

H3C S6800[S6860][S6861] & S6820 Switch Series Virtual Technologies Command Reference

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Preface

This command reference describes the commands for configuring an IRF fabric and an IRF 3.1 system.

This preface includes the following topics about the documentation:

- [Audience](#).
- [Conventions](#).
- [Documentation feedback](#).

Audience

This documentation is intended for:

- Network planners.
- Field technical support and servicing engineers.
- Network administrators working with the S6800[S6860][S6861] & S6820 switch series.

Conventions

The following information describes the conventions used in the documentation.

Command conventions

Convention	Description
Boldface	Bold text represents commands and keywords that you enter literally as shown.
<i>Italic</i>	<i>Italic</i> text represents arguments that you replace with actual values.
[]	Square brackets enclose syntax choices (keywords or arguments) that are optional.
{ x y ... }	Braces enclose a set of required syntax choices separated by vertical bars, from which you select one.
[x y ...]	Square brackets enclose a set of optional syntax choices separated by vertical bars, from which you select one or none.
{ x y ... }*	Asterisk marked braces enclose a set of required syntax choices separated by vertical bars, from which you select a minimum of one.
[x y ...]*	Asterisk marked square brackets enclose optional syntax choices separated by vertical bars, from which you select one choice, multiple choices, or none.
&<1-n>	The argument or keyword and argument combination before the ampersand (&) sign can be entered 1 to n times.
#	A line that starts with a pound (#) sign is comments.

GUI conventions

Convention	Description
Boldface	Window names, button names, field names, and menu items are in Boldface. For example, the New User window opens; click OK .
>	Multi-level menus are separated by angle brackets. For example, File > Create > Folder .

Symbols

Convention	Description
 WARNING!	An alert that calls attention to important information that if not understood or followed can result in personal injury.
 CAUTION:	An alert that calls attention to important information that if not understood or followed can result in data loss, data corruption, or damage to hardware or software.
 IMPORTANT:	An alert that calls attention to essential information.
NOTE:	An alert that contains additional or supplementary information.
 TIP:	An alert that provides helpful information.

Network topology icons

Convention	Description
	Represents a generic network device, such as a router, switch, or firewall.
	Represents a routing-capable device, such as a router or Layer 3 switch.
	Represents a generic switch, such as a Layer 2 or Layer 3 switch, or a router that supports Layer 2 forwarding and other Layer 2 features.
	Represents an access controller, a unified wired-WLAN module, or the access controller engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a wireless terminator unit.
	Represents a wireless terminator.
	Represents a mesh access point.
	Represents omnidirectional signals.
	Represents directional signals.
	Represents a security product, such as a firewall, UTM, multiservice security gateway, or load balancing device.
	Represents a security module, such as a firewall, load balancing, NetStream, SSL VPN, IPS, or ACG module.

Examples provided in this document

Examples in this document might use devices that differ from your device in hardware model, configuration, or software version. It is normal that the port numbers, sample output, screenshots, and other information in the examples differ from what you have on your device.

Documentation feedback

You can e-mail your comments about product documentation to info@h3c.com.

We appreciate your comments.

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IRF commands

display irf

Use `display irf` to display IRF fabric information.

Syntax

```
display irf
```

Views

Any view

Predefined user roles

network-admin

network-operator

Examples

Display IRF fabric information.

```
<Sysname> display irf
```

```
MemberID  Role      Priority  CPU-Mac      Description
   1        Loading  1         00e0-fcbe-3102  F1Num001
  *+2        Master  1         00e0-fcb1-ade2  F1Num002
```

* indicates the device is the master.

+ indicates the device through which the user logs in.

The Bridge MAC of the IRF is: 00e0-fc00-1000

Auto upgrade : yes

Mac persistent : always

Domain ID : 30

Table 1 Command output

Field	Description
MemberID	IRF member ID: <ul style="list-style-type: none">ID of the master is prefixed with an asterisk (*) sign.ID of the device where you are logged in is prefixed with a plus (+) sign.
Role	Role of the member device in the IRF fabric: <ul style="list-style-type: none">Standby—Subordinate device.Master—Master device.Loading—The device is loading software images.
Priority	IRF member priority.
CPU-MAC	MAC address of the CPU in the device. This MAC address is used for internal communication between nodes within the device.

Field	Description
Description	Description you have configured for the member device. <ul style="list-style-type: none"> If no description is configured, this field displays a dashed line (-----). If the description exceeds the maximum number of characters that can be displayed, an ellipsis (...) is displayed in place of the exceeding text. To display the complete description, use the display current-configuration command.
Bridge MAC of the IRF is	IRF bridge MAC address. This MAC address is used by the IRF fabric to communicate with external devices and hosts.
Auto upgrade	Status of the software auto-update feature: <ul style="list-style-type: none"> yes—Enabled. no—Disabled.
MAC persistent	IRF bridge MAC persistence setting: <ul style="list-style-type: none"> 12 min—Bridge MAC address of the IRF fabric remains unchanged for 12 minutes after the address owner leaves. always—Bridge MAC address of the IRF fabric does not change after the address owner leaves. no—Bridge MAC address of the current master replaces the original bridge MAC address as soon as the owner of the original address leaves.
Domain ID	Domain ID of the IRF fabric. The domain ID you assign to an IRF fabric must uniquely identify the fabric in a multi-IRF fabric network.

Related commands

`display irf configuration`

`display irf topology`

display irf configuration

Use `display irf configuration` to display basic IRF settings for each member device.

Syntax

`display irf configuration`

Views

Any view

Predefined user roles

network-admin

network-operator

Examples

Display basic IRF settings for all members.

```
<Sysname> display irf configuration
```

MemberID	NewID	IRF-Port1	IRF-Port2
1	1	Ten-GigabitEthernet2/0/5	Ten-GigabitEthernet1/0/6
2	2	Ten-GigabitEthernet2/0/5	Ten-GigabitEthernet2/0/6
		Ten-GigabitEthernet2/0/7	
		Ten-GigabitEthernet2/0/8	
4	4	Ten-GigabitEthernet4/0/5	Ten-GigabitEthernet4/0/6
			Ten-GigabitEthernet4/0/7

Table 2 Command output

Field	Description
MemberID	Current member ID of the device.
NewID	Member ID assigned to the device. This member ID takes effect at reboot.
IRF-Port1	Physical interfaces bound to IRF-port 1. This field displays disable if no physical interfaces are bound to the IRF port.
IRF-Port2	Physical interfaces bound to IRF-port 2. This field displays disable if no physical interfaces are bound to the IRF port.

Related commands

```
display irf
display irf topology
```

display irf link

Use `display irf link` to display IRF link information.

Syntax

```
display irf link
```

Views

Any view

Predefined user roles

```
network-admin
network-operator
```

Examples

```
# Display IRF link information.
```

```
<Sysname> display irf link
```

```
Member 1
```

IRF Port	Interface	Status
1	disable	--
2	Ten-GigabitEthernet1/0/1	UP
	Ten-GigabitEthernet1/0/2	ADM
	Ten-GigabitEthernet1/0/3	DOWN

```
Member 2
```

IRF Port	Interface	Status
1	Ten-GigabitEthernet2/0/1	UP
	Ten-GigabitEthernet2/0/2	DOWN
	Ten-GigabitEthernet2/0/3	ADM
2	disable	--

Table 3 Command output

Field	Description
Member ID	IRF member ID.

Field	Description
IRF Port	IRF port number: <ul style="list-style-type: none"> 1—IRF-port 1. 2—IRF-port 2.
Interface	Physical interfaces bound to the IRF port. This field displays disable if no physical interfaces have been bound to the IRF port.
Status	Link state of the IRF physical interface: <ul style="list-style-type: none"> UP—The link is up. DOWN—The link is down. ADM—The interface has been manually shut down by using the shutdown command. ABSENT—Interface module that hosts the interface is not present.

display irf topology

Use `display irf topology` to display IRF fabric topology information.

Syntax

```
display irf topology
```

Views

Any view

Predefined user roles

network-admin

network-operator

Examples

Display the IRF fabric topology.

```
<Sysname> display irf topology
```

```

Topology Info
-----
                IRF-Port1                IRF-Port2
MemberID  Link      neighbor  Link      neighbor  Belong To
1          DOWN     ---      UP        2          000f-cbb8-1a82
2          UP       1        DIS      ---      000f-cbb8-1a82

```

Table 4 Command output

Field	Description
IRF-Port1	Information about IRF-port 1, including its link state and neighbor.
IRF-Port2	Information about IRF-port 2, including its link state and neighbor.
MemberID	IRF member ID.

Field	Description
Link	<p>Link state of the IRF port:</p> <ul style="list-style-type: none"> • UP—The IRF link is up. • DOWN—The IRF link is down because the port has no physical link or has not been activated by the <code>irf-port-configuration active</code> command. • DIS—No physical interfaces have been bound to the IRF port. • TIMEOUT—IRF hello interval has timed out. • ISOLATE—The device is isolated from the IRF fabric. This issue might be caused by the following reasons: <ul style="list-style-type: none"> ○ The IRF fabric does not support the device model. ○ The maximum number of member devices has exceeded the upper limit.
neighbor	<p>IRF member ID of the device connected to the IRF port.</p> <p>This field displays three hyphens (---) if no device is connected to the port.</p>
Belong To	<p>IRF fabric that has the device, represented by the CPU MAC address of the master in the IRF fabric.</p>

Related commands

```
display irf
display irf configuration
```

display irf-port load-sharing mode

Use `display irf-port load-sharing mode` to display IRF link load sharing mode.

