



## Overview of IS-IS Fast Convergence

This module provides information about the topics of Intermediate System-to-Intermediate System (IS-IS) fast convergence. The tasks in the modules that follow this overview can help you improve convergence times for IS-IS networks.

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## Prerequisites for IS-IS Fast Convergence

You should be familiar with the concepts described in the "Integrated IS-IS Routing Protocol Overview" module.

## Information About IS-IS Fast Convergence

You should understand the following concepts before you configure any features to improve IS-IS network convergence times:

### Network Convergence

Convergence is the process of all routers coming to agreement on optimal routes in a network. When a network event causes routes to become available or unavailable, routers send routing update messages through the network that cause routing algorithms to recalculate optimal routes. Eventually all the routers agree on the routes as well as the network topology. Fast convergence benefits network performance. Routing algorithms that converge slowly may cause temporary routing loops or temporary network unavailability.

The process of network convergence can be divided into three separate stages:

1. **Routing change detection:** The speed at which a device on the network can detect and react to the failure or modification of one of its own components, or to a topology change caused by the failure or modification of a component on a routing protocol peer.
2. **Routing change notification:** The speed at which the failure or topology change in the previous stage can be communicated to other devices in the network.

3. Alternate path calculation: The speed at which all devices on the network, having been notified of the failure or topology change, can process the information and calculate an alternate path through which data can flow.

An improvement in any one of these stages provides an improvement in overall convergence. In addition to a basic configuration task that is recommended as a first step in configuring an IS-IS router with best practice parameters for achieving fast convergence, several recommended configuration tasks are grouped according to the stage of network convergence they can improve. For more information, see the following modules:

- "Setting Best Practice Parameters for IS-IS Fast Convergence"
- "Reducing Failure Detection Times in IS-IS Networks"
- "Reducing Link Failure and Topology Change Notification Times in IS-IS Networks"
- "Reducing Alternate-Path Calculation Times in IS-IS Networks"

## Design Recommendations for Achieving Faster Network Convergence

A faster processor can provide better performance for network convergence.

## Where to Go Next

To configure features to improve IS-IS network convergence times, complete the optional tasks in one or more of the following modules:

- "Setting Best Practice Parameters for IS-IS Fast Convergence"
- "Reducing Failure Detection Times in IS-IS Networks"
- "Reducing Alternate-Path Calculation Times in IS-IS Networks"

To enhance IS-IS network security, see the "Enhancing Security in an IS-IS Network" module.

## Additional References

### Related Documents

| Related Topic                    | Document Title                                      |
|----------------------------------|---|
| IPv6 addressing and connectivity | <i>IPv6 Configuration Guide</i>                     |
| Cisco IOS commands               | <i>Cisco IOS Master Commands List, All Releases</i> |
| IPv6 commands                    | <i>Cisco IOS IPv6 Command Reference</i>             |
| Cisco IOS IPv6 features          | <i>Cisco IOS IPv6 Feature Mapping</i>               |

| Related Topic                        | Document Title                                      |
|--------------------------------------|---|
| IPv6 Routing: IS-IS Support for IPv6 | "Integrated IS-IS Routing Protocol Overview" module |

### Standards and RFCs

| Standard/RFC  | Title     |
|---------------|-----------|
| RFCs for IPv6 | IPv6 RFCs |

### MIBs

| MIB | MIBs Link   |
|-----|---|
|     | <p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></p> |

### Technical Assistance

| Description   | Link  |
|---|---|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | <a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a> |

## Feature Information for Overview of IS-IS Fast Convergence

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 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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

