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Introduction

This document provides IS-IS route summarization 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 IS-IS route summarization.

Example: Configuring IS-IS route summarization

Network configuration

As shown in [Figure 1](#), the five departments of a company use IS-IS to connect to the backbone network. The five departments are assigned the networks 192.168.1.0/24, 192.168.2.0/24, 192.168.3.0/24, 192.168.4.0/24, and 192.168.5.0/24. Configure IS-IS route summarization to reduce routing entries and save system resources for Device B.

Figure 1 Network diagram

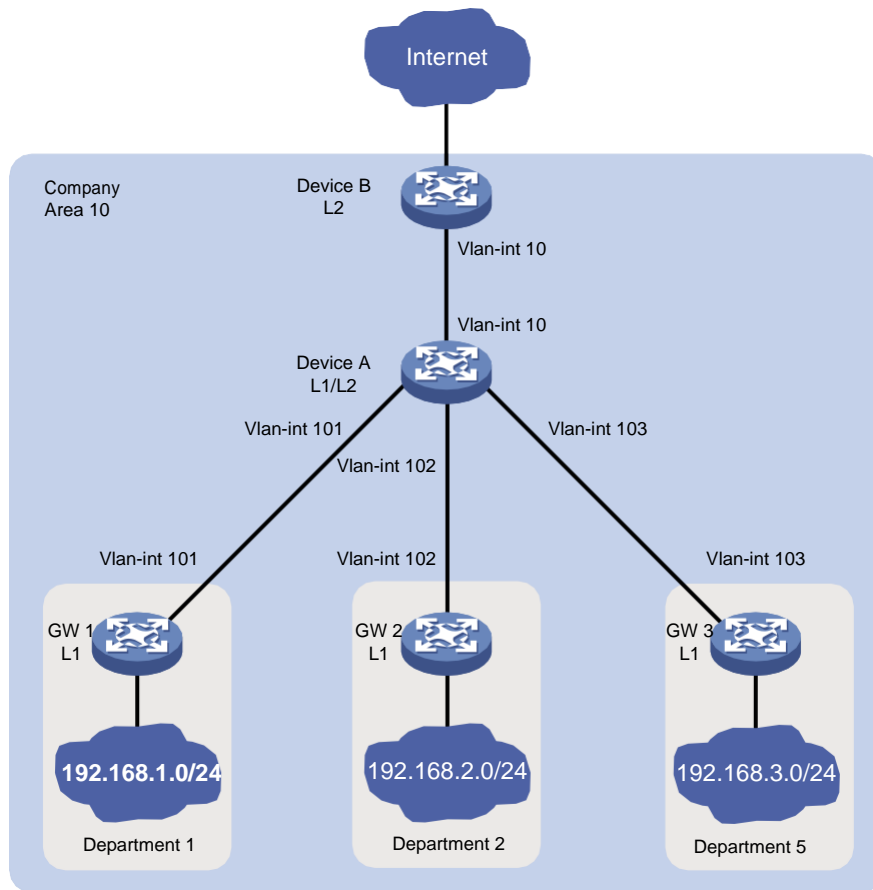


Table 1 Interface and IP address assignment

Device	Interface	IP address	Device	Interface	IP address
Device A	Vlan-int10	172.16.1.1/24	Device B	Vlan-int10	172.168.1.2/24
	Vlan-int101	10.1.1.1/24	GW 1	Vlan-int101	10.1.1.2/24
	Vlan-int102	10.1.2.1/24	GW 2	Vlan-int102	10.1.2.2/24
	Vlan-int103	10.1.3.1/24	GW3	Vlan-int103	10.1.3.2/24

Analysis

Configure route summarization on Device A because route summarization applies only to locally generated LSPs.

To avoid blackhole routes, set the summary route to 192.168.0.0/22.

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 IP addresses for interfaces

Configure an IP address for the interface VLAN-interface 10 on Device A.

```
<DeviceA> system-view
[DeviceA] interface vlan-interface 10
[DeviceA-Vlan-interface10] ip address 172.16.1.1 24
[DeviceA-Vlan-interface10] quit
```

Configure IP addresses for other interfaces as shown in [Figure 1](#) in the same way VLAN-interface 10 is configured. (Details not shown.)

