

# HP 5500 EI & 5500 SI Switch Series

IRF

Command Reference

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# IRF configuration commands

## display irf

### Syntax

```
display irf [ | { begin | exclude | include } regular-expression ]
```

### View

Any view

### Default level

1: Monitor level

### Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin**: Displays the first line that matches the specified regular expression and all lines that follow.

**exclude**: Displays all lines that do not match the specified regular expression.

**include**: Displays all lines that match the specified regular expression.

*regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

### Description

Use **display irf** to display IRF fabric information, including the member ID, role, priority, bridge MAC address, and description of each IRF member.

### Examples

```
# Display IRF fabric information.
<Sysname> display irf
Switch  Role      Priority  CPU-Mac          Description
  1      Slave     1        000f-e2be-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
Switch	IRF member ID: <ul style="list-style-type: none"> <li>• ID of the master is prefixed with an asterisk (*) sign.</li> <li>• ID of the device where you are logged in is prefixed with a plus (+) sign.</li> </ul>
Role	Switch role in the IRF fabric: <ul style="list-style-type: none"> <li>• <b>Slave</b>—The switch is a subordinate device.</li> <li>• <b>Master</b>—The switch is the master.</li> <li>• <b>SlaveWait</b>—The switch is joining the IRF fabric as a subordinate device.</li> <li>• <b>Loading</b>—The switch is loading the system software image.</li> </ul>
CPU-MAC	CPU MAC address of the switch.
Description	Description you have configured for the member device. <ul style="list-style-type: none"> <li>• If no description is configured, this field displays a dashed line (----).</li> <li>• 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 <b>display current-configuration</b> command.</li> </ul>
Auto upgrade	Status of the software auto-update function: <ul style="list-style-type: none"> <li>• <b>yes</b>—Enabled. The master switch automatically propagates its system software image to the switch you are adding to the IRF fabric.</li> <li>• <b>no</b>—Disabled. You must manually make sure the joining switch uses the same system software image as the master switch. If not, the new switch cannot join the IRF fabric.</li> </ul>
MAC persistent	IRF bridge MAC persistence setting: <ul style="list-style-type: none"> <li>• <b>6 min</b>—Bridge MAC address of the IRF fabric persists for six minutes after the master leaves.</li> <li>• <b>always</b>—Bridge MAC address of the IRF fabric does not change after the master leaves.</li> <li>• <b>no</b>—Bridge MAC address of the new master replaces the original one as soon as the old master leaves.</li> </ul>
Domain ID	Domain ID assigned to the IRF fabric. A domain ID uniquely identifies an IRF fabric on a network that has multiple IRF fabrics.

## display irf configuration

### Syntax

```
display irf configuration [ | { begin | exclude | include } regular-expression ]
```

### View

Any view

### Default level

]: Monitor level

### Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin:** Displays the first line that matches the specified regular expression and all lines that follow.

**exclude:** Displays all lines that do not match the specified regular expression.

**include:** Displays all lines that match the specified regular expression.

*regular-expression:* Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

## Description

Use **display irf configuration** to display the basic IRF settings.

The command displays each member's current member ID, new member ID, priority, IRF port state, and IRF port bindings.

The new member ID takes effect after the switch reboots.

## Examples

# Display the basic IRF settings.

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

MemberID	NewID	IRF-Port1	IRF-Port2
1	1	GigabitEthernet1/1/1	disable
2	2	disable	Ten-GigabitEthernet2/2/1

**Table 2 Command output**

Field	Description
MemberID	Current member ID.
NewID	Member ID that will take effect after a reboot.
IRF-Port1	Physical port or ports bound to IRF port 1. If no physical ports are bound to the IRF port, this field displays <b>disable</b> .
IRF-Port2	Physical port or ports bound to IRF port 2. If no physical ports are bound to the IRF port, this field displays <b>disable</b> .

# display irf topology

## Syntax

```
display irf topology [ | { begin | exclude | include } regular-expression ]
```

## View

Any view

## Default level

1: Monitor level

## Parameters

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin:** Displays the first line that matches the specified regular expression and all lines that follow.

**exclude:** Displays all lines that do not match the specified regular expression.

**include:** Displays all lines that match the specified regular expression.

*regular-expression:* Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

## Description

Use **display irf topology** to display the IRF fabric topology.

Command output includes member IDs, IRF port state, and adjacencies of IRF ports.

## Examples

# Display the IRF fabric topology.

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

