Configuring Flexlink+

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Restrictions for FlexLink+

- FlexLink+ is not supported in a Cisco StackWise Virtual solution.
- FlexLink+ is supported only on Layer 2 trunk ports and port channels and is not supported on interfaces that are configured on Layer 3 ports and on VLANs.

Note FlexLink+ is not supported on port channels that are configured with access mode.

Information about FlexLink+

The following sections provide information about FlexLink+

FlexLink+ Overview

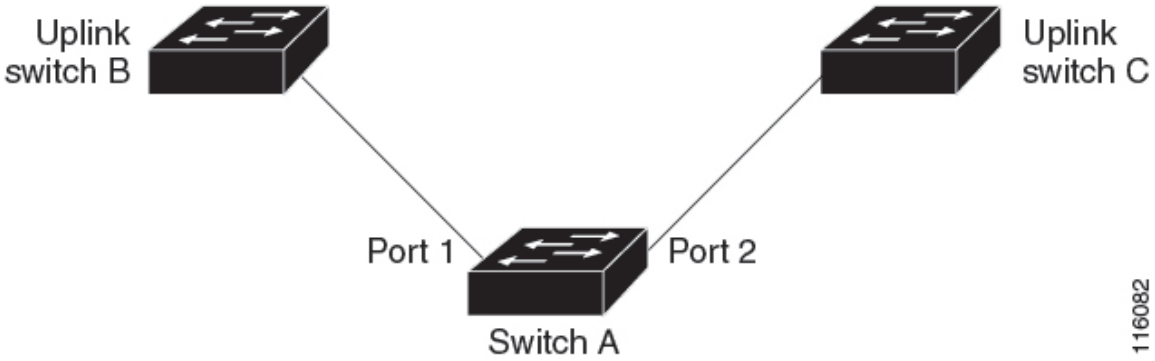
The FlexLink+ feature enables the user to configure a pair of a Layer 2 interfaces (trunk ports or port channels) where one interface is configured to act as a backup to the other. FlexLink+ provides an alternative solution to the Spanning Tree Protocol (STP) when you require simple link redundancy between two network nodes. STP is a complete solution that provides link redundancy and prevents loops in the network. If you need fast link redundancy between two nodes in the network, it is simpler and quicker to use FlexLink+. Flexlinks are typically configured in service provider or enterprise networks where customers do not want to run STP on the device. If the device is running STP, Flexlinks are not necessary because STP already provides link-level redundancy or backup.

In FlexLink+, when one of the links is up and forwarding traffic, the other link is in standby mode, ready to begin forwarding traffic if the active link shuts down. If the primary link shuts down, the standby link starts forwarding traffic. When the active link comes back up, it goes into standby mode and does not forward traffic.

FlexLink+ Configuration

In the following figure, ports 1 and 2 on switch A are connected to uplink switches B and C. Because they are configured with FlexLink+, only one of the interfaces is forwarding traffic; the other 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 forwarding traffic.

Figure 1: FlexLink+ Topology



If STP is configured on the uplink switch interfaces that connect to the FlexLink+ ports (Switch B and Switch C in this case), we recommend running the **spanning-tree portfast trunk** command on such uplink switch interfaces, for faster convergence.

Flexlink+ includes an optimization for improved multicast traffic convergence. The optimization uses Layer 2 multicast snooping mechanisms and requires that the uplink switches connected to the Flexlink+ configured ports have the same Layer 2 multicast snooping feature that is enabled.

Note For IPv4 multicast IGMP snooping is on by default. If IGMP snooping needs to be disabled on the uplink switches it must also be disabled on the Flexlink+ host switch. Otherwise IGMP reports may be looped around the active and standby Flexlink+ ports leading to excessively high CPU utilization.

How to configure Flexlink+

The following sections provide information on how to configure Flexlink+.

