

QoS Command

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Chapter 1 QoS configuration Command

1.1 QoS configuration Command

1.1.1 class

The configuration command “class” in the configuration status of policy mapping can be used for configuring the name of class mapping used by current policy mapping, the occupied bandwidth and queue limit. The “no” format of the command can be used for deleting a class mapping or restoring the default value of parameter.

Syntas

class *class-name* **bandwidth** *bandwidth(kbps)* [**queue-limit** *packet-number*]
no class *class-name* [**bandwidth** *bandwidth(kbps)*] [**queue-limit** *packet-number*]

Parameter

Parameter	Description
<i>class-name</i>	The name of class mapping (the maximum length is 64 bytes)
<i>bandwidth</i>	Size of bandwidth
<i>packet-number</i>	The maximum length of queue

default

The default value of the maximum length of queue is 64, the size of bandwidth has no default value

Command mode

Policy Mapping Configuration Mode

Explanation

none

Relevant command

class-map
policy-map
service-policy

1.1.2 class-map

The global configuration command “class-map” can be used for defining some class stream. The “no” format of the command can be used for deleting some class mapping.

Syntas

class-map *class-name* **match protocol** *protocol-type*

class-map *class-name* **match interface** *interface-type interface-number*

class-map *class-name* **match access-group** *list-name*

no class-map *class-name*

Parameter

Parameter	Description
<i>class-name</i>	Name of class mapping (maximum length is 64 bytes)
<i>protocol-type</i>	Type of Protocol
<i>interface-type</i>	Name of interface
<i>interface-number</i>	Number of interface
<i>List-name</i>	Name of access list

default

None

Command mode

global communication mode

Explanation

none

Relevant command

class

policy-map

service-policy

1.1.3 custom-queue-list

The interface configuration command “custom-queue-list” can be used for using CQ algorithm on an interface. The “no” format of the command can be used for canceling CQ algorithm.

Syntas

custom-queue-list *list-number*

no custom-queue-list *list-number*

Parameter

Parameter	Description
<i>list-number</i>	User-defined list number(1-16)

default

None

Command mode

Interface configuration mode

Explanation

None

Relevant command

queue-list default

queue-list interface

queue-list protocol

queue-list queue byte-count

queue-list queue limit

1.1.4 fair-queue

The interface configuration command “fair-queue” can be used for using fair queue policy. The “no” format of the command can be used for canceling fair queue policy (restoring to “first-in, first-out”)

Syntas

fair-queue

no fair-queue

Parameter

none

Default

On the interface with an operating rate of 2.048Mbps or less, WFQ is the default queue mode.

Command mode

Interface configuration mode

Explanation

The command is disabled on the interface configured with X25 and LAPB

Relevant command

class

class-map

policy-map

service-policy**1.1.5 policy-map**

The global configuration command “policy-map” can be used for configuring a policy mapping. The “no” format of the command can be used for deleting some policy mapping.

Syntas

policy-map *policy-name*

no policy-map *policy-name*

Parameter

Parameter	Description
<i>policy -name</i>	Name of policy mapping (the maximum length is 64 bytes)

default

None

Command mode

global communication mode

Explanation

The configuration status of policy mapping can be accessed by using executing the command.

Relevant command

class

class-map

service-policy

1.1.6 priority-group

The interface configuration command can be used for using PQ algorithm on an interface. The “no” format of the command can be used for canceling PQ algorithm.

Syntas

priority-group *list-number*

no priority-group *list-number*

Parameter

Parameter	Description
<i>list-number</i>	Number of priority list(1-16)

default

None

Command mode

Interface configuration mode

Explanation

None

Relevant command**priority-list default****priority-list interface****priority-list protocol****priority-list queue-limit****1.1.7 priority-list default**

The global configuration command “priority-list default” can be used for distributing a priority queue for the data packet that does not comply with any rules of priority list. The “no” format of the command can be used for restoring default value.

Syntas**priority-list *list-number* default {high | medium | normal | low}****no priority-list *list-number* default****Parameter**

Parameter	Description
<i>list-number</i>	Number of priority list(1-16)
high medium normal low	Priority level

default

The default value of each priority list is normal

Command mode

global communication mode

Explanation

None

Relevant command

priority-group
priority-list interface
priority-list protocol
priority-list queue-limit

1.1.8 priority-list interface

The global configuration command “priority-list interface” can be used for creating queue priority for the data packet accessed to some given interface. The “no” format of the command can be used for deleting some definition.