```
Topology Info
-----
                IRF-Port1                IRF-Port2
Switch  Link   neighbor  Link   neighbor  Belong To
-----  ---
2       DOWN   --        UP     1          0023-8927-ad54
1       UP     2         DIS    --          0023-8927-ad54
```

**Table 3 Command output**

Field	Description
Switch	Member ID.
IRF-Port 1	Link state and neighbor switch of IRF port 1.
IRF-Port 2	Link state and neighbor switch of IRF port 2.
Link	Link state of the IRF port: <ul style="list-style-type: none"><li>• <b>UP</b>—IRF link is up.</li><li>• <b>DOWN</b>—IRF link is down.</li><li>• <b>DIS</b>—No physical ports have been bound to the IRF port. You must use the <b>port group interface</b> command to bind at least one physical port to the IRF port.</li></ul>
neighbor	IRF member ID of the switch connected to the IRF port. If no device is connected to the IRF port, this field displays two hyphens (-).
Belong To	IRF fabric that has the switch, represented by the CPU MAC address of the master in the IRF fabric.

## display irf-port load-sharing mode

### Syntax

```
display irf-port load-sharing mode [ irf-port [ member-id/port-number ] ] [ | { begin | exclude | include } regular-expression ]
```

### View

Any view

### Default level

1: Monitor level

### Parameters

**irf-port**: Displays IRF port specific load sharing modes.

*member-id/port-number*: Specifies an IRF port number. The *member-id* argument represents an IRF member ID. The *port-number* argument represents the index number (1 or 2) of the IRF port on the member device.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin**: Displays the first line that matches the specified regular expression and all lines that follow.

**exclude**: Displays all lines that do not match the specified regular expression.

**include**: Displays all lines that match the specified regular expression.

*regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

## Description

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

To display the global load sharing mode for IRF links, execute this command without any keyword or argument.

To display the load sharing mode used on each IRF port in the IRF fabric, specify the **irf-port** keyword but not any IRF port.

To display the load sharing mode used on a specific IRF port, specify both the **irf-port** keyword and the *member-id/port-number* argument.

## Examples

# Display the global IRF link load sharing mode. 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: destination-mac address, source-mac address
Layer 3 traffic: destination-ip address, source-ip address
```

# Display the global IRF link load sharing mode. In this example, because a global sharing mode based on source and destination IP addresses have been configured, the configured mode applies.

```
<Sysname> display irf-port load-sharing mode
irf-port Load-Sharing Mode:
destination-ip address, source-ip 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: destination-mac address, source-mac address
Layer 3 traffic: destination-ip address, source-ip address
```

# Display the load sharing mode used on IRF port 1/1.

```
<Sysname> display irf-port load-sharing mode irf-port 1/1
irf-port1/1 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-port 1/1 Load-Sharing Mode:
```



```

destination-mac address, source-mac address
irf-port 1/2 Load-Sharing Mode:
Layer 2 traffic: destination-mac address, source-mac address
Layer 3 traffic: destination-ip address, source-ip address

```

**Table 4 Command output**

Field	Description
irf-port Load-Sharing Mode	Global load sharing mode for IRF links: <ul style="list-style-type: none"> <li>• If no user-defined global load sharing mode has been configured, the default global load sharing mode applies.</li> <li>• If a user-defined global load sharing mode has been configured, the configured mode applies.</li> </ul>
irf-port 1/1 Load-Sharing Mode	Load sharing mode for IRF-port 1/1: <ul style="list-style-type: none"> <li>• If you have not configured a port-specific load sharing mode, the global IRF link load sharing mode applies.</li> <li>• If you have configured a port-specific load sharing mode, the configured mode applies.</li> </ul>
Layer 2 traffic: destination-mac address, source-mac address	Default load sharing mode for traffic that has no IP header. By default, this type of traffic is distributed based on source and destination MAC addresses.
Layer 3 traffic: destination-ip address, source-ip address	Default load sharing mode for IP packets. By default, this type of traffic is distributed based on source and destination IP addresses.
destination-mac address, source-mac address	User-configured IRF link load sharing criteria. In this sample output, the criteria are source and destination MAC addresses. Information displayed in this field depends on user configuration.

## display mad

### Syntax

```
display mad [ verbose ] [ | { begin | exclude | include } regular-expression ]
```

### View

Any view

### Default level

1: Monitor level

### Parameters

**verbose:** Displays detailed MAD information. If this keyword is not provided, the system displays brief information about the MAD detection.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin:** Displays the first line that matches the specified regular expression and all lines that follow.

