

Contents

Introduction	1
Prerequisites	1
Example: Configuring DRNI at the access Layer	1
Network configuration	1
Analysis	2
Applicable hardware and software versions	3
Restrictions and guidelines	5
DRNI restrictions and guidelines	5
VRRP restrictions and guidelines	5
Procedures	5
Configuring Device A	5
Configuring Device B	7
Configuring Device C	9
Configuring Device D	11
Configuring Device E	12
Configuring Device F	13
Verifying the configuration	13
Configuration files	16
Example: Configuring DRNI at the distribution Layer	23
Network configuration	23
Analysis	24
Applicable hardware and software versions	24
Restrictions and guidelines	26
DRNI restrictions and guidelines	26
VRRP restrictions and guidelines	26
Procedures	27
Configuring Device A	27
Configuring Device B	29
Configuring Device C	32
Configuring Device D	33
Configuring Device E	33
Verifying the configuration	34
Configuration files	37
Example: Configuring IPv4 and IPv6 dual-active VLAN interfaces on a DR system	43
Network configuration	43
Analysis	45
Applicable hardware and software versions	46
Restrictions and guidelines	47
Procedures	47
Configuring Device A	47
Configuring Device B	50
Configuring Device C	53
Configuring Device D	54
Verifying the configuration	55
Configuration files	58

Introduction

This document provides DRNI configuration examples.

Distributed Resilient Network Interconnect (DRNI) virtualizes two physical devices into one system through multichassis link aggregation. The standard for DRNI is IEEE P802.1AX-REV™/D4.4c, *Draft Standard for Local and Metropolitan Area Networks*.

Prerequisites

The configuration examples 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.

The following information is provided based on the assumption that you have basic knowledge of DRNI.

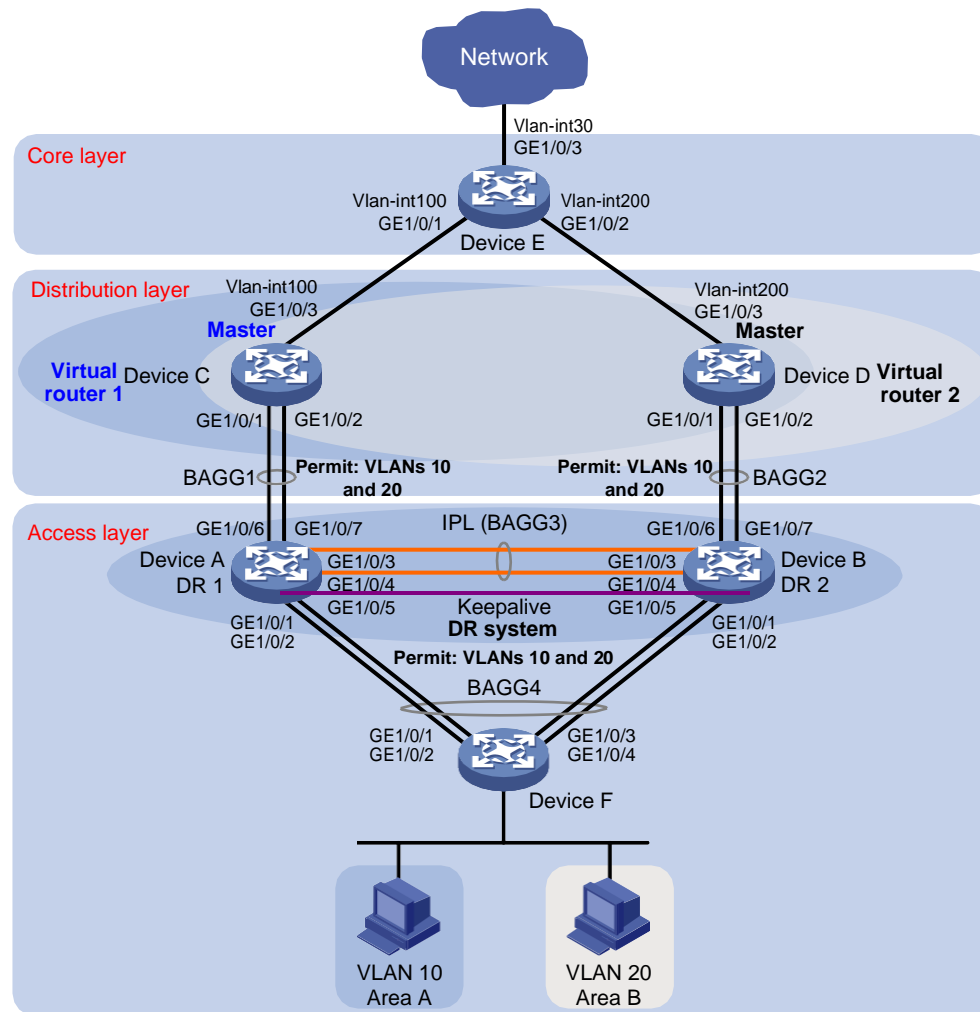
Example: Configuring DRNI at the access Layer

Network configuration

As shown in [Figure 1](#):

- Configure Device A and Device B as a DR system to establish one multichassis aggregate link with Device F and one with Device C and Device D.
- Set up a keepalive link between GigabitEthernet 1/0/5 of Device A and GigabitEthernet 1/0/5 of Device B, and exclude the interfaces from the shutdown action by DRNI MAD.
- Configure two VRRP groups on Device C and Device D to provide gateway services for VLAN 10 and VLAN 20.
 - Configure VRRP group 1 to provide gateway services for hosts in VLAN 10 (Area A). Add Device C and Device D to the group as the master and backup devices, respectively.
 - Configure VRRP group 2 to provide gateway services for hosts in VLAN 20 (Area B). Add Device D and Device C to the group as the master and backup devices, respectively.
- Configure OSPF on Device C, Device D, and Device E for the hosts to communicate with external networks at Layer 3.

Figure 1 Network diagram



Device	Interface	IP address	Device	Interface	IP address
Device A	GE 1/0/5	1.1.1.1/24	Device B	GE1/0/5	1.1.1.2/24
Device C	VLAN-interface 100	100.1.1.1/24	Device D	VLAN-interface 100	200.1.1.1/24
	VLAN-interface 10	10.1.1.1/24		VLAN-interface 10	10.1.1.2/24
	VLAN-interface 20	20.1.1.1/24		VLAN-interface 20	20.1.1.2/24
	Virtual IP 1	10.1.1.100/24		Virtual IP 1	10.1.1.100/24
	Virtual IP 2	20.1.1.100/24		Virtual IP 2	20.1.1.100/24
Device E	VLAN-interface 100	100.1.1.2/24			
	VLAN-interface 200	200.1.1.2/24			
	VLAN-interface 30	30.1.1.1/24			

Analysis

For the secondary DR device to monitor the state of the primary device, establish a Layer 3 keepalive link between the DR member devices.

To balance traffic between two VRRP gateway devices, you can assign them to two VRRP groups with different priorities. In this example, Device C is assigned a higher priority than Device D in VRRP

group 1 so Device C can become the master in this group. Device D is assigned a higher priority than Device C in VRRP group 2 so Device D can become the master in this group.

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	Not supported
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

Restrictions and guidelines

DRNI restrictions and guidelines

For the DR member devices to be identified as one DR system, you must configure the same DR system MAC address and DR system priority on them. You must assign different DR system numbers to the DR member devices.

A DR member device can have only one IPP.

For correct keepalive detection, you must exclude the interfaces used for keepalive detection from the shutdown action by DRNI MAD.

VRRP restrictions and guidelines

You cannot specify the virtual IP address as any of the following IP addresses:

- All-zero address (0.0.0.0).
- Broadcast address (255.255.255.255).
- Loopback address.
- IP address of other than Class A, Class B, and Class C.
- Invalid IP address (for example, 0.0.0.1).

The virtual IP address of an IPv4 VRRP group must be on the same subnet as the downlink interface IP addresses of the VRRP group members to ensure successful traffic forwarding.

Procedures

Configuring Device A

Configure DR system settings.

```
<DeviceA> system-view
[DeviceA] drni system-mac 1-1-1
Changing the system MAC might flap the intra-portal link and cause DR system setup failure.
Continue? [Y/N]:y
[DeviceA] drni system-number 1
Changing the system number might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y
[DeviceA] drni system-priority 123
Changing the system priority might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y
```

Configure DR keepalive packet parameters.

```
[DeviceA] drni keepalive ip destination 1.1.1.2 source 1.1.1.1
```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IP address. The IP address will be used as the source IP address of keepalive packets.

```
[DeviceA] interface gigabitethernet 1/0/5
[DeviceA-GigabitEthernet1/0/5] port link-mode route
[DeviceA-GigabitEthernet1/0/5] ip address 1.1.1.1 24
[DeviceA-GigabitEthernet1/0/5] quit
```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.

```
[DeviceA] drni mad exclude interface gigabitethernet 1/0/5
```

Create VLAN 10 and VLAN 20.

```
[DeviceA] vlan 10
```

```
[DeviceA-vlan10] quit
```

```
[DeviceA] vlan 20
```

```
[DeviceA-vlan20] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 1.

```
[DeviceA] interface bridge-aggregation 1
```

```
[DeviceA-Bridge-Aggregation1] link-aggregation mode dynamic
```

```
[DeviceA-Bridge-Aggregation1] quit
```

Assign GigabitEthernet 1/0/6 and GigabitEthernet 1/0/7 to aggregation group 1.

```
[DeviceA] interface gigabitethernet 1/0/6
```

```
[DeviceA-GigabitEthernet1/0/6] port link-aggregation group 1
```

```
[DeviceA-GigabitEthernet1/0/6] quit
```

```
[DeviceA] interface gigabitethernet 1/0/7
```

```
[DeviceA-GigabitEthernet1/0/7] port link-aggregation group 1
```

```
[DeviceA-GigabitEthernet1/0/7] quit
```

Set the link type of Bridge-Aggregation 1 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceA] interface bridge-aggregation 1
```

```
[DeviceA-Bridge-Aggregation1] port link-type trunk
```

```
Configuring GigabitEthernet1/0/6 done.
```

```
Configuring GigabitEthernet1/0/7 done.
```

```
[DeviceA-Bridge-Aggregation1] port trunk permit vlan 10 20
```

```
Configuring GigabitEthernet1/0/6 done.
```

```
Configuring GigabitEthernet1/0/7 done.
```

```
[DeviceA-Bridge-Aggregation1] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 3 and specify it as the IPP.

```
[DeviceA] interface bridge-aggregation 3
```

```
[DeviceA-Bridge-Aggregation3] link-aggregation mode dynamic
```

```
[DeviceA-Bridge-Aggregation3] port drni intra-portal-port 1
```

```
[DeviceA-Bridge-Aggregation3] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 3.

```
[DeviceA] interface gigabitethernet 1/0/3
```

```
[DeviceA-GigabitEthernet1/0/3] port link-aggregation group 3
```

```
[DeviceA-GigabitEthernet1/0/3] quit
```

```
[DeviceA] interface gigabitethernet 1/0/4
```

```
[DeviceA-GigabitEthernet1/0/4] port link-aggregation group 3
```

```
[DeviceA-GigabitEthernet1/0/4] quit
```

Set the link type of Bridge-Aggregation 3 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceA] interface bridge-aggregation 3
```

```
[DeviceA-Bridge-Aggregation3] port link-type trunk
```

```
Configuring GigabitEthernet1/0/3 done.
```

```
Configuring GigabitEthernet1/0/4 done.
```

```
[DeviceA-Bridge-Aggregation3] port trunk permit vlan 10 20
```

```
Configuring GigabitEthernet1/0/3 done.
```

```

Configuring GigabitEthernet1/0/4 done.
[DeviceA-Bridge-Aggregation3] quit

# Create Layer 2 dynamic aggregate interface Bridge-Aggregation 4 and assign it to DR group 4.
[DeviceA] interface bridge-aggregation 4
[DeviceA-Bridge-Aggregation4] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation4] port drni group 4
[DeviceA-Bridge-Aggregation4] quit

# Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 4.
[DeviceA] interface gigabitethernet 1/0/1
[DeviceA-GigabitEthernet1/0/1] port link-aggregation group 4
[DeviceA-GigabitEthernet1/0/1] quit
[DeviceA] interface gigabitethernet 1/0/2
[DeviceA-GigabitEthernet1/0/2] port link-aggregation group 4
[DeviceA-GigabitEthernet1/0/2] quit

# Set the link type of Bridge-Aggregation 4 to trunk and assign it to VLAN 10 and VLAN 20.
[DeviceA] interface bridge-aggregation 4
[DeviceA-Bridge-Aggregation4] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceA-Bridge-Aggregation4] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceA-Bridge-Aggregation4] quit

```

Configuring Device B

Configure DR system settings.

```

<DeviceB> system-view
[DeviceB] drni system-mac 1-1-1
Changing the system MAC might flap the intra-portal link and cause DR system setup failure.
Continue? [Y/N]:y
[DeviceB] drni system-number 2
Changing the system number might flap the intra-portal link and cause DR system setup
failure. Continue? [Y/N]:y
[DeviceB] drni system-priority 123
Changing the system priority might flap the intra-portal link and cause DR system setup
failure. Continue? [Y/N]:y

```

Configure DR keepalive packet parameters.

```

[DeviceB] drni keepalive ip destination 1.1.1.1 source 1.1.1.2

```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IP address. The IP address will be used as the source IP address of keepalive packets.

```

[DeviceB] interface gigabitethernet 1/0/5
[DeviceB-GigabitEthernet1/0/5] port link-mode route
[DeviceB-GigabitEthernet1/0/5] ip address 1.1.1.2 24
[DeviceB-GigabitEthernet1/0/5] quit

```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.

```

[DeviceB] drni mad exclude interface gigabitethernet 1/0/5

```

Create VLAN 10 and VLAN 20.

