Configuring Layer 2 Interfaces

This chapter describes how to configure Layer 2 interfaces on Cisco NX-OS devices.

Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at https://tools.cisco.com/bugsearch/ and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information"chapter or the Feature History table in this chapter.

Feature History for Configuring Layer 2 Interfaces

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Table 1: Feature History for Configuring Layer 2 Interfaces

Feature Name	Release	Feature Information
Native VLAN tagging on Trunk Ports	6.2(10)	Added support for the **switchport trunk native vlan tag** command and added the **exclude control** keywords to the **vlan dot1q tag native** command.

Feature Name	Release	Feature Information
Display policy errors on interfaces and vlans	6.2(2)	Added the **show interface status error policy** command to display errors on interfaces and VLANs that are inconsistent with hardware policies.
Clear SNMP counters from the interface	6.2(2)	Updated the **clear counters interface** command to include the **snmp** keyword that provides an option to clear SNMP values from the interface.
SVI autostate disable	6.2(2)	Added the **no autostate** command that allows an SVI to be kept up even if no interface is up in the corresponding VLAN.
Slow drain device detection and congestion avoidance	6.1(1)	Added configuration for slow drain device detection and avoiding congestion.
Default interfaces	5.2(1)	Added the **default interface** command to clear configuration of multiple interfaces.
SVI autostate exclude	5.2(1)	Added the **switchport autostate exclude** command to prevent a port's state from affecting the up or down state of the SVI.
Three configurable sampling intervals for interface statistics	4.2(1)	Added the **load-interval** command.

Information About Layer 2 Interfaces

Note From Cisco NX-OS Release 5.2, the Cisco Nexus 7000 Series devices support FabricPath Layer 2 interfaces. See the Cisco Nexus 7000 Series NX-OS FabricPath Command Reference for complete information about the FabricPath feature and interfaces.

From Cisco NX-OS Release 5.1, a Layer 2 port can function as either one of the following:

- A trunk port
- An access port
- A private VLAN port (see the for more information about private VLANs)
- A FabricPath port (see the Cisco Nexus 7000 Series NX-OS FabricPath Configuration Guide for information about FabricPath)

From Cisco NX-OS Release 5.2(1), a Layer 2 port can also function as a shared interface. You cannot configure an access interface as a shared interface. See the for information about shared interfaces.

A Layer 2 port can function as either a trunk port, an access port, or a private VLAN port.

Note

- From Cisco NX-OS Release 6.1, the slow drain device detection and congestion avoidance mechanism is supported on F series I/O modules that carry the Fabric Channel over Ethernet (FCoE) traffic. See the "Configuring Slow Drain Device Detection and Congestion Avoidance" section for more information about configuring slow drain device detection and congestion avoidance on the Cisco Nexus 7000 Series platform.

  You can configure Layer 2 switching ports as access or trunk ports. Trunks carry the traffic of multiple VLANs over a single link and allow you to extend VLANs across an entire network. All Layer 2 switching ports maintain media access control (MAC) address tables.

- A Layer 2 port can function as either a trunk port, an access port, or a private VLAN port. See the for more information about private VLANs.

Access and Trunk Interfaces

Note Cisco NX-OS device supports only IEEE 802.1Q-type VLAN trunk encapsulation.

A Layer 2 port can be configured as an access or a trunk port as follows:

- An access port can have only one VLAN configured on that port; it can carry traffic for only one VLAN.
- A trunk port can have two or more VLANs configured on that port; it can carry traffic for several VLANs simultaneously.

By default, all ports on the device are Layer 3 ports.

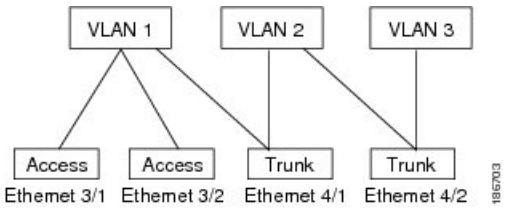
You can make all ports Layer 2 ports using the setup script or by entering the **system default switchport** command. See the for information about using the setup script. To configure the port as a Layer 2 port using the CLI, use the **switchport** command.

All ports in one trunk must be in the same virtual device context (VDC). See the for information about VDCs.

All ports in the same trunk must be in the same VDC, and trunk ports cannot carry VLANs from different VDCs.

The figure below shows how you can use trunk ports in the network. The trunk port carries traffic for two or more VLANs.

Figure 1: Trunk and Access Ports and VLAN Traffic



See the for information about VLANs.

In order to correctly deliver the traffic on a trunk port with several VLANs, the device uses the IEEE 802.1Q encapsulation, or tagging, method (see the "IEEE 802.1Q Encapsulation" section for more information).

Note See the for information about subinterfaces on Layer 3 interfaces.

To optimize the performance on access ports, you can configure the port as a host port. Once the port is configured as a host port, it is automatically set as an access port, and channel grouping is disabled. Use the host designation to decrease the time that it takes the designated port to begin to forward packets.

Only an end station can be set as a host port; you will receive an error message if you attempt to configure other ports as hosts.

If an access port receives a packet with an 802.1Q tag in the header other than the access VLAN value, that port drops the packet without learning its MAC source address.

A Layer 2 interface can function as either an access port or a trunk port; it cannot function as both port types simultaneously.

When you change a Layer 2 interface back to a Layer 3 interface, that interface loses all the Layer 2 configuration and resumes the default VLAN configurations.

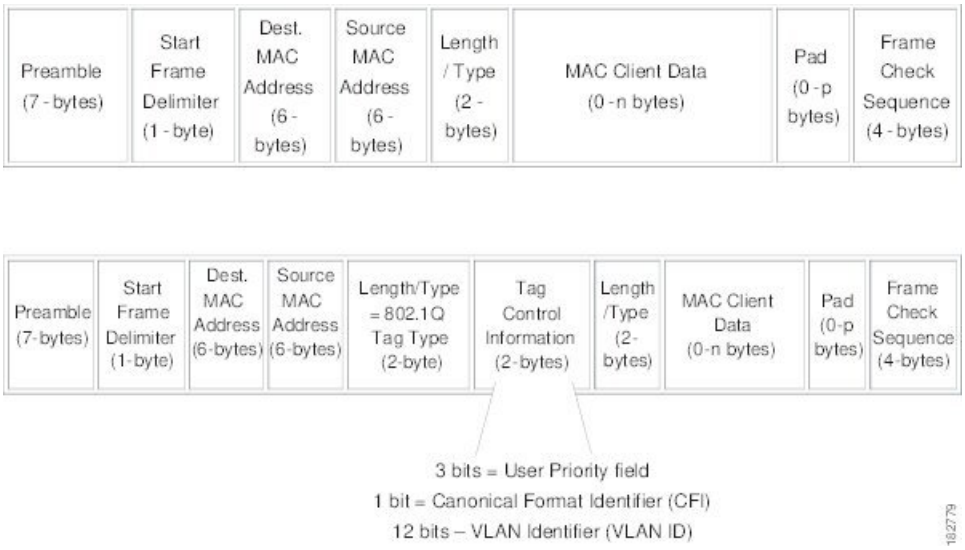
IEEE 802.1Q Encapsulation

Note For information about VLANs, see the .