Configuring basic IS-IS

Configuring Device A

Enable IS-IS on Device A and configure Device A as a Level-1-2 router.

```
[DeviceA] isis 1
[DeviceA-isis-1] network-entity 10.0000.0000.0001.00
[DeviceA-isis-1] is-level level-1-2
[DeviceA-isis-1] quit
```

Enable IS-IS on the interface VLAN-interface 10.

```
[DeviceA] interface vlan-interface 10
[DeviceA-Vlan-interface10] isis enable 1
[DeviceA-Vlan-interface10] quit
```

Configure other interfaces in the same way VLAN-interface 10 is configured. (Details not shown.)

Configuring Device B

Enable IS-IS on Device B and configure Device B as a Level-2 router.

```
[DeviceB] isis 1
[DeviceB-isis-1] network-entity 10.0000.0000.0002.00
[DeviceB-isis-1] is-level level-2
[DeviceB-isis-1] quit
```

Enable IS-IS on the interface VLAN-interface 10.

```
[DeviceB] interface vlan-interface 10
[DeviceB-Vlan-interface10] isis enable 1
[DeviceB-Vlan-interface10] quit
```

Configuring the gateways

Enable IS-IS on GW 1 and configure GW 1 as a Level-1 router.

```
[GW1] isis 1
[GW1-isis-1] network-entity 10.0001.0001.0001.00
[GW1-isis-1] is-level level-1
[GW1-isis-1] quit
```

Enable IS-IS on the interface VLAN-interface 11.

```
[GW1] interface vlan-interface 11
[GW1-Vlan-interface11] isis enable 1
[GW1-Vlan-interface11] quit
```

Configure other gateways in the same way GW 1 is configured. (Details not shown.)

Displaying IS-IS routing information on Device B

Display IS-IS routing information on Device B to view the network address of each department.

```
[DeviceB] display isis route
```

```
Route information for IS-IS(1)
```

```
-----
```

```
Level-2 IPv4 Forwarding Table
```

IPv4 Destination	IntCost	ExtCost	ExitInterface	NextHop	Flags
192.168.1.0/24	30	NULL	Vlan10	172.16.1.1	R/-/-
10.1.1.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
192.168.2.0/24	30	NULL	Vlan10	172.16.1.1	R/-/-
10.1.2.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
192.168.3.0/24	30	NULL	Vlan10	172.16.1.1	R/-/-
10.1.3.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
172.16.1.0/24	10	NULL	Vlan10	Direct	D/L/-

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

Configuring IS-IS route summarization

Configure IS-IS route summarization on Device A.

```
[DeviceA] isis 1
[DeviceA] address-family ipv4
[DeviceA-isis-1-ipv4]summary 192.168.0.0 22
```

Verifying the configuration

Display IS-IS routing information on Device B.

```
[DeviceB] display isis route
```

Route information for IS-IS(1)

Level-2 IPv4 Forwarding Table

IPv4 Destination	IntCost	ExtCost	ExitInterface	NextHop	Flags
10.1.1.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
10.1.2.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
10.1.3.0/24	20	NULL	Vlan10	172.16.1.1	R/-/-
172.16.1.0/24	10	NULL	Vlan10	Direct	D/L/-
192.168.0.0/22	30	NULL	Vlan10	172.16.1.1	R/-/-

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

The output shows that the networks have been summarized into a single network 192.168.0.0/22.

Configuration files

- Device A:

#

```

isis 1
 network-entity 10.0000.0000.0001.00
 #
 address-family ipv4 unicast
  summary 192.168.0.0 255.255.252.0
 #
 vlan 10
 #
 vlan 101 to 103
 #
 interface vlan-interface10
  ip address 172.16.1.1 255.255.255.0
  isis enable 1
 #
 interface vlan-interface101
  ip address 10.1.1.1 255.255.255.0
  isis enable 1
 #
 interface vlan-interface102
  ip address 10.1.2.1 255.255.255.0
  isis enable 1
 #
 interface vlan-interface103
  ip address 10.1.3.1 255.255.255.0
  isis enable 1
 #

```

- **Device B:**

```

#
isis 1
 is-level level-2
 network-entity 10.0000.0000.0002.00
 #
 vlan 10
 #
 interface vlan-interface10
  ip address 172.16.1.2 255.255.255.0
  isis enable 1
 #

```

- **GW 1:**

```

#
isis 1
 is-level level-1
 network-entity 10.0001.0001.0001.00
 #
 vlan 11
 #
 vlan 101
 #

```

```
interface vlan-interface101
  ip address 10.1.1.2 255.255.255.0
  isis enable 1
#
interface vlan-interface11
  ip address 192.168.1.1 255.255.255.0
  isis enable 1
#
```

- The configuration files for other gateways are similar to the configuration file for GW 1. (Details not shown.)