```
[DeviceB] vlan 10
[DeviceB-vlan10] quit
[DeviceB] vlan 20
[DeviceB-vlan20] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 2.

```
[DeviceB] interface bridge-aggregation 2
[DeviceB-Bridge-Aggregation2] link-aggregation mode dynamic
[DeviceB-Bridge-Aggregation2] quit
```

Assign GigabitEthernet 1/0/6 and GigabitEthernet 1/0/7 to aggregation group 2.

```
[DeviceB] interface gigabitethernet 1/0/6
[DeviceB-GigabitEthernet1/0/6] port link-aggregation group 2
[DeviceB-GigabitEthernet1/0/6] quit
[DeviceB] interface gigabitethernet 1/0/7
[DeviceB-GigabitEthernet1/0/7] port link-aggregation group 2
[DeviceB-GigabitEthernet1/0/7] quit
```

Set the link type of Bridge-Aggregation 2 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceB] interface bridge-aggregation 2
[DeviceB-Bridge-Aggregation2] port link-type trunk
Configuring GigabitEthernet1/0/6 done.
Configuring GigabitEthernet1/0/7 done.
[DeviceB-Bridge-Aggregation2] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/6 done.
Configuring GigabitEthernet1/0/7 done.
[DeviceB-Bridge-Aggregation2] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 3 and specify it as the IPP.

```
[DeviceB] interface bridge-aggregation 3
[DeviceB-Bridge-Aggregation3] link-aggregation mode dynamic
[DeviceB-Bridge-Aggregation3] port drni intra-portal-port 1
[DeviceB-Bridge-Aggregation3] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 3.

```
[DeviceB] interface gigabitethernet 1/0/3
[DeviceB-GigabitEthernet1/0/3] port link-aggregation group 3
[DeviceB-GigabitEthernet1/0/3] quit
[DeviceB] interface gigabitethernet 1/0/4
[DeviceB-GigabitEthernet1/0/4] port link-aggregation group 3
[DeviceB-GigabitEthernet1/0/4] quit
```

Set the link type of Bridge-Aggregation 3 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceB] interface bridge-aggregation 3
[DeviceB-Bridge-Aggregation3] port link-type trunk
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceB-Bridge-Aggregation3] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceB-Bridge-Aggregation3] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 4 and assign it to DR group 4.


```
[DeviceB] interface bridge-aggregation 4
[DeviceB-Bridge-Aggregation4] link-aggregation mode dynamic
[DeviceB-Bridge-Aggregation4] port drni group 4
[DeviceB-Bridge-Aggregation4] quit

# Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 4.
[DeviceB] interface gigabitethernet 1/0/1
[DeviceB-GigabitEthernet1/0/1] port link-aggregation group 4
[DeviceB-GigabitEthernet1/0/1] quit
[DeviceB] interface gigabitethernet 1/0/2
[DeviceB-GigabitEthernet1/0/2] port link-aggregation group 4
[DeviceB-GigabitEthernet1/0/2] quit

# Set the link type of Bridge-Aggregation 4 to trunk and assign it to VLAN 10 and VLAN 20.
[DeviceB] interface bridge-aggregation 4
[DeviceB-Bridge-Aggregation4] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceB-Bridge-Aggregation4] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceB-Bridge-Aggregation4] quit
```

Configuring Device C

```
# Create VLAN 10, VLAN 20, and VLAN 100.
<DeviceC> system-view
[DeviceC] vlan 10
[DeviceC-vlan10] quit
[DeviceC] vlan 20
[DeviceC-vlan20] quit
[DeviceC] vlan 100

# Assign GigabitEthernet 1/0/3 to VLAN 100.
[DeviceC] vlan 100
[DeviceC-vlan100] port gigabitethernet 1/0/3
[DeviceC-vlan100] quit

# Create Layer 2 dynamic aggregate interface Bridge-Aggregation 1.
[DeviceC] interface bridge-aggregation 1
[DeviceC-Bridge-Aggregation1] link-aggregation mode dynamic
[DeviceC-Bridge-Aggregation1] quit

# Assign GigabitEthernet 1/0/1 and GigabitEthernet1/0/2 to aggregation group 1.
[DeviceC] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/2
[DeviceC-if-range] port link-aggregation group 1
[DeviceC-if-range] quit

# Set the link type of Bridge-Aggregation 1 to trunk and assign it to VLAN 10 and VLAN 20.
[DeviceC] interface bridge-aggregation 1
[DeviceC-Bridge-Aggregation1] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
```

```
[DeviceC-Bridge-Aggregation1] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceC-Bridge-Aggregation1] quit
```

Create uplink interface VLAN-interface 100 and assign it an IP address.

```
[DeviceC] interface vlan-interface 100
[DeviceC-Vlan-interface100] ip address 100.1.1.1 24
[DeviceC-Vlan-interface100] quit
```

Create VLAN-interface 10 and VLAN-interface 20 and assign an IP address to each of them.

```
[DeviceC] interface vlan-interface 10
[DeviceC-vlan-interface10] ip address 10.1.1.1 24
[DeviceC-vlan-interface10] quit
[DeviceC] interface vlan-interface 20
[DeviceC-vlan-interface20] ip address 20.1.1.1 24
[DeviceC-vlan-interface20] quit
```

Create VRRP group 1 on VLAN-interface 10 and set its virtual IP address to 10.1.1.100.

```
[DeviceC] interface vlan-interface 10
[DeviceC-Vlan-interface10] vrrp vrid 1 virtual-ip 10.1.1.100
```

Set the priority of Device C to 200 for it to become the master in VRRP group 1.

```
[DeviceC-Vlan-interface10] vrrp vrid 1 priority 200
[DeviceC-Vlan-interface10] quit
```

Create VRRP group 2 on VLAN-interface 20 and set its virtual IP address to 20.1.1.100.

```
[DeviceC] interface vlan-interface 20
[DeviceC-Vlan-interface20] vrrp vrid 2 virtual-ip 20.1.1.100
[DeviceC-vlan-interface20] quit
```

Configure Device C to operate in preemptive mode in VRRP group 1. Set the preemption delay to 500 centiseconds to avoid frequent status switchover.

```
[DeviceC] interface vlan-interface 10
[DeviceC-Vlan-interface10] vrrp vrid 1 preempt-mode delay 500
[DeviceC-Vlan-interface10] quit
```

Create track entry 1 to monitor the upstream link status of GigabitEthernet 1/0/3.

```
[DeviceC] track 1 interface gigabitethernet 1/0/3
```

Configure Device C in VRRP group 1 to monitor track entry 1, and decrease its priority by 150 when the track entry transits to Negative.

```
[DeviceC] interface vlan-interface 10
[DeviceC-Vlan-interface10] vrrp vrid 1 track 1 priority reduced 150
[DeviceC-Vlan-interface10] quit
```

Configure OSPF.

```
[DeviceC] ospf
[DeviceC-ospf-1] area 0
[DeviceC-ospf-1-area-0.0.0.0] network 10.1.1.0 0.0.0.255
[DeviceC-ospf-1-area-0.0.0.0] network 20.1.1.0 0.0.0.255
[DeviceC-ospf-1-area-0.0.0.0] network 100.1.1.0 0.0.0.255
[DeviceC-ospf-1-area-0.0.0.0] quit
[DeviceC-ospf-1] quit
```

Configuring Device D

Create VLAN 10, VLAN 20, and VLAN 200.

```
<DeviceD> system-view
[DeviceD] vlan 10
[DeviceD-vlan10] quit
[DeviceD] vlan 20
[DeviceD-vlan20] quit
[DeviceD] vlan 200
```

Assign GigabitEthernet 1/0/3 to VLAN 200.

```
[DeviceD] vlan 200
[DeviceD-vlan200] port gigabitethernet 1/0/3
[DeviceD-vlan200] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 2.

```
[DeviceD] interface bridge-aggregation 2
[DeviceD-Bridge-Aggregation2] link-aggregation mode dynamic
[DeviceD-Bridge-Aggregation2] quit
```

Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 2.

```
[DeviceD] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/2
[DeviceD-if-range] port link-aggregation group 2
[DeviceD-if-range] quit
```

Set the link type of Bridge-Aggregation 2 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceD] interface bridge-aggregation 2
[DeviceD-Bridge-Aggregation2] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceD-Bridge-Aggregation2] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceD-Bridge-Aggregation2] quit
```

Create uplink interface VLAN-interface 200 and assign it an IP address.

```
[DeviceD] interface vlan-interface 200
[DeviceD-Vlan-interface200] ip address 200.1.1.1 24
[DeviceD-Vlan-interface200] quit
```

Create VLAN-interface 10 and VLAN-interface 20 and assign an IP address to each of them.

```
[DeviceD] interface vlan-interface 10
[DeviceD-vlan-interface10] ip address 10.1.1.2 24
[DeviceD-vlan-interface10] quit
[DeviceD] interface vlan-interface 20
[DeviceD-vlan-interface20] ip address 20.1.1.2 24
[DeviceD-vlan-interface20] quit
```

Create VRRP group 1 on VLAN-interface 10 and set its virtual IP address to 10.1.1.100.

```
[DeviceD] interface vlan-interface 10
[DeviceD-Vlan-interface10] vrrp vrid 1 virtual-ip 10.1.1.100
[DeviceD-vlan-interface10] quit
```

Create VRRP group 2 on VLAN-interface 20 and set its virtual IP address to 20.1.1.100.

```
[DeviceD] interface vlan-interface 20
[DeviceD-Vlan-interface20] vrrp vrid 2 virtual-ip 20.1.1.100

# Set the priority of Device D to 200 for it to become the master in VRRP group 2.
[DeviceD-Vlan-interface20] vrrp vrid 2 priority 200

# Configure Device D to operate in preemptive mode in VRRP group 2. Set the preemption delay to
500 centiseconds to avoid frequent status switchover.
[DeviceD-Vlan-interface20] vrrp vrid 2 preempt-mode delay 500
[DeviceD-Vlan-interface20] quit

# Create track entry 2 to monitor the upstream link status of GigabitEthernet 1/0/3.
[DeviceD] track 2 interface gigabitethernet 1/0/3

# Configure Device D in VRRP group 2 to monitor track entry 2, and decrease its priority by 150
when the track entry transits to Negative.
[DeviceD] interface vlan-interface 20
[DeviceD-Vlan-interface20] vrrp vrid 2 track 2 priority reduced 150
[DeviceD-Vlan-interface20] quit

# Configure OSPF.
[DeviceD] ospf
[DeviceD-ospf-1] area 0
[DeviceD-ospf-1-area-0.0.0.0] network 10.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] network 20.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] network 200.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] quit
[DeviceD-ospf-1] quit
```

Configuring Device E

Create VLAN 100 and assign GigabitEthernet 1/0/1 to the VLAN.

```
<DeviceE> system-view
[DeviceE] vlan 100
[DeviceE-vlan100] port gigabitethernet 1/0/1
[DeviceE-vlan100] quit
```

Create VLAN-interface 100 and assign it an IP address.

```
[DeviceE] interface vlan-interface 100
[DeviceE-vlan-interface100] ip address 100.1.1.2 24
[DeviceE-vlan-interface100] quit
```

Create VLAN 200 and assign GigabitEthernet 1/0/2 to the VLAN.

```
[DeviceE] vlan 200
[DeviceE-vlan200] port gigabitethernet 1/0/2
[DeviceE-vlan200] quit
```

Create VLAN-interface 200 and assign it an IP address.

```
[DeviceE] interface vlan-interface 200
[DeviceE-vlan-interface200] ip address 200.1.1.2 24
[DeviceE-vlan-interface200] quit
```

Create VLAN 30 and assign GigabitEthernet 1/0/3 to the VLAN.

```
[DeviceE] vlan 30
[DeviceE-vlan30] port gigabitethernet 1/0/3
[DeviceE-vlan30] quit
```

Create VLAN-interface 30 and assign it an IP address.

```
[DeviceE] interface vlan-interface 30
[DeviceE-vlan-interface30] ip address 30.1.1.1 24
[DeviceE-vlan-interface30] quit
```

Configure OSPF.

```
[DeviceD] ospf
[DeviceD-ospf-1] area 0
[DeviceD-ospf-1-area-0.0.0.0] network 100.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] network 200.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] network 30.1.1.0 0.0.0.255
[DeviceD-ospf-1-area-0.0.0.0] quit
[DeviceD-ospf-1] quit
```

Configuring Device F

Create VLAN 10 and VLAN 20.

```
[DeviceF] vlan 10
[DeviceF-vlan10] quit
[DeviceF] vlan 20
[DeviceF-vlan20] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 4.

```
[DeviceF] interface bridge-aggregation 4
[DeviceF-Bridge-Aggregation4] link-aggregation mode dynamic
[DeviceF-Bridge-Aggregation4] quit
```

Assign GigabitEthernet 1/0/1 through GigabitEthernet 1/0/4 to aggregation group 4.

```
[DeviceF] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/4
[DeviceF-if-range] port link-aggregation group 4
[DeviceF-if-range] quit
```

Set the link type of Bridge-Aggregation 4 to trunk and assign it to VLAN 10 and VLAN 20.

```
[DeviceF] interface bridge-aggregation 4
[DeviceF-Bridge-Aggregation4] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceF-Bridge-Aggregation4] port trunk permit vlan 10 20
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceF-Bridge-Aggregation4] quit
```

Verifying the configuration

This configuration example uses the output from Release 6615P03. The command output varies by software version.

Verify that Device A and Device B have formed a DR system.

```
[DeviceA] display drni summary
Flags: A -- Aggregate interface down, B -- No peer DR interface configured
       C -- Configuration consistency check failed
```

```
IPP: BAGG3
```

```
IPP state (cause): UP
```

```
Keepalive link state (cause): UP
```

DR interface information

DR interface	DR group	Local state (cause)	Peer state	Remaining down time (s)
BAGG4	4	UP	UP	-

```
[DeviceA] display drni verbose
```

```
Flags: A -- Home_Gateway, B -- Neighbor_Gateway, C -- Other_Gateway,
       D -- IPP_Activity, E -- DRCP_Timeout, F -- Gateway_Sync,
       G -- Port_Sync, H -- Expired
```

```
IPP/IPP ID: BAGG3/1
```

```
State: UP
```

```
Cause: -
```

```
Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG
```

```
Local Selected ports (index): GE1/0/3 (260), GE1/0/4 (261)
```

```
Peer Selected ports indexes: 260, 261
```

```
DR interface/DR group ID: BAGG4/4
```

```
Local DR interface state: UP
```

```
Peer DR interface state: UP
```

```
DR group state: UP
```

```
Local DR interface down cause: -
```

```
Remaining DRNI DOWN time: -
```

```
Local DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001
```

```
Peer DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001
```

```
Local DR interface LACP priority: Config=123, Effective=123
```

```
Peer DR interface LACP priority: Config=123, Effective=123
```

```
Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG
```

```
Local Selected ports (index): GE1/0/1 (258), GE1/0/2 (259)
```

```
Peer Selected ports indexes: 258, 259
```

Verify that all member ports of aggregation group 4 are in Selected state on Device F, which indicates a successful link aggregation between the DR system and Device F.

```
[DeviceF] display link-aggregation verbose
```

```
Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing
```

```
Port Status: S -- Selected, U -- Unselected, I -- Individual
```

```
Port: A -- Auto port, M -- Management port, R -- Reference port
```

```
Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
       D -- Synchronization, E -- Collecting, F -- Distributing,
       G -- Defaulted, H -- Expired
```

```
Aggregate Interface: Bridge-Aggregation4
```

```
Creation Mode: Manual
```

Aggregation Mode: Dynamic
 Loadsharing Type: Shar
 Management VLANs: None
 System ID: 0x8000, 1eba-3c46-0300

Local:

Port	Status	Priority	Index	Oper-Key	Flag
GE1/0/1	S	32768	1	1	{ACDEF}
GE1/0/2	S	32768	2	1	{ACDEF}
GE1/0/3	S	32768	3	1	{ACDEF}
GE1/0/4	S	32768	4	1	{ACDEF}

Remote:

Actor	Priority	Index	Oper-Key	SystemID	Flag
GE1/0/1(R)	32768	16385	40004	0x7b , 0001-0001-0001	{ACDEF}
GE1/0/2	32768	16388	40004	0x7b , 0001-0001-0001	{ACDEF}
GE1/0/3	32768	32769	40004	0x7b , 0001-0001-0001	{ACDEF}
GE1/0/4	32768	32772	40004	0x7b , 0001-0001-0001	{ACDEF}

Verify that Device C is the master in VRRP group 1 and Device D is the master in VRRP group 2.

[DeviceC] display vrrp

IPv4 Virtual Router Information:

Running mode : Standard

Total number of virtual routers : 2

Interface	VRID	State	Running Pri	Adver Timer	Auth Type	Virtual IP
Vlan10	1	Master	200	100	None	10.1.1.100
Vlan20	2	Backup	100	100	None	20.1.1.100

[DeviceD] display vrrp

IPv4 Virtual Router Information:

Running mode : Standard

Total number of virtual routers : 2

Interface	VRID	State	Running Pri	Adver Timer	Auth Type	Virtual IP
Vlan10	1	Backup	100	100	None	10.1.1.100
Vlan20	2	Master	200	100	None	20.1.1.100

Verify that Device E has established OSPF neighbor relationships with Device C and Device D.

[DeviceE] display ospf peer

OSPF Process 1 with Router ID 200.1.1.2

Neighbor Brief Information

Area: 0.0.0.0

Router ID	Address	Pri	Dead-Time	State	Interface
100.1.1.1	100.1.1.1	1	35	Full/BDR	Vlan100
200.1.1.1	200.1.1.1	1	33	Full/BDR	Vlan200

Verify that the host in Area A can ping VLAN-interface 30 (30.1.1.1) on Device E.

C:\Documents and Settings\Administrator>ping 30.1.1.1

Pinging 30.1.1.1 with 32 bytes of data:

Reply from 30.1.1.1: bytes=32 time=1ms TTL=126

Reply from 30.1.1.1: bytes=32 time=1ms TTL=126

Reply from 30.1.1.1: bytes=32 time=1ms TTL=126

Reply from 30.1.1.1: bytes=32 time=1ms TTL=126

Ping statistics for 30.1.1.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 1ms, Maximum = 1ms, Average = 1ms

Configuration files



IMPORTANT:

Support for the **port link-mode bridge** command depends on the device model.

- Device A:

```
#
vlan 10
#
vlan 20
#
interface Bridge-Aggregation1
port link-type trunk
port trunk permit vlan 1 10 20
link-aggregation mode dynamic
#
interface Bridge-Aggregation3
port link-type trunk
port trunk permit vlan 1 10 20
link-aggregation mode dynamic
port drni intra-portal-port 1
#
interface Bridge-Aggregation4
port link-type trunk
port trunk permit vlan 1 10 20
link-aggregation mode dynamic
port drni group 4
#
interface GigabitEthernet1/0/5
port link-mode route
ip address 1.1.1.1 255.255.255.0
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
```



```

port link-aggregation group 4
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 4
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 3
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 3
#
interface GigabitEthernet1/0/6
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 1
#
interface GigabitEthernet1/0/7
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 1
#
drni system-mac 0001-0001-0001
drni system-number 1
drni system-priority 123
drni keepalive ip destination 1.1.1.2 source 1.1.1.1
#
drni mad exclude interface GigabitEthernet1/0/5
#

```

- **Device B:**

```

#
vlan 10
#
vlan 20
#
interface Bridge-Aggregation2
port link-type trunk
port trunk permit vlan 1 10 20

```

```

    link-aggregation mode dynamic
#
interface Bridge-Aggregation3
    port link-type trunk
    port trunk permit vlan 1 10 20
    link-aggregation mode dynamic
    port drni intra-portal-port 1
#
interface Bridge-Aggregation4
    port link-type trunk
    port trunk permit vlan 1 10 20
    link-aggregation mode dynamic
    port drni group 4
#
interface GigabitEthernet1/0/5
    port link-mode route
    ip address 1.1.1.2 255.255.255.0
#
interface GigabitEthernet1/0/1
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan 1 10 20
    port link-aggregation group 4
#
interface GigabitEthernet1/0/2
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan 1 10 20
    port link-aggregation group 4
#
interface GigabitEthernet1/0/3
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan 1 10 20
    port link-aggregation group 3
#
interface GigabitEthernet1/0/4
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan 1 10 20
    port link-aggregation group 3
#
interface GigabitEthernet1/0/6
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan 1 10 20
    port link-aggregation group 2
#

```

```

interface GigabitEthernet1/0/7
  port link-mode bridge
  port link-type trunk
  port trunk permit vlan 1 10 20
  port link-aggregation group 2
#
  drni system-mac 0001-0001-0001
  drni system-number 2
  drni system-priority 123
  drni keepalive ip destination 1.1.1.1 source 1.1.1.2
#
  drni mad exclude interface GigabitEthernet1/0/5
#

```

- **Device C:**

```

#
ospf 1
  area 0.0.0.0
    network 10.1.1.0 0.0.0.255
    network 20.1.1.0 0.0.0.255
    network 100.1.1.0 0.0.0.255
#
vlan 10
#
vlan 20
#
vlan 100
#
interface Bridge-Aggregation1
  port link-type trunk
  port trunk permit vlan 1 10 20
  link-aggregation mode dynamic
#
interface Vlan-interface10
  ip address 10.1.1.1 255.255.255.0
  vrrp vrid 1 virtual-ip 10.1.1.100
  vrrp vrid 1 priority 200
  vrrp vrid 1 preempt-mode delay 500
  vrrp vrid 1 track 1 priority reduced 150
#
interface Vlan-interface20
  ip address 20.1.1.1 255.255.255.0
  vrrp vrid 2 virtual-ip 20.1.1.100
#
interface Vlan-interface100
  ip address 100.1.1.1 255.255.255.0
#
interface GigabitEthernet1/0/1
  port link-mode bridge

```

```

port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 1
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 1
#
interface GigabitEthernet1/0/3
port link-mode bridge
port access vlan 100
#
track 1 interface GigabitEthernet1/0/3
#

```

- **Device D:**

```

#
ospf 1
area 0.0.0.0
network 10.1.1.0 0.0.0.255
network 20.1.1.0 0.0.0.255
network 200.1.1.0 0.0.0.255
#
vlan 10
#
vlan 20
#
vlan 200
#
interface Bridge-Aggregation2
port link-type trunk
port trunk permit vlan 1 10 20
link-aggregation mode dynamic
#
interface Vlan-interface10
ip address 10.1.1.2 255.255.255.0
vrp vrid 1 virtual-ip 10.1.1.100
#
interface Vlan-interface20
ip address 20.1.1.2 255.255.255.0
vrp vrid 2 virtual-ip 20.1.1.100
vrp vrid 2 priority 200
vrp vrid 2 preempt-mode delay 500
vrp vrid 2 track 2 priority reduced 150
#
interface Vlan-interface200
ip address 200.1.1.1 255.255.255.0

```

```
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 2
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 2
#
interface GigabitEthernet1/0/3
port link-mode bridge
port access vlan 200
#
track 2 interface GigabitEthernet1/0/3
#
```

- **Device E:**

```
#
ospf 1
area 0.0.0.0
network 30.1.1.0 0.0.0.255
network 100.1.1.0 0.0.0.255
network 200.1.1.0 0.0.0.255
#
vlan 30
#
vlan 100
#
vlan 200
#
interface Vlan-interface30
ip address 30.1.1.1 255.255.255.0
#
interface Vlan-interface100
ip address 100.1.1.2 255.255.255.0
#
interface Vlan-interface200
ip address 200.1.1.2 255.255.255.0
#
interface GigabitEthernet1/0/1
port link-mode bridge
port access vlan 100
#
interface GigabitEthernet1/0/2
port link-mode bridge
```

```

port access vlan 200
#
interface GigabitEthernet1/0/3
port link-mode bridge
port access vlan 30
#

```

- **Device F:**

```

#
vlan 10
#
vlan 20
#
interface Bridge-Aggregation4
port link-type trunk
port trunk permit vlan 1 10 20
link-aggregation mode dynamic
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 4
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 4
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 4
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 10 20
port link-aggregation group 4
#

```

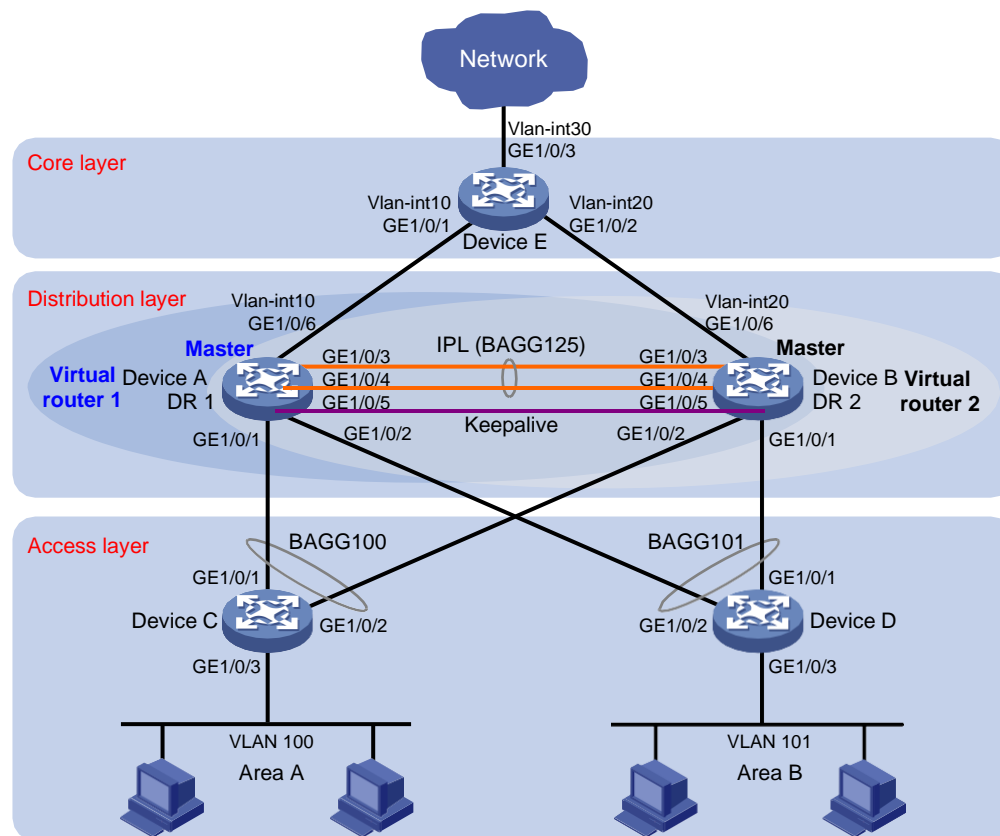
Example: Configuring DRNI at the distribution Layer

Network configuration

As shown in Figure 2:

- Configure Device A and Device B as a DR system to establish one multichassis aggregate link with Device C and Device D.
- Set up a keepalive link between GigabitEthernet 1/0/5 of Device A and GigabitEthernet 1/0/5 of Device B, and exclude the interfaces from the shutdown action by DRNI MAD.
- Configure two VRRP groups on Device A and Device B to provide gateway services for VLAN 100 and VLAN 101.
 - Configure VRRP group 1 to provide gateway services for hosts in VLAN 100 (Area A). Add Device A and Device B to the group as the master and backup devices, respectively.
 - Configure VRRP group 2 to provide gateway services for hosts in VLAN 101 (Area B). Add Device B and Device A to the group as the master and backup devices, respectively.
- Configure OSPF on Device A, Device B, and Device E for the hosts to communicate with external networks at Layer 3.