Syntax

```
display irf-port load-sharing mode [ irf-port
[ member-id/irf-port-number ] ]
```

Views

Any view

Predefined user roles

```
network-admin
network-operator
```

Parameters

irf-port: Displays IRF port-specific load sharing modes. If you do not specify this keyword, the command displays the global load sharing mode for IRF links.

member-id/irf-port-number: Specifies an IRF port number. The *member-id* argument represents an IRF member ID. The *irf-port-number* argument represents the index number (1 or 2) of the IRF port on the member device. If you do not specify the *member-id* and *irf-port-number* arguments, this command displays the load sharing mode used on each IRF port in the IRF fabric. If no IRF ports are in up state, this command displays **No IRF link exists**.

Examples

Display the global load sharing mode for IRF links. In this example, because no user-defined global load sharing mode has been configured, the default global load sharing mode applies.

```
<Sysname> display irf-port load-sharing mode
irf-port Load-Sharing Mode:
```

```
Layer 2 traffic: packet type-based sharing
```

```
Layer 3 traffic: packet type-based sharing
```

Display the global load sharing mode for IRF links. In this example, because a global load sharing mode has been configured, the configured mode applies.

```
<Sysname> display irf-port load-sharing mode
```

```
irf-port Load-Sharing Mode:
```

```
destination-mac address, source-mac address
```

Display the load sharing mode of IRF-port 1/1. In this example, because neither port-specific load sharing mode nor user-defined global load sharing mode has been configured, the default global load sharing mode applies.

```
<Sysname> display irf-port load-sharing mode irf-port 1/1
```

```
irf-port1/1 Load-Sharing Mode:
```

```
Layer 2 traffic: packet type-based sharing
```

```
Layer 3 traffic: packet type-based sharing
```

Display the load sharing mode of IRF-port 1/1 after a load sharing mode is configured on the port.

```
<Sysname> display irf-port load-sharing mode irf-port 1/1
```

```
irf-port 1/1 Load-Sharing Mode:
```

```
destination-mac address, source-mac address
```

Display the load sharing mode used on each IRF port.

```
<Sysname> display irf-port load-sharing mode irf-port
```

```
irf-port1/1 Load-Sharing Mode:
```

```
destination-mac address source-mac address
```

```
irf-port1/2 Load-Sharing Mode:
```

```
destination-ip address source-ip address
```

Table 5 Command output

Field	Description
irf-port Load-Sharing Mode	Global load sharing mode for IRF links: <ul style="list-style-type: none">If no global IRF link load sharing mode has been configured, the default global load sharing mode applies.If a user-defined global load sharing mode has been configured, the configured mode applies.
irf-port1/1 Load-Sharing Mode	Link load sharing mode of IRF-port 1/1: <ul style="list-style-type: none">If you have not configured a port-specific load sharing mode, the global IRF link load sharing mode applies.If you have configured a port-specific load sharing mode, the configured mode applies.
Layer 2 traffic: packet type-based sharing	Default load sharing mode for traffic that has no IP header. By default, this type of traffic is distributed based on packet types.
Layer 3 traffic: packet type-based sharing	Default load sharing mode for non-TCP/-UDP IP packets. By default, this type of traffic is distributed based on packet types.

display mad

Use **display mad** to display MAD status and settings.

Syntax

```
display mad [ verbose ]
```

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

verbose: Displays detailed MAD information. If you do not specify this keyword, the command only displays whether a MAD mechanism is enabled or disabled.

Examples

Display brief MAD information.

```
<Sysname> display mad
MAD ARP disabled.
MAD ND disabled.
MAD LACP enabled.
MAD BFD enabled.
```

Display detailed MAD information.

```
<Sysname> display mad verbose
Multi-active recovery state: No
Excluded ports (user-configured):
  Bridge-Aggregation4
  Vlan-interface999
Excluded ports (system-configured):
  IRF physical interfaces:
    Ten-GigabitEthernet1/0/5
    Ten-GigabitEthernet1/0/6
    Ten-GigabitEthernet1/0/7
    Ten-GigabitEthernet1/0/8
    Ten-GigabitEthernet2/0/5
    Ten-GigabitEthernet2/0/6
    Ten-GigabitEthernet2/0/7
    Ten-GigabitEthernet2/0/8
  BFD MAD interfaces:
    Ten-GigabitEthernet1/0/10
    Ten-GigabitEthernet2/0/10
    Vlan-interface3
Member interfaces of excluded interface Bridge-Aggregation 4:
  Ten-GigabitEthernet1/0/11
  Ten-GigabitEthernet2/0/11
MAD ARP disabled.
MAD ND disabled.
MAD LACP enabled interface: Bridge-Aggregation 1
  MAD status          : Normal
  Member ID           Port                               MAD status
  1                   Ten-GigabitEthernet1/0/1         Normal
  2                   Ten-GigabitEthernet2/0/1         Normal
MAD BFD enabled interface: VLAN-interface 3
```

```

MAD status                : Normal
Member ID  MAD IP address  Neighbor  MAD status
1           192.168.1.1/24   2         Normal
2           192.168.1.2/24   1         Normal

```

Table 6 Command output

Field	Description
MAD ARP disabled.	Status of ARP MAD. This field displays MAD ARP enabled if ARP MAD is enabled.
MAD ND disabled.	Status of ND MAD. This field displays MAD ND enabled if ND MAD is enabled.
MAD LACP enabled.	Status of LACP MAD. This field displays MAD LACP disabled if LACP MAD is disabled.
MAD BFD enabled.	Status of BFD MAD. This field displays MAD BFD disabled if BFD MAD is disabled.
Multi-active recovery state	Whether the IRF fabric is in Recovery state: <ul style="list-style-type: none"> Yes—The IRF fabric is in Recovery state. When MAD detects that an IRF fabric has split into multiple IRF fabrics, it allows one fabric to forward traffic. All the other IRF fabrics are set to the Recovery state. In Recovery state, MAD shuts down all common network interfaces in the fabric except for the system- and user-excluded network interfaces. No—The IRF fabric is not in Recovery state. It is active and can forward traffic.
Excluded ports (user-configured)	Network interfaces manually configured to not shut down when the IRF fabric transits to the Recovery state.
Excluded ports (system-configured)	Network interfaces set to not shut down by the system when the IRF fabric transits to the Recovery state. These interfaces are not manually configured. <ul style="list-style-type: none"> IRF physical interfaces. BFD MAD interfaces: <ul style="list-style-type: none"> VLAN interfaces used for BFD MAD and the Layer 2 Ethernet ports in the VLANs. Layer 3 aggregate interfaces used for BFD MAD and their member ports. Management Ethernet ports used for BFD MAD. Member interfaces of a Layer 2 aggregate interface if the aggregate interface is excluded from the MAD shutdown action. Member interfaces of a Layer 3 aggregate interface if the aggregate interface is excluded from the MAD shutdown action.
MAD ARP enabled interface:	Interfaces on which ARP MAD is enabled. This field displays MAD ARP disabled if ARP MAD is disabled.
MAD ND enabled interface:	Interfaces on which ND MAD is enabled. This field displays MAD ND disabled if ND MAD is disabled.
MAD LACP enabled interface	Interface on which LACP MAD is enabled. This field is displayed for each interface enabled with LACP MAD. This field displays MAD LACP disabled if LACP MAD is disabled.

Field	Description
MAD status	LACP MAD operating status: <ul style="list-style-type: none"> • Normal—LACP MAD is operating correctly. • Faulty—LACP MAD is not operating correctly. Verify the following items: <ul style="list-style-type: none"> ○ Verify that the ports on LACP MAD links are up. ○ Verify that the intermediate device supports extended LACPDUs. ○ Verify that all member devices have member ports used for LACP MAD.
Member ID Port MAD status	LACP MAD details: <ul style="list-style-type: none"> • Member ID—IRF member ID of a device. • Port—Member ports of the aggregate interface used for LACP MAD. • MAD status—LACP MAD operating state on a member port. Values include Normal and Faulty.
MAD BFD enabled interface:	Layer 3 interface on which BFD MAD is enabled. This field displays MAD BFD disabled if BFD MAD is disabled.
MAD status	BFD MAD operating status: <ul style="list-style-type: none"> • Normal—BFD MAD is operating correctly. • Faulty—BFD MAD is not operating correctly. Check the BFD MAD link for connectivity issues. • N/A—BFD MAD link status cannot be detected. If BFD MAD is enabled on a management Ethernet port, it is normal that this field displays N/A.
Member ID MAD IP address Neighbor MAD status	BFD MAD details: <ul style="list-style-type: none"> • Member ID—IRF member ID of the local device. • MAD IP address—MAD IP address of a member device. • Neighbor—IRF member ID of the neighboring member device. • MAD status—BFD MAD link state. The following values are available: <ul style="list-style-type: none"> ○ Normal—BFD MAD is operating correctly. ○ Faulty—BFD MAD is not operating correctly. Check the BFD MAD link for connectivity issues. ○ N/A—BFD MAD link status cannot be detected. If BFD MAD is enabled on a management Ethernet port, it is normal that this field displays N/A.

easy-irf

Use **easy-irf** to bulk-configure basic IRF settings for an IRF member device.