Syntax

priority-list *list-number* **interface** *interface-type* *interface-number* {**high** | **medium** | **normal** | **low**}
no priority-list *list-number* **interface** [*interface-type* *interface-number* **high** | **medium** | **normal** | **low**]

Parameter

Parameter	Description
<i>list-number</i>	Number of priority list(1-16)
<i>interface-type</i>	Name of interface
<i>interface-number</i>	Number of interface
high medium normal low	Priority level

default

None

Command mode

global communication mode

Explanation

If queue number is 0, it means that such kind of packet shall be put into default queue.

When “no” is used for deleting, the key “enter” shall be entered after interface, which will delete all the items using interface as match standards in the list. If not so, the item can be deleted only when the name of interface, interface number and priority level match with each other.

Relevant command

priority-group
priority-list default
priority-list protocol
priority-list queue-limit

1.1.9 priority-list protocol

The global configuration command “priority-list protocol” can be used for creating queue priority on the protocol type. The “no” format of the command can be used for deleting some definition.

Syntas

priority-list *list-number* **protocol** *protocol-type* {**high** | **medium** | **normal** | **low**}
 [*keyword keyword-value*]

no priority-list *list-number* **protocol** [*protocol-type* **high** | **medium** | **normal** | **low**
keyword keyword-value]

Parameter

Parameter	Description
<i>list-number</i>	Number of Priority List (1-16)
<i>protocol-type</i>	Protocol type (including ip,arp,compressed_tcp)
high medium normal low	Priority level
keyword	Keyword type
<i>keyword-value</i>	The value of keyword (for gt and lt, it means the length of packet; For access-list, it means the name of access-list; For tcp and udp, it means interface number; fragment has no this item)

default

none

Command mode

global communication mode

Explanation

The keyword type of arp and compressed_tcp is gt and lt.

If queue number is 0, it means that such kind of packet shall be put into default queue.

When “no” is used for deleting, the key “enter” shall be entered after protocol, which will delete all the items using protocol as match standards in the list. If not so, the item can be deleted only when the protocol type, priority level, keyword type and value of keyword match with each other.

Relevant command

priority-group
priority-list default
priority-list interface
priority-list queue-limit

1.1.10 priority-list queue-limit

The global configuration command “priority-list queue-limit” can be used for designating the queue limit of each priority queue list. The “no” format of the command can be used for restoring the default value.

Syntas

priority-list *list-number* **queue-limit** *high-limit medium-limit normal-limit low-limit*
no priority-list *list-number* **queue-limit**

Parameter

Parameter	Description
<i>list-number</i>	Number of priority list
<i>high-limit</i>	The limit of high priority queue (1-32767)
<i>middle-limit</i>	The limit of middle priority queue
<i>normal-limit</i>	The limit of normal priority queue

default

Default values of high, middle and low priority are 20, 60 and 80 respectively.

Command mode

global communication mode

Explanation

none

Relevant command

priority-group
priority-list default
priority-list interface
priority-list protocol

1.1.11 queue-list default

The global configuration command “queue-list default” can be used for distributing a queue number for the data packet that does not comply with any rules of user-defined list. The “no” format of the command can be used for restoring default value.

Syntas

queue-list *list-number* **default** *queue-number*

no queue-list *list-number* **default**

Parameter

Parameter	Description
<i>list-number</i>	Number of User-defined list (1-16)
<i>queue-number</i>	(queue number)

default

Default value is 1

Command mode

global communication mode

Explanation

none

Relevant command

queue-list interface

queue-list protocol

queue-list queue byte-count

queue-list queue limit

1.1.12 queue-list interface

The global configuration command “queue-list interface” can be used for creating user-defined queue for the data accessing to some given interface. The “no” format of the command can be used for deleting some definition.

Syntas

queue-list *list-number* **interface** *interface-type* *interface-number* *queue-number*

no queue-list *list-number* **interface** [*interface-type* *interface-number* *queue-number*]

Parameter

Parameter	Description
<i>list-number</i>	Number of priority list (1-16)
<i>interface-type</i>	Name of interface
<i>interface-number</i>	Interface number
<i>queue-number</i>	Queue number

default

none

Command mode

global communication mode

Explanation

If queue number is 0, it means that such kind of packet shall be put into default queue.

