



FlexStack-Extended

This module describes the FlexStack-Extended feature supported on Catalyst 2960-X Series Switches with LAN Base license and Cisco Catalyst 2960-XR Series Switches.

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Restrictions for FlexStack-Extended

The following restrictions apply to the horizontal stacking of switches.

- For fiber module, both ports must be configured as either network ports or stack ports. Do not configure one port as a network port and the other as a stack port.
- Online Insertion and Removal (OIR) is possible only with the same type of port.
- To connect a switch with a FlexStack module to a switch with a hybrid module, set the speed manually. The stack speed should be set to 10G.
- If the stack module (hybrid or fiber) on a switch is replaced with a FlexStack module, the bandwidth must to be reset manually.

Information About FlexStack-Extended

FlexStack-Extended

Prior to Cisco IOS Release 15.2(6)E, stacking was supported with FlexStack-Plus module, which has two copper stack ports. Copper stack ports support short reach connectivity across local switches. FlexStack-Extended overcomes the problem of short reach connectivity by using 10G SFP+ ports to enable stacking that allows long reach stacking using optics.

The same models that support FlexStack-Plus on Cisco Catalyst 2960-X Series Switches and Cisco Catalyst 2960-XR Series Switches support FlexStack-Extended.

When you convert a network port to a stack port, it continues to work as a network port without any impact to the current running configuration until the next reload of the switch.

When you convert a stack port back to a network port, it continues to work as a stack port until the next reload. After reload, the port comes up as a network port with the default configuration.



Note When uplink ports are working as stack ports, these particular uplink interfaces (for example, TenGigabitEthernet 1/1/1) are not displayed in any show command or are not available under any configuration command, unlike other network ports. These uplink interfaces are made available only after the reload of the switch; once ports are converted back to network ports.

FlexStack-Extended on Catalyst 2960-X and 2960-XR Switches

Cisco Catalyst 2960-X and 2960-XR Series Switches support FlexStack-Extended with hybrid stack and fiber stack modules, and also with 10G SFP+ front panel uplink ports.

The following models support FlexStack-Extended with hybrid stack and fiber stack modules:

- Cisco Catalyst 2960X-24PD-L
- Cisco Catalyst 2960X-24PS-L
- Cisco Catalyst 2960X-24TD-L
- Cisco Catalyst 2960X-24TS-L
- Cisco Catalyst 2960X-48FPD-L
- Cisco Catalyst 2960X-48FPS-L
- Cisco Catalyst 2960X-48LPD-L
- Cisco Catalyst 2960X-48LPS-L
- Cisco Catalyst 2960X-48TD-L
- Cisco Catalyst 2960XR-24PD-I
- Cisco Catalyst 2960XR-24PS-I
- Cisco Catalyst 2960XR-24TD-I
- Cisco Catalyst 2960XR-48FPD-I
- Cisco Catalyst 2960XR-48FPS-I
- Cisco Catalyst 2960XR-48LPD-I
- Cisco Catalyst 2960XR-48LPS-I
- Cisco Catalyst 2960XR-48TD-I

The following models support front-panel stacking:

- Cisco Catalyst 2960X-24TD-L
- Cisco Catalyst 2960X-48FPD-L

- Cisco Catalyst 2960X-48LPD-L
- Cisco Catalyst 2960X-48TD-L
- Cisco Catalyst 2960XR-24PD-I
- Cisco Catalyst 2960XR-24TD-I
- Cisco Catalyst 2960XR-48FPD-I
- Cisco Catalyst 2960XR-48LPD-I
- Cisco Catalyst 2960XR-48TD-I

A hybrid stack module has one copper stack connector and one SFP+ port. The copper port allows short-reach connectivity across the local stack of switches, and the SFP+ allows for long-reach stacking using standard optics. Hybrid-stack module ports can only be used as stack ports. The SFP+ port of the module cannot be changed to a network port.

A fiber stack module has two SFP+ interfaces, which allows for long-reach stacking using standard optics. Fiber stack ports are used either as network ports or stack ports. By default all ports on the fiber stack module are stack port. These ports can be converted to network ports.



Note Stack fast convergence is not supported on hybrid stack and fiber stack modules.