**exclude:** Displays all lines that do not match the specified regular expression.

**include:** Displays all lines that match the specified regular expression.

*regular-expression:* Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

## Description

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

## Examples

```
# Display brief MAD information.
<Sysname> display mad
MAD ARP disabled.
MAD LACP disabled.
MAD BFD disabled.

# Display detailed MAD information.
<Sysname> display mad verbose
Current MAD status: Detect
Excluded ports(configurable):
  Vlan-interface999
Excluded ports(can not be configured):
  Ten-GigabitEthernet1/0/53
MAD ARP enabled interface:
  Vlan-interface2
MAD enabled aggregation port:
  Bridge-Aggregation1
MAD BFD enabled interface:
  Vlan-interface3
    mad ip address 3.3.3.1 255.255.255.0 member 1
    mad ip address 3.3.3.2 255.255.255.0 member 2
```

**Table 5 Command output**

Field	Description
Current MAD status	MAD status: <ul style="list-style-type: none"><li>• <b>Detect</b>—The IRF fabric is integrated.</li><li>• <b>Recovery</b>—IRF fabric is in Recovery state. When detecting a multi-active collision, MAD places the IRF fabric with higher master ID in Recovery state. MAD also shuts down all physical ports in the fabric except IRF physical ports and ports that are configured to not shut down.</li><li>• <b>Detect to Recovery</b>—State of the IRF fabric is transitioning from Detect to Recovery, for example, as the result of an IRF split.</li><li>• <b>Recovery to Detect</b>—State of the IRF fabric is transitioning from Recovery to Detect.</li></ul>
Excluded ports(configurable)	Ports manually configured to not shut down when the IRF fabric transitions to the Recovery state.
Excluded ports(can not be configured)	Ports automatically set by the system to not shut down when the IRF fabric transitions to the Recovery state.
MAD ARP enabled interface: Vlan-interface2	Interface where ARP MAD is enabled.
MAD enabled aggregation port: Bridge-Aggregation1	Aggregate interface where LACP MAD is enabled.
MAD BFD enabled interface	Interface where BFD MAD is enabled.

Field	Description
Vlan-interface3 mad ip address 192.168.2.2 255.255.0.0 member 1 mad ip address 192.168.2.3 255.255.0.0 member 2	VLAN interface used for BFD MAD, and the MAD IP address configured for each member on this interface.

## display switchover state

### Syntax

**display switchover state** [ *slot member-id* ] [ | { **begin** | **exclude** | **include** } *regular-expression* ]

### View

Any view

### Default level

1: Monitor level

### Parameters

**slot member-id**: Specifies an IRF member by its member ID. If no IRF member is specified, this command displays the master/subordinate switchover states of the master.

|: Filters command output by specifying a regular expression. For more information about regular expressions, see *Fundamentals Configuration Guide*.

**begin**: Displays the first line that matches the specified regular expression and all lines that follow.

**exclude**: Displays all lines that do not match the specified regular expression.

**include**: Displays all lines that match the specified regular expression.

*regular-expression*: Specifies a regular expression, a case-sensitive string of 1 to 256 characters.

### Description

Use **display switchover state** to display the master/subordinate switchover states of IRF member switches.

### Examples

# Display the master/subordinate switchover states of the master.

```
<Sysname> display switchover state
```

```
Master HA State to slot 2: Slave is absent.
```

```
Master HA State to slot 3: Realtime backup to slave.
```

```
Master HA State to slot 4: Waiting batch backup request from slave.
```

**Table 6 Command output for the master**

Field	Description
Master HA State to slot <i>slot-number</i>	Describes the master/subordinate switchover state between the master and a specific member. The <i>slot-number</i> argument represents an IRF member ID.
Slave is absent	The IRF member ID is not used in this IRF fabric.
Waiting batch backup request from slave	The master switch is waiting for the batch backup request from the subordinate switch.

Field	Description
Batch backup	The subordinate switch is bulk-backing up data from the master.
Realtime backup to slave	The subordinate switch is backing up real-time data from the master switch.
Data smooth	The subordinate switch is transitioning to be the master.

# Display the master/subordinate switchover state of member switch 3.

```
<Sysname> display switchover state slot 3
```

```
Slave HA State: Receiving realtime data.
```

**Table 7 Command output for a subordinate**

Field	Description
Slave HA State	Describes the master/subordinate switchover state of the subordinate switch.
Waiting	The subordinate switch is ready for bulk-backing up data.
Sending batch backup request	The subordinate switch is requesting for a bulk-backup.
Receiving batch data	The subordinate switch is bulk backing up data.
Receiving realtime data	The member switch is receiving real-time data.

## irf auto-update enable

### Syntax

**irf auto-update enable**

**undo irf auto-update enable**

### View

System view

### Default level

3: Manage level

### Parameters

None

### Description

Use **irf auto-update enable** to enable the software auto-update function for propagating the system software image of the master to all its members.

Use **undo irf auto-update enable** to disable this function.

By default, software auto-update for subordinate switches is enabled.

When you add a switch to the IRF fabric, the software auto-update function compares the system software versions of the switch and the IRF master. If the versions are different, the switch automatically downloads the system software image from the master, sets the downloaded file as the system software for the next reboot, and automatically reboots with the new system software image to rejoin the IRF fabric.

To avoid an update failure, make sure the switch has efficient space for the new system software image.

If the switch you are adding to the IRF fabric is incompatible with the software version running on the master, the software auto-update function cannot work correctly.

If software auto-update function is disabled, you must manually update the switch with the system software image of the master.

## Examples

```
# Enable the software auto-update function.
<Sysname> system-view
[Sysname] irf auto-update enable
```

## irf domain

### Syntax

**irf domain** *domain-id*

**undo irf domain**

### View

System view

### Default level

3: Manage level

### Parameters

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

### Description

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

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

The default IRF domain ID is 0.

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 you use a member in one IRF fabric as the intermediate device for performing ARP MAD or LACP MAD for another IRF fabric, assign the two IRF fabrics different domain IDs to avoid false detection of IRF split.

## Examples

```
# Set the IRF domain ID to 30.
<Sysname> system-view
[Sysname] irf domain 30
```

## irf link-delay

### Syntax

**irf link-delay** *interval*

**undo irf link-delay**

### View

System view

## Default level

3: Manage level

## Parameters

*interval*: Sets the IRF link down report delay in milliseconds. The value range is 0 to 10000. If your IRF fabric requires a fast master/subordinate or IRF link switchover or has deployed the BFD or GR feature, HP recommends setting the delay to 0 seconds.

## Description

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

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

By default, the IRF link down event report delay is 4 seconds.

An IRF link down report delay helps avoid link flapping, which causes frequent IRF splits and merges during a short time.

An IRF port handles link down and link up events as follows:

- When the IRF link changes from up to down, the port does not immediately report the change to the IRF fabric. If the IRF link state is still down when the delay time is reached, the port reports the change to the IRF fabric.
- When the IRF link changes from down to up, the link layer immediately reports the event to the IRF fabric.

## Examples

```
# Set the IRF link down report delay to 300 milliseconds.  
<Sysname> system-view  
[Sysname] irf link-delay 300
```

# irf mac-address persistent

## Syntax

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

## View

System view

## Default level

3: Manage level

## Parameters

**always**: Enables the IRF bridge MAC address to be retained forever. The IRF bridge MAC address does not change after master re-election.

**timer**: Enables the IRF bridge MAC address to remain the same for six minutes after the master device leaves. If the device rejoins the IRF fabric before the time limit is reached, the IRF bridge MAC address does not change. If not, the IRF fabric uses the bridge MAC address of the new master as the IRF bridge MAC address.

## Description

Use **irf mac-address persistent** to configure IRF bridge MAC persistence so the IRF fabric continues to use the bridge MAC address of the old master as its bridge MAC address for a period of time after a master re-election.

Use **undo irf mac-address persistent** to disable IRF bridge MAC persistence so the IRF fabric changes its bridge MAC address as soon as the master leaves.

By default, after the master device leaves, the IRF fabric continues to use its bridge MAC address as the IRF bridge MAC address for six minutes.

An IRF fabric by default uses the bridge MAC address of the master device as its bridge MAC address. This bridge MAC address is used by Layer 2 protocols, for example, LACP, to identify the IRF fabric, and must be unique on a switched LAN for correct communication.

To avoid duplicate bridge MAC addresses, an IRF fabric can automatically change its bridge MAC address after its master leaves. However, the change causes temporary service disruption. To avoid this situation, configure bridge MAC persistence.

If two IRF fabrics have the same bridge MAC address, they cannot be merged into one IRF fabric.

If ARP MAD is used, you must use the **undo irf mac-address persistent** command to enable immediate bridge MAC address change after the master leaves.

## Examples

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

# irf member description

## Syntax

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

## View

System view

## Default level

3: Manage level

## Parameters

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

*text*: Configures the IRF member description, a string of 1 to 127 characters.

## Description

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

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

By default, no description is configured for any IRF member.

## Examples

```
# Configure a description for IRF member 1.  
<Sysname> system-view
```

```
[Sysname] irf member 1 description F1Num001
```

## irf member priority

### Syntax

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

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

### View

System view

### Default level

3: Manage level

### Parameters

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

*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.

### Description

Use **irf member priority** to change the priority of an IRF member.

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

By default, the priority of a member switch is 1.

