



OSPF ABR Type 3 LSA Filtering

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The OSPF ABR Type 3 LSA Filtering feature extends the ability of an ABR that is running the OSPF protocol to filter type 3 link-state advertisements (LSAs) that are sent between different OSPF areas. This feature allows only packets with specified prefixes to be sent from one area to another area and restricts all packets with other prefixes. This type of area filtering can be applied out of a specific OSPF area, into a specific OSPF area, or into and out of the same OSPF areas at the same time.

History for the OSPF ABR Type 3 LSA Filtering Feature

Release	Modification
12.0(15)S	This feature was introduced.
12.2(4)T	This feature was integrated into Cisco IOS Release 12.2(4)T.
12.2(4)T3	Support for the Cisco 7500 series was added in Cisco IOS Release 12.2(4)T3.
12.2(8)T	Support for the Cisco 1710, 1721, 3631, 3725, 3745 and IGX 8400 series URM was added in Cisco IOS Release 12.2(8)T.
12.2(11)T	Support for the Cisco AS5300, AS5400, and AS5800 series was integrated into Cisco IOS Release 12.2(11)T.
12.2(28)SB	This feature was integrated into Cisco IOS Release 12.2(28)SB.

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Benefits

The OSPF ABR Type 3 LSA Filtering feature gives the administrator improved control of route distribution between OSPF areas.

Restrictions

Only type 3 LSAs that originate from an ABR are filtered.

Related Features and Technologies

This feature is an extension of the OSPF routing protocol. For more information about configuring OSPF and configuring route summarization and filtering, refer to the “OSPF” chapter of the *Cisco IOS IP Configuration Guide*, Release 12.4 and the Cisco IOS IP Routing Protocols Command Reference, Release 12.4T.

Configuration Tasks

See the following sections for configuration tasks for the OSPF ABR Type 3 LSA Filtering feature. Each task in the list is identified as either required or optional:

- [Configuring OSPF ABR Type 3 LSA Filtering, page 3](#) (required)
- [Verifying OSPF ABR Type 3 LSA Filtering, page 3](#) (optional)
- [Monitoring and Maintaining OSPF ABR Type 3 LSA Filtering, page 4](#)

Configuring OSPF ABR Type 3 LSA Filtering

To filter interarea routes into a specified area, use the following commands beginning in router configuration mode:

	Command	Purpose
Step 1	Router(config)# router ospf <i>process-id</i>	Configures the router to run an OSPF process.
Step 2	Router(config-router)# area <i>area-id</i> filter-list prefix <i>prefix-list-name</i> in	Configures the router to filter interarea routes into the specified area.
Step 3	Router(config-router)# ip prefix-list <i>list-name</i> [seq <i>seq-value</i>] deny permit network/len [ge <i>ge-value</i>] [le <i>le-value</i>]	Creates a prefix list with the name specified for the <i>list-name</i> argument.

To filter interarea routes out of a specified area, use the following commands beginning in router configuration mode:

	Command	Purpose
Step 1	Router(config)# router ospf <i>process-id</i>	Configures the router to run an OSPF process.
Step 2	Router(config-router)# area <i>area-id</i> filter-list prefix <i>prefix-list-name</i> out	Configures the router to filter interarea routes out of the specified area.
Step 3	Router(config-router)# ip prefix-list <i>list-name</i> [seq <i>seq-value</i>] deny permit network/len [ge <i>ge-value</i>] [le <i>le-value</i>]	Creates a prefix list with the name specified for the <i>list-name</i> argument.

Verifying OSPF ABR Type 3 LSA Filtering

To verify that the OSPF ABR Type 3 LSA Filtering feature has been configured, use the **show ip ospf** command in the EXEC mode. The **show ip ospf** command will show that this feature has been enabled by listing the area filter as “in” or “out.” The following is sample output from the **show ip ospf** command:

```
router# show ip ospf 1
Routing Process "ospf 1" with ID 172.16.0.1
Supports only single TOS(TOS0) routes
Supports opaque LSA
It is an area border router
SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
Number of external LSA 0. Checksum Sum 0x0
Number of opaque AS LSA 0. Checksum Sum 0x0
Number of DCbitless external and opaque AS LSA 0
Number of DoNotAge external and opaque AS LSA 0
Number of areas in this router is 2. 2 normal 0 stub 0 nssa
External flood list length 0
  Area BACKBONE(0)
    Number of interfaces in this area is 2
    Area has no authentication
    SPF algorithm executed 6 times
    Area ranges are
      10.0.0.0/8 Passive Advertise
    Area-filter AREA_0_IN in
    Area-filter AREA_0_OUT out
    Number of LSA 5. Checksum Sum 0x29450
```

```

Number of opaque link LSA 0. Checksum Sum 0x0
Number of DChitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0
Area 1
Number of interfaces in this area is 1
Area has no authentication
SPF algorithm executed 4 times
Area ranges are
Area-filter AREA_1_IN in
Area-filter AREA_1_OUT out
Number of LSA 6. Checksum Sum 0x30100
Number of opaque link LSA 0. Checksum Sum 0x0
Number of DChitless LSA 0
Number of indication LSA 0
Number of DoNotAge LSA 0
Flood list length 0

