FiberstoreOS

Data Center Configuration Guide

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1 Configuring VXLAN

1.1 Overview

Virtual Extensible LAN (VXLAN) is a networking technology that encapsulates MAC-based Layer 2 Ethernet frames within Layer 3 UDP packets to aggregate and tunnel multiple layer 2 networks across a Layer 3 infrastructure. VXLAN scales up to 16 million logical networks and supports layer 2 adjacency across IP networks. Multicast transmission architecture is used for broadcast, multicast, and unknown.

1.2 Topology

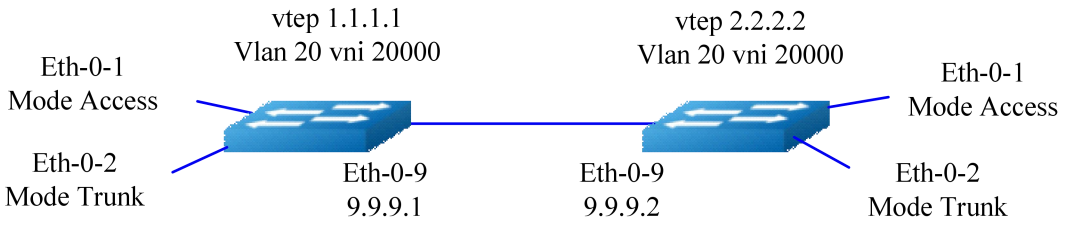

Figure 1-1 Configuring vxlan

1.3 Vxlan Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20	Create vlan 20
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change port mode to trunk

DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set vxlan source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type vxlan	Create vxlan remote vtep
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set vxlan peer for vlan 20

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20	Create vlan 20
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport mode trunk	Change port mode to trunk
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode
DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24

DUT2 (config)# overlay	Enter overlay configuration mode
DUT2 (config-overlay)# source 2.2.2.2	Set vxlan source vtep ip address
DUT2 (config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type vxlan	Create vxlan remote vtep
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set vxlan peer for vlan 20

1.4 Validation

```
DUT1# show overlay vlan 20
------------------------------------------------------------
ECMP Mode        : Normal
Source VTEP      : 1.1.1.1
Remote VTEP Index: 1, Ip address: 2.2.2.2, Type: VxLAN
------------------------------------------------------------
VLAN ID        : 2
VNI            : 20000
Remote VTEP NUM: 1
          Index: 1, Ip address: 2.2.2.2,  Type: VxLAN
DVR Gateway NUM: 0
------------------------------------------------------------
```

2 Configuring NVGRE

2.1 Overview

Network Virtualization using Generic Routing Encapsulation (NVGRE) is an encapsulation technique intended to allow virtual network overlays across the physical network. NVGRE uses Generic Routing Encapsulation (GRE) as the encapsulation method. It uses the lower 24 bits of the GRE header to represent the Tenant Network Identifier (TNI.) Like VXLAN this 24 bit space allows for 16 million virtual networks.

2.2 Topology

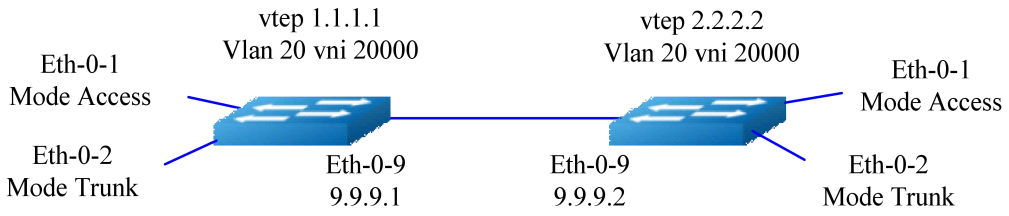

Figure 2-1 Configuring NVGRE

2.3 NVGRE Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20	Create vlan 20
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1

DUT1 (config-if)# switchport mode trunk	Change port mode to trunk
DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set nvgre source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type nvgre	Create nvgre remote vtep
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set nvgre peer for vlan 20

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20	Create vlan 20
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport mode trunk	Change port mode to trunk
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode

DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24
DUT2 (config)# overlay	Enter overlay configuration mode
DUT2 (config-overlay)# source 2.2.2.2	Set nvgre source vtep ip address
DUT2(config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type nvgre	Create nvgre remote vtep
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set nvgre peer for vlan 20