Syntax

```
easy-irf [ member member-id [ renumber new-member-id ] domain domain-id
[ priority priority ] [ irf-port1 interface-list1 ] [ irf-port2
interface-list2 ] ]
```

Views

System view

Predefined user roles

network-admin

Parameters

member *member-id*: Specifies the member ID of a member device. The value range for the member ID is 1 to 10.

renumber *new-member-id*: Specifies a new member ID for the device. The value range for the member ID is 1 to 10. The member device automatically reboots for the new member ID to take effect. If you do not specify this option, the command does not change the member ID.

domain *domain-id*: Specifies an IRF domain ID in the range of 0 to 4294967295. Assign the same domain ID to all devices you are adding to the same IRF fabric.

priority *priority*: Specifies an IRF priority in the range of 1 to 32. The greater the priority value, the higher the priority. A member with higher priority is more likely to be the master.

irf-port1 *interface-list1*: Specifies interfaces bound to IRF-port 1. The *interface-list1* argument represents a space-separated list of up to eight interface items. Each interface item specifies one interface in the *interface-type interface-number* form.

irf-port2 *interface-list2*: Specifies interfaces bound to IRF-port 2. A physical interface can be bound to only one IRF port. The *interface-list2* argument represents a space-separated list of up to eight interface items. Each interface item specifies one interface in the *interface-type interface-number* form.

Usage guidelines

This command bulk-configures basic IRF settings for a member device, including the member ID, domain ID, priority, and IRF port bindings.

The easy IRF feature provides the following configuration methods:

- **Interactive method**—Enter the **easy-irf** command without parameters. The system will guide you to set the parameters step by step.
- **Non-interactive method**—Enter the **easy-irf** command with parameters.

As a best practice, use the interactive method if you are new to IRF.

If you execute this command multiple times, the following settings take effect:

- The most recent settings for the member ID, domain ID, and priority.
- IRF port bindings added through repeated executions of the command.

When you specify physical interfaces for an IRF port, you must follow the IRF port binding requirements in *Virtual Technologies Configuration Guide*.

If you specify physical interfaces by using the interactive method, you must also follow these restrictions and guidelines:

- Do not enter spaces between the interface type and interface number.
- Use a comma (,) to separate two physical interfaces. No spaces are allowed between interfaces.

To remove an IRF physical interface from an IRF port, you must use the **undo port group interface** command in IRF port view.

Examples

```
# Bulk-configure basic IRF settings by using the non-interactive method. Change the member ID from 2 to 3, set the domain ID to 10, configure the member priority as 10, and bind Ten-GigabitEthernet 2/0/1 and Ten-GigabitEthernet 2/0/2 to IRF-port 1.
```

```
<Sysname> system-view
```

```
[Sysname] easy-irf member 2 renumber 3 domain 10 priority 10 irf-port1 ten-gigabitethernet 2/0/1 ten-gigabitethernet 2/0/2
```

```
*****
```

```
Configuration summary for member 2
```

```
IRF new member ID: 3
```

```
IRF domain ID      : 10
```

```
IRF priority       : 10
```

```

IRF-port 1      : Ten-GigabitEthernet2/0/1, Ten-GigabitEthernet2/0/2
IRF-port 2      : Disabled
*****
Are you sure to use these settings to set up IRF? [Y/N] y
Starting to configure IRF...
Configuration succeeded.
The device will reboot for the new member ID to take effect. Continue? [Y/N] y

# Bulk-configure basic IRF settings by using the interactive method. Change the member ID from 2
to 3, set the domain ID to 10, configure the member priority as 10, and bind Ten-GigabitEthernet
2/0/1 and Ten-GigabitEthernet 2/0/2 to IRF-port 1.

<Sysname> system-view
[Sysname] easy-irf
*****
Welcome to use easy IRF.
To skip the current step, enter a dot sign (.).
To return to the previous step, enter a minus sign (-).
To use the default value (enclosed in []) for each parameter, press Enter without
entering a value.
To quit the setup procedure, press CTRL+C.
*****
Select a member by its ID <2> [2]:2
Specify a new member ID <1~10> [1]: 3
Specify a domain ID <0~4294967295> [0]: 10
Specify a priority <1~32> [1]: 10
Specify IRF-port 1 bindings (a physical interface or a comma-separated physical
interface list)[Disabled]: ten-gigabitethernet2/0/1,ten-gigabitethernet2/0/2
Specify IRF-port 2 bindings (a physical interface or a comma-separated physical
interface list)[Disabled]:
*****
Configuration summary for member 2
IRF new member ID: 3
IRF domain ID      : 10
IRF priority       : 10
IRF-port 1        : Ten-GigabitEthernet2/0/1, Ten-GigabitEthernet2/0/2
IRF-port 2        : Disabled
*****
Are you sure to use these settings to set up IRF? [Y/N] y
Starting to configure IRF...
Configuration succeeded.
The device will reboot for the new member ID to take effect. Continue? [Y/N] y

```

irf auto-update enable

Use **irf auto-update enable** to enable the software auto-update feature.

Use **undo irf auto-update enable** to disable the software auto-update feature.

Syntax

```
irf auto-update enable
```

```
undo irf auto-update enable
```

Default

Software auto-update is enabled.

Views

System view

Predefined user roles

network-admin

Usage guidelines

This command automatically propagates the current software images of the master device in the IRF fabric to any devices you are adding to the IRF fabric.

To ensure a successful software update, verify that the new device you are adding to the IRF fabric has sufficient storage space for the new software images. If sufficient storage space is not available, the device automatically deletes the current software images. If the reclaimed space is still insufficient, the device cannot complete the auto-update. You must reboot the device, and then access the BootWare menus to delete files.

Examples

```
# Enable the software auto-update feature.
```

```
<Sysname> system-view
```

```
[Sysname] irf auto-update enable
```

irf domain

Use **irf domain** to assign a domain ID to the IRF fabric.

Use **undo irf domain** to restore the default.

Syntax

```
irf domain domain-id
```

```
undo irf domain
```

Default

The IRF domain ID is 0.

Views

System view

Predefined user roles

network-admin

Parameters

domain-id: Specifies a domain ID for the IRF fabric. The value range is 0 to 4294967295.

Usage guidelines

One IRF fabric forms one IRF domain. IRF uses IRF domain IDs to uniquely identify IRF fabrics and prevent IRF fabrics from interfering with one another.

If one IRF fabric uses another IRF fabric as the intermediate device for LACP MAD, ARP MAD, or ND MAD, you must assign the two IRF fabrics different domain IDs for correct split detection. False detection causes IRF split.

An IRF fabric has only one IRF domain ID. You can change the IRF domain ID by using the following commands: **irf domain**, **mad enable**, **mad arp enable**, or **mad nd enable**. The IRF domain IDs configured by using these commands overwrite each other.

Examples

```
# Set the IRF domain ID to 10.
```

```
<Sysname> system-view
```

```
[Sysname] irf domain 10
```

irf link-delay

Use **irf link-delay** to set a delay for the IRF ports to report a link down event.

Use **undo irf link-delay** to restore the default.

Syntax

```
irf link-delay interval
```

```
undo irf link-delay
```

Default

The delay time is 4 seconds.

Views

System view

Predefined user roles

network-admin

Parameters

interval: Sets the IRF link down report delay, in the range of 0 to 10000 milliseconds. If the interval is set to 0, link down events are reported without any delay.

Usage guidelines

When you configure the IRF link down report delay, follow these restrictions and guidelines:

- Make sure the IRF link down report delay is shorter than the heartbeat or hello timeout settings of upper-layer protocols (for example, CFD and OSPF). If the report delay is longer than the timeout setting of a protocol, unnecessary recalculations might occur.
- Set the delay to 0 seconds in the following situations:
 - The IRF fabric requires a fast master/subordinate or IRF link switchover.
 - The RRPP, BFD, or GR feature is used.
 - You want to shut down an IRF physical interface or reboot an IRF member device. (After you complete the operation, reconfigure the delay depending on the network condition.)

Examples

```
# Set the IRF link down report delay to 300 milliseconds.
```

```
<Sysname> system-view
```

```
[Sysname] irf link-delay 300
```

irf mac-address

Use **irf mac-address** to specify a MAC address as the IRF bridge MAC address.

Use **undo irf mac-address** to restore the default.

Syntax

```
irf mac-address mac-address
undo irf mac-address
```

Default

An IRF fabric uses the bridge MAC address of the master device as the IRF bridge MAC address.

