



## OSPF Link-State Database Overload Protection

- [Feature History for OSPF link state database overload protection, on page 1](#)
- [OSPF Link-State Database Overload Protection, on page 1](#)
- [Limit the number of non self-generated LSAs for an OSPF process, on page 2](#)
- [Configuration example set a limit for LSA generation, on page 4](#)

## Feature History for OSPF link state database overload protection

This table provides release and platform support 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 Name and Description	Supported Platform
Cisco IOS XE 17.18.1	OSPF link state database overload protection: The OSPF link state database overload protection is an enhancement feature that limits the number of non-self-generated LSAs for an OSPF or OSPFv3 process.	Cisco C9350 Series Smart Switches Cisco C9610 Series Smart Switches

## OSPF Link-State Database Overload Protection

The OSPF Link-State Database Overload Protection is an enhancement feature that limits the number of non-self-generated Link-State Advertisements (LSAs) for an OSPF or OSPFv3 process.

This feature safeguards the device from CPU and memory exhaustion by limiting the number of non-self-generated LSAs it will accept and process.

## How OSPF link-state database overload protection works

OSPF devices maintain a link-state database (LSDB) containing LSAs generated by themselves and other devices in the OSPF domain. If a device receives an excessive number of non-self-generated LSAs (often due to misconfiguration, route leaks, or excessive redistribution), its memory and CPU can become overwhelmed. With LSDB overload protection enabled, the device is configured with a maximum threshold for

non-self-generated LSAs. If this threshold is exceeded, the device enters an overload state, stopping further OSPF processing and advertising its overload condition to peers.

## Limit the number of non self-generated LSAs for an OSPF process

You can perform this task to configure the maximum number of non self-generated LSAs the switch can receive.

When the configured maximum number of LSAs is exceeded:

- the switch sends a notification and stops accepting any new LSAs. If the count of received LSAs is still higher than the configured maximum, then the OSPF process takes down all adjacencies, clears the OSPF database, and enters the IGNORE state.

You can configure the **ignore-time** *minutes* to set the time for which the OSPF process can remain in the IGNORE state.

- Each time the OSPF process enters the IGNORE state, a counter is incremented.

You can set the count on the number of times the OSPF process has entered the IGNORE state using the **ignore-count** *count-number*. When the configured count is exceeded, the OSPF process remains in the IGNORE state. You must restart the OSPF process to restore normal operation.

- If the OSPF process has returned to its normal state of operation, you can configure the **reset-time** *minutes* to specify the duration to wait before the IGNORE state counter is reset.

Additionally if you require warning messages to be displayed, you can use *threshold-percentage* and **warning-only**.

### Procedure

#### 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* [**vrf** *vrf-name*]

##### Example:

```
Device(config)# router ospf 15
```

Enables OSPF routing and enters router configuration mode.

- *process-id*: The process ID is an internally used identification parameter that is locally assigned. Each OSPF process has a unique process ID.

Process ID can be a positive integer from 1 to 65535.

- *vrf*: Indicates that the OSPF process is being configured for a specific VRF.
- *vrf-name*: Specifies the name of the VRF for which this OSPF process is being created.

#### Step 4 **router-id** *ip-address*

##### Example:

```
Device(config-router)# router-id 10.0.0.1
```

Specifies a fixed router ID for an OSPF process.

*ip-address*: The IP address to identify the device in the routing domain.

#### Step 5 **log-adjacency-changes** [**detail**]

##### Example:

```
Device(config-router)# log-adjacency-changes
```

Configures the device to send a syslog message when an OSPF neighbor goes up or down.

**detail**: Logs all adjacency state changes, including states like DOWN, INIT, 2EXCHANGE, LOADING, and so on.

#### Step 6 **max-lsa** *maximum-number* [*threshold-percentage*] [**warning-only**] [**ignore-time** *minutes*] [**ignore-count** *count-number*] [**reset-time** *minutes*]

##### Example:

```
Device(config-router)# max-lsa 12000
```

Limits the number of non self-generated LSAs that an OSPF routing process can keep in the OSPF link-state database (LSDB).