The stack bandwidth for the following stack configuration is 40G:

- Stack using hybrid stack module.
- Stack using fiber stack module.
- Stack using FlexStack-Plus, hybrid, and fiber modules.

For more information on Installing the Switch, see the *Catalyst 2960-X and 2960-XR Switch Hardware Installation Guide* on www.cisco.com.

In Cisco IOS Release 15.2(6)E, FlexStack-Extended is supported on C2960X-HYBRID-STK and C2960X-FIBER-STK modules. By default, all ports are treated as stack ports. Online Insertion and Removal (OIR) of these module (hot swappable) is supported; however, these should be replaced with the same module type. If the module is replaced by a different module type, a reload is required.

The SFP+ port in C2960X-HYBRID-STK module can only be used as a stack port.

Two 10G SFP+ stack ports in the C2960X-FIBER-STK module can be converted to network ports. Using one port as uplink and the other as a stack port is not supported. The SFP+ ports are displayed as Te1/1/1 and Te1/1/2 when converted to network ports.

All SFP+ optics supported by front panel uplink ports are supported by these modules.

Default Port Configurations

The following section lists the default port configurations:

Hybrid Stack

- The default is stack port.

Fiber Stack

- The default is stack port.

FlexStack-Extended LED

The light-emitting diode (LED) behavior is the same for stack ports and network ports. The LED status is as given below:

- OFF—Cable removed/no cable/the switch is off.
- Solid green—Cable inserted and link is up.
- Blinking green—Traffic is running.
- Blinking amber—Cable is connected and the link is coming up.

How to Configure FlexStack-Extended

The 10G SFP+ can be used either as a network port or a stack port.

- All TenGigabitEthernet ports available on the active stack and all stack members that are capable of FlexStack-Extended can be converted to network ports or stack ports.
- If any TenGigabitEthernet port is converted to a horizontal stack port, the stack port number (1 or 2) is displayed corresponding to that port.



Note You cannot choose one stack port from the front panel and another from the back panel. Both stack ports should either be from the front panel or back panel. The following example shows how to configure hstack ports:

```
switch 1 hstack-port 1 TenGigabitEthernet 1/0/1
switch 1 hstack-port 2 TenGigabitEthernet 1/0/2
```

Configuring a Stack Port as a Network Port

You can configure both 10G stack ports as network ports.

Procedure

| | Command or Action | Purpose |
|---------------|--|---|
| Step 1 | enable Example: Device> enable | Enables Privileged EXEC mode. • Enter your password if prompted. |
| Step 2 | configure terminal Example: | Enters global configuration mode. |

| | Command or Action | Purpose |
|---------------|--|---|
| | Device# <code>configure terminal</code> | |
| Step 3 | no switch <i>switch-number</i> hstack-port <i>stack-port</i> Example: Device(config)# <code>no switch 1 hstack-port 1</code> | Configures the stack port as a network port. <ul style="list-style-type: none"> The TenGigabitEthernet interface number is automatically added when the command is configured. |
| Step 4 | exit Example: Device(config)# <code>exit</code> | Exits global configuration mode and returns to privileged EXEC mode. |
| Step 5 | reload Example: Device# <code>reload</code> | Reloads a device. <ul style="list-style-type: none"> Save the configuration by using the copy running-config startup-config command before reloading a device. |
| Step 6 | show switch hstack-ports Example: Device# <code>show switch hstack-ports</code> | Shows the current status and the next reload status for ports. Note For Flexstack-Plus and Hybrid stack modules, port numbers are not displayed. |

What to do next

The following is sample output from the **show switch hstack-ports** command:

```
Device# show switch hstack-ports
```

```
Horizontal stack port status :
Te Ports  Stack Port  Operational Status  Next Reload Status  Media Type
-----
Tel/0/1   NA             N/W Port            N/W Port            Fiber
Tel/0/2   NA             N/W Port            N/W Port            Fiber
Tel/1/1   NA             N/W port            N/W port            Fiber
Tel/1/2   NA             N/W Port            N/W port            Fiber
```

Configuring a Network Port as a Stack Port

You can configure both 10G Network ports as stack ports.

