

DES-7200

Reliability Command Reference Guide

Version 10.4(3)

D-Link[®]

DES-7200 CLI Reference Guide

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Date:

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Preface

Version Description

This manual matches the firmware version 10.4(3).

Target Readers

This manual is intended for the following readers:



Network engineers



Technical salespersons



Network administrators

Conventions in this Document

1. Universal Format Convention

Arial: Arial with the point size 10 is used for the body.

Note: A line is added respectively above and below the prompts such as caution and note to separate them from the body.

Format of information displayed on the terminal: Courier New, point size 8, indicating the screen output. User's entries among the information shall be indicated with bolded characters.

2. Command Line Format Convention

Arial is used as the font for the command line. The meanings of specific formats are described below:

Bold: Key words in the command line, which shall be entered exactly as they are displayed, shall be indicated with bolded characters.

Italic: Parameters in the command line, which must be replaced with actual values, shall be indicated with italic characters.

[]: The part enclosed with [] means optional in the command.

{ x | y | ... }: It means one shall be selected among two or more options.

[x | y | ...]: It means one or none shall be selected among two or more options.

//: Lines starting with an exclamation mark "://" are annotated.

3. Signs

Various striking identifiers are adopted in this manual to indicate the matters that special attention should be paid in the operation, as detailed below:



Caution

Warning, danger or alert in the operation.



Note

Descript, prompt, tip or any other necessary supplement or explanation for the operation.



Note

The port types mentioned in the examples of this manual may not be consistent with the actual ones. In real network environments, you need configure port types according to the support on various products.

The display information of some examples in this manual may include the information on other series products, like model and description. The details are subject to the used equipments.

1 VRRP Configuration Commands

1.1 Configuration Related Commands

1.1.1 vrrp accept_mode

Use this command to enable the packet accepting function on the IPv6 VRRP virtual router. The **no** form of this command is used to disable the function..

vrrp ipv6 *group* accept_mode

no vrrp ipv6 *group* accept_mode

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number

Default configuration

The master IPv6 VRRP is not allowed to accept packets whose destination IPv6 address is the IPv6 address of a virtual router. However, the NA and NS packets should be accepted regardless of the configuration of Accept_Mode. Also, the master IPv6 VRRP virtual router in the owner state will accept and process any packets whose destination IPv6 address is the IPv6 address of a virtual router, regardless of the configuration of Accept_Mode.

Command mode

Interface configuration mode.

Usage guidelines

Configuration of the network interface is effective for the master virtual router.



Caution

Only IPv6 VRRP has this configuration mode.

Examples	<p>The example below enables the accept mode on the group 1:</p> <pre>vrrp ipv6 1 accept_mode</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DES-7200(config-if)# vrrp group ipv6 <i>ipaddress</i></td> <td>Enable VRRP and configure an IPv6 address for the virtual router.</td> </tr> </tbody> </table>	Command	Description	DES-7200(config-if)# vrrp group ipv6 <i>ipaddress</i>	Enable VRRP and configure an IPv6 address for the virtual router.
Command	Description				
DES-7200(config-if)# vrrp group ipv6 <i>ipaddress</i>	Enable VRRP and configure an IPv6 address for the virtual router.				
Platform description	-				

1.1.2 vrrp authentication

Use this command to enable VRRP authentication . The **no** format of this command disables the function.

vrrp group authentication *string*

no vrrp group authentication

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>group</i></td> <td>VRRP group number</td> </tr> <tr> <td><i>string</i></td> <td>String for the VRRP group authentication (within 8 bytes, plaintext password)</td> </tr> </tbody> </table>	Parameter	Description	<i>group</i>	VRRP group number	<i>string</i>	String for the VRRP group authentication (within 8 bytes, plaintext password)
Parameter	Description						
<i>group</i>	VRRP group number						
<i>string</i>	String for the VRRP group authentication (within 8 bytes, plaintext password)						

Default configuration

By default, the VRRP function is not enabled on the interface. Even if the VRRP function is enabled, no authentication password is configured by default.

Command mode

Interface configuration mode.

Usage guidelines

The devices in the same VRRP group must have the same authentication password configured. The plaintext authentication password cannot provide security. It aims only to prevent/prompt the incorrect VRRP configuration.

Examples

The example below sets the authentication password for

VRRP group 1.

```
vrrp 1 authentication x30dn78k
```

Related commands

Command	Description
DES-7200(config-if)# vrrp <i>group ip</i> <i>ipaddress [secondary]</i>	Enable the VRRP function and set the IP address for the virtual device.

1.1.3 vrrp delay

Use this command to set the reload latency of the VRRP group on the interface.

```
vrrp delay { minimum min-seconds | reload reload-seconds }
```

```
no vrrp delay
```

Parameter description

Parameter	Description
<i>min-seconds</i>	When the interface is up, VRRP group shall be reloaded after at least min-seconds.
<i>reload-seconds</i>	The reload latency of the VRRP group. If the configured min-seconds is more than reload-seconds, the actual reload latency of the VRRP group will be min-seconds.

Default configuration

By default, the VRRP reload delay function is not enabled on the interface.

Command mode

Interface configuration mode.

Usage guidelines

Use this command to set the reload latency of the VRRP group on the interface, when it is required that the VRRP group shall not be reloaded immediately after the system reloads or the interface is up. The reload latency range is 0-60.

Examples

The example below sets the VRRP reload latency on E0 to 10s. When E0 is up, VRRP group 1 shall be reloaded in 10s.

```

interface FastEthernet 0/0
shutdown
ip address 10.0.1.1 255.255.255.0
vrrp delay minimum 10
vrrp 1 ip 10.0.1.20
no shutdown
show vrrp 1

```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ipaddress [secondary]	Enable the VRRP function and set the IP address for the virtual device.

1.1.4 vrrp description

Use this command to specify a descriptor for the VRRP. The **no** form of it restores it to the default.

vrrp group description text

no vrrp group description

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number
	<i>text</i>	VRRP group descriptor

Default configuration

By default, the VRRP function is not enabled on the interface. Even if the VRRP function is enabled, no VRRP group descriptor is configured by default.

Command mode

Interface configuration mode.

Usage guidelines

This command will set the descriptor for the VRRP group to facilitate the identification of the VRRP group.

Examples

The example below labels the VRRP group 1 on Ethernet interface E0 as Building A – Marketing and Administration:

```

interface FastEthernet 0/0
ip address 10.0.1.1 255.255.255.0

```



```

vrrp 1 ip 10.0.1.20
vrrp 1 description "Building A - Marketing and
Administration"

```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device

1.1.5 vrrp ip

Use this command to enable VRRP on the interface and specify the related virtual IP address. The **no** format of the command disables the VRRP function and removes the setting of virtual IP address.

vrrp group ip *ipaddress* [secondary]

no vrrp group ip *ipaddress* [secondary]

Parameter description

Parameter	Description
<i>group</i>	VRRP group number of the virtual device
<i>ipaddress</i>	IP address of the virtual device
secondary	Specify the secondary IP address of the virtual device.

Default configuration

Disabled.

Command mode

Interface configuration mode.

Usage guidelines

If the **secondary** parameter is not used, the IP address set here will become the master IP address of the virtual device. Note that if the VRRP group is using the IP address of the Ethernet interface, an error occurs when you remove the IP address of the VRRP group with the **no** command, because there are duplicated IP address in the LAN.

Examples

The example below enables the VRRP function on Ethernet interface 0. The VRRP group number is 1,

primary IP address of the virtual device is 10.0.1.20 and secondary IP address is 10.0.2.20.

```
interface FastEthernet 0/0
no switchport// Used on the switch only.
ip address 10.0.1.1 255.255.255.0
ip address 10.0.2.1 255.255.255.0 secondary
vrrp 1 ip 10.0.1.20
vrrp 1 ip 10.0.2.20 secondary
```

Related commands

Command	Description
DES-7200# show vrrp [brief group]	Show the VRRP configuration.

1.1.6 vrrp ipv6

Use this command to enable IPv6 VRRP on the interface and specify the related virtual IPv6 address. The **no** format of the command disables the IPv6 VRRP function and removes the setting of virtual IPv6 address.

vrrp group ipv6 *ipv6-address*

no vrrp group ip *ipv6-address*

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number of the virtual device.
	<i>ipaddress</i>	IPv6 address of the virtual device.

Default configuration

Disabled.

Command mode

Interface configuration mode.

Usage guidelines

IPv6 VRRP and IPv4 VRRP share group numbers ranging from 1 to 255. One VRRP group number of an interface is applicable to both IPv4 VRRP and IPv6 VRRP at the same time. The first configured address should be the link's local address, which cannot be deleted until the other virtual addresses are deleted.

Examples

The example below enables the IPv6 VRRP function on

Ethernet interface FastEthernet 0/0 with VRRP group number 1 and virtual IPv6 address FE80::1 and 2001::1.

```
interface FastEthernet 0/0
no switchport
ipv6 enable
ip6 address 2001::2/64
vrrp 1 ipv6 FE80::1
vrrp 1 ipv6 2001::1
```

Related commands

Command	Description
DES-7200# show ipv6 vrrp [brief group]	Show the IPv6 VRRP configuration.

Platform description

Supported on all platforms.

1.1.7 vrrp preempt

Use this command to set the preemption mode of the VRRP group. The **no** command disables the VRRP preemption function.

vrrp group preempt [delay seconds]

no vrrp group preempt[delay]

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number
	delay seconds	(Optional)Specify the delay before a device declares itself master. The default value is 0s.

Default configuration

By default, the VRRP function is not enabled on the interface. Once the VRRP function is enabled, the VRRP group will work in the preemption mode by default.

Command mode

Interface configuration mode.

Usage

If the VRRP group is working in the preemption mode,

guidelines once a device finds its priority is higher than the priority of the master, it will become the master device of the VRRP group. If the VRRP group is not working in the preemption mode, even if a device finds its priority is higher than the master's priority, it will not become the master device of the VRRP group. In case the VRRP group is using the Ethernet interface IP address, the setting of the preemption mode does not make sense, because that VRRP group has the highest priority and thus automatically becomes the master device in the VRRP group.

Examples In the example below, once the VRRP group finds its priority (200) is higher than that of the current master device, it will declare its preemption of master after a delay of 15 s:

```

vrrp 1 preempt delay 15
vrrp 1 priority 200

```

	Command	Description
Related commands	DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.
	DES-7200(config-if)# vrrp group priority <i>level</i>	Set the VRRP group priority.

1.1.8 vrrp priority

Use this command to specify the priority of the VRRP group. The **no** form of this command restores it to the default.

vrrp group priority level

no vrrp group priority

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number
	<i>level</i>	VRRP group priority

Default configuration By default, the VRRP function is not enabled on the interface. Once the VRRP function is enabled, the default priority of the VRRP group is 100.

Command mode	Interface configuration mode.						
Usage guidelines	None.						
Examples	The example below sets the priority of VRRP group 1 as 254. <pre>vrrp 1 priority 254</pre>						
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]</td> <td>Enable the VRRP function and set the IP address for the virtual device.</td> </tr> <tr> <td>DES-7200(config-if)# vrrp group preempt [delay <i>seconds</i>]</td> <td>Set the VRRP in the preemption mode.</td> </tr> </tbody> </table>	Command	Description	DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.	DES-7200(config-if)# vrrp group preempt [delay <i>seconds</i>]	Set the VRRP in the preemption mode.
Command	Description						
DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.						
DES-7200(config-if)# vrrp group preempt [delay <i>seconds</i>]	Set the VRRP in the preemption mode.						

1.1.9 vrrp timers advertise

Use this command to specify the interval for the master device to send the VRRP advertisement. The **no** form of this command restores it to the default.

vrrp group timers advertise *interval*

no vrrp group timers advertise

	Parameter	Description
Parameter description	<i>group</i>	VRRP group number
	<i>interval</i>	Advertisement interval (in seconds)

Default configuration

By default, the VRRP function is not enabled on the interface. Once the VRRP function is enabled, the default advertisement interval of the master device is 1 second.

Command mode

Interface configuration mode.

Usage guidelines

If the current device becomes the master device in the VRRP group, it will notify its VRRP status, priority and

other information by sending the VRRP advertisement in the set interval.

Examples

The example below sets the VRRP advertisement interval as 4 seconds.

```
vrrp 1 timers advertise 4
```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.
DES-7200(config-if)# vrrp group timers learn	Enable the timer learning function.

1.1.10 vrrp timers learn

Use this command to enable the timer learning function. The **no** format of it disables the function.

vrrp group timers learn

no vrrp group timers learn

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number

Default configuration

By default, the VRRP function is not enabled on the interface. Even if the VRRP function is enabled, the timer learning function is disabled by default.

Command mode

Interface configuration mode.

Usage guidelines

Once the timer learning function is enabled, if the current device is a VRRP backup device, it will learn the VRRP advertisement interval from the VRRP advertisement of the master device, with which it calculates the master device's failure interval instead of the VRRP advertisement interval configured locally. This command may synchronize the VRRP advertisement timer with the master device.

Examples

The example below enables the timer learning function on the IPv4 VRRP group 1.

```
vrrp 1 timers learn
```

The example below enables the timer learning function on the IPv6 VRRP group 1.

```
vrrp ipv6 1 timers learn
```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.
DES-7200(config-if)# vrrp group ipv6 <i>ipaddress</i>	Enable the VRRP function and set the IPv6 address for the virtual device.
DES-7200(config-if)# vrrp group timers advertise interval	Set the IPv4 VRRP advertising interval.
DES-7200(config-if)# vrrp ipv6 group timers advertise interval	Set the IPv6 VRRP advertising interval.

