This article describes how to identify and resolve problems that can occur with ports in Cisco NX-OS.

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Information About Troubleshooting Ports

Before a switch can relay frames from one data link to another, the characteristics of the interfaces through which the frames are received and sent must be defined. The configured interfaces can be Ethernet interfaces, the management interface (mgmt0), or VLAN interfaces (SVIs).

Each interface has an associated administrative configuration and operational status as follows:

- The administrative configuration does not change unless you modify it. This configuration has various attributes that you can configure in administrative mode.
- The operational status represents the current status of a specified attribute like the interface speed. This status cannot be changed and is read-only. Some values may not be valid when the interface is down (such as the operation speed).

For a complete description of port modes, administrative states, and operational states, see the *Cisco NX-OS Interfaces Configuration Guide*.

Port Guidelines

Follow these guidelines when you configure a port interface:

- Before you begin configuring a switch, make sure that the modules in the chassis are functioning as designed. Use the **show module** command to verify that a module is OK or active before continuing the configuration.
- When configuring dedicated ports in a port group, follow these port mode guidelines:
  - You can configure only the one port in each four-port group in dedicated mode. The other three ports are not usable and remain shut down.
  - If any of the other three ports are enabled, you cannot configure the remaining port in dedicated mode. The other three ports continue to remain enabled.

License Requirements

There are no licensing requirements for port configuration in Cisco NX-OS.

Initial Troubleshooting Checklist

Begin troubleshooting the port configuration by checking the following issues:

Checklist	Check off
Check the physical media to ensure that there are no damaged parts.	
Verify that the SFP (small form-factor pluggable) devices in use are those authorized by Cisco and that they are not faulty.	
Verify that you have enabled the port by using the **no shutdown** command.	
Use the **show interface** command to verify the state of the interface. See the *Cisco NX-OS Interfaces Configuration Guide* for reasons why a port may be in a down operational state.	
Verify that you have configured a port as dedicated and make sure that you have not connected to the other three ports in the port group.	

Viewing Port Information

You can use the **show interface counters** command to view port counters. Typically, you only observe counters while actively troubleshooting, in which case you should first clear the counters to create a baseline. The values, even if they are high for certain counters, can be meaningless for a port that has been active for an extended period. Clearing the counters provides a better idea of the link behavior as you begin to troubleshoot.

Use one of the following commands to clear all port counters or the counters for specified interfaces:

- **clear counters interface all**
- **clear counters interface** *range*

The counters can identify synchronization problems by displaying a significant disparity between received and transmitted frames.

Use the following commands to gather more information about ports:

- **show interface status**
- **show interfaces capabilities**
- **show udld**
- **show tech-support udld**

Troubleshooting Port States from the CLI

To display complete information for an interface, use the **show interface** command. In addition to the state of the port, this command displays the following:

- Speed
- Trunk VLAN status
- Number of frames sent and received
- Transmission errors, including discards, errors, and invalid frames

Example: show interface Command Output displays the **show interface** command output.

Example: show interface Command Output

```
switch(config)# show interface ethernet 2/45
Ethernet2/45 is down (Administratively down)
  Hardware is 10/100/1000 Ethernet, address is 0019.076c.4dd8 (bia 0019.076c.4dd8)
  MTU 1500 bytes, BW 1000000 Kbit, DLY 10 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA
  auto-duplex, auto-speed
  Beacon is turned off
  Auto-Negotiation is turned on
  Input flow-control is off, output flow-control is off
  Auto-mdix is turned on
  Last clearing of "show interface" counters never
```

```
  1 minute input rate 0 bytes/sec, 0 packets/sec
  1 minute output rate 0 bytes/sec, 0 packets/sec
  L3 Switched:
    input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
  Rx
    0 input packets 0 unicast packets 0 multicast packets
    0 broadcast packets 0 jumbo packets 0 storm suppression packets
    0 bytes
  Tx
    0 output packets 0 multicast packets
    0 broadcast packets 0 jumbo packets
    0 bytes
    0 input error 0 short frame 0 watchdog
    0 no buffer 0 runt 0 CRC 0 ecc
    0 overrun  0 underrun 0 ignored 0 bad etype drop
    0 bad proto drop 0 if down drop 0 input with dribble
    0 output error 0 collision 0 deferred
    0 late collision 0 lost carrier 0 no carrier
    0 babble
    0 Rx pause 0 Tx pause 0 reset
Receive data field Size is 2112
```

Port-Interface Issues

This section includes symptoms and solutions for troubleshooting ports.