When “no” is used for deleting, the key “enter” shall be entered after interface, which will delete all the items using interface as match standards in the list. If not so, the item can be deleted only when the name of interface, interface number, queue number match with each other.

Relevant command**queue-list default****queue-list protocol****queue-list queue byte-count****queue-list queue limit****1.1.13 queue-list protocol**

The global configuration command “queue-list protocol” can be used for creating user-defined queue on the protocol type.

Syntas

queue-list *list-number* **protocol** *protocol-type* *queue-number* [*keyword* *keyword-value*]

no queue-list *list-number* **protocol** [*protocol-type* *queue-number* *keyword* *keyword-value*]

Parameter

Parameter	Description
<i>list-number</i>	Number of user-defined list (1-16)
<i>protocol-type</i>	Protocol type (including ip,arp,compressed_tcp)
<i>queue-number</i>	Queue number
keyword	Keyword type (gt,lt,fragment,access-list,tcp,udp)
<i>keyword-value</i>	The value of keyword (for gt and lt, it means the length of packet; For access-list, it means the name of access-list; For tcp and udp, it means interface number; fragment has no this item)

default

none

Command mode

global communication mode

Explanation

The keyword type of arp and compressed_tcp is gt and lt.

If queue number is 0, it means that such kind of packet shall be put into default queue.

When “no” is used for deleting, the key “enter” shall be entered after protocol, which will delete all the items using protocol as match standards in the list. If not so, the item can be deleted only when the protocol type, queue number, keyword type and value of keyword match with each other.

Relevant command

queue-list default

queue-list interface

queue-list queue byte-count

queue-list queue limit

1.1.14 queue-list queue byte-count

The global configuration command “queue -list queue byte-count” can be used for designating the number of transmit byte of each queue of some user-defined list. The “no” format of the command can be used for restoring default value.

Syntas

queue-list *list-number* **queue** *queue-number* **byte-count** *byte-count-number*

no queue-list *list-number* **queue** *queue-number* **byte-count** *byte-count-number*

Parameter

Parameter	Description
<i>list-number</i>	Number of user-defined list
<i>queue-number</i>	Number of queue
<i>byte-count-number</i>	Number of transmit byte

default

Default value is 1500

Command mode

global communication mode

Explanation

none

Relevant command

queue-list default
queue-list interface
queue-list protocol
queue-list queue limit

1.1.15 queue-list queue limit

The global configuration command “queue -list queue limit” is used for designating the queue limit of each queue of some user-defined list. The “no” format of the command can be used for restoring the default value.

Syntas

queue-list *list-number* **queue** *queue-number* **limit** *limit-number*
no queue-list *list-number* **queue** *queue-number* **limit** *limit-number*

Parameter

Parameter	Description
<i>list-number</i>	Number of user-defined list
<i>queue-number</i>	Number of queue
<i>limit-number</i>	The limit of queue (1-32767)

default

Default value is 20

Command mode

global communication mode

Explanation

none

Relevant command

queue-list default
queue-list interface
queue-list protocol
queue-list queue byte-count

1.1.16 random-detect

The interface configuration command “random-detect” can be used for configuring weighting early random detect. The “no” format of the command can be used for restoring default value.

Syntas

random-detect
no random-detect

Parameter

none

Default

none

Command mode

Interface configuration mode

Explanation

The command has no effect on the interface configured with X25 and LAPB.

Relevant command

none

1.1.17 service-policy

The interface configuration command “service-policy” can be used for configuring some policy mapping on an interface. The “no” format of the command can be used for deleting policy mapping from the interface.

Syntas

service-policy *policy-name*
no service-policy

Parameter

Parameter	Description
<i>policy-name</i>	The name of policy mapping (the maximum length is 64 bytes)

default

none

Command mode

Interface configuration mode

Explanation

The interface configured with WFQ is effective.

Relevant command**class-map****fair-queue****policy-map****1.1.18 show class-map**

The authorization mode command “show class-map” can be used for showing the configuration of type mapping.