2.4 Validation

```
DUT1# show overlay vlan 20
------------------------------------------------------------
ECMP Mode        : Normal
Source VTEP      : 1.1.1.1
Remote VTEP Index: 1, Ip address: 2.2.2.2, Type: NvGRE
------------------------------------------------------------
VLAN ID        : 2
VNI            : 20000
Remote VTEP NUM: 1
          Index: 1, Ip address: 2.2.2.2,  Type: NvGRE
DVR Gateway NUM: 0
------------------------------------------------------------
```

3 Configuring GENEVE

3.1 Overview

Generic Network Virtualization Encapsulation (GENEVE) is a networking technology that encapsulates MAC-based Layer 2 Ethernet frames within Layer 3 UDP packets to aggregate and tunnel multiple layer 2 networks across a Layer 3 infrastructure. GENEVE scales up to 16 million logical networks and supports layer 2 adjacency across IP networks. Multicast transmission architecture is used for broadcast, multicast, and unknown

3.2 Topology

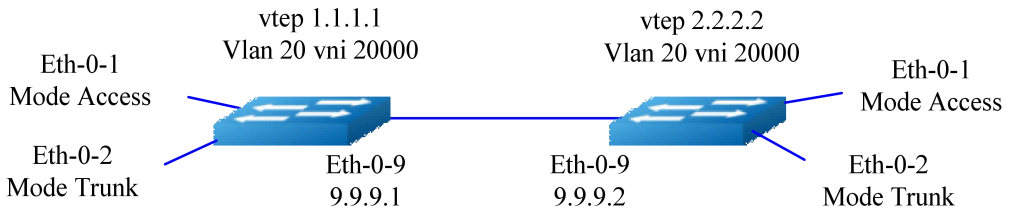

Figure 3-1 Configuring GENEVE

3.3 GENEVE Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20	Create vlan 20
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1

DUT1 (config-if)# switchport mode trunk	Change port mode to trunk
DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set geneve source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type geneve	Create geneve remote vtep
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set geneve peer for vlan 20

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20	Create vlan 20
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport access vlan 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-1
DUT2 (config-if)# switchport mode trunk	Change port mode to trunk
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port allow vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode

DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24
DUT2 (config)# overlay	Enter overlay configuration mode
DUT2 (config-overlay)# source 2.2.2.2	Set geneve source vtep ip address
DUT2(config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type geneve	Create geneve remote vtep
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan and vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set geneve peer for vlan 20

3.4 Validation

```
DUT1# show overlay vlan 20
------------------------------------------------------------
ECMP Mode        : Normal
Source VTEP      : 1.1.1.1
Remote VTEP Index: 1, Ip address: 2.2.2.2, Type: GENEVE
------------------------------------------------------------
VLAN ID         : 2
VNI             : 20000
Remote VTEP NUM: 1
          Index: 1, Ip address: 2.2.2.2,  Type: GENEVE
DVR Gateway NUM: 0
------------------------------------------------------------
```

4 Configuring VXLAN Routing

4.1 Overview

Virtual Extensible LAN (VXLAN) is a networking technology that encapsulates MAC-based Layer 2 Ethernet frames within Layer 3 UDP packets to aggregate and tunnel multiple layer 2 networks across a Layer 3 infrastructure. VXLAN scales up to 16 million logical networks and supports layer 2 adjacency across IP networks. Multicast transmission architecture is used for broadcast, multicast, and unknown.