You Cannot See The Interface

You may have a problem where an interface does not show up on your device because of the VDC configuration.

Symptom	Possible Cause	Solution
You cannot see the interface.	The interface has been allocated to a different VDC.	Log in as network-admin and use the **show vdc membership** command to determine which VDC owns the interface.

The Interface Configuration Has Disappeared

You may have a problem where your interface configuration disappears.

Symptom	Possible Cause	Solution
The interface configuration has disappeared.	The interface was reallocated to a different VDC.	Cisco NX-OS removes the interface configuration when you reallocate an interface to a different VDC. You must reconfigure the interface.
	The interface mode has changed to or from the	Cisco NX-OS removes the interface configuration when you switch between Layer 2 and Layer 3 port

	switchport mode.	mode. You must reconfigure the interface.

You Cannot Enable an Interface

You may have a problem when enabling an interface.

Symptom	Possible Cause	Solution
You cannot enable an interface.	The interface is part of a a dedicated port group.	You cannot enable the other three ports in a port group if one port is dedicated. Use the **show running-config interface** CLI command to verify the rate mode setting.
	The interface configuration is incompatible with a remote port.	Use the **show interface capabilities** command on both ports to determine if both ports have the same capabilities. Modify the configuration as needed to make the ports compatible.
	The Layer 2 port is not associated with an access VLAN or the VLAN is suspended.	Use the **show interface brief** command to see if the interface is configured in a VLAN. Use the **show vlan brief** command to determine the status of the VLAN. Use the **state active** command in VLAN configuration mode to configure the VLAN as active.
	An incorrect SFP is connected to the port.	Use the **show interface brief** command to see if you are using an incorrect transceiver. Replace with a Cisco-supported SFP.

You Cannot Configure a Dedicated Port

You may have a problem when trying to configure a port as dedicated.

Symptom	Possible Cause	Solution
You cannot configure a dedicated port.	The other three ports in the port group are not shut down.	Use the **shutdown** command in interface configuration mode to disable the other three ports in the port group.
	One or more of the other three ports in the port group are not configured in the same VDC.	Use the **show vdc membership** command to find out which ports are in a different VDC.
	The port is not the first port in the port group.	You can only set the first port in a port group to the dedicated mode.

A Port Remains in a Link Failure or Not Connected State

You may have a problem with ports or links becoming operational.

Symptom	Possible Cause	Solution
	The port connection is bad.	

A port remains in a link-failure state.		Use the **show port internal info** command to verify the port status is in link-failure. Verify the type of media in use. Is it copper or optical, single-mode (SM), or multimode (MM)? Verify that the media is not broken or damaged. Is the LED on the switch green? Use the **shutdown** command followed by the **no shutdown** command to disable and enable the port. If this problem persists, try moving the connection to a different port on the same or another module.
	There is no signal because of a transit fault in the small form-factor pluggable (SFP) or the SFP may be faulty.	When this problem occurs, the port stays in a transit port state and you see no signal. There is no synchronization at the MAC level. The problem may be related to the port speed setting or autonegotiation. Verify that the SFP on the interface is seated properly. If reseating the SFP does not resolve the issue, replace the SFP or try another port on the switch.
	The link is stuck in the initialization state or the link is in a point-to-point state.	Use the **show logging** command to check for a "Link Failure, Not Connected system" message. Use the **shutdown** command followed by the **no shutdown** command to disable and enable the port. If this problem persists, try moving the connection to a different port on the same or another module.

An Unexpected Link Flapping Occurs

When a port is flapping, it cycles through the following states, in this order, and then starts over again:

1. Initializing-The link is initializing.
2. Offline-The port is offline.
3. Link failure or not connected-The physical layer is not operational and there is no active device connection.