- *maximum-number*: Maximum number of non-self-generated LSAs allowed in the LSDB.
- *threshold-percentage*: (Optional) Percentage of the maximum number at which a warning message is logged. Default is 75%.
- **warning-only**: (Optional) If specified, only a warning message is logged when the limit is exceeded; the OSPF process does not enter the ignore state. Disabled by default.
- **ignore-time** *minutes*: (Optional) Time in minutes to ignore all neighbors after the maximum LSA limit is exceeded. Default is 5 minutes.
- **ignore-count** *count-number*: (Optional) Number of times the OSPF process can consecutively enter the ignore state. Default is 5 times.
- **reset-time** *minutes*: (Optional) Time in minutes after which the ignore count is reset to zero. Default is 10 minutes (or 2 times ignore-time in some platforms).

#### Step 7 **network** *ip-address wildcard-mask area area-id*

##### Example:

```
Device(config-router)# network 10.1.1.1 255.240.0.0 area 20
```

Defines an interface on which OSPF runs and the area ID for that interface.

- *address wild-card-mask*: Addresses of the networks that belong to a particular OSPF area. The wildcard-mask allows you to use a single command to define one or more multiple interfaces to be associated with a specific OSPF area.

*area-id*: The area identifier. The area identifier can be a decimal value or an IP address.

#### Step 8 end

##### Example:

```
Device(config-router)# end
```

Returns to privileged EXEC mode.

#### Step 9 show ip ospf [process-id area-id] database database-summary

##### Example:

```
Device(config)# show ip ospf 2000 database database-summary
```

Displays lists of information related to the OSPF database for a specific device.

Use this command to verify the number of non self-generated LSAs on a device.

## Configuration example set a limit for LSA generation

In this example, the device is configured to stop accepting non self-generated LSAs after the maximum of 14,000 has been exceeded:

```
Device(config)# router ospf 1
Device(config-router)# router-id 192.168.0.1
Device(config-router)# log-adjacency-changes
Device(config-router)# max-lsa 14000
Device(config-router)# area 33 nssa
Device(config-router)# network 192.168.0.10.0.0.0 area 1
Device(config-router)# network 192.168.5.10.0.0.0 area 1
Device(config-router)# network 192.168.2.10.0.0.0 area 0
```

In this example, the device is configured to stop accepting non self-generated LSAs once a maximum of 12,000 has been exceeded for an OPSFv3 process:

```
Device> enable
Device# configure terminal
Device(config)# router ospfv3 1
Device(config-router)# router-id 10.0.0.1
Device(config-router)# log-adjacency-changes
Device(config-router)# max-lsa 12000
```

In this example, the **show ip ospf** command is entered to confirm the configuration:

```
Device# show ip ospf 1
Routing Process "ospf1" with ID 192.168.0.1
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling(LLS)
```

```
Supports area transit capability
Maximum number of nonself-generated LSA allowed 14000
Threshold for warning message 75%
Ignore-time 5minutes, reset-time 10minutes
Ignore-count allowed 5, current ignore-count 0
```

In this example, the output is displayed when the **show ip ospf** command is entered when the device is in the ignore state:

```
Device# show ip ospf 1
Routing Process "ospf1" with ID 192.168.0.1
Supports only single TOS(TOS0) routes
Supports opaque LSA
Supports Link-local Signaling (LLS)
Supports area transit capability
Maximum number of nonself-generated LSA allowed 14000
Threshold for warning message 75%
Ignore-time 5minutes, reset-time 10minutes
Ignore-count allowed 5, current ignore-count 1
Ignoring all neighbors due to max-lsa limit, time remaining: 00:04:52
```

This output is displayed when the **show ip ospf** command is entered after the device left the ignore state:

```
Device# show ip ospf 1
Routing Process "ospf 1" with ID 192.168.0.1
Supports only single TOS(TOS0) routes
Supports opaque LSA Supports Link-local Signaling (LLS)
Supports area transit capability
Maximum number of non self-generated LSA allowed 14000
Threshold for warning message 75%
Ignore-time 5 minutes, reset-time 10 minutes
Ignore-count allowed 5, current ignore-count 1- time remaining: 00:09:51
```

This output is displayed when the **show ip ospf** command is entered for a device that is permanently in the ignore state:

```
Device# show ip ospf 1
Routing Process "ospf 1" with ID 192.168.0.1
Supports only single TOS(TOS0) routes
Supports opaque LSA Supports Link-local Signaling (LLS)
Supports area transit capability
Maximum number of non self-generated LSA allowed 14000
Threshold for warning message 75%
Ignore-time 5 minutes, reset-time 10 minutes
Ignore-count allowed 5, current ignore-count 6
Permanently ignoring all neighbors due to max-lsa limit
```

