Configuring Port Tracking

This chapter describes how to configure port tracking.

This chapter includes the following sections:

- Configuring Port Tracking, page 1

Configuring Port Tracking

Cisco SAN switches offer the port tracking feature on physical Fibre Channel interfaces (but not on virtual Fibre Channel interfaces). This feature uses information about the operational state of the link to initiate a failure in the link that connects the edge device. This process of converting the indirect failure to a direct failure triggers a faster recovery process towards redundant links. When enabled, the port tracking feature brings down the configured links based on the failed link and forces the traffic to be redirected to another redundant link.

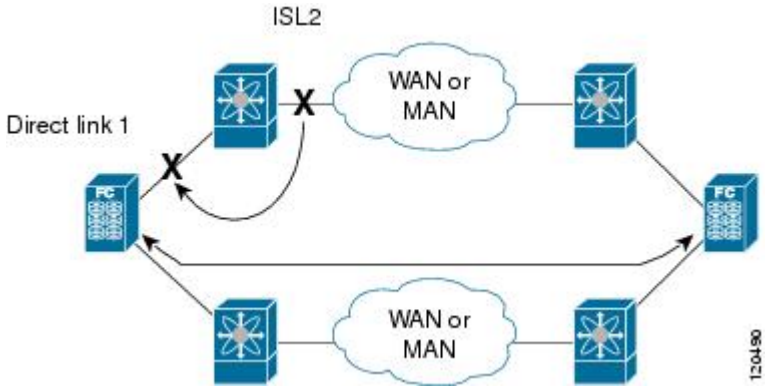
Information About Port Tracking

Port tracking allows you to use information about the operational state of the link so that you can initiate a failure in the link that connects the edge device. Converting the indirect failure to a direct failure triggers a faster recovery process towards redundant links. When enabled, port tracking brings down the configured links based on the failed link and forces the traffic to be redirected to another redundant link.

Generally, hosts can instantly recover from a link failure on a link that is immediately (direct link) connected to a switch. However, recovering from an indirect link failure between switches in a WAN or MAN fabric with a keepalive mechanism is dependent on several factors such as the timeout values (TOVs) and on registered state change notification (RSCN) information.

In the following figure, when the direct link 1 to the host fails, recovery can be immediate. However, when the ISL 2 fails between the two switches, recovery depends on TOVs, RSCNs, and other factors.

Figure 1: Traffic Recovery Using Port Tracking



Port tracking monitors and detects failures that cause topology changes and brings down the links that connect the attached devices. When you enable this feature and explicitly configure the linked and tracked ports, the switch software monitors the tracked ports and alters the operational state of the linked ports on detecting a link state change.

The following terms are used in this chapter:

- Tracked ports—A port whose operational state is continuously monitored. The operational state of the tracked port is used to alter the operational state of one or more ports. Fibre Channel, VSAN, SAN port channel, or a Gigabit Ethernet port can be tracked. Generally, ports in E and TE port modes can also be F ports.
- Linked ports—A port whose operational state is altered based on the operational state of the tracked ports. Only physical Fibre Channel ports can be linked ports.

Port tracking has the following features:

- The application brings the linked port down when the tracked port goes down. When the tracked port recovers from the failure and comes back up again, the linked port is also brought up automatically (unless otherwise configured).
- You can forcefully continue to keep the linked port down, even though the tracked port comes back up. In this case, you must explicitly bring up the linked port when required.

Related Topics

About RSCN Information
Fibre Channel Timeout Values

Default Settings for Port Tracking

The following table lists the default settings for port tracking parameters.

Table 1: Default Port Tracking Parameters

Parameters	Default
Port tracking	Disabled
Operational binding	Enabled along with port tracking

Configuring Port Tracking

Before configuring port tracking, consider the following guidelines:

- Verify that the tracked ports and the linked ports are on the same Cisco switch.
- Be aware that the linked port is automatically brought down when the tracked port goes down.
- Do not track a linked port back to itself (for example, Port fc2/2 to Port fc2/4 and back to Port fc2/2) to avoid recursive dependency.