4.2 Topology

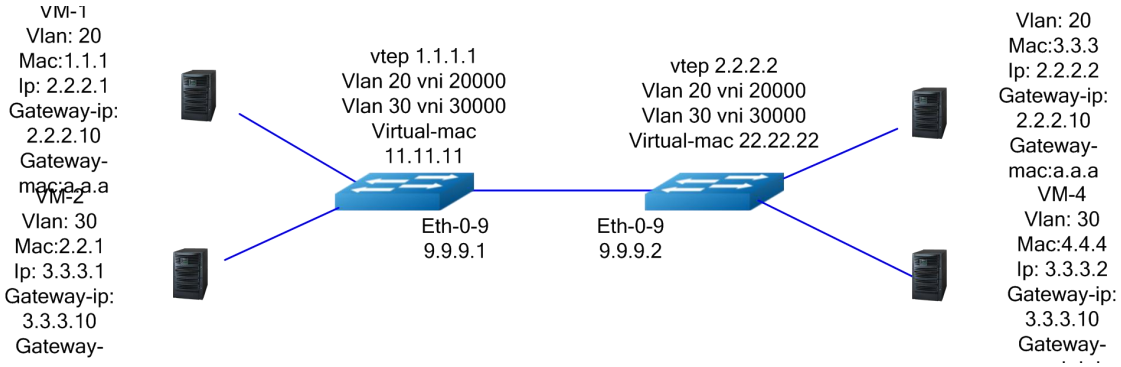

Figure 4-1 Configuring VXLAN Routing

4.3 VXLAN Routing Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20,30	Create vlan 20,30
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# ip vrf tenant	Create vrf tenant

DUT1 (config-vrf)# overlay gateway enable	Enable overlay dvr feature in vrf
DUT1 (config-vrf)# exit	Return to configuration mode
DUT1 (config)# int vlan 20	Create interface vlan 20
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config-if)# ip address 2.2.2.111/24	Add ip address of vlan interface
DUT1 (config)# int vlan 30	Create interface vlan 20
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config-if)# ip address3.3.3.111/24	Add ip address of vlan interface
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set geneve source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type vxlan	Create remote vxlan vtep
DUT1 (config-overlay)# remote-vtep 1 virtual-mac 22.22.22	Set remote vtep virtual mac address
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT1 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set vxlan peer for vlan 20
DUT1 (config-overlay)# vlan 30 remote-vtep 1	Set vxlan peer for vlan 30
DUT1 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT1 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 20 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode

DUT1 (config)# ip route vrf tenant 2.2.2.2/32 remote-vtep 1 vni 20000 inner-macda 3.3.3	Add vxlan route to VM-3
DUT1 (config)# ip route vrf tenant 3.3.3.2/32 remote-vtep 1 vni 30000	Add vxlan route to VM-4

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20,30	Create vlan 20, 30
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# ip vrf tenant	Create vrf tenant
DUT2 (config-vrf)# overlay gateway enable	Enable overlay dvr feature in vrf
DUT2 (config-vrf)# exit	Return to configuration mode
DUT2 (config)# interface vlan 20	Create interface vlan 20
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT2(config-if)# ip address 2.2.2.222/24	Add ip address of vlan interface
DUT2 (config)# interface vlan 30	Create interface vlan 30
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 30 to vrf tenant
DUT1 (config-if)# ip address 3.3.3.222/24	Add ip address of vlan interface
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode
DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24
DUT2 (config)# overlay	Enter overlay configuration mode
DUT2 (config-overlay)# source 2.2.2.2	Set geneve source vtep ip address

DUT2 (config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type vxlan	Create remote vxlan vtep
DUT2 (config-overlay)# remote-vtep 1 virtual-mac 11.11.11	Set remote vtep virtual mac address
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT2 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set vxlan peer for vlan 20
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set vxlan peer for vlan 20
DUT2 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT2 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 30 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode
DUT1 (config)# ip route vrf tenant 2.2.2.1/32 remote-vtep 1 vni 20000 inner-macda 1.1.1	Add vxlan route to VM-1
DUT1 (config)# ip route vrf tenant 3.3.3.1/32 remote-vtep 1 vni 30000	Add vxlan route to VM-2

4.4 Validation

```
DUT1# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.2/32 is in overlay remote vxlan vtep:2.2.2.2, vni:20000
S        3.3.3.2/32 is in overlay remote vxlan vtep:2.2.2.2, vni:30000
```

```
DUT2# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.1/32 is in overlay remote vxlan vtep:1.1.1.1, vni:20000
S        3.3.3.1/32 is in overlay remote vxlan vtep:1.1.1.1, vni:30000
```

5 Configuring NVGRE Routing

5.1 Overview

Network Virtualization using Generic Routing Encapsulation (NVGRE) is an encapsulation technique intended to allow virtual network overlays across the physical network. NVGRE uses Generic Routing Encapsulation (GRE) as the encapsulation method. It uses the lower 24 bits of the GRE header to represent the Tenant Network Identifier (TNI.) Like VXLAN this 24 bit space allows for 16 million virtual networks.