### Examples

Change the member priority assignment scheme in the IRF fabric so member 2 takes over as the master at the next master election:

```
# Display IRF fabric information.
```

```
<Sysname> display irf
Switch    Role    Priority  CPU-Mac
-----
+1        Slave   29       00e0-fc00-1115
2         Slave   1        00e0-fc00-1615
*3        Master  32       00e0-fc00-1015
9         Slave   30       00e0-fc00-1515
-----
* 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
```

```
# Change the priority of the current master (member ID 3) to 16.
```

```
<Sysname> system-view
[Sysname] irf member 3 priority 16
```

```
# Change the priority of member 2 to 32.
```

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



# irf member renumber

## Syntax

**irf member** *member-id* **renumber** *new-member-id*

**undo irf member** *member-id* **renumber**

## View

System view

## Default level

3: Manage level

## Parameters

*member-id*: Specifies the current ID of an IRF member switch. For the HP 5500 EI switches, the value range is 1 to 9. For the HP 5500 SI switches, the value range is 1 to 4.

*new-member-id*: Assigns a new ID to the IRF member switch. For the HP 5500 EI switches, the value range is 1 to 9. For the HP 5500 SI switches, the value range is 1 to 4.

## Description

Use **irf member renumber** to change the IRF member ID of a switch.

Use **undo irf member renumber** to set the IRF member ID of a switch to 1.

By default, the IRF member ID is 1.

---

### CAUTION:

In an IRF fabric, changing IRF member IDs might cause undesirable configuration changes and data loss. Before you do that, back up the configuration and make sure you fully understand the impact on your network. For example, all member switches in an IRF fabric are the same model. If you swapped the IDs of any two members, their interface settings would also be swapped.

---

To create an IRF fabric, you must assign a unique IRF member ID to each switch.

Assigning IRF member IDs before the IRF fabric is formed. To prevent any undesirable configuration change or data loss, avoid changing member IDs after the IRF fabric is formed.

The new member ID takes effect at a reboot. After the switch reboots, the settings on all member-ID related physical resources (including common physical network ports) are removed and require reconfiguration, regardless of whether you have saved the configuration.

To cancel the change before you reboot the member switch, use the **irf member renumber** command rather than its **undo** form. In the command, set the new member ID to be the same as the old member ID.

## Examples

# Change the member ID of an IRF member from 1 to 3.

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

```
[Sysname] irf member 1 renumber 3
```

```
Warning: Renumbering the switch number may result in configuration change or loss.
```

```
Continue?[Y/N]:Y
```

# Change the member ID of an IRF member from 2 to 4.

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

```
[Sysname] irf member 2 renumber 4
```

```
Warning: Renumbering the switch number may result in configuration change or loss.
Continue?[Y/N]y
```

```
# Cancel the change in the preceding example before rebooting the switch.
```

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

```
Warning: Renumbering the switch number may result in configuration change or loss.
Continue?[Y/N]y
```

## irf switch-to

### Syntax

```
irf switch-to member-id
```

### View

System view

### Default level

3: Manage level

### Parameters

*member-id*: Specifies the member ID of a subordinate member. The *member-id* argument cannot take the member ID of the master switch.

### Description

Use **irf switch-to** to access a subordinate switch's CLI from the master's CLI.

When you log in to an IRF fabric, you are placed at the CLI of the master, regardless of at which member switch you are logged in. After that, you can access the CLI of a subordinate switch to execute a limited set of maintenance commands.

At the CLI of a subordinate switch, you are placed in user view, and the command prompt changes to `<Sysname-Slave#member-ID/slot-number>`, for example, `<Sysname-Slave#2>`. You can use the following commands at a subordinate switch's CLI:

- **display**
- **quit**
- **return**
- **system-view**
- **debugging**
- **terminal debugging**
- **terminal trapping**
- **terminal logging**

To return to the CLI of the master switch, use the **quit** command.

### Examples

```
# Log in to the CLI of IRF member switch 2.
```

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

```
[Sysname] irf switch-to 2
```

```
<Sysname-Slave#2>
```

# irf-port

## Syntax

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

## View

System view

## Default level

3: Manage level

## Parameters

*member-id/port-number*: Specifies an IRF port number. The *member-id* argument represents the IRF member ID. The *port-number* argument represents the index of the port on the member switch, and must be 1 or 2.

## Description

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

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

To set up an IRF link between two switches, you must enter IRF port view to bind physical ports to the IRF port used by each switch for IRF connection.

Before removing all port bindings on an IRF port, shut down all its physical ports.

Related commands: **port group interface**.

## Examples

```
# Bind Ten-GigabitEthernet 3/1/1 to IRF-port 1 on member device 3.
<Sysname> system-view
[Sysname] interface ten-gigabitethernet 3/1/1
[Sysname-Ten-GigabitEthernet3/1/1] shutdown
[Sysname-Ten-GigabitEthernet3/1/1] quit
[Sysname] irf-port 3/1
[Sysname-irf-port 3/1] port group interface ten-gigabitethernet 3/1/1
[Sysname-irf-port 3/1] quit
[Sysname] interface ten-gigabitethernet 3/1/1
[Sysname-Ten-GigabitEthernet3/1/1] undo shutdown
```

# irf-port load-sharing mode

## Syntax

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

## View

System view, IRF port view

## Default level

3: Manage level

## 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.

## Description

Use **irf-port load-sharing mode** to set the global or port-specific load sharing mode for IRF links.