1.1.11 vrrp track

Use the **vrrp group track** *interface-type number* command to enable the VRRP track in the interface configuration mode. Use the **vrrp group track** *ip_address* command to enable the VRRP IP address track. Use the **vrrp group track bfd** command to track the specified neighbor IP address via BFD. Use the **no** form of this command to disable this function.

```
vrrp group track {interface-type number | bfd interface-type number  
ipv4-address} [priority]
```

```
vrrp group track ip-address [[[ interval interval-value ] timeout timeout-value ]  
priority ]
```

```
vrrp group track [interface-type number | bfd interface-type number  
ipv4-address] [ip-address]
```

Parameter description	Parameter	Description
	<i>group</i>	VRRP group number
	<i>interface-type</i>	Type of monitored interface
	<i>number</i>	Number of the monitored interface

<i>ipv4-address</i>	Monitored IPv4 address. With BFD configured, it refers to the neighbor IP address.
<i>interval-value</i>	The interval of time to probe whether the monitored ip address is reachable or not. If this parameter is not selected, the default value is 3s.
<i>timeout-value</i>	The timeout time of the unreachable monitored ip address. If this parameter is not selected, the default value is 1s.
<i>interface-priority</i>	VRRP priority change range when the interface or ip address reachability status changes. If this parameter is not selected, the default value is 10.

Default configuration

By default, the VRRP function is not enabled on the interface. Even if the VRRP function is enabled, no interface or ip address is specified.

Command mode

Interface configuration mode.

Usage guidelines

This command can be used to monitor the outlet links. Note that layer-3 routable logical interfaces can be monitored (such as Routed Port, SVI, Loopback and Tunnel). This command can also be used to monitor the reachability of the specified IP address.

Examples

The example below enables the VRRP group 1 to monitor the routed port Fa1/1. If the Fa1/1 link is disconnected, the priority of the VRRP group decreases by 30. When the Fa1/1 link recovers, the priority of VRRP group 1 is restored.

```
vrrp 1 track FastEthernet 1/1 30
```

The example below shows how to set the VRRP to track the specified neighbor IP address 192.168.1.3 through BFD:

```
DES-7200#configure terminal
```



```

Enter configuration commands, one per line. End with
CNTL/Z.
DES-7200(config)#interface FastEthernet 0/1
DES-7200(config-if)#no switchport //used on the switch.
DES-7200(config-if)#ip address 192.168.1.1
255.255.255.0
DES-7200(config-if)#bfd interval 50 min_rx 50 multiplier
3
DES-7200(config)#interface FastEthernet 0/2
DES-7200(config-if)#no switchport //used on the switch
DES-7200(config-if)#ip address 192.168.201.17
255.255.255.0

DES-7200(config-if)#vrrp 1 priority 120

DES-7200(config-if)#vrrp 1 ip 192.168.201.1

DES-7200(config-if)#vrrp 1 track bfd FastEthernet
0/1 192.168.1.3 30

DES-7200(config-if)#end

```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.
DES-7200(config-if)# vrrp group priority <i>level</i>	Set the VRRP group priority.

1.1.12 vrrp version

Use this command to configure the version of sending the IPv4 VRRP multicast packets. For the IPv4 VRRP, there are two version: VRRPv2 and VRRPv3.

vrrp group version {2 | 3}

no vrrp group version

Parameter description	Parameter	Description
	2	Use the VRRPv2 version to send the packets.
	3	Use the VRRPv3 version to send the packets.

Default configuration

VRRPv2.

Command mode	Interface configuration mode.						
Usage guidelines	Considering the compatibility of VRRPv2 and VRRPv3 for the IPv4 VRRP, you can choose the version of VRRP packets based on the actual network environment. VRRPv2 is based on RFC3768 and VRRPv3 is based on RFC 5798. This command is applicable to IPv4 VRRP only.						
Examples	The example below configures the version of sending the IPv4 VRRP packets on the interface gig4/1. <pre>vrp 1 version 3</pre>						
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>DES-7200(config-if)# vrp group ip <i>ipaddress</i> [secondary]</td> <td>Enable the VRRP function and set the IP address for the virtual device.</td> </tr> <tr> <td>DES-7200(config-if)# vrp group timers advertise <i>interval</i></td> <td>Set the interval of sending the VRRP advertisement.</td> </tr> </tbody> </table>	Command	Description	DES-7200(config-if)# vrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.	DES-7200(config-if)# vrp group timers advertise <i>interval</i>	Set the interval of sending the VRRP advertisement.
Command	Description						
DES-7200(config-if)# vrp group ip <i>ipaddress</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device.						
DES-7200(config-if)# vrp group timers advertise <i>interval</i>	Set the interval of sending the VRRP advertisement.						

1.2 VRRP Monitoring and Maintenance Commands

1.2.1 debug vrrp

Use this command to turn on the VRRP error prompt, VRRP event, VRRP message and status debug switches. The **no** form of this command turns off the switches.

debug vrrp

no debug vrrp

Default configuration	By default, the debug switches are turned off.
------------------------------	--

Command mode	Privileged mode.
---------------------	------------------

Examples

In the example below, the user turns on the VRRP debug switch.

```
DES-7200# debug vrrp
DES-7200#
VRRP: Grp 1 Advertisement priority 120, ipaddr
192.168.201.213
VRRP: Grp 1 Event - Advert higher or equal priority
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Master
-> Backup
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 1 state Backup
-> Master
DES-7200#
```

Related commands

Command	Description
DES-7200# debug vrrp errors	Turn on the VRRP error prompt debugging switch.
DES-7200# debug vrrp events	Turning on the VRRP event debugging switch.
DES-7200# debug vrrp state	Turning on the VRRP state debugging switch.

1.2.2 debug vrrp errors

Use this command to turn on the VRRP error prompt debug switch. The **no** form of this command turns off the switch.

debug vrrp errors**no debug vrrp errors****Default configuration**

By default, the VRRP error debug switch is turned off.

Command mode

Privileged mode.

Examples

In the example below, the user turns on the VRRP error debug switch.

```
DES-7200# debug vrrp errors
DES-7200#
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
```

```
virtual address 192.168.1.1
VRRP: Grp 1 Advertisement from 192.168.201.213 has invalid
virtual address 192.168.1.1
```

1.2.3 debug vrrp events

Use this command to turn on the VRRP event debug switch. The **no** form of this command turns off the switch.

debug vrrp events

no debug vrrp events

Default configuration	By default, the VRRP event debug switch is turned off.
------------------------------	--

Command mode	Privileged mode.
---------------------	------------------

Examples	In the example below, the user turns on the VRRP event debug switch.
-----------------	--

```
DES-7200# debug vrrp events
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
VRRP: Grp 1 Event - Advert higher or equal priority
```

1.2.4 debug vrrp packets

Use this command to turn on the VRRP packet debug switch. The **no** form of this command turns off the switch.

debug vrrp packets

no debug vrrp packets

Default configuration	By default, the VRRP packet debug switch is turned off.
------------------------------	---

Command mode	Privileged mode.
---------------------	------------------

Examples	In the example below, the user turns on the VRRP packet debug switch, where the checksum of the packets of VRRP group 1 is displayed.
-----------------	---

```
DES-7200# debug vrrp packets
DES-7200#
VRRP: Grp 2 sending Advertisement checksum DD4D
```

```
VRRP: Grp 2 sending Advertisement checksum DD4D
```

```
VRRP: Grp 2 sending Advertisement checksum DD4D
```

In the example below, the user turns on the VRRP packet debug switch, where the source IP address of the VRRP group 1 packets and the priority of VRRP group 1 are displayed.

```
DES-7200# debug vrrp packets
```

```
DES-7200#
```

```
VRRP: Grp 1 Advertisement priority 120, ipaddr  
192.168.201.213
```

```
VRRP: Grp 1 Advertisement priority 120, ipaddr  
192.168.201.213
```

```
VRRP: Grp 1 Advertisement priority 120, ipaddr  
192.168.201.213
```

1.2.5 debug vrrp state

Use this command to turn on the VRRP status debug switch. The **no** form of this command turns off the switch.

debug vrrp state

no debug vrrp state

Default configuration

By default, the VRRP debug switch is turned off.

Command mode

Privilege mode.

Examples

In the example below, the user turns on the VRRP status debug switch.

```
DES-7200# debug vrrp state
```

```
DES-7200#
```

```
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master  
-> Backup
```

```
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Backup  
-> Master
```

```
DES-7200# config terminal
```

```
Enter configuration commands, one per line. End with  
CNTL/Z.
```

```
DES-7200(config)# interface fastethernet 0/0
```

```
DES-7200(config-if)#no shutdown
```

```
DES-7200(config-if)# end
```

```
DES-7200#
```

```
%VRRP-6-STATECHANGE: FastEthernet 0/0 Grp 2 state Master  
-> Init
```

1.3 Showing Related Command

1.3.1 show vrrp

Use this command to show the VRRP information.

show vrrp [*brief* | *group*]

	Parameter	Description
Parameter description	brief	(Optional) Show the brief of the VRRP group.
	<i>group</i>	Number of the VRRP group to be displayed

Command mode

Privileged mode.

Usage guidelines

If no optional parameter is used, the information of all VRRP groups is displayed.

Examples

Show the information of all VRRP groups:

```
DES-7200# show vrrp
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Device is 192.168.201.213 , priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Device is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec
DES-7200#
```

Show the brief information of the VRRP group:

```
DES-7200# show vrrp brief
Interface      Grp Pri Time  Own Pre State  Master addr  Group
addr
FastEthernet 0/0  1  100  -  -  P Backup 192.168.201.213
192.168.201.1
FastEthernet 0/0  2  120  -  -  P Master 192.168.201.217
192.168.201.2
DES-7200#
```

Related commands

Command	Description
DES-7200(config-if)# vrrp group ip ipaddress [secondary]	Enable the VRRP function and set the IP address for the virtual device.

1.3.2 show vrrp interface

Use this command to show the information of the VRRP on the interface.

show vrrp interface *type number* [**brief**]

Parameter description

Parameter	Description
<i>type</i>	Interface type
<i>number</i>	Interface number
brief	(Optional) Show the brief of the VRRP group on the interface.

Command mode

Privileged mode.

Examples

The example below shows the VRRP information on Ethernet interface E1/0

```
DES-7200# show vrrp interface fastethernet 0/0
FastEthernet 0/0 - Group 1
State is Backup
Virtual IP address is 192.168.201.1 configured
Virtual MAC address is 0000.5e00.0101
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 100
Master Device is 192.168.201.213 , pritority is 120
Master Advertisement interval is 3 sec
```

```

Master Down interval is 9 sec
FastEthernet 0/0 - Group 2
State is Master
Virtual IP address is 192.168.201.2 configured
Virtual MAC address is 0000.5e00.0102
Advertisement interval is 3 sec
Preemption is enabled
min delay is 0 sec
Priority is 120
Master Device is 192.168.201.217 (local), priority is 120
Master Advertisement interval is 3 sec
Master Down interval is 9 sec

```

**Related
commands**

Command	Description
DES-7200(config-if)# vrrp <i>group ip ip address</i> [secondary]	Enable the VRRP function and set the IP address for the virtual device

1.3.3 show vrrp packets statistics

Use this command to show the statistics of the VRRP packets transmission.

show vrrp packet statistics [*interface-type interface-number*]

Parameter description	Parameter	Description
	<i>interface-type</i> <i>interface-number</i>	Interface type and number.

**Command
mode**

Privileged mode.

Examples

N/A

**Related
commands**

Command	Description
-	-

2 VRRP Plus Configuration Commands

2.1 Configuration Related Command

2.1.1 vrrp balance

Use this command to enable the VRRP Plus function. Use the **no** form of this command to disable this function.

vrrp group balance

no vrrp group balance

Parameter description	Parameter	Description
	<i>group</i>	Enable the VRRP Plus function on the VRRP of specified group ID.

Default Disabled.

Command mode Interface configuration mode.

Usage guidelines The VRRP function should be configured before enabling the VRRP Plus function.

Examples The following example enables the VRRP Plus function on the layer3 interface FastEthernet0/0.

```
interface FastEthernet 0/0
vrrp 1 ip 192.168.1.1
vrrp 1 balance
```

Related	Command	Description
---------	---------	-------------

vrrp <i>group</i> load-balancing { host-dependent round-robin weighted }	Set the load balancing policy of the VRRP Plus.
show vrrp balance [brief <i>group</i>]	Show the VRRP Plus running status.
show vrrp balance interface <i>type number</i> [brief]	Show the VRRP Plus running status of the specified interface.

2.1.2 vrrp forwarder preempt

Use this command to enable the forwarding preemption on the VRRP Plus backup group. Use the **no** form of this command to disable this function. .

vrrp *group* **forwarder preempt**

no vrrp *group* **forwarder preempt**

	Parameter	Description
Parameter description	<i>group</i>	Enable the forwarding preemption function on the VRRP Plus backup group of specified group ID.
Default		Enabled.
Command mode		Global configuration mode.
Usage guidelines		The VRRP Plus function should be configured before enabling the forwarding preemption.
Examples		<p>The following example enables the forwarding preemption function of the VRRP Plus backup group on the layer3 interface FastEthernet0/0.</p> <pre>interface FastEthernet 0/0 vrrp 1 ip 192.168.1.1 vrrp 1 balance vrrp 1 forwarder preempt</pre>

	Command	Description
Related commands	vrrp group balance	Enable the VRRP Plus function.
	show vrrp balance [brief <i>group</i>]	Show the VRRP Plus running status.
	show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.

