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Introduction

This document provides MVRP configuration examples.

Prerequisites

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

This document assumes that you have basic knowledge of MVRP.

Example: Configuring MVRP

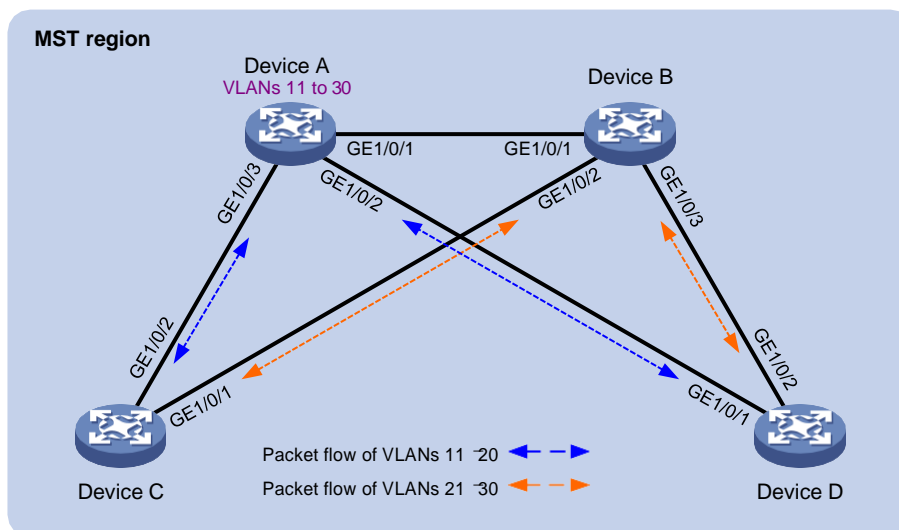
Network configuration

As shown in [Figure 1](#):

- Device A and Device B are core layer devices. Device C and Device D are aggregation layer devices.
- Ports on all devices allow packets from VLANs 11 through 30 to pass through.
- MSTP implements load balancing and link backup for traffic of VLANs 11 through 30 between the core layer devices and the aggregation layer devices.

Configure MVRP on all devices to synchronize and update VLAN information. When the network is stable, set the registration mode to **fixed** on GigabitEthernet 1/0/1 of Device B to maintain dynamic VLAN information.

Figure 1 Network diagram



Analysis

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

- To assign all devices to the same MST region, configure the same settings for the following parameters on all the devices:
 - Spanning tree mode. (This example uses the default mode MSTP.)
 - MST region name. (This example uses the region name **test**.)
 - MST region revision level. (This example uses the default setting 0.)
 - VLAN-to-instance mappings. (This example maps VLANs 11 through 20 to MSTI 1, and maps VLANs 21 through 30 to MSTI 2.)
- For MSTIs 1 and 2 to use different uplinks for backup, set Device A and Device B as the root bridges of MSTIs 1 and 2, respectively.
- Make sure each MSTI is mapped to an existing VLAN on each device in the network.
- MVRP takes effect only on trunk ports. You must set the port link type to trunk for MVRP participants.

Applicable hardware and software versions

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

Hardware	Software version
SC 3570 switch series	Release 11xx
SC 5525 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 5520 switch series	Release 63xx, Release 65xx, Release 6615Pxx, Release 6628Pxx
SC 3170 switch series	Release 11xx
SC 3130 switch series	Release 63xx

Restrictions and guidelines

When you configure MVRP, follow these restrictions and guidelines:

- MVRP can work with STP, RSTP, or MSTP. Ports blocked by STP, RSTP, or MSTP can receive and send MVRP frames. MVRP cannot work with other link layer topology protocols, including service loopback, PVST, RRPP, and Smart Link.
- On a Layer 2 aggregate interface, MVRP takes effect on both the aggregate interface and all Selected member ports in the link aggregation group.
- MVRP configuration made on an aggregation group member port takes effect only after the port is removed from the aggregation group.