5.2 Topology

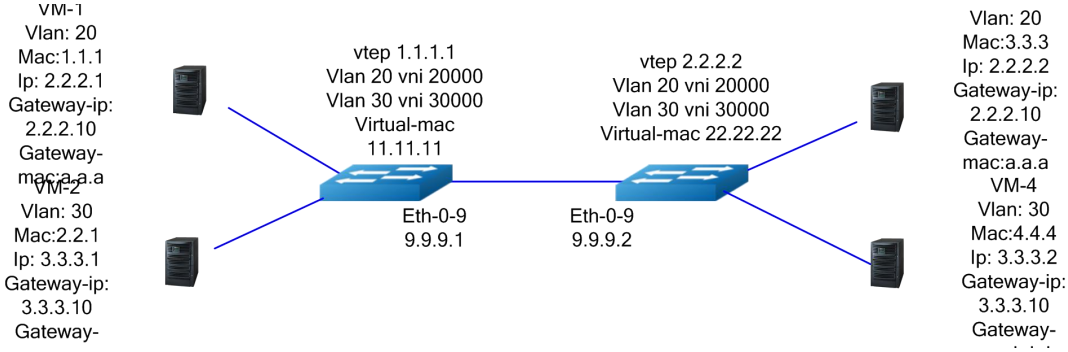

Figure 5-1 Configuring NVGRE Routing

5.3 NVGRE Routing Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20,30	Create vlan 20,30
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# ip vrf tenant	Create vrf tenant

DUT1 (config-vrf)# overlay gateway enable	Enable overlay dvr feature in vrf
DUT1 (config-vrf)# exit	Return to configuration mode
DUT1 (config)# int vlan 20	Create interface vlan 20
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config-if)# ip address 2.2.2.111/24	Add ip address of vlan interface
DUT1 (config)# int vlan 30	Create interface vlan 20
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config-if)# ip address 3.3.3.111/24	Add ip address of vlan interface
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set geneve source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type nvgre	Create remote nvgre vtep
DUT1 (config-overlay)# remote-vtep 1 virtual-mac 22.22.22	Set remote vtep virtual mac address
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT1 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set nvgre peer for vlan 20
DUT1 (config-overlay)# vlan 30 remote-vtep 1	Set nvgre peer for vlan 30
DUT1 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT1 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 20 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode

DUT1 (config)# ip route vrf tenant 2.2.2.2/32 remote-vtep 1 vni 20000 inner-macda 3.3.3	Add nvgre route to VM-3
DUT1 (config)# ip route vrf tenant 3.3.3.2/32 remote-vtep 1 vni 30000	Add nvgre route to VM-4

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20,30	Create vlan 20, 30
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# ip vrf tenant	Create vrf tenant
DUT2 (config-vrf)# overlay gateway enable	Enable overlay dvr feature
DUT2 (config-vrf)# exit	Return to configuration mode
DUT2 (config)# interface vlan 20	Create interface vlan 20
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT2 (config-if)# ip address 2.2.2.222/24	Add ip address of vlan interface
DUT2 (config)# interface vlan 30	Create interface vlan 30
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 30 to vrf tenant
DUT2 (config-if)# ip address 3.3.3.222/24	Add ip address of vlan interface
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode
DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24
DUT2 (config)# overlay	Enter overlay configuration mode
DUT2 (config-overlay)# source 2.2.2.2	Set geneve source vtep ip address

DUT2 (config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type nvgre	Create remote nvgre vtep
DUT2 (config-overlay)# remote-vtep 1 virtual-mac 11.11.11	Set remote nvgre vtep virtual route mac address
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT2 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set nvgre peer for vlan 20
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set nvgre peer for vlan 20
DUT2 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT2 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 30 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode
DUT1 (config)# ip route vrf tenant 2.2.2.1/32 remote-vtep 1 vni 20000 inner-macda 1.1.1	Add nvgre route to VM-1
DUT1 (config)# ip route vrf tenant 3.3.3.1/32 remote-vtep 1 vni 30000	Add nvgre route to VM-2