Figure 2 Network diagram



Device	Interface	IP address	Device	Interface	IP address
Device A	GE 1/0/5	1.1.1.1/24	Device B	GE 1/0/5	1.1.1.2/24

Device	Interface	IP address	Device	Interface	IP address
	VLAN-interface 100	100.1.1.1/24		VLAN-interface 100	100.1.1.2/24
	VLAN-interface 101	101.1.1.1/24		VLAN-interface 101	101.1.1.2/24
	VLAN-interface 10	10.1.1.1/24		VLAN-interface 20	20.1.1.1/24
	Virtual IP 1	100.1.1.100/24		Virtual IP 1	100.1.1.100/24
	Virtual IP 2	101.1.1.100/24		Virtual IP 2	101.1.1.100/24
Device E	VLAN-interface 10	10.1.1.2/24			
	VLAN-interface 20	20.1.1.2/24			
	VLAN-interface 30	30.1.1.1/24			

Analysis

For the secondary DR device to monitor the state of the primary device, establish a Layer 3 keepalive link between the DR member devices.

For Device A to be the master in VRRP group 1, assign it a higher priority than Device B. For Device B to be the master in VRRP group 2, assign it a higher priority than Device A.

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	Not supported
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

Restrictions and guidelines

DRNI restrictions and guidelines

For the DR member devices to be identified as one DR system, you must configure the same DR system MAC address and DR system priority on them. You must assign different DR system numbers to the DR member devices.

To balance traffic between two VRRP gateway devices, you can assign them to two VRRP groups with different priorities. In this example, Device A is assigned a higher priority than Device B in VRRP group 1 so Device A can become the master in this group. Device B is assigned a higher priority than Device A in VRRP group 2 so Device B can become the master in this group.

A DR member device can have only one IPP.

For correct keepalive detection, you must exclude the interfaces used for keepalive detection from the shutdown action by DRNI MAD.

VRRP restrictions and guidelines

You cannot specify the virtual IP address as any of the following IP addresses:

- All-zero address (0.0.0.0).
- Broadcast address (255.255.255.255).
- Loopback address.
- IP address of other than Class A, Class B, and Class C.
- Invalid IP address (for example, 0.0.0.1).

The virtual IP address of an IPv4 VRRP group must be on the same subnet as the downlink interface IP addresses of the VRRP group members to ensure successful traffic forwarding.

Procedures

Configuring Device A

Configure DR system settings.

```
<DeviceA> system-view
[DeviceA] drni system-mac 1-1-1
Changing the system MAC might flap the intra-portal link and cause DR system setup failure.
Continue? [Y/N]:y
[DeviceA] drni system-number 1
Changing the system number might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y
[DeviceA] drni system-priority 123
Changing the system priority might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y
```

Configure DR keepalive packet parameters.

```
[DeviceA] drni keepalive ip destination 1.1.1.2 source 1.1.1.1
```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IP address. The IP address will be used as the source IP address of keepalive packets.

```
[DeviceA] interface gigabitethernet 1/0/5
[DeviceA-GigabitEthernet1/0/5] port link-mode route
[DeviceA-GigabitEthernet1/0/5] ip address 1.1.1.1 24
[DeviceA-GigabitEthernet1/0/5] quit
```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.

```
[DeviceA] drni mad exclude interface gigabitethernet 1/0/5
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 125 and specify it as the IPP.

```
[DeviceA] interface bridge-aggregation 125
[DeviceA-Bridge-Aggregation125] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation125] port drni intra-portal-port 1
[DeviceA-Bridge-Aggregation125] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 125.

```
[DeviceA] interface gigabitethernet 1/0/3
[DeviceA-GigabitEthernet1/0/3] port link-aggregation group 125
[DeviceA-GigabitEthernet1/0/3] quit
[DeviceA] interface gigabitethernet 1/0/4
[DeviceA-GigabitEthernet1/0/4] port link-aggregation group 125
[DeviceA-GigabitEthernet1/0/4] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 100 and assign it to DR group 1.

```
[DeviceA] interface bridge-aggregation 100
[DeviceA-Bridge-Aggregation100] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation100] port drni group 1
[DeviceA-Bridge-Aggregation100] quit
```

Assign GigabitEthernet 1/0/1 to aggregation group 100.

```
[DeviceA] interface gigabitethernet 1/0/1
[DeviceA-GigabitEthernet1/0/1] port link-aggregation group 100
[DeviceA-GigabitEthernet1/0/1] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 101 and assign it to DR group 2.

```
[DeviceA] interface bridge-aggregation 101
[DeviceA-Bridge-Aggregation101] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation101] port drni group 2
[DeviceA-Bridge-Aggregation101] quit
```

Assign GigabitEthernet 1/0/2 to aggregation group 101.

```
[DeviceA] interface gigabitethernet 1/0/2
[DeviceA-GigabitEthernet1/0/2] port link-aggregation group 101
[DeviceA-GigabitEthernet1/0/2] quit
```

Create VLAN 10, VLAN 100, and VLAN 101.

```
[DeviceA] vlan 10
[DeviceA-vlan10] quit
[DeviceA] vlan 100
[DeviceA-vlan100] quit
[DeviceA] vlan 101
[DeviceA-vlan101] quit
```

Assign GigabitEthernet 1/0/6 to VLAN 10.

```
[DeviceA] vlan 10
[DeviceA-vlan10] port gigabitethernet 1/0/6
[DeviceA-vlan10] quit
```

Set the link type of Bridge-Aggregation 100 to trunk and assign it to VLAN 100.

```
[DeviceA] interface bridge-aggregation 100
[DeviceA-Bridge-Aggregation100] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
[DeviceA-Bridge-Aggregation100] port trunk permit vlan 100
Configuring GigabitEthernet1/0/1 done.
[DeviceA-Bridge-Aggregation100] quit
```

Set the link type of Bridge-Aggregation 101 to trunk and assign it to VLAN 101.

```
[DeviceA] interface bridge-aggregation 101
[DeviceA-Bridge-Aggregation101] port link-type trunk
Configuring GigabitEthernet1/0/2 done.
[DeviceA-Bridge-Aggregation101] port trunk permit vlan 101
Configuring GigabitEthernet1/0/2 done.
[DeviceA-Bridge-Aggregation101] quit
```

Set the link type of Bridge-Aggregation 125 to trunk and assign it to VLAN 100 and VLAN 101.

```
[DeviceA] interface bridge-aggregation 125
[DeviceA-Bridge-Aggregation125] port link-type trunk
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceA-Bridge-Aggregation125] port trunk permit vlan 100 101
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceA-Bridge-Aggregation125] quit
```

Create VLAN-interface 10, VLAN-interface 100, and VLAN-interface 101 and assign an IP address to each of them.

```
[DeviceA] interface vlan-interface 10
[DeviceA-vlan-interface10] ip address 10.1.1.1 24
```

```
[DeviceA-vlan-interface10] quit
[DeviceA] interface vlan-interface 100
[DeviceA-vlan-interface100] ip address 100.1.1.1 24
[DeviceA-vlan-interface100] quit
[DeviceA] interface vlan-interface 101
[DeviceA-vlan-interface101] ip address 101.1.1.1 24
[DeviceA-vlan-interface101] quit
```

Configure OSPF.

```
[DeviceA] ospf
[DeviceA-ospf-1] area 0
[DeviceA-ospf-1-area-0.0.0.0] network 10.1.1.0 0.0.0.255
[DeviceA-ospf-1-area-0.0.0.0] network 100.1.1.0 0.0.0.255
[DeviceA-ospf-1-area-0.0.0.0] network 101.1.1.0 0.0.0.255
[DeviceA-ospf-1-area-0.0.0.0] quit
[DeviceA-ospf-1] quit
```

Create VRRP group 1 on VLAN-interface 100 and set its virtual IP address to 100.1.1.100.

```
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] vrrp vrid 1 virtual-ip 100.1.1.100
```

Set the priority of Device A to 200 for it to become the master in VRRP group 1.

```
[DeviceA-Vlan-interface100] vrrp vrid 1 priority 200
[DeviceA-Vlan-interface100] quit
```

Create VRRP group 2 on VLAN-interface 101 and set its virtual IP address to 101.1.1.100.

```
[DeviceA] interface vlan-interface 101
[DeviceA-Vlan-interface101] vrrp vrid 2 virtual-ip 101.1.1.100
[DeviceA-Vlan-interface101] quit
```

Configure Device A to operate in preemptive mode in VRRP group 1. Set the preemption delay to 500 centiseconds to avoid frequent status switchover.

```
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] vrrp vrid 1 preempt-mode delay 500
[DeviceA-Vlan-interface100] quit
```

Create track entry 1 to monitor the upstream link status of GigabitEthernet 1/0/6.

```
[DeviceA] track 1 interface gigabitethernet 1/0/6
```

Configure Device A in VRRP group 1 to monitor track entry 1, and decrease its priority by 150 when the track entry transits to Negative.

```
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] vrrp vrid 1 track 1 priority reduced 150
[DeviceA-Vlan-interface100] quit
```

Configuring Device B

Configure DR system settings.

```
<DeviceB> system-view
[DeviceB] drni system-mac 1-1-1
Changing the system MAC might flap the intra-portal link and cause DR system setup failure.
Continue? [Y/N]:y
[DeviceB] drni system-number 2
```

Changing the system number might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y

```
[DeviceB] drni system-priority 123
```

Changing the system priority might flap the intra-portal link and cause DR system setup failure. Continue? [Y/N]:y

Configure DR keepalive packet parameters.

```
[DeviceB] drni keepalive ip destination 1.1.1.1 source 1.1.1.2
```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IP address. The IP address will be used as the source IP address of keepalive packets.

```
[DeviceB] interface gigabitethernet 1/0/5
```

```
[DeviceB-GigabitEthernet1/0/5] port link-mode route
```

```
[DeviceB-GigabitEthernet1/0/5] ip address 1.1.1.2 24
```

```
[DeviceB-GigabitEthernet1/0/5] quit
```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.

```
[DeviceB] drni mad exclude interface gigabitethernet 1/0/5
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 125 and specify it as the IPP.

```
[DeviceB] interface bridge-aggregation 125
```

```
[DeviceB-Bridge-Aggregation125] link-aggregation mode dynamic
```

```
[DeviceB-Bridge-Aggregation125] port drni intra-portal-port 1
```

```
[DeviceB-Bridge-Aggregation125] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 125.

```
[DeviceB] interface gigabitethernet 1/0/3
```

```
[DeviceB-GigabitEthernet1/0/3] port link-aggregation group 125
```

```
[DeviceB-GigabitEthernet1/0/3] quit
```

```
[DeviceB] interface gigabitethernet 1/0/4
```

```
[DeviceB-GigabitEthernet1/0/4] port link-aggregation group 125
```

```
[DeviceB-GigabitEthernet1/0/4] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 100 and assign it to DR group 1.

```
[DeviceB] interface bridge-aggregation 100
```

```
[DeviceB-Bridge-Aggregation100] link-aggregation mode dynamic
```

```
[DeviceB-Bridge-Aggregation100] port drni group 1
```

```
[DeviceB-Bridge-Aggregation100] quit
```

Assign GigabitEthernet 1/0/2 to aggregation group 100.

```
[DeviceB] interface gigabitethernet 1/0/2
```

```
[DeviceB-GigabitEthernet1/0/2] port link-aggregation group 100
```

```
[DeviceB-GigabitEthernet1/0/2] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 101 and assign it to DR group 2.

```
[DeviceB] interface bridge-aggregation 101
```

```
[DeviceB-Bridge-Aggregation101] link-aggregation mode dynamic
```

```
[DeviceB-Bridge-Aggregation101] port drni group 2
```

```
[DeviceB-Bridge-Aggregation101] quit
```

Assign GigabitEthernet 1/0/1 to aggregation group 101.

```
[DeviceB] interface gigabitethernet 1/0/1
```

```
[DeviceB-GigabitEthernet1/0/1] port link-aggregation group 101
```

```
[DeviceB-GigabitEthernet1/0/1] quit
```

Create VLAN 20, VLAN 100, and VLAN 101.

```
[DeviceB] vlan 20
[DeviceB-vlan20] quit
[DeviceB] vlan 100
[DeviceB-vlan100] quit
[DeviceB] vlan 101
[DeviceB-vlan101] quit
```

Assign GigabitEthernet 1/0/6 to VLAN 20.

```
[DeviceB] vlan 20
[DeviceB-vlan20] port gigabitethernet 1/0/6
[DeviceB-vlan20] quit
```

Set the link type of Bridge-Aggregation 100 to trunk and assign it to VLAN 100.

```
[DeviceB] interface bridge-aggregation 100
[DeviceB-Bridge-Aggregation100] port link-type trunk
Configuring GigabitEthernet1/0/2 done.
[DeviceB-Bridge-Aggregation100] port trunk permit vlan 100
Configuring GigabitEthernet1/0/2 done.
[DeviceB-Bridge-Aggregation100] quit
```

Set the link type of Bridge-Aggregation 101 to trunk and assign it to VLAN 101.

```
[DeviceB] interface bridge-aggregation 101
[DeviceB-Bridge-Aggregation101] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
[DeviceB-Bridge-Aggregation101] port trunk permit vlan 101
Configuring GigabitEthernet1/0/1 done.
[DeviceB-Bridge-Aggregation101] quit
```

Set the link type of Bridge-Aggregation 125 to trunk and assign it to VLAN 100 and VLAN 101.

```
[DeviceB] interface bridge-aggregation 125
[DeviceB-Bridge-Aggregation125] port link-type trunk
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceB-Bridge-Aggregation125] port trunk permit vlan 100 101
Configuring GigabitEthernet1/0/3 done.
Configuring GigabitEthernet1/0/4 done.
[DeviceB-Bridge-Aggregation125] quit
```

Create VLAN-interface 20, VLAN-interface 100, and VLAN-interface 101 and assign an IP address to each of them.

```
[DeviceB] interface vlan-interface 20
[DeviceB-vlan-interface20] ip address 20.1.1.1 24
[DeviceB-vlan-interface20] quit
[DeviceB] interface vlan-interface 100
[DeviceB-vlan-interface100] ip address 100.1.1.2 24
[DeviceB-vlan-interface100] quit
[DeviceB] interface vlan-interface 101
[DeviceB-vlan-interface101] ip address 101.1.1.2 24
[DeviceB-vlan-interface101] quit
```