Procedures

Configuring Device A

Create VLANs 11 through 30.

```
<DeviceA> system-view
[DeviceA] vlan 11 to 30
```

Enter MST region view.

```
[DeviceA] stp region-configuration
```

Set the MST region name to **test**.

```
[DeviceA-mst-region] region-name test
# Map VLANs 11 through 20 to MSTI 1.
[DeviceA-mst-region] instance 1 vlan 11 to 20
# Map VLANs 21 through 30 to MSTI 2.
[DeviceA-mst-region] instance 2 vlan 21 to 30
# Activate the MST region configuration.
[DeviceA-mst-region] active region-configuration
[DeviceA-mst-region] quit
# Configure Device A as the root bridge of MSTI 1.
[DeviceA] stp instance 1 root primary
# Enable the spanning tree feature globally.
[DeviceA] stp global enable
# Enable MVRP globally.
[DeviceA] mvrp global enable
```

Configure the ports GigabitEthernet 1/0/1 through GigabitEthernet 1/0/3 as trunk ports, assign the ports to VLANs 11 through 30, and enable MVRP on these ports.

```
[DeviceA] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/3
[DeviceA-if-range] port link-mode bridge
[DeviceA-if-range] port link-type trunk
[DeviceA-if-range] port trunk permit vlan 11 to 30
[DeviceA-if-range] mvrp enable
[DeviceA-if-range] undo shutdown
[DeviceA-if-range] quit
```

Configuring Device B

Create VLANs 11 and 21.

```
<DeviceB> system-view
[DeviceB] vlan 11
[DeviceB-vlan11] quit
[DeviceB] vlan 21
[DeviceB-vlan21] quit
```

Enter MST region view.

```
[DeviceB] stp region-configuration
```

Set the MST region name to test.

```
[DeviceB-mst-region] region-name test
```

Map VLANs 11 through 20 to MSTI 1.

```
[DeviceB-mst-region] instance 1 vlan 11 to 20
```

Map VLANs 21 through 30 to MSTI 2.

```
[DeviceB-mst-region] instance 2 vlan 21 to 30
```

Activate the MST region configuration.

```
[DeviceB-mst-region] active region-configuration
[DeviceB-mst-region] quit
```

Configure Device B as the root bridge of MSTI 2.

```
[DeviceB] stp instance 2 root primary
```

Enable the spanning tree feature globally.

```
[DeviceB] stp global enable
```

Enable MVRP globally.

```
[DeviceB] mvrp global enable
```

Configure the ports GigabitEthernet 1/0/1 through GigabitEthernet 1/0/3 as trunk ports, assign the ports to VLANs 11 through 30, and enable MVRP on these ports.

```
[DeviceB] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/3
[DeviceB-if-range] port link-mode bridge
[DeviceB-if-range] port link-type trunk
[DeviceB-if-range] port trunk permit vlan 11 to 30
[DeviceB-if-range] mvrp enable
[DeviceB-if-range] undo shutdown
[DeviceB-if-range] quit
```

Configuring Device C

Create VLANs 11 and 21.

```
<DeviceC> system-view
[DeviceC] vlan 11
[DeviceC-vlan11] quit
[DeviceC] vlan 21
[DeviceC-vlan21] quit
```

Enter MST region view.

```
[DeviceC] stp region-configuration
```

Set the MST region name to test.

```
[DeviceC-mst-region] region-name test
```

Map VLANs 11 through 20 to MSTI 1.

```
[DeviceC-mst-region] instance 1 vlan 11 to 20
```

Map VLANs 21 through 30 to MSTI 2.

```
[DeviceC-mst-region] instance 2 vlan 21 to 30
```

Activate the MST region configuration.

```
[DeviceC-mst-region] active region-configuration
[DeviceC-mst-region] quit
```

Enable the spanning tree feature globally.

```
[DeviceC] stp global enable
```

Enable MVRP globally.

```
[DeviceC] mvrp global enable
```

Configure the ports GigabitEthernet 1/0/1 and GigabitEthernet 1/0/2 as trunk ports, assign the ports to VLANs 11 through 30, and enable MVRP on these ports.

```
[DeviceC] interface range gigabitethernet 1/0/1 to gigabitethernet 1/0/2
[DeviceC-if-range] port link-mode bridge
[DeviceC-if-range] port link-type trunk
[DeviceC-if-range] port trunk permit vlan 11 to 30
[DeviceC-if-range] mvrp enable
[DeviceC-if-range] undo shutdown
[DeviceC-if-range] quit
```

Configuring Device D

Configure Device D in the same way Device C is configured. (Details not shown.)