Syntas**show class-map** [*class-name*]**Parameter**

Parameter	Description
<i>class-name</i>	Name of type mapping (the maximum length is 64 bytes)

default

none

Command mode

Authorization command mode

Explanation

If name is entered, only the configuration of the type mapping is shown, otherwise the configuration of all type mappings.

Relevant command**class-map****1.1.19 show policy-map**

The authorization mode command “show policy-map” can be used for showing the configuration of policy mapping.

Syntas**show policy-map** [*policy-name*]**Parameter**

Parameter	Description
<i>policy-name</i>	The name of policy mapping (the maximum length is 64 bytes)

default

none

Command mode

Authorization command mode

Explanation

If name is entered, the configuration of policy mapping is shown; otherwise the configuration of all the policy mapping is shown.

Relevant command

policy-map

1.1.20 show queue

The authorization mode command “show queue” can be used for showing the status of interface queue.

Syntas

show queue *interface-type interface-number*

Parameter

Parameter	Description
<i>interface-type</i>	Name of interface
<i>interface-number</i>	Number of interface

default

none

Command mode

Authorization command mode

Explanation

none

Relevant command

none

1.1.21 show queueing

The authorization command mode can be used for the configuration of user-defined list or priority list

Syntas

show queueing { custom | priority }

Parameter

none

Default

none

Command mode

Authorization command mode

Explanation

none

Relevant command

None

Chapter 2 CRTP Command

2.1 CRTP Command

This chapter describes CRTP commands. CRTP is used on the low-speed serial linkage. The command can be used for compressing the header of RTP packet to effectively lower the occupation of bandwidth. At the same time, due to the reduction in packet length, the delay of packet transit on the linkage can be shortened substantially.

2.1.1 debug ip rtp header-compression

Syntas

[no] debug ip rtp header-compression

Command mode

global configuration mode

Example

```
Router#debug ip rtp header-compression
21:39:30: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30315, Gen = 0
21:39:30: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23507, Gen = 0
21:39:30: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30316, Gen = 0
21:39:30: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23508, Gen = 0
21:39:31: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30317, Gen = 0
21:39:31: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23509, Gen = 0
21:39:31: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30318, Gen = 0
21:39:31: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23510, Gen = 0
21:39:31: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30319, Gen = 0
21:39:31: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23511, Gen = 0
21:39:31: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30320, Gen = 0
21:39:31: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23512, Gen = 0
21:39:31: RHC Serial1/0: output COMPRESSED_RTP, conn 0, cksum 0x0000, seq 30321, Gen = 0
21:39:31: RHC Serial1/0: rcv COMPRESSED_RTP, conn 0, cksum 0x0000, seq 23513, Gen = 0
```

The form below describes the explanation of the output of the command “CRTP debug”

Area	Explanation
21:39:31	Current time of system
RHC	RTP header compression
Serial 1/0	Interface number
Recv (output)	Input or output
COMPRESSED RTP (uncompress)	Packet type
Conn	Connection number
Cksum	UDP check sum
Seq	RTP sequence number
Gen	Generation value of CRTP packet

2.1.2 ip rtp header-compression

This command is needed to use under interface configuration mode for activating CRTP on the serial linkage. The “no” format of the command can be used for forbidding CRTP.

Syntas

ip rtp header-compression [{iphc-format | passive}]

no ip rtp header-compression

Parameter

Parameter	Description
iphc-format	Obeying CRT Pprotocol of rfc2507 IPHC standard
cisco-format	the format of IPCP negotiation packet that use the cisco format
passive	CRTP packet started to be transmitted after receiving CRTP packet of the opposite terminal.

default

It is under forbidden state without configuring the command. When this command is configured, the default is **passive** in the case of without adding optional parameters.

Command mode

interface configuration mode

Explanation

Currently CRTP is supported only on the serial linkage of PPP encapsulation and will be extended to Frame Relay ` HDLC and ISDN port, etc. The command should be configured simultaneously on the two terminals of serial linkage, otherwise it will not work. Meanwhile, when the relative header of effective load of packet is relatively small, this protocol is quite applicable. However, when the header is far below net load, it will reversely add the processing spending of the router for the packet. Therefore, the protocol is used for transmitting the similar RPT packet on the linkage.

Example

```
Router_config#interface serial 1/2
Router_config_s1/2#ip rtp header-compression
Router_config_s1/2#ip rtp compression-connections 25
Router_config_s1/2#enc ppp
Router_config_s1/2#
```

2.1.3 ip rtp compression-connections**Syntas**

ip rtp compression-connections *number*
no ip rtp compression-connections

Parameter

Parameter	Description
<i>number</i>	The maximum linkages of local-reserved CRTP.

default

15 connections

Command mode

interface configuration mode

Explanation

The number of RTP dialogue that is likely to occur simultaneously on the linkage can be estimated under general condition. It will be tight when the number of the configured connection is bigger than that of RTP dialogue.

Example

```
Router_config#interface serial 1/2
Router_config_s1/2#ip rtp header-compression
Router_config_s1/2#ip rtp compression-connections 25
Router_config_s1/2#enc ppp
Router_config_s1/2#
```

2.1.4 show ip rtp header-compression**Syntas**

show ip rtp header-compression [*type number*] [**detail**]

Parameter

Parameter	Description
<i>type number</i>	(optional) Interface type and interface number, such as serial 1/0.
detail	(optional) showing detailed information of each link.

command mode

global configuration mode

Example

```
Router#sh ip rtp header-compression
RTP/UDP/IP header compression statistics:
Interface Serial1/0:
Rcvd:      8900 total, 8858 compressed, 0 errors
          0 dropped, 0 buffer copies, 0 buffer failures
Sent:      8907 total, 8865 compressed,
          336735 bytes saved, 197685 bytes sent
Connect: 15 rx slots, 15 tx slots, 14 long searches, 1 misses
Router#
```

Keyword explanation of command display is made in the form below:

Keyword	Explanation
Interface Serial1/0:	Interface number and interface type
Rcvd: total	Total of CRTP packet received at the port.
Compressed	Total of compressed CRTP packet
Errors	Total of erroneous packet received.
Dropped	Total of directly deleted packet received.
buffer copies,	The number of the packet that should be copied and saved.
buffer failures	The number of failures of applying for memory at the time of restoring normal IP packet.
Sent: total	Total of CRTP packet sent.
Compressed	Total of compressed CRTP packet sent.
bytes saved	Saved bytes
bytes sent	Real byte sent
Connect: rx slots	Total of data structure received.
tx slots	Total of data structure sent
long searches	It is needed to search in transmit data structure so as to determine the number of which to be used.
Misses	Search the number of failure of data structure.

Chapter 3 CTCP Configuration Command

3.1 CTCP Configuration Command

This chapter describes CRTP commands. CRTP is used on the low-speed serial linkage. The command can be used for compressing the header of TCP/IP packet to effectively lower the occupation of bandwidth. At the same time, due to the reduction in packet length, the delay of packet transit on the linkage can be shortened substantially. CTCP is especially useful in employing the interactive protocol of TELNET kind with good response speed

3.1.1 debug ip tcp header-compression

Syntas

[no] debug ip tcp header-compression

Command mode

global configuration mode

Example

Router#debug ip tcp h

TCP header compression debug is enalbed!

22:17:02: THC Serial1/0: new connection, conn 0

22:17:02: THC Serial1/0: output uncompressed, conn 0, cksum 0xA286, seq 95270092

22:17:02: THC Serial1/0: output COMPRESSED_TCP, conn 0, cksum 0x9F7D, seq 952702

22:17:02: THC Serial1/0: recv uncompressed, conn 0, cksum 0xA17F, seq 1220171780

22:17:02: THC Serial1/0: output uncompressed, conn 0, cksum 0xA283, seq 95270095

22:17:02: THC Serial1/0: recv COMPRESSED_TCP, conn 0, cksum 0x24CC, seq 12201713

22:17:02: THC Serial1/0: output COMPRESSED_TCP, conn 0, cksum 0xA283, seq 952705

The form below describes the explanation of the output of CTCP debug command

Area	Explanation
22:17:02	Current time of system
THC	TCP header compression
Serial 1/0	Interface number
Recv (output)	Input or output
COMPRESSED_TCP uncompressed)	Packet Type
Conn	Connection number
Cksum	UDP check sum
Seq	Sequence number of RTP

3.1.2 ip tcp header-compression

The command needs to be used under interface configuration mode for activating CTCP on serial linkage. The “no” format of the command needs to be used for forbidding CTCP.