When you are troubleshooting an unexpected link flapping, you should know the following information:

- Who initiated the link flap.
- The actual link down reason.

Symptom	Possible Cause	Solution
An unexpected link flapping	The bit rate exceeds the threshold and puts the port into	Use the **shutdown** command followed by the **no shutdown** command to return the port to the normal state.

occurs.	the errDisabled state.	
	A problem in the system triggers the link flap action by the end device. Some of the causes are as follows: • A packet drop in the switch occurs, because of either a hardware failure or an intermittent hardware error such as an X-bar sync loss. • A packet drop results from a software error. • A control frame is erroneously sent to the device.	Determine the link flap reason as indicated by the MAC driver. Use the debug facilities on the end device to troubleshoot the problem. An external device may choose to reinitialize the link when it encounters the error. In such cases, the method of reinitializing the link varies by device.

A Port Is in the ErrDisabled State

The ErrDisabled state indicates that the switch detected a problem with the port and disabled the port. This state could be caused by a flapping port or a high amount of bad frames (CRC errors), which could indicate a problem with the media.

Symptom	Possible Cause	Solution
A port is in the ErrDisabled state.	The port is flapping.	Use the Verify the ErrDisable State Using the CLI procedure to verify the SFP, cable, and connections.
	The device detected a high amount of bad frames (CRC errors), which might indicate a problem with the media.	

Verifying the ErrDisable State Using the CLI

To verify the ErrDisable state using the CLI, follow these steps:

1. Use the **show interface** command to verify that the switch detected a problem and disabled the port.

```
switch# show interface e1/14
e1/7 is down (errDisabled)
```

2. Check cables, SFPs, and optics.

3. View information about the internal state transitions of the port.

```
switch# show system internal ethpm event-history interface e1/7
>>>>FSM: <e1/7> has 86 logged transitions<<<<<
1) FSM:<e1/7> Transition at 647054 usecs after Tue Jan  1 22:44..
    Previous state: [ETH_PORT_FSM_ST_NOT_INIT]
    Triggered event: [ETH_PORT_FSM_EV_MODULE_INIT_DONE]
    Next state: [ETH_PORT_FSM_ST_IF_INIT_EVAL]
2) FSM:<e1/7> Transition at 647114 usecs after Tue Jan  1 22:43..
    Previous state: [ETH_PORT_FSM_ST_INIT_EVAL]
    Triggered event: [ETH_PORT_FSM_EV_IE_ERR_DISABLED_CAP_MISMATCH]
    Next state: [ETH_PORT_FSM_ST_IF_DOWN_STATE]
```

In this example, port ethernet 1/7 entered the ErrDisabled state because of a capability mismatch, or "CAP MISMATCH."

4. Display the switch log file and view a list of port state changes.

```
switch# show logging logfile
 . . .
Jan  4 06:54:04 switch %PORT_CHANNEL-5-CREATED: port-channel 7 created
Jan  4 06:54:24 switch %PORT-5-IF_DOWN_PORT_CHANNEL_MEMBERS_DOWN: Interface port-channel 7 is down
Jan  4 06:54:40 switch %PORT_CHANNEL-5-PORT_ADDED: e1/8 added to port-channel 7
Jan  4 06:54:56 switch %PORT-5-IF_DOWN_ADMIN_DOWN: Interface e1/7 is down (Admnistratively down)
Jan  4 06:54:59 switch %PORT_CHANNEL-3-COMPAT_CHECK_FAILURE: speed is not compatible
Jan 4 06:55:56 switch%PORT_CHANNEL-5-PORT_ADDED: e1/7 added to port-channel 7
```

In this example, an error was recorded when someone attempted to add port e1/7 to port channel 7. The port was not configured identically to port channel 7, so the attempt failed.

See Also

Cisco NX-OS/IOS Interface Comparison

Further Reading

The following links contain further information on this topic from Cisco.com:

Cisco Nexus 7000 Series NX-OS Interfaces Configuration Guide

External Links

External links contain content developed by external authors. Cisco does not review this content for accuracy.

NX-OS Intro part 5 -Port channels (video)

packetlife.net - Errdisable autorecovery