Configuring the Active Port for FlexLink+

To configure the active port for FlexLink+, follow this procedure:

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	**interface** *interface-id* **Example:** `Device# interface Port-channel2`	Specifies the interface, and enters interface configuration mode.
Step 4	**switchport trunk allowed vlan** *vlan-list* **Example:** `Device(config-if)# switchport trunk allowed vlan 20-23,40,41`	Configures the allowed VLANs for an interface.
Step 5	**switchport mode trunk** **Example:** `Device(config-if)# switchport mode trunk`	Configures the interface as a Layer 2 trunk.
Step 6	**rep segment** *segment-id* **edge no-neighbor primary** **Example:** `Device(config-if)# rep segment 1023 edge no-neighbor primary`	Specifies that the port is the primary edge port where you can configure the active port of FlexLink+. A segment has only one primary edge port.

Configuring the Standby Port for FlexLink+

To configure the standby port for FlexLink+, follow this procedure:

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# configure terminal`	
Step 3	**interface** *interface-id* **Example:** `Device# interface Port-channel7`	Specifies the interface, and enters interface configuration mode.
Step 4	**switchport trunk allowed vlan** *vlan-list* **Example:** `Device(config-if)# switchport trunk allowed vlan 20-23,40,41`	Configures the allowed VLANs for an interface.
Step 5	**switchport mode trunk** **Example:** `Device(config-if)# switchport mode trunk`	Configures the interface as a Layer 2 trunk.
Step 6	**rep segment** *segment-id* **edge no-neighbor preferred** **Example:** `Device(config-if)# rep segment 1023 edge no-neighbor preferred`	Specifies the segment edge as one with no external REP neighbor. Specifies that the port is the standby port for FlexLink+. **Note** • Use the **preferred** keyword to ensure that the standby port becomes the blocking port. This optional keyword indicates that the port is the preferred alternate port or the preferred port for VLAN load balancing. • Configuring a port as **preferred** does not guarantee that it becomes the alternate port; it merely gives the port a slight edge over equal contenders. The alternate port is usually a previously failed port.

Configuration Examples for FlexLink+

The following sections provide examples for configuring FlexLink+.

Example: Configuring the Active Port for FlexLink+

This example shows how to configure the active port for FlexLink+.

```
Device# interface Port-channel2
 Device(config-if)# switchport trunk allowed vlan 20-23,40,41
 Device(config-if)# switchport mode trunk
 Device(config-f)# rep segment 1023 edge no-neighbor primary
```

Example: Configuring the Standby Port for FlexLink+

This example shows how to configure the standby port for FlexLink+.

```
Device# interface Port-channel7
 Device(config-if)# switchport trunk allowed vlan 20-23,40,41
 Device(config-if)# switchport mode trunk
 Device(config-f)# rep segment 1023 edge no-neighbor preferred
```

Feature History for FlexLink+

This table provides release and related information for features explained in this module.

These features are available on all releases subsequent to the one they were introduced in, unless noted otherwise.

Release	Feature	Feature Information
Cisco IOS XE Gibraltar 16.12.1	FlexLink+	The FlexLink+ feature enables the user to configure a pair of a Layer 2 interfaces (trunk ports or port channels) where one interface is configured to act as a backup to the other interface. Support for this feature was introduced only on the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the Cisco Catalyst 9500 Series Switches.
Cisco IOS XE Amsterdam 17.2.1	VLAN Load Balancing for FlexLink+ Preemption for VLAN Load Balancing FlexLink+ Dummy Multicast Packets	VLAN load balancing feature was introduced on FlexLink+. VLAN load-balancing allows you to configure a FlexLink+ pair so that both ports can simultaneously forward the traffic for some mutually exclusive VLANs. You can trigger VLAN load balancing either by manually triggering it or by configuring a preempt delay. When a primary link fails, FlexLink+ transmits dummy multicast packets over the new active interface. These packets help learn the source MAC address. Support for this feature was introduced only on the C9500-12Q, C9500-16X, C9500-24Q, C9500-40X models of the Cisco Catalyst 9500 Series Switches.

Use Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn.