WAN Command

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Chapter 1 Frame Relay Command

1.1 Frame Relay

1.1.1 encapsulation frame-relay

encapsulation of frame-relay. No to diable.

Syntas

encapsulation frame-relay

no encapsulation frame-relay

Parameter

None

default

none

command mode

Interface configuration mode

explanation

Use no to diable encapsulation, which means, back to the encapsulation HDLC mode

Example

The following example, configure frame relay encapsulation mode in serial s1/1:

interface s1/1
encapsulation frame-relay

1.1.2 frame-relay cir

Specify committed information speed for frame relay virtual circuit.

Syntas

frame-relay cir *bps*

Parameter

Parameter	Description
bps	Submit information rate, number of bits every second, default value 64000.

the value is one between 1 to 2048000.

Default

64000

Command mode

Interface configuration mode

Explanation

The submission rate is confirmed when applying for DLCI.

Example

Configure s1/1 port as frame relay, and configure cir as 2048000.

```
interface s1/1
encapsulation frame-relay
frame-relay cir 2048000
```

Relevant command

none

1.1.3 frame-relay intf-type

Configure the exchange type of the frame relay.

Syntas

frame-relay intf-type [**dce** | **dte** | **nni**]

Parameter

Parameter	Description
dce	(optional) connect to the router of the router or access the server and works under the mode of exchanger.
dte	(optional) router or access the server to work under the mode of connecting into the terminal device of the frame relay network. This is the default configuration.
nni	(optional) router or access the server to connect to the network under the mode of exchanger, which means that it supports NNI network connection.

default

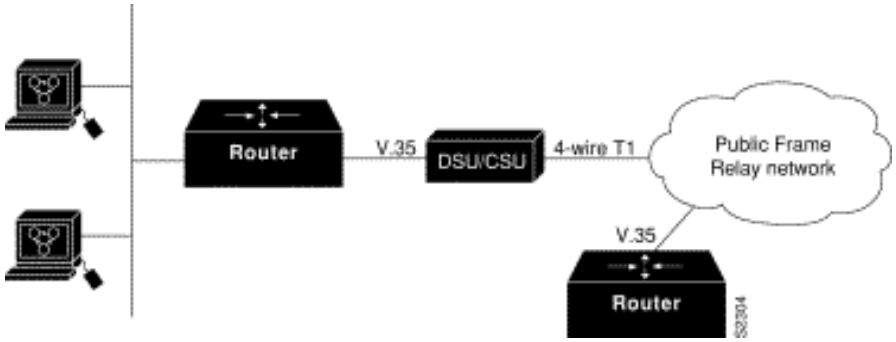
dte

Command mode

Interface configuration mode

Explanation

When the frame relay port connects with the network, normally it will be configured as DTE, if the router is connected back on back, then one is configured as DTE, the other will be DCE. If you require double direction LMI process, it should be configured as NNI. Frame relay standard describes an interface between a terminal user and a frame relay network, which is named UNI, and the interface between the neighboring frame relay networks, which are named NNI. The following chart describes the concept of UNI and NNI.



A PVC link from port to port consists of many PVC sections. Each PVC section is separated by one UNI and one NNI or two NNIs. If you want to activate one PVC, you should activate all PVC sections. The network can be link-shaped. A network terminal user station connected is called save and draw network, the network between is called the transfer network. Every network conducts local allocation, this means that every section of PVC has its dependent DLCI number. But the DLCI number used on the link of the two neighboring networks should be the same. NNI and UNI are based on the same standards. In order to provide a balanced interface, it should provide simultaneously the network and client process on both sides.

Example

Configure s1/1 port as frame-relay, configure the interface as dce.

interface s1/1
enca frame-relay
frame-relay intf-type dce

1.1.4 frame-relay inverse-arp

On the router or access server configured frame relay, if inverse address resolution protocol is not activated, then use this command to reactivate it.

Syntas

[**no**] **frame-relay inverse-arp**

Parameter

none

Default

Enable inverse address resolution protocol (IARP)

Command mode

Interface configuration mode

Explanation

IARP is the protocol used to inquire the protocol address on frame relay network. Please refer to RFC1293 for the implementation of it. It enables the router or access server which are configured frame relay to discover protocol address related to virtual circuit.

In frame relay network, the DLCI of pvc can be regarded as hardware address. The network establishes a virtual circuit by signal information, it can find out the protocol address on the other side of the circuit by IARP.

Example

Configure the s1/1 port as frame relay and prohibit IARP.

interface s1/1
enca frame-relay
no fr inverse-arp

Relevant command

show frame-relay

1.1.5 frame-relay lmi-type

Configure LMI type. Use command “no frame-relay lmi-type ” to reset to default type value.

Syntas

[**no**] **frame-relay lmi-type** { **q933a** | **bcisco** | **ansi**}

Parameter

Parameter	Description
q933a	ITU-T Q.933 attachment A.
ansi	The interface type defined by attachment ANSI T1.617.
bcisco	Rev 1 of Group of Four, compatible with Cisco.

default

Autosense

Command mode

Interface configuration mode

Explanation

LMI defines the operation between the user ’ s device and frame relay network, it provides the mode or overtime notice of permanent virtual circuit(PVC). Q933a used

the defined process and information in attachment A of ITU-T Q.933. ansi used the defined process and information in attachment D of ANSI T1.617. bcisco uses the defined process and information in Group of Four Rev.#1. The configuration of LMI type is based on the interface and can be checked by command “ show interface ”.

Example

The following example configures the LMI interface as ANSI attachment D:

```
interface S1/1
encapsulation frame-relay
frame-relay lmi-type ansi
```

1.1.6 frame-relay local-dlci

Configure local DLCI. Use command no to diable.