Enabling Port Tracking

The port tracking feature is disabled by default. When you enable this feature, port tracking is globally enabled for the entire switch.

To configure port tracking, enable the port tracking feature and configure the linked ports for the tracked port.

You can enable port tracking

SUMMARY STEPS

1. **configure terminal**
2. **port-track enable**
3. **no port-track enable**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**port-track enable** **Example:** `switch(config)# port-track enable`	Enables port tracking.

	Command or Action	Purpose
Step 3	**no port-track enable** **Example:** `switch(config)# no port-track enable`	Removes the currently applied port tracking configuration and disables port tracking.

Configuring Linked Ports

You can link ports using one of two methods:

- Operationally binding the linked ports to the tracked port (default).
- Continuing to keep the linked port down forcefully, even if the tracked port has recovered from the link failure.

Operationally Binding a Tracked Port

When you configure the first tracked port, operational binding is automatically in effect. When you use this method, you have the option to monitor multiple ports or monitor ports in one VSAN.

To operationally bind a tracked port, perform this task:

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface fc** *slot*/*port*
3. switch(config-if)# **port-track interface fc** *slot*/*port* | **san-port-channel** *port*
4. switch(config-if)# **no port-track interface fc** *slot*/*port* | **san-port-channel** *port*

DETAILED STEPS

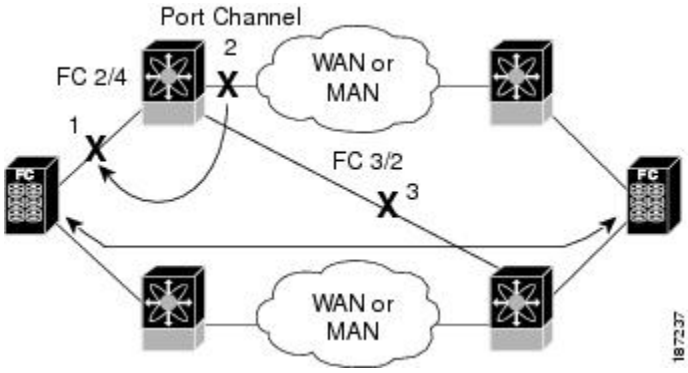
	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **interface fc** *slot*/*port*	Enters the interface configuration mode for the linked port. You can now configure the tracked ports.
Step 3	switch(config-if)# **port-track interface fc** *slot*/*port*	**san-port-channel** *port*	Specifies the tracked port. When the tracked port goes down, the linked port is also brought down.
Step 4	switch(config-if)# **no port-track interface fc** *slot*/*port*	**san-port-channel** *port*	Removes the port tracking configuration that is currently applied to the interface.

Tracking Multiple Ports

You can control the operational state of the linked port based on the operational states of multiple tracked ports. When more than one tracked port is associated with a linked port, the operational state of the linked port will be set to down only if all the associated tracked ports are down. Even if one tracked port is up, the linked port will stay up.

In the following figure, only if both ISLs 2 and 3 fail, will the direct link 1 be brought down. Direct link 1 will not be brought down if either 2 or 3 are still functioning as desired.

Figure 2: Traffic Recovery Using Port Tracking



Tracking Multiple Ports

To track multiple ports, perform this task:

SUMMARY STEPS

1. switch# **configure terminal**
2. switch(config)# **interface fc** *slot*/*port*
3. switch(config-if)# **port-track interface interface fc** *slot*/*port* | **san-port-channel** *port*

DETAILED STEPS

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **interface fc** *slot*/*port*	Configures the specified interface and enters the interface configuration mode. You can now configure tracked ports.
Step 3	switch(config-if)# **port-track interface interface fc** *slot*/*port*	**san-port-channel** *port*	Tracks the linked port with the specified interface. When the tracked port goes down, the linked port is also brought down.

Monitoring Ports in a VSAN

You can optionally configure one VSAN from the set of all operational VSANs on the tracked port with the linked port by specifying the required VSAN. This level of flexibility provides higher granularity in tracked ports. In some cases, when a tracked port is a TE port, the set of operational VSANs on the port can change dynamically without bringing down the operational state of the port. In such cases, the port VSAN of the linked port can be monitored on the set of operational VSANs on the tracked port.