Views

System view

Predefined user roles

network-admin

Parameters

mac-address: Specifies a MAC address in the format of H-H-H. The MAC address cannot be the all-zero or all-F MAC address, or a multicast MAC address. You can omit the consecutive zeros at the beginning of each segment. For example, you can enter **f-e2-1** for 000f-00e2-0001.

Usage guidelines



CAUTION:

IRF bridge MAC address change will cause transient traffic disruption.

Before you replace an IRF fabric entirely, you can configure the new IRF fabric with the bridge MAC address of the existing IRF fabric to minimize service interruption.

You must make sure the IRF bridge MAC address is unique on the switched LAN after the replacement.

After you specify an IRF bridge MAC address, the IRF fabric always uses the specified address as the IRF bridge MAC address.

If the IRF fabric splits after you configure the IRF bridge MAC address, both of the split IRF fabrics use the configured bridge MAC address as the IRF bridge MAC address.

When IRF fabrics merge, IRF ignores the IRF bridge MAC address and checks the bridge MAC address of each member device in the IRF fabrics. IRF merge fails if any two member devices have the same bridge MAC address.

After IRF fabrics merge, the merged IRF fabric uses the bridge MAC address of the merging IRF fabric that won the master election as the IRF bridge MAC address.

Examples

```
# Configure the IRF fabric to use c4ca-d9e0-8c3c as the IRF bridge MAC address.
```

```
<Sysname> system-view
```

```
[Sysname] irf mac-address c4ca-d9e0-8c3c
```

irf mac-address persistent

Use `irf mac-address persistent` to configure IRF bridge MAC persistence.

Use `undo irf mac-address persistent` to disable IRF bridge MAC persistence.

Syntax

```
irf mac-address persistent { always | timer }
undo irf mac-address persistent
```

Default

The IRF bridge MAC address remains unchanged for 12 minutes after the address owner leaves.

Views

System view

Predefined user roles

network-admin

Parameters

always: Enables the IRF bridge MAC address to be permanent. The IRF bridge MAC address does not change after the address owner leaves the fabric.

timer: Enables the IRF bridge MAC address to remain unchanged for 12 minutes after the address owner leaves. If the owner rejoins the IRF fabric within the time limit, the IRF bridge MAC address does not change. If the owner does not rejoin the IRF fabric within the time limit, the IRF fabric uses the bridge MAC address of the current master as the bridge MAC address.

Usage guidelines

If the **undo** form of this command is used, bridge MAC address of the current master replaces the original IRF bridge MAC as soon as the original address owner leaves.

This command does not take effect if the IRF bridge MAC address is configured by using the **irf mac-address mac-address** command.

If ARP MAD or ND MAD is used with the spanning tree feature, disable IRF bridge MAC persistence by using the **undo irf mac-address persistent** command. In addition, do not specify an IRF bridge MAC address by using the **irf mac-address mac-address** command.

If TRILL is configured, use the **irf mac-address persistent always** command or the **irf mac-address mac-address** command to retain the IRF bridge MAC address permanently. This command avoids unnecessary traffic disruption caused by IRF bridge MAC address changes on the TRILL network.

If the IRF fabric uses a daisy-chain topology and has aggregate links with upstream or downstream devices, do not execute the **undo irf mac-address persistent** command. Use of this command might result in transmission delay or packet loss after the address owner leaves or reboots.

If the IRF fabric has multichassis aggregate links, do not use the **undo irf mac-address persistent** command. Use of this command might cause traffic disruption.

By default, an IRF fabric uses the bridge MAC address of the master device as its bridge MAC address.

On a switched LAN, the IRF bridge MAC address must be unique for correct traffic transmission.

When IRF fabrics merge, IRF ignores the IRF bridge MAC address and checks the bridge MAC address of each member device in the IRF fabrics. IRF merge fails if any two member devices have the same bridge MAC address.

Examples

```
# Enable the IRF bridge MAC address to persist forever.
<Sysname> system-view
[Sysname] irf mac-address persistent always
```

irf member description

Use **irf member description** to configure a description for an IRF member device.

Use `undo irf member description` to restore the default.

Syntax

```
irf member member-id description text  
undo irf member member-id description
```

Default

No description is configured for an IRF member device.

Views

System view

Predefined user roles

network-admin

Parameters

member-id: Specifies the ID of an IRF member.

text: Specifies a description, a string of 1 to 127 characters.

Examples

```
# Configure the description as F1Num001 for IRF member 1.  
<Sysname> system-view  
[Sysname] irf member 1 description F1Num001
```

irf member priority

Use `irf member priority` to change the priority of an IRF member device.

Use `undo irf member priority` to restore the default.

Syntax

```
irf member member-id priority priority  
undo irf member member-id priority
```

Default

The IRF member priority is 1.

Views

System view

Predefined user roles

network-admin

Parameters

member-id: Specifies an IRF member ID. The value range for IRF member IDs is 1 to 10.

priority: Sets priority in the range of 1 to 32. The greater the priority value, the higher the priority. A member with higher priority is more likely to be the master.

Usage guidelines

The new priority setting takes effect at the next master election, but it does not trigger a master election.

Examples

```
# Set the priority of IRF member 2 to 32.
```

```
<Sysname> system-view
[Sysname] irf member 2 priority 32
```

irf member renumber

Use **irf member renumber** to change the member ID of an IRF member device.

Use **undo irf member renumber** to restore the previous IRF member ID of the device.

Syntax

```
irf member member-id renumber new-member-id
undo irf member member-id renumber
```

Default

The IRF member ID is 1.

Views

System view

Predefined user roles

network-admin

Parameters

member-id: Specifies the ID of an IRF member. The value range for IRF member IDs is 1 to 10.

new-member-id: Assigns a new ID to the IRF member. The value range for IRF member IDs is 1 to 10.

Usage guidelines



CAUTION:

IRF member ID change can invalidate member ID-related settings, including interface and file path settings, and cause data loss. Make sure you fully understand its impact on your live network.

To have the new ID take effect, you must reboot the IRF member. To cancel the member ID change before you reboot the member device, use the **undo irf member renumber** command. In the command, set the new member ID to be the same as the old member ID.

When adding a device into an IRF fabric, you must assign a unique IRF member ID to the device. If its IRF member ID has been used in the IRF fabric, the device cannot join the IRF fabric.

Interchanging member IDs between IRF member devices might cause undesirable configuration changes and data loss. For example, the IRF member IDs of Device A and Device B are 2 and 3, respectively. After you interchange their member IDs, their port settings also interchange.

Examples

Change the ID of an IRF member device from 1 to 2.

```
<Sysname> display irf
```

```
[Sysname] irf member 1 renumber 2
```

```
Renumbering the member ID may result in configuration change or loss. Continue?[Y/N]Y
```

Before rebooting the device, cancel the change in the preceding example.

```
[Sysname] undo irf member 1 renumber
```

```
Renumbering the member ID may result in configuration change or loss. Continue?[Y/N]y
```

If you reboot the device after executing the **irf member 1 renumber 2** command, the device member ID changes to 2 at system reboot. Using **undo irf member 1 renumber** cannot restore

the member ID to 1. You must use the `irf member 2 renumber 1` command to reconfigure the member ID.

irf-port

Use `irf-port` to enter IRF port view.

Use `undo irf-port` to remove all port bindings on an IRF port.

Syntax

```
irf-port member-id/irf-port-number
undo irf-port member-id/irf-port-number
```

Views

System view

Predefined user roles

network-admin

Parameters

member-id: Specifies an IRF member device by its member ID.

irf-port-number: Specifies an IRF port on the member device. The *irf-port-number* argument represents the IRF port index and must be 1 or 2.

Usage guidelines

To bind physical interfaces to an IRF port, you must enter IRF port view.

Examples

```
# Enter IRF-port 2/1 view.
<Sysname> system-view
[Sysname] irf-port 2/1
[Sysname-irf-port2/1]
```

Related commands

```
port group interface
```

irf-port global load-sharing mode

Use `irf-port global load-sharing mode` to set the global load sharing mode for IRF links.

Use `undo irf-port global load-sharing mode` to restore the default.

Syntax

```
irf-port global load-sharing mode { destination-ip | destination-mac |
source-ip | source-mac } *
undo irf-port global load-sharing mode
```

Default

The traffic is distributed based on packet types.

Views

System view

Predefined user roles

network-admin

Parameters

destination-ip: Distributes traffic across IRF member links based on destination IP address.

destination-mac: Distributes packets across IRF member links based on destination MAC address.

source-ip: Distributes packets across IRF member links based on source IP address.

source-mac: Distributes packets across IRF member links based on source MAC address.

Usage guidelines

The global IRF link load sharing mode applies to all IRF ports in the IRF fabric. You can configure the sharing mode to include a combination of multiple criteria for making traffic distribution decisions. If your device does not support a criterion combination, the system displays an error message.

If you configure the global load sharing mode multiple times, the most recent configuration takes effect.

You can also configure a port-specific load sharing mode for an IRF port in IRF port view by using the **irf-port load-sharing mode** command.

An IRF port preferentially uses the port-specific load sharing mode. If no port-specific load sharing mode is available, the port uses the global load sharing mode.