Verifying the configuration

Verifying MSTI topologies

Display brief spanning tree information on Device A.

```
[DeviceA] display stp brief
```

MST ID	Port	Role	STP State	Protection
...				
1	GigabitEthernet1/0/1	DESI	FORWARDING	NONE

1	GigabitEthernet1/0/2	DESI	FORWARDING	NONE
1	GigabitEthernet1/0/3	DESI	FORWARDING	NONE
2	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
2	GigabitEthernet1/0/2	DESI	FORWARDING	NONE
2	GigabitEthernet1/0/3	DESI	FORWARDING	NONE

Display brief spanning tree information on Device B.

```
[DeviceB] display stp brief
```

MST ID	Port	Role	STP State	Protection
...				
1	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
1	GigabitEthernet1/0/2	DESI	FORWARDING	NONE
1	GigabitEthernet1/0/3	DESI	FORWARDING	NONE
2	GigabitEthernet1/0/1	DESI	FORWARDING	NONE
2	GigabitEthernet1/0/2	DESI	FORWARDING	NONE
2	GigabitEthernet1/0/3	DESI	FORWARDING	NONE

Display brief spanning tree information on Device C.

```
[DeviceC] display stp brief
```

MST ID	Port	Role	STP State	Protection
...				
1	GigabitEthernet1/0/1	ALTE	DISCARDING	NONE
1	GigabitEthernet1/0/2	ROOT	FORWARDING	NONE
2	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
2	GigabitEthernet1/0/2	ALTE	DISCARDING	NONE

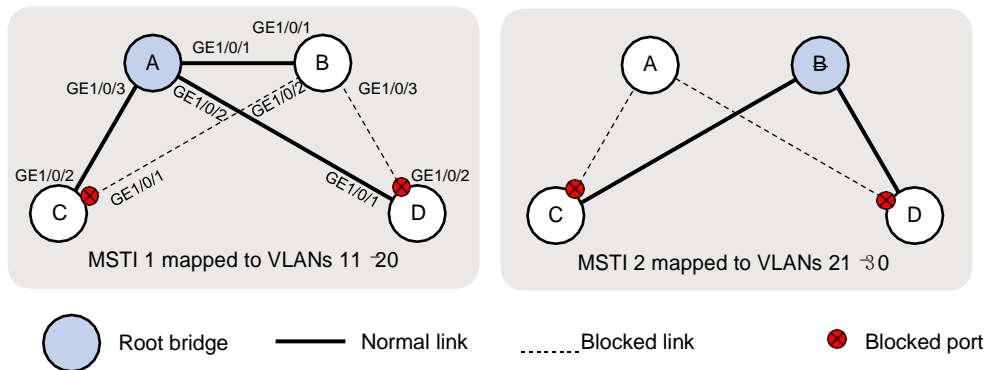
Display brief spanning tree information on Device D.

```
[DeviceD] display stp brief
```

MST ID	Port	Role	STP State	Protection
...				
1	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
1	GigabitEthernet1/0/2	ALTE	DISCARDING	NONE
2	GigabitEthernet1/0/1	ALTE	DISCARDING	NONE
2	GigabitEthernet1/0/2	ROOT	FORWARDING	NONE

Based on the output, you can get MSTI topologies, as shown in [Figure 2](#).

Figure 2 MSTI topologies



Verifying local VLAN information on all devices

Display local VLAN information on Device A.

```
[DeviceA] display mvrp running-status
-----[MVRP Global Info] -----
Global Status      : Enabled
Compliance-GVRP   : False

----[GigabitEthernet1/0/1] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
  1(default), 11, 21
Declared VLANs :
  1(default), 11-30
Propagated VLANs :
  1(default), 11, 21

----[GigabitEthernet1/0/2] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
  1(default), 11
Declared VLANs :
  1(default), 11-30
Propagated VLANs :
  1(default), 11

----[GigabitEthernet1/0/3] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
  1(default), 11
```



```
Declared VLANs :
1(default), 11-30
Propagated VLANs :
1(default), 11
```

The output shows that all ports of Device A have declared VLANs 11 through 30.

Display local VLAN information on Device B.

```
[DeviceB] display mvrp running-status
-----[MVRP Global Info] -----
Global Status      : Enabled
Compliance-GVRP    : False

----[GigabitEthernet1/0/1] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
1(default), 11-30
Declared VLANs :
1(default), 11, 21
Propagated VLANs :
1(default), 11-30

----[GigabitEthernet1/0/2] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
21
Declared VLANs :
1(default), 11-30
Propagated VLANs :
21

----[GigabitEthernet1/0/3] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
```

```

Registration Type           : Normal
Registered VLANs :
21
Declared VLANs :
1(default), 11-30
Propagated VLANs :
21

```

The output shows that:

- GigabitEthernet 1/0/1 has registered and propagated VLANs 11 through 30.
- GigabitEthernet 1/0/2 and GigabitEthernet 1/0/3 have declared VLANs 11 through 30.

