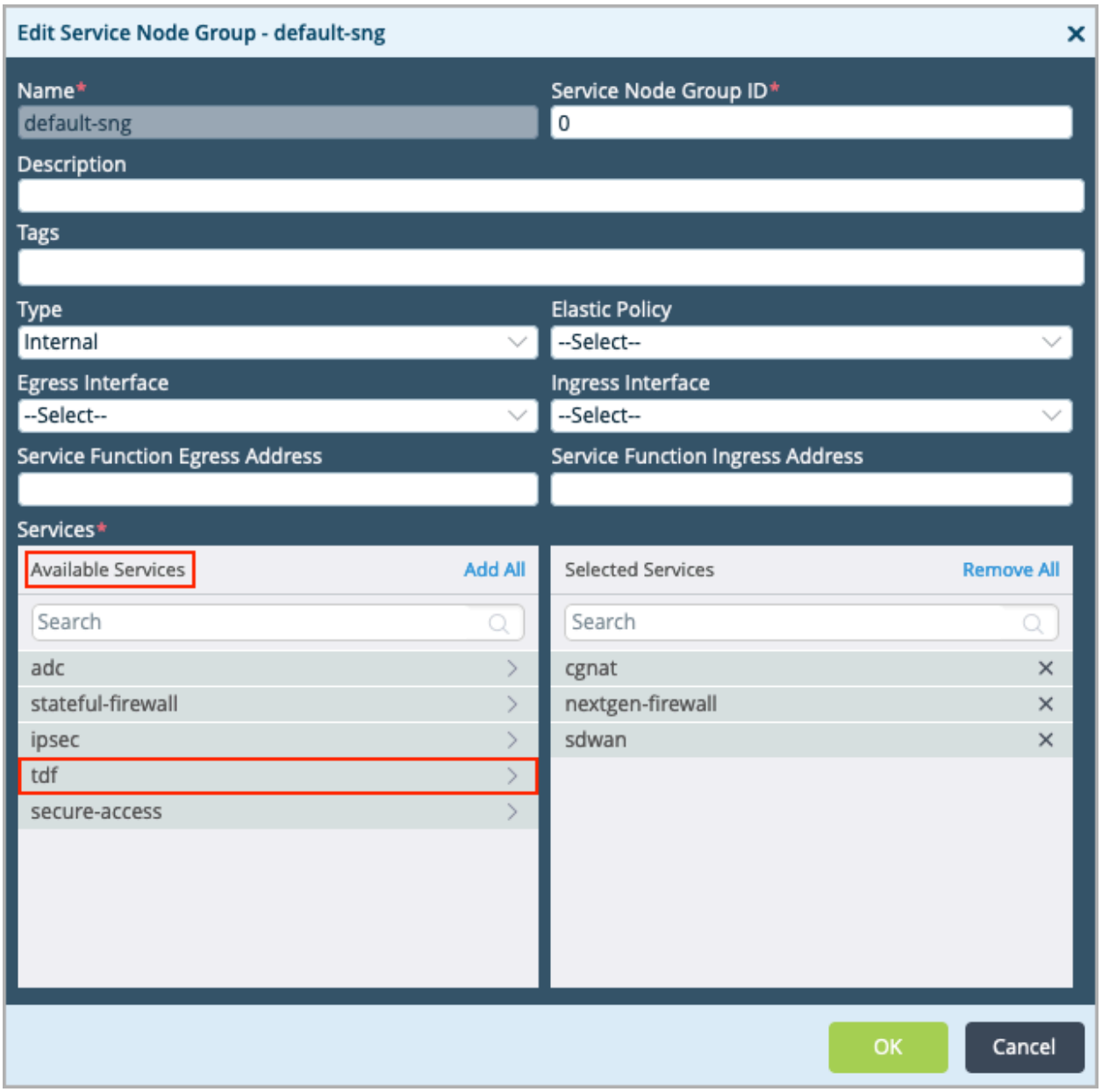
Outer MAC	Outer IP Header	ESP	Encrypted Mirrored IP/IPv6 Packets

To configure flow mirroring over an IPsec tunnel:

1. In Director view:
   a. Select the Administration tab in the top menu bar.
   b. Select Appliances in the left menu bar.
   c. Select a device in the main pane. The view changes to Appliance view.
2. Select the Configuration tab in the top menu bar.
3. Select Networking > Interfaces > Tunnel in the left menu bar.
4. Click the Add icon. The Add Tunnel Interface popup window displays.
5. Select the Tunnel tab, and then click Mirror Interface to enable flow mirroring on the IPsec tunnel. In the Tunnel Type field, select Point-To-Point IPsec Tunnel.