If you configure this feature, the linked port is up only when the VSAN is up on the tracked port.

The specified VSAN does not have to be the same as the port VSAN of the linked port.

Monitoring Ports in a VSAN

You can monitor a tracked port in a specific VSAN.

SUMMARY STEPS

1. **configure terminal**
2. switch(config)# **interface fc** *slot*/*port*
3. **port-track interface san-port-channel 1 vsan 2**
4. **no port-track interface san-port-channel 1 vsan 2**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	switch(config)# **interface fc** *slot*/*port*	Configures the specified interface and enters the interface configuration mode. You can now configure tracked ports.
Step 3	**port-track interface san-port-channel 1 vsan 2** **Example:** `switch(config-if)# port-track interface san-port-channel 1 vsan 2`	Enables tracking of the SAN port channel in VSAN 2.
Step 4	**no port-track interface san-port-channel 1 vsan 2** **Example:** `switch(config-if)# port-track interface san-port-channel 1 vsan 2`	Removes the VSAN association for the linked port. The SAN port channel link remains in effect.

Forcefully Shutting down

If a tracked port flaps frequently, tracking ports using the operational binding feature may cause frequent topology changes. You might choose to keep the port in the down state until you are able to resolve the reason for these frequent flaps. Keeping the flapping port in the down state forces the traffic to flow through the redundant path until the primary tracked port problems are resolved. When the problems are resolved and the tracked port is back up, you can explicitly enable the interface.

If you configure this feature, the linked port continues to remain in the shutdown state even after the tracked port comes back up. You must explicitly remove the forced shut state (by administratively bringing up this interface) of the linked port once the tracked port is up and stable.

Forcefully Shutting Down a Tracked Port

You can forcefully shut down a tracked port.

SUMMARY STEPS

1. **configure terminal**
2. switch(config)# **interface fc** *slot*/*port*
3. **port-track force-shut**
4. **no port-track force-shut**

DETAILED STEPS

	Command or Action	Purpose

Step 1	**configure terminal**
	
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	switch(config)# **interface fc** *slot*/*port*	Configures the specified interface and enters the interface configuration mode. You can now configure tracked ports.
Step 3	**port-track force-shut** **Example:** `switch(config-if)# port-track force-shut`	Forcefully shuts down the tracked port.
Step 4	**no port-track force-shut** **Example:** `switch(config-if)# no port-track force-shut`	Removes the port shutdown configuration for the tracked port.

Displaying Port Tracking Information

The **show** commands display the current port tracking settings for the switch.

The following example shows how to display tracked port configuration for a specific interface:

```
switch# show interface vfc21
fc2/1 is down (Administratively down)
    Hardware is Fibre Channel, FCOT is short wave laser w/o OFC (SN)
    Port WWN is 20:01:00:05:30:00:0d:de
    Admin port mode is FX
    Port vsan is 1
    Receive data field Size is 2112
    Beacon is turned off
    Port tracked with interface vc22 (down)
    Port tracked with interface san-port-channel 1 vsan 2 (down)
5 minutes input rate 0 bits/sec, 0 bytes/sec, 0 frames/sec
...
```

The following example shows how to display tracked port configuration for a SAN port channel:

```
switch# show interface san-port-channel 1
port-channel 1 is down (No operational members)
    Hardware is Fibre Channel
    Port WWN is 24:01:00:05:30:00:0d:de
    Admin port mode is auto, trunk mode is on
    Port vsan is 2
    Linked to 1 port(s)
      Port linked to interface vfc21
...
```

The following example shows how to display the port track mode:

```
switch# show interface vfc 24
vfc24 is up
    Hardware is Fibre Channel, FCOT is short wave laser
...
    Transmit B2B Credit is 64
    Receive B2B Credit is 16
    Receive data field Size is 2112
    Beacon is turned off
    Port track mode is force_shut <-- this port remains shut even if the tracked port is
back up
```