# OSPF Inbound Filtering Using Route Maps with a Distribute List

The OSPF Inbound Filtering Using Route Maps with a Distribute List feature allows users to define a route map to prevent Open Shortest Path First (OSPF) routes from being added to the routing table. In the route map, the user can match on any attribute of the OSPF route.

**History for the OSPF Inbound Filtering Using Route Maps with a Distribute List Feature**

| Release | Modification |
|---|---|
| 12.0(24)S | This feature was introduced. |
| 12.2(15)T | This feature was integrated into Cisco IOS Release 12.2(15)T. |
| 12.2(18)S | This feature was integrated into Cisco IOS Release 12.2(18)S. |
| 12.2(27)SBC | This feature was integrated into Cisco IOS Release 12.2(27)SBC. |

### Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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**Corporate Headquarters:**
**Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA**

# Prerequisites OSPF Inbound Filtering Using Route Maps with a Distribute List

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

# Information About OSPF Inbound Filtering Using Route Maps with a Distribute List

Before you configure filtering based on an OSPF route map, you should understand the concept described in this section.

- Benefits of OSPF Route-Map-Based-Filtering, page 2

## Benefits of OSPF Route-Map-Based-Filtering

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 LSA flooding. In the route map, the user can match on any attribute of the OSPF route. That is, the route map could be based on the following **match** options:

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

This feature can be useful during redistribution if the user tags prefixes when they get redistributed on ASBRs and later uses the tag to filter the prefixes from being installed in the routing table on other routers.

#### 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** 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.

# How to Configure OSPF Inbound Filtering Using Route Maps

This section describes enabling OSPF filtering based on a route map.

- Configuring OSPF Route- Map-Based Filtering, page 3

## Configuring OSPF Route-Map-Based Filtering

This section describes how to configure OSPF route map-based filtering. Step 4 is simply an example of a route map; other **match** commands could be used.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **route-map** *map-tag* [**permit** | **deny**] [*sequence-number*]
4. **match tag** *tag-name*

   or other **match** commands.
5. Repeat Steps 3 and 4 with other **route-map** and **match** commands if you choose.
6. **exit**
7. **router ospf** *process-id*
8. **distribute-list route-map** *map-tag* **in**
9. **end**

### DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br><br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br><br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 3** | **route-map** *map-tag* [**permit** \| **deny**] [*sequence-number*]<br><br>**Example:**<br>`Router(config)# route-map tag-filter deny 10` | Defines a route map to control filtering. |
| **Step 4** | **match tag** *tag-name*<br><br>or other **match** command(s)<br><br>**Example:**<br>`Router(config-router)# match tag 777` | Matches routes with a specified name, to be used as the route map is referenced.<br>• At least one **match** command is required, but it need not be this **match** command. This is just an example.<br>• The list of **match** commands available to be used in this type of route map appears on the **distribute-list in** command reference page.<br>• This type of route map will have no **set** commands. |
| **Step 5** | Repeat Steps 3 and 4 with other **route-map** and **match** commands if you choose. | Optional. |
| **Step 6** | **exit**<br><br>**Example:**<br>`Router(config-router)# exit` | Exits router configuration mode. |
| **Step 7** | **router ospf** *process-id*<br><br>**Example:**<br>`Router(config)# router ospf 1` | Configures an OSPF routing process. |
| **Step 8** | **distribute-list route-map** *map-tag* **in**<br><br>**Example:**<br>`Router(config-router)# distribute-list route-map tag-filter in` | Enables filtering based on an OSPF route map. |
| **Step 9** | **end**<br><br>**Example:**<br>`Router(config-router)# end` | Exits router configuration mode. |

# Configuration Examples for OSPF Inbound Filtering Using Route Maps with a Distribute List

This section contains an example of filtering based on an OSPF route map.

