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# Introduction

This document provides IPv6 IS-IS configuration examples.

## Prerequisites

The configuration examples in this document were created and verified in a lab environment, and all the devices were started with the factory default configuration. When you are working on a live network, make sure you understand the potential impact of every command on your network.

This document assumes that you have basic knowledge of IPv6 IS-IS.

## Example: Configuring IPv6 IS-IS

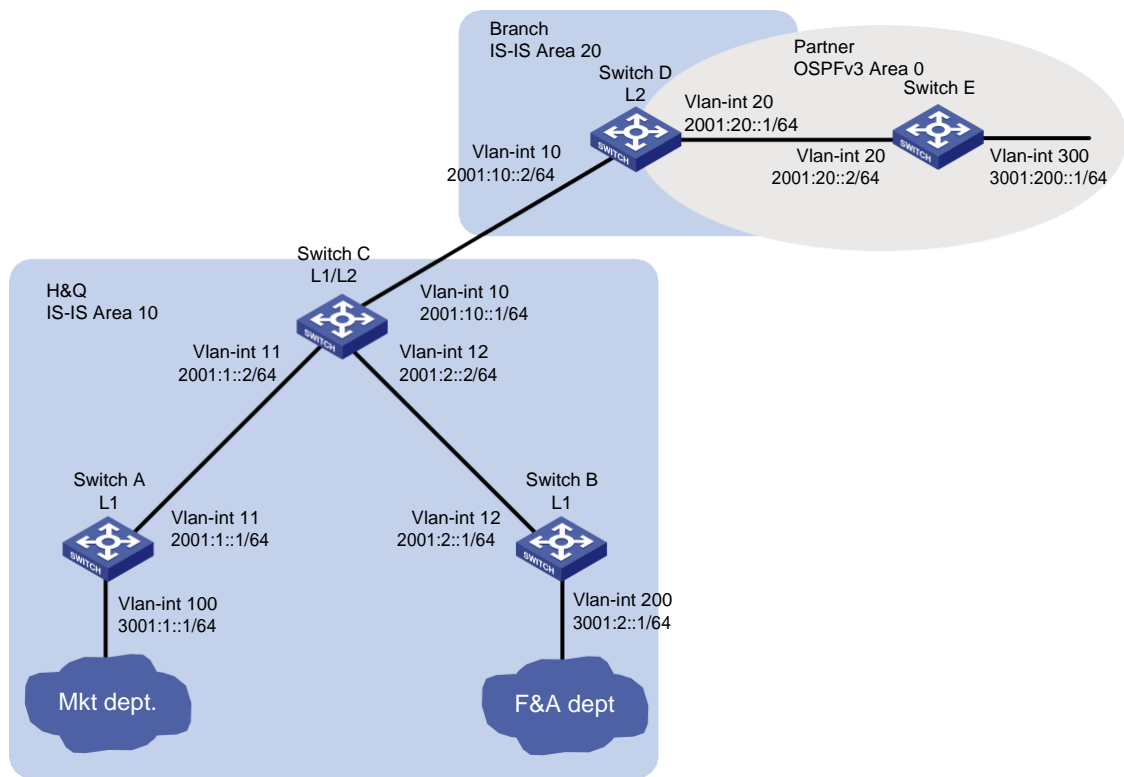
### Network configuration

As shown in [Figure 1](#), the company's headquarters and the branch run IPv6 IS-IS. The partner runs OSPFv3.

Configure the switches to meet the following requirements:

- The Marketing department can reach the Finance department, the branch, and the partner.
- The Finance department and the branch cannot reach each other, and the branch does not have a route to the Finance department.

**Figure 1 Network diagram**



# Analysis

To meet the network requirements, you must perform the following tasks:

- Configure Switch A and Switch B in Area 10 as Level-1 routers to allow communication between the Marketing department and the Finance department.
- Configure route redistribution between IPv6 IS-IS and OSPFv3 on Switch D to allow communication between the Marketing department and the partner.
- Configure Switch C to use a prefix list to advertise only network 3001:1::/64 to Level-2. So that the branch does not have a route to the Finance department.

## Applicable hardware and software versions

The following matrix shows the hardware and software versions to which this configuration example is applicable:

| Hardware              | Software version   |
|-----------------------|--|
| SC 3570 switch series | Release 11xx   |
| SC 5525 switch series | Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx |
| SC 5520 switch series | Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx |
| SC 3170 switch series | Not supported  |
| SC 3130 switch series | Not supported  |

## Procedures

### Configuring Switch A

# Configure an IPv6 address for VLAN-interface 11.

```
<SwitchA> system-view
[SwitchA] interface vlan-interface 11
[SwitchA-Vlan-interface11] ipv6 address 2001:1::1 64
[SwitchA-Vlan-interface11] quit
```

# Configure IPv6 addresses for other interfaces, as shown in [Figure 1](#). (Details not shown.)

# Configure IPv6 IS-IS.

```
[SwitchA] isis 1
[SwitchA-isis-1] is-level level-1
[SwitchA-isis-1] network-entity 10.3001.0001.0001.00
[SwitchA-isis-1] address-family ipv6
[SwitchA-isis-1-ipv6] quit
[SwitchA-isis-1] quit
[SwitchA] interface vlan-interface 11
[SwitchA-vlan-interface 11] isis ipv6 enable 1
[SwitchA-vlan-interface 11] quit
[SwitchA] interface vlan-interface 100
[SwitchA-Vlan-interface100] isis ipv6 enable 1
```

```
[SwitchA-Vlan-interface100] quit
```

## Configuring Switch B

**# Configure an IPv6 address for VLAN-interface 12.**

```
<SwitchB> system-view  
[SwitchB] interface vlan-interface 12  
[SwitchB-Vlan-interface12] ipv6 address 2001:2::1 64  
[SwitchB-Vlan-interface12] quit
```

**# Configure IPv6 addresses for other interfaces, as shown in [Figure 1](#). (Details not shown.)**

**# Configure IPv6 IS-IS.**

```
[SwitchB] isis 1  
[SwitchB-isis-1] is-level level-1  
[SwitchB-isis-1] network-entity 10.3001.0002.0001.00  
[SwitchB-isis-1] address-family ipv6  
[SwitchB-isis-1-ipv6] quit  
[SwitchB-isis-1] quit  
[SwitchB] interface vlan-interface 12  
[SwitchB-Vlan-interface12] isis ipv6 enable 1
```

```
[SwitchB-Vlan-interface12] quit
[SwitchB] interface vlan-interface 200
[SwitchB-Vlan-interface 200] isis ipv6 enable 1
[SwitchB-Vlan-interface 200] quit
```

## Configuring Switch C

**# Configure an IPv6 address for VLAN-interface 11.**

```
<SwitchC> system-view
[SwitchC] interface vlan-interface 11
[SwitchC-Vlan-interface11] ipv6 address 2001:1::2 64
[SwitchC-Vlan-interface11] quit
```

**# Configure IPv6 addresses for other interfaces, as shown in [Figure 1](#). (Details not shown.)**

**# Configure IPv6 IS-IS.**

```
[SwitchC] isis 1
[SwitchC-isis-1] is-level level-1
[SwitchC-isis-1] network-entity 10.2001.0010.0001.00
[SwitchC-isis-1] address-family ipv6
[SwitchC-isis-1-ipv6] quit
[SwitchC-isis-1] quit
[SwitchC] interface vlan-interface 10
[SwitchC-Vlan-interface10] isis ipv6 enable 1
[SwitchC-Vlan-interface10] quit
[SwitchC] interface vlan-interface 11
[SwitchC-Vlan-interface11] isis ipv6 enable 1
[SwitchC-Vlan-interface11] quit
[SwitchC] interface vlan-interface 12
[SwitchC-Vlan-interface12] isis ipv6 enable 1
[SwitchC-Vlan-interface12] quit
```

**# Configure route leaking from Level-1 to Level-2, and use prefix list 1 to advertise only network 3001:1::/64 to Level-2.**

```
[SwitchC] ipv6 prefix-list 1 permit 3001:1:: 64
[SwitchC] isis 1
[SwitchC-isis-1] address-family ipv6
[SwitchC-isis-1-ipv6] import-route isisv6 level-1 into level-2 filter-policy prefix-list 1
[SwitchC-isis-1-ipv6] quit
[SwitchC-isis-1] quit
```

## Configuring Switch D

**# Configure an IPv6 address for VLAN-interface 10.**

```
<SwitchD> system-view
[SwitchD] interface vlan-interface 10
[SwitchD-Vlan-interface10] ipv6 address 2001:10::2 64
[SwitchD-Vlan-interface10] quit
```

**# Configure IPv6 addresses for other interfaces, as shown in [Figure 1](#). (Details not shown.)**

### # Configure IPv6 IS-IS.

```
[SwitchD] isis 1
[SwitchD-isis-1] is-level level-2
[SwitchD-isis-1] network-entity 20.2001.0020.0001.00
[SwitchD-isis-1] address-family ipv6
[SwitchD-isis-1-ipv6] quit
[SwitchD-isis-1] quit
[SwitchD] interface vlan-interface 10
[SwitchD-Vlan-interface10] isis ipv6 enable 1
[SwitchD-Vlan-interface10] quit
[SwitchD] interface vlan-interface 20
[SwitchD-Vlan-interface20] isis ipv6 enable 1
[SwitchD-Vlan-interface20] quit
```

### # Configure OSPFv3.

```
[SwitchD] ospfv3
[SwitchD-ospfv3-1] router-id 4.4.4.4
[SwitchD-ospfv3-1] quit
[SwitchD] interface vlan-interface 20
[SwitchD-Vlan-interface20] ospfv3 1 area 0
[SwitchD-Vlan-interface20] quit
```

### # Redistribute OSPFv3 and direct routes into IPv6 IS-IS.

```
[SwitchD] isis 1
[SwitchD-isis-1] address-family ipv6
[SwitchD-isis-1-ipv6] import-route ospfv3
[SwitchD-isis-1-ipv6] import-route direct
[SwitchD-isis-1-ipv6] quit
[SwitchD-isis-1] quit
```

### # Redistribute IPv6 IS-IS and direct routes into OSPFv3.

```
[SwitchD] ospfv3 1
[SwitchD-ospfv3-1] import-route isisv6 1
[SwitchD-ospfv3-1] import-route direct
```

## Configuring Switch E

### # Configure an IPv6 address for VLAN-interface 20.

```
<SwitchE> system-view
[SwitchE] interface vlan-interface20
[SwitchE-Vlan-interface12] ipv6 address 2001:20::2 64
[SwitchE-Vlan-interface12] quit
```

### # Configure IPv6 addresses for other interfaces, as shown in [Figure 1](#). (Details not shown.)

### # Configure OSPFv3.

```
[SwitchE] ospfv3
[SwitchE-ospfv3-1] router-id 5.5.5.5
[SwitchE-ospfv3-1] quit
[SwitchE] interface vlan-interface 20
[SwitchE-Vlan-interface 20] ospfv3 1 area 0
[SwitchE-Vlan-interface 20] quit
```

```
[SwitchE] interface vlan-interface 300
[SwitchE-Vlan-interface 300] ospfv3 1 area 0
[SwitchE-Vlan-interface 300] quit
```

## Verifying the configuration

# Verify that the branch can reach the Marketing department, but cannot reach the Finance department.

```
[SwitchD] display isis route ipv6

Route information for IS-IS(1)
-----
Level-2 IPv6 Forwarding Table
-----

Destination : 2001:10::                PrefixLen: 64
Flag        : D/L/-                    Cost      : 10
Next Hop    : Direct                    Interface: Vlan10
Destination : 2001:1::                  PrefixLen: 64
Flag        : R/-/-                    Cost      : 20
Next Hop    : FE80::7625:8AFF:FE02:4D13 Interface: Vlan10
Destination : 2001:2::                  PrefixLen: 64
Flag        : R/-/-                    Cost      : 20
Next Hop    : FE80::7625:8AFF:FE02:4D13 Interface: Vlan10
Destination : 3001:1::                  PrefixLen: 64
Flag        : R/-/-                    Cost      : 30
Next Hop    : FE80::7625:8AFF:FE02:4D13 Interface: Vlan10

Flags: D-Direct, R-Added to Rib, L-Advertised in LSPs, U-Up/Down Bit Set
```

