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Configuring static routing

About static routes

Static routes are manually configured. If a network's topology is simple, you only need to configure static routes for the network to work correctly.

Static routes cannot adapt to network topology changes. If a fault or a topological change occurs in the network, the network administrator must modify the static routes manually.

Configuring a static route

1. Enter system view.

```
system-view
```

2. Configure a static route.

Public network:

```
ip route-static dest-address { mask-length | mask } { interface-type  
interface-number [ next-hop-address [ nexthop-index index-string ] ]  
| next-hop-address [ nexthop-index index-string ] [ recursive-lookup  
host-route ] | vpn-instance d-vpn-instance-name next-hop-address  
[ recursive-lookup host-route ] } [ permanent | track  
track-entry-number ] [ preference preference ] [ tag tag-value ]  
[ description text ]
```

By default, no static route is configured.

You can associate Track with a static route to monitor the reachability of the next hops. For more information about Track, see *High Availability Configuration Guide*.

VPN:

```
ip route-static vpn-instance s-vpn-instance-name dest-address  
{ mask-length | mask } { interface-type interface-number  
[ next-hop-address [ nexthop-index index-string ] ] | next-hop-address  
[ nexthop-index index-string ] [ recursive-lookup host-route ]  
[ public ] | vpn-instance d-vpn-instance-name next-hop-address  
[ recursive-lookup host-route ] } [ permanent | track  
track-entry-number ] [ preference preference ] [ tag tag-value ]  
[ description text ]
```

By default, no static route is configured.

You can associate Track with a static route to monitor the reachability of the next hops. For more information about Track, see *High Availability Configuration Guide*.

3. (Optional.) Enable periodic sending of ARP requests to the next hops of static routes.

```
ip route-static arp-request interval interval
```

By default, the device does not send ARP requests to the next hops of static routes.

4. (Optional.) Configure the default preference for static routes.

```
ip route-static default-preference default-preference
```

The default setting is 60.

Configuring a static route group

About static route groups

This task allows you to batch create static routes with different prefixes but the same output interface and next hop.

You can create a static route group, and specify the static group in the **ip route-static** command. All prefixes in the static route group will be assigned the next hop and output interface specified in the **ip route-static** command.

Procedure

1. Enter system view.
system-view
2. Create a static route group and enter its view.
ip route-static-group *group-name*
By default, no static route group is configured.
3. Add a static route prefix to the static route group.
prefix *dest-address* { *mask-length* | *mask* }
By default, no static route prefix is added to the static route group.
4. Return to system view.
quit
5. Configure a static route.
Public network:
ip route-static group *group-name* { *interface-type interface-number* [*next-hop-address*] | *next-hop-address* [**recursive-lookup host-route**] | **vpn-instance** *d-vpn-instance-name* *next-hop-address* [**recursive-lookup host-route**] [**track** *track-entry-number*] } [**permanent** | **track** *track-entry-number*] [**preference** *preference*] [**tag** *tag-value*] [**description** *text*]
VPN:
ip route-static vpn-instance *s-vpn-instance-name* **group** *group-name* { *interface-type interface-number* [*next-hop-address*] | *next-hop-address* [**recursive-lookup host-route**] [**public**] | **vpn-instance** *d-vpn-instance-name* *next-hop-address* [**recursive-lookup host-route**] } [**permanent** | **track** *track-entry-number*] [**preference** *preference*] [**tag** *tag-value*] [**description** *text*]
By default, no static route is configured.

Deleting static routes

About deleting static routes

To delete a static route, use the **undo ip route-static** command. To delete all static routes including the default route, use the **delete static-routes all** command.

Procedure

1. Enter system view.
system-view
2. Delete all static routes.

Public network:

```
delete static-routes all
```

VPN:

```
delete vpn-instance vpn-instance-name static-routes all
```

Configuring BFD for static routes

ⓘ IMPORTANT:

Enabling BFD for a flapping route could worsen the situation.

About BFD

BFD provides a general-purpose, standard, medium-, and protocol-independent fast failure detection mechanism. It can uniformly and quickly detect the failures of the bidirectional forwarding paths between two routers for protocols, such as routing protocols and MPLS.

For more information about BFD, see *High Availability Configuration Guide*.

Configuring bidirectional control mode

About bidirectional control mode

To use BFD bidirectional control detection between two devices, enable BFD control mode for each device's static route destined to the peer.

To configure a static route and enable BFD control mode, use one of the following methods:

- Specify an output interface and a direct next hop.
- Specify an indirect next hop and a specific BFD packet source address for the static route.

Configuring BFD control mode for a static route (direct next hop)

1. Enter system view.

```
system-view
```

2. Configure BFD control mode for a static route.

Public network:

```
ip route-static dest-address { mask-length | mask } interface-type  
interface-number next-hop-address bfd control-packet [ preference  
preference ] [ tag tag-value ] [ description text ]
```

VPN:

```
ip route-static vpn-instance s-vpn-instance-name dest-address  
{ mask-length | mask } interface-type interface-number  
next-hop-address bfd control-packet [ preference preference ] [ tag  
tag-value ] [ description text ]
```

By default, BFD control mode for a static route is not configured.

Configuring BFD control mode for a static route (indirect next hop)

1. Enter system view.

```
system-view
```

2. Configure BFD control mode for a static route.

Public network:

```
ip route-static dest-address { mask-length | mask } { next-hop-address
bfd control-packet bfd-source ip-address | vpn-instance
d-vpn-instance-name next-hop-address bfd control-packet bfd-source
ip-address } [ preference preference ] [ tag tag-value ] [ description
text ]
```

VPN:

```
ip route-static vpn-instance s-vpn-instance-name dest-address
{ mask-length | mask } { next-hop-address bfd control-packet bfd-source
ip-address | vpn-instance d-vpn-instance-name next-hop-address bfd
control-packet bfd-source ip-address } [ preference preference ] [ tag
tag-value ] [ description text ]
```

By default, BFD control mode for a static route is not configured.

Configuring single-hop echo mode

About single-hop echo mode

With BFD echo mode enabled for a static route, the output interface sends BFD echo packets to the destination device, which loops the packets back to test the link reachability.

ⓘ IMPORTANT:

Do not use BFD for a static route with the output interface in spoofing state.

Procedure

1. Enter system view.

```
system-view
```

2. Configure the source address of echo packets.

```
bfd echo-source-ip ip-address
```

By default, the source address of echo packets is not configured.

For more information about this command, see *High Availability Command Reference*.

3. Configure BFD echo mode for a static route.

Public network:

```
ip route-static dest-address { mask-length | mask } interface-type
interface-number next-hop-address bfd echo-packet [ preference
preference ] [ tag tag-value ] [ description text ]
```

VPN:

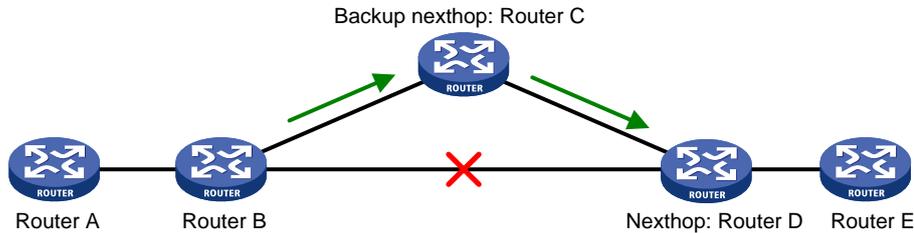
```
ip route-static vpn-instance s-vpn-instance-name dest-address
{ mask-length | mask } interface-type interface-number
next-hop-address bfd echo-packet [ preference preference ] [ tag
tag-value ] [ description text ]
```

Configuring static route FRR

About static route FRR

A link or router failure on a path can cause packet loss. Static route fast reroute (FRR) enables fast rerouting to minimize the impact of link or node failures.

Figure 1 Network diagram



As shown in Figure 1, upon a link failure, packets are directed to the backup next hop to avoid traffic interruption. You can either specify a backup next hop for FRR or enable FRR to automatically select a backup next hop (which must be configured in advance).

Restrictions and guidelines for static route FRR

- Do not use static route FRR and BFD (for a static route) at the same time.
- Equal-cost routes do not support static route FRR.
- Besides the configured static route for FRR, the device must have another route to reach the destination.

When the state of the primary link (with Layer 3 interfaces staying up) changes from bidirectional to unidirectional or down, static route FRR quickly redirects traffic to the backup next hop. When the Layer 3 interfaces of the primary link are down, static route FRR temporarily redirects traffic to the backup next hop. In addition, the device searches for another route to reach the destination and redirects traffic to the new path if a route is found. If no route is found, traffic interruption occurs.

Configuring static route FRR by specifying a backup next hop

Restrictions and guidelines

A static route does not take effect when the backup output interface is unavailable.

To change the backup output interface or next hop, you must first remove the current setting. The backup output interface and next hop must be different from the primary output interface and next hop.

Procedure

1. Enter system view.

```
system-view
```

2. Configure static route FRR.

Public network:

```
ip route-static dest-address { mask-length | mask } interface-type  
interface-number [ next-hop-address [ backup-interface interface-type  
interface-number [ backup-nexthop backup-nexthop-address ] ] ]  
[ permanent ] [ preference preference ] [ tag tag-value ] [ description  
text ]
```

VPN:

```
ip route-static vpn-instance s-vpn-instance-name dest-address  
{ mask-length | mask } interface-type interface-number  
[ next-hop-address [ backup-interface interface-type interface-number  
[ backup-nexthop backup-nexthop-address ] ] ] [ permanent ] [ preference  
preference ] [ tag tag-value ] [ description text ]
```

By default, static route FRR is disabled.

Configuring static route FRR to automatically select a backup next hop

1. Enter system view.

```
system-view
```

2. Configure static route FRR to automatically select a backup next hop.

```
ip route-static fast-reroute auto
```

By default, static route FRR is disabled from automatically selecting a backup next hop.

Enabling BFD echo packet mode for static route FRR

About BFD echo packet mode

By default, static route FRR uses ARP to detect primary link failures. Perform this task to enable static route FRR to use BFD echo packet mode for fast failure detection on the primary link.

Procedure

1. Enter system view.

```
system-view
```

2. Configure the source IP address of BFD echo packets.

```
bfd echo-source-ip ip-address
```

By default, the source IP address of BFD echo packets is not configured.

The source IP address cannot be on the same network segment as any local interface's IP address.

For more information about this command, see *High Availability Command Reference*.

3. Enable BFD echo packet mode for static route FRR.

```
ip route-static primary-path-detect bfd echo
```

By default, BFD echo mode for static route FRR is disabled.

Display and maintenance commands for static routing

Execute **display** commands in any view.

Task	Command
Display static route information.	display ip routing-table protocol static [inactive verbose]
Display static route next hop information.	display route-static nib [<i>nib-id</i>] [verbose]
Display static routing table information.	display route-static routing-table [vpn-instance <i>vpn-instance-name</i>] [<i>ip-address</i> { <i>mask-length</i> <i>mask</i> }]

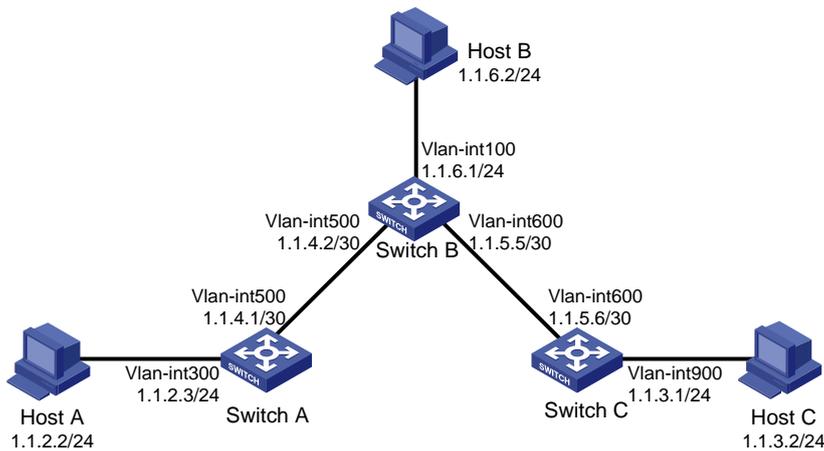
Static route configuration examples

Example: Configuring basic static routes

Network configuration

As shown in [Figure 2](#), configure static routes on the switches for interconnections between any two hosts.