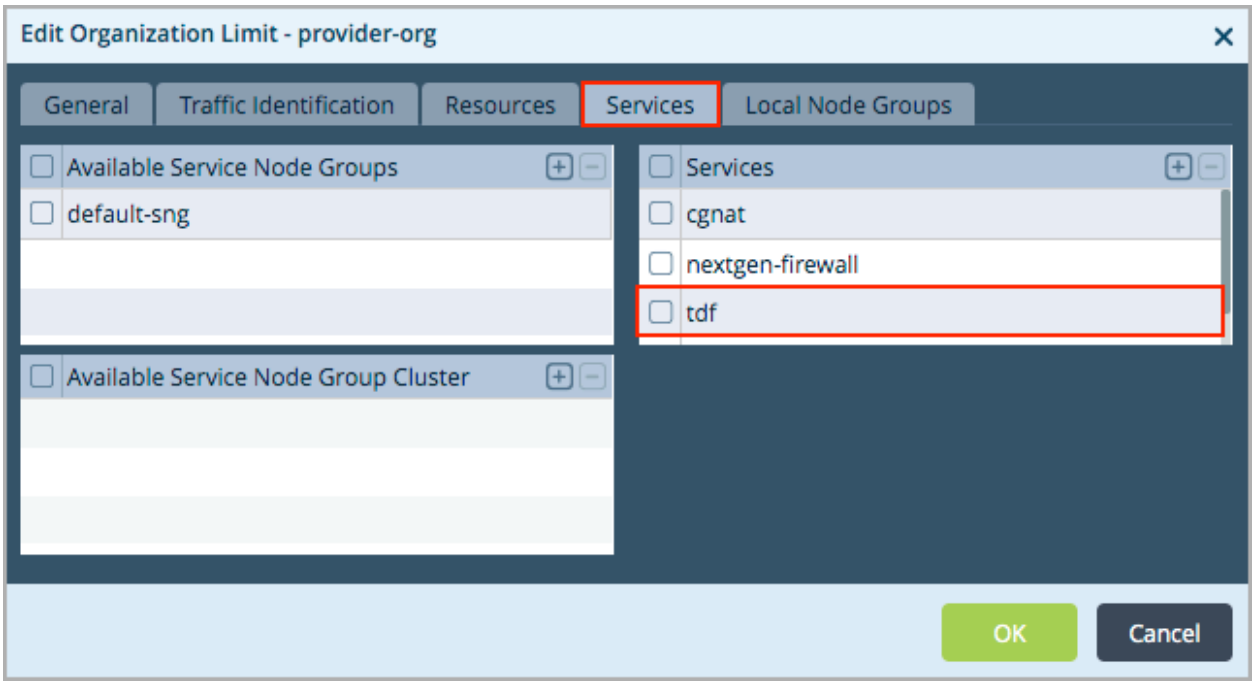


6. Click OK.
7. Create IPsec profiles. For more information, see the Configure IPsec Profiles section in the [Create and Manage Staging and Post-Staging Templates](#) article.
8. Select Others > Service Nodes > Service Node Groups in the left menu bar.
9. In the main pane, select default-sng. The Edit Service Node Group popup window displays.
10. In the Services group of fields, click TDF in the Available Services table to move it to the Selected Services table.



11. Click OK.

12. Select Others > Organization > Limits in the left menu bar.
13. Select an organization in the main pane. You must select an organization whose Appliance Owner field status is True. The Edit Organization Limit popup window displays.

