

FSOS

NVGRE Configuration Guide

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1 Configuring NVGRE

1.1 Overview

Network virtualization involves creating virtual Layer 2 and/or Layer 3 topologies on top of an arbitrary physical Layer 2/Layer 3 network. Connectivity in the virtual topology is provided by tunneling Ethernet frames in IP over the physical network.

GRE is a IETF standard and provides a way for encapsulating an arbitrary protocol over IP. NVGRE leverages the GRE header to carry VSID information in each packet. The VSID information in each packet can be used to build multi-tenant-aware tools for traffic analysis, traffic inspection, and monitoring.

The configuration guide will describe the basic configuration of NVGRE in our system and give example for it.

Note: this feature is only available on E350-SDN image.

1.2 Topology

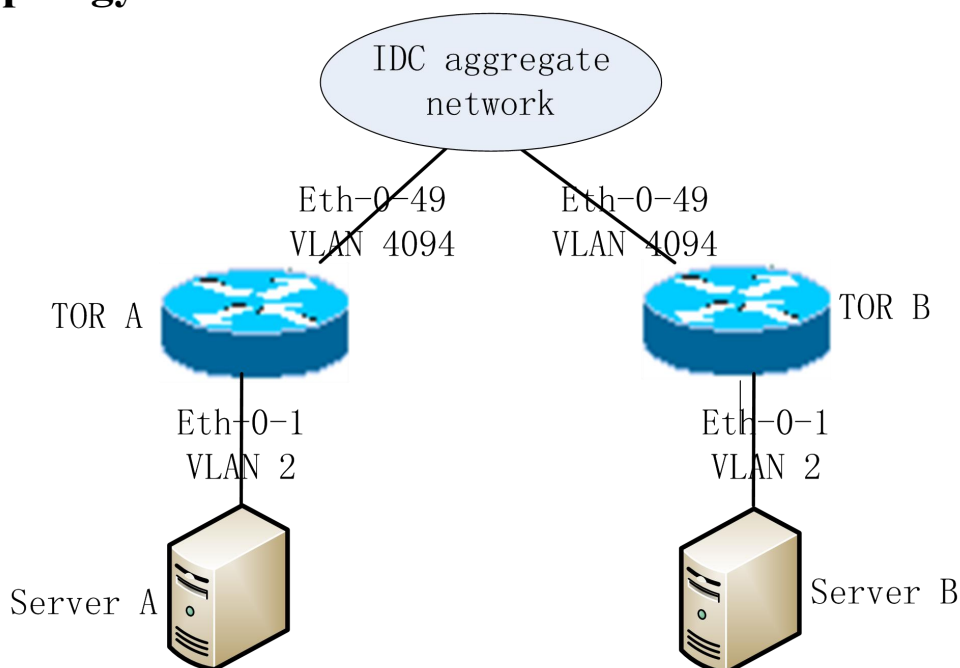


Figure 1-1 NVGRE example topology

1.3 Configuring NVGRE profile

Before configuring NVGRE feature, user must set the switch table profile to NVGRE unicast mode, otherwise NVGRE feature will not be supported.

Configure TOR A

Beginning in privileged EXEC mode, follow these steps to configure NVGRE profile.

TORA# configure terminal	Enter the Configure mode
TORA(config)# stm prefer nvgre	Change to NVGRE unicast mode profile
TORA(config)# quit	Exit config mode
TORA#reboot	Reboot to make new profile take effect

Configure TOR B

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORB# configure terminal	Enter the Configure mode
TORB(config)# stm prefer nvgre	Change to NVGRE unicast mode profile
TORB(config)# quit	Exit config mode
TORB#reboot	Reboot to make new profile take effect

1.4 Configuring VLAN

As the above topology, eth-0-49 of TOR A and TOR B belong to the same uplink VLAN, they are used to pass the NVGRE traffic, and eth-0-1 of TOR A and TOR B belong to the server-facing VLAN, and the VLAN can be specified on a per-TOR basis.

Configure TOR A

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORA# configure terminal	Enter the Configure mode
TORA(config)# vlan database	Enter the VLAN mode
TORA(config-vlan)# vlan 2	Configure the server facing VLAN
TORA(config-vlan)# vlan 4094	Configure the uplink VLAN
TORA(config-vlan)# exit	Exit the VLAN mode

Configure TOR B

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORB# configure terminal	Enter the Configure mode
TORB(config)# vlan database	Enter the VLAN mode
TORB(config-vlan)# vlan 2	Configure the server facing VLAN
TORB(config-vlan)# vlan 4094	Configure the uplink VLAN
TORB(config-vlan)# exit	Exit the VLAN mode

1.5 Configuring Uplink interface

Since NVGRE required ip reachability of each TOR because TOR serves as VTEP, user can choose to create VLAN interface and assign ip address to it.