A trunk is a point-to-point link between the switch and another networking device. Trunks carry the traffic of multiple VLANs over a single link and allow you to extend VLANs across an entire network.

To correctly deliver the traffic on a trunk port with several VLANs, the device uses the IEEE 802.1Q encapsulation, or tagging, method that uses a tag that is inserted into the frame header (see the figure below). This tag carries information about the specific VLAN to which the frame and packet belong. This method allows packets that are encapsulated for several different VLANs to traverse the same port and maintain traffic separation between the VLANs. Also, the encapsulated VLAN tag allows the trunk to move traffic end-to-end through the network on the same VLAN.

Figure 2: Header Without and With 802.1Q Tag



Access VLANs

Note If you assign an access VLAN that is also a primary VLAN for a private VLAN, all access ports with that access VLAN will also receive all the broadcast traffic for the primary VLAN in the private VLAN mode.

See the for complete information on private VLANs.

When you configure a port in access mode, you can specify which VLAN will carry the traffic for that interface. If you do not configure the VLAN for a port in access mode, or an access port, the interface carries traffic for the default VLAN (VLAN1).

You can change the access port membership in a VLAN by specifying the new VLAN. You must create the VLAN before you can assign it as an access VLAN for an access port. If you change the access VLAN on an access port to a VLAN that is not yet created, the system shuts that access port down.

If an access port receives a packet with an 802.1Q tag in the header other than the access VLAN value, that port drops the packet without learning its MAC source address.

Native VLAN IDs for Trunk Ports

A trunk port can carry nontagged packets simultaneously with the 802.1Q tagged packets. When you assign a default port VLAN ID to the trunk port, all untagged traffic travels on the default port VLAN ID for the trunk port, and all untagged traffic is assumed to belong to this VLAN. This VLAN is referred to as the native VLAN ID for a trunk port. That is, the native VLAN ID is the VLAN that carries untagged traffic on trunk ports.

Note Native VLAN ID numbers must match on both ends of the trunk.

The trunk port sends an egressing packet with a VLAN that is equal to the default port VLAN ID as untagged; all the other egressing packets are tagged by the trunk port. If you do not configure a native VLAN ID, the trunk port uses the default VLAN.

Note You cannot use a Fibre Channel over Ethernet (FCoE) VLAN as a native VLAN for an Ethernet trunk switchport.

Tagging Native VLAN Traffic

The Cisco software supports the IEEE 802.1Q standard on trunk ports. In order to pass untagged traffic through the trunk ports, you must create a VLAN that does not tag any packets (or you can use the default VLAN). Untagged packets can pass through trunk ports and access ports.

However, all packets that enter the device with an 802.1Q tag that matches the value of the native VLAN on the trunk are stripped of any tagging and egress the trunk port as untagged packets. This situation can cause problems because you may want to retain the tagging on packets on the native VLAN for the trunk port.

You can configure the device to drop all untagged packets on the trunk ports and to retain the tagging of packets entering the device with 802.1Q values that are equal to that of the native VLAN ID. All control traffic still passes on the native VLAN. This configuration is global; trunk ports on the device either do or do not retain the tagging for the native VLAN.

From Cisco NX-OS Release 6.2(10), you can specify whether control and data packets are tagged or untagged using the **switchport trunk native vlan tag** command at the port level. For example, by using the **switchport trunk native vlan tag exclude control** command, you can specify that data packets are tagged and control packets are untagged.

Note When a port-level configuration is applied, the global configuration for native VLAN tagging will no longer take effect on that port. Port-level configurations take priority over global configurations.

See the Cisco Nexus 7000 Series NX-OS Interfaces Command Reference for more information on the **switchport trunk native vlan tag** command.

Allowed VLANs

By default, a trunk port sends traffic to and receives traffic from all VLANs. All VLAN IDs are allowed on each trunk. However, you can remove VLANs from this inclusive list to prevent traffic from the specified VLANs from passing over the trunk. Later, you can add any specific VLANs that you may want the trunk to carry traffic for back to the list.

To partition the Spanning Tree Protocol (STP) topology for the default VLAN, you can remove VLAN1 from the list of allowed VLANs. Otherwise, VLAN1, which is enabled on all ports by default, will have a very big STP topology, which can result in problems during STP convergence. When you remove VLAN1, all data traffic for VLAN1 on this port is blocked, but the control traffic continues to move on the port.

See the for more information about STP.

From Cisco Release 5.2, you can change the block of VLANs reserved for internal use. See the for more information about changing the reserved VLANs.

Default Interfaces

The default interface feature allows you to clear the existing configuration of multiple interfaces such as Ethernet, loopback, VLAN network, port-channel, and tunnel interfaces. All user configuration under a specified interface will be deleted. You can optionally create a checkpoint before clearing the interface configuration so that you can later restore the deleted configuration. You can use the default interface feature to clear the configured parameters for both physical and logical interfaces such as the Ethernet, loopback, VLAN network, tunnel, and the port-channel interface.

Note The default interface feature is not supported for management interfaces because the device could go to an unreachable state.

Note A maximum of eight ports can be selected for the default interface. The default interfaces feature is not supported for management interfaces because the device could go to an unreachable state.

Switch Virtual Interface and Autostate Behavior

In Cisco NX-OS, a switch virtual interface (SVI) represents a logical interface between the bridging function and the routing function of a VLAN in the device.

The operational state of this interface is governed by the state of the various ports in its corresponding VLAN. An SVI interface on a VLAN comes up when at least one port in that VLAN is in the Spanning Tree Protocol (STP) forwarding state. Similarly, this interface goes down when the last STP forwarding port goes down or goes to another STP state.

SVI Autostate Exclude

Typically, when a VLAN interface has multiple ports in the VLAN, the SVI goes to the down state when all the ports in the VLAN go down. You can use the SVI autostate exclude feature to exclude specific ports and port channels while defining the status of the SVI (up or down) even if it belongs to the same VLAN. For example, even if the excluded port or port channel is in the up state and other ports are in the down state in the VLAN, the SVI state is changed to down.