2.1.3 vrrp load-balancing

Use this command to set the VRRP Plus load balancing policy. Use the **no** form of this command to restore it to the default setting.

vrrp group load-balancing { **host-dependent** | **round-robin** | **weighted** }

no vrrp group load-balancing { **host-dependent** | **round-robin** | **weighted** }

	Parameter	Description
Parameter description	<i>group</i>	Specify the VRRP group ID.
	host-dependent	Set the host-dependent load balancing policy, so as to use the different virtual MACs to reply the host's ARP request based on different hosts.
	round-robin	Set the round-robin balancing policy, so as to use the different virtual MACs to reply the host's ARP request in turn, which is the default setting.
	weighted	Set the weight balancing policy, so as to perform the ARP reply based on the device weight of the backup group.

Default	Round-robin.
Command mode	Interface configuration mode.
Usage guidelines	The VRRP Plus function should be enabled before setting the VRRP Plus load balancing policy.
Examples	The following example sets the load balancing policy of the VRRP Plus group1 as the host-dependent.

```
DES-7200(config-if)# vrrp 1 ip 192.168.1.1
DES-7200(config-if)# vrrp 1 balance
DES-7200(config-if)# vrrp 1 load-balancing
host-dependent
```

	Command	Description
Related commands	vrrp group balance	Enable the VRRP Plus function.
	show vrrp balance [brief <i>group</i>]	Show the VRRP Plus running status.
	show vrrp balance interface type number [brief]	Show the VRRP Plus running status o the specified interface.

2.1.4 vrrp timers redirect

Use this command to set the redirection interval and timeout of the proxy virtual MAC address for the VRRP Plus backup group. Use the **no** form of this command to restore the redirection interval and timeout to the default value.

vrrp group timers redirect *redirect timeout*

no vrrp group timers redirect

	Parameter	Description
Parameter description	<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.
	<i>redirect</i>	The redirection time, 300 seconds (namely 5 minutes) by default, in the range of 0 to 3600.
	<i>timeout</i>	The timeout, 14400 seconds (namely 4 hours) by default, in the range of (redirect+600) to 64800.

Default

Redirection interval: 300 seconds, redirection timeout: 14400 seconds.

Command mode

Interface configuration mode.

Usage guidelines	The VRRP Plus function should be enabled before setting the redirection interval and timeout of the proxy virtual MAC address for the VRRP Plus backup group.								
Examples	<pre>DES-7200(config-if)# vrrp 1 ip 192.168.1.1 DES-7200(config-if)# vrrp 1 balance DES-7200(config-if)# vrrp 1 timers redirect 300 6000</pre>								
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>vrrp group balance</td> <td>Enable the VRRP Plus function.</td> </tr> <tr> <td>show vrrp balance [brief group]</td> <td>Show the VRRP Plus running status.</td> </tr> <tr> <td>show vrrp balance interface type number [brief]</td> <td>Show the VRRP Plus running status o the specified interface.</td> </tr> </tbody> </table>	Command	Description	vrrp group balance	Enable the VRRP Plus function.	show vrrp balance [brief group]	Show the VRRP Plus running status.	show vrrp balance interface type number [brief]	Show the VRRP Plus running status o the specified interface.
Command	Description								
vrrp group balance	Enable the VRRP Plus function.								
show vrrp balance [brief group]	Show the VRRP Plus running status.								
show vrrp balance interface type number [brief]	Show the VRRP Plus running status o the specified interface.								

2.1.5 vrrp weighting

Use this command to set the weight and threshold of the VRPP Plus backup group. Use the **no** form of this command to restore the two values to default.

vrrp group weighting maximum [lower lower] [upper upper]

no vrrp group weighting

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>group</i></td> <td>VRRP Plus backup group ID, in the range of 1 to 255.</td> </tr> <tr> <td><i>maximum</i></td> <td>Weight, 100 by default, in the range of 1 to 254.</td> </tr> <tr> <td><i>lower</i></td> <td>Weight lower, 1 by default, in the range of 1 to (maximum-1)</td> </tr> <tr> <td><i>upper</i></td> <td>Weight upper, 100 by default, in the range of lower to maximum.</td> </tr> </tbody> </table>	Parameter	Description	<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.	<i>maximum</i>	Weight, 100 by default, in the range of 1 to 254.	<i>lower</i>	Weight lower, 1 by default, in the range of 1 to (maximum-1)	<i>upper</i>	Weight upper, 100 by default, in the range of lower to maximum.
Parameter	Description										
<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.										
<i>maximum</i>	Weight, 100 by default, in the range of 1 to 254.										
<i>lower</i>	Weight lower, 1 by default, in the range of 1 to (maximum-1)										
<i>upper</i>	Weight upper, 100 by default, in the range of lower to maximum.										

Default	<p>VRRP Plus backup group weight: 100.</p> <p>Weight lower: 1.</p> <p>Weight upper: 100.</p>
----------------	--

Command mode	Interface configuration mode.
---------------------	-------------------------------

Usage guidelines	The VRRP Plus function should be enabled before setting the weight and threshold of the VRRP Plus backup group.								
Examples	<p>The following example sets the weight and threshold of the VRRP Plus group1.</p> <pre>DES-7200(config-if)# vrrp 1 ip 192.168.1.1 DES-7200(config-if)# vrrp 1 balance DES-7200(config-if)# vrrp 1 weighting 50 lower 30 upper 50</pre>								
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>vrrp group balance</td> <td>Enable the VRRP Plus function.</td> </tr> <tr> <td>show vrrp balance [brief <i>group</i>]</td> <td>Show the VRRP Plus running status.</td> </tr> <tr> <td>show vrrp balance interface type number [brief]</td> <td>Show the VRRP Plus running status of the specified interface.</td> </tr> </tbody> </table>	Command	Description	vrrp group balance	Enable the VRRP Plus function.	show vrrp balance [brief <i>group</i>]	Show the VRRP Plus running status.	show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.
Command	Description								
vrrp group balance	Enable the VRRP Plus function.								
show vrrp balance [brief <i>group</i>]	Show the VRRP Plus running status.								
show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.								

2.1.6 vrrp weighting track

Use this command to set the track object corresponding to the weight of the VRRP Plus backup group. Use the **no** form of this command to delete the corresponding track object.

vrrp group weighting track *object-number* [**decrement** *value*]

no vrrp group weighting track *object-number*

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>group</i></td> <td>VRRP Plus backup group ID, in the range of 1 to 255.</td> </tr> <tr> <td><i>object-number</i></td> <td>The ID of the track object created by the track module, in the range of 1 to 700.</td> </tr> <tr> <td><i>value</i></td> <td>Weight decrement performed when the track object is down, which is 10 by default and is in the 1 to 255.</td> </tr> </tbody> </table>	Parameter	Description	<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.	<i>object-number</i>	The ID of the track object created by the track module, in the range of 1 to 700.	<i>value</i>	Weight decrement performed when the track object is down, which is 10 by default and is in the 1 to 255.
Parameter	Description								
<i>group</i>	VRRP Plus backup group ID, in the range of 1 to 255.								
<i>object-number</i>	The ID of the track object created by the track module, in the range of 1 to 700.								
<i>value</i>	Weight decrement performed when the track object is down, which is 10 by default and is in the 1 to 255.								

Default No track is configured by default.

Command mode	Interface configuration mode.								
Usage guidelines	The VRRP Plus function should be enabled before setting the track object corresponding to the weight of the VRRP Plus backup group..								
Examples	<pre>DES-7200(config)#track 1 interface gigabitEthernet 0/14 line-protocol DES-7200(config-if)# vrrp 1 ip 192.168.1.1 DES-7200(config-if)# vrrp 1 balance DES-7200(config-if)# vrrp 1 weighting track 1 decrement 50</pre>								
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>vrrp group balance</td> <td>Enable the VRRP Plus function.</td> </tr> <tr> <td>show vrrp balance [brief group]</td> <td>Show the VRRP Plus running status.</td> </tr> <tr> <td>show vrrp balance interface type number [brief]</td> <td>Show the VRRP Plus running status of the specified interface.</td> </tr> </tbody> </table>	Command	Description	vrrp group balance	Enable the VRRP Plus function.	show vrrp balance [brief group]	Show the VRRP Plus running status.	show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.
Command	Description								
vrrp group balance	Enable the VRRP Plus function.								
show vrrp balance [brief group]	Show the VRRP Plus running status.								
show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.								

2.2 Monitoring and maintenance Related Commands

2.2.1 debug vrrp balance

The VRRP Plus module is added the following debugging switch:

- ◆ **debug vrrp balance errors**, which is used to monitor the errors.
- ◆ **debug vrrp balance messages**, which is used to monitor the messages between the VRRP and TRACK modules.
- ◆ **debug vrrp balance packets**, which is used to monitor the VRRP Plus protocol packets.
- ◆ **debug vrrp balance state**, which is used to monitor the VRRP Plus group state.
- ◆ **debug vrrp balance timer**, which is used to monitor the VRRP Plus group timer.

- ◆ **debug vrrp balance event**, which is used to monitor the VRRP Plus group events.
- ◆ **debug vrrp balance**, which is used to monitor all information.

2.2.2 show vrrp balance

1.2.2.1 show vrrp balance interface

Use this command to show the actions of the VRRP Plus group on the specified interface .

show vrrp balance interface *type number* [**brief**]

	Parameter	Description
Parameter description	interface <i>type number</i>	Specify the interface type and number.
	brief	(Optional) show the brief information.

Default -

Command mode Privileged mode.

Usage guidelines -

Examples The following example shows the actions of the VRRP Plus on FastEthernet 0/0.

```
DES-7200# show vrrp balance interface FastEthernet 0/0
FastEthernet 0/0 - Group 1
  State is BVG
  Virtual IP address is 192.168.1.54
  Hello time 1 sec, hold time 3 sec
  Load balancing: host-dependent
  Redirect time 300 sec, forwarder time-out 14400 sec
  Weighting 90 (configured 100), thresholds: lower 1,
  upper 100
  Track object 1, state: down, decrement weight: 10
  There are 2 forwarders
  Forwarder 1 (local)
```



```

MAC address:
    0000.5e00.0101
Owner ID is 00d0.f822.33ab
Forwarder 2
MAC address:
    001a.a916.0201
Owner ID is 00d0.f822.8800

```

Related commands

Command	Description
vrrp group balance	Enable the VRRP Plus function.
vrrp load-balancing { host-dependent round-robin weighted }	Set the load balancing policy of the VRRP Plus.
show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.

1.2.2.2 show vrrp balance

Use this command to show the VRRP Plus brief or details .

show vrrp balance [**brief** | *group*]

Parameter description	Parameter	Description
	brief	(Optional) show the VRRP Plus brief.
	<i>group</i>	(Optional) show the VRRP Plus details.

Default

NA

Command mode

Privileged mode.

Usage guidelines

If no optional parameter is used, the details of all VRRP Plus group are shown.

Examples

The following example shows the details of all VRRP Plus

groups.

```
DES-7200#show vrrp balance
```

```
VLAN 1 - Group 1
```

```
State is BVG
```

```
Virtual IP address is 192.168.1.54
```

```
Hello time 1 sec, hold time 3 sec
```

```
Load balancing: host-dependent
```

```
Redirect time 300 sec, forwarder time-out 14400 sec
```

```
Weighting 90 (configured 100), thresholds: lower 1,  
upper 100
```

```
Track object 1, state: down, decrement weight: 10
```

```
There are 2 forwarders
```

```
Forwarder 1 (local)
```

```
MAC address:
```

```
0000.5e00.0101
```

```
Owner ID is 00d0.f822.33ab
```

```
Forwarder 2
```

```
MAC address:
```

```
001a.a916.0201
```

```
Owner ID is 00d0.f822.8800
```

The following example shows the brief of the VRRP Plus group.

```
DES-7200# show vrrp balance brief
```

```
Interface Grp State Group Addr MAC addr  
VLAN 1 1 BVG 192.168.1.1 0000.5e00.0101
```

Related commands

Command	Description
vrrp group balance	Enable the VRRP Plus function.
vrrp load-balancing { host-dependent round-robin weighted }	Set the load balancing policy of the VRRP Plus.
show vrrp balance interface type number [brief]	Show the VRRP Plus running status of the specified interface.

3

BFD Configuration Commands

3.1 Related Configuration Commands

3.1.1 bfd

Use this command to set the BFD session parameter in the interface configuration mode. Use the **no** form of this command to remove the setting.

bfd interval *milliseconds* **min_rx** *milliseconds* **multiplier** *multiplier-value*

no bfd interval

	Parameter	Description
Parameter description	interval <i>milliseconds</i>	Interval of sending the BFD control messages to the BFD session neighbor. <i>milliseconds</i> : valid range from 50ms to 10000ms.
	min_rx <i>milliseconds</i>	Expected interval of receiving the BFD control messages from the BFD session neighbor. <i>milliseconds</i> : valid range from 50ms to 10000ms.
	multiplier <i>multiplier-value</i>	Count of BFD control message not received from the peer in the configured interval. <i>multiplier-value</i> :: valid range from 3 to 50.

Default

No BFD session parameters by default. Those parameters must be configured before enabling the BFD session.

Command mode

Interface configuration mode.

