Configuring OSPF NSR

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Restrictions for OSPF Nonstop Routing

- OSPF nonstop routing can significantly increase the memory used by OSPF during certain phases of its operation. CPU usage also can be increased. You should be aware of router memory capacity and estimate the likely memory requirements of OSPF nonstop Routing.

  For more information, see Configuring OSPF Nonstop Routing. For devices where memory and CPU are constrained, you might want to consider using OSPF Nonstop Forwarding (NSF) instead. For more information, see OSPF RFC 3623 Graceful Restart Helper Mode.

- A changeover from the active to the standby Route Processor (RP) can take several seconds, depending on the hardware platform, and during this time OSPF is unable to send Hello packets. As a result, configurations that use small OSPF dead intervals might not be able to maintain adjacencies across a changeover.

Information About OSPF Nonstop Routing

The OSPF Nonstop Routing feature allows a device with redundant Route Processors (RPs) to maintain its Open Shortest Path First (OSPF) state and adjacencies across planned and unplanned RP changeovers. The OSPF state is maintained by checkpointing the state information from OSPF on the active RP to the standby RP. After a changeover to the standby RP, OSPF uses the checkpointed information to continue operations without interruption.

Although OSPF Nonstop Routing serves a similar function to OSPF Nonstop Forwarding (NSF), it works differently. With NSF, OSPF on the newly active standby RP initially has no state information. OSPF uses extensions to the OSPF protocol to recover its state from neighboring OSPF devices. For the recovery to work, the neighbors must support the NSF protocol extensions and be willing to act as “helpers” to the device that is restarting. The neighbors must also continue forwarding data traffic to the device that is restarting while protocol state recovery takes place.

With nonstop routing, by contrast, the device that performs the changeover preserves its state internally, and in most cases the neighbors are unaware of the changeover. Because assistance is not needed from neighboring devices, nonstop routing can be used in situations where NSF cannot be used; for example, in networks where not all neighbors implement the NSF protocol extensions, or where network topology changes during the recovery making NSF unreliable, use nonstop routing instead of NSF.

How to Configure OSPF Nonstop Routing

The following sections provide information on configuring OSPF nonstop routing.

Configuring OSPF Nonstop Routing

To configure OSPF nonstop routing , perform this procedure.

Note Devices that do not support nonstop routing will not accept the **nsr** (OSPFv3) command.

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	**router ospf** *process-id* **Example:** `Device(config)# router ospf 109`	Configures an OSPF routing process and enters router configuration mode.
Step 4	**nsr** **Example:** `Device(config-router)# nsr`	Configures nonstop routing.
Step 5	**end** **Example:** `Device(config-router)# end`	Exits router configuration mode and returns to privileged EXEC mode.
Step 6	**show ip ospf** [*process-id*] **nsr** [**objects** | **statistics**] **Example:** `Device# show ip ospf 109 nsr`	Displays OSPF nonstop routing status information.

Configuration Examples for OSPF Nonstop Routing

Example: Configuring OSPF Nonstop Routing

The following is an example output that shows how to configure OSPF NSR:

```
Device> enable
Device# configure terminal
Device(config)# router ospf 1
Device(config-router)# nsr
Device(config-router)# end
Device# show ip ospf 1 nsr
Standby RP
 Operating in duplex mode
 Redundancy state: STANDBY HOT
 Peer redundancy state: ACTIVE
 ISSU negotation complete
 ISSU versions compatible
Routing Process "ospf 1" with ID 10.1.1.100
 NSR configured
 Checkpoint message sequence number: 3290
 Standby synchronization state: synchronized
 Bulk sync operations:  1
 Last sync start time:  15:22:48.971 UTC Fri Jan 14 2011
 Last sync finish time: 15:22:48.971 UTC Fri Jan 14 2011
 Last sync lost time:   -
 Last sync reset time:  -
 LSA Count: 2, Checksum Sum 0x00008AB4
```

The output shows that OSPF nonstop routing is configured and that OSPF on the standby RP is fully synchronized and ready to continue operation should the active RP fail or if a manual changeover is performed.

Feature History for OSPF Nonstop Routing

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

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

Release	Feature	Feature Information
Cisco IOS XE Amsterdam 17.3.1	OSPF Nonstop Routing	The OSPF Nonstop Routing feature allows a device with redundant Route Processors to maintain its OSPF state and adjacencies across planned and unplanned RP changeovers.
Cisco IOS XE Cupertino 17.7.1	OSPF Nonstop Routing	This feature was implemented on the supervisor modules C9400X-SUP-2 and C9400X-SUP-2XL.

Use the Cisco Feature Navigator to find information about platform and software image support. To access Cisco Feature Navigator, go to https://cfnng.cisco.com/.