Configure OSPF.

```
[DeviceB] ospf
[DeviceB-ospf-1] area 0
```

```

[DeviceB-ospf-1-area-0.0.0.0] network 20.1.1.0 0.0.0.255
[DeviceB-ospf-1-area-0.0.0.0] network 100.1.1.0 0.0.0.255
[DeviceB-ospf-1-area-0.0.0.0] network 101.1.1.0 0.0.0.255
[DeviceB-ospf-1-area-0.0.0.0] quit
[DeviceB-ospf-1] quit

# Create VRRP group 1 on VLAN-interface 100 and set its virtual IP address to 100.1.1.100.
[DeviceB] interface vlan-interface 100
[DeviceB-Vlan-interface100] vrrp vrid 1 virtual-ip 100.1.1.100
[DeviceB-Vlan-interface100] quit

# Create VRRP group 2 on VLAN-interface 101 and set its virtual IP address to 101.1.1.100.
[DeviceB] interface vlan-interface 101
[DeviceB-Vlan-interface101] vrrp vrid 2 virtual-ip 101.1.1.100

# Set the priority of Device B to 200 for it to become the master in VRRP group 2.
[DeviceB-Vlan-interface101] vrrp vrid 2 priority 200

# Configure Device B to operate in preemptive mode in VRRP group 2. Set the preemption delay to 500 centiseconds to avoid frequent status switchover.
[DeviceB-Vlan-interface101] vrrp vrid 2 preempt-mode delay 500
[DeviceB-Vlan-interface101] quit

# Create track entry 2 to monitor the upstream link status of GigabitEthernet 1/0/6.
[DeviceB] track 2 interface gigabitethernet 1/0/6

# Configure Device B in VRRP group 2 to monitor track entry 2, and decrease its priority by 150 when the track entry transits to Negative.
[DeviceB] interface vlan-interface 101
[DeviceB-Vlan-interface101] vrrp vrid 2 track 2 priority reduced 150
[DeviceB-Vlan-interface101] quit

```

Configuring Device C

```

# Create VLAN 100.
[DeviceC] vlan 100
[DeviceC-vlan100] quit

# Assign GigabitEthernet 1/0/3 to VLAN 100.
[DeviceC] interface gigabitethernet 1/0/3
[DeviceC-GigabitEthernet1/0/3] port access vlan 100
[DeviceC-GigabitEthernet1/0/3] quit

# Create Layer 2 dynamic aggregate interface Bridge-Aggregation 100.
<DeviceC> system-view
[DeviceC] interface bridge-aggregation 100
[DeviceC-Bridge-Aggregation100] link-aggregation mode dynamic
[DeviceC-Bridge-Aggregation100] quit

# Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 100.
[DeviceC] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/2
[DeviceC-if-range] port link-aggregation group 100
[DeviceC-if-range] quit

# Set the link type of Bridge-Aggregation 100 to trunk and assign it to VLAN 100.
[DeviceC] interface bridge-aggregation 100

```

```
[DeviceC-Bridge-Aggregation100] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceC-Bridge-Aggregation100] port trunk permit vlan 100
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceC-Bridge-Aggregation100] quit
```

Configuring Device D

Create VLAN 101.

```
[DeviceD] vlan 101
[DeviceD-vlan101] quit
```

Assign GigabitEthernet 1/0/3 to VLAN 101.

```
[DeviceD] interface gigabitethernet 1/0/3
[DeviceD-GigabitEthernet1/0/3] port access vlan 101
[DeviceD-GigabitEthernet1/0/3] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 101.

```
<DeviceD> system-view
[DeviceD] interface bridge-aggregation 101
[DeviceD-Bridge-Aggregation101] link-aggregation mode dynamic
[DeviceD-Bridge-Aggregation101] quit
```

Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 101.

```
[DeviceD] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/2
[DeviceD-if-range] port link-aggregation group 101
[DeviceD-if-range] quit
```

Set the link type of Bridge-Aggregation 101 to trunk and assign it to VLAN 101.

```
[DeviceD] interface bridge-aggregation 101
[DeviceD-Bridge-Aggregation101] port link-type trunk
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceD-Bridge-Aggregation101] port trunk permit vlan 101
Configuring GigabitEthernet1/0/1 done.
Configuring GigabitEthernet1/0/2 done.
[DeviceD-Bridge-Aggregation101] quit
```

Configuring Device E

Create VLAN 10 and assign GigabitEthernet 1/0/1 to the VLAN.

```
<DeviceE> system-view
[DeviceE] vlan 10
[DeviceE-vlan10] port gigabitethernet 1/0/1
[DeviceE-vlan10] quit
```

Create VLAN-interface 10 and assign it an IP address.

```
[DeviceE] interface vlan-interface 10
[DeviceE-vlan-interface10] ip address 10.1.1.2 24
[DeviceE-vlan-interface10] quit
```


Create VLAN 20 and assign GigabitEthernet 1/0/2 to the VLAN.

```
[DeviceE] vlan 20
[DeviceE-vlan20] port gigabitethernet 1/0/2
[DeviceE-vlan20] quit
```

Create VLAN-interface 20 and assign it an IP address.

```
[DeviceE] interface vlan-interface 20
[DeviceE-vlan-interface20] ip address 20.1.1.2 24
[DeviceE-vlan-interface20] quit
```

Create VLAN 30 and assign GigabitEthernet 1/0/3 to the VLAN.

```
[DeviceE] vlan 30
[DeviceE-vlan30] port gigabitethernet 1/0/3
[DeviceE-vlan30] quit
```

Create VLAN-interface 30 and assign it an IP address.

```
[DeviceE] interface vlan-interface 30
[DeviceE-vlan-interface30] ip address 30.1.1.1 24
[DeviceE-vlan-interface30] quit
```

Configure OSPF.

```
[DeviceE] ospf
[DeviceE-ospf-1] area 0
[DeviceE-ospf-1-area-0.0.0.0] network 10.1.1.0 0.0.0.255
[DeviceE-ospf-1-area-0.0.0.0] network 20.1.1.0 0.0.0.255
[DeviceE-ospf-1-area-0.0.0.0] network 30.1.1.0 0.0.0.255
[DeviceE-ospf-1-area-0.0.0.0] quit
[DeviceE-ospf-1] quit
```

Verifying the configuration

This configuration example uses the output from Release 6615P03. The command output varies by software version.

Verify that Device A and Device B have formed a DR system.

```
[DeviceA] display drni summary
Flags: A -- Aggregate interface down, B -- No peer DR interface configured
       C -- Configuration consistency check failed
```

IPP: BAGG125

IPP state (cause): UP

Keepalive link state (cause): UP

DR interface information

DR interface	DR group	Local state (cause)	Peer state	Remaining down time (s)
BAGG100	1	UP	UP	-
BAGG101	2	UP	UP	-

```
[DeviceA] display drni verbose
```

```
Flags: A -- Home_Gateway, B -- Neighbor_Gateway, C -- Other_Gateway,
       D -- IPP_Activity, E -- DRCP_Timeout, F -- Gateway_Sync,
       G -- Port_Sync, H -- Expired
```

IPP/IPP ID: BAGG125/1

State: UP

Cause: -

Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG

Local Selected ports (index): GE1/0/3 (261), GE1/0/4 (262)

Peer Selected ports indexes: 261, 262

DR interface/DR group ID: BAGG100/1

Local DR interface state: UP

Peer DR interface state: UP

DR group state: UP

Local DR interface down cause: -

Remaining DRNI DOWN time: -

Local DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001

Peer DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001

Local DR interface LACP priority: Config=123, Effective=123

Peer DR interface LACP priority: Config=123, Effective=123

Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG

Local Selected ports (index): GE1/0/1 (259)

Peer Selected ports indexes: 259

DR interface/DR group ID: BAGG101/2

Local DR interface state: UP

Peer DR interface state: UP

DR group state: UP

Local DR interface down cause: -

Remaining DRNI DOWN time: -

Local DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001

Peer DR interface LACP MAC: Config=0001-0001-0001, Effective=0001-0001-0001

Local DR interface LACP priority: Config=123, Effective=123

Peer DR interface LACP priority: Config=123, Effective=123

Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG

Local Selected ports (index): GE1/0/2 (260)

Peer Selected ports indexes: 260

Verify that all member ports of aggregation group 100 are in Selected state on Device C, which indicates a successful link aggregation between the DR system and Device C.

[DeviceC] display link-aggregation verbose

Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing

Port Status: S -- Selected, U -- Unselected, I -- Individual

Port: A -- Auto port, M -- Management port, R -- Reference port

Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
D -- Synchronization, E -- Collecting, F -- Distributing,
G -- Defaulted, H -- Expired

Aggregate Interface: Bridge-Aggregation100

Creation Mode: Manual

Aggregation Mode: Dynamic

Loadsharing Type: Shar

Management VLANs: None

System ID: 0x8000, 8e33-8e4a-0300

Local:

Port	Status	Priority	Index	Oper-Key	Flag
GE1/0/1	S	32768	1	1	{ACDEF}
GE1/0/2	S	32768	2	1	{ACDEF}

Remote:

Actor	Priority	Index	Oper-Key	SystemID	Flag
GE1/0/1(R)	32768	16386	40001	0x7b , 0001-0001-0001	{ACDEF}
GE1/0/2	32768	32770	40001	0x7b , 0001-0001-0001	{ACDEF}

Verify that all member ports of aggregation group 101 are in Selected state on Device D, which indicates a successful link aggregation between the DR system and Device D.

[DeviceD] display link-aggregation verbose

Loadsharing Type: Shar -- Loadsharing, NonS -- Non-Loadsharing

Port Status: S -- Selected, U -- Unselected, I -- Individual

Port: A -- Auto port, M -- Management port, R -- Reference port

Flags: A -- LACP_Activity, B -- LACP_Timeout, C -- Aggregation,
D -- Synchronization, E -- Collecting, F -- Distributing,
G -- Defaulted, H -- Expired

Aggregate Interface: Bridge-Aggregation101

Creation Mode: Manual

Aggregation Mode: Dynamic

Loadsharing Type: Shar

Management VLANs: None

System ID: 0x8000, 8e33-9400-0400

Local:

Port	Status	Priority	Index	Oper-Key	Flag
GE1/0/1	S	32768	1	1	{ACDEF}
GE1/0/2	S	32768	2	1	{ACDEF}

Remote:

Actor	Priority	Index	Oper-Key	SystemID	Flag
GE1/0/1(R)	32768	16387	40002	0x7b , 0001-0001-0001	{ACDEF}
GE1/0/2	32768	32771	40002	0x7b , 0001-0001-0001	{ACDEF}

Verify that Device A is the master in VRRP group 1 and Device B is the master in VRRP group 2.

[DeviceA] display vrrp

IPv4 Virtual Router Information:

Running mode : Standard

Total number of virtual routers : 2

Interface	VRID	State	Running Pri	Adver Timer	Auth Type	Virtual IP
Vlan100	1	Master	200	100	None	100.1.1.100
Vlan101	2	Backup	100	100	None	101.1.1.100

[DeviceB] display vrrp

IPv4 Virtual Router Information:

Running mode : Standard

Total number of virtual routers : 2

Interface	VRID	State	Running Pri	Adver Timer	Auth Type	Virtual IP
Vlan100	1	Backup	100	100	None	100.1.1.100
Vlan101	2	Master	200	100	None	101.1.1.100

Verify that Device E has established OSPF neighbor relationships with Device A and Device B.

```
[DeviceE] display ospf peer
```

```
OSPF Process 1 with Router ID 30.1.1.1
Neighbor Brief Information
```

```
Area: 0.0.0.0
```

Router ID	Address	Pri	Dead-Time	State	Interface
101.1.1.1	10.1.1.1	1	34	Full/DR	Vlan10
101.1.1.2	20.1.1.1	1	36	Full/DR	Vlan20

Verify that a host in Area A can ping the host at 101.1.1.4 in Area B.

```
C:\Documents and Settings\Administrator>ping 101.1.1.4
```

```
Pinging 101.1.1.4 with 32 bytes of data:
```

```
Reply from 101.1.1.4: bytes=32 time=1ms TTL=126
```

```
Reply from 101.1.1.4: bytes=32 time=1ms TTL=126
```

```
Reply from 101.1.1.4: bytes=32 time=1ms TTL=126
```

```
Reply from 101.1.1.4: bytes=32 time=1ms TTL=126
```

```
Ping statistics for 101.1.1.4:
```

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Verify that a host in Area A can ping VLAN-interface 30 (30.1.1.1) on Device E.