- OSPF Route-Map-Based Filtering: Example, page 5

## OSPF Route-Map-Based Filtering: Example

In this example, OSPF external LSAs have a tag. The value of the tag is examined before the prefix is installed in the routing table. All OSPF external prefixes that have the tag value of 777 are filtered (prevented from being installed in the routing table). The permit statement with sequence number 20 has no match conditions, and there are no other route-map statements after sequence number 20, so all other conditions are permitted.

```
route-map tag-filter deny 10
 match tag 777
route-map tag-filter permit 20
!
router ospf 1
 router-id 10.0.0.2
 log-adjacency-changes
 network 172.16.2.1 0.0.0.255 area 0
 distribute-list route-map tag-filter in
```

# Additional References

For additional information related to OSPF, refer to the following references:


- Related Documents, page 5
- Standards, page 5
- MIBs, page 6
- RFCs, page 6
- Technical Assistance, page 6


## Related Documents

| Related Topic | Document Title |
|---|---|
| OSPF commands | "OSPF Commands" chapter in the *Network Protocols Command Reference, Part 1,* Release 12.0 |
| OSPF configuration tasks | "Configuring OSPF" chapter in the *Network Protocols Configuration Guide, Part 1*, Release 12.0 |

## Standards

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

## MIBs

| MIBs | 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:<br>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 Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content. | http://www.cisco.com/techsupport |

# Command Reference

This section documents a modified command only.

- **distribute-list in (IP)**

# distribute-list in (IP)

To filter networks received in updates, use the **distribute-list in** command in address family or router configuration mode. To change or cancel the filter, use the **no** form of this command.

**distribute-list** [*access-list-number* | *name*] | [**route-map** *map-tag*] **in** [*interface-type* | *interface-number*]

**no distribute-list** [*access-list-number* | *name*] | [**route-map** *map-tag*] **in** [*interface-type* | *interface-number*]

## Syntax Description

| | |
|---|---|
| *access-list-number* \| *name* | (Optional) Standard IP access list number or name. The list defines which networks are to be received and which are to be suppressed in routing updates. |
| **route-map** *map-tag* | (Optional) Name of the route map that defines which networks are to be installed in the routing table and which are to be filtered from the routing table. This argument is supported by OSPF only. |
| **in** | Applies the access list to incoming routing updates. |
| *interface-type* | (Optional) Interface type. The *interface-type* argument cannot be used in address family configuration mode. |
| *interface-number* | (Optional) Interface number on which the access list should be applied to incoming updates. If no interface is specified, the access list will be applied to all incoming updates. The interface *type* and *number* arguments can apply if you specify an access list, not a route map. The *interface-type* argument cannot be used in address family configuration mode. |

## Defaults

This command is disabled by default.

## Command Modes

Address family configuration
Router configuration

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |
| 11.2 | The *access-list-name*, *type*, and *number* arguments were added. |
| 12.0(7)T | Address family configuration mode was added. |
| 12.0(24)S | The **route-map** *map-tag* keyword and argument were added. |
| 12.2(27)SBC | This command was integrated into Cisco IOS Release 12.2(27)SBC. |

## Usage Guidelines

This command must specify either an access list or a map-tag name of a route map. The route map is supported for OSPF filtering only.

The *interface-type* and *interface-type* arguments cannot be used in address family configuration mode.

OSPF routes cannot be filtered from entering the OSPF database. If you use this command for OSPF, it only filters routes from the routing table; it does not prevent link-state packets from being propagated.

If a route map is specified, the route map can be based on the following **match** options:

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

Configure the route map before specifying it in the **distribute-list in** command.

## Examples

In the following example, EIGRP process 1 is configured to accept two networks—network 0.0.0.0 and network 10.108.0.0:

```
access-list 1 permit 0.0.0.0
access-list 1 permit 10.108.0.0
access-list 1 deny 0.0.0.0 255.255.255.255
router eigrp 1
 network 10.108.0.0
 distribute-list 1 in
```

In the following example, OSPF external LSAs have a tag. The value of the tag is examined before the prefix is installed in the routing table. All OSPF external prefixes that have the tag value of 777 are filtered (prevented from being installed in the routing table). The permit statement with sequence number 20 has no match conditions, and there are no other route-map statements after sequence number 20, so all other conditions are permitted.

```
route-map tag-filter deny 10
 match tag 777
route-map tag-filter permit 20
!
router ospf 1
 router-id 10.0.0.2
 log-adjacency-changes
 network 172.16.2.1 0.0.0.255 area 0
 distribute-list route-map tag-filter in
```

## Related Commands

| Command | Description |
|---|---|
| **access-list (IP extended)** | Defines an extended IP access list. |
| **access-list (IP standard)** | Defines a standard IP access list. |
| **distribute-list out (IP)** | Suppresses networks from being advertised in updates. |
| **redistribute (IP)** | Redistributes routes from one routing domain into another routing domain. |