5.4 Validation

```
DUT1# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.2/32 is in overlay remote nvgre vtep:2.2.2.2, vni:20000
S        3.3.3.2/32 is in overlay remote nvgre vtep:2.2.2.2, vni:30000
```

```
DUT2# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.1/32 is in overlay remote nvgre vtep:1.1.1.1, vni:20000
S        3.3.3.1/32 is in overlay remote nvgre vtep:1.1.1.1, vni:30000
```

6 Configuring GENEVE Routing

6.1 Overview

Generic Network Virtualization Encapsulation (GENEVE) is a networking technology that encapsulates MAC-based Layer 2 Ethernet frames within Layer 3 UDP packets to aggregate and tunnel multiple layer 2 networks across a Layer 3 infrastructure. GENEVE scales up to 16 million logical networks and supports layer 2 adjacency across IP networks. Multicast transmission architecture is used for broadcast, multicast, and unknown

6.2 Topology

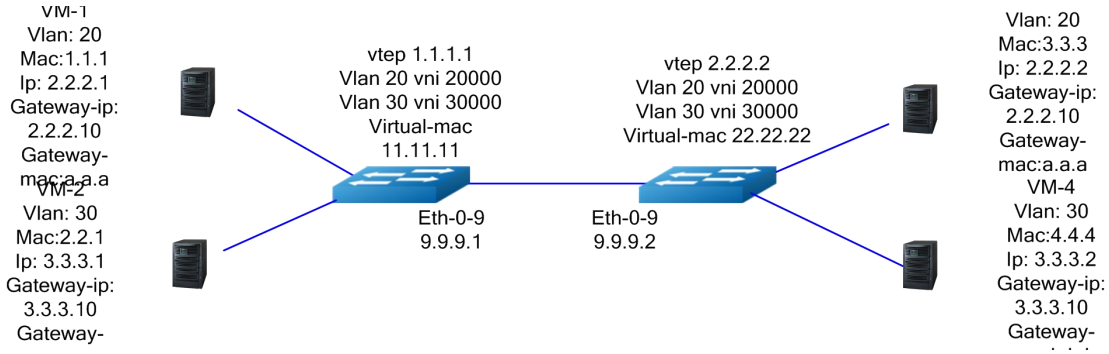

Figure 6-1 Configuring GENEVE Routing

6.3 GENEVE Routing Configuration

DUT1:

DUT1# configure terminal	Enter Configuration mode
DUT1 (config)# vlan database	Enter vlan Configuration mode
DUT1 (config-vlan)# vlan 20,30	Create vlan 20,30
DUT1 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT1 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT1 (config-vlan)# exit	Return to configuration mode
DUT1 (config)# ip vrf tenant	Create vrf tenant

DUT1 (config-vrf)# overlay gateway enable	Enable overlay dvr feature in vrf
DUT1 (config-vrf)# exit	Return to configuration mode
DUT1 (config)# int vlan 20	Create interface vlan 20
DUT1 (config-if)# ip address 2.2.2.111/24	Add ip address of vlan interface
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config)# int vlan 30	Create interface vlan 20
DUT1 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT1 (config-if)# ip address 3.3.3.111/24	Add ip address of vlan interface
DUT1 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT1 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT1 (config-if)# no switchport	Change to routed port
DUT1 (config-if)# ip address 9.9.9.1/24	Set ip address on eth-0-9
DUT1 (config-if)# overlay uplink enable	Enable overaly uplink on eth-0-9
DUT1 (config-if)# no shutdown	No shutdown
DUT1 (config-if)# interface loopback0	Create interface loopback0
DUT1 (config-if)# ip address 1.1.1.1/32	Set ip address on loopback0
DUT1 (config-if)# exit	Return to configuration mode
DUT1 (config)# ip route 2.2.2.0/24 9.9.9.2	Set static route for 2.2.2.0/24
DUT1 (config)# overlay	Enter overlay configuration mode
DUT1 (config-overlay)# source 1.1.1.1	Set geneve source vtep ip address
DUT1 (config-overlay)# remote-vtep 1 ip-address 2.2.2.2 type geneve	Create remote geneve vtep
DUT1 (config-overlay)# remote-vtep 1 virtual-mac 22.22.22	Set remote vtep virtual mac address
DUT1 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT1 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT1 (config-overlay)# vlan 20 remote-vtep 1	Set geneve peer for vlan 20
DUT1 (config-overlay)# vlan 30 remote-vtep 1	Set geneve peer for vlan 30
DUT1 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT1 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 20 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode

DUT1 (config)# ip route vrf tenant 2.2.2.2/32 geneve -peer 2.2.2.2 vni 20000 inner-macda 3.3.3	Add geneve route to VM-3
DUT1 (config)# ip route vrf tenant 3.3.3.2/32 geneve -peer 2.2.2.2 vni 30000	Add geneve route to VM-4

DUT2:

DUT2# configure terminal	Enter Configuration mode
DUT2 (config)# vlan database	Enter vlan Configuration mode
DUT2 (config-vlan)# vlan 20,30	Create vlan 20, 30
DUT2 (config-vlan)# vlan 20 overlay enable	Enable overlay of vlan 20
DUT2 (config-vlan)# vlan 30 overlay enable	Enable overlay of vlan 30
DUT2 (config-vlan)# exit	Return to configuration mode
DUT2 (config)# ip vrf tenant	Create vrf tenant
DUT2 (config-vrf)# overlay gateway enable	Enable overlay dvr feature in vrf
DUT2 (config-vrf)# exit	Return to configuration mode
DUT2 (config)# interface vlan 20	Create interface vlan 20
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 20 to vrf tenant
DUT2 (config-if)# ip address 2.2.2.222/24	Add ip address of vlan interface
DUT2 (config)# interface vlan 30	Create interface vlan 30
DUT2 (config-if)# ip vrf forwarding tenant	Add interface vlan 30 to vrf tenant
DUT2 (config-if)# ip address 3.3.3.222/24	Add ip address of vlan interface
DUT2 (config)# interface eth-0-1	Enter interface configure mode on eth-0-1
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 20	Add port to vlan 20
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-2	Enter interface configure mode on eth-0-2
DUT1 (config-if)# switchport mode trunk	Change to trunk mode
DUT2 (config-if)# switchport trunk allowed vlan add 30	Add port to vlan 30
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface eth-0-9	Enter interface configure mode on eth-0-9
DUT2 (config-if)# no switchport	Change to routed port
DUT2 (config-if)# ip address 9.9.9.2/24	Set ip address on eth-0-9
DUT2 (config-if)# overlay uplink enable	Enable overlay uplink on eth-0-9
DUT2 (config-if)# no shutdown	No shutdown
DUT2 (config-if)# interface loopback0	Create interface loopback0
DUT2 (config-if)# ip address 2.2.2.2/32	Set ip address on loopback0
DUT2 (config-if)# exit	Return to configuration mode
DUT2 (config)# ip route 1.1.1.0/24 9.9.9.1	Set static route for 1.1.1.0/24
DUT2 (config)# overlay	Enter overlay configuration mode

DUT2 (config-overlay)# source 2.2.2.2	Set geneve source vtep ip address
DUT2 (config-overlay)# remote-vtep 1 ip-address 1.1.1.1 type geneve	Create remote geneve vtep
DUT2 (config-overlay)# remote-vtep 1 virtual-mac 11.11.11	Set remote vtep virtual mac address
DUT2 (config-overlay)# vlan 20 vni 20000	Set vlan 20 with vni mapping
DUT2 (config-overlay)# vlan 30 vni 30000	Set vlan 30 with vni mapping
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set geneve peer for vlan 20
DUT2 (config-overlay)# vlan 20 remote-vtep 1	Set geneve peer for vlan 20
DUT2 (config-overlay)# vlan 20 gateway-mac a.a.a	Set vlan 20 gateway mac
DUT2 (config-overlay)# vlan 30 gateway-mac b.b.b	Set vlan 30 gateway mac
DUT1 (config-overlay)# exit	Exit overlay configure mode
DUT1 (config)# ip route vrf tenant 2.2.2.1/32 geneve-peer 1.1.1.1 vni 20000 inner-macda 1.1.1	Add geneve route to VM-1
DUT1 (config)# ip route vrf tenant 3.3.3.1/32 geneve-peer 1.1.1.1 vni 30000	Add geneve route to VM-2