```
C:\Documents and Settings\Administrator>ping 30.1.1.1
```

```
Pinging 30.1.1.1 with 32 bytes of data:
```

```
Reply from 30.1.1.1: bytes=32 time=1ms TTL=126
```

```
Reply from 30.1.1.1: bytes=32 time=1ms TTL=126
```

```
Reply from 30.1.1.1: bytes=32 time=1ms TTL=126
```

```
Reply from 30.1.1.1: bytes=32 time=1ms TTL=126
```

```
Ping statistics for 30.1.1.1:
```

```
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
Approximate round trip times in milli-seconds:
```

```
Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Configuration files



IMPORTANT:

- Device A:

```
#
ospf 1
 area 0.0.0.0
   network 10.1.1.0 0.0.0.255
   network 100.1.1.0 0.0.0.255
   network 101.1.1.0 0.0.0.255
#
vlan 10
#
vlan 100 to 101
#
interface Bridge-Aggregation100
 port link-type trunk
 port trunk permit vlan 1 100
 link-aggregation mode dynamic
 port drni group 1
#
interface Bridge-Aggregation101
 port link-type trunk
 port trunk permit vlan 1 101
 link-aggregation mode dynamic
 port drni group 2
#
interface Bridge-Aggregation125
 port link-type trunk
 port trunk permit vlan 1 100 to 101
 link-aggregation mode dynamic
 port drni intra-portal-port 1
#
interface Vlan-interface10
 ip address 10.1.1.1 255.255.255.0
#
interface Vlan-interface100
 ip address 100.1.1.1 255.255.255.0
 vrrp vrid 1 virtual-ip 100.1.1.100
 vrrp vrid 1 priority 200
 vrrp vrid 1 preempt-mode delay 500
 vrrp vrid 1 track 1 priority reduced 150
#
interface Vlan-interface101
 ip address 101.1.1.1 255.255.255.0
 vrrp vrid 2 virtual-ip 101.1.1.100
#
interface GigabitEthernet1/0/5
 port link-mode route
```

```

ip address 1.1.1.1 255.255.255.0
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100
port link-aggregation group 100
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 101
port link-aggregation group 101
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100 to 101
port link-aggregation group 125
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100 to 101
port link-aggregation group 125
#
interface GigabitEthernet1/0/6
port link-mode bridge
port access vlan 10
#
drni system-mac 0001-0001-0001
drni system-number 1
drni system-priority 123
drni keepalive ip destination 1.1.1.2 source 1.1.1.1
#
drni mad exclude interface GigabitEthernet1/0/5
#
track 1 interface GigabitEthernet1/0/6
#

```

- **Device B:**

```

#
ospf 1
area 0.0.0.0
network 20.1.1.0 0.0.0.255
network 100.1.1.0 0.0.0.255
network 101.1.1.0 0.0.0.255
#
vlan 20

```

```

#
vlan 100 to 101
#
interface Bridge-Aggregation100
port link-type trunk
port trunk permit vlan 1 100
link-aggregation mode dynamic
port drni group 1
#
interface Bridge-Aggregation101
port link-type trunk
port trunk permit vlan 1 101
link-aggregation mode dynamic
port drni group 2
#
interface Bridge-Aggregation125
port link-type trunk
port trunk permit vlan 1 100 to 101
link-aggregation mode dynamic
port drni intra-portal-port 1
#
interface Vlan-interface20
ip address 20.1.1.1 255.255.255.0
#
interface Vlan-interface100
ip address 100.1.1.2 255.255.255.0
vrrp vrid 1 virtual-ip 100.1.1.100
#
interface Vlan-interface101
ip address 101.1.1.2 255.255.255.0
vrrp vrid 2 virtual-ip 101.1.1.100
vrrp vrid 2 priority 200
vrrp vrid 2 preempt-mode delay 500
vrrp vrid 2 track 2 priority reduced 150
#
interface GigabitEthernet1/0/5
port link-mode route
ip address 1.1.1.2 255.255.255.0
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 101
port link-aggregation group 101
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk

```

```

port trunk permit vlan 1 100
port link-aggregation group 100
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100 to 101
port link-aggregation group 125
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100 to 101
port link-aggregation group 125
#
interface GigabitEthernet1/0/6
port link-mode bridge
port access vlan 20
#
drni system-mac 0001-0001-0001
drni system-number 2
drni system-priority 123
drni keepalive ip destination 1.1.1.1 source 1.1.1.2
#
drni mad exclude interface GigabitEthernet1/0/5
#
track 2 interface GigabitEthernet1/0/6
#

```

- **Device C:**

```

#
vlan 100
#
interface Bridge-Aggregation100
port link-type trunk
port trunk permit vlan 1 100
link-aggregation mode dynamic
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100
port link-aggregation group 100
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 100
port link-aggregation group 100

```



```

#
interface GigabitEthernet1/0/3
 port link-mode bridge
 port access vlan 100
#
• Device D:
#
vlan 101
#
interface Bridge-Aggregation101
 port link-type trunk
 port trunk permit vlan 1 101
 link-aggregation mode dynamic
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port link-type trunk
 port trunk permit vlan 1 101
 port link-aggregation group 101
#
interface GigabitEthernet1/0/2
 port link-mode bridge
 port link-type trunk
 port trunk permit vlan 1 101
 port link-aggregation group 101
#
interface GigabitEthernet1/0/3
 port link-mode bridge
 port access vlan 101
#
• Device E:
#
ospf 1
 area 0.0.0.0
  network 10.1.1.0 0.0.0.255
  network 20.1.1.0 0.0.0.255
  network 30.1.1.0 0.0.0.255
#
vlan 10
#
vlan 20
#
vlan 30
#
interface Vlan-interface10
 ip address 10.1.1.2 255.255.255.0
#
interface Vlan-interface20

```

```
ip address 20.1.1.2 255.255.255.0
#
interface Vlan-interface30
ip address 30.1.1.1 255.255.255.0
#
interface GigabitEthernet1/0/1
port link-mode bridge
port access vlan 10
#
interface GigabitEthernet1/0/2
port link-mode bridge
port access vlan 20
#
interface GigabitEthernet1/0/3
port link-mode bridge
port access vlan 30
#
```

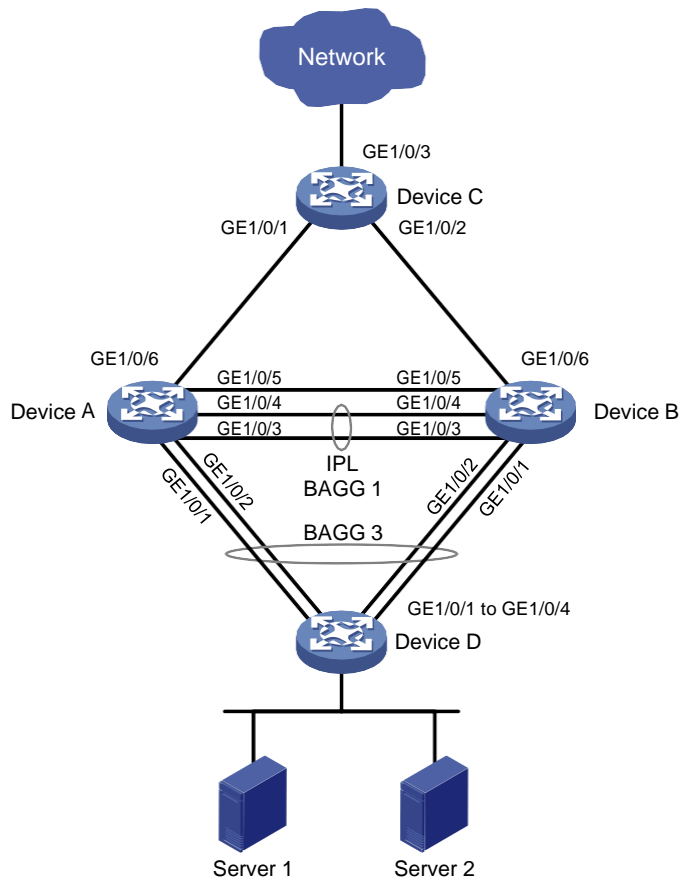
Example: Configuring IPv4 and IPv6 dual-active VLAN interfaces on a DR system

Network configuration

As shown in [Figure 3](#), set up a DR system with Device A and Device B as follows.

- Attach Device D to DR interfaces on the DR system.
- Configure ECMP routes between the DR system and Device C.
- Configure dual-active VLAN interfaces on the DR system to provide IPv4 and IPv6 gateway services for the servers.

Figure 3 Network diagram



Device	Interface	IP address	Peer device and interface
Device A	GE1/0/1	-	Device D: GE1/0/1
	GE1/0/2	-	Device D: GE1/0/2
	GE1/0/3	-	Device B: GE1/0/3
	GE1/0/4	-	Device B: GE1/0/4
	GE1/0/5	IPv4: 21.1.1.1 IPv6: 21::1	Device B: GE1/0/5
	GE1/0/6	-	Device C: GE1/0/1
	Vlan-int100	IPv4: 100.1.1.100/24 IPv6: 100::100/64	-
	Vlan-int101	IPv4: 101.1.1.1/24 IPv6: 101::1/64	Device B: Vlan-int101 • IPv4: 101.1.1.2/24 • IPv6: 101::2/64
	Vlan-int32	IPv4: 32.1.1.1/24 IPv6: 32::1/64	Device C: Vlan-int32 • IPv4: 32.1.1.2/24 • IPv6: 32::2/64
Device B	GE1/0/1	-	Device D: GE1/0/3
	GE1/0/2	-	Device D: GE1/0/4

Device	Interface	IP address	Peer device and interface
	GE1/0/3	-	Device A: GE1/0/3
	GE1/0/4	-	Device A: GE1/0/4
	GE1/0/5	IPv4: 21.1.1.2 IPv6: 21::2	Device A: GE1/0/5
	GE1/0/6	-	Device C: GE1/0/6
	Vlan-int100	IPv4: 100.1.1.100/24 IPv6: 100::100/64	-
	Vlan-int101	IPv4: 101.1.1.2/24 IPv6: 101::2/64	Device A: Vlan-int101 • IPv4: 101.1.1.1/24 • IPv6: 101::1/64
	Vlan-int33	IPv4: 33.1.1.1/24 IPv6: 33::1/64	Device C: Vlan-int33 • IPv4: 33.1.1.2/24 • IPv6: 33::2/64
Device C	GE1/0/1	-	Device A: GE1/0/6
	GE1/0/2	-	Device B: GE1/0/6
	GE1/0/3	-	Network 1
	Vlan-int22	IPv4: 22.1.1.1/24 IPv6: 22::1/64	Network 1
	Vlan-int32	IPv4: 32.1.1.2/24 IPv6: 32::2/64	Device A: Vlan-int32 • IPv4: 32.1.1.1/24 • IPv6: 32::1/64
	Vlan-int33	IPv4: 33.1.1.2/24 IPv6: 33::2/64	Device B: Vlan-int33 • IPv4: 33.1.1.1/24 • IPv6: 33::1/64
Device D	GE1/0/1	-	Device A: GE1/0/1
	GE1/0/2	-	Device A: GE1/0/2
	GE1/0/3	-	Device B: GE1/0/1
	GE1/0/4	-	Device B: GE1/0/2

Analysis

To configure IPv4 and IPv6 dual-active VLAN interfaces, perform the following tasks:

- Assign the same IPv4 address, MAC address, IPv6 address, and IPv6 link-local address to VLAN-interface 100 interfaces on Device A and Device B.
- Create VLAN-interface 101 on both Device A and Device B for them to have Layer 3 connectivity. When an uplink to Device C fails, all traffic will be processed by the available DR member device.

Applicable hardware and software versions

Hardware	Software version
SC 3570 switch series	Not supported
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

Restrictions and guidelines

For two DR member devices to be identified as one DR system, you must configure the same DR system MAC address on them. Make sure DR systems use unique DR system MAC addresses.

Procedures

Configuring Device A

Configure DR system settings.

```
<DeviceA> system-view
```

```
[DeviceA] drni system-mac 0002-0002-0002
```

```
[DeviceA] drni system-number 1
[DeviceA] drni system-priority 123
```

Configure DR keepalive packet parameters.

```
[DeviceA] drni keepalive ip destination 21.1.1.2 source 21.1.1.1
```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IPv4 address and an IPv6 address. The IP addresses will be used as the source IP addresses of keepalive packets.

```
[DeviceA] interface gigabitethernet 1/0/5
[DeviceA-GigabitEthernet1/0/5] port link-mode route
[DeviceA-GigabitEthernet1/0/5] ip address 21.1.1.1 255.255.255.0
[DeviceA-GigabitEthernet1/0/5] ipv6 address 21::1 64
[DeviceA-GigabitEthernet1/0/5] quit
```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.

```
[DeviceA] drni mad exclude interface gigabitethernet 1/0/5
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 1.

```
[DeviceA] interface bridge-aggregation 1
[DeviceA-Bridge-Aggregation1] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation1] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 1.

```
[DeviceA] interface gigabitethernet 1/0/3
[DeviceA-GigabitEthernet1/0/3] port link-aggregation group 1
[DeviceA-GigabitEthernet1/0/3] quit
[DeviceA] interface gigabitethernet 1/0/4
[DeviceA-GigabitEthernet1/0/4] port link-aggregation group 1
[DeviceA-GigabitEthernet1/0/4] quit
```

Configure Bridge-Aggregation 1 as the IPP.

```
[DeviceA] interface bridge-aggregation 1
[DeviceA-Bridge-Aggregation1] port drni intra-portal-port 1
[DeviceA-Bridge-Aggregation1] undo port trunk permit vlan 1
[DeviceA-Bridge-Aggregation1] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 3, and assign it to DR group 1.

```
[DeviceA] interface bridge-aggregation 3
[DeviceA-Bridge-Aggregation3] link-aggregation mode dynamic
[DeviceA-Bridge-Aggregation3] port drni group 1
[DeviceA-Bridge-Aggregation3] quit
```

Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 3.

```
[DeviceA] interface gigabitethernet 1/0/1
[DeviceA-GigabitEthernet1/0/1] port link-aggregation group 3
[DeviceA-GigabitEthernet1/0/1] quit
[DeviceA] interface gigabitethernet 1/0/2
[DeviceA-GigabitEthernet1/0/2] port link-aggregation group 3
[DeviceA-GigabitEthernet1/0/2] quit
```

Create VLAN 100 and VLAN 101.

```
[DeviceA] vlan 100
[DeviceA-vlan100] quit
[DeviceA] vlan 101
```

```
[DeviceA-vlan101] quit
```

Set the link type of Bridge-Aggregation 3 to trunk, and assign it to VLAN 100.

```
[DeviceA] interface bridge-aggregation 3
[DeviceA-Bridge-Aggregation3] port link-type trunk
[DeviceA-Bridge-Aggregation3] port trunk permit vlan 100
[DeviceA-Bridge-Aggregation3] undo port trunk permit vlan 1
[DeviceA-Bridge-Aggregation3] quit
```

Create VLAN-interface 100, and assign it an IPv4 address and a MAC address for it to act as an IPv4 gateway.