As the above topology, since the uplink interface joins the same uplink VLAN, user can assign ip address from a single ip subnet (e.g. 192.168.1.0/24), then TOR A and TOR B can routing NVGRE traffic on the uplink VLAN provided that the aggregate switch allows the uplink VLAN on its TOR-facing interface.

Configure TOR A

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORA# configure terminal	Enter the Configure mode
TORA(config)# interface vlan 4094	Create VLAN interface

TORA(config-if)# ip address 192.168.1.1/24	Assign ip address to VLAN interface
TORA(config-if)#exit	Exit the interface mode
TORA(config-if)#interface eth-0-49	Enter the interface mode
TORA(config-if)#no shutdown	No shutdown the interface
TORA(config-if)#switchport mode trunk	Change the uplink interface to trunk mode
TORA(config-if)#switchport trunk allowed vlan add 4094	Allow uplink VLAN 4094 on the uplink interface
TORA(config-if)#nvgre enable	Enable decapsulating NVGRE packets on this interface

Configure TOR B

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORB# configure terminal	Enter the Configure mode
TORB(config)# interface vlan 4094	Create VLAN interface
TORB(config-if)# ip address 192.168.1.2/24	Assign ip address to VLAN interface
TORB(config-if)#exit	Exit the interface mode
TORB(config)#interface eth-0-49	Enter the interface mode
TORB(config-if)#no shutdown	No shutdown the interface
TORB(config-if)#switchport mode trunk	Change the uplink interface to trunk mode
TORB(config-if)#switchport trunk allowed vlan add 4094	Allow uplink VLAN 4094 on the uplink interface
TORA(config-if)#nvgre enable	Enable decapsulating NVGRE packets on this interface

1.6 Configuring Server-facing interface

As the above tology, server may send VLAN tagged packet of different tenant to the server-facing interface, user must allow these VLAN tag on the interface.

Configure TOR A

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORA# configure terminal	Enter the Configure mode
TORA(config)#interface eth-0-1	Enter the interface mode
TORA(config-if)#no shutdown	No shutdown the interface
TORA(config-if)#switchport mode trunk	Change the server-facing interface to trunk mode
TORA(config-if)#switchport trunk allowed vlan add 2	Allow tenant VLAN 2 on the server-facing interface

Configure TOR B

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORB# configure terminal	Enter the Configure mode
TORA(config)#interface eth-0-1	Enter the interface mode
TORA(config-if)#no shutdown	No shutdown the interface
TORA(config-if)#switchport mode trunk	Change the server-facing interface to trunk mode
TORA(config-if)#switchport trunk allowed vlan add 2	Allow tenant VLAN 2 on the server-facing interface

1.7 Configuring NVGRE

As the above topology, user can map VLAN 2 to NVGRE VSID(tunnel ID), and configure NVGRE tunnel between TOR A and TOR B, then VLAN 2 on each server can now communicate through the overlay network.

Configure TOR A

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORA# configure terminal	Enter the Configure mode
TORA(config)# nvgre	Enter the NVGRE mode
TORA(config-nvgre)# source 192.168.1.1	Set source ip address of NVGRE encapsulated packet
TORA(config-nvgre)# vlan 2 tunnel-id 2	Map vlan 2 to VSID(tunnel ID) 2
TORA(config-nvgre)# vlan 2 peer 192.168.1.2	Configure tunnel to TOR B for vlan 2
TORA(config-nvgre)# exit	Exit the NVGRE mode

Configure TOR B

Beginning in privileged EXEC mode, follow these steps to configure the VLAN.

TORA# configure terminal	Enter the Configure mode
TORA(config)# nvgre	Enter the NVGRE mode
TORA(config-nvgre)# source 192.168.1.2	Set source ip address of NVGRE encapsulated packet
TORA(config-nvgre)# vlan 2 tunnel-id 2	Map vlan 2 to VSID(tunnel ID) 2
TORA(config-nvgre)# vlan 2 peer 192.168.1.1	Configure tunnel to TOR B for vlan 2
TORA(config-nvgre)# exit	Exit the NVGRE mode

1.8 Validation

The result of show mac address of TOR A and TOR B.

TORA# show mac address-table

```
Switch# show mac address-table
      Mac Address Table
-----
(*) - Security Entry
Vlan  Mac Address      Type      Ports
----  -
4094  2c4d.5437.1400    dynamic   eth-0-49
2     0000.0000.0001    dynamic   eth-0-1
2     0000.0000.0002    dynamic   nvgre: 192.168.1.2
```

TORB# show mac address-table

```
Switch# show mac address-table
      Mac Address Table
-----
(*) - Security Entry
Vlan  Mac Address      Type      Ports
----  -
4094  2c4d.5437.1401    dynamic   eth-0-49
2     0000.0000.0002    dynamic   eth-0-1
2     0000.0000.0001    dynamic   nvgre: 192.168.1.1
```