



OSPFv3 Route Filtering Using Distribute-List

The OSPFv3 route filtering using distribute-list feature allows users to filter the incoming routes that are programmed in routing table, and the outgoing routes that are advertised.

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Prerequisites for OSPFv3 Route Filtering Using Distribute-List

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

Information About OSPFv3 Route Filtering Using Distribute-List

Users can define a route map to prevent OSPF routes from being added to the routing table. This filtering happens at the moment when OSPF is installing the route in the routing table. This feature has no effect on link-state advertisement (LSA) flooding.

This feature can be useful during redistribution if the user tags prefixes when they get redistributed on Autonomous System Boundary Routers (ASBRs) and later uses the tag to filter the prefixes from being installed in the routing table on other routers. The below mentioned options are available only for distribute-list filtering using route-map.

Filtering Based on Route Tag

Users can assign tags to external routes when they are redistributed to OSPF. Then the user can deny or permit those routes in the OSPF domain by identifying that tag in the **route-map** and **distribute-list in** or **distribute-list out** commands.

Filtering Based on Route Type

In OSPF, the external routes could be Type 1 or Type 2. Users can create route maps to match either Type 1 or Type 2 and then use the **distribute-list in** command to filter certain prefixes. Also, route maps can identify internal routes (interarea and intra-area) and then those routes can be filtered.

Filtering Based on Route Source

When a match is done on the route source, the route source represents the OSPF Router ID of the LSA originator of the LSA in which the prefix is advertised.

Filtering Based on Interface

When a match is done on the interface, the interface represents the outgoing interface for the route that OSPF is trying to install in the routing table.

Filtering Based on Next Hop

When a match is done on the next hop, the next hop represents the next hop for the route that OSPF is trying to install in the routing table.



Note The **distribute-list in** command can be configured to prevent routes from being installed in the global Routing Information Base (RIB). Prior to the implementation of OSPF local RIB (for feature information on OSPF local RIB, see OSPFv2 Local RIB), OSPF would attempt to install a less preferred route (e.g. an inter-area route when the intra-area path is filtered). With OSPF local RIB, only the best route is considered (because this is the only route the local RIB maintains). There is no concept of a "second-best" OSPF route. For more information on the routing algorithm used by Cisco OSPF routers, please refer to RFC 2328.

How to Configure OSPFv3 Route Filtering Using Distribute-List

Configuring OSPFv3 (IPv4 address-family)

Command Mode: Address family mode (address-family ipv4 unicast). Following is the syntax:

```
[no] distribute-list [<access-list #> | <access-list name>] |
    {prefix <name1> gateway <name2>} |
    {prefix <name1> | {gateway <name2>} |
    {route-map name} in [<interface>]

[no] distribute-list [<access-list #> | <access-list name>] | [prefix <name>] out
    [{ <routing-process> | <interface> }]
```

Interface: Incoming (used with Inbound filtering) or outgoing (used with outbound filtering) interface.

Routing-process: Source protocol for the route to be filtered.

Configuring Inbound Filtering: Route Map

SUMMARY STEPS

1. Configure OSPFv3.
2. Configure address-family ipv4 unicast.
3. Configure distribute list with the appropriate route-map.

DETAILED STEPS

Step 1 Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2 Configure address-family ipv4 unicast.

```
Device(config-router)#address-family ipv4 unicast
```

Step 3 Configure distribute list with the appropriate route-map.

```
Device(config-router-af)#distribute-list route-map rmap-name in
```

The following match options in a route-map are supported:

- match interface
 - match ip address
 - match ip next-hop
 - match ip route-source
 - match metric
 - match route-type
 - match tag
-

Configuring Inbound Filtering: Prefix-List/Access-List

SUMMARY STEPS

1. Configure OSPFv3.
2. Configure address-family ipv4 unicast.
3. Defines prefix list to be used and the direction for the filter.

DETAILED STEPS

Step 1 Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2 Configure address-family ipv4 unicast.

```
Device(config-router)#address-family ipv4 unicast
```

Step 3 Defines prefix list to be used and the direction for the filter.

```
Device(config-router-af)#distribute-list prefix pfxname in
```

Note The following are the available optional arguments. You can use these arguments to filter based on incoming interface. Choose any interface that is available on your device.

Ethernet	IEEE 802.3
Loopback	Loopback interface
Null	Null interface
Port-channel	Ethernet Channel of interfaces
Serial	Serial
Tunnel	Tunnel interface
Vlan	Catalyst Vlans

Configuring Outbound Filtering

SUMMARY STEPS

1. Configure OSPFv3.
2. Configure address-family ipv4 unicast.
3. Configure distribute list with the appropriate route-map.

DETAILED STEPS

Step 1

Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2

Configure address-family ipv4 unicast.

```
Device(config-router)#address-family ipv4 unicast
```

Step 3

Configure distribute list with the appropriate route-map.

```
Device(config-router-af)#distribute-list prefix pfxlist-name out
```

Note The following are the available optional arguments. You can use these options to filter based on the source protocol of the route.

bgp	Border Gateway Protocol (BGP)
connected	Connected
eigrp	Enhanced Interior Gateway Routing Protocol (EIGRP)
isis	ISO IS-IS
lisp	Locator ID Separation Protocol (LISP)
ospf	Open Shortest Path First (OSPF)
ospfv3	OSPFv3
rip	Routing Information Protocol (RIP)
static	Static routes

Configuring Route Filtering Using Distribute-List for OSPFv3 (IPv6 address-family)

Mode: Address-family mode (address-family ipv6 unicast). Prefix-list and route-map are supported as filtering options. Following is the syntax:

```
[no] distribute-list prefix-list <name> in [<interface>]
[no] distribute-list route-map <name> in
[no] distribute-list prefix-list <name> out <routing-process>
```

Interface: Incoming (used with Inbound filtering) or outgoing (used with outbound filtering) interface.

Routing-process: Source protocol for the route to be filtered.

Configuring Inbound Filtering: Route Map

SUMMARY STEPS

1. Configure OSPFv3.
2. Configure address-family ipv6unicast.
3. Define route map.

DETAILED STEPS

Step 1 Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2 Configure address-family ipv6unicast.

```
Device(config-router)#address-family ipv6 unicast
```

Step 3 Define route map.

```
Device(config-router-af)#distribute-list route-map rmap-name in
```

The following match options in a route-map are supported:

- match interface
 - match ip address
 - match ip next-hop
 - match metric
 - match route-type
 - match tag
-

Configuring Inbound Filtering: Prefix-List

SUMMARY STEPS

1. Configure OSPFv3.
2. Configure address-family ipv6 unicast.
3. Define prefix list name.
4. Define filter incoming routing updates.

DETAILED STEPS**Step 1** Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2 Configure address-family ipv6 unicast.

```
Device(config-router)#address-family ipv6 unicast
```

Step 3 Define prefix list name.

```
Device(config-router-af)#distribute-list prefix pfxlist-name
```

Step 4 Define filter incoming routing updates.

```
Device(config-router-af)#distribute-list prefix pfxname in
```

Note The following are the available optional arguments. You can use these arguments to filter based on incoming interface. Choose any interface that is available on your device.

Ethernet	IEEE 802.3
Loopback	Loopback interface
Null	Null interface
Port-channel	Ethernet Channel of interfaces
Serial	Serial
Tunnel	Tunnel interface
Vlan	Catalyst Vlans

Configuring Outbound Filtering**SUMMARY STEPS**

1. Configure OSPFv3.
2. Configure address-family ipv6 unicast.
3. Define prefix list name.

DETAILED STEPS**Step 1** Configure OSPFv3.

```
Device(config)#router ospfv3 1
```

Step 2 Configure address-family ipv6 unicast.

```
Device(config-router)#address-family ipv6 unicast
```

Step 3 Define prefix list name.

```
Device(config-router-af)#distribute-list prefix-list pfxlist-name out
```

Note These are the available options for the routing process. The **<routing-process>** argument is mandatory for IPv6 outbound route filtering.

bgp	Border Gateway Protocol (BGP)
connected	Connected Routes

eigrp	Enhanced Interior Gateway Routing Protocol (EIGRP)
isis	ISO IS-IS
lisp	Locator ID Separation Protocol (LISP)
ospf	Open Shortest Path First (OSPFv3)
rip	IPv6 Routing Information Protocol (RIPv6)
static	Static Routes

Additional References

Related Documents

Related Topic	Document Title
OSPF commands	<i>Cisco IOS IP Routing: OSPF Command Reference</i>

MIBs

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

RFCs

RFCs	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.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for OSPFv3 Route Filtering Using Distribute-List

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. An account on Cisco.com is not required.

Table 1: Feature Information for OSPFv3 Route Filtering Using Distribute-List

Feature Name	Releases	Feature Information
OSPFv3 Route Filtering Using Distribute-List	Cisco IOS XE Denali 16.3.1	The route-map support for OSPFv3 route-filtering using distribute-list is supported.

Table 2: Feature Information for OSPFv3 Route Filtering Using Distribute-List

Feature Name	Releases	Feature Information
OSPFv3 Route Filtering Using Distribute-List	Cisco IOS XE Release 17.4	This feature was introduced.