ip tcp header-compression [{*iphc-format* | *passive*}]

no ip tcp header-compression

parameter

iphc-format (optional) **obeying** CTCP protocol of rfc2507 IPHC standard.

passive (optional) CTCP packet started to be sent after CTCP packet of opposite terminal is received.

default:

It is under forbidden state without configuring the command. When the command is configured, the default value is *iphc-format iphc-format* in the case of not adding optional parameters.

command mode

interface configuration mode

explanation

Currently CRTP is supported only on the serial linkage of PPP encapsulation and will

be extended to Frame Relay ` HDLC and ISDN port, etc. The command should be configured simultaneously on the two terminals of serial linkage, otherwise it will not work. Meanwhile, when the relative header of effective load of packet is relatively small, this protocol is quite applicable. However, when the header is far below net load, it will reversely add the processing spending of the router for the packet. Therefore, the protocol is used for transmitting the similar RPT packet on the linkage.

If CRTP is configured in our CTCP implementation, CRTP and TCP/IP header compression that is based on IPHC format of rfc2507 will be applied at the same time in spite of whether TCP/IP header compression is configured or not later. Therefore, if the opposite terminal only supports the terminal of TCP/IP header compression standards stipulated by rfc1144, it is not able to communicate. In addition, TCP/IP header compression shall be configured on the condition that CRTP is not configured to the local terminal. In PPP protocol, if the opposite terminal request TCP/IP header compression negotiation regulated by rfc2507, it will pass and support TCP/IP header compression regulated by CRTP and rfc2507. Otherwise, TCP/IP header compression standards stipulated by rfc1144.

Example

```
Router_config#interface serial 1/2
Router_config_s1/2#ip tcp header-compression
```

3.1.3 ip tcp compression-connections

Syntas

ip tcp compression-connections *number*
no ip tcp compression-connections

Parameter

Parameter	Description
<i>number</i>	Maximum number of CTCP connection, the scope is 3-256, the default value is 16.

default

16 connections

Command mode

interface configuration mode

Explanation

The number of TCP/IP dialogue that is likely to occur simultaneously in the linkage can be estimated under general condition. It will right when the number of configured connection is bigger than the number of TCP/IP dialogue.

Example

```
Router_config#interface serial 1/2
Router_config_s1/2#ip tcp header-compression
Router_config_s1/2#ip tcp compression-connections 25
```

```
Router_config_s1/2#enc ppp
Router_config_s1/2#
```

3.1.4 show ip tcp header-compression

Syntas

show ip tcp header-compression [*type number*] [**detail**]

Parameter

Parameter	Description
<i>type number</i>	(optional) Interface type and interface number, such as serial 1/2.
detail	(optional) Showing detailed information of each linkage.

command mode

global configuration mode

Example

```
Router#sh ip tcp header-compression
IP/TCP header compression statistics:
Interface Serial1/0:
Rcvd:      8900 total, 8858 compressed, 0 errors
          0 dropped, 0 buffer copies, 0 buffer failures
Sent:      8907 total, 8865 compressed,
          336735 bytes saved, 197685 bytes sent
Connect: 16 rx slots, 16 tx slots, 15 long searches, 1 misses
Router#
```

Keyword explanation of command display is made in the form below.

Keyword	Explanation
Interface Serial1/0:	Interface number and interface type
Rcvd: total	Total of CRTP packet received at the port.
compressed	Total of compressed CTCP packet
errors	Total of erroneous packet received.
dropped	Total of directly deleted packet received.
buffer copies,	The number of the packet that should be copied and saved.
buffer failures	The number of failures of applying for memory at the time of restoring normal IP packet.
Sent: total	Total of CTCP packet sent.
compressed	Total of compressed CTCP packet sent.
bytes saved	Saved bytes
bytes sent	Real number of bytes sent
Connect: rx slots	Total of data structure received
tx slots	Total of data structure sent

long searches	It is needed to search in transmit data structure so as to determine the number of which to be used.
Misses	Search the number of failure of data structure.

Chapter 4 DLC Configuration Command

4.1 DLC Configuration Command

4.1.1 Dlc-compress Lempel-Ziv

To configure Lempel-Ziv (STAC LZS) compression protocol for interface

Syntas

dlc-compress Lempel-Ziv

no dlc-compress

Parameter

None

Default

no dlc-compress

Command Mode

Interface configuration mode

Explanation

PPP Protocol must be encapsulated for interface , the same compression protocol must be configured.