Examples

```
# Configure the global IRF link load sharing mode to distribute traffic based on destination MAC address.
```

```
<Sysname> system-view
```

```
[Sysname] irf-port global load-sharing mode destination-mac
```

Related commands

```
irf-port load-sharing mode
```

irf-port load-sharing mode

Use **irf-port load-sharing mode** to configure a port-specific load sharing mode for an IRF port to distribute traffic across its physical links.

Use **undo irf-port load-sharing mode** to restore the default.

Syntax

```
irf-port load-sharing mode { destination-ip | destination-mac | source-ip  
| source-mac } *
```

```
undo irf-port load-sharing mode
```

Default

The global IRF link load sharing mode is used.

Views

IRF port view

Predefined user roles

network-admin

Parameters

destination-ip: Distributes traffic across IRF member links based on destination IP address.

destination-mac: Distributes packets across IRF member links based on destination MAC address.

source-ip: Distributes packets across IRF member links based on source IP address.

source-mac: Distributes packets across IRF member links based on source MAC address.

Usage guidelines

To successfully configure a port-specific load sharing mode for an IRF port, make sure you have bound a minimum of one physical interface to the IRF port.

You can configure an IRF port-specific load sharing mode to include a combination of multiple criteria for making traffic distribution decisions. If your device does not support a criterion combination, the system displays an error message.

If you configure the port-specific load sharing mode multiple times on an IRF port, the most recent configuration takes effect.

An IRF port preferentially uses the port-specific load sharing mode. If no port-specific load sharing mode is available, the port uses the global load sharing mode.

Examples

```
# Configure a port-specific load sharing mode for IRF-port 1/1 to distribute traffic based on destination MAC address.
```

```
<Sysname> system-view
```

```
[Sysname] irf-port 1/1
```

```
[Sysname-irf-port1/1] irf-port load-sharing mode destination-mac
```

Related commands

```
irf-port global load-sharing mode
```

irf-port-configuration active

Use **irf-port-configuration active** to activate IRF ports.

Syntax

```
irf-port-configuration active
```

Views

System view

Predefined user roles

network-admin

Usage guidelines

After connecting the physical interfaces between two devices and binding them to the correct IRF ports, you must use this command to activate the settings on the IRF ports. This command merges the two devices into one IRF fabric.

The system activates the IRF port settings automatically in the following situations:

- The configuration file that the device starts with contains IRF port bindings.
- You are binding physical interfaces to an IRF port after an IRF fabric is formed.

Examples

To configure and activate IRF-port 1/2 when the port is in DIS state:

```

# Bind Ten-GigabitEthernet 1/0/1 to IRF-port 1/2.
<Sysname> system-view
[Sysname] interface ten-gigabitethernet 1/0/1
[Sysname-Ten-GigabitEthernet1/0/1] shutdown
[Sysname-Ten-GigabitEthernet1/0/1] quit
[Sysname] irf-port 1/2
[Sysname-irf-port1/2] port group interface Ten-GigabitEthernet 1/0/1
You must perform the following tasks for a successful IRF setup:
Save the configuration after completing IRF configuration.
Execute the "irf-port-configuration active" command to activate the IRF ports.
[Sysname-irf-port1/2] quit
[Sysname] interface ten-gigabitethernet 1/0/1
[Sysname-Ten-GigabitEthernet1/0/1] undo shutdown
[Sysname-Ten-GigabitEthernet1/0/1] quit

# Save the configuration so the IRF port settings can take effect after the device reboots.
[Sysname] save
The current configuration will be written to the device. Are you sure? [Y/N]:y
Please input the file name(*.cfg)[flash:/startup.cfg]
(To leave the existing filename unchanged, press the enter key):
flash:/startup.cfg exists, overwrite? [Y/N]:y
Validating file. Please wait.....
Saved the current configuration to mainboard device successfully.

# Activate the IRF port.
[Sysname] irf-port-configuration active

```

mad arp enable

Use **mad arp enable** to enable ARP MAD.

Use **undo mad arp enable** to disable ARP MAD.

Syntax

```

mad arp enable
undo mad arp enable

```

Default

ARP MAD is disabled.

Views

Management Ethernet interface view

VLAN interface view

Predefined user roles

network-admin

Usage guidelines

Do not configure ARP MAD together with LACP MAD or BFD MAD, because they handle collisions differently.

When you configure ARP MAD on a VLAN interface, follow these restrictions and guidelines:

Category	Restrictions and guidelines
ARP MAD VLAN	<ul style="list-style-type: none"> Do not enable ARP MAD on VLAN-interface 1. If you are using an intermediate device, perform the following tasks: <ul style="list-style-type: none"> On the IRF fabric and the intermediate device, create a VLAN for ARP MAD. On the IRF fabric and the intermediate device, assign the ports of ARP MAD links to the ARP MAD VLAN. On the IRF fabric, create a VLAN interface for the ARP MAD VLAN. As a best practice, do not use the ARP MAD VLAN for any other purposes.
ARP MAD and feature configuration	<p>If an intermediate device is used, make sure the following requirements are met:</p> <ul style="list-style-type: none"> Run the spanning tree feature between the IRF fabric and the intermediate device to ensure that there is only one ARP MAD link in forwarding state. For more information about the spanning tree feature and its configuration, see <i>Layer 2—LAN Switching Configuration Guide</i>. Enable the IRF fabric to change its bridge MAC address as soon as the address owner leaves. If the intermediate device is also an IRF fabric, assign the two IRF fabrics different domain IDs for correct split detection.

When you configure ARP MAD on a management Ethernet port, follow these restrictions and guidelines:

Category	Restrictions and guidelines
Management Ethernet ports for ARP MAD	Connect a management Ethernet port on each member device to the common Ethernet ports on the intermediate device.
ARP MAD VLAN	On the intermediate device, create a VLAN for ARP MAD, and assign the ports used for ARP MAD to the VLAN. On the IRF fabric, you do not need to assign the management Ethernet ports to the VLAN.
ARP MAD and feature configuration	<ul style="list-style-type: none"> Enable the IRF fabric to change its bridge MAC address as soon as the address owner leaves. If the intermediate device is also an IRF fabric, assign the two IRF fabrics different domain IDs for correct split detection.

When you use the **mad arp enable** command, the system prompts you to enter a domain ID. If you do not want to change the current domain ID, press **enter** at the prompt.

An IRF fabric has only one IRF domain ID. You can change the IRF domain ID by using the following commands: **irf domain**, **mad enable**, **mad arp enable**, or **mad nd enable**. The IRF domain IDs configured by using these commands overwrite each other.

Examples

Enable ARP MAD on VLAN-interface 3.

```
<Sysname> system-view
[Sysname] interface vlan-interface 3
[Sysname-Vlan-interface3] mad arp enable
You need to assign a domain ID (range: 0-4294967295)
[Current domain ID is: 0]: 1
The assigned domain ID is: 1
```

Related commands

irf domain

mad bfd enable

Use `mad bfd enable` to enable BFD MAD.

Use `undo mad bfd enable` to disable BFD MAD.

Syntax

`mad bfd enable`

`undo mad bfd enable`

Default

BFD MAD is disabled.

Views

VLAN interface view

Layer 3 aggregate interface view

Management Ethernet interface view

Predefined user roles

network-admin

Usage guidelines

Do not configure BFD MAD together with ARP MAD or ND MAD, because they handle collisions differently.

When you configure BFD MAD on a VLAN interface, follow these guidelines:

Category	Restrictions and guidelines
BFD MAD VLAN	<ul style="list-style-type: none">• Do not enable BFD MAD on VLAN-interface 1.• If you are using an intermediate device, perform the following tasks:<ul style="list-style-type: none">○ On the IRF fabric and the intermediate device, create a VLAN for BFD MAD.○ On the IRF fabric and the intermediate device, assign the ports of BFD MAD links to the BFD MAD VLAN.○ On the IRF fabric, create a VLAN interface for the BFD MAD VLAN.• Make sure the IRF fabrics on the network use different BFD MAD VLANs.• Make sure the BFD MAD VLAN contains only ports on the BFD MAD links. Exclude a port from the BFD MAD VLAN if that port is not on a BFD MAD link. If you have assigned that port to all VLANs by using the <code>port trunk permit vlan all</code> command, use the <code>undo port trunk permit</code> command to exclude that port from the BFD MAD VLAN.
BFD MAD VLAN and feature compatibility	<p>Do not use the BFD MAD VLAN for any purposes other than configuring BFD MAD.</p> <ul style="list-style-type: none">• Use only the <code>mad bfd enable</code> and <code>mad ip address</code> commands on the BFD MAD-enabled VLAN interface. If you configure other features, both BFD MAD and other features on the interface might run incorrectly.• Disable the spanning tree feature on any Layer 2 Ethernet ports in the BFD MAD VLAN. The MAD feature is mutually exclusive with the spanning tree feature.

Category	Restrictions and guidelines
MAD IP address	<ul style="list-style-type: none"> To avoid network issues, only use the mad ip address command to configure IP addresses on the BFD MAD-enabled VLAN interface. Do not configure an IP address by using the ip address command or configure a VRRP virtual address on the BFD MAD-enabled VLAN interface. Make sure all the MAD IP addresses are on the same subnet.

