# Configuring Port VLAN Mapping on VLANs

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## Port VLAN Mappings

When a service provider has multiple customers connecting to the same physical switch using the same VLAN encapsulation, but they should not be on the same Layer 2 segment, translating the incoming VLAN to a unique VLAN/VNI is the right way to extend the segment.

- Allows multiple customers to use the same VLAN encapsulation on the same switch without sharing a Layer 2 segment.
- Translates incoming VLANs to unique VLANs or VNIs for each customer.
- Supported on Cisco Nexus 9300-EX/FX/FX2/FX3/GX/GX2, C9408 platform switches, and Cisco Nexus 9500 switches with 9700-EX/FX/GX line cards (beginning with Cisco NX-OS Release 10.3(3)F).

Port VLAN mapping enables translation between ingress (incoming) VLANs and local (translated) VLANs on a port.

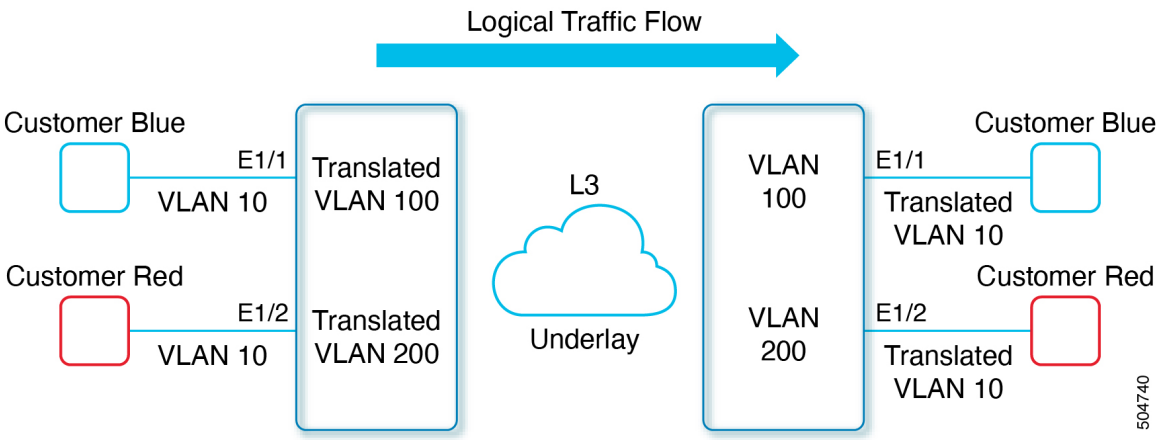
- Traffic arriving on an interface with VLAN translation enabled is mapped from the incoming VLAN to a translated VLAN.
- On the underlay, the inner dot1q is deleted and switched over to the non-VXLAN network.
- On the outgoing interface, traffic is converted back to the original VLAN and egressed out.
- VLAN counters should be checked on the translated VLAN, not on the ingress VLAN.

Example scenario:

- Two customers, Blue and Red, connect to the leaf using VLAN 10 as their encapsulation.
- VLAN 10 for Customer Blue (on interface E1/1) is mapped to VLAN 100.
- VLAN 10 for Customer Red (on interface E1/2) is mapped to VLAN 200.

- On the other leaf, the mapping is reversed: incoming VLAN 100 is mapped to VLAN 10 on Interface E1/1, and VLAN 200 is mapped to VLAN 10 on Interface E1/2.

***Figure 1: Logical Traffic Flow***




# Guidelines and Limitations for Port VLAN Mapping on VLANs

The following are the guidelines and limitations for Port VLAN Mapping.

- Beginning with Cisco NX-OS Release 10.3(3)F, Port VLAN mapping on VLANs is supported on Cisco Nexus 9300-EX/FX/FX2/FX3/GX/GX2, C9408 platform switches and Cisco Nexus 9500 switches with 9700-EX/FX/GX line cards.
- Beginning with Cisco NX-OS Release 10.4(1)F, Port VLAN mapping on VLANs is supported on Cisco Nexus 9332D-H2R switch.
- Beginning with Cisco NX-OS Release 10.4(2)F, Port VLAN mapping on VLANs is supported on Cisco Nexus 93400LD-H1 switch.
- The ingress (incoming) VLAN does not need to be configured on the switch as a VLAN. The translated VLAN must be configured.
- All Layer 2 source address learning and Layer 2 MAC destination lookup occurs on the translated VLAN. See the VLAN counters on the translated VLAN and not on the ingress (incoming) VLAN.
- Port VLAN mapping routing supports configuring an SVI on the translated VLAN.
- The following example shows incoming VLAN 10 being mapped to local VLAN 100:

```
interface ethernet1/1
switchport vlan mapping 10 100
```

- The following is an example of overlapping VLAN for PV translation. In the first statement, VLAN-102 is a translated VLAN. In the second statement, VLAN-102 is the VLAN where it is translated to VLAN-103:

```
interface ethernet1/1
switchport vlan mapping 101 102
switchport vlan mapping 102 103
```