Usage guidelines	Note that this command is not configurable on the L3 AP. The express forwarding must be enabled before enabling BFD on the routers.										
Examples	The following example shows how to configure the BFD session parameter on Routed Port FastEthernet 0/2: <pre>DES-7200(config)# interface fastEthernet 0/2 DES-7200(config)# no switchport DES-7200(config-if)# bfd interval 100 min_rx 100 multiplier 3</pre>										
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>bfd all-interfaces</td> <td>Configure BFD for all route protocols on the interface.</td> </tr> <tr> <td>clear bfd</td> <td>Clear the BFD session statistics.</td> </tr> <tr> <td>ip ospf bfd</td> <td>Configure BFD for OSPF.</td> </tr> <tr> <td>ip rip bfd</td> <td>Configure BFD for RIP.</td> </tr> </tbody> </table>	Command	Description	bfd all-interfaces	Configure BFD for all route protocols on the interface.	clear bfd	Clear the BFD session statistics.	ip ospf bfd	Configure BFD for OSPF.	ip rip bfd	Configure BFD for RIP.
Command	Description										
bfd all-interfaces	Configure BFD for all route protocols on the interface.										
clear bfd	Clear the BFD session statistics.										
ip ospf bfd	Configure BFD for OSPF.										
ip rip bfd	Configure BFD for RIP.										

3.1.2 bfd all-interfaces

Use this command to configure the BFD for the route protocols in the (RIP, OSPF)router configuration mode. Use the **no** form of this command to disable this function.

bfd all-interfaces

no bfd all-interfaces

Parameter description	Parameter	Description
	-	-

Default	By default, BFD can not be configured for all route protocols on the interface.
----------------	---

Command mode	Route configuration mode.
---------------------	---------------------------

Usage guidelines	Use the following two methods to enable or disable the BFD configuration for route protocols on the interface:
-------------------------	--

1. Use the **[no] bfd all-interfaces** command in the OSPF and RIP route configuration mode;
2. Use the **ip ospf bfd [disable]** or **ip rip bfd [disable]** command in the interface configuration mode.

Examples

The following example shows how to configure the BFD for OSPF on all interfaces:

```
DES-7200(config)# router ospf 123
```

```
DES-7200(config-router)# bfd all-interfaces
```

Related commands

Command	Description
bfd	Configure the BFD session parameter.
ip ospf bfd	Configure the BFD for OSPF.
ip rip bfd	Configure the BFD for RIP.

3.1.3 bfd cpp

Use this command to enable the BFD protection policy in the global configuration command. Use the **no** form of this command to disable BFD CPP.

bfd cpp**no bfd cpp****Parameter description**

Parameter	Description
-	-

Default

Enabled.

Command mode

Global configuration mode.

Usage guidelines

BFD protocol is so sensitive that if the device with BFD function enabled suffers from attack (for example, a large amount of Ping packets attack the device), which lead to the BFD session turbulence, the device can be protected by enabling the BFD protection policy. However, if the BFD function and the BFD protection policy are enabled at the same time, the loss of BFD packets on the attacked device

occurs when the packets sent from the last-hop device go through this device, influencing the BFD session establishment between the last-hop device and other devices. This function is valid only for the switches.

Examples

The following example shows how to enable the BFD protection policy:

```
DES-7200(config)# bfd cpp
```

Related commands

Command	Description
-	-

3.1.4 bfd echo

Use this command to enable the echo mode in the interface configuration mode. Use the **no** form of this command to disable this function.

bfd echo

no bfd echo

Parameter description

Parameter	Description
-	-

Default

Enabled

Command mode

Interface configuration mode.

Usage guidelines

By default, with BFD session parameter configured, the system enables the echo mode automatically. The minimum sending and receiving interval for the echo packets are the values of the configured **interval milliseconds** and **min_rx milliseconds**.

**Caution**

This command can not be configured on the L3 AP port.

Before enabling BFD ECHO mode, it is necessary to use the **no ip redirects** command to disable the ICMP redirection messages sending on the neighbor device of the BFD session, use the **no ip deny land** to disable the DDOS(Land-based attack prevention) function.

With both ends of the BFD session enabled, the Echo mode takes effect.

Examples

The example below shows how to set the echo mode on the Routed Port FastEthernet 0/2:

```
DES-7200(config)# interface fastEthernet 0/2
```

```
DES-7200(config)# no switchport
```

```
DES-7200(config-if)# bfd echo
```

Related commands

Command	Description
bfd	Configure the BFD session parameter.
ip redirects	Enable the ICMP message redirection function.
bfd slow-timer	Configure the slow-timer time.

3.1.5 bfd slow-timer

Use this command to enable the BFD ECHO function and set the slow timer, which is used to send the BFD control packets in the BFD asynchronous mode in the global configuration mode. Use the **no** form of this command to return to the default value.

bfd slow-timer *milliseconds*

no bfd slow-timer

Parameter description	Parameter	Description
	<i>milliseconds</i>	BFD slow-timer time, in ms. In the range of 1000-30000, the default value is 1000ms.

Default	1000ms.				
Command mode	Global configuration mode.				
Usage guidelines	-				
Examples	The example below sets the slow-timer as 14000ms: <pre>DES-7200(config)# bfd slow-timer 14000</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>bfd echo</td> <td>Enable the BFD echo function</td> </tr> </tbody> </table>	Command	Description	bfd echo	Enable the BFD echo function
Command	Description				
bfd echo	Enable the BFD echo function				

3.1.6 bfd up-dampening

Use this command to set the bfd up-dampening time. Use the **no** form of this command to return to the default value.

bfd up-dampening [*milliseconds*]

no up-dampening

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>milliseconds</i></td> <td>(Optional) Set the bfd up-dampening time, in ms. In the range of 0-300000.</td> </tr> </tbody> </table>	Parameter	Description	<i>milliseconds</i>	(Optional) Set the bfd up-dampening time, in ms. In the range of 0-300000.
Parameter	Description				
<i>milliseconds</i>	(Optional) Set the bfd up-dampening time, in ms. In the range of 0-300000.				
Default	0ms, which means that the session state is UP and notifying the application level of the state change immediately.				
Command mode	Interface configuration mode.				
Usage guidelines	-				
Examples	The example below sets the bfd up-dampening time as 60000ms: <pre>DES-7200(config)# bfd up-dampening 60000</pre>				

Related commands	Command	Description
	bfd	Configure the BFD session parameter.

3.1.7 bfd bind peer-ip

Use this command to create a bfd session to co-operate with one interface status in this interface configuration mode. Use the **no** form of this command to remove this session.

bfd bind peer-ip *ip-address* [**source-ip** *ip-address*] **process-pst**

no bfd bind peer-ip *ip-address*

Parameter description	Parameter	Description
	peer-ip <i>ip-address</i>	The peer IP address to be detected, which must directly-connect to the Layer-3 interface.
	source-ip <i>ip-address</i>	Source IP address for sending the BFD packets, which avoids the packets dropped by the URPF in case that this function is used with other functions such as the URPF at the same time.

process-pst	Associate this session with the bfd status of the Layer-3 interface.
--------------------	--

Default	None
----------------	------

Command mode	Interface configuration mode.
---------------------	-------------------------------

Usage guidelines	Note that this command must be configured on the Layer-3 interface and the peer-ip detected must be the address directly-connected to the interface.
-------------------------	--

Examples	The example below detects the peer 1.1.1.2 through BFD on the routed port to generate the BFD status of the
-----------------	---

interface.

```
DES-7200(config)# interface FastEthernet 0/2
DES-7200(config-if)#no sw
DES-7200(config-if)#ip address 1.1.1.1 255.255.255.0
DES-7200(config-if)#bfd bind peer-ip 1.1.1.2 source-ip
1.1.1.1 process-pst
```

Related commands

Command	Description
-	-

3.1.8 ip ospf bfd

Use this command to configure the BFD for OSPF in the interface configuration mode. Use the **no** form of this command to remove this configuration.

ip ospf bfd [disable]

no ip ospf bfd [disable]

Parameter description	Parameter	Description
	disable	(Optional) Disable the configuration of BFD for OSPF on the interface.

Default

Enabled if the keyword **disable** is not input.

Command mode

Interface configuration mode.

Usage guidelines

The following two methods are used to enable or disable the configuration of BFD for OSPF:

1. Use the **[no] bfd all-interfaces** command to enable or disable the configuration of BFD for the routing protocols on all interfaces in the OSPF routing configuration mode.
2. Use the **ip ospf bfd [disable]** command to enable or disable the configuration of BFD for OSPF on the specified interface in the interface configuration mode.

Examples

The example below shows how to disable the configuration of BFD for OSPF on the Routed Port FastEthernet 0/2:

```
DES-7200(config)# interface FastEthernet 0/2
DES-7200(config-if)# no switchport
DES-7200(config-if)# ip ospf bfd disable
```

Related commands	Command	Description
	bfd	Set the BFD session parameters.
	bfd all-interfaces	Configure the BFD for the routing protocols on all interfaces.

3.1.9 ip rip bfd

Use this command to configure the BFD for RIP in the interface configuration mode. Use the **no** form of this command to remove this configuration.

ip rip bfd [disable]

no ip rip bfd

Parameter description	Parameter	Description
	disable	(Optional) Disable the configuration of BFD for RIP on the interface.

Default

Enabled if the keyword **disable** is not input.

Command mode

Interface configuration mode.

Usage guidelines

The following two methods are used to enable or disable the configuration of BFD for RIP:

1. Use the **[no] bfd all-interfaces** command to enable or disable the configuration of BFD for the routing protocols on all interfaces in the RIP routing configuration mode.
2. Use the **ip rip bfd [disable]** command to enable or disable the configuration of BFD for RIP on the specified interface in the interface configuration mode.

Examples

The example below shows how to disable the configuration of BFD for RIP on the Routed Port FastEthernet 0/2:

```
DES-7200(config)# interface FastEthernet 0/2
DES-7200(config-if)# no switchport
DES-7200(config-if)# ip rip bfd disable
```

	Command	Description
Related commands	bfd	Set the BFD session parameters.
	bfd all-interfaces	Configure the BFD for the routing protocols on all interfaces.

3.1.10 ip route static bfd

Use this command to configure the BFD for the static route in the global configuration mode. Use the **no** form of this command to remove this configuration.

ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [*source ip-address*]

no ip route static bfd [**vrf** *vrf-name*] *interface-type interface-number gateway* [*source ip-address*]

	Parameter	Description
Parameter description	vrf <i>vrf-name</i>	(Optional) set the VRF name of the static router.
	<i>interface-type interface-number</i>	Set the interface type and interface number.
	<i>gateway</i>	Set the IP address for the gateway, which is the neighbor IP address for BFD. The static route next-hop of the neighbor detects the reachability of the forwarding path through BFD.
	source <i>ip-address</i>	(Optional) set the source IP address for the BFD session. It is necessary to set this parameter if the distance between the session IP address and the neighbor IP address are multi-hops.

Default

No configuration of BFD for the static route.

Command mode	Global configuration mode.				
Usage guidelines	Note that the BFD session parameters must have been configured before the configuration.				
Examples	<p>The example below shows how to configure the BFD for the static routes and detects the forwarding path between the neighbor 172.16.0.2 through BFD:</p> <pre>DES-7200(config)# interface FastEthernet 0/1 DES-7200(config-if)# no switchport DES-7200(config-if)# ip address 172.16.0.1 255.255.255.0 DES-7200(config-if)# bfd interval 50 min_rx 50 multiplier 3 DES-7200(config)# ip route static bfd FastEthernet 0/1 172.16.0.2 DES-7200(config)# ip route 10.0.0.0 255.0.0.0 FastEthernet 0/1 172.16.0.2</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>bfd</td> <td>Set the BFD session parameters.</td> </tr> </tbody> </table>	Command	Description	bfd	Set the BFD session parameters.
Command	Description				
bfd	Set the BFD session parameters.				

3.1.11 neighbor fall-over bfd

Use this command to configure the BFD for BGP and detects the change of the specified neighbor to speed up the BGP convergence in the route or address-family configuration mode. Use the **no** form of this command to disable this function.

neighbor *ip-address* **fall-over bfd**

no neighbor *ip-address* **fall-over bfd**

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>ip-address</i></td> <td>Specify the BGP neighbor.</td> </tr> </tbody> </table>	Parameter	Description	<i>ip-address</i>	Specify the BGP neighbor.
Parameter	Description				
<i>ip-address</i>	Specify the BGP neighbor.				
Default	No configuration of BFD for BGP.				

Command mode	Route or address-family configuration mode.				
Usage guidelines	Note that the BFD session parameters must have been configured before the configuraiton.				
Examples	<p>The example below shows how to configure the BFD for BGP and detects the forwarding path between the neighbor 172.16.0.2 through BFD:</p> <pre>DES-7200(config)# routerbgp 44000 DES-7200(config-router)# bgp log-neighbors-changes DES-7200(config-router)# neighbor 172.16.0.2 remote-as 45000 DES-7200(config-router)# neighbor 172.16.0.2 fall-over bfd DES-7200(config-router)# end</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>bfd</td> <td>Set the BFD session parameters.</td> </tr> </tbody> </table>	Command	Description	bfd	Set the BFD session parameters.
Command	Description				
bfd	Set the BFD session parameters.				