When you configure BFD MAD on a management Ethernet port, follow these restrictions and guidelines:

Category	Restrictions and guidelines
Management Ethernet ports for BFD MAD	Connect a management Ethernet port on each member device to the common Ethernet ports on the intermediate device.
BFD MAD VLAN	<ul style="list-style-type: none"> On the intermediate device, create a VLAN for BFD MAD, and assign the ports used for BFD MAD to the VLAN. On the IRF fabric, you do not need to assign the management Ethernet ports to the VLAN. Make sure the IRF fabrics on the network use different BFD MAD VLANs. Make sure the BFD MAD VLAN on the intermediate device contains only ports on the BFD MAD links.
MAD IP address	<ul style="list-style-type: none"> Use the mad ip address command instead of the ip address command to configure MAD IP addresses on the BFD MAD-enabled management Ethernet ports. Make sure all the MAD IP addresses are on the same subnet.

When you configure BFD MAD on a Layer 3 aggregate interface, follow these restrictions and guidelines:

Category	Restrictions and guidelines
BFD MAD-enabled Layer 3 aggregate interface	<ul style="list-style-type: none"> Make sure the Layer 3 aggregate interface operates in static aggregation mode. Make sure the member ports in the aggregation group do not exceed the maximum number of Selected ports allowed for an aggregation group. If the number of member ports exceeds the maximum number of Selected ports, some member ports cannot become Selected. BFD MAD will be unable to work correctly and its state will change to Faulty.
BFD MAD VLAN	<ul style="list-style-type: none"> On the intermediate device (if any), assign the ports on the BFD MAD links to the same VLAN. Do not assign the ports to an aggregate interface. If the ports are hybrid ports, make sure these ports are untagged members of their PVIDs. If the intermediate device acts as a BFD MAD intermediate device for multiple IRF fabrics, assign different BFD MAD VLANs to the IRF fabrics. Do not use the BFD MAD VLAN on the intermediate device for any purposes other than BFD MAD. Make sure the BFD MAD VLAN on the intermediate device contains only ports on the BFD MAD links. Exclude a port from the BFD MAD VLAN if that port is not on a BFD MAD link. If you have assigned that port to all VLANs by using the port trunk permit vlan all command, use the undo port trunk permit command to exclude that port from the BFD MAD VLAN.
BFD MAD-enabled Layer 3 aggregate interface and feature compatibility	Use only the mad bfd enable and mad ip address commands on the BFD MAD-enabled interface. If you configure other features, both BFD MAD and other features on the interface might run incorrectly.

Category	Restrictions and guidelines
MAD IP address	<ul style="list-style-type: none"> To avoid problems, only use the mad ip address command to configure IP addresses on the BFD MAD-enabled interface. Do not configure an IP address by using the ip address command or configure a VRRP virtual address on the BFD MAD-enabled interface. Make sure all the MAD IP addresses are on the same subnet.

Examples

```
# Enable BFD MAD on VLAN-interface 3.
<Sysname> system-view
[Sysname] interface vlan-interface 3
[Sysname-Vlan-interface3] mad bfd enable
```

mad enable

Use **mad enable** to enable LACP MAD.

Use **undo mad enable** to disable LACP MAD.

Syntax

```
mad enable
undo mad enable
```

Default

LACP MAD is disabled.

Views

Aggregate interface view

Predefined user roles

network-admin

Usage guidelines

LACP MAD handles collisions differently than ARP MAD and ND MAD. To avoid conflicts, do not enable LACP MAD together with ARP MAD and ND MAD on an IRF fabric.

LACP MAD requires a device that supports extended LACPDUs for MAD to act as the intermediate device. You must set up a dynamic link aggregation group that spans all IRF member devices between the IRF fabric and the intermediate device. To enable dynamic link aggregation, configure the **link-aggregation mode dynamic** command on the aggregate interface.

If one IRF fabric uses another IRF fabric as the intermediate device for LACP MAD, you must assign the two IRF fabrics different domain IDs for correct split detection. False detection causes IRF split.

When you use the **mad enable** command, the system prompts you to enter a domain ID. If you do not want to change the current domain ID, press **enter** at the prompt.

An IRF fabric has only one IRF domain ID. You can change the IRF domain ID by using the following commands: **irf domain**, **mad enable**, **mad arp enable**, or **mad nd enable**. The IRF domain IDs configured by using these commands overwrite each other.

Examples

```
# Enable LACP MAD on Bridge-Aggregation 1, a Layer 2 dynamic aggregate interface.
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] link-aggregation mode dynamic
```

```
[Sysname-Bridge-Aggregation1] mad enable
You need to assign a domain ID (range: 0-4294967295)
[Current domain ID is: 0]: 1
The assigned domain ID is: 1
```

Enable LACP MAD on Route-Aggregation 1, a Layer 3 dynamic aggregate interface.

```
<Sysname> system-view
[Sysname] interface route-aggregation 1
[Sysname-Route-Aggregation1] link-aggregation mode dynamic
[Sysname-Route-Aggregation1] mad enable
You need to assign a domain ID (range: 0-4294967295)
[Current domain ID is: 0]: 1
The assigned domain ID is: 1
```

Related commands

irf domain

mad exclude interface

Use **mad exclude interface** to exclude an interface from being shut down when the IRF fabric transits to the Recovery state upon detection of a multi-active collision.

Use **undo mad exclude interface** to configure the IRF fabric to shut down an interface when it transits to the Recovery state upon detection of a multi-active collision.

Syntax

```
mad exclude interface interface-type interface-number
undo mad exclude interface interface-type interface-number
```

Default

Except for the network interfaces automatically excluded by the system, all network interfaces are shut down when the IRF fabric transits to the Recovery state. The system automatically excludes the following network interfaces from being shut down:

- IRF physical interfaces.
- Interfaces used for BFD MAD.
- Member interfaces of an aggregate interface if the aggregate interface is excluded from being shut down.

Views

System view

Predefined user roles

network-admin

Parameters

interface-type interface-number: Specifies an interface by its type and number.

Usage guidelines

If an interface must be kept in up state for special purposes such as Telnet connection, exclude the interface from the shutdown action. As a best practice to avoid incorrect traffic forwarding, do not exclude any interfaces except the interfaces used for Telnet.

The interfaces that have been shut down by MAD come up when the member devices reboot to join the recovered IRF fabric. If the active IRF fabric fails before the IRF link is recovered, use the **mad**

restore command on the inactive IRF fabric to recover the inactive IRF fabric. This command also brings up all interfaces that were shut down by MAD.

Examples

```
# Exclude Ten-GigabitEthernet 1/0/1 from being shut down when the MAD status transits to Recovery.
```

```
<Sysname> system-view
```

```
[Sysname] mad exclude interface ten-gigabitethernet 1/0/1
```

Related commands

mad restore

mad ip address

Use **mad ip address** to assign a MAD IP address to an IRF member device for BFD MAD.

Use **undo mad ip address** to delete the MAD IP address for an IRF member device.

Syntax

```
mad ip address ip-address { mask | mask-length } member member-id
```

```
undo mad ip address ip-address { mask | mask-length } member member-id
```

Default

No MAD IP address is configured for an IRF member device.

Views

VLAN interface view

Layer 3 aggregate interface view

Management Ethernet interface view

Predefined user roles

network-admin

Parameters

ip-address: Specifies an IP address in dotted decimal notation.

mask: Specifies a subnet mask in decimal dotted notation.

mask-length: Specifies a subnet mask in length, in the range of 0 to 32.

member *member-id*: Specifies the ID of an IRF member.

Usage guidelines

To use BFD MAD, configure a MAD IP address for each IRF member. Make sure all the MAD IP addresses are on the same subnet.

Do not configure a MAD IP address by using the **ip address** command or configure a VRRP virtual address on the BFD MAD-enabled port or interface.

The master attempts to establish BFD sessions with other member devices by using its MAD IP address as the source IP address.

- If the IRF fabric is integrated, only the MAD IP address of the master takes effect. The master cannot establish a BFD session with any other member. If you execute the **display bfd session** command, the state of the BFD sessions is **Down**.

- When the IRF fabric splits, the IP addresses of the masters in the partitioned IRF fabrics take effect. The masters can establish a BFD session. If you execute the **display bfd session** command, the state of the BFD session between the two devices is **Up**.

Examples

Assign a MAD IP address to IRF member 1 on VLAN-interface 3.

```
<Sysname> system-view
[Sysname] interface vlan-interface 3
[Sysname-Vlan-interface3] mad ip address 192.168.0.1 255.255.255.0 member 1
```

Assign a MAD IP address to IRF member 2 on VLAN-interface 3.

```
[Sysname-Vlan-interface3] mad ip address 192.168.0.2 255.255.255.0 member 2
```

Related commands

mad bfd enable

mad nd enable

Use **mad nd enable** to enable ND MAD.

Use **undo mad nd enable** to disable ND MAD.

Syntax

mad nd enable

undo mad nd enable

Default

ND MAD is disabled.