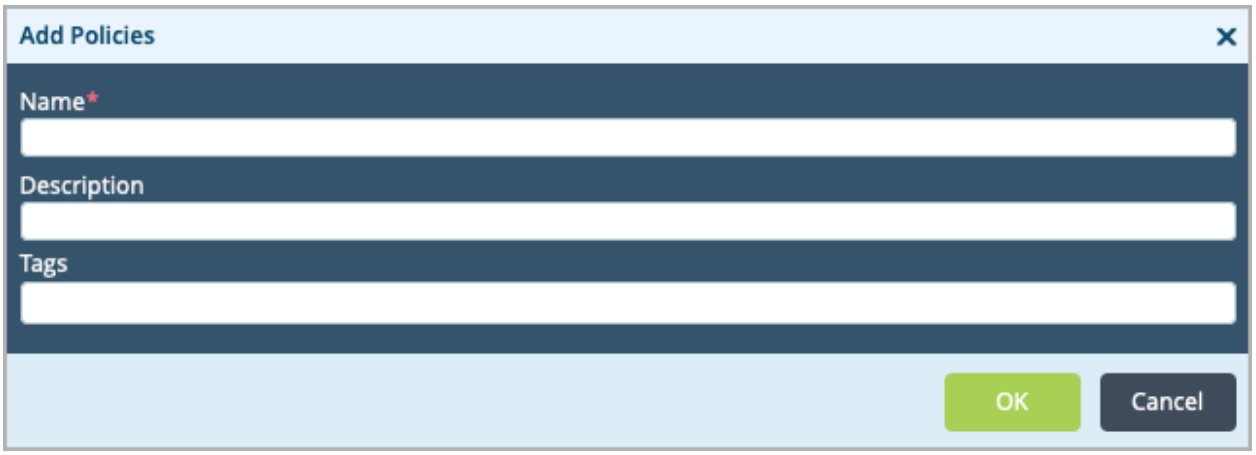


14. Select the Services tab.

15. In the Services field, click the Add icon and add the TDF service.
16. Click OK.

17. Select Services > TDF > Traffic Mirroring Policy in the left menu bar.

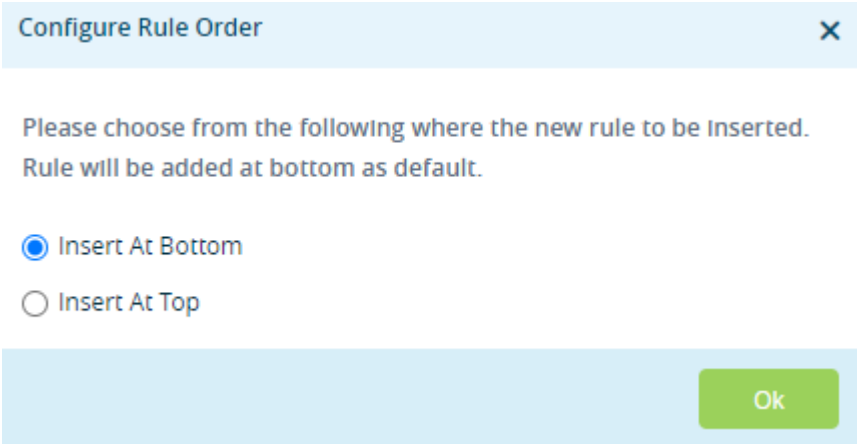
18. Select the Policies tab in the horizontal menu bar, and click the Add icon. The Add Policies popup window displays. Enter information for the following fields.



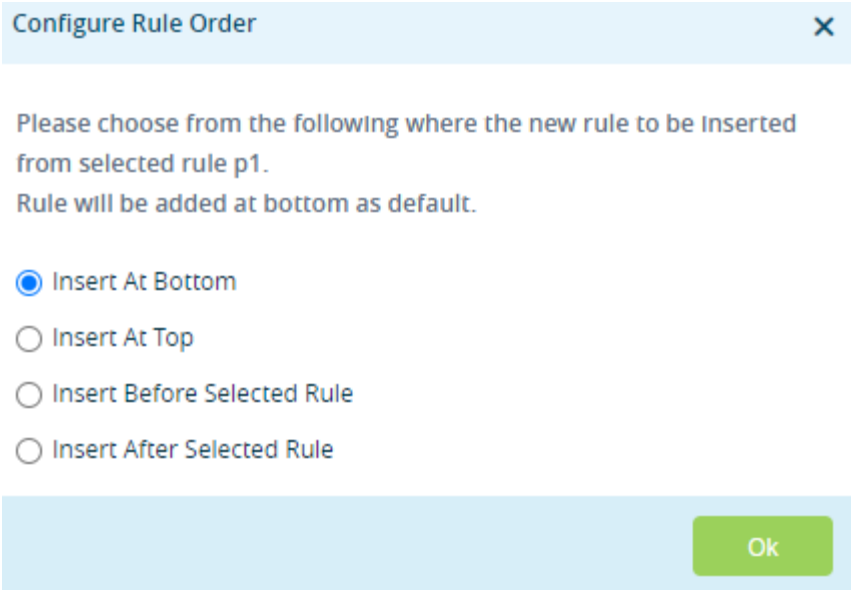
Field	Description
Name (Mandatory)	Enter the name of the traffic-mirroring policy. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the policy. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the policy. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