- When adding a member to an existing port channel using the force command, the "mapping enable" configuration must be consistent. For example:

```
Int po 101
switchport vlan mapping enable
switchport vlan mapping 101 10
switchport trunk allowed vlan 10

int eth 1/8
/***No configuration***/
```

**Note** The switchport VLAN mapping enable command is supported only when the port mode is trunk.

- VLAN mapping helps with VLAN localization to a port, scoping the VLANs per port. A typical use case is in the service provider environment where the service provider leaf switch has different customers with overlapping VLANs that come in on different ports. For example, customer A has VLAN 10 coming in on Eth 1/1 and customer B has VLAN 10 coming in on Eth 2/2.
- Port VLAN mapping does not coexist with PVLAN.
- If the **inherit port-profile** command is configured on a PV interface, use the **no inherit port-profile** *<profile name>* command to detach and then execute the **no switchport vlan mapping all** command.
- If the **system dot1q-tunnel transit vlan provider_vlan_list** command is globally configured on the switch, do not set the provider VLAN as the native or access port VLAN for any other trunk or access port on the system. It is expected to choose provider VLANs other than the native VLANs on the system.

# Configure Port VLAN Mapping on VLANs

**Before you begin**

- Ensure that the physical or port channel on which you want to implement VLAN translation is configured as a Layer 2 trunk port.
- Ensure that the translated VLANs are created on the switch and are also added to the Layer 2 trunk ports trunk-allowed VLAN vlan-list.

**Note** As a best practice, do not add the ingress VLAN ID to the switchport allowed vlan-list under the interface.

**Procedure**

**Step 1** Use the **configure terminal** command to enter global configuration mode.

**Example:**

```
switch# configure terminal
```

**Step 2** Use the **interface** *type/port* command to specify the interface that you are configuring.

**Example:**

```
switch(config)# interface Ethernet1/1
```

**Step 3** Use the **[no] switchport vlan mapping enable** command to enable VLAN translation on the switch port.

**Example:**

```
switch(config-if)# [no] switchport vlan mapping enable
```

Enables VLAN translation on the switch port. VLAN translation is disabled by default.

**Note**
Use the **no** form of this command to disable VLAN translation.

**Step 4** Use the **[no] switchport vlan mapping** *vlan-id translated-vlan-id* command to translate a VLAN to another VLAN.

**Example:**

```
switch(config-if)# switchport vlan mapping 10 100
```

Translates a VLAN to another VLAN.

- The range for *vlan-id* is from 1 to 4094. For *translated-vlan-id*, only non-reserved VLAN IDs are allowed.
- You can configure VLAN translation between the ingress (incoming) VLAN and a local (translated) VLAN on a port. For the traffic arriving on the interface where VLAN translation is enabled, the incoming VLAN is mapped to a translated VLAN.

Routing of traffic happens in context of SVI for translated VLAN. On the outgoing interface, where VLAN translation is configured, the traffic is converted to the original VLAN and egresses out.

**Note**
Use the **no** form of this command to clear the mappings between a pair of VLANs.

**Step 5** Use the **no switchport vlan mapping all** command to remove all VLAN mappings configured on the interface.

**Example:**

```
switch(config-if)# no switchport vlan mapping all
```

**Step 6** Use the **copy running-config startup-config** command to copy the running configuration to the startup configuration.

**Example:**

```
switch(config-if)# copy running-config startup-config
```

**Note**
The VLAN translation configuration does not become effective until the switch port becomes an operational trunk port.

**Step 7** Use the **show interface** [*if-identifier*] **vlan mapping** command to display VLAN mapping information for a range of interfaces or for a specific interface.

**Example:**

```
switch# show interface ethernet1/1 vlan mapping
```

This example shows how to configure VLAN translation between (the ingress) VLAN 10 and (the local) VLAN 100. The show vlan counters command output shows the statistic counters as translated VLAN instead of customer VLAN.

```
switch#  configure terminal
switch(config)#  interface ethernet1/1
switch(config-if)#  switchport vlan mapping enable
switch(config-if)#  switchport vlan mapping 10 100
switch(config-if)#  switchport trunk allowed vlan 100
switch(config-if)#  show interface ethernet1/1 vlan mapping
Interface eth1/1:
Original VLAN           Translated VLAN
------------------      ---------------
10                           100

switch(config-if)#  show vlan counters
Vlan Id                              :100
Unicast Octets In                    :292442462
Unicast Packets In                   :1950525
Multicast Octets In                  :14619624
Multicast Packets In                 :91088
Broadcast Octets In                  :14619624
Broadcast Packets In                 :91088
Unicast Octets Out                   :304012656
Unicast Packets Out                  :2061976
L3 Unicast Octets In                 :0
L3 Unicast Packets In                :0
```