Views

VLAN interface view

Management Ethernet interface view

Predefined user roles

network-admin

Usage guidelines

Do not configure ND MAD together with LACP MAD or BFD MAD, because they handle collisions differently.

When you configure ND MAD on a VLAN interface, follow these restrictions and guidelines:

Category	Restrictions and guidelines
ND MAD VLAN	<ul style="list-style-type: none"> • Do not enable ND MAD on VLAN-interface 1. • If you are using an intermediate device, perform the following tasks: <ul style="list-style-type: none"> ○ On the IRF fabric and the intermediate device, create a VLAN for ND MAD. ○ On the IRF fabric and the intermediate device, assign the ports of ND MAD links to the ND MAD VLAN. ○ On the IRF fabric, create a VLAN interface for the ND MAD VLAN. • If no intermediate device is used, connect each IRF member device to all other member devices. • As a best practice, do not use the ND MAD VLAN for any other purposes.

Category	Restrictions and guidelines
ND MAD and feature configuration	<p>If an intermediate device is used, make sure the following requirements are met:</p> <ul style="list-style-type: none"> • Run the spanning tree feature between the IRF fabric and the intermediate device to ensure that there is only one ND MAD link in forwarding state. For more information about the spanning tree feature and its configuration, see <i>Layer 2—LAN Switching Configuration Guide</i>. • Enable the IRF fabric to change its bridge MAC address as soon as the address owner leaves. • If the intermediate device is also an IRF fabric, assign the two IRF fabrics different domain IDs for correct split detection.

When you configure ND MAD on a management Ethernet port, follow these restrictions and guidelines:

Category	Restrictions and guidelines
Management Ethernet ports for ND MAD	Connect a management Ethernet port on each member device to the common Ethernet ports on the intermediate device.
ND MAD VLAN	On the intermediate device, create a VLAN for ND MAD, and assign the ports used for ND MAD to the VLAN. On the IRF fabric, you do not need to assign the management Ethernet ports to the VLAN.
ND MAD and feature configuration	<ul style="list-style-type: none"> • Enable the IRF fabric to change its bridge MAC address as soon as the address owner leaves. • If the intermediate device is also an IRF fabric, assign the two IRF fabrics different domain IDs for correct split detection.

When you use the `mad nd enable` command, the system prompts you to enter a domain ID. If you do not want to change the current domain ID, press **enter** at the prompt.

An IRF fabric has only one IRF domain ID. You can change the IRF domain ID by using the following commands: `irf domain`, `mad enable`, `mad arp enable`, or `mad nd enable`. The IRF domain IDs configured by using these commands overwrite each other.

Examples

```
# Enable ND MAD on VLAN-interface 3.
<Sysname> system-view
[Sysname] interface vlan-interface 3
[Sysname-Vlan-interface3] mad nd enable
You need to assign a domain ID (range: 0-4294967295)
[Current domain ID is: 0]: 1
The assigned domain ID is: 1
```

Related commands

`irf domain`

mad restore

Use `mad restore` to restore the normal MAD state of the IRF fabric in Recovery state.

Syntax

`mad restore`

Views

System view

Predefined user roles

network-admin

Usage guidelines

If the active IRF fabric has failed to work before the IRF split problem is fixed, use this command to restore an IRF fabric in Recovery state. The recovered IRF fabric will take over the active IRF fabric role.

Examples

```
# Restore the normal MAD state of the IRF fabric in Recovery state.
```

```
<Sysname> system-view
```

```
[Sysname] mad restore
```

```
This command will restore the device from multi-active conflict state. Continue? [Y/N]:Y
```

```
Restoring from multi-active conflict state, please wait...
```

port group interface

Use **port group interface** to bind a physical interface to an IRF port.

Use **undo port group interface** to remove the binding of a physical interface to an IRF port.

Syntax

```
port group interface interface-type interface-number
```

```
undo port group interface interface-name
```

Default

No physical interfaces are bound to an IRF port.

Views

IRF port view

Predefined user roles

network-admin

Parameters

interface-type interface-number: Specifies a physical interface by its type and number.

interface-name: Specifies a physical interface in the *interface-type interface-number* format. No space is allowed between the *interface-type* and *interface-number* arguments.

Usage guidelines

Execute this command multiple times to bind multiple physical interfaces to an IRF port. You can bind a maximum number of eight physical interfaces to an IRF port.

Use the **shutdown** command to shut down a physical interface before you bind it to or remove it from an IRF port. To bring up the physical interface after a binding or binding removal operation, use the **undo shutdown** command.

The system does not dynamically remove IRF port bindings when IRF links are lost, for example, because an interface module is removed. To remove IRF port bindings, you must use the **undo port group interface** command.

When you bind a physical interface in a group to an IRF port, the rates of all physical interfaces in the group are automatically set to the default rate. Their rate will not be configurable until all their bindings with IRF ports are removed.

For more information about IRF port binding requirements, see *Virtual Technologies Configuration Guide*.

Examples

Bind Ten-GigabitEthernet 1/0/1 to IRF-port 1/1 on IRF member 1.

```
<Sysname> system-view
[Sysname] interface ten-gigabitethernet 1/0/1
[Sysname-Ten-GigabitEthernet1/0/1] shutdown
[Sysname-Ten-GigabitEthernet1/0/1] quit
[Sysname] irf-port 1/1
[Sysname-irf-port1/1] port group interface ten-gigabitethernet 1/0/1
[Sysname-irf-port1/1] quit
[Sysname] interface ten-gigabitethernet 1/0/1
[Sysname-Ten-GigabitEthernet1/0/1] undo shutdown
```

Related commands

irf-port

IRF 3.1 commands

The S6820 switch series does not support IRF 3.1 commands.

description

Use **description** to configure a description for a PEX group.

Use **undo description** to restore the default.

Syntax

```
description text  
undo description
```

Default

The description of a PEX group uses the **PEX group** *group-id* format (for example, PEX group 2).

Views

PEX group view

Predefined user roles

network-admin

Parameters

text: Specifies a description, a case-sensitive string of 1 to 79 characters.

Examples

```
# Configure the description as text for PEX group 1.  
<Sysname> system-view  
[Sysname] pex group 1  
[Sysname-pex-group-1]description test
```

Related commands

pex group

display pex interface

Use **display pex interface** to display PEX information for a cascade port or for all cascade ports.

Syntax

```
display pex interface [ interface-name ] [ brief ]
```

Views

Any view

Predefined user roles

network-admin

network-operator

Parameters

interface-name: Specifies a cascade port. If you do not specify a cascade port, this command displays PEX information for all cascade ports.

brief: Displays brief PEX information. If you do not specify this keyword, the command displays detailed information about attached PEXs and PE CSP statistics for a cascade port or for all cascade ports.

Examples

Display detailed information about attached PEXs and PE CSP statistics for Layer 2 aggregate interface 1.

```
<Sysname> display pex interface Bridge-Aggregation1
Interface name      : Bridge-Aggregation1
Link state         : UP
Description        : Bridge-Aggregation1 interface
PEX group          : 1
Virtual slot number : 100
PEX bridge MAC     : 9a00-abae-0200
PEX state          : Offline
PE CSP statistics:
  Parent:
    Request errors : 0
    Response errors: 0
  PEX:
    Request errors : 0
    Response errors: 0
```

Table 7 Command output

Field	Description
Link state	Link state: <ul style="list-style-type: none">• ADM DOWN—The interface is administratively shut down by using the shutdown command.• UP—The link is up for the interface.• DOWN—The link is down for the interface.
Description	Interface description.
PEX group	PEX group ID.
Virtual slot number	Virtual slot number of the PEX. This field displays N/A if no virtual slot number is configured.
PEX bridge MAC	Bridge MAC address of the PEX.
PEX state	PEX state: <ul style="list-style-type: none">• Offline—The PEX is offline.• Online—The PEX is online. The PEX and the parent fabric have finished PE CSP negotiation.
PE CSP statistics	Statistics for PE CSP packets.
Parent	Statistics for the parent fabric.
PEX	Statistics for the PEX.
Request errors	Number of received error PE CSP requests.
Response errors	Number of received error PE CSP responses.

```
# Display brief PEX information for Layer 2 aggregate interface 1.
```

```
<Sysname> display pex interface Bridge-Aggregation1 brief
Interface   Link state   Associated ID   Group   PEX state   Description
BAGG1       UP           100            1       Online      test
```

Table 8 Command output

Field	Description
Interface	Interface name abbreviation.
Link state	Link state: <ul style="list-style-type: none">• ADM DOWN—The interface is administratively shut down by using the shutdown command.• UP—The link is up for the interface.• DOWN—The link is down for the interface.
Associated ID	Virtual slot number of the attached PEX. This field displays N/A if no virtual slot number is configured.
Group	PEX group ID.
PEX state	PEX state: <ul style="list-style-type: none">• Offline—The PEX is offline.• Online—The PEX is online. The PEX and the parent fabric have finished PE CSP negotiation.
Description	Interface description.

display pex system-working-mode

Use **display pex system-working-mode** to display system operating mode information in an IRF 3.1 system.