Figure 2 Network diagram



Procedure

1. Configure IP addresses for interfaces. (Details not shown.)
2. Configure static routes:
Configure a default route on Switch A.

```
<SwitchA> system-view
[SwitchA] ip route-static 0.0.0.0 0.0.0.0 1.1.4.2
```


Configure two static routes on Switch B.

```
<SwitchB> system-view
[SwitchB] ip route-static 1.1.2.0 255.255.255.0 1.1.4.1
[SwitchB] ip route-static 1.1.3.0 255.255.255.0 1.1.5.6
```


Configure a default route on Switch C.

```
<SwitchC> system-view
[SwitchC] ip route-static 0.0.0.0 0.0.0.0 1.1.5.5
```
3. Configure the default gateways of Host A, Host B, and Host C as 1.1.2.3, 1.1.6.1, and 1.1.3.1. (Details not shown.)

Verifying the configuration

Display static routes on Switch A.

```
[SwitchA] display ip routing-table protocol static
```

```
Summary Count : 1
```

```
Static Routing table status : <Active>
```

```
Summary Count : 1
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
0.0.0.0/0	Static	60	0	1.1.4.2	Vlan500

Static Routing table status : <Inactive>

Summary Count : 0

Display static routes on Switch B.

[SwitchB] display ip routing-table protocol static

Summary Count : 2

Static Routing table status : <Active>

Summary Count : 2

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
1.1.2.0/24	Static	60	0	1.1.4.1	Vlan500

Static Routing table status : <Inactive>

Summary Count : 0

Use the ping command on Host B to test the reachability of Host A (Windows XP runs on the two hosts).

C:\Documents and Settings\Administrator>ping 1.1.2.2

Pinging 1.1.2.2 with 32 bytes of data:

```

Reply from 1.1.2.2: bytes=32 time=1ms TTL=126

```

Ping statistics for 1.1.2.2:

```

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 1ms, Maximum = 1ms, Average = 1ms

```

Use the tracert command on Host B to test the reachability of Host A.

C:\Documents and Settings\Administrator>tracert 1.1.2.2

Tracing route to 1.1.2.2 over a maximum of 30 hops

```

  1  <1 ms    <1 ms    <1 ms    1.1.6.1
  2  <1 ms    <1 ms    <1 ms    1.1.4.1
  3   1 ms    <1 ms    <1 ms    1.1.2.2

```

Trace complete.

Example: Configuring BFD for static routes (direct next hop)

Network configuration

Configure the following, as shown in [Figure 3](#):

- Configure a static route to subnet 120.1.1.0/24 on Switch A.
- Configure a static route to subnet 121.1.1.0/24 on Switch B.
- Enable BFD for both routes.
- Configure a static route to subnet 120.1.1.0/24 and a static route to subnet 121.1.1.0/24 on Switch C.

When the link between Switch A and Switch B through the Layer 2 switch fails, BFD can detect the failure immediately. Switch A then communicates with Switch B through Switch C.

Figure 3 Network diagram

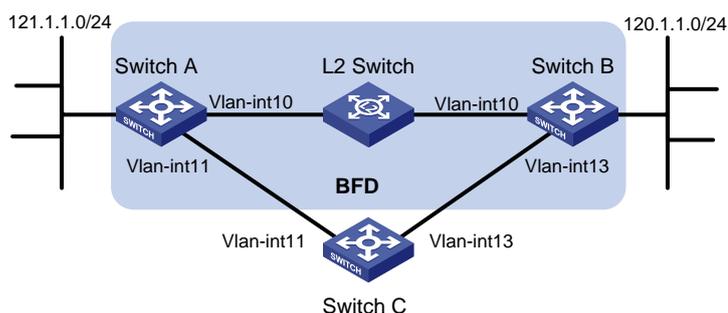


Table 1 Interface and IP address assignment

Device	Interface	IP address
Switch A	VLAN-interface 10	12.1.1.1/24
Switch A	VLAN-interface 11	10.1.1.102/24
Switch B	VLAN-interface 10	12.1.1.2/24
Switch B	VLAN-interface 13	13.1.1.1/24
Switch C	VLAN-interface 11	10.1.1.100/24
Switch C	VLAN-interface 13	13.1.1.2/24

Procedure

1. Configure IP addresses for the interfaces. (Details not shown.)
2. Configure static routes and BFD:

Configure static routes on Switch A and enable BFD control mode for the static route that traverses the Layer 2 switch.

```
<SwitchA> system-view
[SwitchA] interface vlan-interface 10
[SwitchA-vlan-interface10] bfd min-transmit-interval 500
[SwitchA-vlan-interface10] bfd min-receive-interval 500
[SwitchA-vlan-interface10] bfd detect-multiplier 9
[SwitchA-vlan-interface10] quit
[SwitchA] ip route-static 120.1.1.0 24 vlan-interface 10 12.1.1.2 bfd control-packet
[SwitchA] ip route-static 120.1.1.0 24 vlan-interface 11 10.1.1.100 preference 65
```

```

[SwitchA] quit
# Configure static routes on Switch B and enable BFD control mode for the static route that
traverses the Layer 2 switch.
<SwitchB> system-view
[SwitchB] interface vlan-interface 10
[SwitchB-vlan-interface10] bfd min-transmit-interval 500
[SwitchB-vlan-interface10] bfd min-receive-interval 500
[SwitchB-vlan-interface10] bfd detect-multiplier 9
[SwitchB-vlan-interface10] quit
[SwitchB] ip route-static 121.1.1.0 24 vlan-interface 10 12.1.1.1 bfd control-packet
[SwitchB] ip route-static 121.1.1.0 24 vlan-interface 13 13.1.1.2 preference 65
[SwitchB] quit
# Configure static routes on Switch C.
<SwitchC> system-view
[SwitchC] ip route-static 120.1.1.0 24 13.1.1.1
[SwitchC] ip route-static 121.1.1.0 24 10.1.1.102

```

Verifying the configuration

Display BFD sessions on Switch A.

```
<SwitchA> display bfd session
```

```
Total Session Num: 1      Up Session Num: 1      Init Mode: Active
```

```
IPv4 Session Working Under Ctrl Mode:
```

LD/RD	SourceAddr	DestAddr	State	Holdtime	Interface
4/7	12.1.1.1	12.1.1.2	Up	2000ms	Vlan10

The output shows that the BFD session has been created.

Display the static routes on Switch A.

```
<SwitchA> display ip routing-table protocol static
```

```
Summary Count : 1
```

```
Static Routing table status : <Active>
```

```
Summary Count : 1
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
120.1.1.0/24	Static	60	0	12.1.1.2	Vlan10

```
Static Routing table status : <Inactive>
```

```
Summary Count : 0
```

The output shows that Switch A communicates with Switch B through VLAN-interface 10. Then the link over VLAN-interface 10 fails.

Display static routes on Switch A.

```
<SwitchA> display ip routing-table protocol static
```

```
Summary Count : 1
```

Static Routing table status : <Active>

Summary Count : 1

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
120.1.1.0/24	Static	65	0	10.1.1.100	Vlan11

Static Routing table status : <Inactive>

Summary Count : 0

The output shows that Switch A communicates with Switch B through VLAN-interface 11.

Example: Configuring BFD for static routes (indirect next hop)

Network configuration

Figure 4 shows the network topology as follows:

- Switch A has a route to interface Loopback 1 (2.2.2.9/32) on Switch B, with the output interface VLAN-interface 10.
- Switch B has a route to interface Loopback 1 (1.1.1.9/32) on Switch A, with the output interface VLAN-interface 12.
- Switch D has a route to 1.1.1.9/32, with the output interface VLAN-interface 10, and a route to 2.2.2.9/32, with the output interface VLAN-interface 12.

Configure the following:

- Configure a static route to subnet 120.1.1.0/24 on Switch A.
- Configure a static route to subnet 121.1.1.0/24 on Switch B.
- Enable BFD for both routes.
- Configure a static route to subnet 120.1.1.0/24 and a static route to subnet 121.1.1.0/24 on both Switch C and Switch D.

When the link between Switch A and Switch B through Switch D fails, BFD can detect the failure immediately. Switch A then communicates with Switch B through Switch C.

Figure 4 Network diagram

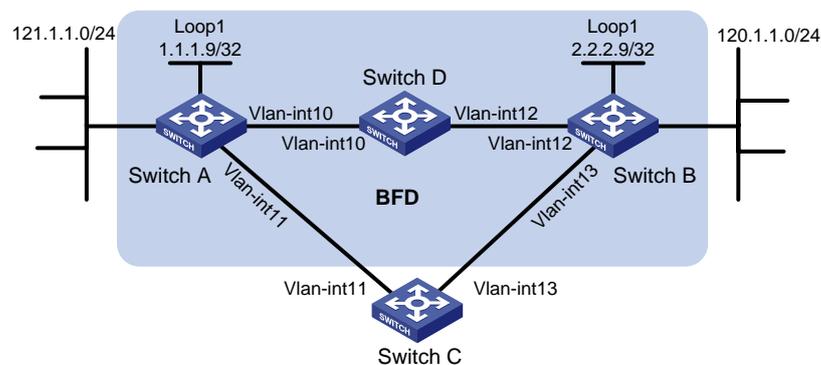


Table 2 Interface and IP address assignment

Device	Interface	IP address
Switch A	VLAN-interface 10	12.1.1.1/24

Device	Interface	IP address
Switch A	VLAN-interface 11	10.1.1.102/24
Switch A	Loopback 1	1.1.1.9/32
Switch B	VLAN-interface 12	11.1.1.1/24
Switch B	VLAN-interface 13	13.1.1.1/24
Switch B	Loopback 1	2.2.2.9/32
Switch C	VLAN-interface 11	10.1.1.100/24
Switch C	VLAN-interface 13	13.1.1.2/24
Switch D	VLAN-interface 10	12.1.1.2/24
Switch D	VLAN-interface 12	11.1.1.2/24

Procedure

1. Configure IP addresses for interfaces. (Details not shown.)
2. Configure static routes and BFD:

Configure static routes on Switch A and enable BFD control mode for the static route that traverses Switch D.

```
<SwitchA> system-view
[SwitchA] bfd multi-hop min-transmit-interval 500
[SwitchA] bfd multi-hop min-receive-interval 500
[SwitchA] bfd multi-hop detect-multiplier 9
[SwitchA] ip route-static 120.1.1.0 24 2.2.2.9 bfd control-packet bfd-source 1.1.1.9
[SwitchA] ip route-static 120.1.1.0 24 vlan-interface 11 10.1.1.100 preference 65
[SwitchA] quit
```

Configure static routes on Switch B and enable BFD control mode for the static route that traverses Switch D.

```
<SwitchB> system-view
[SwitchB] bfd multi-hop min-transmit-interval 500
[SwitchB] bfd multi-hop min-receive-interval 500
[SwitchB] bfd multi-hop detect-multiplier 9
[SwitchB] ip route-static 121.1.1.0 24 1.1.1.9 bfd control-packet bfd-source 2.2.2.9
[SwitchB] ip route-static 121.1.1.0 24 vlan-interface 13 13.1.1.2 preference 65
[SwitchB] quit
```

Configure static routes on Switch C.

```
<SwitchC> system-view
[SwitchC] ip route-static 120.1.1.0 24 13.1.1.1
[SwitchC] ip route-static 121.1.1.0 24 10.1.1.102
```

Configure static routes on Switch D.

```
<SwitchD> system-view
[SwitchD] ip route-static 120.1.1.0 24 11.1.1.1
[SwitchD] ip route-static 121.1.1.0 24 12.1.1.1
```

Verifying the configuration

Display BFD sessions on Switch A.

```
<SwitchA> display bfd session
```

```
Total Session Num: 1      Up Session Num: 1      Init Mode: Active
```

```
IPv4 Session Working Under Ctrl Mode:
```

LD/RD	SourceAddr	DestAddr	State	Holdtime	Interface
4/7	1.1.1.9	2.2.2.9	Up	2000ms	N/A

The output shows that the BFD session has been created.

