



## OSPF Incremental SPF

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The Open Shortest Path First (OSPF) protocol can be configured to use an incremental SPF algorithm for calculating the shortest path first routes. Incremental SPF is more efficient than the full SPF algorithm, thereby allowing OSPF to converge faster on a new routing topology in reaction to a network event.

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## Prerequisites for OSPF Incremental SPF

It is presumed that you have OSPF configured in your network.

## Information About OSPF Incremental SPF

OSPF uses Dijkstra's SPF algorithm to compute the shortest path tree (SPT). During the computation of the SPT, the shortest path to each node is discovered. The topology tree is used to populate the routing table with routes to IP networks. When changes to a Type-1 or Type-2 link-state advertisement (LSA) occur in an area, the entire SPT is recomputed. In many cases, the entire SPT need not be recomputed because most of the tree remains unchanged. Incremental SPF allows the system to recompute only the affected part of the tree. Recomputing only a portion of the tree rather than the entire tree results in faster OSPF convergence and saves CPU resources. Note that if the change to a Type-1 or Type-2 LSA occurs in the calculating router itself, then the full SPT is performed.

Incremental SPF is scheduled in the same way as the full SPF. Routers enabled with incremental SPF and routers not enabled with incremental SPF can function in the same internetwork.

# How to Enable OSPF Incremental SPF

## Enabling Incremental SPF

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `router ospf process-id`
4. `ispf`
5. `end`

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b>  Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"><li>• Enter your password if prompted.</li></ul>
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b>  Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>router ospf <i>process-id</i></b> <b>Example:</b>  Router(config)# router ospf 1	Configures an OSPF routing process.
<b>Step 4</b>	<b>ispf</b> <b>Example:</b>  Router(config-router)# ispf	Enables incremental SPF.
<b>Step 5</b>	<b>end</b> <b>Example:</b>  Router(config-router)# end	Exits router configuration mode.

# Configuration Examples for OSPF Incremental SPF

## Example Incremental SPF

This example enables incremental SPF:

```
router ospf 1
 ispf
```

## Additional References

The following sections provide references related to OSPF Incremental SPF.

### Related Documents

Related Topic	Document Title
OSPF commands	<i>Cisco IOS IP Routing: OSPF Command Reference</i>
Configuring OSPF	"Configuring OSPF"
Cisco IOS master command list, all releases	<a href="#">Cisco IOS Master Command List, All Releases</a>

### Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	--

### MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

**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 OSPF Incremental SPF

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.

**Table 1: Feature Information for OSPF Incremental SPF**

Feature Name	Releases	Feature Information
OSPF Incremental SPF	Cisco IOS XE Release 2.1	<p>OSPF can be configured to use an incremental SPF algorithm for calculating the shortest path first routes. Incremental SPF is more efficient than the full SPF algorithm, thereby allowing OSPF to converge faster on a new routing topology in reaction to a network event</p> <p>The following commands are introduced or modified in the feature documented in this module:</p> <ul style="list-style-type: none"> <li>• <b>ispf</b></li> </ul>

**Table 2: Feature Information for OSPF Incremental SPF**

Feature Name	Releases	Feature Information
OSPF Incremental SPF	Cisco IOS XE Release 17.4	This feature was introduced.