Syntax

```
display pex system-working-mode
```

Views

Any view

Predefined user roles

```
network-admin
network-operator
```

Examples

```
# Display system operating mode information in an IRF 3.1 system.
```

```
<Sysname> display pex system-working-mode
Current PEX operating mode: auto
PEX operating mode at next startup: pex
```

display pex topology

Use **display pex topology** to display PEX topology information.

Syntax

```
display pex topology [ group group-id ] [ slot slot-number ]
```

Views

Any view

Predefined user roles

network-admin
network-operator

Parameters

group *group-id*: Specifies an existing PEX group. If you do not specify a PEX group, this command displays topology information for all PEXs of the parent fabric.

slot *slot-number*: Specifies a PEX by its virtual slot number. The value range is the virtual slot numbers that have been assigned to PEXs. If you do not specify a PEX, this command displays topology information for all PEXs of the parent fabric.

Examples

Display topology information for all PEXs of the parent fabric.

```
<Sysname> display pex topology
Group 1:
  Tier 1
    PEX 100 ----> Parent
    PEX 101 ----> Parent
```

Table 9 Command output

Field	Description
Group	PEX group ID.
Tier	PEX tier.
PEX 100 ----> Parent	The PEX in virtual slot 100 is attached to the parent fabric.
---->	The link is up.
--X-->	The link is down.

pex associate

Use **pex associate** to assign a virtual slot number to a PEX.

Use **undo pex associate** to remove the virtual slot number of a PEX.

Syntax

```
pex associate slot slot-number
undo pex associate
```

Default

No virtual slot number is assigned to a PEX.

Views

Layer 2 aggregate interface view

Predefined user roles

network-admin

Parameters

slot *slot-number*: Specifies a virtual slot number. The value range for the slot number is 100 to 129.

Usage guidelines

For this command to take effect, you must enable PEX connection capability on the interface.

If you execute this command multiple times, the most recent configuration takes effect.

Examples

Assign virtual slot number 100 to the PEX attached to Layer 2 aggregate interface 1.

```
<Sysname> system-view
[Sysname] interface bridge-aggregation 1
[Sysname-Bridge-Aggregation1] pex associate slot 100
```

Related commands

pex-capability enable

pex group

Use **pex group** to create a PEX group and enter its view, or enter the view of an existing PEX group.

Use **undo pex group** to delete a PEX group.

Syntax

```
pex group group-id
undo pex group group-id
```

Default

No PEX groups exist.

Views

System view

Predefined user roles

network-admin

Parameters

group-id: Specifies a PEX group ID. The value range for the group ID is 1 to 30.

Usage guidelines

To allow user-side ports of different PEXs to join the same aggregation group, you must assign the cascade ports to which the PEXs are attached to the same PEX group.

If you delete a PEX group, all PEXs in that group will go offline with all settings issued from the parent device removed.

Examples

Create PEX group 1 and enter PEX group view.

```
<Sysname> system-view
[Sysname] pex group 1
[Sysname-pex-group-1]
```

Related commands

pex-capability enable

pex local-forwarding

Use `pex local-forwarding` to enable PEX local forwarding for a PEX.

Use `undo pex local-forwarding` to disable PEX local forwarding for a PEX.

Syntax

```
pex local-forwarding
undo pex local-forwarding
```

Default

PEX local forwarding is disabled.

Views

Layer 2 aggregate interface view

Predefined user roles

network-admin

Usage guidelines

This command takes effect only on cascade ports.

If PEX local forwarding is disabled, the PEX sends any incoming traffic to the parent fabric. The parent fabric makes forwarding decisions and sends the traffic to the outgoing interfaces.

If PEX local forwarding is enabled, the PEX performs local forwarding for Layer 2 unicast packets with known MAC addresses and reports other packets to the parent fabric for processing.

When you enable or disable PEX local forwarding on a cascade port, the PEX will go offline and then come online again.

Examples

```
# Enable PEX local forwarding on Layer 2 aggregate interface 1.
```

```
<Sysname> system-view
```

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

```
[Sysname-Bridge-Aggregation1] pex local-forwarding
```

```
Executing this command will cause the PEX to disconnect and then reconnect. Are you sure you want to continue?[Y/N]: y
```

pex persistent-forwarding

Use `pex persistent-forwarding` to enable PEX persistent forwarding for a PEX.

Use `undo pex persistent-forwarding` to disable PEX persistent forwarding for a PEX.

Syntax

```
pex persistent-forwarding
undo pex persistent-forwarding
```

Default

PEX persistent forwarding is disabled.

Views

Layer 2 aggregate interface view

Predefined user roles

network-admin

Usage guidelines

This command takes effect only on cascade ports.

For this command to take effect on a PEX, you must enable PEX local forwarding for that PEX.

If PEX persistent forwarding is enabled, the system will not clear the running data or shut down the network interfaces on the PEX after the PEX goes offline. The PEX can still perform local forwarding.

If PEX persistent forwarding is disabled, the system clears the running data and shuts down all network interfaces on the PEX after the PEX goes offline. However, the system does not shut down the upstream member interfaces on the PEX. The PEX will attempt to recover the connection with the parent fabric by sending protocol control packets out of the upstream member interfaces.

Examples

```
# Enable PEX persistent forwarding on Layer 2 aggregate interface 1.
```

```
<Sysname> system-view
```

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

```
[Sysname-Bridge-Aggregation1] pex persistent-forwarding
```

Related commands

```
pex local-forwarding
```

pex system-working-mode

Use **pex system-working-mode** to set the device operating mode in an IRF 3.1 system.

Use **undo pex system-working-mode** to restore the default.

Syntax

```
pex system-working-mode { auto | pex | switch }
```

```
undo pex system-working-mode
```

Default

The device operates in auto mode.

Views

System view

Predefined user roles

network-admin

Parameters

auto: Specifies the auto operating mode. The device automatically reboots with the factory defaults and operates as a PEX to join an IRF 3.1 system when it detects LLDP packets from a parent device on the upstream port. Before that, the device operates as an independent node. When the device operates as a PEX, it cannot automatically change to an independent node even if it disconnects from the parent fabric.

pex: Specifies the PEX operating mode. For the mode to take effect, save the running configuration and manually reboot the device.

switch: Specifies the switch operating mode. In this mode, the device operates independently as a node. It is not part of an IRF 3.1 system, whether or not it has connections to the parent fabric.

Usage guidelines

When the device operates in PEX mode, you cannot set the operating mode to auto.

Examples

```
# Specify the device operating mode as switch.
```

```
<Sysname> system-view
```

```
[Sysname] pex system-working-mode switch
```

```
PEX operating mode changed. For the mode change to take effect, save the configuration and reboot the system.
```

pex-capability enable

Use **pex-capability enable** to enable PEX connection capability for a Layer 2 aggregate interface and assign the interface to a PEX group.

Use **undo pex-capability enable** to disable PEX connection capability for a Layer 2 aggregate interface.

Syntax

```
pex-capability enable group group-id
```

```
undo pex-capability enable
```

Default

PEX connection capability is disabled for a Layer 2 aggregate interface.

Views

Layer 2 aggregate interface view

Predefined user roles

network-admin

Parameters

group-id: Specifies a PEX group ID. The group must exist on the device.

Usage guidelines

After PEX connection capability is enabled on a Layer 2 aggregate interface, the parent fabric and the PEX exchange LLDP packets for neighbor discovery. After the parent fabric and the PEX finish neighbor discovery, they send PE CSP Open requests to each other for connection establishment.

A Layer 2 aggregate interface enabled with PEX connection capability automatically operates in dynamic aggregation mode. In addition, the system automatically configures the aggregate interface as an edge port of the spanning tree feature for the PEX to quickly come online.

You must assign member interfaces to an extended-link aggregation group before enabling PEX connection capability on the Layer 2 extended-link aggregate interface.

After you disable PEX connection capability on a Layer 2 aggregate interface, the aggregate interface is automatically removed from the PEX group, and its attached PEX goes offline.

Examples

```
# Enable PEX connection capability on Layer 2 aggregate interface 1 and assign the interface to PEX group 1.
```

```
<Sysname> system-view
```

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

```
[Sysname-Bridge-Aggregation1] pex-capability enable group 1
```

Related commands

`lldp enable` (*Layer 2—LAN Switching Command Reference*)
`lldp global enable` (*Layer 2—LAN Switching Command Reference*)
`pex associate`
`stp edged-port` (*Layer 2—LAN Switching Command Reference*)

switchto pex

Use `switchto pex` to log in to a PEX from the parent fabric.

Syntax

```
switchto pex slot slot-number
```

Views

System view

Predefined user roles

network-admin

Parameters

`slot slot-number`: Specifies a PEX by its virtual slot number. The value range is the slot numbers that have been assigned to PEXs.

Usage guidelines

After you log in to a PEX, you can execute the following commands:

- The `display` commands.
- File system management commands. To obtain information about the access permissions to the commands, use the `display role feature name filesystem` command in RBAC. For more information about the file system management and RBAC commands, see *Fundamentals Command Reference*.

To exit a PEX, execute the `quit` command.

Examples

```
# Log in to PEX 100.  
<Sysname> system-view  
[Sysname] switchto pex slot 100
```