Display local VLAN information on Device C.

```

[DeviceC] display mvrp running-status
-----[MVRP Global Info] -----
Global Status      : Enabled
Compliance-GVRP   : False

----[GigabitEthernet1/0/1] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
1(default), 11-30
Declared VLANs :
21
Propagated VLANs :
21-30

----[GigabitEthernet1/0/2] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Normal
Registered VLANs :
1(default), 11-30
Declared VLANs :
1(default), 11
Propagated VLANs :
1(default), 11-20

```

The output shows that:

- GigabitEthernet 1/0/1 has registered VLANs 11 through 30. Because GigabitEthernet 1/0/1 is a blocked port in MSTI 1, the port propagated only VLANs 21 through 30.
- GigabitEthernet 1/0/2 has registered VLANs 11 through 30. Because GigabitEthernet 1/0/2 is a blocked port in MSTI 2, the port propagated only VLANs 11 through 20.

Display local VLAN information on Device D.

```
[DeviceD] display mvrp running-status
-----[MVRP Global Info] -----
Global Status      : Enabled
Compliance-GVRP    : False

----[GigabitEthernet1/0/1] ----
Config Status      : Enabled
Running Status      : Enabled
Join Timer          : 20 (centiseconds)
Leave Timer          : 60 (centiseconds)
Periodic Timer      : 100 (centiseconds)
LeaveAll Timer       : 1000 (centiseconds)
Registration Type    : Normal
Registered VLANs :
1(default), 11-30
Declared VLANs :
1(default), 11
Propagated VLANs :
1(default), 11-20

----[GigabitEthernet1/0/2] ----
Config Status      : Enabled
Running Status      : Enabled
Join Timer          : 20 (centiseconds)
Leave Timer          : 60 (centiseconds)
Periodic Timer      : 100 (centiseconds)
LeaveAll Timer       : 1000 (centiseconds)
Registration Type    : Normal
Registered VLANs :
1(default), 11-30
Declared VLANs :
21
Propagated VLANs :
21-30
```

The output shows that:

- GigabitEthernet 1/0/1 has registered VLANs 11 through 30. Because GigabitEthernet 1/0/1 is a blocked port in MSTI 2, the port propagated only VLANs 11 through 20.
- GigabitEthernet 1/0/2 has registered VLANs 11 through 30. Because GigabitEthernet 1/0/2 is a blocked port in MSTI 1, the port propagated only VLANs 21 through 30.

Verifying VLAN information after changing the registration mode

When the network is stable, set the MVRP registration mode to **fixed** on GigabitEthernet 1/0/1 of Device B. Then, verify that dynamic VLANs on the port will not be deregistered.

Set the MVRP registration mode to **fixed** on GigabitEthernet 1/0/1 of Device B.

```
[DeviceB] interface gigabitethernet 1/0/1
[DeviceB-GigabitEthernet1/0/1] mvrp registration fixed
[DeviceB-GigabitEthernet1/0/1] quit
```

Remove VLAN 30 from Device A.

```
[DeviceA] undo vlan 30
```

Display local VLAN information on GigabitEthernet 1/0/1 of Device B.

```
[DeviceB] display mvrp running-status interface gigabitethernet 1/0/1
-----[MVRP Global Info] -----
Global Status      : Enabled
Compliance-GVRP    : False

----[GigabitEthernet1/0/1] ----
Config Status      : Enabled
Running Status     : Enabled
Join Timer         : 20 (centiseconds)
Leave Timer         : 60 (centiseconds)
Periodic Timer     : 100 (centiseconds)
LeaveAll Timer      : 1000 (centiseconds)
Registration Type   : Fixed
Registered VLANs   :
1(default), 21-30
Declared VLANs    :
1(default), 21
Propagated VLANs  :
1(default), 21-30
```

The output shows that VLAN information on GigabitEthernet 1/0/1 does not change after you set its MVRP registration mode to **fixed**.

Create VLAN 30 on Device A.

```
[DeviceA] vlan 30
```

Verifying VLAN information after changing the network topology

Shut down GigabitEthernet1/0/2 of Device C to change the network topology, and then verify the VLAN information on this port.

Display VLAN information on GigabitEthernet 1/0/2 of Device C.

```
[DeviceC] display interface gigabitethernet 1/0/2
GigabitEthernet1/0/2
Current state: UP
Line protocol state: UP
```

```

...
Port link-type: Trunk
VLAN Passing: 1(default vlan), 11-30
VLAN permitted: 1(default vlan), 11-30
Trunk port encapsulation: IEEE 802.1q
...

```

The output shows that VLAN 1 and VLANs 11 through 30 can pass through GigabitEthernet 1/0/2.

Shut down GigabitEthernet 1/0/2.

```

[DeviceC] interface gigabitethernet 1/0/2
[DeviceC-GigabitEthernet1/0/2] shutdown
[DeviceC-GigabitEthernet1/0/2] quit

```

Display brief spanning tree information on Device C.

```

[DeviceC] display stp brief

```

MST ID	Port	Role	STP State	Protection
0	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
1	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
2	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE

Display brief spanning tree information on Device D.

```

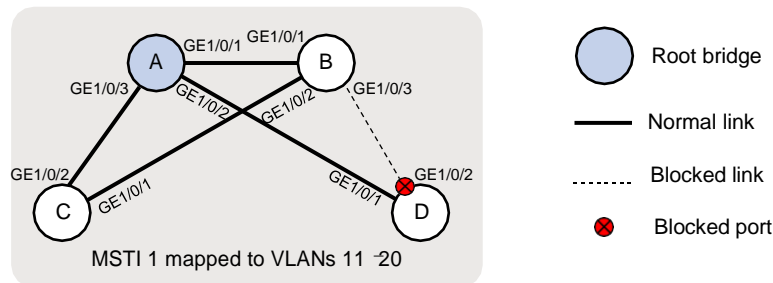
[DeviceD] display stp brief

```

MST ID	Port	Role	STP State	Protection
0	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
0	GigabitEthernet1/0/2	ALTE	DISCARDING	NONE
1	GigabitEthernet1/0/1	ROOT	FORWARDING	NONE
1	GigabitEthernet1/0/2	ALTE	DISCARDING	NONE
2	GigabitEthernet1/0/1	ALTE	DISCARDING	NONE
2	GigabitEthernet1/0/2	ROOT	FORWARDING	NONE

Based on the output, you can get the topology of MSTI 1, as shown in [Figure 3](#).

Figure 3 Topology of MSTI 1



Display dynamic VLANs on Device C.

```

[DeviceC] display vlan dynamic
Dynamic VLANs: 18
The dynamic VLANs include:
12-20, 22-30

```

Display VLAN information on GigabitEthernet 1/0/2 of Device C.

```

[DeviceC] display interface gigabitethernet 1/0/2
...
Port link-type: Trunk

```

```
VLAN Passing: 1(default vlan), 11, 21
VLAN permitted: 1(default vlan), 11-30
Trunk port encapsulation: IEEE 802.1q
...
```

The output shows that:

- VLANs 1, 11, and 21 can pass through GigabitEthernet 1/0/2.
- GigabitEthernet 1/0/2 failed to learn dynamic VLANs.

Configuration files



IMPORTANT:

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

- Device A:

```
#
sysname DeviceA
#
mvrp global enable
#
vlan 1
#
vlan 11 to 30
#
stp region-configuration
region-name test
instance 1 vlan 11 to 20
instance 2 vlan 21 to 30
active region-configuration
#
stp instance 0 to 1 root primary
stp global enable
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
```

- ```

port trunk permit vlan 1 11 to 30
mvrp enable
#

```
- **Device B:**

```

#
sysname DeviceB
#
mvrp global enable
#
vlan 1
#
vlan 11
#
vlan 21
#
stp region-configuration
region-name test
instance 1 vlan 11 to 20
instance 2 vlan 21 to 30
active region-configuration
#
stp instance 2 root primary
stp global enable
#
interface GigabitEthernet1/0/1
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
interface GigabitEthernet1/0/3
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#

```
  - **Device C:**

```

#
sysname DeviceC
#
mvrp global enable
#

```

```

vlan 1
#
vlan 11
#
vlan 21
#
stp region-configuration
 region-name test
 instance 1 vlan 11 to 20
 instance 2 vlan 21 to 30
 active region-configuration
#
 stp global enable
#
interface GigabitEthernet1/0/1
 port link-mode bridge
 port link-type trunk
 port trunk permit vlan 1 11 to 30
 mvrp enable
#
interface GigabitEthernet1/0/2
 port link-mode bridge
 port link-type trunk
 port trunk permit vlan 1 11 to 30
 mvrp enable
#

```

- **Device D:**

```

#
 sysname DeviceD
#
 mvrp global enable
#
vlan 1
#
vlan 11
#
vlan 21
#
stp region-configuration
 region-name test
 instance 1 vlan 11 to 20
 instance 2 vlan 21 to 30
 active region-configuration
#
 stp global enable
#
interface GigabitEthernet1/0/1
 port link-mode bridge

```



```
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
interface GigabitEthernet1/0/2
port link-mode bridge
port link-type trunk
port trunk permit vlan 1 11 to 30
mvrp enable
#
```