Example

```
router>enable
router#config
router_config#interface s1/0
router_config_s1/0#enca ppp
router_config_s1/0# dlc-compress Lempel-Ziv
```

4.1.2 Dlc-compress MPPC

To configure MPPC compression protocol for interface

Syntas

dlc-compress mppc

no dlc-compress

Parameter

none

Default

No dlc-compress

Command mode

Interface configuration mode

Explanation

PPP Protocol must be encapsulated for interface , the same compression protocol must be configured.

Example

```
router>enable
router#config
router_config#interface s0/0
router_config_s0/0#enca ppp
router_config_s0/0# dlc-compress MPPC
```

4.1.3 Debug compress events

Enable the function of displaying debug information about compression events

Syntas

debug compress events

no debug compress events

Parameter

none

Default

no debug compress events

Comand mode

Supervisor mode

Explanation

Only after configuring compression protocol, events debug information will be displayed when compression events occur.

Example

```
router>enable
router# debug compress events
```

4.1.4 Debug compress error

Enable the function of displaying debug information about compression error

Syntas

debug compress error
no debug compress error

Parameter

none

Default

no debug compress error

Command mode

Supervisor mode

Explanation

Only after configuring compression protocol, error debug information will be displayed when compression error occurs

Example

```
router>enable
router # debug compress error
```

4.1.5 Debug compress packet

Enable the function of displaying debug information about compressed/uncompressed packet

Syntas

debug compress packet
no debug compress packet

Parameter

none

Default

no debug compress packet

Command mode

Supervisor mode

Explanation

Only after configuring compression protocol, packet debug information will be displayed

Example

```
router>enable
router # debug compress packet
```

4.1.6 show compress-statistics

This command is used to open the debug information switch that is about debugging compression and decompression of interfix affair.

Syntas

show compress-statistics

Parameter

none

Default

none

Command mode

global configuration mode, user management mode, port configuration mode

Explanation

It is in deed effect only under configuration compression protocol.

Example

```
router>enable
router # show compress-statistics
DLC Data Statistics ---
In interface Serial2/0:0 compress type Lempel-Ziv
Receive bytes compressed: 5076
Receive bytes decompressed: 6120
sent bytes compresseds: 133111
sent bytes original: 277983
resyns: 0
```

Through the showing information we know that port S2/0:0 configure Lempel-Ziv compression arithmetic, and we can work out compression ratio. For the information upwards, we can work out the compression ratio of sending channels: $277983/133111 = 2.1$, and the compression ratio of receiving channels is: $6120/5076 = 1.2$.

Chapter 5 CAR Command

5.1 CAR Command

This chapter describes the rate-limit command of CAR. You can designate CAR rate-limiting policies based on physical port and other criteria specifiable by access lists or extended access lists.

5.1.1 rate-limit

configure rate-limit

Syntas

rate-limit [input | output] [all | access-group *name*] *bps*

no rate-limit [input | output] [all | access-group *name*]

Parameter

Parameter	Description
<i>name</i>	the name of access-list(It is a character string of 20 characters at most)
<i>bps</i>	Bits per second(8000 — 1000000000)

default

None

Command mode

Interface configuration mode

Explanation

Support port type: Ethernet port, E1/T1 port, SYNC Serial port.

An interface cannot configure rate limit rules of output or input more than eight.

Relevant

None

Example

```
Router_config#ip access-list extended aaa
Router_config_ext_nacl#permit tcp any any eq www
Router_config#interface fastethernet 0/0
Router_config_f0/0#ip address 10.0.0.1 255.255.255.0
Router_config_f0/0#rate-limit input access-group aaa 6000000
```

5.1.2 show rate-limit

display rate-limit information

Syntas

show rate-limit interface-type interface-number

Parameter

Parameter	Description
<i>interface-type</i>	interface type
<i>interface-number</i>	interface number

default

Display all interface rate-limit information

Command mode

Global communication mode

Explanation

Support port type: Ethernet port, E1/T1 port, SYNC Serial port.

Relevant

None

Example

Router_config#show rate-limit interface fastethernet 0/0