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

By default, traffic that has no IP header is distributed by source and destination MAC addresses, and IP traffic is distributed by source and destination IP addresses.

On an IRF port that has multiple links, traffic is balanced across its physical links. You can configure the IRF port to distribute traffic based on source IP address, destination IP address, source MAC address, destination address, or any combination of the criteria. If a criteria combination is not supported, the system displays an error message.

Configure the global IRF link load sharing mode in system view, and configure a port-specific load sharing mode in IRF port view. To successfully configure a load sharing mode for an IRF port, make sure you have bound at least one physical port to the IRF port.

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

## Examples

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

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

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

```
# Configure IRF port 1/1 to distribute traffic across its physical links based on destination MAC address.
```

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

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

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

# irf-port-configuration active

## Syntax

**irf-port-configuration active**

## View

System view

## Default level

3: Manage level

## Parameters

None

## Description

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

After connecting the physical ports between two switches and bind them to the correct IRF ports, you must use this command to activate the settings on the IRF ports to merge the two switches into one IRF fabric. After an IRF port is activated, its link state in the **display irf topology** command output changes from **DIS** or **DOWN** to **UP**.

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

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

Activating IRF port settings can cause IRF merge and device reboot. To avoid configuration loss, follow this procedure to set up your IRF fabric:

1. Plan the IRF setup, including the IRF fabric topology, IRF fabric size, member ID assignment, and bindings of physical ports and IRF ports.
2. Change the IRF member ID of each switch to make sure they are unique in the IRF fabric.
3. Connect the physical ports between neighboring switches and make sure that the peer ports can reach each other.
4. Enter the IRF port view.
5. Bind the physical ports to the IRF ports on each switch.
6. Save the configuration to the next-startup configuration file on each switch.
7. Activate the IRF ports on each switch.

## Examples

To configure and activate IRF port 1/2:

```
# Bind Ten-GigabitEthernet 1/1/2 to IRF port 1/2.
```

```
<Sysname> system-view
[Sysname] interface ten-gigabitEthernet 1/1/2
[Sysname-Ten-GigabitEthernet1/1/2] shutdown
[Sysname-Ten-GigabitEthernet1/1/2] quit
[Sysname] irf-port 1/2
[Sysname-irf-port1/2] port group interface Ten-GigabitEthernet 1/1/2
[Sysname-irf-port1/2] quit
[Sysname] interface ten-gigabitEthernet 1/1/2
[Sysname-Ten-GigabitEthernet1/1/2] undo shutdown
[Sysname-Ten-GigabitEthernet1/1/2] quit
```

```
# Save the configuration so the IRF port settings can take effect after the switch 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:/aa.cfg exists, overwrite? [Y/N]:y
Validating file. Please wait.....
Saved the current configuration to mainboard device successfully.
Slot 1:
Save next configuration file successfully.
Configuration is saved to device successfully.
```

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

## mad arp enable

### Syntax

```
mad arp enable  
undo mad arp enable
```

### View

VLAN interface view

### Default level

3: Manage level

### Parameters

None

### Description

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

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

By default, ARP MAD is disabled.

You can set up ARP MAD links between neighbor IRF members or between each IRF member device and an intermediate device.

When you configure ARP MAD, follow these guidelines:

- If an intermediate device is used, you can use common data links as ARP MAD links. If no intermediate device is used, set up dedicated ARP MAD links between IRF member devices.
- Use a VLAN dedicated to ARP MAD.
- If an intermediate device is used, make sure the following requirements are met:
  - Run the spanning tree feature between the IRF fabric and the intermediate device.
  - Enable the IRF fabric to change its bridge MAC address as soon as the master leaves.
  - Create the ARP MAD VLAN and assign the ports on the ARP MAD links to the VLAN.
- If the intermediate device is in an IRF fabric, assign this fabric a different domain ID than the ARP MAD-enabled fabric to avoid false detection of IRF split.

### Examples

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

## mad bfd enable

### Syntax

```
mad bfd enable
```

## **undo mad bfd enable**

### View

VLAN interface view

### Default level

3: Manage level

### Parameters

None

### Description

Use **mad bfd enable** to enable BFD MAD.

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

By default, BFD MAD is disabled.

BFD MAD is available only on the HP 5500 EI switches.

BFD MAD uses the BFD protocol for detecting multi-active collisions, and can work with or without intermediate devices.