Syntas

frame-relay local-dlci *number* [**cir** *speed*]

no frame-relay local-dlci *number*

Parameter

Parameter	Description
number	Local DLCI
speed	CIR rate

default

no local DLCI.

Default speed of CIR is 64000.

Command mode

Interface configuration mode

Explanation

Use to configure usable DLCI when LMI is not configured or has been back-to-back connected and served as DCE. In other stances, it can be obtained though LMI. No to delete this DLCI.

Example

The following example, configure a no.100 local DLCI:

```
interface s1/1
frame-relay local-dlci 100
```

1.1.7 frame-relay n391

Configure the status query times before the query of all status information.

Syntas

frame-relay n391 *keep-exchanges*

Parameter

Parameter	Description
keep-exchanges	Configure the query interval of all mode information. Range: 1-255.

default

Exchange for six times

Command mode

Interface configuration mode

Explanation

The interface must be DTE device or NNI interface to use this command. Send a request for complete PVC mode in every n391 enquiry packet.

Example

In the following example, there is one complete mode information query every four mode queries. For the rest of the queries, the exchanger only returns with the mode information of the change.

interface s1/0
frame-relay intf-type dte
frame-relay n391 4

1.1.8 frame-relay n392

Configure error threshold counter.

frame-relay n392 *threshold*

Parameter

Parameter	Description
threshold	The threshold value of the errors. Range from 1 to 10. default value is 3.

default

3

Command mode

Interface configuration mode

Explanation

If there are consecutively n392 failures in every n393 query packets, then the link mode is abnormal. Before the N393 event counter to judge the closure of the link arrives, there should be error times defined by N392. so, this value must be smaller than the defined value in frame-relay n393.

Example

The following example, configure the LMI error threshold value as 4. this router is frame relay DCE device or NNI exchanger:

```
interface s1/0
frame-relay intf-type dce
frame-relay n392 4
```

Relevant command

frame-relay n393

1.1.9 frame-relay n393

Configure the supervising event counter

frame-relay n393 *events*

Parameter

Parameter	Description
events	Supervising event counter. Range from 1 to 10 and default value is 4.

default

4

Command mode

Interface configuration mode

Explanation

This command and the parameters configured by frame-relay n392 are the conditions of link closure. During the execution, in the n393 event timer to judge the link closure, the error times defined by N392 must emerge.

Example

The following example, configure the LMI supervising event counter value as 3. The router works under the mode of DCE of frame relay or NNI exchanger:

```
interface s1/0
frame-relay interface dce
frame-relay n393 3
```

Relevant command

frame-relay n392

Figuer 1-1 List: LMI system parameter counter

Counter	Description	Range	Default	Usage	User or network
N391	Mode (full) enquiry counter	1－255	6	Enquiry loop	User
N392	Error threshold	1－10	3	error	Both
N393	Supervised event counting	1－10	4	event	Both

Note:

N392 should be smaller or equal to N393. N391 always allies to user process.

1.1.10 frame-relay t391

Configure link integrity authentication enquiry timer.

Syntas

frame-relay t391 *seconds*

Parameter

Parameter	Description
seconds	The value of authentication enquiry timer, second as the unit, range from 5 to 30, default value is 10 seconds.

default

10 seconds

Command mode

Interface configuration mode

Explanation

Used on DTE. Send mode request information every t391 seconds, if the mode information is not received, log the error.

Example

The following command, configure the value of link integrity authentication enquiry timer as 20 seconds:

```
interface s1/1
frame-relay intf-type dce
frame-relay t391 20
```

Relevant command

frame-relay t392

1.1.11 frame-relay t392

Configure authentication enquiry timer.

Syntas

frame-relay t392 *seconds*

Parameter

Parameter	Description
seconds	Value of authentication enquiry timer, second as the unit, range from 5 to 30, default value is 15 seconds.

default

15 seconds

Command mode

Interface configuration mode

Explanation

Used on DCE. Expect a mode request information every t392 seconds. If not received , log the error. T392>t391.

Example

The following command, configure the value of authentication enquiry timer as 20 seconds:

interface s1/1
frame-relay intf-type dce
frame-relay t392 20

Relevant command

frame-relay t391

Figuer 1-2 LMI system parameter timer

Timer	Description	Range	Default	Enable	Stop	Activity of overtime system

T391	Link integrity authentication enquiry timer	5~30	10s	Send mode enquiry information		If it does not receive mode information, log the error.
T392	authentication enquiry timer	5~30	15s	Send mode information	Receive mode enquiry information	Add N392 to log the errors, and restart the timer

Note:

T392 must be greater than T391, T391 is always used in user process, T392 is always used in the network process

1.1.12 frswitch

This global configuration command activates PVC exchange on DEC of frame relay or NNI. No to diable.

Syntas

frswitch in-port in-dlci out-port out-dlci

no frswitch in-port in-dlci out-port out-dlci

Parameter

Parameter	Description
in_port	First port exchanged
in_dlci	DLCI of the first port
out_port	Second port exchanged
out_dlci	DLCI of the second port

default

none

Command mode

global configuration mode

Explanation

When you are configuring the exchange list, the two ports connected must be encapsulated as frame relay, and there exists effective PVC.

Example

The following example narrates, the router enables PVC exchange between interface s1/1 and interface s1/2. The DLCI 100 frame receives on interface 1 will be forwarded on DLCI 200 of serial 2.

frswitch s1/1 100 s1/2 200

1.1.13 frame-relay map

Configure the destination protocol address by DLCI connection. Use command “no” to diable the configuration.

Syntas

[**no**] **frame-relay map** *ipaddress* **pvc** *dlci* [**broadcast**]

Parameter

Parameter	Description
ipaddress	Destination IP address
dlci	The DLCI of connected destination protocol address (16-1007)
broadcast	(Optional parameter) when Multicast is not activated, forwarding the broadcast packet from this interface.

default

None

Command mode

Interface configuration mode

Explanation

The router and the access server may have several DLCIs to send data. But they can be reused on a physical link. Frame relay map command defines the logical connection among specific protocol and address pair and DLCI. Broadcast activates two functions: if multicast is not activated, it forwards broadcast and simplifies the OSPF configuration in frame relay non-broadcast network.

Example

The following example maps the IP address 172.16.123.1 to DLCI 100:

```
interface s1/0
frame-relay map 172.16.123.1 pvc 100 broadcast
```

OSPF will use DLCI 100 broadcast route update.

1.1.14 clear frame-relay-inarp

Syntas

clear frame-relay-inarp [*serial*]

Parameter

Parameter	Description
serial	the name of interface to encapsulate frame relay

default

None

Command mode

supervisor mode

Explanation

This command is used to clear the remote address list got via Inverse ARP protocl by designated frame relay port (or all ports).

1.1.15 show frame-relay

Show the current mapping entry and information of the connection.

Syntas

show frame-relay

Parameter

None

Command mode

All configuration modes

Explanation

Check all frame relay ports and active DLCI state. First, show the protocol state on all ports configured frame relay protocol, can be either “UP” or “DOWN”, you must guarantee that the protocol state is “UP” before carrying out upstream protocol data transfer. State table is sorted by port and DLCI, each occupies one line, each line is divided into 5 lines, from left to right, in order: port name, DLCI value, DLCI state, remote IP address, local IP address and type. DLCI state can be ACTIVE, INACTIVE or DELETED, class area is mainly used to distinguish static or dynamic mapping mode. M means static, I means dynamic（InverseARP）。

Example

Here is a sample output

Router#show frame-relay
Frame Relay/Ip state
Serial1/0 UP

interface	DLCI	state	remote IP address	Local IP address	Type
==========					
serial1/0	32	active	130.130.0.2		M
serial1/1	33	active	133.133.0.3		M

relevant command

show interface

1.1.16 show frswitch

Show the information of frame relay switch list.

Syntas

show frswitch

Parameter

None

Command mode

All configuration modes

Explanation

When frame relay is experimenting back on back, the DLCI on the two sides must be the same, if they are connected through the exchanger, the DLCIs may be different.

Example

Here is a sample output

```
Router#show frswitch
Frame relay PVC connection routing table
source interface  pvc              destination interface  pvc
Serial1/0     32    <--->    Serial1/1     35
```

Relevant command

show interface

1.1.17 show interface

This command is used to show serial port information and protocol statistics. If the serial port uses frame relay encapsulation, then you can use it to show the statistics of frame relay protocol.

Syntas

show interface *type number*

Parameter

Parameter	Description
type	Interface type.
number	Interface number.

command mode

All configuration modes

Explanation

This command shows the state and statistical information of frame relay link.

Example

Here we are going to run the sample output of the serial port:

```
router#show int s1/0
Serial1/0 is up, line protocol is up
Hardware is SCC Mode=Sync,Speed=64000
  DTR=UP,DSR=UP,RTS=UP,CTS=UP,DCD=UP
  Interface address is 96.0.0.2/8
  MTU 1500 bytes, BW 64 kbit, DLY 2000 usec
  Encapsulation frame-relay, loopback not set
  Keepalive set(10 sec)
  frame-relay DCE, LMI type is Q933A, LMI DLCI 1023
  LMI DCE Link Errors 1, Protocol Errors 2, Inactives 0
  Recvd Octets 2640, Recvd Frames 203, Recvd Discards 0
  Sent Octets 2802, Sent Frames 202, Sent Discards 0
  Recvd Errors 1, Send Errors 0, Recvd Unknowns 1
   1 minute input rate 11 bits/sec, 0 packets/sec
  1 minute output rate 11 bits/sec, 0 packets/sec
     203 packets input, 3046 bytes, 0 no buffer
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     202 packets output, 3206 bytes, 0 underruns
PowerQUICC SCC specific errors:
  0 recv allocb mblk fail       0 recv no buffer
  0 transmitter queue full      0 transmitter hwqueue_full
```

Relevant command

show frame-relay

The statistical information frame relay may display are listed in the following table:

Parameter	Description
English	Meaning.
Recvd Octets	Bits received on this interface since it is configured as frame relay protocol.
Recvd Frames	Frames received on this interface since it is configured as frame relay protocol.
Recvd Discards	Frames correctly received yet discarded on this interface since it is configured as frame relay protocol.
Recvd Errors	Error frames received on this interface since it is configured as frame relay protocol.
Recvd Unknown Protocols	Frames received correct but encapsulate unknown protocol on this interface since it is configured as frame relay protocol.
Sent Octets	Bits sent successfully on this interface since it is configured as frame relay protocol.
Sent Frames	Frames sent on this interface since it is configured as frame relay protocol.

Sent Discards	Frames to be sent yet discarded on this interface since it is configured as frame relay protocol.
Sent Errors	Error frames sent on this interface since it is configured as frame relay protocol.
LMI DTE Link Errors	Link errors discovered through LMI DTE process since it is configured as frame relay protocol.
LMI DTE Inactives	Protocol states invalids discovered through LMI DTE process since it is configured as frame relay protocol.
LMI DTE Protocol Errors	Information content errors discovered through LMI DTE process since it is configured as frame relay protocol.
LMI DCE Link Errors	Link errors discovered through LMI DCE process since it is configured as frame relay protocol.
LMI DCE Inactives	Protocol states invalid discovered through LMI DCE process since it is configured as frame relay protocol.
LMI DCE Protocol Errors	Information content errors discovered through LMI DCE process since it is configured as frame relay protocol.

1.1.18 debug frame-relay

Syntas

[**no**] **debug frame-relay** [**raw** | **event** | **lmi** | **packet**] *serial*

Parameter

Parameter	Description
serial	The interface name require\ed to open debug information. This interface can either be physical or E1 mapped one.
raw	Show raw frame relay.
event	Show all frame relay events.
lmi	Show all LMI information.
packet	Show all data backets.

command mode

supervisor mode.

Explanation

Show frame relay interactive information. Use no debug frame-relay to stop showing.

Example

```
Router#debug frame-relay lmi s1/0
Router#debug frame-relay event s1/0
Router#debug frame-relay packet s1/0
FR Serial1/0: TX -> LMI STATUS ENQUIRY(full) message, send seq 5, expect seq 7
FR Serial1/0: RX <- LMI STATUS(full) message, send seq 8, expect seq 5 200 A
FR Serial1/0: Active DLCI 200 according LMI message
FR Serial1/0: TX -> InARP request on DLCI 200, src(0,192.168.75.4),dst(200,0.0.0.0)
FR Serial1/0: RX <- InARP reply on DLCI 200, src(200,192.168.75.1),dst(200,192.168.75.4)
FR Serial1/0: Add map DLCI 200 to IP 8.0.0.1 according InARP message
```

FR Serial1/0: TX -> LMI STATUS ENQUIRY(link) message, send seq 7, expect seq 9
FR Serial1/0: RX <- LMI STATUS(link) message, send seq 10, expect seq 7
FR Serial1/0: Receive packet from upper on DLCI 200：Len = 84
FR Serial1/0: TX -> IP packet on DLCI 200:Len = 88
FR Serial1/0: RX <- IP Packet on DLCI 200:Len = 84
45 00 00 54 00 07 00 00 FF 01 AB 9F 08 00 00 01 E..T.....
08 00 00 02 00 00 E2 70 00 0D 00 00 03 05 25 6E .....p.....%n
FR Serial1/0: Forward packet to upper on DLCI 200：Len = 84

The first line means the port sends the complete state query information of LMI.

The second line means the port receives complete state response information of LMI, DLCI 200 is valid among them.

The third line means the port activates DLCI 200 according to the complete state response information of LMI.

The fourth line means the port sends InverseARP request, and carries the local IP address 192.168.75.4.

The fifth line means the interface receives InverseARP response. The recipient address is 192.168.75.1, corresponds DLCI 200.

The sixth line means the port sets up dynamic mapping relation between DLCI 200 and 192.168.75.1.

The seventh line means the port sends LMI state request information.

The eighth line means the port receives state response information of LMI.

The ninth line means the port receives upstream data packet, DLCI 200. The length of the packet is 86 bits.

The tenth line means the port sends the packet through DLCI 200 and the length of the packet is 88 bits.

The eleventh line means the port receives data packet on DLCI 200, and the length of the packet is 88 bits. The following two lines are the detailed information about data packets.

The fourteenth line means the port will hand in this packet to the network later (IP).

Chapter 2 X.25 & LAPB Command

Use commands in this chapter to configure LAPB and X25 service. X25 can provide services include remote end-point access and encapsulation of IPprotocol.

For configuration information and examples of X25 and LAPB, please refer to chapter “configure X25 and LAPB” in “WAN configuration guide”.

2.1 X.25 & LAPB Command

2.1.1 encapsulation x25

Designate the serial interface as X25 device. Use no encapsulation x25 to disable X25 encapsulation.

Syntas

[**no**] **encapsulation x25**

Parameter

None

Command mode

Interface configuration mode

Explanation

One side of X25 link must be logical Dce, and the other side must be logical DTE, (this allocation bears no relation with DTE or DCE identification of interface hardware).

Example

The following example configures the encapsulation of X25 protocol:

Router_config**#interface** s1/0
Router_config_s1/0**#encapsulation x25**

Related commands

x25 map

2.1.2 translate x25

Encapsulate X25 to the virtual interface.

Syntas

translate x25 *x121-address* **virtual-template** *virtual-template-interface-number*

Parameter

Parameter	Description
x121-address	Variable X121 address which is allocated by X25 network service.
virtual-template-interface-number	Interface-number of Logical Virtual template.

default

None

Command mode

global configuration mode

Explanation

x.121 address is attained by the address allocated by X25 network service provider plus a sub-address (can be used to identify logical virtual port). When the length of X121 address is less than 15 bits, X25 network will transfer all the address information to the destination. As this configuration is to map vc of X25 to logical virtual port, so the maximum virtual connection is limited by the maximum virtual ports (less that 300 for the router system), it is different from the real X25 virtual connection (a maximum of 4095 can be configured on each physical port).

Example

The following example configures to send x25 packet with destination address (123456+11) to the virtual logical port cloned from logical virtual template 0 (this port is created dynamically), in order to complete the real communication process.

Router_config# translate x25 12345611 virtual-template 0

2.1.3 translate tcp

Configure X25-Tcp exchange.

Syntas

translate tcp ip *ip-address* x25 x121address

Parameter

Parameter	Description
x121-address	Variable X.121 address, this address is allocated by X.25 network service provider.
ip-address	IP address connects with source.

default

none

Command mode

global configuration mode

Explanation

X.121 address is attained by the address allocated by X25 network service provider plus a sub-address (can be used to identify logical virtual port). When the length of X121 address is less than 15 bits, X25 network will transfer all the address information to the destination. (this function is not provided in the formal version, it is only provided in some trial version.

Example：

The following example configures to forward the tcp connection attempt from 192.168.20.130 to the X25 connection attempt with destination address of 111 so as to establish the exchange link of X25-tcp (please refer to “configuration table”).