You can configure the SVI autostate Exclude feature on an Ethernet interface or a port channel. You can use the autostate Exclude option to enable or disable the port from bringing up or down the SVI calculation and applying it to all VLANs that are enabled on the selected port. You can also use the SVI autostate Exclude VLAN feature to exclude a VLAN from the autostate excluded interface.

Note You can use the SVI autostate exclude feature only for switched physical Ethernet ports and port channels.

SVI Autostate Disable

You can also use the SVI for inband managment of a device. Specifically, you can configure the autostate disable feature to keep an SVI up even if no interface is up in the corresponding VLAN. You can configure this feature for the system (for all SVIs) or for an individual SVI.

High Availability

The software supports high availability for Layer 2 ports.

Note See the Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide for complete information about high availability features.

Virtualization Support

The device supports virtual device contexts (VDCs).

All ports in the same trunk must be in the same VDC, and trunk ports cannot carry VLANs from different VDCs.

Note See the for complete information about VDCs and assigning resources.

Prerequisites for Layer 2 Interfaces

Layer 2 interfaces have the following prerequisites:

- You are logged onto the device.
- You must configure the port as a Layer 2 port before you can use the switchport mode command. By default, all ports on the device are Layer 3 ports.

Default Settings for Layer 2 Interfaces

Table 2: Default Access and Trunk Port Mode Parameters

Parameter	Default
Switchport mode	Access
Allowed VLANs	1 to 3967, 4048 to 4094
Access VLAN ID	VLAN1
Native VLAN ID	VLAN1
Native VLAN ID tagging	Disabled
Administrative state	Shut
SVI autostate	Enabled

Guidelines and Limitations for Layer 2 Interfaces

VLAN trunking has the following configuration guidelines and limitations:

- A port can be either a Layer 2 or a Layer 3 interface; it cannot be both simultaneously.
- QSFP-100G-DR-S and QSFP-100G-FR-S transceivers does not support breakout.
- You can view a link-up time difference of few seconds for QSFP-100G-DR-S transceiver.
- When you change a Layer 3 port to a Layer 2 port or a Layer 2 port to a Layer 3 port, all layer-dependent configuration is lost. When you change an access or trunk port to a Layer 3 port, all information about the access VLAN, native VLAN, allowed VLANs, and so forth, is lost.
- Do not connect devices with access links because access links may partition a VLAN.
- When connecting Cisco devices through an 802.1Q trunk, make sure that the native VLAN for an 802.1Q trunk is the same on both ends of the trunk link. If the native VLAN on one end of the trunk is different from the native VLAN on the other end, spanning tree loops might result.
- Disabling spanning tree on the native VLAN of an 802.1Q trunk without disabling spanning tree on every VLAN in the network can cause spanning tree loops. You must leave spanning tree enabled on the native VLAN of an 802.1Q trunk. If you cannot leave spanning tree enabled, you must disable spanning tree on every VLAN in the network. Make sure that your network has no physical loops before you disable spanning tree.
- When you connect two Cisco devices through 802.1Q trunks, the devices exchange spanning tree bridge protocol data units (BPDUs) on each VLAN allowed on the trunks. The BPDUs on the native VLAN of the trunk are sent untagged to the reserved IEEE 802.1D spanning tree multicast MAC address (01-80-C2-00-00-00). The BPDUs on all other VLANs on the trunk are sent tagged to the reserved Cisco Shared Spanning Tree (SSTP) multicast MAC address (01-00-0c-cc-cc-cd).
- Non-Cisco 802.1Q devices maintain only a single instance of spanning tree (the Mono Spanning Tree) that defines the spanning tree topology for all VLANs. When you connect a Cisco switch to a non-Cisco switch through an 802.1Q trunk, the Mono Spanning Tree of the non-Cisco switch and the native VLAN spanning tree of the Cisco switch combine to form a single spanning tree topology known as the Common Spanning Tree (CST).
- Because Cisco devices transmit BPDUs to the SSTP multicast MAC address on VLANs other than the native VLAN of the trunk, non-Cisco devices do not recognize these frames as BPDUs and flood them on all ports in the corresponding VLAN. Other Cisco devices connected to the non-Cisco 802.1Q cloud receive these flooded BPDUs. This BPDU reception allows Cisco switches to maintain a per-VLAN spanning tree topology across a cloud of non-Cisco 802.1Q devices. The non-Cisco 802.1Q cloud that separates the Cisco devices is treated as a single broadcast segment between all devices connected to the non-Cisco 802.1Q cloud through 802.1Q trunks.
- Make certain that the native VLAN is the same on all of the 802.1Q trunks that connect the Cisco devices to the non-Cisco 802.1Q cloud.
- If you are connecting multiple Cisco devices to a non-Cisco 802.1Q cloud, all of the connections must be through 802.1Q trunks. You cannot connect Cisco devices to a non-Cisco 802.1Q cloud through access ports because doing so places the access port on the Cisco device into the spanning tree “port inconsistent” state and no traffic will pass through the port.

- You can group trunk ports into port-channel groups, but all trunks in the group must have the same configuration. When a group is first created, all ports follow the parameters set for the first port to be added to the group. If you change the configuration of one of these parameters, the device propagates that setting to all ports in the group, such as the allowed VLANs and the trunk status. For example, if one port in a port group ceases to be a trunk, all ports cease to be trunks.
- If you try to enable 802.1X on a trunk port, an error message appears, and 802.1X is not enabled. If you try to change the mode of an 802.1X-enabled port to trunk, the port mode is not changed.
- Changing the native VLAN on an access port or trunk port will flap the interface. This behavior is expected.

Configuring Access and Trunk Interfaces

If you are familiar with the Cisco IOS CLI, be aware that the Cisco NX-OS commands for this feature might differ from the Cisco IOS commands that you would use.

All VLANs on a trunk must be in the same VDC.

Configuring a VLAN Interface as a Layer 2 Access Port

You can configure a Layer 2 port as an access port. An access port transmits packets on only one, untagged VLAN. You specify which VLAN traffic that the interface carries, which becomes the access VLAN. If you do not specify a VLAN for an access port, that interface carries traffic only on the default VLAN. The default VLAN is VLAN1.

The VLAN must exist before you can specify that VLAN as an access VLAN. The system shuts down an access port that is assigned to an access VLAN that does not exist.