19. Click OK.

20. Select the Rules tab in the horizontal menu bar, and click the Add icon. The Edit Rules popup window displays.
21. (For Releases 21.2.1 and later.) If you have already added one or more rules, the Configure Rule Order popup window displays.
    a. Select where you want to insert the policy rule, either at the beginning or end of the existing rules.



    b. If you select a rule and then click the Add icon, the Configure Rule Order popup window displays the following options:



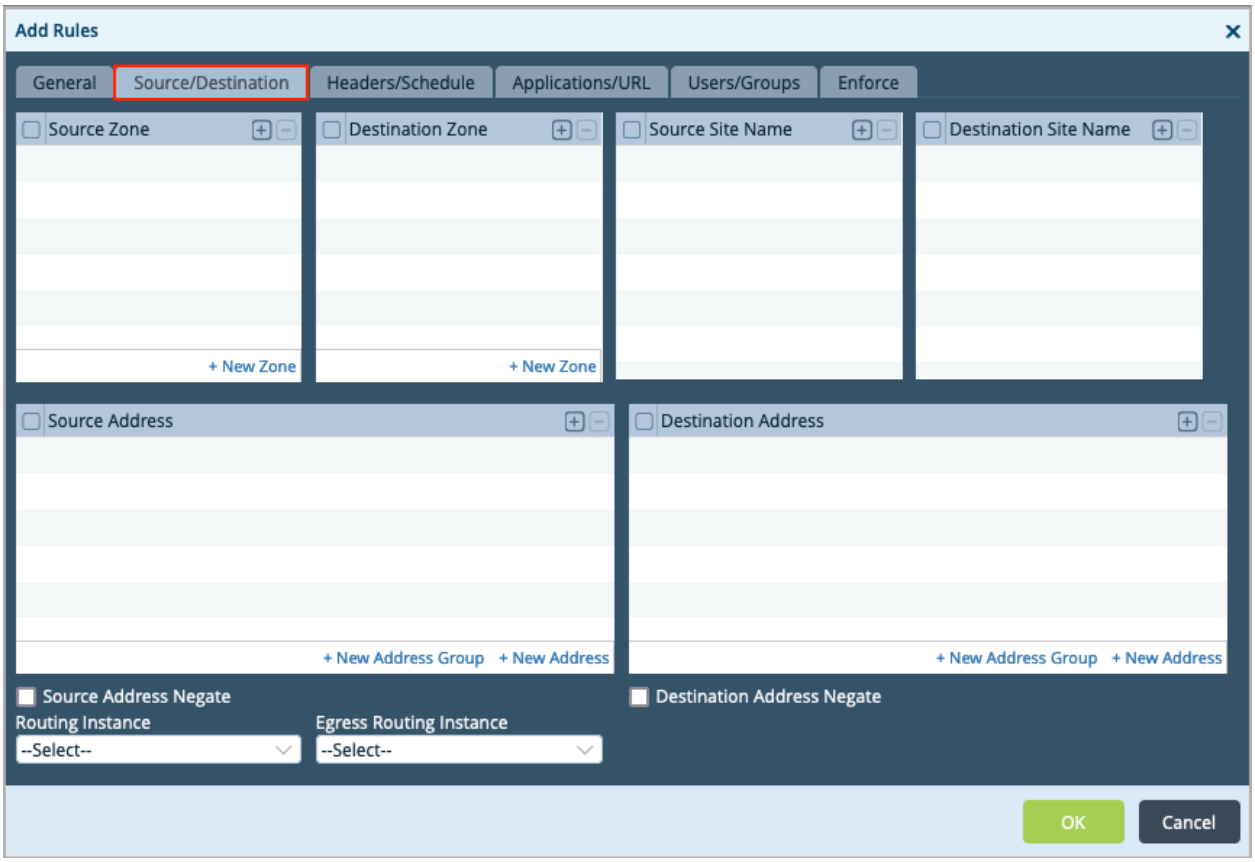
c. Select the order to insert the rule (at the beginning or end bottom of the existing rules, or before or after the selected rule).

d. Click OK. The Add Rule popup window displays.