Router_config# translate tcp ip 192.168.20.130 x25 111

2.1.4 translate tcp listen-port

Configure the listen-port of X25-TCP.

Syntas

translate tcp listen-port *port*

Parameter

Parameter	Description
port	Listen port of TCP connection

default

none

Command mode

global configuration mode

Explanation

You can only enable the listening process of TCP connection after configuring this command.

Example

The following configuration will enable TCP listening process on port 2000.

Router_config# translate tcp listen-port 2000

2.1.5 translate tcp userdata

Configure the user data of X25 linkage

Syntas

translate tcp userdata *line*

Parameter

Parameter	Description
line	Hex value of user data.

default

CC000000

Command mode

global configuration mode

Explanation

You may use different user data in X25 linkage processes in different applications. It uses the user data 0xcc000000 aims at the situation when upstream is ip.

Example

The following example configures to include user data 03010100 in X25 linkage packet.

Router_config# translate tcp userdata 03010100

2.1.6 x25 address

Configure the X.121 address on network interface.

Syntas

x25 address *x121-address*

Parameter

Parameter	Description
x121-address	Variable X121 address. This address is allocated by X.25 network service provider.

default

none

Command mode

Interface configuration mode

Explanation

The user must configure this parameter before normal operation. This address must match the address allocated by X25 network service provide.

Example

The following command configures the X.121 address on the interface:

Router#interface s1/0
Router_config_s1/0#encapsulation x25
Router_config_s1/0#x25 address 00000123005

2.1.7 x25 alias

Configure the cname of the address of interface, this address cname allows the interface to use other information register address to receive calling.

Syntas

[**no**] **x25 alias** *string*

Parameter

Parameter	Description
string	Set an address alias for local interface.

default

none

Command mode

Interface configuration mode

Explanation

There are 8 address aliases to be configured on the interface at most. When they receive incoming calls, these aliases can have the same function as the local X.121 address, when they are calling out, these address aliases do not function.

Example

In the following example, serial 1/0 is configured as alias 12345:

Router#interface s1/0
Router_config_s1/0#encapsulation x25
Router_config_s1/0#x25 address 0000123
Router_config_s1/0#x25 alias 12345

2.1.8 x25 cwla

X25 calling request the packet to carry calling address.

Syntas

[**no**] **x25 cwla**

Parameter

Parameter	Description
no	Prohibit carrying calling address in outgoing calling packet.

default

Carry calling address in calling request packet

Command mode

Interface configuration mode

Explanation:

Calling address can be omitted in X.25 calling request packet. This command means whether to carry calling address in outgoing calling packet

Example

Prohibit carrying of calling address in outgoing calling packet

Router_config_s1/0**#**no x25 cwla

2.1.9 x25 dbit

Set whether to permit D bit reset

Syntas

[**no**] **x25 dbit**

Parameter

Parameter	Description
no	Do not permit D bit reset.

default

Do not permit D bit reset

Command mode

Interface configuration mode

Explanation

D bit can be used in call set up packet and data packet. The purpose of it is to

distinguish whether the acknowledgement of the data packet is confirmed locally by X25 interface or by remote DTE.D=0 means acknowledged local, D=1 means acknowledged by DTE.

Example

Permit D bit reset

Router_config_s1/0#x25 dbit

2.1.10 x25 ebackup

Ebackup function is used to run remote listening towards X.25 or frame realy line, and to realize backup without using dynamic routing. Ebackup function will run remote host state supervision towards all ebackup type map addresses on this interface. It will report the state of the remote host to upstream module to realize the stable conversion of multi-line backup process.

Syntas

x25 ebackup *seconds*

Parameter

Parameter	Description
seconds	Enquiry interval 1-65535 (second).

command mode

Interface configuration mode

Example

The following is the typical configuration of ebackup function:

Router_config_s1/0#x25 map 192.168.0.1 svc 1111 ebackup
Router_config_s1/0#x25 ebackup 30

2.1.11 x25 htc

Use interface configuration command “x25 htc” to configure the maximum virtual circuit number:

Syntas

x25 htc *circuit-number*

Parameter

Parameter	Description
circuit-number	Virtual circuit number between 1 and 4095. Default value is 16.

default

16

Command mode

interface configuration mode

Explanation

The number of htc is bigger than pvc.

Example

The following example sets the range of effective virtual circuit as 25:

Router_config_s1/0#x25 htc 25

Relevant commands

For document information of the related commands, please use main index or search online.

x25 pvc

x25 clear

2.1.12 x25 idle

Designate the SVC leisure time before the router clears SVC.

Syntas

x25 idle *seconds*

Parameter

Parameter	Description
seconds	Leisure circle. Range: 0- 2147483647(s) 100 seconds by default, 0 means this timer is not used.

default

100 seconds

Command mode

Interface configuration mode

Explanation

When transferring IP data on X.25 network, it is a must to first establish X.25 connection before transferring IP data packets. If there is a persistent IP data transmission, X.25 connected will not be cleared and is always on. Because the charge of X.25 is based on the data volume and the duration of time after the connection, so from the perspective of saving the communication cost, if there is not IP data packet

transferring for a long time, you shall clear the X.25 connection. This parameter is to set the duration to wait to clear X.25 when the noneIP data packets are designated. After clearing the X.25 connection, when there is IP data transmission next time, it still automatically establishes X.25 connection first.

When this parameter is set as 0, the leisure circle is infinity.

Example

The following example sets a 5 minutes wait circle before clearing the leisure circuit:

```
Router_config#interface s1/2
Router_config_s1/2#x25 idle 300
```

2.1.13 x25 incallcheck

Syntas

Configure whether to check the call address according to X.25 map list

[**no**] **x25 incallcheck**

Parameter

Parameter	Description
no	no checking of the X.121 address of the call.

default

Check the call address according to X.25 map list

Command mode

Interface configuration mode

Example

No checking of the called X.121 address.

```
Router_config_s1/1#no x25 incallcheck
```

2.1.14 x25 interface

Designates if the current X.25 port is DTE or DCE.