When you configure BFD MAD, follow these guidelines:

- You cannot enable BFD MAD detection on VLAN-interface 1.
- Do not use the BFD MAD VLAN for any other purpose. No Layer 2 or Layer 3 features, including ARP and LACP, can work on the BFD MAD-enabled VLAN interface or any port in the VLAN. If you configure any other feature on the VLAN, neither the configured feature nor the BFD MAD function can work correctly.
- Do not enable the spanning tree function on any port in a BFD MAD VLAN. The MAD function is mutually exclusive with the spanning tree function.
- Do not bind a BFD MAD-enabled VLAN interface to any VPN. The MAD function is mutually exclusive with VPN.
- To avoid problems, make sure a BFD MAD-enabled VLAN interface has only IP addresses assigned with the **mad ip address** command. Do not use any other command, including the **ip address** command, to assign an IP address to the interface.
- If an intermediate device is used, assign the ports of BFD MAD links to the BFD MAD VLAN on the device.

Related commands: **mad ip address**.

### Examples

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

## mad enable

### Syntax

**mad enable**

**undo mad enable**

## View

Layer 2 aggregate interface view, Layer 3 aggregate interface view

## Default level

3: Manage level

## Parameters

None

## Description

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

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

By default, LACP MAD is disabled.

LACP MAD uses extended LACP packets for detecting multi-active collisions and requires an intermediate HP device that also supports LACP MAD packets.

When you use LACP MAD, follow these guidelines:

- The intermediate device must be an HP device that support extended LACP for MAD.
- If the intermediate device is in an IRF fabric, assign this fabric a different domain ID than the LACP MAD-enabled fabric to avoid false detection of IRF partition.
- Use dynamic link aggregation mode. MAD is LACP dependent. Even though LACP MAD can be configured on both static and dynamic aggregate interfaces, it takes effect only on dynamic aggregate interfaces.
- Configure link aggregation settings also on the intermediate device.

---

### NOTE:

Layer 3 aggregate interfaces are available on the HP 5500 EI switches but not on the HP 5500 SI switches.

## 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] mad enable
```

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

```
<Sysname> system-view
[Sysname] interface route-aggregation 1
[Sysname-Route-Aggregation1] mad enable
```

# mad exclude interface

## Syntax

**mad exclude interface** *interface-type interface-number*

**undo mad exclude interface** *interface-type interface-number*

## View

System view



## Default level

3: Manage level

## Parameters

*interface-type interface-number*: Specifies a port by its type and number.

## Description

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

Use **undo mad exclude interface** to restore the default MAD action on a physical network port.

By default, all physical network ports but the IRF physical ports shut down when the IRF fabric transitions to the Recovery state.

MAD action is not configurable for IRF physical ports.

When MAD detects that an IRF fabric has split into two or more identical active IRF fabrics, only the IRF fabric whose master has the lowest member ID among all the masters can still forward data traffic. MAD changes its status to Recovery on all the other IRF fabrics and shuts down all their physical ports except the IRF physical ports and those manually configured to not shut down.

If a port must be kept in up state for special purposes such as Telnet connection, exclude it from the shutdown action. To avoid problems, HP recommends not excluding any ports except the ports used for Telnet and MAD.

The ports that have shut down by MAD come up when the member devices reboot to join the recovered IRF fabric. If auto recovery fails because the current master has failed or any other exception has occurred, use the **mad restore** command to manually recover the member devices and bring up the ports.

## Examples

```
# Exclude GigabitEthernet 2/0/5 from being shut down when the MAD status transitions to Recovery.  
<Sysname> system-view  
[Sysname] mad exclude interface gigabitethernet 2/0/5
```

## mad ip address

---

### ⓘ IMPORTANT:

This command is available only on the HP 5500 EI switches.

---

## Syntax

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

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

## View

VLAN interface view

## Default level

3: Manage level

## Parameters

*ip-address*: Specifies an IP address in dotted decimal notation. This IP address is bound to an IRF member for BFD detection and is called a "MAD IP address." This MAD IP address must not be on the same subnet as any IP address configured on any member device.

*mask*: Specifies a subnet mask in dotted decimal notation.

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

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

## Description

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

Use **undo mad ip address** to delete a MAD IP address.

By default, no MAD IP address is configured on any VLAN interface.

To use BFD MAD, you must configure a MAD IP address on a BFD MAD enabled VLAN interface for each IRF member, and make sure all the MAD IP addresses are on the same subnet.

To avoid problems, make sure a BFD MAD-enabled VLAN interface has only IP addresses assigned with the **mad ip address** command. Do not use any other command, including the **ip address** command, to assign an IP address to the interface.

The master tries to establish BFD sessions with other members 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 is effective, and 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, and the two 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**.

Related commands: **mad bfd enable**.

## 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
```

# mad restore

## Syntax

```
mad restore
```

## View

System view

## Default level

3: Manage level

## Parameters

None

## Description

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

When MAD detects that an IRF fabric has split into multiple IRF fabrics, only the one whose master has the lowest member ID among all the masters can still forward traffic. All the other fabrics are set in Recovery state and cannot forward traffic.