Display the static routes on Switch A.

```
<SwitchA> display ip routing-table protocol static
```

```
Summary Count : 1
```

```
Static Routing table status : <Active>
```

```
Summary Count : 1
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
120.1.1.0/24	Static	60	0	12.1.1.2	Vlan10

```
Static Routing table status : <Inactive>
```

```
Summary Count : 0
```

The output shows that Switch A communicates with Switch B through VLAN-interface 10. Then the link over VLAN-interface 10 fails.

Display static routes on Switch A.

```
<SwitchA> display ip routing-table protocol static
```

```
Summary Count : 1
```

```
Static Routing table status : <Active>
```

```
Summary Count : 1
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
120.1.1.0/24	Static	65	0	10.1.1.100	Vlan11

```
Static Routing table status : <Inactive>
```

```
Summary Count : 0
```

The output shows that Switch A communicates with Switch B through VLAN-interface 11.

Example: Configuring static route FRR

Network configuration

As shown in [Figure 5](#), configure static routes on Switch A, Switch B, and Switch C, and configure static route FRR. When Link A becomes unidirectional, traffic can be switched to Link B immediately.

Figure 5 Network diagram

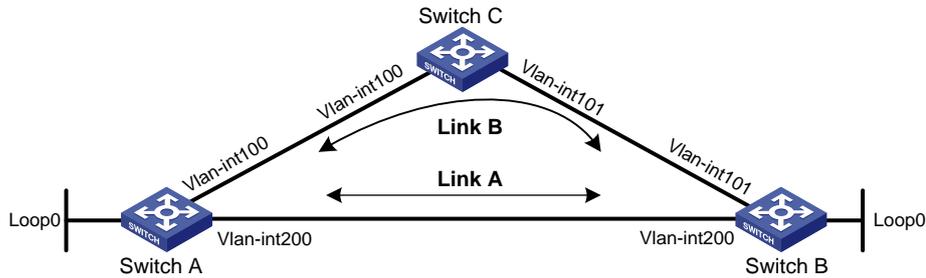


Table 3 Interface and IP address assignment

Device	Interface	IP address
Switch A	VLAN-interface 100	12.12.12.1/24
Switch A	VLAN-interface 200	13.13.13.1/24
Switch A	Loopback 0	1.1.1.1/32
Switch B	VLAN-interface 101	24.24.24.4/24
Switch B	VLAN-interface 200	13.13.13.2/24
Switch B	Loopback 0	4.4.4.4/32
Switch C	VLAN-interface 100	12.12.12.2/24
Switch C	VLAN-interface 101	24.24.24.2/24

Procedure

1. Configure IP addresses for interfaces. (Details not shown.)
2. Configure static route FRR on link A by using one of the following methods:
 - (Method 1.) Specify a backup next hop for static route FRR:
 - # Configure a static route on Switch A, and specify VLAN-interface 100 as the backup output interface and 12.12.12.2 as the backup next hop.

```
<SwitchA> system-view
[SwitchA] ip route-static 4.4.4.4 32 vlan-interface 200 13.13.13.2
backup-interface vlan-interface 100 backup-nexthop 12.12.12.2
```

 - # Configure a static route on Switch B, and specify VLAN-interface 101 as the backup output interface and 24.24.24.2 as the backup next hop.

```
<SwitchB> system-view
[SwitchB] ip route-static 1.1.1.1 32 vlan-interface 200 13.13.13.1
backup-interface vlan-interface 101 backup-nexthop 24.24.24.2
```
 - (Method 2.) Configure static route FRR to automatically select a backup next hop:
 - # Configure static routes on Switch A, and enable static route FRR.

```
<SwitchA> system-view
[SwitchA] ip route-static 4.4.4.4 32 vlan-interface 200 13.13.13.2
[SwitchA] ip route-static 4.4.4.4 32 vlan-interface 100 12.12.12.2 preference 70
[SwitchA] ip route-static fast-reroute auto
```