Procedure

| | Command or Action | Purpose |
|---------------|-------------------|-------------------------------|
| Step 1 | enable | Enables Privileged EXEC mode. |

| | Command or Action | Purpose |
|---------------|--|---|
| | Example: Device> enable | <ul style="list-style-type: none"> • Enter your password if prompted. |
| Step 2 | configure terminal Example: Device# configure terminal | Enters global configuration mode. |
| Step 3 | switch <i>switch-number</i> hstack-port <i>stack-port</i> <i>interface-id</i> [tengigabitethernet <i>interface-number</i>] Example: Device(config)# switch 1 hstack-port 1 Tengigabitethernet 1/1/1 | Configures the network port as a stack port. |
| Step 4 | exit Example: Device(config)# exit | Exits global configuration mode and returns to privileged EXEC mode. |
| Step 5 | reload Example: Device# reload | Reloads a device. <ul style="list-style-type: none"> • Save the configuration by using the copy running-config startup-config command before reloading a device. |
| Step 6 | show switch hstack-ports Example: Device# show switch hstack-ports | Shows the current status and the next reload status for the ports. Note For Flexstack-Plus and Hybrid stack modules, the port numbers cannot be seen. |

Example

The following is sample output from the **show switch hstack-ports** command:

```
Device# show switch hstack-ports
```

```
Horizontal stack port status :
```

| Te Ports | Stack Port | Operational Status | Next Reload Status | Media Type |
|----------|------------|--------------------|--------------------|------------|
| Tel/0/1 | NA | N/W Port | N/W Port | Fiber |
| Tel/0/2 | NA | N/W Port | N/W Port | Fiber |
| Tel/1/1 | 1 | Stack Port | Stack Port | Fiber |
| Tel/1/2 | 2 | Stack Port | Stack Port | Fiber |

Configuring the Stack Speed

The speed change is configured on the back stack port with a FlexStack-Plus module. Perform this task to configure the stack speed.

Procedure

| | Command or Action | Purpose |
|---------------|--|--|
| Step 1 | enable Example: Device> enable | Enables Privileged EXEC mode. • Enter your password if prompted. |
| Step 2 | configure terminal Example: Device# configure terminal | Enters global configuration mode. |
| Step 3 | switch stack port-speed <i>speed</i> Example: Device(config)# switch stack port-speed 10 | Configures the speed of the switch stack port. Note Use the no form of the command to change the stack speed. |
| Step 4 | exit Example: Device(config)# exit | Exits global configuration mode and returns to privileged EXEC mode. |

Configuration Examples for FlexStack-Extended

Examples: Configuring FlexStack-Extended

The following example shows how to convert a stack port to network port:

```
Device> enable
Device# configure terminal
Device(config)# no switch 1 hstack-port 1
```

```
Do you want to continue?[confirm]
New port setting will be effective after next reload
```

The following is sample output from the **show switch hstack-ports** command:

```
Device# show switch hstack-ports

Horizontal stack port status :
Te Ports  Stack Port  Operational Status  Next Reload Status  Media Type
-----
Tel/0/1   NA              N/W Port           N/W Port           Fiber
Tel/0/2   NA              N/W Port           N/W Port           Fiber
```

```
Tel1/1/1  NA          N/W Port          N/W Port          Fiber
Tel1/1/2  NA          N/W Port          N/W Port          Fiber
```

The following example shows how you can set the speed of the switch stack port:

```
Device> enable
Device# configure terminal
Device(config)# switch stack port-speed 10
Device(config)# end
```

Feature Information for FlexStack-Extended

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use the Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for FlexStack-Extended

| Feature Name | Release | Feature Information |
|--------------------|----------------------------|--|
| FlexStack-Extended | Cisco IOS Release 15.2(6)E | Switches that support 10G Small Form-Factor Pluggable (SFP+) uplink ports can be part of horizontal stacking. Based on your requirement, create a half-ring or a full-ring stack, and remaining uplink ports can continue to work as network ports. In Cisco IOS Release 15.2(6)E, this feature was implemented on the following platforms: <ul style="list-style-type: none"> • Cisco Catalyst 2960-X Series Switches |