```
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] ip address 100.1.1.100 255.255.255.0
[DeviceA-Vlan-interface100] mac-address 0000-0010-0010
```

Assign VLAN-interface 100 an IPv6 address and a link-local address for it to act as an IPv6 gateway.

```
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] ipv6 address 100::100 64
[DeviceA-Vlan-interface100] ipv6 address FE80::80 link-local
```

Exclude VLAN-interface 100 from the shutdown action by DRNI MAD.

```
[DeviceA] drni mad exclude interface vlan-interface100
```

Create VLAN-interface 101 and assign it an IPv4 address and an IPv6 address for the device to communicate with the DR peer at Layer 3.

```
[DeviceA] interface vlan-interface 101
[DeviceA-Vlan-interface101] ip address 101.1.1.1 255.255.255.0
[DeviceA-Vlan-interface101] ipv6 address 101::1 64
[DeviceA-Vlan-interface101] quit
```

Exclude VLAN-interface 101 from the shutdown action by DRNI MAD.

```
[DeviceA] drni mad exclude interface vlan-interface101
```

Configure the router ID as 3.3.3.3.

```
[DeviceA] router id 3.3.3.3
```

Configure OSPF on VLAN-interface 100 and VLAN-interface 101. Disable VLAN-interface 100 from receiving and sending OSPF packets. The OSPF configuration enables the DR member devices to have IPv4 connectivity.

```
[DeviceA] ospf 1
[DeviceA-ospf-1] silent-interface vlan-interface 100
[DeviceA-ospf-1] import-route direct
[DeviceA-ospf-1] area 0
[DeviceA-ospf-1-area-0.0.0.0] quit
[DeviceA-ospf-1] quit
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] ospf 1 area 0.0.0.0
[DeviceA-Vlan-interface100] quit
[DeviceA] interface vlan-interface 101
[DeviceA-Vlan-interface101] ospf 1 area 0.0.0.0
[DeviceA-Vlan-interface101] quit
```

Configure OSPFv3 on VLAN-interface 100 and VLAN-interface 101. Disable VLAN-interface 100 from receiving and sending OSPFv3 packets. The OSPFv3 configuration enables the DR member devices to have IPv6 connectivity.

```
[DeviceA] ospfv3 1
[DeviceA-ospfv3-1] silent-interface vlan-interface 100
[DeviceA-ospfv3-1] import-route direct
[DeviceA-ospfv3-1] area 0
[DeviceA-ospfv3-1-area-0.0.0.0] quit
[DeviceA-ospfv3-1] quit
[DeviceA] interface vlan-interface 100
[DeviceA-Vlan-interface100] ospfv3 1 area 0.0.0.0
[DeviceA-Vlan-interface100] quit
[DeviceA] interface vlan-interface 101
[DeviceA-Vlan-interface101] ospfv3 1 area 0.0.0.0
[DeviceA-Vlan-interface101] quit
```

Create VLAN 32, and assign GigabitEthernet 1/0/6 to the VLAN. The interface is an uplink member interface of the DR interface.

```
[DeviceA] vlan 32
[DeviceA-vlan32] quit
[DeviceA] interface gigabitethernet 1/0/6
[DeviceA-GigabitEthernet1/0/6] port link-type trunk
[DeviceA-GigabitEthernet1/0/6] port trunk permit vlan 32
[DeviceA-GigabitEthernet1/0/6] undo port trunk permit vlan 1
[DeviceA-GigabitEthernet1/0/6] quit
```

Create VLAN-interface 32, and assign the interface an IPv4 address and an IPv6 address. Enable OSPF and OSPFv3 on the interface.

```
[DeviceA] interface vlan-interface 32
[DeviceA-Vlan-interface32] ip address 32.1.1.1 255.255.255.0
[DeviceA-Vlan-interface32] ipv6 address 32::1 64
[DeviceA-Vlan-interface32] ospf 1 area 0
[DeviceA-Vlan-interface32] ospfv3 1 area 0
[DeviceA-Vlan-interface32] quit
```

Configuring Device B

Configure DR system settings.

```
<DeviceB> system-view
[DeviceB] drni system-mac 0002-0002-0002
[DeviceB] drni system-number 2
[DeviceB] drni system-priority 123
```

Configure DR keepalive packet parameters.

```
[DeviceB] drni keepalive ip destination 21.1.1.1 source 21.1.1.2
```

Configure GigabitEthernet 1/0/5 as a routed (Layer 3) interface and assign the interface an IP address. The IP address will be used as the source IP address of keepalive packets.

```
[DeviceB] interface gigabitethernet 1/0/5
[DeviceB-GigabitEthernet1/0/5] port link-mode route
[DeviceB-GigabitEthernet1/0/5] ip address 21.1.1.2 255.255.255.0
[DeviceB-GigabitEthernet1/0/5] ipv6 address 21::2 64
[DeviceB-GigabitEthernet1/0/5] quit
```

Exclude the interface used for DR keepalive detection (GigabitEthernet 1/0/5) from the shutdown action by DRNI MAD.


```
[DeviceB] drni mad exclude interface gigabitethernet 1/0/5
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 1.

```
[DeviceB] interface bridge-aggregation 1
[DeviceB-Bridge-Aggregation1] link-aggregation mode dynamic
[DeviceB-Bridge-Aggregation1] quit
```

Assign GigabitEthernet 1/0/3 and GigabitEthernet 1/0/4 to aggregation group 1.

```
[DeviceB] interface gigabitethernet 1/0/3
[DeviceB-GigabitEthernet1/0/3] port link-aggregation group 1
[DeviceB-GigabitEthernet1/0/3] quit
[DeviceB] interface gigabitethernet 1/0/4
[DeviceB-GigabitEthernet1/0/4] port link-aggregation group 1
[DeviceB-GigabitEthernet1/0/4] quit
```

Configure Bridge-Aggregation 1 as the IPP.

```
[DeviceB] interface bridge-aggregation 1
[DeviceB-Bridge-Aggregation1] port drni intra-portal-port 1
[DeviceB-Bridge-Aggregation1] undo port trunk permit vlan 1
[DeviceB-Bridge-Aggregation1] quit
```

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 3, and assign it to DR group 1.

```
[DeviceB] interface bridge-aggregation 3
[DeviceB-Bridge-Aggregation3] link-aggregation mode dynamic
[DeviceB-Bridge-Aggregation3] port drni group 1
[DeviceB-Bridge-Aggregation3] quit
```

Assign GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 to aggregation group 3.

```
[DeviceB] interface gigabitethernet 1/0/1
[DeviceB-GigabitEthernet1/0/1] port link-aggregation group 3
[DeviceB-GigabitEthernet1/0/1] quit
[DeviceB] interface gigabitethernet 1/0/2
[DeviceB-GigabitEthernet1/0/2] port link-aggregation group 3
[DeviceB-GigabitEthernet1/0/2] quit
```

Create VLAN 100 and VLAN 101.

```
[DeviceB] vlan 100
[DeviceB-vlan100] quit
[DeviceB] vlan 101
[DeviceB-vlan101] quit
```

Set the link type of Bridge-Aggregation 3 to trunk, and assign it to VLAN 100.

```
[DeviceB] interface bridge-aggregation 3
[DeviceB-Bridge-Aggregation3] port link-type trunk
[DeviceB-Bridge-Aggregation3] port trunk permit vlan 100
[DeviceB-Bridge-Aggregation3] undo port trunk permit vlan 1
[DeviceB-Bridge-Aggregation3] quit
```

Create VLAN-interface 100, and assign it an IPv4 address and a MAC address for it to act as an IPv4 gateway.

```
[DeviceB] interface vlan-interface 100
[DeviceB-Vlan-interface100] ip address 100.1.1.100 255.255.255.0
[DeviceB-Vlan-interface100] mac-address 0000-0010-0010
```

Assign VLAN-interface 100 an IPv6 address and a link-local address for it to act as an IPv6 gateway.

```

[DeviceB] interface vlan-interface 100
[DeviceB-Vlan-interface100] ipv6 address 100::100 64
[DeviceB-Vlan-interface100] ipv6 address FE80::80 link-local

# Exclude VLAN-interface 100 from the shutdown action by DRNI MAD.
[DeviceB] drni mad exclude interface vlan-interface100

# Create VLAN-interface 101 and assign it an IPv4 address and an IPv6 address for the device to
communicate with the DR peer at Layer 3.
[DeviceB] interface vlan-interface 101
[DeviceB-vlan-interface101] ip address 101.1.1.2 24
[DeviceB-vlan-interface101] ipv6 address 101::2 64
[DeviceB-vlan-interface101] quit

# Exclude VLAN-interface 101 from the shutdown action by DRNI MAD.
[DeviceB] drni mad exclude interface vlan-interface101

# Configure the router ID as 4.4.4.4.
[DeviceB] router id 4.4.4.4

# Configure OSPF on VLAN-interface 100 and VLAN-interface 101. Disable VLAN-interface 100
from receiving and sending OSPF packets. The OSPF configuration enables the DR member
devices to have IPv4 connectivity.
[DeviceB] ospf 1
[DeviceB-ospf-1] silent-interface vlan-interface100
[DeviceB-ospf-1] import-route direct
[DeviceB-ospf-1] area 0
[DeviceB-ospf-1-area-0.0.0.0] quit
[DeviceB-ospf-1] quit
[DeviceB] interface vlan-interface 100
[DeviceB-Vlan-interface100] ospf 1 area 0.0.0.0
[DeviceB-Vlan-interface100] quit
[DeviceB] interface vlan-interface 101
[DeviceB-Vlan-interface101] ospf 1 area 0.0.0.0
[DeviceB-Vlan-interface101] quit

# Configure OSPFv3 on VLAN-interface 100 and VLAN-interface 101. Disable VLAN-interface 100
from receiving and sending OSPFv3 packets. The OSPFv3 configuration enables the DR member
devices to have IPv6 connectivity.
[DeviceB] ospfv3 1
[DeviceB-ospfv3-1] silent-interface vlan-interface100
[DeviceB-ospfv3-1] import-route direct
[DeviceB-ospfv3-1] area 0
[DeviceB-ospfv3-1-area-0.0.0.0] quit
[DeviceB-ospfv3-1] quit
[DeviceB] interface vlan-interface 100
[DeviceB-vlan-interface100] ospfv3 1 area 0
[DeviceB-vlan-interface100] quit
[DeviceB] interface vlan-interface 101
[DeviceB-vlan-interface101] ospfv3 1 area 0
[DeviceB-vlan-interface101] quit

# Create VLAN 33, and assign GigabitEthernet 1/0/6 to the VLAN. The interface is an uplink member
interface of the DR interface.
[DeviceB] vlan 33

```

```
[DeviceB-vlan33] quit
[DeviceB] interface gigabitethernet 1/0/6
[DeviceB-GigabitEthernet1/0/6] port link-type trunk
[DeviceB-GigabitEthernet1/0/6] port trunk permit vlan 33
[DeviceB-GigabitEthernet1/0/6] undo port trunk permit vlan 1
[DeviceB-GigabitEthernet1/0/6] quit
```

Create VLAN-interface 33, and assign the interface an IPv4 address and an IPv6 address. Enable OSPF and OSPFv3 on the interface.

```
[DeviceB] interface vlan-interface 33
[DeviceB-Vlan-interface33] ip address 33.1.1.1 255.255.255.0
[DeviceB-Vlan-interface33] ipv6 address 33::1 64
[DeviceB-Vlan-interface33] ospf 1 area 0
[DeviceB-Vlan-interface33] ospfv3 1 area 0
[DeviceB-Vlan-interface33] quit
```

Configuring Device C

Create VLAN 32 and assign GigabitEthernet 1/0/1 (attached to Device A) to the VLAN. Create VLAN-interface 32 and assign it an IPv4 address and an IPv6 address.

```
<DeviceC> system-view
[DeviceC] vlan 32
[DeviceC-vlan32] quit
[DeviceC] interface gigabitethernet 1/0/1
[DeviceC-GigabitEthernet1/0/1] port link-type trunk
[DeviceC-GigabitEthernet1/0/1] port trunk permit vlan 32
[DeviceC-GigabitEthernet1/0/1] undo port trunk permit vlan 1
[DeviceC-GigabitEthernet1/0/1] quit
[DeviceC] interface vlan-interface 32
[DeviceC-Vlan-interface32] ip address 32.1.1.2 24
[DeviceC-Vlan-interface32] ipv6 address 32::2 64
[DeviceC-Vlan-interface32] quit
```

Create VLAN 33 and assign GigabitEthernet 1/0/2 (attached to Device B) to the VLAN. Create VLAN-interface 33 and assign it an IPv4 address and an IPv6 address.

```
[DeviceC] vlan 33
[DeviceC-vlan33] quit
[DeviceC] interface gigabitethernet 1/0/2
[DeviceC-GigabitEthernet1/0/2] port link-type trunk
[DeviceC-GigabitEthernet1/0/2] port trunk permit vlan 33
[DeviceC-GigabitEthernet1/0/2] undo port trunk permit vlan 1
[DeviceC-GigabitEthernet1/0/2] quit
[DeviceC] interface vlan-interface 33
[DeviceC-Vlan-interface33] ip address 33.1.1.2 24
[DeviceC-Vlan-interface33] ipv6 address 33::2 64
[DeviceC-Vlan-interface33] quit
```

Configure the router ID as 5.5.5.5.

```
[DeviceC] router id 5.5.5.5
```

Enable OSPF on VLAN-interface 32 and VLAN-interface 33.

```
[DeviceC] ospf 1
```

```
[DeviceC-ospf-1] import-route direct
[DeviceC-ospf-1] area 0
[DeviceC-ospf-1-area-0.0.0.0] quit
[DeviceC-ospf-1] quit
[DeviceC] interface vlan-interface 32
[DeviceC-Vlan-interface32] ospf 1 area 0
[DeviceC-Vlan-interface32] quit
[DeviceC] interface vlan-interface 33
[DeviceC-Vlan-interface33] ospf 1 area 0
[DeviceC-Vlan-interface33] quit
```