 - # Configure static routes on Switch B, and enable static route FRR.

```
<SwitchB> system-view
[SwitchB] ip route-static 1.1.1.1 32 vlan-interface 200 13.13.13.1
[SwitchB] ip route-static 1.1.1.1 32 vlan-interface 101 24.24.24.2 preference 70
```

```
[SwitchB] ip route-static fast-reroute auto
```

3. Configure static routes on Switch C.

```
<SwitchC> system-view
```

```
[SwitchC] ip route-static 4.4.4.4 32 vlan-interface 101 24.24.24.4
```

```
[SwitchC] ip route-static 1.1.1.1 32 vlan-interface 100 12.12.12.1
```

Verifying the configuration

Display route 4.4.4.4/32 on Switch A to view the backup next hop information.

```
[SwitchA] display ip routing-table 4.4.4.4 verbose
```

```
Summary Count : 1
```

```
Destination: 4.4.4.4/32
```

```
Protocol: Static
```

```
Process ID: 0
```

```
SubProtID: 0x0
```

```
Age: 04h20m37s
```

```
Cost: 0
```

```
Preference: 60
```

```
IpPre: N/A
```

```
QosLocalID: N/A
```

```
Tag: 0
```

```
State: Active Adv
```

```
OrigTblID: 0x0
```

```
OrigVrf: default-vrf
```

```
TableID: 0x2
```

```
OrigAs: 0
```

```
NibID: 0x26000002
```

```
LastAs: 0
```

```
AttrID: 0xffffffff
```

```
Neighbor: 0.0.0.0
```

```
Flags: 0x1008c
```

```
OrigNextHop: 13.13.13.2
```

```
Label: NULL
```

```
RealNextHop: 13.13.13.2
```

```
BkLabel: NULL
```

```
BkNextHop: 12.12.12.2
```

```
SRLLabel: NULL
```

```
BkSRLLabel: NULL
```

```
Tunnel ID: Invalid
```

```
Interface: Vlan-interface200
```

```
BkTunnel ID: Invalid
```

```
BkInterface: Vlan-interface100
```

```
FtnIndex: 0x0
```

```
TrafficIndex: N/A
```

```
Connector: N/A
```

```
PathID: 0x0
```

Display route 1.1.1.1/32 on Switch B to view the backup next hop information.

```
[SwitchB] display ip routing-table 1.1.1.1 verbose
```

```
Summary Count : 1
```

```
Destination: 1.1.1.1/32
```

```
Protocol: Static
```

```
Process ID: 0
```

```
SubProtID: 0x0
```

```
Age: 04h20m37s
```

```
Cost: 0
```

```
Preference: 60
```

```
IpPre: N/A
```

```
QosLocalID: N/A
```

```
Tag: 0
```

```
State: Active Adv
```

```
OrigTblID: 0x0
```

```
OrigVrf: default-vrf
```

```
TableID: 0x2
```

```
OrigAs: 0
```

```
NibID: 0x26000002
```

```
LastAs: 0
```

```
AttrID: 0xffffffff
```

```
Neighbor: 0.0.0.0
```

```
Flags: 0x1008c
```

```
OrigNextHop: 13.13.13.1
```

```
Label: NULL
```

```
RealNextHop: 13.13.13.1
```

BkLabel: NULL	BkNextHop: 24.24.24.2
SRLabel: NULL	BkSRLabel: NULL
Tunnel ID: Invalid	Interface: Vlan-interface200
BkTunnel ID: Invalid	BkInterface: Vlan-interface101
FtnIndex: 0x0	TrafficIndex: N/A
Connector: N/A	PathID: 0x0

Configuring a default route

A default route is used to forward packets that do not match any specific routing entry in the routing table. Without a default route, packets that do not match any routing entries are discarded and an ICMP destination-unreachable packet is sent to the source.

A default route can be configured in either of the following ways:

- The network administrator can configure a default route with both destination and mask being 0.0.0.0. For more information, see "[Configuring static routing](#)."
- Some dynamic routing protocols (such as OSPF, IS-IS, and RIP) can generate a default route. For example, an upstream router running OSPF can generate a default route and advertise it to other routers. These routers install the default route with the next hop being the upstream router. For more information, see the respective chapters on these routing protocols in this configuration guide.