```

Monitoring and Maintaining OSPF ABR Type 3 LSA Filtering

Command	Purpose
Router# show ip prefix-list	Displays information about a prefix list or prefix list entries.

Configuration Examples

The following configuration example output shows interarea filtering that is applied to both incoming and outgoing routes:

```

Router(config)# router ospf 1
log-adjacency-changes
area 1 filter-list prefix AREA_1_OUT out
area 3 filter-list prefix AREA_3_IN in
network 10.0.0.0 0.255.255.255 area 3
network 172.16.1.0 0.0.0.255 area 0
network 192.168.0.0 0.255.255.255 area 1
!
ip prefix-list AREA_1_OUT seq 10 permit 10.25.0.0/8 ge 16
ip prefix-list AREA_1_OUT seq 20 permit 172.20.20.0/24
!
ip prefix-list AREA_3_IN seq 10 permit 172.31.0.0/16
!

```

Additional References

The following sections provide references related to OSPF ABR Type 3 LSA Filtering.

Related Documents

Related Topic	Document Title
Configuring OSPF ABR Type 3 LSA Filtering	“OSPF ABR Type 3 LSA Filtering” Chapter in the <i>Cisco IOS IP Routing Protocols Configuration Guide</i> , Release 12.4
OSPF Commands	“OSPF Commands” Chapter in the <i>Cisco IOS IP Routing Protocols Command Reference</i> , Release 12.4T

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
None	—

Technical Assistance

Description	Link
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Command Reference

This section documents modified commands only.

- [area filter-list](#)

area filter-list

To filter prefixes advertised in type 3 link-state advertisements (LSAs) between Open Shortest Path First (OSPF) areas of an Area Border Router (ABR), use the **area filter-list** command in router configuration mode. To change or cancel the filter, use the **no** form of this command.

```
area area-id filter-list prefix {prefix-list-name in | out}
```

```
no area area-id filter-list prefix {prefix-list-name in | out}
```

Syntax Description

<i>area-id</i>	Identifier of the area for which filtering is configured. The identifier can be specified as either a decimal value or an IP address.
prefix	Indicates that a prefix list is used.
<i>prefix-list-name</i>	Name of a prefix list.
in	Prefix list applied to prefixes advertised to the specified area from other areas.
out	Prefix list applied to prefixes advertised out of the specified area to other areas.

Defaults

This command has no default behavior.

Command Modes

Router configuration

Command History

Release	Modification
12.0(15)S	This command was introduced.
12.2(4)T	This command was integrated into Cisco IOS Release 12.2(4)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.

Usage Guidelines

With this feature enabled in the “in” direction, all type 3 LSAs originated by the ABR to this area, based on information from all other areas, are filtered by the prefix list. Type 3 LSAs that were originated as a result of the **area range** command in another area are treated like any other type 3 LSA that was originated individually. Any prefix that does not match an entry in the prefix list is implicitly denied.

With this feature enabled in the “out” direction, all type 3 LSAs advertised by the ABR, based on information from this area to all other areas, are filtered by the prefix list. If the **area range** command has been configured for this area, type 3 LSAs that correspond to the area range are sent to all other areas, only if at least one prefix in the area range matches an entry in the prefix list.

If all specific prefixes are denied by the prefix list, type 3 LSAs that correspond to the **area range** command will not be sent to any other area. Prefixes that are not permitted by the prefix list are implicitly denied.

Examples

The following example filters prefixes that are sent from all other areas to area 1:

```
area 1 filter-list prefix AREA_1 in
```

Related Commands

Command	Description
area range	Consolidates and summarizes routes at an area boundary.

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