22. Select the General tab, and enter information for the following fields..

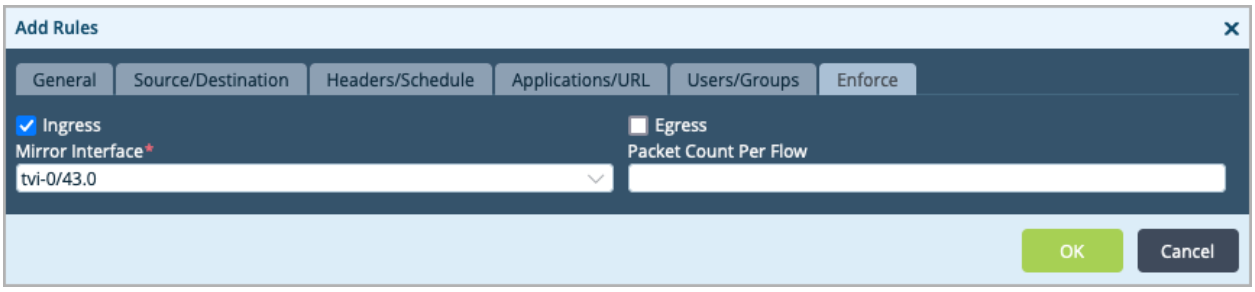
Field	Description
Name (Required)	Enter the name of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Description	Enter a description of the rule. *Value:* Text string from 1 through 255 characters *Default:* None
Tags	Enter a text string or phrase to associate with the rule. Tags allow you to locate a policy when you perform a filtered search of all policies. *Value:* Text string from 1 through 255 characters *Default:* None

23. Select the Source/Destination tab, and enter information for the following fields.



Field	Description
Source Zone	Source zones to which to apply the rule. The rule applies to traffic received from any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Destination Zone	Destination zones to which to apply the rule. The rule applies to traffic sent to any interface in the zone. Click the Add icon to add zones. Click + New Zone to create a new zone.
Source Site Name	Source sites to which to apply the rule. Click the Add icon to add sites.
Destination Site Name	Destination sites to which to apply the rule. Click the Add icon to add sites.
Source Address	Source addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Source Address Negate	elect to apply the rule to any source addresses except the ones in the Source Address field.
Destination Address	Destination addresses to which to apply the rule. Click the Add icon to add addresses. Click + New Address Group to create a new address group. Click + New Address to create a new address.
Destination Address Negate	Select to apply the rule to any destination addresses except the ones in the Destination Address field.
Routing Instance	Select the ingress routing instance to which to apply the rule.
Egress Routing Instance	Select the egress routing instance to which to apply the rule.

24. Click OK.
25. Select the Enforce tab, and enter information for the following fields.



Field	Description
Ingress	Click to mirror ingress traffic on the VOS device. *Default:* Disabled
Egress	Click to mirror the egress traffic on the VOS device. *Default:* Disabled
Mirror Interface	Select the interface on which to mirror the traffic.
Packet Count Per Flow	Enter the number of packets per flow to be mirrored. *Range:* 0 through 4294967295 *Default:* None

26. Select the Headers/Schedule, Applications/URL, and Users/Groups tabs and configure any necessary information.
27. Click OK.

Configure Flow Mirroring over an IPsec Tunnel Using the CLI

1. Configure an IPsec tunnel interface to use for flow mirroring:

```
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/2 enable true
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/2 mirror-interface
admin@SDWAN-Branch1-cli(config)% set interfaces tvi-0/2 unit 0 enable true
```

2. Enable the traffic-mirroring service on the VOS device, and add TDF service in an available service node group. Doing this introduces flow mirroring as a new service in the TDF service set.

```
admin@Branch1-cli(config)% set service-node-groups default-sng services tdf
```

3. Configure a traffic-monitoring policy rule in an organization service:

```
admin@Branch5-cli(config)% set orgs org-services example-org-name1 traffic-mirroring policies
policy-name rules rule-name
```

4. Create policy match criteria for the packets to mirror on the mirror interface:

```
admin@Branch5-cli(config)% set orgs org-services example-org-name1 traffic-mirroring policies
```

```
example-policy1 rules example-rule1 match
```

5. Create policy action criteria to define the action to take when packets match the match criteria:

```
admin@Branch5-cli(config)% set orgs org-services example-org-name1 traffic-mirroring policies
example-policy1 rules example-rule1 set
```

Verify Flow-Mirroring Operation

To verify flow-mirroring operation, view information about the mirrored ingress and egress packets:

```
admin@VOS# show debug vsf nfp module stats brief
ID Module  Input      Input      Output     Output     Data       Data
                     Packet     Drop       Packet     Drop       Hold
-- ------- ---------- ---------- ---------- ---------- ---------- ----------
30 mirror 4097        0          2063       0          0          0
```

Supported Software Information

Releases 20.2 and later support all content described in this article, except:

- Releases 21.2.1 and later support configuring rule order for traffic mirroring policy rules for Ethernet interfaces, GRE tunnels, and IPsec tunnels.

Additional Information

Configure Interfaces