3.1.12 set ip next-hop verify-avalability

Use this command to configure the BFD for PBR and detects whether the next-hop of the configured PBR is valid or not by the Track method. Use the **no** form of this command to disable this function.

set ip next-hop verify-availability next-hop-address {**track** number |**bfd** [vrf vrf-name]} interface-type interface-number gateway}

no set ip next-hop verify-availability next-hop-address {**track** number |**bfd** [vrf vrf-name]} interface-type interface-number gateway}

Parameter description	Parameter	Description
	vrf <i>vrf-name</i>	Set the VRF name of the static router.
	<i>next-hop-address</i>	Set the next-hop IP address.
	track	Determine whether the next-hop is valid or not by the Track method.
	<i>number</i>	The track object number.
	bfd	Neighbor detection by the

	BFD method.
<i>interface-type</i> <i>interface-number</i>	Set the interface type and interface number.
<i>gateway</i>	Set the IP address for the gateway, which is the neighbor IP address for BFD. The static route next-hop of the neighbor detects the reachability of the forwarding path through BFD.

Default

No configuration of BFD for PBR.

Command mode

Route-map configuration mode.

Usage guidelines

Note that the BFD session parameters must have been configured before the configuration.

Examples

The example below shows how to configure the BFD for PBR and detects the forwarding path between the neighbor 172.16.0.2 through BFD:

```
DES-7200#configure terminal
Enter configuration commands, one per line. End with
CNTL/Z.
DES-7200(config)# route-map Example1 permit 10
DES-7200(config-route-map)# match ip address 1
DES-7200(config-route-map)# set ip precedence priority
DES-7200(config-route-map)#set      ip      next-hop
verify-availability 172.16.0.2 bfd FastEthernet 0/1
172.16.0.2
DES-7200(config-route-map)#end
```

Related commands

Command	Description
bfd	Set the BFD session parameters.

3.1.13 vrrp bfd

Use this command to configure the BFD for VRRP and detects whether the master router is active or not in the interface configuration mode. Use the **no** form of this command to disable this function.

vrrp group-number **bfd** ip-address

no vrrp group-number **bfd** ip-address

	Parameter	Description
Parameter description	<i>group-number</i>	Configure the BFD for the specified VRRP group to detect whether the master router is active or not.
	<i>ip-address</i>	Specify the neighbor IP address.

Default By default, VRRP does not detect whether the master or backup router is active or not through BFD.

Command mode Interface configuration mode.

Usage guidelines Note that the BFD session parameters must have been configured before the configuraiton.

If multiple routers exist in the VRRP group, it is a necessity to use this command to set the neighbor IP address for all possible backup routers.

Examples The example below shows how to configure the BFD for VRRP and detects the forwarding path between the master and backup routers through BFD:

```
DES-7200#configure terminal
Enter configuration commands, one per line. End with
CNTL/Z.
DES-7200(config)#interface FastEthernet 0/1
DES-7200(config-if)#no switchport
DES-7200(config-if)#ip          address      192.168.201.11
255.255.255.0
DES-7200(config-if)#bfd interval 50 min_rx 50 multiplier
3 DES-7200(config-if)#vrrp 1 priority 120
```



```
DES-7200(config-if)#vrrp 1 ip 192.168.201.1
DES-7200(config-if)#vrrp 1 bfd 192.168.201.12
DES-7200(config-if)#end
```

**Related
commands**

Command	Description
bfd	Set the BFD session parameters.

3.2 Showing and Monitoring Commands

3.2.1 show bfd neighbors

Use this command to show the BFD session parameters.

```
show bfd neighbors [vrf vrf-name] [client { bgp | ospf | rip | vrrp |
static-route | vrrp-balance | ldp-lsp | static-lsp | backward-lsp-with-ip | pst}]
[ipv4 ip-address | ipv6 ip-address] [details]
```

Parameter description	Parameter	Description
	vrf <i>vrf-name</i>	(Optional) set the neighbor VRF name.
	client	(Optional) specify the routing protocol.
	bgp	Show the BFD session configuration for BGP.
	ospf	Show the BFD session configuration for OSPF.
	rip	Show the BFD session configuration for RIP.
	vrrp	Show the BFD session configuration for VRRP.
	static-route	Show the BFD session configuration for the static route.
	pbr	Show the BFD session configuration for PBR.
	vrrp-balance	Show the BFD session configuration for the VRPP.
	ldp-lsp	Show the BFD session configuration for the

	LDP-LSP.
backward-lsp-with-ip	Show the BFD session configuration for the LSP backward IP co-operation.
static-lsp	Show the BFD session configuration for the static LSP co-operation.
pst	Show the BFD session configuration and the layer-3 interface status.
ipv4 ip-address	(Optional) Show the session information of the specified IPv4 neighbor.
ipv6 ip-address	(Optional) Show the session information of the specified IPv6 neighbor.
details	(Optional) Show the configurations in detail.

Command mode

Privileged EXEC mode.

Usage guidelines

In the release 10.4(3), the `ldp-lsp`, `static-lsp` and `backward-lsp-with-ip` are not supported by routers, but only supported by DES-7200 series.

Examples

#The following shows the result of the command **show bfd neighbors**:

```
DES-7200# show bfd neighbors
OurAddr  NeighAddr  LD/RD  RH  Holdown(mult)  State
Int
172.16.11.1 172.16.11.2 1/2    1   532 (3 ) Up
Ge2/1
```

#The following shows the result of the command **show bfd neighbors details**:

```
DES-7200# show bfd neighbors details
OurAddr  NeighAddr  LD/RD  RH  Holdown(mult)  State
      Int
172.16.11.1  172.16.11.2  1/2    1    532 (3 )  Up
      Ge2/1

Local Diag: 0, Demand mode: 0, Poll bit: 0
MinTxInt: 200000, MinRxInt: 200000, Multiplier: 3
Received MinRxInt: 50000, Received Multiplier: 3
Holdown (hits): 600(22), Hello (hits): 200(84453)
Rx Count: 49824, Rx Interval (ms) min/max/avg:
208/440/332
Tx Count: 84488, Tx Interval (ms) min/max/avg:
152/248/196 Registered protocols: BGP
Uptime: 02:18:49
Last packet:      Version: 1      -
Diagnostic: 0
I Hear You bit: 1      - Demand bit: 0
Poll bit: 0      - Final bit: 0
Multiplier: 3      - Length: 24
My Discr.: 2      - Your Discr.: 1
Min tx interval: 50000  - Min rx interval: 50000
Min Echo interval: 0
```

Field	Description
OurAddr	Local IP address.
NeighAddr	Neighbor IP address.
LD/RD	Local & Remote identifiers.
RH/RS	Whether the remote session responds the local session.
Holdown(mult)	Time of not receiving the hello packets for the local session and the times of the timeout detection.
State	The current session state.
Int	The interface number for the session.

Session state is UP and using echo function with 50 ms interval	Whether the session is in the echo mode and the echo interval (which is shown only in the echo mode).
Local Diag	Session diagnostic information.
Demand mode	Whether the session poll mode is active or not.
Poll bit	Whether the session configuration has been modified or not.
MinTxInt	The minimum sending interval for the local session.
MinRxInt	The minimum receiving interval for the local session.
Multiplier	The timeout detection times for the local session.
Received MinRxInt	The minimum sending interval for the remote session.
Received Multiplier	The timeout detection times for the remote session.
Holdown (hits)	The session detection time and the times of the timeout detection.
Hello (hits)	The minimum interval of receiving the hello packets after the session negotiation.
Rx Count	The number of BFD packets received by the local session.
Rx Interval (ms) min/max/avg	The minimum, maximum and average intervals of receiving for the local session.

Tx Count	The number of BFD packets sent by the local session.
Tx Interval (ms) min/max/avg	The minimum, maximum and average intervals of sending for the local session.
Registered protocols	The registered protocol type of the session.
Uptime	The time of keeping the session UP.
Last packet	The last BFD packet information received by the local session.

4 DLDP Configuration Commands

4.1 Configuration Related Commands

4.1.1 dldp ip

Use this command to enable the DLDP detection function. Use the **no** form of this command to disable the DLDP detection function for the specified IP address.

dldp ip [*nexthopip*] [**interval** *interval-value* | **retry** *retry-value*] **resume** *resume-value*]

no dldp ip [*nexthopip*]

	Parameter	Description
Parameter description	<i>ip</i>	The peer IP address
	<i>nexthopip</i>	The nexthop IP address
	<i>interval-value</i>	The detection interval time. The valid range is 1-3600, in ticket, 1 ticket≈10ms
	<i>retry-value</i>	The retransmission times. The valid range is 1-3600.
	<i>resume-value</i>	The resume times of the link of the peer device detected. Before changing the link state from DOWN to UP, the continuous DLDP detection packets shall be received. The valid range is 1-200.

Default configuration

Interval:100ms;
 Retry:3;
 Working mode: passive mode;
 Resume: 1.

Command mode	Interface configuration mode.
Usage guidelines	Use this command to enable the DLDP detection function for the rapid detection of the Ethernet link error.
Examples	<p>Example 1: enable the DLDP function for the device 10.83.132.10:</p> <pre>DES-7200(config)# interface fastethernet 1/0 DES-7200(config-if)# dldp 10.83.132.1 DES-7200(config-if)#</pre> <p>Example 2: enable the DLDP function in the passive mode:</p> <pre>DES-7200(config-if)# dldp passive.</pre> <p>Example 3: enable the DLDP function for the across-network-segment device 20.1.1.1 with the nexthop ip 10.1.1.1:</p> <pre>DES-7200(config)# dldp 20.1.1.1 10.1.1.1</pre> <p>Example 4: set the resume as 3:</p> <pre>DES-7200(config)# dldp 1.1.1.1 resume 3</pre>

4.1.2 dldp passive

Use this command to set the DLDP detection in the passive mode. Use the **no** form of this command to return to the default active DLDP detection mode.

dldp passive

no dldp passive

Parameter description	<table border="1"> <thead> <tr> <th style="border: 1px solid black;">Parameter</th> <th style="border: 1px solid black;">Description</th> </tr> </thead> <tbody> <tr> <td style="border: 1px solid black;">-</td> <td style="border: 1px solid black;">-</td> </tr> </tbody> </table>	Parameter	Description	-	-
Parameter	Description				
-	-				
Default configuration	By default, the DLDP detection is in the active mode.				

Command mode	Interface configuration mode.
Usage guidelines	For the point-to-multi-point model, the dldp can be used to set the centralized point as the passive mode to reduce its burden.
Examples	The following example shows how to set the DLDP detection in the passive mode: DES-7200(config-if)# dldp passive

4.2 Showing Related Command

4.2.1 show dldp

Use this command to show the UP and DOWN times on the Ethernet interface in a period time.

show dldp interface [fastEthernet/GigabitEthernet *interface-number*]

	Parameter	Description
Parameter description	<i>interface-number</i>	Specify the Ethernet interface number to the dldp status of next interface only.
	<i>Enter</i>	Press the Enter to show the dldp status on all interfaces.

Command mode	Privileged mode.
Usage guidelines	Use this command to show the UP and DOWN times in a period time on one/all Ethernet interfaces. Dldp menas the dldp link configured. Down times: times of the dldp link chaning from UP to DOWN since last reset. Up times: times of the dldp link changing from DOWN to UP since last reset. Start times means the last reset system time

Examples**Example 1:** show the dldp state of the Ethernet interface 0/1

```
DES-7200(config)#show dldp fastEthernet 0/0.1
===== FastEthernet 0/0.1 =====
dldp          down times  up times start time
dldp 8.8.8.1   1           2           1970-0-1 0:0:31
dldp 8.8.8.10  1           2           1970-0-1 0:0:31
dldp 8.8.8.9   1           2           1970-0-1 0:0:31
```

Example 2: show the dldp state of all Ethernet interfaces :

```
DES-7200(config)#show dldp interface
DES-7200#sh dldp interface
=====FastEthernet 0/0 =====
dldp          down times  up times start time
dldp 7.7.7.1   3           4           2009-1-1 0:0:31
=====FastEthernet0/0.1 =====
dldp          down times  up times start time
dldp 8.8.8.1   1           1           2009-1-1 0:0:31
dldp 8.8.8.10  1           1           2009-1-1 0:0:31
dldp 8.8.8.9   1           1           2009-1-1 0:0:31
=====FastEthernet 0/1 =====
dldp          down times  up times start time
dldp 9.7.7.1   3           2           2009-1-1 0:0:31
```

4.3 Clearing Related Command

4.3.1 clear dldp

Use this command to clear the UP and DOWN times recorded by the link DLDP enabled and then recalculates.

clear-dldp {all | destip [*nexthopip*] }

Parameter description	Parameter	Description
	<i>destip</i>	Destination IP address for the DLDP detection, which is used to clear the UP and DOWN times recorded in the link with IP address specified.
	<i>all</i>	Clear all UP and DOWN times recorded of all Ethernet interfaces.