If the active IRF fabric has failed before the IRF split problem is fixed, use this command to restore an IRF fabric in Recovery state to 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

## Syntax

```
port group interface interface-type interface-number [ mode { enhanced | normal } ]
```

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

## View

IRF port view

## Default level

3: Manage level

## Parameters

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

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

**mode**: Sets the operating mode of the physical IRF port. If no mode is set, the port operates in normal mode. The operating mode set in this command takes effect only when the physical port is operating as an IRF physical port.

- **enhanced**—Sets the physical IRF port to operate in enhanced mode. The switch does not support this keyword.
- **normal**—Sets the physical IRF port to operate in normal mode.

## Description

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

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

By default, no physical ports are bound to any IRF port.

Before binding a physical port to an IRF port or removing their binding, use the **shutdown** command to shut down the physical port.

The switch supports up to two physical ports for an IRF port, and these two ports must be located on the same interface card.

Make sure the physical ports at both ends of an IRF link are using the same operating mode. For an aggregate IRF link, HP recommends configuring the same operating mode for all physical IRF ports at both ends.

The system does not automatically remove the binding between a physical port and an IRF port even if the IRF link has been lost, for example, because the interface card holding the physical port is removed. To remove the binding, use the **undo port group interface** command.

## Examples

# Bind Ten-GigabitEthernet 3/1/1 to IRF port 3/1.

```
<Sysname> system-view
[Sysname] interface ten-gigabitethernet 3/1/1
[Sysname-Ten-GigabitEthernet3/1/1] shutdown
[Sysname-Ten-GigabitEthernet3/1/1] quit
[Sysname] irf-port 3/1
[Sysname-irf-port3/1] port group interface ten-gigabitethernet 3/1/1
[Sysname-irf-port3/1] quit
[Sysname] interface ten-gigabitethernet 3/1/1
[Sysname-Ten-GigabitEthernet3/1/1] undo shutdown
```

---

# Support and other resources

## Contacting HP

For worldwide technical support information, see the HP support website:

<http://www.hp.com/support>

Before contacting HP, collect the following information:

- Product model names and numbers
- Technical support registration number (if applicable)
- Product serial numbers
- Error messages
- Operating system type and revision level
- Detailed questions

## Subscription service

HP recommends that you register your product at the Subscriber's Choice for Business website:

<http://www.hp.com/go/wwalerts>

After registering, you will receive email notification of product enhancements, new driver versions, firmware updates, and other product resources.

## Related information

### Documents

To find related documents, browse to the Manuals page of the HP Business Support Center website:

<http://www.hp.com/support/manuals>

- For related documentation, navigate to the Networking section, and select a networking category.
- For a complete list of acronyms and their definitions, see *HP FlexNetwork Technology Acronyms*.

### Websites

- HP.com <http://www.hp.com>
- HP Networking <http://www.hp.com/go/networking>
- HP manuals <http://www.hp.com/support/manuals>
- HP download drivers and software <http://www.hp.com/support/downloads>
- HP software depot <http://www.software.hp.com>
- HP Education <http://www.hp.com/learn>

# Conventions

This section describes the conventions used in this documentation set.





## Command conventions

Convention	Description
<b>Boldface</b>	<b>Bold</b> 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 at least 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
<b>Boldface</b>	Window names, button names, field names, and menu items are in bold text. For example, the <b>New User</b> window appears; click <b>OK</b> .
>	Multi-level menus are separated by angle brackets. For example, <b>File &gt; Create &gt; Folder</b> .

## Symbols

Convention	Description
 <b>WARNING</b>	An alert that calls attention to important information that if not understood or followed can result in personal injury.
 <b>CAUTION</b>	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.
 <b>IMPORTANT</b>	An alert that calls attention to essential information.
<b>NOTE</b>	An alert that contains additional or supplementary information.
 <b>TIP</b>	An alert that provides helpful information.

## Network topology icons

---

	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 switching engine on a unified wired-WLAN switch.
	Represents an access point.
	Represents a security product, such as a firewall, a UTM, or a load-balancing or security card that is installed in a device.
	Represents a security card, such as a firewall card, a load-balancing card, or a NetStream card.

---

## Port numbering in examples

The port numbers in this document are for illustration only and might be unavailable on your device.

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