Syntas

x25 interface [**dte**|**dce**]

Parameter

Parameter	Description
dte	Designate current X.25 port as DTE.
dce	Designate current X.25 port as DCE.

default

dte

Command mode

Interface configuration mode

Explanation

An X.25 connection should be DCE logically on one port, and DTE on another. Normally, when connected into public grouping exchange network, the user device was set as DTE, and the grouping exchanger as DCE.

Example

Set the port as DCE mode

Router_config_s1/1#x25 interface dce

2.1.15 x25 k

Designate the maximum number of unprocessed frames permitted (called the window size).

Syntas

x25 k *window-size*

Parameter

Parameter	Description
window-size	Frame number, range from 2 to modulus size-1. If the modulus is 7, maximum frame number is 7, if the modulus is 128, maximum frame number is 127. 7 by default.

default

7 frames

Command mode

Interface configuration mode

Explanation

When the protocol is connecting, if the window size is changed, there will be protocolreset.

When you are using LAPB modulus 128 (extension mode), you should add window parameter k to send more frames before confirmation. The parameter to add windows is the basis of acquiring more take in and send out capability on high speed links with low error rate.

This value should match the value configured in X.25 exchanger. The non-matching

will bring about repeated LAPB rejection frames.

Example

The following example, set the LAPB window size (k parameter) as 10 frames:

Router_config_s1/0#x25 k 10

Related commands

x25 mod

2.1.16 x25 map pad

Configure to enable the access of router's source x121 address list through pad:

Syntas

[**no**] **x25 map pad** *x121-address*

Parameter

Parameter	Description
x121-address	X.121 address

default

none

Command mode

Interface configuration

Explanation

This list only applies after configured command "x25 pad access…… filters the incoming x121 address.

No command Means delete a exchange virtual circuit map, otherwise increase a exchange virtual circuit map.

Example

The following example. configure an X.121 address 1234 which can access this router:

Router_config#interface s1/0
Router_config_s1/0#x25 map pad 1234

Related commands

x25 pad－access

show x25

2.1.17 x25 map(pvc)

Syntas

[**no**] **x25 map** *ipaddress pvc pvc_no* **[broadcast] [ebackup]**

Parameter

Parameter	Description
ipaddress	IP address
pvc_no	DLCI number
broadcast	Means this address map permits sending of broadcast packets/
ebackup	Measn that this address map belongs to enhanced backup type.

default

Do not configure map to the remote host.

Command mode

Interface configuration mode

Explanation

Use the interface configuration command “X25 map” to configure the map from LAN protocol to the remote host. Add or delete a PVC map according to the command.

No command Means to delete an exchange virtual circuit map, otherwise add one.

Example

(1) Configure the s1/1 port as X.25, add a PVC may: 130.130.0.1, pvc 16.

```
Router_config#interface s1/1
Router_config_s1/1#enca x25
Router_config_s1/1#x25 map 130.130.0.1 pvc 16
```

(2) Delete a PVC map:130.130.0.1, pvc_no:16

```
Router_config_s1/0#no x25 map 130.130.0.1 pvc 16
```

Related commands

For document information about the related command, please use the main index or online search.

show x25

2.1.18 x25 map(svc)

Configure the map from LANprotocol to remote host. Add or delete an exchange virtual circuit map according to the following command:

Syntas

[**no**] **x25 map** *ipaddress* **svc** *x121-address* [**broadcast**] [**ebackup**]

Parameter

Parameter	Description
ipaddress	IP address.
x121-address	X.121 address
broadcast	Means that this address map permits sending broadcast packets
ebackup	Means this address map belongs to enhances backup type.
no	Means delete an exchange virtual circuit may, otherwise add one.

Default

No configuration of the map to remote server.

Command mode

Interface configuration

Explanation

When client's X.121 address is not certain (for example the client enters into the network through X.32 or dial-up with X.28), you should configure the client's X.121 address as 8 "0"s, here the router will not actively call the client.

As most data packet router protocols send packets to their neighbour via multicast or broadcast, so you should use key word "broadcast" to run such router protocol on X.25.

In order to avoid the confusion of configuration, a given protocol address pair cannot be applied on various maps on the same interface.

Example

The following example maps the IP address 172.20.2.5 as X.121 address 000000010300. key word "broadcast" sends the broadcast to the designated X.121 address through this interface.

Router_config#interface s1/0
Router_config_s1/0#x25 map 171.20.2.5 **svc** 000000010300 **broadcast**

Related commands

show x25

2.1.19 x25 mod

To designate basic (modulus8) and extension (modulus128) protocol mode of LAPB and X25.

Syntas

x25 mod *modulus*

Parameter

Parameter	Description
modulus	8 or 128. 8 designates the basic mode, 128 for extension mode. 8 by default.

default

Modulus 8

Command mode

Interface configuration mode

Explanation

Modulus parameter determines whether to use basic mode or extension mode. Basic mode attributes serial number to information frames between 0-7, extension mode attributes serial number to information frames between 0-128. We use basic mode more often, and it is enough for most links. Extension mode is optional this function can have more transmission volume on high speed links with lower error rate.

LAPB mode can be configured on LAPB link or X.25. the modulus of X.25 has no relation with the modulus of LAPB layer, you should use the same LAPB modulus on the two sides of the link. In order to simplify the configuration, the router simultaneously configures the modulus of LAPB and X.25, which means that this command can simultaneously configure the operation mode of LAPB and X25, the two are always the same.