	<i>destip</i> <i>nexthopip</i>	Clear the UP and DOWN times recorded if the nexthop exists.
Command mode	Privileged mode.	
Usage guidelines	The dldp records the number of UP and DOWN. With this command executed, the UP and DOWN times recorded in the specified/all link on the Ethernet interface are cleared and reset to 0.	
Examples	<p>Example 1: clear the up/down statistical times of all dldps on the Ethernet interface 0/0:</p> <pre>DES-7200(config)#interface fastEthernet 0/0 DES-7200(config-if-FastEthernet 0/0)#clear-dldp all</pre> <p>Example 2: clear the up/down statistical times of the dldp 1.1.1.1 on Ethernet interface 0/0:</p> <pre>DES-7200(config)#interface fastEthernet 0/0 DES-7200(config-if-FastEthernet 0/0)#clear-dldp 1.1.1.1</pre> <p>Example 3: clear the up/down statistical times of the dldp 20.1.1.1 10.1.1.1 on Ethernet interface 0/0:</p> <pre>DES-7200(config)#interface fastEthernet 0/0 DES-7200(config-if-FastEthernet 0/0)#clear-dldp 20.1.1.1 10.1.1.1</pre>	

5 RERP Configuration Commands

5.1 Related Configuration Commands

5.1.1 rerp enable

Use this command to enable RERP globally. Use the **no** form of this command to disable the function.

rerp enable

no rerp enable

Parameter description	N/A.				
Default	Disabled.				
Command mode	Global configuration mode.				
Usage guidelines	Only when the global RERP is enabled, the configuration of other parameters will take effect.				
Examples	The following example shows how to enable RERP: <pre>DES-7200(config)# rerp enable</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>rerp region</td> <td>Create an RERP domain.</td> </tr> </tbody> </table>	Command	Description	rerp region	Create an RERP domain.
Command	Description				
rerp region	Create an RERP domain.				

5.1.2 rerp hello-interval

Use this command to configure the interval at which the RERP sends the Hello message on the primary port. Use the **no** form of this command to restore it to the default value.

rerp hello-interval *interval*

no rerp hello-interval

Parameter description	Parameter	Description
	<i>interval</i>	Interval of sending the Hello message, in the range 1 to 6 seconds
Default	1 seconds.	
Command mode	Global configuration mode.	
Usage guidelines	The detection interval must be less than the failure time.	
Examples	<p>The following example shows how to set the interval as 2s:</p> <pre>DES-7200(config)# rerp hello-interval 2</pre>	
Related commands	Command	Description
	rerp fail-interval	Configure the timeout time.

5.1.3 rerp fail-interval

Use this command to configure the maximum time for the RERP to wait on the secondary port to receive the Hello message from the primary port. This time is also used for the backup and transit device to wait before receiving the master IP address and clear packets. Use the **no** form of this command to restore it to the default value.

rerp fail-interval *num*

no rerp fail-interval

Parameter description	Parameter	Description
	<i>num</i>	Maximum waiting time in the range 3 to 18 seconds
Default	3 seconds.	

Command mode	Global configuration mode.				
Usage guidelines	This command is used together with the detection interval and must be larger than the detection interval.				
Examples	The following example shows how to set the failure interval as 6 seconds: DES-7200(config)# rerp fail-interval 6				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>rerp hello-interval</td> <td>Configure detection interval.</td> </tr> </tbody> </table>	Command	Description	rerp hello-interval	Configure detection interval.
Command	Description				
rerp hello-interval	Configure detection interval.				

5.1.4 rerp region

Use this command to create an RERP region and enter the RERP region configuration mode. Use the **no** form of this command to restore it to the default value.

rerp region *num*

no rerp region *num*

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>num</i></td> <td>Region ID in the range 1 to 64</td> </tr> </tbody> </table>	Parameter	Description	<i>num</i>	Region ID in the range 1 to 64
Parameter	Description				
<i>num</i>	Region ID in the range 1 to 64				
Default	N/A.				
Command mode	Global configuration mode.				
Usage guidelines	When a region is created, this device is allowed to enter this region.				
Examples	The example below demonstrates how to use this command: DES-7200# rerp region 1				
Related	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> </table>	Command	Description		
Command	Description				

commands	rerp enable	Enable RERP globally.
-----------------	--------------------	-----------------------

5.1.5 ring

Use this command to configure the role, control vlan and primary/secondary port of device in the specified region.

ring *num* **role** [**master** | **backup** | **transit**] **ctrl-vlan** *vid* **primary-port interface** *interface-id* **secondary-port interface** *interface-id*

no ring *num*

Parameter	Description
<i>num</i>	Ring ID.
master backup transit	Configure the device as a master/backup/slave device.
<i>vid</i>	Control vlan ID.
<i>interface-id</i>	Interface identifier.

Default N/A.

Command mode RERP region configuration mode.

Usage guidelines Each device plays only one role in a RERP ring. One RERP ring can configure only one master device and one backup device. The port joined the RERP ring is configured as the trunk port automatically, and native vlan is configured as the control vlan automatically.

Examples

```
DES-7200(config)# rerp region 1
DES-7200(config-rerp)# ring 1 role master ctrl-vlan 100
primary-port interface GigabitEthernet 0/1
secondary-port interface GigabitEthernet 0/2
```

Related commands	Command	Description
	rerp region	Create an RERP region.

5.1.6 edge-ring

Use this command to configure the sub-ring. One RERP ring shall be configured before this command execution.

edge-ring *num* **role** [primary-edge|secondary-edge] **ctrl-vlan** *vid*
shared-port interface *interface-id* **sub-port interface** *interface-id*

no ring *num*

	Parameter	Description
Parameter description	<i>num</i>	Ring ID.
	primary-edge secondary-edge	The device on the primary/secondary edge.
	<i>vid</i>	Control VLAN ID.
	<i>interface-id</i>	Interface identifier.

Default N/A.

Command mode RERP region configuration mode.

Usage guidelines The shared port must have been configured in a RERP ring before. That is to say, one RERP ring shall be configured before this command execution.

Examples

```
DES-7200(config)# rerp region 1
DES-7200(config-rerp)# edge-ring 2 role primary-edge
ctrl-vlan 200 shared-port interface GigabitEthernet 0/1
sub-port interface GigabitEthernet 0/3
```

	Command	Description
Related commands	rerp region	Create an RERP domain.
	ring	Configure an RERP ring.

5.1.7 major-ring

Use this command to configure the edge-ring for the specified major-ring in order to enable the messages in the edge-ring to be transmitted on the major-ring interface.

major-ring *num* **edge-ring-vlan** *vid*

Parameter description	Parameter	Description
	<i>num</i>	Major-ring ID.
	<i>vid</i>	Control VLAN ID.
Default	N/A.	
Command mode	RERP region configuration mode.	
Usage guidelines	Major-ring must have been configured before this command execution.	
Examples	<p>The example below demonstrates how to use this command:</p> <pre>DES-7200(config)# rerp region 1 DES-7200(config-rerp)# major-ring 1 edge-ring-vlan 100</pre>	
Related commands	Command	Description
	rerp enable	Enable RERP globally.
	ring	Configure the RERP ring.

5.2 Showing and Monitoring Commands

5.2.1 show rerp

Use this command to show the RERP parameter and status.

show rerp

Command mode	Privileged EXEC mode.
Examples	<pre>DES-7200# show rerp rerp state : enable rerp admin hello interval : 1(*1s) rerp admin fail interval : 3(*1s) rerp edge interval : 1(*300 ms)</pre>


```

rerp local bridge          : 001a.a902.fe0b
-----
region 1
ring                       : 1
rerp oper hello interval  : 1
rerp oper fail interval   : 3
ring master                : 001a.a902.fe0b
ctrl-vlan                  : 100
edge-vlan                  :
role                       : master
primary-port               : Gi 0/4(forwarding)
secondary-port             : Gi 0/21(down)

```

5.2.2 show rerp statistics

Use this command to show the RERP message statistics.

show rerp statistics region *num* ring *ring_id*

Command

mode

Privileged EXEC mode.

Examples

```

DES-7200# sh rerp statistics region 1 ring 1
The statistics for region 1 ring 1 GigabitEthernet 0/4
TX hello packets      23, RX hello packets      0
TX edge-hello packets 0, RX edge-hello packets
0
TX flush packets      0, RX flush packets      0
TX down packets       0, RX down packets       0
TX up packets         0, RX up packets         0
TX major fail packets 0, RX major fail packets
0
TX major resume packets 0, RX major resume packets 0
TX sub complete packets 0, RX sub complete packets 0

The statistics for region 1 ring 1 GigabitEthernet 0/5
TX hello packets      23, RX hello packets      0
TX edge-hello packets 0, RX edge-hello packets
0
TX flush packets      0, RX flush packets      0

```

```

TX down packets      0, RX down packets      0
TX up packets        0, RX up packets      0
TX major fail packets 0, RX major fail packets
0
TX major resume packets 0, RX major resume packets 0
TX sub complete packets 0, RX sub complete packets 0

```

5.2.3 clear rerp statistics

Use this command to clear the RERP message statistics.

clear rerp statistics

Command

mode Privileged EXEC mode.

5.2.4 debug rerp

Use this command to turn on the RERP service debugging switch. The **no** form of this command is used to turn off the debugging switch.

debug rerp [packet | event]

undebug rerp [packet | event]

	Parameter	Description
Parameter description	packet	Turn on the incoming/outgoing packet debugging switch.
	event	Turn on the event debugging switch.

Command

mode Privileged EXEC mode.

6 REUP Configuration Commands

6.1 Related Configuration Commands

The REUP configuration commands include global configuration commands and interface mode configuration commands.

6.1.1 link state track

Use this command to enable the link state track group. The **no** form of this command is used to disable a link state track group

link state track [*num*]

no link state track [*num*]

Parameter description	Parameter	Description
	<i>num</i>	Interface ID of the link aggregation group.
Default	N/A.	
Command mode	Global configuration mode.	
Usage guidelines	First create a link state track group and then add a port into the specified link state track group.	
Examples	<p>The following example shows how to create a link state track group:</p> <pre>DES-7200(config)# link state track 1</pre>	

Related commands	Command	Description
	link state group	Add the port to the specified link state track group.

6.1.2 link state group

Use this command to add the port into the specified link state track group. The **no** form of this command is used to delete a port from the specified link state track group.

link state group *num* {**upstream** | **downstream**}

no link state group

Parameter description	Parameter	Description
	<i>num</i>	ID of the link state track group.
	upstream	Configure the port to be an upstream port in the link state track group.
	downstream	Configures the port to be a downstream port in the link state track group.

Default

The port is not added into any link state track group.

Command mode

Interface configuration mode.

Usage guidelines

First create a link state track group and then add a port into the specified link state track group.

Examples

The following example shows how to add the port fa0/2 into the link state track group:

```
DES-7200(config)# link state track 1
```

```
DES-7200(config)# interface fa 0/2
```

```
DES-7200(config-if)# link state group 1 upstream
```

Related commands	Command	Description
	link state track	Enable a link state track group.

6.1.3 **mac-address-table move update max-update-rate**

Use this command to configure the maximum number of MAC address update packets sent per second.

mac-address-table move update max-update-rate *pkts-per-second*

no mac-address-table move update max-update-rate

	Parameter	Description				
Parameter description	<i>pkts-per-second</i>	The maximum number of MAC address update packets sent per second. It ranges from 0 to 32000, and the default value is 150.				
Default		A maximum of 150 MAC address update packets are sent per second.				
Command mode		Global configuration mode.				
Usage guidelines		When a link is switched, REUP sends a certain number of MAC address update packets to an uplink device in every second to recover downlink data transmission of the uplink device.				
Examples		<p>The following example shows how to configure the maximum number of MAC address update packets sent per second:</p> <pre>DES-7200(config)# mac-address-table move update max-update-rate 20</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>-</td> <td>-</td> </tr> </tbody> </table>	Command	Description	-	-	
Command	Description					
-	-					

6.1.4 **switchport backup interface *interface-id***

Use this command to configure the REUP dual link backup interface.

switchport backup interface *interface-id*

no switchport backup

Parameter description	Parameter	Description
	<i>Interface-id</i>	Interface ID of the backup link.
Default	N/A.	
Command mode	Interface configuration mode.	
Usage guidelines	Enter the primary interface configuration mode, the <i>interface-id</i> in the parameter is for the backup interface. When the active link fails, the backup link transmission is restored rapidly.	
Examples	<p>The following example shows how to set the dual link backup, with <i>fa 0/1</i> and <i>fa 0/2</i> as primary interface and backup interface:</p> <pre>DES-7200(config)# interface fa 0/1 DES-7200(config-if)# switchport backup interface fa 0/2</pre>	
Related commands	Command	Description
	show interface switchport backup	View the dual link backup configuration on the switch.

6.1.5 switchport backup interface *interface-id* preemption

Use this command to configure the REUP link preemption function.

switchport backup interface *interface-id* preemption mode {forced | bandwidth | off }

switchport backup interface *interface-id* preemption delay *delay-time*

no switchport backup interface *interface-id* preemption delay

Parameter description	Parameter	Description
	<i>interface-id</i>	The interface id of the backup link.
	<i>delay-time</i>	The preemption delay time.

Default	The preemption function is disabled by default. The default preemption delay time is 35s.				
Command mode	Interface configuration mode.				
Usage guidelines	<p>The preemption mode includes forced, bandwidth and off. In the bandwidth preemption mode, the interface with high bandwidth has priority over other interfaces to transmit the data. In the forced preemption mode, the primary has priority over backup interfaces to transmit the data. No preemption event occurs in the off preemption mode. By default, the preemption mode is off.</p> <p>The preemption delay refers to the delay time of the link reswitch after the restoration of the link failure.</p>				
Examples	<p>The following example shows how to set the dual link backup, with fa 0/1 and fa 0/2 as the primary interface and backup interface, set the bandwidth preemption mode and 40s preemption delay:</p> <pre>DES-7200(config)# interface fa 0/1 DES-7200(config-if)# switchport backup interface fa 0/2 preemption mode bandwidth DES-7200(config-if)# switchport backup interface fa 0/2 preemption delay 40</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>show interface switchport backup</td> <td>View the dual link backup configuration.</td> </tr> </tbody> </table>	Command	Description	show interface switchport backup	View the dual link backup configuration.
Command	Description				
show interface switchport backup	View the dual link backup configuration.				