Before you begin

Ensure that you are configuring a Layer 2 interface.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** {{**type** *slot/port*} | {**port-channel** *number*}}	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport mode** {**access** | **trunk**}	Sets the interface as a nontrunking nontagged, single-VLAN Layer 2 interface. An access port can carry traffic in one VLAN only. By default, an access port carries traffic for VLAN1; to set the access port to carry traffic for a different VLAN, use the **switchport access vlan** command.
Step 4	switch(config-if)# **switchport access vlan** *vlan-id*	Specifies the VLAN for which this access port will carry traffic. If you do not enter this

	Command or Action	Purpose
		command, the access port carries traffic on VLAN1 only; use this command to change the VLAN for which the access port carries traffic.
Step 5	switch(config-if)# **exit**	Exits the interface mode.
Step 6	switch(config)# **exit**	Exits global configuration mode.
Step 7	(Optional) switch# **show interface**	Displays the interface status and information.
Step 8	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 9	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 10	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to set Ethernet 3/1 as a Layer 2 access port that carries traffic for VLAN 5 only:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport mode access
switch(config-if)# switchport access vlan 5
```

Configuring Access Host Ports

Note You should apply the **switchport host** command only to interfaces that are connected to an end station.

You can optimize the performance of access ports that are connected to end stations by simultaneously setting that port as an access port. An access host port handles the STP like an edge port and immediately moves to the forwarding state without passing through the blocking and learning states. Configuring an interface as an access host port also disables port channeling on that interface.

Note See the for information about port-channel interfaces

Before you begin

Ensure that you are configuring the correct interface to an interface that is an end station.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** *type slot/port*	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport host**	Sets the interface to be an access host port, which immediately moves to the spanning tree forwarding state and disables port channeling on this interface. **Note** Apply this command only to end stations.
Step 4	switch(config-if)# **exit**	Exits the interface mode.
Step 5	switch(config)# **exit**	Exits the configuration mode.
Step 6	(Optional) switch# **show interface**	Displays the interface status and information.
Step 7	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 8	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 9	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to set Ethernet 3/1 as a Layer 2 access port with PortFast enabled and port channel disabled:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport host
```

Configuring a Trunk Port

You can configure a Layer 2 port as a trunk port. A trunk port transmits untagged packets for one VLAN plus encapsulated, tagged, packets for multiple VLANs. (See the "IEEE 802.1Q Encapsulation" section for information about encapsulation.)

Note The device supports 802.1Q encapsulation only.

Before you begin

Before you configure a trunk port, ensure that you are configuring a Layer 2 interface.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** {{**type** *slot/port*} | {**port-channel** *number*}}	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport mode** {**access** | **trunk**}	Sets the interface as a Layer 2 trunk port. A trunk port can carry traffic in one or more VLANs on the same physical link (VLANs are based on the trunk-allowed VLANs list). By default, a trunk interface can carry traffic for all VLANs. To specify that only certain VLANs are allowed on the specified trunk, use the **switchport trunk allowed vlan** command.
Step 4	switch(config-if)# **exit**	Exits the interface mode.
Step 5	switch(config)# **exit**	Exits the configuration mode.
Step 6	(Optional) switch# **show interface**	Displays the interface status and information.
Step 7	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 8	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy

	Command or Action	Purpose
		programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 9	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to set Ethernet 3/1 as a Layer 2 trunk port:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport mode trunk
```

Configuring the Native VLAN for 802.1Q Trunking Ports

You can configure the native VLAN for 802.1Q trunk ports. If you do not configure this parameter, the trunk port uses the default VLAN as the native VLAN ID.

Note You cannot configure an FCoE VLAN as a native VLAN for an Ethernet interface.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** {{**type** *slot/port*} | {**port-channel** *number*}}	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport trunk native vlan** *vlan-id*	Sets the native VLAN for the 802.1Q trunk. Valid values are from 1 to 4094, except those VLANs reserved for internal use. The default value is VLAN1.
Step 4	switch(config-if)# **exit**	Exits the interface mode.
Step 5	switch(config)# **exit**	Exits global configuration mode.
Step 6	switch# **show vlan**	Displays the status and information of VLANs.
Step 7	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.

	Command or Action	Purpose
Step 8	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 9	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to set the native VLAN for the Ethernet 3/1, Layer 2 trunk port to VLAN 5:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport trunk native vlan 5
```

Configuring the Allowed VLANs for Trunking Ports

You can specify the IDs for the VLANs that are allowed on the specific trunk port.

The **switchport trunk allowed vlan** *vlan-list* command replaces the current VLAN list on the specified port with the new list. You are prompted for confirmation before the new list is applied.

If you are doing a copy and paste of a large configuration, you might see some failures because the CLI is waiting for a confirmation before accepting other commands. To avoid this problem, you can disable prompting by using the **terminal dont-ask** command before you paste the configuration.

Before you begin

Before you configure the allowed VLANs for the specified trunk ports, ensure that you are configuring the correct interfaces and that the interfaces are trunks.

From Cisco Release 5.2, you can change the block of VLANs reserved for internal use. See the for more information about changing the reserved VLANs.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **interface** {{**type** *slot/port*} | {**port-channel** *number*}}	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport trunk allowed vlan** {*vlan-list* | **add** *vlan-list* | **all** | **except** *vlan-list* | **none** | **remove** *vlan-list*}	Sets the allowed VLANs for the trunk interface. The default is to allow all VLANs on the trunk interface: 1 to 3967 and 4048 to 4094. VLANs

	Command or Action	Purpose
		3968 to 4047 are the default VLANs reserved for internal use by default. By default, all VLANs are allowed on all trunk interfaces. From Cisco Release 5.2(1), the default reserved VLANs are 3968 to 4094, and you can change the block of reserved VLANs. See the for more information. **Note** You cannot add internally allocated VLANs as allowed VLANs on trunk ports. The system returns a message if you attempt to list an internally allocated VLAN as an allowed VLAN.
Step 4	switch(config-if)# **exit**	Exits the interface mode.
Step 5	switch(config)# **exit**	Exits the configuration mode.
Step 6	switch# **show vlan**	Displays the status and information of VLANs.
Step 7	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 8	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 9	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to add VLANs 15 to 20 to the list of allowed VLANs on the Ethernet 3/1, Layer 2 trunk port:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport trunk allowed vlan 15-20
```

Configuring a Default Interface

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **default interface** *int-if* [**checkpoint** *name*]	Deletes the configuration of the interface and restores the default configuration. Use the **?** keyword to display the supported interfaces. Use the **checkpoint** keyword to store a copy of the running configuration of the interface before clearing the configuration.
Step 3	switch(config)# **exit**	Exits global configuration mode.
Step 4	switch# **show interface**	Displays the interface status and information.
Step 5	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 6	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.

Example

This example shows how to delete the configuration of an Ethernet interface while saving a checkpoint of the running configuration for rollback purposes:

```
switch# configure terminal
switch(config)# default interface ethernet 3/1 checkpoint test8
.......Done
```

Configuring SVI Autostate Exclude

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.

	Command or Action	Purpose
Step 2	switch(config)# **interface** {{**type** *slot/port*} | {**port-channel** *number*}}	Specifies an interface to configure, and enters interface configuration mode.
Step 3	switch(config-if)# **switchport**	Sets the interface as a Layer 2 interface.
Step 4	switch(config-if)# [**no**] **switchport autostate exclude**	Excludes this port from the VLAN interface link-up calculation when there are multiple ports in the VLAN. To revert to the default settings, use the **no** form of this command.
Step 5	switch(config-if)# [**no**] **switchport autostate exclude vlan** *vlan id*	Excludes a vlan or a set of vlans from the autostate-excluded interface. This will help to minimize any disruption to the system. To revert to the default settings, use the **no** form of this command.
Step 6	switch(config-if)# **exit**	Exits the interface mode.
Step 7	switch(config)# **exit**	Exits global configuration mode.
Step 8	(Optional) switch# **show running-config interface** {{**type** *slot/port*} | {**port-channel** *number*}	Displays configuration information about the specified interface.
Step 9	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 10	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 11	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to exclude a port from the VLAN interface link-up calculation on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
```

```
switch(config-if)# switchport
switch(config-if)# switchport autostate exclude
```

This example shows how to exclude a VLAN from the auto-excluded interface:

```
switch# configure terminal
switch(config)# interface ethernet 3/1
switch(config-if)# switchport
switch(config-if)# switchport autostate exclude
switch(config-if)# switchport autostate exclude vlan 10
```

Configuring SVI Autostate Disable for the System

You can configure the SVI autostate disable feature to keep an SVI up even if no interface is up in the corresponding VLAN. Use this procedure to configure this feature for the entire system.

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **system default interface-vlan no autostate**	Disables the default autostate behavior for the device.
Step 3	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 4	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 5	(Optional) switch# **show running-config** [**all**]	Displays the running configuration. To display the default and configured information, use the **all** keyword.

Example

This example shows how to disable the default autostate behavior on the Cisco NX-OS device:

```
switch# configure terminal
switch(config)# system default interface-vlan no autostate
switch(config)# show running-config
```

Configuring SVI Autostate Disable Per SVI

You can configure SVI autostate enable or disable on individual SVIs. The SVI-level setting overrides the system-level SVI autostate configuration for that particular SVI.

Before you begin

Before you configure this feature at SVI-level, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **feature interface-vlan**	Enables VLAN interface mode.
Step 3	switch(config)# **interface vlan** *vlan-id*	Creates a VLAN interface and enters interface configuration mode. The range is from 1 and 4094.
Step 4	switch(config-if)# [**no**] **autostate**	By default, enables the SVI autostate feature on specified interface. To disable the default settings, use the **no** form of this command.
Step 5	switch(config-if)# **exit**	Exits interface configuration mode.
Step 6	(Optional) switch(config)#**show running config-interface vlan** *vlan-id*	Displays the running configuration for the specified VLAN interface.
Step 7	(Optional) switch(config)# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 8	(Optional) switch(config)# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 9	(Optional) switch(config)# **show startup-config interface vlan** *vlan id*	Displays the VLAN configuration in the startup configuration.

Example

This example shows how to disable the default autostate behavior on an individual SVI:

```
switch# configure terminal
switch(config)# feature interface-vlan
switch(config)# interface vlan10
witch(config-if)# no autostate
```

Configuring the Device to Tag Native VLAN Traffic

When you are working with 802.1Q trunked interfaces, you can maintain the tagging for all packets that enter with a tag that matches the value of the native VLAN ID and drops all untagged traffic (you will still carry control traffic on that interface). This feature applies to the entire device; you cannot apply it to selected VLANs on a device.

The **vlan dot1q tag native global** command changes the behavior of all native VLAN ID interfaces on all trunks on the device.

Note If you enable 802.1Q tagging on one device and disable it on another device, all traffic is dropped on the device and this feature is disabled. You must configure this feature identically on each device.

Note If you enable 802.1Q tagging on the device, you need to enable **vlan dotq tag native exclude control** globally or enable **switchport trunk native vlan tag exclude control** at interface level. This will ensure the port-channel with LACP to work correctly.

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command. You can repeat VLAN names and IDs in different VDCs, so you must confirm that you are working in the correct VDC.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **vlan dot1q tag native**	Modifies the behavior of a 802.1Q trunked native VLAN ID interface. The interface maintains the taggings for all packets that enter with a tag that matches the value of the native VLAN ID and drops all untagged traffic. The control traffic is still carried on the native VLAN. The default is disabled.
Step 3	switch(config)# **exit**	Exits global configuration mode.

	Command or Action	Purpose
Step 4	(Optional) switch# **show vlan**	Displays the status and information for VLANs.
Step 5	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 6	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 7	(Optional) switch# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to change the behavior of the native VLAN on an 802.1Q trunked interface to maintain the tagged packets and drop all untagged traffic (except control traffic):

```
switch# configure terminal
switch(config)# vlan dot1q tag native
switch#
```

Changing the System Default Port Mode to Layer 2

You can set the system default port mode to Layer 2 access ports.

See the for information on setting the system default port mode to Fibre Channel in storage VDCs.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters the global configuration mode.
Step 2	switch(config)# **system default switchport** [**shutdown**]	Sets the default port mode for all interfaces on the system to Layer 2 access port mode and enters interface configuration mode. By default, all the interfaces are Layer 3.

	Command or Action	Purpose
		Note When the **system default switchport shutdown** command is issued, any FEX HIFs that are not configured with **no shutdown** are shutdown. To avoid the shutdown, configure the FEX HIFs with **no shut**.
Step 3	switch(config)# **exit**	Exits global configuration mode.
Step 4	(Optional) switch# **show interface brief**	Displays the status and information for interfaces.
Step 5	(Optional) switch# **show interface status error policy** [**detail**]	Displays the interfaces and VLANs that produce errors during policy programming to ensure that policies are consistent with hardware policies. Use the **detail** command to display the details of the interfaces that produce an error.
Step 6	(Optional) switch# **no shutdown**	Clears the errors on the interfaces and VLANs where policies correspond with hardware policies. This command allows policy programming to continue and the port to come up. If policies do not correspond, the errors are placed in an error-disabled policy state.
Step 7	(Optional) switch(config)# **copy running-config startup-config**	Copies the running configuration to the startup configuration.