When using LAPB modulus 128 (extension mode), you should add window parameter k to send more frames before requesting confirmation. Adding window parameter is the basis to acquire more volume of the high speed link with a low error rate.

Change the window size when the protocol is in connection mode, and it will result in protocolreset.

Example

he following example uses LAPB extension mode to configure X.25 link:

```
Router_config#interface s1/1
Router_config_s1/1#encapsulation x25
Router_config_s1/1#x25 mod 128
Router_config_s1/1#x25 k 40
```

Related commands

x25 k

2.1.20 x25 n1

To designate the maximum frame length (LAPB N1 parameter), use X25 n1 interface configuration command:

Syntas

x25 n1 *bytes*

Parameter

Parameter	Description
Bytes	Maximum byte, 137-1512.

default

1500

Command mode

Interface configuration mode

Explanation

The change of value of LAPB N1 parameter cannot give much benefit to the interface MTU, and if the configuration is wrong, it will easily cause link failure. It is suggested that you save this parameter as the default value.

X.25 accepts calls of default grouping size, this call designates the maximum size which is greater than what LAPB layer supports, but negotiates the calls on the maximum interface it may support. For exchange calls, the grouping size performs port to port negotiation through the router, so the calls will not exceed the maximum grouping size of any ports of the concerned two.

Example

Set n1 to 136:

```
Router_config# interface s1/1
Router_config_s1/1# x25 n1 137
```

2.1.21 x25 n2

To designate the maximum times of the data frame transmission (LAPB N2 parameter), use X25 n2 interface configuration command:

Syntas

x25 n2 *tries*

Parameter

Parameter	Description
tries	Transfer calculation. Range from 1-255. 16 by default.

default

16 times

Command mode

Interface configuration mode

Explanation

Normally 5-16 for N2.

Example

The following example set N2 to 50：

```
Router_config#interface s1/0
Router_config_s1/0#x25 n2 50
```

2.1.22 x25 nps

Open/close the grouping length negotiation function.

Syntas

[**no**] **x25 nps**

Parameter

None

Default

Prohibit grouping length negotiation (outgoing calls)

Command mode:

Interface configuration mode

Explanation:

When the router receives all X.25 incoming call groupings, it can process the related negotiation parameters about length and window in grouping, and makes corresponding treatment. This parameter mainly means whether to attach negotiation parameters during outgoing calls.

No command Prohibits grouping length negotiation (outgoing calls).

Example

Open the grouping length negotiation function (outgoing calls).

```
Router_config_s1/1#x25 nps
```

2.1.23 x25 nui

Use x25 nui interface configuration command to set the network user identification and password.

Syntas

[**no**] **x25 nui** *passwd&nui*

Parameter

Parameter	Description
passwd&nui	password and nui, nui has 8 bits by standard.

default

No default value for standard X.25 encapsulation.

Command mode

Interface configuration

Example

Set the NUI as SHSHX000, and the password is ABCDEF

Router_config_s1/1#x25 nui ABCDEFSHSHX000

2.1.24 x25 nws

Open/close the grouping window size negotiation function.

Syntas

[**no**] **x25 nws**

Parameter

None

Default

Prohibit grouping window size negotiation (outgoing calls)

Command mode

Interface configuration mode

Explanation

When the router accepts all X.25 incoming call groupings, it can process the related negotiation parameters about length and window in groupings, and treat them accordingly. This parameter mainly means whether to attach negotiation parameter during outgoing calls.

No command Prohibit grouping window size negotiation (outgoing calls).

Example

Open the grouping window size negotiation function (outgoing calls)

Router_config_s1/1#x25 nws

2.1.25 x25 pad-access

Open/close x25 pad access control function.

Syntas

[**no**] **x25 pad-access**

Parameter

None

Default

Prohibit x25 pad access control function

Command mode

Interface configuration mode

Explanation:

When configured this function, the router checks x121 address of the calling source during acceptance of all X25 pad incoming call groupings, if this address is in the pad map list statically configured, accepts it, otherwise refuses it. If not configured pad map list, refuses all pad incoming calls.

No command prohibits X25 pad access control function.

Example

Enable X25 pad access control function

Router_config_s1/1#x25 pad-access

2.1.26 x25 psize

Set the grouping size of X25 grouping layer, use x25 psize interface configuration command:

Syntas

x25 psize *size*

Parameter

Parameter	Description
size	Grouping size of grouping layer (byte as the unit), range (128,256,512,1024).

default

128 by default

Command mode

Interface configuration mode

Explanation

When modifying the value of psize, remember to set the N1 value greater than 8 plus psize value.

Example

Change psize to 256

Router_config_s1/1#x25 psize 256

2.1.27 x25 pvc

In order to set the maximum permanent virtual circuit number, use x25 pvc interface configuration command:

Syntas

x25 pvc *circuit-number*

Parameter

Parameter	Description
circuit-number	Virtual circuit number between 1 and 1024, if there isn't a virtual circuit, the number is 0. 0 by default. The maximum value is affected by command x25 htc.

default

0

Command mode

Interface configuration mode

Explanation

The number of PVCs should be less or equal to the total virtual circuits. Under the following configuration, the modees of various virtual circuits are as follows:

Virtual circuit	1	2	3	4	...	14	15	16
Mode	pvc	pvc	svc	svc	...	svc	svc	svc

example

The following example sets the range of effective PVC:

```
Router_config#interface s1/0
Router_config_s1/0#x25 pvc 2
```

Related commands

x25 htc

x25 clear

2.1.28 x25 t1

In order to set resend timer circle (LAPB T1 parameter), use x25 t1 interface configuration command:

Syntas

x25 t1 *seconds*

Parameter

Parameter	Description
seconds	Time in seconds. Value ranges from 1 to 64 seconds. 3 seconds by default.

default

3

Command mode

Interface configuration mode

Explanation

After resend timer decides how much time the transfer frame can remain uncertain, LAPB soft begins to make enquiry confirmation. LAPB protocol design defines that if it does not receive confirmation in T1, the frame is supposed to be lost. A too small value of T1 can result in repeat control information, this may seriously interrupt the service.