6.4 Validation

```
DUT1# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.2/32 is in overlay remote geneve vtep:2.2.2.2, vni:20000
S        3.3.3.2/32 is in overlay remote geneve vtep:2.2.2.2, vni:30000
```

```
DUT2# show ip route vrf tenant
Codes: K - kernel, C - connected, S - static, R - RIP, B - BGP
       O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       Dc - DHCP Client
       [*] - [AD/Metric]
       * - candidate default
S        2.2.2.1/32 is in overlay remote geneve vtep:1.1.1.1, vni:20000
S        3.3.3.1/32 is in overlay remote geneve vtep:1.1.1.1, vni:30000
```

7 Configuring PFC

7.1 Overview

Traditional IEEE 802.3 Ethernet defines an unreliable communication medium; it does not offer guarantees that a packet injected into the network will arrive at its intended destination. Reliability is expected by means of upper-layer protocols and is outside the scope of the initial definition.

In a network path that normally consists of multiple hops between source and destination, lack of feedback between transmitters and receivers at each hop is one of the main causes of unreliability. Transmitters can send packets faster than receivers accept packets, and as the receivers run out of available buffer space to absorb incoming flows, they are forced to silently drop all traffic that exceeds their capacity. These semantics work fine at Layer 2, so long as upper-layer protocols handle drop-detection and retransmission logic.

For applications that cannot build reliability on upper layers, the addition of flow control functions at Layer 2 can offer a solution. Flow control enables feedback from a receiver to its sender to communicate buffer availability. Its first implementation in IEEE 802.3 Ethernet uses the IEEE 802.3x PAUSE control frames. IEEE 802.3x PAUSE is defined in Annex 31B of the IEEE 802.3 specification. Simply put, a receiver can generate a MAC control frame and send a PAUSE request to a sender when it predicts the potential for buffer overflow. Upon receiving a PAUSE frame, the sender responds by stopping transmission of any new packets until the receiver is ready to accept them again.

IEEE 802.3x PAUSE works as designed, but it suffers a basic disadvantage that limits its field of applicability: after a link is paused, a sender cannot generate any more packets. As obvious as that seems, the consequence is that the application of IEEE 802.3x PAUSE makes an Ethernet segment unsuitable for carrying multiple traffic flows that might require different quality of service (QoS). Thus, enabling IEEE 802.3x PAUSE for one application can affect the performance of other network applications.

IEEE 802.1Qbb PFC extends the basic IEEE 802.3x PAUSE semantics to multiple CoSs, enabling applications that require flow control to coexist on the same wire with applications that perform better without it. PFC uses the IEEE 802.1p CoS values in the IEEE 802.1Q VLAN tag to differentiate up to eight CoSs that can be subject to flow control independently.

7.2 Topology

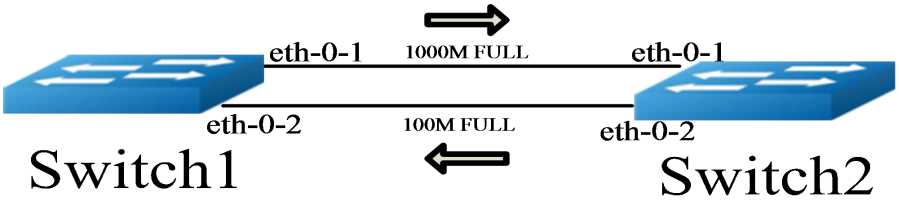

Figure 7-1 Priority-based Flow Control Configuration Topology

7.3 Configuring Priority-based Flow Control

Switch2# configure terminal	Enter the Configure mode
Switch2(config)# lldp enable	Enable lldp globally
Switch2(config)# interface eth-0-1	Enter the Interface mode
Switch2(config-if)#lldp enable	Enable lldp on the interface
Switch2(config-if)# lldp tlv 8021-org-specific dcbx	Enable dcbx tlv on the interface
Switch2(config-if)# priority-flow-control mode on	Enable PFC on the interface1，do not negotiating with the peer
Switch2(config-if)# priority-flow-control enable priority 2 3 4	Enable PFC on priorities 2 3 4
Switch2(config)# interface eth-0-2	Enter the Interface mode
Switch2(config-if)#lldp enable	Enable lldp on the interface
Switch2(config-if)# lldp tlv 8021-org-specific dcbx	Enable dcbx tlv on the interface
Switch2(config-if)# priority-flow-control mode auto	Enable PFC on the interface2，need to negotiating with the peer
Switch2(config-if)# priority-flow-control enable priority 2 3 4	Enable PFC on priorities 2 3 4
Switch2 (config-if)# exit	Exit the Interface mode and enter the Configure mode