6.1.6 mac-address-table move update receive

Use this command to enable REUP to receive the mac-address-table update messages.

mac-address-table move update receive

no mac-address-table move update receive

Default	Disabled.				
Command mode	Global configuration mode.				
Usage guidelines	The dual link backup switchover will lead to the loss of downstream data flow, for the MAC address for the uplink switch has not been updated in time. Therefore, it is necessary to update the MAC address table of the uplink switch, to reduce the loss of L2 data flow. You need to enable the switch of receiving the MAC address update messages on the uplink switch.				
Examples	<pre>DES-7200(config)# mac-address-table move update receive</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mac-address-table move update transit</td> <td>Enable REUP to transmit the mac-address-table update messages.</td> </tr> </tbody> </table>	Command	Description	mac-address-table move update transit	Enable REUP to transmit the mac-address-table update messages.
Command	Description				
mac-address-table move update transit	Enable REUP to transmit the mac-address-table update messages.				

6.1.7 mac-address-table move update receive vlan

Use this command to configure the VLANs processing MAC address update packets.

mac-address-table move update receive vlan *vlan-range*

no mac-address-table move update receive vlan *vlan-range*

Parameter description	Parameter	Description
	<i>vlan-range</i>	Range of the VLANs processing MAC address update packets.

Default	All VLANs process MAC address update packets.
Command mode	Global configuration mode.
Usage guidelines	This command can be used to disable some VLANs from processing MAC address update packets. VLANs disabled

from processing MAC address update packets can still recover downlink data transmission of the uplink device using MAC address update packets, but the capability to provide convergence on link failure will be degraded.

Examples

The following example configures VLANs processing MAC address update packets:

```
DES-7200(config)# no mac-address-table move update
receive vlan 20
```

Related commands

Command	Description
mac-address-table move update receive	Enable REUP to receive MAC address update packets.

6.1.8 mac-address-table move update transit

Use this command to enable REUP to transmit the mac-address-table update messages.

mac-address-table move update transit

no mac-address-table move update transit

Default Disabled.

Command mode Global configuration mode.

Usage guidelines In order to reduce the link switchover and the loss of the downstream data flow, it is necessary to enable the switch of receiving the MAC address update messages on the uplink switch.

Examples

```
DES-7200(config)# mac-address-table move update transit
```

Related commands

Command	Description
mac-address-table move update transit vlan	Enable REUP to transmit the mac-address-table update messages.

6.1.9 mac-address-table move update transit vlan

Use this command to enable REUP to transmit the mac-address update messages.

mac-address-table move update transit vlan *vid*

no mac-address-table move update transit vlan

Parameter description	Parameter	Description				
	<i>vid</i>	ID of the VLAN transmitting MAC address update packets.				
Default	Transmit the MAC-address update messages in the default VLAN on the port.					
Command mode	Interface configuration mode.					
Usage guidelines	When a link is switched, the VLAN enabled to transmit MAC address update packets will send MAC address update packets to its uplink device.					
Examples	<p>The following example configures VLANs transmitting MAC address update packets:</p> <pre>DES-7200(config)# mac-address-table move update transit</pre>					
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>mac-address-table move update transit</td> <td>Enable REUP to receive the mac-address-table update messages.</td> </tr> </tbody> </table>	Command	Description	mac-address-table move update transit	Enable REUP to receive the mac-address-table update messages.	
Command	Description					
mac-address-table move update transit	Enable REUP to receive the mac-address-table update messages.					

6.1.10 mac-address-table update group

Use this command to set the mac-address-table update group.

mac-address-table update group [*group-num*]

no mac-address-table update group

Parameter description	Parameter	Description
	<i>group-num</i>	The mac-address-table update group

	ID.				
Default	The default group number is 1. By default, no mac-address-table update group is configured.				
Command mode	Interface configuration mode.				
Usage guidelines	In order to reduce the flood due to the MAC address update and the influence on the normal data transmission of the switch, DES-7200products add a configuration of MAC address update group. Only if all the interfaces are added to a MAC address update group, the downstream data transmission be restored rapidly.				
Examples	<pre>DES-7200(config-if)# mac-address-table update group 2</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>show mac-address-table update group detail</td> <td>Show the mac-address-table update group information.</td> </tr> </tbody> </table>	Command	Description	show mac-address-table update group detail	Show the mac-address-table update group information.
Command	Description				
show mac-address-table update group detail	Show the mac-address-table update group information.				

6.1.11 switchport backup interface *interface-id* prefer instance

Use this command to configure VLAN load balancing on a link. The **no** form of this command is used to delete the configured VLAN load strategy.

switchport backup interface *interface-id* prefer instance *instance-range*

no switchport backup interface *interface-id* prefer

Parameter description	Parameter	Description
	<i>interface-id</i>	Interface ID of the backup link.
	<i>instance-range</i>	Instance range of loading on the backup interface.

Default No VLAN load on the backup interface.

Command mode	Interface configuration mode.						
Usage guidelines	MSTP instance mapping can be used to modify the mapping between an instance and a VLAN.						
Examples	<p>The following example configures VLAN load balancing on dual links.</p> <pre>DES-7200(config)# interface gigabitEthernet 0/1 DES-7200(config-if)# switchport backup interface gigabitEthernet 0/2 prefer instance 1</pre>						
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>show interface switchport backup</td> <td>Show the configuration of dual-link backup on the switch.</td> </tr> <tr> <td>spanning-tree mst configuration</td> <td>Configure MSTP instances.</td> </tr> </tbody> </table>	Command	Description	show interface switchport backup	Show the configuration of dual-link backup on the switch.	spanning-tree mst configuration	Configure MSTP instances.
Command	Description						
show interface switchport backup	Show the configuration of dual-link backup on the switch.						
spanning-tree mst configuration	Configure MSTP instances.						

6.2 Showing and Monitoring Commands

6.2.1 show link state group

Use this command to show the information of a link state track group.

show link state group *num*

Parameter description	Parameter	Description
	<i>num</i>	ID of a link state track group.

Default None

Command mode Privileged EXEC mode.

Examples

The following example shows the link state track group:

```
DES-7200# show link state group
Link State Group:1 Status: Enabled, UP
Upstream Interfaces :Gi0/1(Up)
Downstream Interfaces :Gi0/3(Dwn), Gi0/4(Dwn)
```

```

Link State Group:2  Status: Disabled, Down
Upstream Interfaces :
Downstream Interfaces :

(Up):Interface up (Dwn):Interface Down (Dis):Interface
disabled

```

6.2.2 show interfaces [*interface-id*] switchport backup [detail]

Use this command to show the dual link backup information on the interfaces.

show interfaces [*interface-id*] switchport backup [detail]

	Parameter	Description
Parameter description	<i>interface-id</i>	The interface id of the dual link backup.
	detail	Show the detailed information about the dual link backup.

Default Show the dual link backup information on all interfaces.

Command mode Privileged EXEC mode.

Examples

```

DES-7200# show interfaces switchport backup detail

Switch Backup Interface Pairs:

Active Interface      Backup Interface      State
-----
Gi0/23                Gi0/24                Active
Up/Backup Standby

Interface Pair : Gi0/23, Gi0/24

Preemption Mode : Off

Preemption Delay : 35 seconds

Bandwidth : Gi0/23(1000 Mbits), Gi0/24(1000 Mbits)

```

6.2.3 show mac-address-table update group detail

Use this command to show the mac-address-table update group information.

show mac-address-table update group detail

Parameter description	Parameter	Description
	detail	Show the detailed information about the mac-address-table update group.
Default	Show the mac-address-table update group information.	
Command mode	Privileged EXEC mode.	
Examples	<pre> DES-7200# configure terminal DES-7200(config)# mac-address-table move update receive DES-7200(config)# interface range gigabitEthernet 0/3-4 DES-7200(config-if-range)# mac-address-table update group DES-7200(config-if-range)# end DES-7200# show mac-address-table update group detail Mac-address-table Update Group:1 Received mac-address-table update message count:7 Group member Receive Count Last Receive Switch-ID Receive Time ----- ----- GigabitEthernet 0/3 0 0000.0000.0000 GigabitEthernet 0/4 0 0000.0000.0000 </pre>	

7

RLDP Configuration Command

7.1 Configuration Related Commands

The RLDP configuration commands include global configuration commands, interface mode configuration commands and privilege mode configuration commands.

7.1.1 rldp enable

Use this command to enable RLDP globally. Use the **no** form of this command to disable the function.

rldp enable

no rldp enable

Parameter description	N/A.				
Default	Disabled.				
Command mode	Global configuration mode.				
Usage guidelines	You can enable RLDP on the interface only when the global RLDP is enabled.				
Examples	The following example shows how to enable RLDP: <pre>DES-7200(config)# rldp enable</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>rldp port</td> <td>Enable the RLDP function on the port.</td> </tr> </tbody> </table>	Command	Description	rldp port	Enable the RLDP function on the port.
Command	Description				
rldp port	Enable the RLDP function on the port.				

7.1.2 rldp detect-interval

Use this command to configure the interval at which the RLDLP sends the detection message on the port. Use the **no** form of this command to restore it to the default value.

rldp detect-interval *interval*

no rldp detect-interval

Parameter description	Parameter	Description
	<i>interval</i>	Detection interval in the range 2 to 15 seconds
Default	3 seconds.	
Command mode	Global configuration mode.	
Usage guidelines	In the environment where STP is enabled, it is recommended that the product of interval multiplying the maximum number of detections is less than the topology convergence time of STP.	
Examples	<p>The following example shows how to set the detection interval as 5s:</p> <pre>DES-7200(config)# rldp detect-interval 5</pre>	
Related commands	Command	Description
	rldp detect-max	Set the maximum number of detections.

7.1.3 rldp detect-max

Use this command to set the maximum number of sending detection packets on the port. If the neighboring port does not respond when this detection number is exceeded, the link is considered faulty. Use the **no** form of this command to restore it to the default value.

rldp detect-max *num*

no rldp detect-max

Parameter description	Parameter	Description
	<i>num</i>	Maximum number of detections in the range 2 to 10
Default	2.	
Command mode	Global configuration mode.	
Usage guidelines	This command is used together with the detection interval to specify the maximum number of detections.	
Examples	<p>The following example shows how to set the maximum number of detections as 5:</p> <pre>DES-7200(config)# rldp detect-max 5</pre>	
Related commands	Command	Description
	rldp detect-interval	Set the detection interval.

7.1.4 rldp port

Use this command to enable RLDLP on the port and specify detection type and troubleshooting method. Use the **no** form of this command to disable the function.

rldp port {**unidirection-detect** | **bidirection-detect** | **loop-detect**} {**warning** | **shutdown-svi** | **shutdown-port** | **block**}

no rldp port { **unidirection-detect** | **bidirection-detect** | **loop-detect** }

Parameter description	Parameter	Description
	unidirection-detect	Set unidirectional link detection.
	bidirection-detect	Set bidirectional link detection.
	loop-detect	Set loop detection type.
	warning	Warn the user.
	shutdown-svi	Shutdown the SVI the port belongs to.

	<table border="1"> <tr> <td>shutdown-port</td> <td>Shutdown the port.</td> </tr> <tr> <td>block</td> <td>Disable the learning-forwarding function of the port.</td> </tr> </table>	shutdown-port	Shutdown the port.	block	Disable the learning-forwarding function of the port.
shutdown-port	Shutdown the port.				
block	Disable the learning-forwarding function of the port.				
Default	N/A.				
Command mode	Interface configuration mode.				
Usage guidelines	The RLDP detection on the port takes effect only when the global RLDP is enabled.				
Examples	<p>The following example demonstrates how to configure RLDP detection on fas 0/1, specify the detection type as loop detection, and troubleshooting method as block.</p> <pre>DES-7200(config)# interface fas 0/1 DES-7200(config-if)# rldp port loop-detect block</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>rldp enable</td> <td>Enable RLDP globally.</td> </tr> </tbody> </table>	Command	Description	rldp enable	Enable RLDP globally.
Command	Description				
rldp enable	Enable RLDP globally.				

7.1.5 rldp reset

Use this command to make all the ports that have been handled using **rldp shutdown** or **disable** to perform RLDP detection again.

rldp reset

Parameter description	N/A.
Default	N/A.
Command mode	Privileged EXEC mode.
Examples	<p>The example below demonstrates how to use this command:</p> <pre>DES-7200# rldp reset</pre>

Related commands	Command	Description
	rldp enable	Enable RLDP globally.

7.2 Showing and Monitoring Commands

7.2.1 show rldp

Use this command to show the RLDP information.

show rldp [**interface** *interface-id*]

Parameter description	Parameter	Description
	<i>interface-id</i>	Interface ID

Command mode	Privileged EXEC mode.
---------------------	-----------------------

7.2.2 debug rldp

Use this command to turn on the RLDP service debugging switch. The **no** form of this command is used to turn off the debugging switch.

- **debug rldp** [**packet** | **event** | **error**]
- **undebug rldp** [**packet** | **event** | **error**]

Parameter description	Parameter	Description
	packet	Turn on the incoming/outgoing RLDP packet debugging switch.
	event	Turn on the event debugging switch.
	error	Turn on the error debugging switch.

Command mode	Privileged EXEC mode.
---------------------	-----------------------

8 TPP Configuration Commands

8.1 Configuration Related Commands

8.1.1 topology guard

In the global configuration command mode, use this command to enable the topology protection function. Use the **no** form of this command to disable the topology protection function.

