



## Configuring Flex Links

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This chapter describes how to configure Flex Links on the Catalyst 6500 series switch. Release 12.2(18)SXF and later releases support Flex Links.



### Note

For complete syntax and usage information for the commands used in this chapter, refer to the *Cisco IOS Master Command List*, Release 12.2SX, at this URL:

[http://www.cisco.com/en/US/docs/ios/mcl/allreleasemcl/all\\_book.html](http://www.cisco.com/en/US/docs/ios/mcl/allreleasemcl/all_book.html)

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The chapter consists of these sections:

- [Understanding Flex Links, page 11-1](#)
- [Configuring Flex Links, page 11-2](#)
- [Monitoring Flex Links, page 11-4](#)



### Tip

For additional information about Cisco Catalyst 6500 Series Switches (including configuration examples and troubleshooting information), see the documents listed on this page:

[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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## Understanding Flex Links

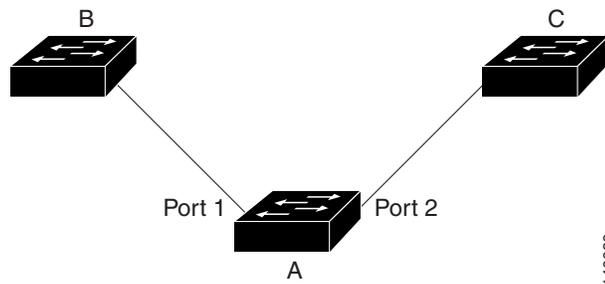
Flex Links are a pair of a Layer 2 interfaces (switchports or port channels), where one interface is configured to act as a backup to the other. Flex Links are typically configured in service-provider or enterprise networks where customers do not want to run STP. Flex Links provide link-level redundancy that is an alternative to Spanning Tree Protocol (STP). STP is automatically disabled on Flex Links interfaces.

The Catalyst 6500 series switches support a maximum of 16 Flex Links.

To configure the Flex Links feature, you configure one Layer 2 interface as the standby link for the link that you want to be primary. With Flex Links configured for a pair of interfaces, only one of the interfaces is in the linkup state and is forwarding traffic. If the primary link shuts down, the standby link starts forwarding traffic. When the inactive link comes back up, it goes into standby mode.

In [Figure 11-1](#), ports 1 and 2 on switch A are connected to uplink switches B and C. Because they are configured as Flex Links, only one of the interfaces is forwarding traffic and the other one is in standby mode. If port 1 is the active link, it begins forwarding traffic between port 1 and switch B; the link between port 2 (the backup link) and switch C is not forwarding traffic. If port 1 goes down, port 2 comes up and starts forwarding traffic to switch C. When port 1 comes back up, it goes into standby mode and does not forward traffic; port 2 continues to forward traffic.

**Figure 11-1 Flex Links Configuration Example**



If a primary (forwarding) link goes down, a trap notifies the network management stations. If the standby link goes down, a trap notifies the users.

Flex Links are supported only on Layer 2 ports and port channels, not on VLANs or on Layer 3 ports.

## Configuring Flex Links

These sections contain this configuration information:

- [Flex Links Default Configuration, page 11-2](#)
- [Flex Links Configuration Guidelines and Restrictions, page 11-2](#)
- [Configuring Flex Links, page 11-3](#)

## Flex Links Default Configuration

There is no default Flex Links configuration.

## Flex Links Configuration Guidelines and Restrictions

When configuring Flex Links, follow these guidelines and restrictions:

- You can configure only one Flex Links backup link for any active link, and it must be a different interface from the active interface.
- An interface can belong to only one Flex Links pair. An interface can be a backup link for only one active link. An active link cannot belong to another Flex Links pair.
- Neither of the links can be a port that belongs to an EtherChannel. However, you can configure two port channels (EtherChannel logical interfaces) as Flex Links, and you can configure a port channel and a physical interface as Flex Links, with either the port channel or the physical interface as the active link.

- A backup link does not have to be the same type as the active link (Fast Ethernet, Gigabit Ethernet, or port channel). However, you should configure both Flex Links with similar characteristics so that there are no loops or changes in operation if the standby link becomes active.
- STP is disabled on Flex Links ports. If STP is disabled on the switch, be sure that there are no Layer 2 loops in the network topology.
- Do not configure the following STP features on Flex Links ports or the ports to which the links connect:
  - Bridge Assurance
  - UplinkFast
  - BackboneFast
  - EtherChannel Guard
  - Root Guard
  - Loop Guard
  - PVST Simulation
- Configured MAC addresses should be different on active and backup ports. The current CLI disallows configuring of the same address on two ports. Therefore, users have to reconfigure those addresses after Flex Links failover.
- Port security on Flex Links ports may trigger false violations during Flex Links switchover which in turn triggers a port security shutdown or restrict action. We do *not* recommend configuring port security on Flex Links ports.

## Configuring Flex Links

To configure Flex Links, perform this task:

	Command	Purpose
<b>Step 1</b>	Router# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	Router(conf)# <b>interface</b> {{type <sup>1</sup> slot/port}   {port-channel number}}	Specifies a Layer 2 interface.
<b>Step 3</b>	Router(conf-if)# <b>switchport backup interface</b> {{type <sup>1</sup> slot/port}   {port-channel number}}	Configures the interface as part of a Flex Links pair.
<b>Step 4</b>	Router(conf-if)# <b>exit</b>	Exits configuration mode.
<b>Step 5</b>	Router# <b>show interface</b> [{type <sup>1</sup> slot/port}   {port-channel number}] <b>switchport backup</b>	Verifies the configuration.
<b>Step 6</b>	Router# <b>copy running-config startup config</b>	(Optional) Saves your entries in the switch startup configuration file.

1. *type* = ethernet, fastethernet, gigabithernet, or tengigabithernet

This example shows how to configure an interface with a backup interface and how to verify the configuration:

```
Router# configure terminal
Router(conf)# interface fastethernet1/1
Router(conf-if)# switchport backup interface fastethernet1/2
Router(conf-if)# exit
Router# show interface switchport backup
```

Router Backup Interface Pairs:

Active Interface	Backup Interface	State
FastEthernet1/1	FastEthernet1/2	Active Up/Backup Standby
FastEthernet1/3	FastEthernet2/4	Active Up/Backup Standby
Port-channel1	GigabitEthernet7/1	Active Up/Backup Standby

## Monitoring Flex Links

Table 11-1 shows the privileged EXEC command for monitoring the Flex Links configuration.

**Table 11-1** Flex Links Monitoring Command

Command	Purpose
<code>show interface</code> [{ <i>type</i> <sup>1</sup> <i>slot/port</i> }   { <i>port-channel number</i> }] <code>switchport backup</code>	Displays the Flex Links backup interface configured for an interface, or displays all Flex Links configured on the switch and the state of each active and backup interface (up or standby mode).

1. *type* = ethernet, fastethernet, gigabithethernet, or tengigabithethernet



### Tip

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[http://www.cisco.com/en/US/products/hw/switches/ps708/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/hw/switches/ps708/tsd_products_support_series_home.html)

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