7.4 Validation

Switch2# show priority-flow-control

```
DUT1# show priority-flow-control
Port       PFC-enable     PFC-enable on priority
          admin    oper       admin      oper
-----    ------- --------    --------  --------
eth-0-1    on       on          234       234
eth-0-2    auto     off         234       off
eth-0-3    off      off         off       off
eth-0-4    off      off         off       off
eth-0-5    off      off         off       off
eth-0-6    off      off         off       off
eth-0-7    off      off         off       off
eth-0-10   off      off         off       off
eth-0-11   off      off         off       off
eth-0-12   off      off         off       off
eth-0-13   off      off         off       off
eth-0-14   off      off         off       off
```

8 Configuring EFD

8.1 Overview

Elephants versus Mice

Majority of flow are short-lived (mice), but majority of packets are long-lived (elephants).

Mice tend to be bursty and latency-sensitive.

Elephants tend to transfer large amount of data and less concerned about latency.

Elephants can fill up network buffers, which introduce latency for mice.

Elephants flow detect (EFD)

The switch can detect elephant flow's on input port

The flow wich rate above 50Mbps shall be detected as an elephant flow. Packets with same hash field(like: ipda, ipsa, destport, sourceport, sourceportand so on)will be recognized as same flow.

What the switch can do with elephants

Reset flow's color or traffic-class to reduce introduce latency and congestion for mice.

Do ECMP DLB only with elephants flow

Do IPfix only with elephants flow

8.2 Topology

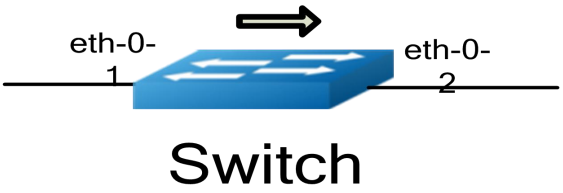

Figure 8-1 Topology

8.3 Configuring EFD detect

Switch# configure terminal	Enter the Configure mode
Switch(config)# interface eth-0-1	Enter the Interface mode
Switch(config-if)# efd enable	Enable efd detect on the interface
Switch(config-if)# exit	Enable dcbx tlv on the interface
Switch(config-if)#mac-address-table 0000.0000.0001 forward eth-0-2 vlan 1	Add fdb for the EFD flow

8.4 Validation

```
Switch# show efd flow information
EFD flow issued at:19:19:47 UTC Mon Nov 30 2015 From:eth-0-1
------------------------------------------------------------
00 00 00 00 00 01 00 00 00 00 00 02 08 00 45 00
00 2e 00 00 00 00 40 ff 51 a0 0a 0a 0a 0a 0a 0a
0a 14 00 01 02 03 04 05 06 07 08 09 0a 0b 0c 0d
0e 0f 10 11 12 13 14 15 16 17 18 19
```

8.5 Configuring EFD traffic-class

Switch# configure terminal	Enter the Configure mode
Switch(config)# efd flow-traffic-class 2	The traffic class will be set to 2, if one flow is detected as EFD flow

8.6 Validation

```
Switch# show qos interface eth-0-2 statistics queue
Queue Transmit-packets      Transmit-Bytes       Drop-packets         Drop-Bytes
UC0   0                     0                    0                    0
```

UC1	0	0	0	0
UC2	11876009	760064576	0	0
UC3	0	0	0	0
UC4	0	0	0	0
UC5	0	0	0	0
UC6	0	0	0	0
UC7	0	0	0	0
MC0	0	0	0	0
MC1	**0**	**0**	**0**	**0**
MC2	**0**	**0**	**0**	**0**
MC3	**0**	**0**	**0**	**0**
SPAN	**0**	**0**	**0**	**0**