[no] topology guard

Default configuration

Enabled.

Command mode

Global configuration mode.

Usage guidelines

The topology protection function is enabled by default, so as to protect the network against topology oscillation due to attacks. It should be used with the **cpu topology-limit** command.

Examples

The following example shows how to enable and disable the global topology protection function:

```
DES-7200(config)# topology guard
DES-7200(config)# no topology guard
```

Related commands

Command	Description
tp-guard port enable	Enable the topology protection function on the interface.
cpu topology-limit	Set the CPU utilization limitation.

8.1.2 tp-guard port enable

Use this command to enable the topology protection function on the port. Use the **no** form of this command to disable the function.

[no] tp-guard port enable

Parameter description	N/A.				
Default configuration	N/A.				
Command mode	Interface configuration mode.				
Usage guidelines	If both the global topology protection function and the topology protection function of the port are enabled, the remote device of this port will be notified when the CPU utilization of the local device is too high or there are other problems with the local device. This command is applicable to the layer 2 switching interfaces and routing interfaces. Other interfaces (including AP member port) do not support this command.				
Examples	The following example shows how to configure the topology protection function for the port: <pre>DES-7200(config-if)# tp-guard port enable DES-7200(config-if)# no tp-guard port enable</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>topology guard</td> <td>Enable the topology protection function globally.</td> </tr> </tbody> </table>	Command	Description	topology guard	Enable the topology protection function globally.
Command	Description				
topology guard	Enable the topology protection function globally.				

8.2 Showing Related Commands

8.2.1 show tpp

Use this command to show the configuration of topology protection.

show tpp

Parameter description	N/A.				
Default configuration	N/A.				
Command mode	Privileged EXEC mode.				
Usage guidelines	This command is used to view the current TPP configuration and port detection.				
Examples	<p>The following example shows how to display information about the topology protection function:</p> <pre>DES-7200# show tpp</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>topology guard</td> <td>Enable the topology protection function globally.</td> </tr> </tbody> </table>	Command	Description	topology guard	Enable the topology protection function globally.
Command	Description				
topology guard	Enable the topology protection function globally.				

9

NLB GROUP Configuration Commands

9.1 Configuration Related Commands

9.1.1 nlb-group

Use this command to create a cluster group and specify the cluster's attributes (VRF, IP address and reflector port) or the port connecting the cluster with device. The **no** form of this command is used to delete the cluster's attributes or delete the port connecting with the cluster separately.

nlb-group *group-number* [**vrf** *vrf-name*] **ip** *nlb-address* [**reflector-port** *interface-name*]

nlb-group *group-number* **destination-port** *interface-name*

no nlb-group *group-number* [[**vrf** *vrf-name*] **ip** *nlb-address* [**reflector-port** *interface-name*]]

no nlb-group *group-number* [**destination-port** *interface-name*]

no nlb-group all

Parameter description	Parameter	Description
	<i>group-number</i>	Cluster group number
	<i>vrf-name</i>	VRF name
	<i>nlb-address</i>	NLB address
	reflector-port <i>interface-name</i>	Reflector port, which serves as a relay port to send the packets to the cluster. For the interface-name, please specify the corresponding interface number and it can be the physical port (the L2AP excluded) only.

	destination-port <i>interface-name</i>	Port connecting the cluster with device. For the interface-name, please specify the corresponding interface number and it can be the physical port (the L2AP included) only, but not the SVI or Routed Port.
--	--	---

Default configuration N/A

Command mode Global configuration mode.

The Switch Port and L2AP can be both configured as the cluster connecting port. However, only the Switch Port can be set as the reflector port. Only after configuring the cluster's VRF, IP address and reflector port, the packets are allowed to be routed to the connecting port. If no cluster's connecting port is configured, the packets will flood in the VLAN belonging to the cluster.

With the cluster's VRF, IP address and reflector port deleted, the packets routed to the cluster can only be routed to the single server of the cluster.

When deleting, if no cluster attributes or connecting ports are specified, the entire cluster group will be removed.

Use the command **show nlb-group** to show the cluster configurations.

Usage guidelines



Caution

- After a port has been configured as a reflector port, other configurations are not allowed for this port.
- One port can not be both the reflector port and connecting port.
- After configuring the cluster attributes, the cluster service is enabled only on the connecting port with cluster configured.
- If no cluster attribute is configured, the cluster service is not enabled.
- No VRF keyword means the global VRF takes effect.
- Up to 5 cluster groups can be configured on each switch and up to 16 connecting ports are configurable on per cluster group.

Examples

The following example creates a cluster group and configures the cluster attributes and the cluster connecting port.

```
DES-7200(config)# nlb-group 1 vrf vpn-1 ip 192.168.10.1
reflecter-port gigabitethernet 0/1
```

```
DES-7200(config)# nlb-group 1 destination-port
gigabitethernet 0/2, 0/3
```

The following example deletes the cluster attributes of cluster group1:

```
DES-7200(config)# no nlb-group 1 vrf vpn-1 ip 192.168.10.1
reflecter-port gigabitethernet 0/1
```

The following example deletes the connecting port of cluster group1.

```
DES-7200(config)# no nlb-group 1 destination-port
gigabitethernet 0/2, 0/3
```

Related commands

Command	Description
show nlb-group	Show the cluster configurations.

Platform description

-

9.2 Show Related Command

9.2.1 show nlb-group

Use this command to show the cluster configurations.

show nlb-group [*group_number*].

Parameter description	Parameter	Description
	<i>group-number</i>	Cluster group number

Default configuration

All cluster groups are shown by default.

Command mode

Privileged mode.

Usage guidelines

N/A

The following example shows the cluster configurations.

```
DES-7200# show nlb-group 1

group-number: 1
cluster-vrf: vpn-1
cluster-ip: 192.168.10.1
destination-port: Gi 0/2, Gi 0/3, Gi 0/3
```

Examples

Field	Description
group-number	Cluster group number.
destination-port	Port connecting the cluster with device.
cluster-vrf	Cluster VRF name.
cluster-ip	Cluster IP address.
reflector-port	Reflector port.

Related commands

Command	Description
nlb-group	Create a cluster group and specify the cluster attributes and the port connecting the cluster with device.

Command mode

-

10 Supervisor Engine Redundancy Configuration Commands

10.1 Related Configuration Commands

The configuration commands for supervisor engine redundancy include the redundant mode commands and privileged mode commands.

10.1.1 auto-sync

Use this command to synchronize running-config and startup-config in the case of redundancy of dual supervisor engines. Use the **no** form of this command to disable the function.

auto-sync { **standard** | **running-config** | **startup-config**}

no auto-sync { **standard** | **running-config** | **startup-config**}

	Parameter	Description
Parameter description	standard	Synchronize all the system files.
	running-config	Synchronize the runtime configuration files.
	startup-config	Synchronize the startup configuration files.

Default All the files are synchronized by default.

Command mode Redundancy configuration mode.

Usage guidelines Generally the **standard** synchronization should be used if there is no special requirement.

Examples

The following example only synchronizes the **startup-config** files

```
DES-7200(config)# redundancy
DES-7200(config-red)# auto-sync startup-config
DES-7200(config-red)# exit
```

The following example synchronizes all the files other than the startup-config files.

```
DES-7200(config)# redundancy
DES-7200(config-red)# no auto-sync startup-config
DES-7200(config-red)# exit
```

**Platform
description**

This command is supported on DES-7200.

10.1.2 auto-sync time-period

Use this command to configure the auto-sync time-period of running-config and startup-config when the dual supervisor engines is redundant. Use the **no** form of this command to disable the function.

auto-sync time-period *value*

no auto-sync time-period

Parameter description	Parameter	Description
	<i>value</i>	Auto-sync time-period interval (second).

Default

Auto-sync with 1 hour (3600 seconds) time-period interval

**Command
mode**

Redundancy configuration mode.

**Usage
guidelines**

Use standard synchronization if there is no particular demand.

Examples

The following example only synchronizes the startup-config file:

```
DES-7200(config)# redundancy

DES-7200(config-red)# auto-sync time-period 60

Redundancy auto-sync time-period: enabled (60 seconds).
DES-7200(config-red)# exit
```

The following example disables auto-sync:

```
DES-7200(config)# redundancy

DES-7200(config-red)# no auto-sync time-period

Redundancy auto-sync time-period: disabled.
DES-7200(config-red)# exit
```

**Platform
description**

This command is supported on DES-7200.

10.1.3 redundancy

Use this command to enter redundancy configuration mode in the global configuration mode.

redundancy**Command
mode**

Global configuration mode.

**Usage
guidelines**

Enter the redundancy configuration mode in the global configuration mode to execute the redundant mode commands like auto-sync、auto-sync time-period、switchover timeout,etc, to do the related redundancy configuration.

Examples

```
DES-7200# config terminal
DES-7200(config)# redundancy
DES-7200(config-red)# exit
```

Platform description	This command is supported on DES-7200.
-----------------------------	--

10.1.4 redundancy reload

In the privileged EXEC mode, use the **redundancy reload** command to reset slave device or reset both master and slave devices.

redundancy reload {peer | shelf}

Parameter description	Parameter	Description
	peer	Reset the slave device only.
	shelf	Reset the master and slave devices.

Default	N/A.
----------------	------

Command mode	Privileged EXEC mode.
---------------------	-----------------------

Usage guidelines	The redundancy reload peer does not affect the data transfer. During the resetting of the Slave, the data transfer is not disconnected and the user session information is not lost.
-------------------------	---

Examples	<pre>DES-7200# redundancy reload peer Reload peer? [confirm] y Preparing to reload peer</pre>
-----------------	---

Related commands	Command	Description
	reload	Reset the master supervisor engine.

Platform description	This command is supported on DES-7200.
-----------------------------	--

10.1.5 redundancy forceswitch

In privileged EXEC mode, use this command to enforce Slave supervisor engine to switchover.

redundancy forceswitch

Parameter description	N/A.				
Command mode	Privileged EXEC mode.				
Usage guidelines	This command allows you to select the slot in which the supervisor engine serves as the master supervisor engine and that as the slave supervisor engine, or the slot in which the supervisor engine is superior to that in another slot as the master board.				
Examples	<pre>DES-7200# redundancy forceswitch Proceed with switchover to standby PRE? [confirm]</pre>				
Related commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>reload</td> <td>Reset the master supervisor engine.</td> </tr> </tbody> </table>	Command	Description	reload	Reset the master supervisor engine.
Command	Description				
reload	Reset the master supervisor engine.				
Platform description	This command is supported on DES-7200.				

10.1.6 switchover timeout

In the redundancy configuration mode, use the **switchover timeout** command to configure the switchover timeout value for the supervisor engine. Use the **no** form of this command to restore the timeout to the default value.

switchover timeout *timeout-period*

no switchover timeout

Parameter description	<table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>timeout-period</i></td> <td>Switchover timeout in the range 160 to 25,000 (milliseconds).</td> </tr> </tbody> </table>	Parameter	Description	<i>timeout-period</i>	Switchover timeout in the range 160 to 25,000 (milliseconds).
Parameter	Description				
<i>timeout-period</i>	Switchover timeout in the range 160 to 25,000 (milliseconds).				
Default	4000 milliseconds.				

Command mode	Redundancy configuration mode.
Usage guidelines	When the slave device has not received a heartbeat message of the master device within the timeout period, the switchover will occur. If you are not sure, do not modify the default value.
Examples	<pre>DES-7200# config terminal DES-7200(config)# redundancy DES-7200(config-red)# DES-7200(config-red)# switchover timeout 4000 DES-7200(config-red)# exit DES-7200(config)# exit DES-7200(config)#</pre>
Platform description	This command is supported on DES-7200.

10.2 Showing and Monitoring Commands

10.2.1 show redundancy auto-sync

Use command **show redundancy auto-sync** to show the current redundancy auto-sync mode in user EXEC or privileged EXEC mode. For the detailed information, please refer to auto-sync description in previous text.

show redundancy auto-sync

Default	N/A
Command mode	User mode or Privileged EXEC mode.
Examples	<pre>DES-7200> enable DES-7200# show redundancy auto-sync Redundancy auto-sync mode: auto-sync standard. ...</pre>

Platform description	This command is supported on DES-7200.
-----------------------------	--

10.2.2 show redundancy states

Use this command to show the current redundancy in the user mode or privileged EXEC mode.

show redundancy states

Parameter description	Parameter	Description
	states	Show the redundancy status of the master or the slave devices.

Default	N/A.
----------------	------

Command mode	User mode or privileged EXEC mode
---------------------	-----------------------------------

Usage guidelines	N/A.
-------------------------	------

Examples	<pre>DES-7200> enable DES-7200# configure terminal Enter configuration commands, one per line. End with CNTL/Z. DES-7200# show redundancy states Redundancy states: My state = 19 -ACTIVE peer state = 37 -STANDBY HOT ...</pre>
-----------------	---

Platform description	This command is supported on DES-7200.
-----------------------------	--

10.2.3 show redundancy switchover timeout

Use **show redundancy switchover timeout** command to show current redundant switchover timeout time in user EXEC or privileged EXEC mode.

show redundancy switchover timeout

Default	N/A
Command mode	User mode or Privileged EXEC mode.
Examples	<pre>DES-7200> enable DES-7200# show redundancy switchover redundancy switch timeout is : 4000 ms. ...</pre>
Platform description	This command is supported on DES-7200.