Example

This example shows how to set the system ports to be Layer 2 access ports by default:

```
switch# configure terminal
switch(config-if)# system default switchport
```

Configuration Examples for Access Ports and Trunk Ports

This example shows how to configure a Layer 2 access interface and assign the access VLAN mode for that interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/30
switch(config-if)# switchport
switch(config-if)# switchport mode access
switch(config-if)# switchport access vlan 5
switch(config-if)#
```

This example shows how to configure a Layer 2 trunk interface, assign the native VLAN and the allowed VLANs, and configure the device to tag the native VLAN traffic on the trunk interface:

```
switch# configure terminal
switch(config)# interface ethernet 2/35
switch(config-if)# switchport
switch(config-if)# switchport mode trunk
switch(config-if)# switchport trunk native vlan 10
switch(config-if)# switchport trunk allowed vlan 5, 10
switch(config-if)# exit
switch(config)# vlan dot1q tag native
switch(config)#
```

Configuring Slow Drain Device Detection and Congestion Avoidance

The data traffic between the end devices in Fibre Channel over Ethernet (FCoE) uses link level and per-hop based flow control. When the slow devices are attached to the fabric, the end devices do not accept the frames at a configured rate. The presence of the slow devices leads to traffic congestion on the links. The traffic congestion affects the unrelated flows in the fabric that use the same inter-switch links (ISLs) for its traffic, even though the destination devices do not experience the slow drain.

From Cisco NX-OS Release 6.1, slow drain device detection and congestion avoidance is supported on the F-series I/O modules that carry the FCoE traffic. The enhancements are mainly on the edge ports that are connected to the slow drain devices to minimize the congestion condition in the edge ports.

Once the slow drain devices are detected on the network, you can configure a smaller frame timeout value for the edge ports and force a timeout drop for all the packets that are using the configured thresholds. The smaller frame timeout value helps to alleviate the slow drain condition that affects the fabric by dropping the packets on the edge ports sooner than the time they actually get timed out. The default timeout value is 500 milliseconds. This function empties the buffer space in ISL, which can be used by other unrelated flows that do not experience the slow drain condition.

If you try to override the Embedded Event Manager (EEM) system policy __ori_mac_edge_pause for the F1 I/O module and __clm_sw_edge_port_pause for the F2 /I/O module, the default-action, default syslog, will also appear. We recommend that you specify the action err-disable to isolate the faulty port where this condition occurs.

This example shows how to override the EEM system policy for an F1 I/O module:

```
event manager applet my_eem_policy override __ori_mac_edge_pause
description "my_f1_Pause_eem_policy"
event policy-default count 1 time 2
action 1.0 cli switchto vdc storage
action 2.0 cli eth-port-manager internal-errdisable $interface $cause $SYSERR
```

Configuring a Congestion Frame Timeout Value

When an FCoE frame takes longer than the congestion-drop timeout period to be transmitted by the egress port, the frame is dropped. This dropping of the frames is useful in controlling the effect of slow egress ports that are paused almost continuously (long enough to cause congestion), but not long enough to trigger the pause timeout drop. Frames dropped due to the congestion drop threshold are counted as egress discards against the egress port. Egress discards release buffers in the upstream ingress ports of the switch, allowing the unrelated flows to move continuously through them.

The default congestion frame timeout value is 500 milliseconds. We recommend that you retain the default configuration for the ISLs and configure a value that does not exceed the default value for the edge ports. If the frame is in the switch for a longer time than the configured congestion frame timeout, it gets dropped, which empties the buffer space in the ISL and alleviates the congestion.

To configure the congestion drop timeout value for FCoE, perform the following steps:

Procedure

Step 1 Enter configuration mode:

switch# **configure terminal**

Step 2 Depending on the Cisco Nexus 7000 NX-OS release version you are using, use one of the following commands to configure the system-wide FCoE congestion drop timeout, in milliseconds, for either core or edge ports

- Cisco Nexus 7000 NX-OS Release 8.1(1) and earlier releases:

  switch(config)# **system default interface congestion timeout** *milliseconds* **mode {core | edge}**

  Configures a new congestion frame timeout value in milliseconds and the port mode for the device. The FCoE congestion drop timeout range is from 100 to 1000 ms. To prevent premature packet drops, the minimum value recommended for FCoE congestion drop timeout is 200 milliseconds.

- Cisco Nexus 7000 NX-OS Release 8.2(1) and later releases:

  switch(config)# **system timeout fcoe congestion-drop** {*milliseconds* | **default**} **mode {core | edge}**

  Configures a new congestion frame timeout value in milliseconds and the port mode for the device. The FCoE congestion drop timeout range is from 200 to 500 ms.

(Optional) Depending on the Cisco Nexus 7000 NX-OS release version you are using, use one of the following commands to revert to the default FCoE congestion drop timeout value of 500 milliseconds:

- Cisco Nexus 7000 NX-OS Release 8.1(1) and earlier releases:

  switch(config)# **no system default interface congestion timeout** *milliseconds* **mode {core | edge}**

- Cisco Nexus 7000 NX-OS Release 8.2(1) and later releases:

  switch(config)# **no system timeout fcoe congestion-drop** {*milliseconds* | **default**} **mode {core | edge}**

Step 3 (Optional) switch# **show logging onboard flow-control request-timeout**

Displays the request timeout for a source-destination pair per module with the timestamp information.

Example

Note

- The congestion frame timeout configuration is local to a vdc and will be effective only on the ports (edge/core) owned by the vdc.
- Use the default configuration for the core ports and configure a congestion frame timeout value for the fabric edge ports that does not exceed 500 milliseconds. The recommended range for the congestion frame timeout value is from 100 to 200 milliseconds.

The following example shows how to display the request timeout for a source-destination pair per module with the timestamp information for the supervisor CLI:

```
SUP CLI:
switch# show logging onboard flow-control request-timeout
----------------------------
Module: 2
----------------------------
--------------------------------------------------------------------------------
| Dest |     Source |   Events   |   Timestamp    |  Timestamp      |
| Intf |       Intf |    Count   |     Earliest   |   Latest        |
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 1736|11/14/2002-00:40:07|11/14/2002-00:57:22|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 3477|11/13/2002-23:23:27|11/14/2002-00:00:48|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 4298|11/13/2002-22:31:40|11/13/2002-23:18:00|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 9690|11/13/2002-04:54:50|11/13/2002-07:31:58|
```

The following example shows how to display the request timeout for a source-destination pair per module with the time-stamp information for the module CLI:

```
Module CLI:
module--x# show logging onboard flow-control request-timeout
--------------------------------------------------------------------------------
| Dest |     Source |   Events   |   Timestamp    |  Timestamp      |
| Intf |       Intf |    Count   |     Earliest   |   Latest        |
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 1736|11/14/2002-00:40:07|11/14/2002-00:57:22|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 3477|11/13/2002-23:23:27|11/14/2002-00:00:48|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 4298|11/13/2002-22:31:40|11/13/2002-23:18:00|
--------------------------------------------------------------------------------
|fc4/3 |eth2/1,eth2/2 | 9690|11/13/2002-04:54:50|11/13/2002-07:31:58|
```

Note The following example outputs are applicable for Cisco Nexus 7000 NX-OS 8.2(1) release and later:

The following example shows how to configure congestion-drop timeout to the default value of 500 milliseconds for a core device:

```
switch# configure terminal
switch(config)# system timeout fcoe congestion-drop default mode core
```

The following example shows how to configure congestion-drop timeout to the default value of 500 milliseconds for a edge device:

```
switch# configure terminal
switch(config)# system timeout fcoe congestion-drop default mode edge
```

Configuring a smaller timeout on the edge ports, for example 200 milliseconds, helps to reduce the congestion on the edge ports. When congestion is observed, the packets on these ports time out sooner.

Note

- The congestion frame timeout configuration is local to a Virtual Device Context (VDC) and will be effective only on the ports (edge/core) owned by the VDC.
- Use the default configuration for the core ports and configure a congestion-frame timeout value for the fabric-edge ports that does not exceed 500 milliseconds. The recommended range for the congestion-frame timeout value is from 200 to 500 milliseconds.

Configuring a Pause Frame Timeout Value

From Cisco NX-OS 6.1 release, you can enable or disable a pause frame timeout value on a port. The system periodically checks the ports for a pause condition and enables a pause frame timeout on a port if it is in a continuous pause condition for a configured period of time. This situation results in all frames that come to that port getting dropped in the egress. This function empties the buffer space in the ISL link and helps to reduce the fabric slowdown and the congestion on the other unrelated flows using the same link.

When a pause condition is cleared on a port or when a port flaps, the system disables the pause frame timeout on that particular port.

The pause frame timeout is enabled by default and the value is set to 500 milliseconds. We recommend that you retain the default configuration for the ISLs and configure a value that does not exceed the default value for the edge ports.

For a faster recovery from the slow drain device behavior, you should configure a pause frame timeout value because it drops all the frames in the edge port that face the slow drain whether the frame is in the switch for a congested timeout or not. This process instantly clears the congestion in the ISL. You should configure a pause frame timeout value to clear the congestion completely instead of configuring a congestion frame timeout value.

Procedure

	Command or Action	Purpose
Step 1	Enter configuration mode:	switch# **configure terminal**
Step 2	Depending on the Cisco Nexus 7000 NX-OS release version you are using, use one of the following commands to configure the system-wide FCoE pause drop timeout value, in milliseconds, for either edge or core ports:	• Cisco Nexus 7000 NX-OS Release 8.1(1) and earlier releases: switch(config)# **system default interface pause timeout** *milliseconds* **mode {core | edge}** • (Optional) Depending on the Cisco Nexus 7000 NX-OS release version you are using,

	Command or Action	Purpose
		use one of the following commands to enable the FCoE pause drop timeout to the default value of 500 milliseconds for edge or core ports: • Cisco Nexus 7000 NX-OS Release 8.1(1) and earlier releases: switch(config)# **system default interface pause mode {core | edge}** • (Optional) Depending on the Cisco Nexus 7000 NX-OS release version you are using, use one of the following commands to disable the FCoE pause drop timeout for edge or core ports: • Cisco Nexus 7000 NX-OS Release 8.1(1) and earlier releases: switch(config)# **no system default interface pause mode {core | edge}**
Step 3	(Optional) switch# **show logging onboard flow-control pause-event** [**module** *x*]	Displays the total number of the pause events per module per interface.
Step 4	(Optional) switch# **show logging onboard flow-control pause-count** [**module** *x*] [*last mm minutes*] [*last hh hours*] [*last dd days*]	Displays the pause counters per module per interface with the time-stamp information.
Step 5	(Optional) switch# **show logging onboard flow-control timeout-drops** [**module** *x*] [*last mm minutes*] [*last hh hours*] [*last dd days*]	Displays the timeout drops per module per interface with the time-stamp information.

Example

The example shows how to display the total number of the pause events per module per interface for the supervisor CLI:

```
SUP CLI:
switch# show logging onboard flow-control pause-event module 2
----------------------------
Module: 2
----------------------------
--------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
--------------------------------------------------------------------------------
                         |            | Time Stamp      |In|Port
Error Stat Counter Name  | Count      |MM/DD/YY HH:MM:SS|st|Range
                         |            |                 |Id|
--------------------------------------------------------------------------------
SW PL0 pause event VL3   |0x4e45b     |06/18/03 05:27:50 |00|1
SW PL0 pause event VL3   |0x4e1a0     |06/18/03 05:25:50 |00|1
```

```
SW PL0 pause event VL3    |0x4dee5     |06/18/03 05:23:50 |00|1
SW PL0 pause event VL3    |0x4dc2a     |06/18/03 05:21:50 |00|1
```

The example shows how to display the total number of the pause events per module per interface for the module CLI:

```
Module CLI:
module-2# show logging onboard flow-control pause-event
-------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
-------------------------------------------------------------------------------
                          |            | Time Stamp      |In|Port
Error Stat Counter Name   | Count      |MM/DD/YY HH:MM:SS|st|Range
                          |            |                 |Id|
-------------------------------------------------------------------------------
SW PL0 pause event VL3    |0x4e45b     |06/18/03 05:27:50|00|1
SW PL0 pause event VL3    |0x4e1a0     |06/18/03 05:25:50|00|1
SW PL0 pause event VL3    |0x4dee5     |06/18/03 05:23:50|00|1
SW PL0 pause event VL3    |0x4dc2a     |06/18/03 05:21:50|00|1
SW PL0 pause event VL3    |0x4d96f     |06/18/03 05:19:50|00|1
```

The following example shows how to display the pause counters per module per interface with time-stamp information for the supervisor CLI:

```
SUP CLI:
switch# show logging onboard flow-control pause-count
-------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
-------------------------------------------------------------------------------
                                 |            | Time Stamp      |In|Port
Error Stat Counter Name          | Count      |MM/DD/YY HH:MM:SS|st|Range
                                 |            |                 |Id|
-------------------------------------------------------------------------------
GD Received pause transitions of XO|0x984       |06/17/03 14:23:59|00|1
FF-XON UP3                        |            |                 |  |
GD Received pause transitions of XO|0x41f       |06/17/03 14:21:59|00|1
FF-XON UP3                        |            |                 |  |
```

The example shows how to display the pause counters per module per interface with time-stamp information for the module CLI:

```
Module CLI:
module-2# show logging onboard flow-control pause-count
-------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
-------------------------------------------------------------------------------
                                 |            | Time Stamp      |In|Port
Error Stat Counter Name          | Count      |MM/DD/YY HH:MM:SS|st|Range
                                 |            |                 |Id|
-------------------------------------------------------------------------------
GD Received pause transitions of XO|0x984 |06/17/03 14:23:59|00|1
FF-XON UP3                        |      |                 |  |
GD Received pause transitions of XO|0x41f |06/17/03 14:21:59|00|1
FF-XON UP3                        |      |                 |  |
```

The following example shows how to display the timeout drops per module per interface with time-stamp information for the supervisor CLI:

```
SUP CLI:
switch# show logging onboard flow-control timeout-drops
switch# show logging onboard flow-control timeout-drops
```

```
----------------------------
Module: 2
----------------------------
--------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
--------------------------------------------------------------------------------
                                  |            | Time Stamp      |In|Port
Error Stat Counter Name           | Count      |MM/DD/YY HH:MM:SS|st|Range
                                  |            |                 |Id|
--------------------------------------------------------------------------------
ORI_EB_CNT_P0_SF_TIMESTAMP_DROP   |0x100e      |11/14/02 00:45:43|00|1
ORI_EB_CNT_P0_SF_TIMESTAMP_DROP   |0xfd2       |11/14/02 00:43:42|00|1
Module CLI:
```

The following example shows how to display the timeout drops per module per interface with time-stamp information for the module CLI:

```
module-2# show logging onboard flow-control timeout-drops
--------------------------------------------------------------------------------
STATISTICS INFORMATION FOR DEVICE ID 137 DEVICE Orion MAC Driver
--------------------------------------------------------------------------------
                                  |            | Time Stamp      |In|Port
Error Stat Counter Name           | Count      |MM/DD/YY HH:MM:SS|st|Range
                                  |            |                 |Id|
--------------------------------------------------------------------------------
ORI_EB_CNT_P0_SF_TIMESTAMP_DROP   |0x100e      |11/14/02 00:45:43|00|1
ORI_EB_CNT_P0_SF_TIMESTAMP_DROP   |0xfd2       |11/14/02 00:43:42|00|1
```

Note The following examples are applicable for Cisco Nexus 7000 NX-OS 8.2(1) release and later:

The following example shows how to configure pause-drop timeout to the default value of 500 milliseconds for a core device:

```
switch# configure terminal
switch(config)# system timeout fcoe pause-drop default mode core
```

The following example shows how to configure pause-drop timeout to the default value of 500 milliseconds for a edge device:

```
switch# configure terminal
switch(config)# system timeout fcoe pause-drop default mode edge
```

Use the [**no**] **system timeout fcoe pause-drop** {*milliseconds* |**default** }[**mode**] **edge** command to disable the pause frame timeout value on the edge ports.

Verifying the Interface Configuration

To display access and trunk interface configuration information, perform one of the following tasks:

Table 3: Verifying the Interface Configuration

Command	Purpose
show interface ethernet *slot/port* [**brief** | **counters** | **debounce** | **description** | **flowcontrol** | **mac-address** | **status** | **transceiver**]	Displays the interface configuration.
show interface brief	Displays interface configuration information, including the mode.
show interface switchport	Displays information, including access and trunk interface, information for all Layer 2 interfaces.
show interface trunk [**module** *module-number* | **vlan** *vlan-id*]	Displays trunk configuration information.
show interface capabilities	Displays information about the capabilities of the interfaces.
show interface status error policy [**detail**]	Displays errors about interfaces and VLANs that are inconsistent with hardware policies. The **detail** command displays the details of the interfaces that produce an error.
show running-config [**all**]	Displays information about the current configuration. The **all** command displays the default and current configurations.
show running-config interface ethernet *slot/port*	Displays configuration information about the specified interface.
show running-config interface port-channel *slot/port*	Displays configuration information about the specified port-channel interface.
show running-config interface vlan *vlan-id*	Displays configuration information about the specified VLAN interface.

For detailed information about these commands, see the Cisco Nexus 7000 Series NX-OS Layer 2 Switching Command Reference.

Monitoring Layer 2 Interfaces

Use the following commands to display Layer 2 interfaces:

Table 4: Monitoring Layer Interfaces

Command	Purpose
clear counters interface [*interface*]	Clears the counters.

Command	Purpose
load-interval {**interval** *seconds* {**1** | **2** | **3**}}	From Cisco NX-OS Release 4.2(1) for the Cisco Nexus 7000 Series devices, sets three different sampling intervals to bit-rate and packet-rate statistics.
show interface counters [**module** *module*]	Displays input and output octets unicast packets, multicast packets, and broadcast packets.
show interface counters detailed [**all**]	Displays input packets, bytes, and multicast as well as output packets and bytes.
show interface counters errors [**module** *module*]	Displays information on the number of error packets.

See the Cisco Nexus 7000 Series NX-OS Interfaces Command Reference for information on these commands.

Related Documents

Table 5: Related Documents

Related Topic
Cisco Nexus 7000 Series NX-OS Interfaces Command Reference
Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide
Cisco Nexus 2000 Series NX-OS Fabric Extender Software Configuration Guide for Cisco Nexus 7000 Series Switches, Release 6.x
Cisco NX-OS Licensing Guide
VLANs, MAC address tables, private VLANs, and the Spanning Tree Protocol.
Cisco Nexus 7000 Series NX-OS FabricPath Command Reference
Cisco Nexus 7000 Series NX-OS FabricPath Configuration Guide

MIBs

MIBs	MIBs Link
• BRIDGE-MIB • IF-MIB • CISCO-IF-EXTENSION-MIB • ETHERLIKE-MIB	To locate and download MIBs, go to: https://cfnng.cisco.com/mibs