CHAPTER 7

Port Channels and Trunking

Use this chapter to troubleshoot port channels and trunking.

This chapter includes the following topics:

Overview

This section includes the following topics:

Port Channel Overview

Port channels aggregate multiple physical interfaces into one logical interface to provide higher bandwidth, load balancing, and link redundancy.

A port channel performs the following functions:

- Increases the aggregate bandwidth on a link by distributing traffic among all functional links in the channel.
- Load balances across multiple links and maintains optimum bandwidth usage.
- Provides high availability. If one link fails, traffic previously carried on this link is switched to the remaining links. If a link goes down in a port channel, the upper protocol is not aware of it. To the upper protocol, the link is still there, although the bandwidth is diminished. The MAC address tables are not affected by link failure.

Trunking Overview

Trunking, also known as VLAN trunking, enables interconnected ports to transmit and receive frames in more than one VLAN, over the same physical link.

Trunking and port channels function as follows:

- Port channels enable several physical links to be combined into one aggregated logical link.
- Trunking enables a link to carry (trunk) multiple VLAN traffic.

Initial Troubleshooting Checklist

Use the following checklist to begin troubleshooting port channel and trunking issues:

Checklist	√
Use the s**how port-channel compatibility-parameters** CLI command to determine port channel requirements.	
Ensure that all interfaces in the port channel have the same destination device for LACP channels. By using Asymmetric Port Channel (APC) feature in the Cisco Nexus 1000V, ports in a ON mode channel can be connected to two different destination devices. **Note** APC is supported only on mode channels. It is not supported for LACP channels.	
Verify that either side of a port channel is connected to the same number of interfaces.	
Verify that each interface is connected to the same type of interface on the other side.	
Verify that all required VLANS on a trunk port are in the allowed VLAN list.	
Verify that all the members trying to form a port channel are on the same module.	
Verify that the port channel configuration is present in the profile used by the physical ports.	
Configure APC if the ports are connected to different upstream switches.	
If the upstream switch does not support port channels, make sure to configure APC in the profile. In addition, make sure that there are two ports at most in the APC.	

The following commands help troubleshoot port channels and trunking:

- **show port-channel summary**
- **show port-channel internal event-history interface port-channel** *channel-number*
- **show port-channel internal event-history interface ethernet** *slot-number*
- **show system internal ethpm event-history interface port-channel** *channel-number*
- **show system internal ethpm event-history interface ethernet** *slot-number*
- **show vlan internal trunk interface ethernet** *slot-number*
- **show vlan internal trunk interface port-channel** *channel-number*
- **debug port-channel error**

- **module vem** *module-number* **execute vemcmd show port**
- **module vem** *module-number* **execute vemcmd show pc**
- **module vem** *module-number* **execute vemcmd show trunk**

Example 7-1 shows output of the **show port-channel summary** command.

Example 7-1 show port-channel summary Command

```
n1000v# show port-channel summary
Flags:  D - Down        P - Up in port-channel (members)
        I - Individual  H - Hot-standby (LACP only)
        s - Suspended   r - Module-removed
        S - Switched    R - Routed
        U - Up (port-channel)
--------------------------------------------------------------------------------
Group Port-       Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
1     Po1(SU)     Eth      NONE      Eth3/4(P)
2     Po2(SU)     Eth      NONE      Eth3/2(P)    Eth3/6(P)
```

Troubleshooting Asymmetric Port Channels

When troubleshooting asymmetric port channels, follow these guidelines:

- Use APC when you want to configure a port channel whose members are connected to two different upstream switches.
- APC depends on Cisco Discovery Protocol (CDP). Make sure CDP is enabled on VSM and upstream switches.
- Physical ports within an APC get assigned subgroup IDs based on the CDP information received from upstream switches.
- A user can manually configure subgroup IDs in interface configuration submode.
- Make sure that you configured sub-group CDP either with a port profile or on the port channel interface.
- Ports in APC will come up only when they are assigned subgroup IDs manually or through CDP.
- Issue the **show cdp neighbors** command on the VSM and check the output.
- Once the ports came up, check that ports are put in the correct sub-groups by issuing the **module vem** *module-number* **execute vemcmd show pc** command on the VEM.
- Use the **debug port-channel trace** command to collect information.

Cannot Create Port Channel

Symptom	Possible Cause	Solution
Cannot create a port channel.	Maximum number of port channels reached for system.	Use the command, **show port-channel summary**, to verify the number of port-channels already configured. You can have a maximum of 256 port channels on the Cisco Nexus 1000V.

Newly Added Interface Does Not Come Online In a Port Channel

Symptom	Possible Cause	Solution
Newly added interface does not come online in a port channel.	Port channel mode is on.	1. Make sure you have the port channel configuration in the port profile (port group) used by that interface. 2. Check if there is a port channel already present on the module that is using the same port profile. If there is, check the running configuration on the port channel and the newly added interface. The interface will not come up if the port channel configurations are different. 3. If the port channel configuration is different, apply the difference on the newly added interface. Remove the port, and then add it back.
	Interface parameters are not compatible with those of the existing port.	Use the procedure, Forcing Port Channel Characteristics onto an Interface, page 7-4, to force the physical interface to take on the parameters of the port channel. Use this procedure only if you want to configure the port channel manually and not through the port profile.

Forcing Port Channel Characteristics onto an Interface

Use this procedure to force the physical interface to take on the characteristics of the port channel. Use this procedure only if you want to configure the port channel manually and not through the port profile.

BEFORE YOUR BEGIN

- You are logged in to the CLI in configuration mode.
- The forced interface must have the same speed, duplex, and flow control settings as the channel group.

DETAILED STEPS

Step 1 From CLI configuration mode, enter the following command.

interface ethernet *slot/port*

You are placed into interface configuration mode.

Example:
```
switch(config)# interface ethernet 1/4
switch(config-if)
```

Step 2 Enter the following command:

channel-group *channel-number* **force**

The physical interface with an incompatible configuration is forced to join the channel group.

Example:
```
switch(config-if)# channel-group 5 force
switch(config-if)
```

Verifying a Port Channel Configuration

Use this procedure to debug port channels configured through a port profile.

BEFORE YOUR BEGIN

- You are logged in to the CLI in configuration mode.

DETAILED STEPS

Step 1 Issue the **show port-profile name** *profile-name* command to verify that you have configured a port channel in the profile.

Step 2 Issue the **show port-channel summary** command.

Step 3 Issue the **debug port-channel trace** command.

VLAN Traffic Does Not Traverse Trunk

Symptom	Possible Cause	Solution
VLAN traffic does not traverse trunk.	VLAN not in allowed VLAN list.	Add the VLAN to allowed VLAN list. Use the **switchport trunk allowed vlan add** *vlan-id* command in the profile used by the interface.