



# Configure Topology-Independent Loop-Free Alternate (TI-LFA)

Topology-Independent Loop-Free Alternate (TI-LFA) uses segment routing to provide link protection in topologies where other fast reroute techniques cannot provide protection. The goal of TI-LFA is to reduce the packet loss that results while routers converge after a topology change due to a link failure. Rapid failure repair (< 50 msec) is achieved through the use of pre-calculated backup paths that are loop-free and safe to use until the distributed network convergence process is completed.



**Note** TI-LFA supports IPv4 only.

TI-LFA provides link protection. The link is excluded during the post convergence backup path calculation.

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## Configuring TI-LFA for IS-IS

This task describes how to enable per-prefix Topology Independent Loop-Free Alternate (TI-LFA) computation to converge traffic flows around link failures.

### Before you begin

Ensure that the following topology requirements are met:

- Router interfaces are configured as per the topology.
- Routers are configured with IS-IS.
- Segment routing for IS-IS is configured. See [Enabling Segment Routing for IS-IS Protocol](#).
- Enter the following commands in global configuration mode:

```
Router(config)# ipv4 unnumbered mpls traffic-eng Loopback0  
Router(config)# mpls traffic-eng  
Router(config-mpls-te)# exit  
Router(config)#
```

## SUMMARY STEPS

1. **configure**
2. **router isis *instance-id***
3. **interface *type interface-path-id***
4. **address-family ipv4 [unicast]**
5. **fast-reroute per-prefix**
6. **fast-reroute per-prefix ti-lfa**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>configure</b>	
<b>Step 2</b>	<b>router isis <i>instance-id</i></b> <b>Example:</b> RP/0/RP0/CPU0:router(config)# <b>router isis 1</b>	Enables IS-IS routing for the specified routing instance, and places the router in router configuration mode.  <b>Note</b> You can change the level of routing to be performed by a particular routing instance by using the <b>is-type</b> router configuration command.
<b>Step 3</b>	<b>interface <i>type interface-path-id</i></b> <b>Example:</b> RP/0/RP0/CPU0:router(config-isis)# <b>interface GigabitEthernet0/0/2/1</b>	Enters interface configuration mode.
<b>Step 4</b>	<b>address-family ipv4 [unicast]</b> <b>Example:</b> RP/0/RP0/CPU0:router(config-isis-if)# <b>address-family ipv4 unicast</b>	Specifies the IPv4 address family, and enters router address family configuration mode.
<b>Step 5</b>	<b>fast-reroute per-prefix</b> <b>Example:</b> RP/0/RP0/CPU0:router(config-isis-if-af)# <b>fast-reroute per-prefix</b>	Enables per-prefix fast reroute .
<b>Step 6</b>	<b>fast-reroute per-prefix ti-lfa</b> <b>Example:</b> RP/0/RP0/CPU0:router(config-isis-if-af)# <b>fast-reroute per-prefix ti-lfa</b>	Enables per-prefix TI-LFA fast reroute link protection.

TI-LFA has been successfully configured for segment routing.

# Configuring TI-LFA for OSPF

This task describes how to enable per-prefix Topology Independent Loop-Free Alternate (TI-LFA) computation to converge traffic flows around link failures.



**Note** TI-LFA can be configured on the instance, area, or interface. When configured on the instance or area, all interfaces in the instance or area inherit the configuration.

## Before you begin

Ensure that the following topology requirements are met:

- Router interfaces are configured as per the topology.
- Routers are configured with OSPF.
- Segment routing for OSPF is configured. See [Enabling Segment Routing for OSPF Protocol](#).
- Enter the following commands in global configuration mode:

```
Router(config)# ipv4 unnumbered mpls traffic-eng Loopback0
Router(config)# mpls traffic-eng
Router(config-mpls-te)# exit
Router(config)#
```

## SUMMARY STEPS

1. **configure**
2. **router ospf** *process-name*
3. **area** *area-id*
4. **interface** *type interface-path-id*
5. **fast-reroute per-prefix**
6. **fast-reroute per-prefix ti-lfa**

## DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure</b>	
Step 2	<b>router ospf</b> <i>process-name</i>  <b>Example:</b>  RP/0/RP0/CPU0:router(config)# <b>router ospf 1</b>	Enables OSPF routing for the specified routing process, and places the router in router configuration mode.
Step 3	<b>area</b> <i>area-id</i>  <b>Example:</b>  RP/0/RP0/CPU0:router(config-ospf)# <b>area 1</b>	Enters area configuration mode.

	Command or Action	Purpose
<b>Step 4</b>	<b>interface</b> <i>type interface-path-id</i> <b>Example:</b> RP/0/RP0/CPU0:router(config-ospf-ar) # <b>interface</b> <b>GigabitEthernet0/0/2/1</b>	Enters interface configuration mode.
<b>Step 5</b>	<b>fast-reroute per-prefix</b> <b>Example:</b> RP/0/RP0/CPU0:router(config-ospf-ar-if) # <b>fast-reroute per-prefix</b>	Enables per-prefix fast reroute.
<b>Step 6</b>	<b>fast-reroute per-prefix ti-lfa</b> <b>Example:</b> RP/0/RP0/CPU0:router(config-ospf-ar-if) # <b>fast-reroute per-prefix ti-lfa</b>	Enables per-prefix TI-LFA fast reroute link protection.

TI-LFA has been successfully configured for segment routing.