# Verify that the company can communicate with the partner.

- Display the IPv6 IS-IS routing table on Switch C.

```
[SwitchC] display isis route ipv6 level-2

Route information for IS-IS(1)
-----
Level-2 IPv6 Forwarding Table
-----

Destination : 2001:10::                PrefixLen: 64
Flag        : D/L/-                    Cost      : 10
Next Hop    : Direct                    Interface: Vlan10
Destination : 2001:1::                  PrefixLen: 64
Flag        : D/L/-                    Cost      : 10
Next Hop    : Direct                    Interface: Vlan11
Destination : 2001:2::                  PrefixLen: 64
Flag        : D/L/-                    Cost      : 10
Next Hop    : Direct                    Interface: Vlan12
Destination : 2001:20::                 PrefixLen: 64
Flag        : R/L/-                    Cost      : 20
Next Hop    : FE80::BAAF:67FF:FE30:3304 Interface: Vlan10
Destination : 3001:200::                PrefixLen: 64
Flag        : R/-/-                    Cost      : 20
Next Hop    : FE80::BAAF:67FF:FE30:3304 Interface: Vlan10
```

Flags: D-Direct, R-Added to Rib, L-Advertised in LSPs, U-Up/Down Bit Set

- **Ping 3001:200::1 from Switch A.**

```
[SwitchA] ping ipv6 -a 3001:1::1 3001:200::1
Ping6(56 data bytes) 3001:1::1 --> 3001:200::1, press CTRL+C to break
56 bytes from 3001:200::1, icmp_seq=0 hlim=63 time=7.230 ms
56 bytes from 3001:200::1, icmp_seq=1 hlim=63 time=3.449 ms
56 bytes from 3001:200::1, icmp_seq=2 hlim=63 time=2.779 ms
56 bytes from 3001:200::1, icmp_seq=3 hlim=63 time=2.652 ms
56 bytes from 3001:200::1, icmp_seq=4 hlim=63 time=2.558 ms
--- Ping6 statistics for 3001:200::1 ---
5 packet(s) transmitted, 5 packet(s) received, 0.0% packet loss
round-trip min/avg/max/std-dev = 2.558/3.734/7.230/1.776 ms
```

## Configuration files

- **Switch A:**

```
#
isis 1
 is-level level-1
 network-entity 10.3001.0001.0001.00
#
 address-family ipv6 unicast
#
vlan 11
#
vlan 100
#
interface Vlan-interface11
 isis ipv6 enable 1
 ipv6 address 2001:1::1/64
#
interface Vlan-interface100
 isis ipv6 enable 1
 ipv6 address 3001:1::1/64
#
```

- **Switch B:**

```
#
isis 1
 is-level level-1
 network-entity 10.3001.0002.0001.00
#
 address-family ipv6 unicast
#
vlan 12
#
vlan 200
#
interface Vlan-interface12
```



```

isis ipv6 enable 1
ipv6 address 2001:2::1/64
#
interface Vlan-interface200
isis ipv6 enable 1
ipv6 address 3001:2::1/64
#

```

- **Switch C:**

```

#
isis 1
network-entity 10.2001.0010.0001.00
#
address-family ipv6 unicast
import-route isisv6 level-1 into level-2 filter-policy prefix-list 1
#
vlan 10 to 12
#
interface Vlan-interface10
isis ipv6 enable 1
ipv6 address 2001:10::1/64
#
interface Vlan-interface11
isis ipv6 enable 1
ipv6 address 2001:1::2/64
#
interface Vlan-interface12
isis ipv6 enable 1
ipv6 address 2001:2::2/64
#
ipv6 prefix-list 1 index 10 permit 3001:1:: 64
#

```

- **Switch D:**

```

#
isis 1
is-level level-2
network-entity 20.2001.0020.0001.00
#
address-family ipv6 unicast
import-route direct
import-route ospfv3 1
#
ospfv3 1
router-id 4.4.4.4
area 0.0.0.0
import-route direct
import-route isisv6 1
#
vlan 10

```

```

#
vlan 20
#
interface Vlan-interface10
  isis ipv6 enable 1
  ipv6 address 2001:10::2/64
#
interface Vlan-interface20
  ospfv3 1 area 0.0.0.0
  ipv6 address 2001:20::1/64
#
• Switch E:
#
ospfv3 1
  router-id 5.5.5.5
  area 0.0.0.0
#
vlan 20
#
vlan 300
#
interface Vlan-interface20
  ospfv3 1 area 0
  ipv6 address 2001:20::2/64
#
interface Vlan-interface300
  ospfv3 1 area 0
  ipv6 address 3001:200::1/64
#

```