Enable OSPFv3 on VLAN-interface 32 and VLAN-interface 33.

```
[DeviceC] ospfv3 1
[DeviceC-ospfv3-1] import-route direct
[DeviceC-ospfv3-1] area 0
[DeviceC-ospfv3-1-area-0.0.0.0] quit
[DeviceC-ospfv3-1] quit
[DeviceC] interface vlan-interface 32
[DeviceC-Vlan-interface32] ospfv3 1 area 0
[DeviceC-Vlan-interface32] quit
[DeviceC] interface vlan-interface 33
[DeviceC-Vlan-interface33] ospfv3 1 area 0
[DeviceC-Vlan-interface33] quit
```

Create VLAN 22, and assign GigabitEthernet 1/0/3 (attached to the upstream network) to the VLAN. Create VLAN-interface 22 and assign it an IPv4 address and an IPv6 address.

```
[DeviceC] vlan 22
[DeviceC-vlan22] quit
[DeviceC] interface gigabitethernet 1/0/3
[DeviceC-GigabitEthernet1/0/3] port link-type trunk
[DeviceC-GigabitEthernet1/0/3] port trunk permit vlan 22
[DeviceC-GigabitEthernet1/0/3] undo port trunk permit vlan 1
[DeviceC-GigabitEthernet1/0/3] quit
[DeviceC] interface vlan-interface 22
[DeviceC-Vlan-interface22] ip address 22.1.1.1 24
[DeviceC-Vlan-interface22] ipv6 address 22::1 64
[DeviceC-Vlan-interface22] quit
```

Configuring Device D

Create Layer 2 dynamic aggregate interface Bridge-Aggregation 3.

```
<DeviceD> system-view
[DeviceD] interface bridge-aggregation 3
[DeviceD-Bridge-Aggregation3] link-aggregation mode dynamic
[DeviceD-Bridge-Aggregation3] quit
```

Assign GigabitEthernet 1/0/1 through GigabitEthernet 1/0/4 to aggregation group 3.

```
[DeviceD] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/4
[DeviceD-if-range] port link-aggregation group 3
[DeviceD-if-range] quit
```

Create VLAN 100.

```
[DeviceD] vlan 100
[DeviceD-vlan100] quit

# Set the link type of Bridge-Aggregation 3 to trunk, and assign it to VLAN 100.
[DeviceD] interface bridge-aggregation 3
[DeviceD-Bridge-Aggregation3] port link-type trunk
[DeviceD-Bridge-Aggregation3] port trunk permit vlan 100
[DeviceD-Bridge-Aggregation3] undo port trunk permit vlan 1
[DeviceD-Bridge-Aggregation3] quit
```

Verifying the configuration

Verifying the DRNI configuration

The following tasks use Device A as an example.

Verify that Device A has formed a DR system with Device B.

```
[DeviceA] display drni summary
Flags: A -- Aggregate interface down, B -- No peer DR interface configured
      C -- Configuration consistency check failed
```

```
IPP: BAGG1
IPP state (cause): UP
Keepalive link state (cause): UP
```

```
DR interface information
DR interface  DR group  Local state (cause)  Peer state  Remaining down time (s)
BAGG3         1          UP                  UP          -
```

Verify that the keepalive link is operating correctly.

```
[DeviceA] display drni keepalive
Neighbor keepalive link status: Up
Neighbor is alive for: 64765 s 28 ms
Keepalive packet transmission status:
  Sent: Successful
  Received: Successful
Last received keepalive packet information:
  Source IP address: 21.1.1.2
  Time: 2021/01/17 17:10:52
  Action: Accept
```

```
Distributed relay keepalive parameters:
Destination IP address: 21.1.1.2
Source IP address: 21.1.1.1
Keepalive UDP port : 6400
Keepalive VPN name : N/A
Keepalive interval : 1000 ms
Keepalive timeout : 5 sec
Keepalive hold time: 3 sec
```

Verify that the DR system is operating correctly.

```
<Sysname> display drni system
```

System information

Local system number: 1	Peer system number: 2
Local system MAC: 0002-0002-0002	Peer system MAC: 0002-0002-0002
Local system priority: 123	Peer system priority: 123
Local bridge MAC: 3cd4-3ce1-0200	Peer bridge MAC: 3cd4-437d-0300
Local effective role: Primary	Peer effective role: Secondary
Health level: 0	
Standalone mode on split: Disabled	
In standalone mode: No	

System timer information

Timer	State	Value (s)	Remaining time (s)
Auto recovery	Disabled	-	-
Restore delay	Disabled	30	-
Consistency-check delay	Disabled	15	-
Standalone delay	Disabled	-	-
Role to None delay	Disabled	60	-

Verify that the interfaces used by DRNI are operating correctly.

[DeviceA] display drni verbose

Flags: A -- Home_Gateway, B -- Neighbor_Gateway, C -- Other_Gateway,
D -- IPP_Activity, E -- DRCP_Timeout, F -- Gateway_Sync,
G -- Port_Sync, H -- Expired

IPP/IPP ID: BAGG1/1

State: UP

Cause: -

Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG

Local Selected ports (index): GE1/0/3 (27), GE1/0/4 (32)

Peer Selected ports indexes: 125, 130

DR interface/DR group ID: BAGG3/1

Local DR interface state: UP

Peer DR interface state: UP

DR group state: UP

Local DR interface down cause: -

Remaining DRNI DOWN time: -

Local DR interface LACP MAC: Config=N/A, Effective=0002-0002-0002

Peer DR interface LACP MAC: Config=N/A, Effective=0002-0002-0002

Local DR interface LACP priority: Config=32768, Effective=123

Peer DR interface LACP priority: Config=32768, Effective=123

Local DRCP flags/Peer DRCP flags: ABDFG/ABDFG

Local Selected ports (index): GE1/0/1 (12), GE1/0/2 (13)

Peer Selected ports indexes: 56, 57

Verifying routing configuration

Verify that Device A have established OSPF neighbor relationships.

[DeviceA] display ospf peer

OSPF Process 1 with Router ID 3.3.3.3

Neighbor Brief Information

Area: 0.0.0.0

Router ID	Address	Pri	Dead-Time	State	Interface
4.4.4.4	101.1.1.2	1	36	Full/DR	Vlan101
5.5.5.5	32.1.1.2	1	38	Full/DR	Vlan32

Verify that Device A have established OSPFv3 neighbor relationships.

[DeviceA] display ospfv3 peer

OSPFv3 Process 1 with Router ID 3.3.3.3

Area: 0.0.0.0

Router ID	Pri	State	Dead-Time	InstID	Interface
4.4.4.4	1	Full/DR	00:00:36	0	Vlan101
5.5.5.5	1	Full/DR	00:00:35	0	Vlan32

Verify that Device B have established OSPF neighbor relationships.

[DeviceB] display ospf peer

OSPF Process 1 with Router ID 4.4.4.4

Neighbor Brief Information

Area: 0.0.0.0

Router ID	Address	Pri	Dead-Time	State	Interface
3.3.3.3	101.1.1.1	1	32	Full/BDR	Vlan101
5.5.5.5	33.1.1.2	1	33	Full/DR	Vlan33

Verify that Device B have established OSPFv3 neighbor relationships.

[DeviceB] display ospfv3 peer

OSPFv3 Process 1 with Router ID 4.4.4.4

Area: 0.0.0.0

Router ID	Pri	State	Dead-Time	InstID	Interface
3.3.3.3	1	Full/BDR	00:00:35	0	Vlan101
5.5.5.5	1	Full/DR	00:00:38	0	Vlan33

Verify that Device C have established OSPF neighbor relationships.

[DeviceC] display ospf peer

OSPF Process 1 with Router ID 5.5.5.5

Neighbor Brief Information

Area: 0.0.0.0

Router ID	Address	Pri	Dead-Time	State	Interface
-----------	---------	-----	-----------	-------	-----------

3.3.3.3	32.1.1.1	1	32	Full/DR	Vlan32
4.4.4.4	33.1.1.1	1	38	Full/DR	Vlan33

Verify that Device C have established OSPFv3 neighbor relationships.

```
[DeviceC] display ospfv3 peer
```

```
OSPFv3 Process 1 with Router ID 5.5.5.5
```

```
Area: 0.0.0.0
```

```
-----
Router ID      Pri State          Dead-Time InstID Interface
3.3.3.3        1  Full/DR          00:00:37  0      Vlan32
4.4.4.4        1  Full/DR          00:00:34  0      Vlan33
```

Verifying network connectivity

Verify that Server 1 and Server 2 have both IPv4 and IPv6 connectivity to the upstream network connected to Device C.

Verifying traffic failover

Disconnect the uplink interface on Device A and verify that Server 1 and Server 2 have connectivity to the upstream network connected to Device C. Transient traffic loss will occur during traffic failover.

Configuration files

- Device A:


```
#
router id 3.3.3.3
#
ospf 1
import-route direct
silent-interface Vlan-interface100
area 0.0.0.0
#
ospfv3 1
import-route direct
silent-interface Vlan-interface100
area 0.0.0.0
#
vlan 1
#
vlan 32
#
vlan 100 to 101
#
interface Bridge-Aggregation1
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 2 to 4094
link-aggregation mode dynamic
```



```

port drni intra-portal-port 1
#
interface Bridge-Aggregation3
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
link-aggregation mode dynamic
port drni group 1
#
interface Vlan-interface32
ip address 32.1.1.1 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
ipv6 address 32::1/64
#
interface Vlan-interface100
ip address 100.1.1.100 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
mac-address 0000-0010-0010
ipv6 address FE80::80 link-local
ipv6 address 100::100/64
#
interface Vlan-interface101
ip address 101.1.1.1 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
ipv6 address 101::1/64
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
combo enable fiber
port link-aggregation group 3
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
combo enable fiber
port link-aggregation group 3
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk

```

```

undo port trunk permit vlan 1
port trunk permit vlan 2 to 4094
port link-aggregation group 1
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 2 to 4094
port link-aggregation group 1
#
interface GigabitEthernet1/0/5
port link-mode route
ip address 21.1.1.1 255.255.255.0
ipv6 address 21::1/64
#
interface GigabitEthernet1/0/6
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 32
#
drni system-mac 0002-0002-0002
drni system-number 1
drni system-priority 123
drni keepalive ip destination 21.1.1.2 source 21.1.1.1
drni mad exclude interface GigabitEthernet1/0/5
drni mad exclude interface Vlan-interface100
drni mad exclude interface Vlan-interface101
#

```

- **Device B:**

```

#
router id 4.4.4.4
#
ospf 1
import-route direct
silent-interface Vlan-interface100
area 0.0.0.0
#
ospfv3 1
import-route direct
silent-interface Vlan-interface100
area 0.0.0.0
#
vlan 1
#
vlan 33
#

```

```

vlan 100 to 101
#
interface Bridge-Aggregation1
port link-type trunk
port trunk permit vlan all
link-aggregation mode dynamic
port drni intra-portal-port 1
#
interface Bridge-Aggregation3
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
link-aggregation mode dynamic
port drni group 1
#
interface Vlan-interface33
ip address 33.1.1.1 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
ipv6 address 33::1/64
#
interface Vlan-interface100
ip address 100.1.1.100 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
mac-address 0000-0010-0010
ipv6 address FE80::80 link-local
ipv6 address 100::100/64
#
interface Vlan-interface101
ip address 101.1.1.2 255.255.255.0
ospf 1 area 0.0.0.0
ospfv3 1 area 0.0.0.0
ipv6 address 101::2/64
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
combo enable fiber
port link-aggregation group 3
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100

```

```

    combo enable fiber
    port link-aggregation group 3
#
interface GigabitEthernet1/0/3
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan all
    port link-aggregation group 1
#
interface GigabitEthernet1/0/4
    port link-mode bridge
    port link-type trunk
    port trunk permit vlan all
    port link-aggregation group 1
#
interface GigabitEthernet1/0/5
    port link-mode route
    ip address 21.1.1.2 255.255.255.0
    ipv6 address 21::2/64
#
interface GigabitEthernet1/0/6
    port link-mode bridge
    port link-type trunk
    undo port trunk permit vlan 1
    port trunk permit vlan 33
#
    drni system-mac 0002-0002-0002
    drni system-number 2
    drni system-priority 123
    drni keepalive ip destination 21.1.1.1 source 21.1.1.2
    drni mad exclude interface GigabitEthernet1/0/5
    drni mad exclude interface Vlan-interface100
    drni mad exclude interface Vlan-interface101
#

```

- **Device C:**

```

#
    router id 5.5.5.5
#
ospf 1
    import-route direct
    area 0.0.0.0
#
ospfv3 1
    import-route direct
    area 0.0.0.0
#
vlan 1
#

```

```

vlan 22
#
vlan 32 to 33
#
interface Vlan-interface22
 ip address 22.1.1.1 255.255.255.0
 ipv6 address 22::1/64
#
interface Vlan-interface32
 ip address 32.1.1.1 255.255.255.0
 ospf 1 area 0.0.0.0
 ospfv3 1 area 0.0.0.0
 ipv6 address 32::2/64
#
interface Vlan-interface33
 ip address 33.1.1.2 255.255.255.0
 ospf 1 area 0.0.0.0
 ospfv3 1 area 0.0.0.0
 ipv6 address 33::2/64
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 32
#
interface GigabitEthernet1/0/2
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 33
#
interface GigabitEthernet1/0/3
 port link-mode bridge
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 22
#

```

- **Device D:**

```

#
vlan 1
#
vlan 100
#
interface Bridge-Aggregation3
 port link-type trunk
 undo port trunk permit vlan 1
 port trunk permit vlan 100

```

```
link-aggregation mode dynamic
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
port link-aggregation group 3
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
port link-aggregation group 3
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
port link-aggregation group 3
#
interface GigabitEthernet1/0/4
port link-mode bridge
port link-type trunk
undo port trunk permit vlan 1
port trunk permit vlan 100
port link-aggregation group 3
#
```