Example

The following example sets the T1 resend timer to 2 seconds:

```
Router_config#interface s1/0
Router_config_s1/0#x25 t1 2
```

2.1.29 x25 t2

To configure the link layer receiving overtime timer, use x25 t2 interface configuration command:

Syntas

x25 t2 *seconds*

Parameter

Parameter	Description
seconds	Link layer receiving overtime seconds, ranges from 1 to 32.

default

1

Command mode

Interface configuration mode

Explanation

T2 value in DTE device can be different with t2 value in DCE, but should inform the client. When t2 timer dues, DTE(or DCE) should send confirmation frame, so as to enable it to receive confirmation frame (t2<t1) before T1 timer of DTE(or DCE) overtimes.

Example

Set t2 as 2:

Router_config#interface s1/0
Router_config_s1/0#encapsulation x25
Router_config_s1/0#x25 t2 2

Related commands

x25 n2

x25 t1

2.1.30 x25 t20

In order to configure resend timer(t20) of DTE device, please use command x25 t20:

Syntas

x25 t20 *seconds*

Parameter

Parameter	Description
seconds	Number of seconds, 180 seconds by default.

default

180

Command mode

Interface configuration mode

Example

The following example sets the T20 timer as 90:

```
Router_config#interface s1/0
Router_config_s1/0#x25 t20 90
```

2.1.31 x25 t23

In order to the clear request resend timer (T23) of DTE device, use x25 t23 interface configuration command:

Syntas

x25 t23 *seconds*

Parameter

Parameter	Description
seconds	Number of seconds. 180 seconds by default

default

180

Command mode

Interface configuration mode

Example

The following example configures the T23 timer to 90 seconds:

```
interface s1/0
 x25 t23 90
```

2.1.32 x25 tcp

Configure the x25-tcp exchange gateway related parameter.

Syntas

x25 tcp user-data *line*

x25 tcp pkt-format [**rfc1006**|**transparent**|**user**]

x25 tcp *iso-address line*

x25 tcp pvc-cause-diag *cause diag*

x25 tcp pvc-rst-timeout-*value*

Parameter

Parameter	Description
line	String format in hex form.
rfc1006	Performs packet exchange with rfc1006 format.
trans-parent	Performs packet exchange with transparent mode.
user	Performs packet exchange according to specific format defined by the user.
pvc-cause-diag	When adopting pvc mode of X25-TCP, the cause and diagnose code of pvc reset packet.
pvc-rst-timeout	The wait timer before receiving the second pvc reset.

default:

user-data　empty by default

rfc1006 by default

Empty by default

0,0 by default

60 seconds by default

Command mode

Interface configuration mode

Explanation

The configuration of user-data is set according to the configuration requirement of destination exchanger. User of pkt-format enabled the requirement of specific user, normally no need to configure this option, for iso-address, some exchangers require it while others do not, no configuration by default. Different types of exchangers may use different cause and diagnose code to set up pvc connection, you can configure command x25 pvc pvc-cause-diag. Different types of exchangers may require different times of pvc reset process, for each reset process, you can set the pvc－rst－timeout to the shortest (1s), for two reset processes, you can set pvc－rst－timeout to the longest（255s）to guarantee the second reset process.

Example

The following example configures the user data as “10300025”, this data will be taken in the setup packets when x25 establishes a link.

```
config_s1/1#x25 tcp user-data 10300025
```

2.1.33 x25 wsize

Configure x.25 grouping layer window size, use x25 wsize interface configuration command:

Syntas

x25 wsize *packets*

Parameter

Parameter	Description
packets	Grouping layer window size, range from 2 to wsize modulus minus 1

default

2 by default

Command mode

Interface configuration mode

Explanation

When the modulus is 8, this parameter has a value from 2 to 7, when the modulus is 128, this parameter has a value from 2 to 127

Example

Change wsize to 5.

config_s1/1#x25 wsize 5

2.1.34 x25 switch connect

Use interface configuration command x25 switch connect to add/delete a PVC connection route in X.25 exchange list.

Syntas

[**no**] **x25 switch connect port1** *port1_pvc_no port2 port2_pvc_no*

Parameter

Parameter	Description
port1	The first port of PVC exchange.
port1_pvc_no	The PVC number of the first port.
port2	The second port of pvc exchange.
port2_pvc_no	The pvc number of the second port.

default

none

Command mode

global configuration mode

Explanation

When configuring the exchange list, the two sides connected should be encapsulated

as x25, and there should be effective pvc.

No command means to delete a pvc connection route, otherwise means to add one.

Example

Set s1/0,s1/1 port as X25, set their pvc number as 2, add pvc connection in the x25 exchange list, exchange grouping between the first pvc of s1/0 port and that of s1/1 port.

```
Router_config#int s1/0
Router_config_s1/0#enca x25
Router_config_s1/0#x25 pvc 2
Router_config_s1/0#quit
Router_config#int s1/1
Router_configs1/1# enca x25
Router_config_s1/10#x25 pvc 2
Router_config_s1/1#quit
Router_config#x25sw connect s1/0 1 s1/1 1
```

2.1.35 x25switch destination

Add/delete a port address in x.25(SVC) exchange list:

Syntas

[**no**] **x25switch destination** [*x121addr*|**default]** *port*

Parameter

Parameter	Description
x121addr	X121 address (can use "*" to illustrate 0-9
default	Default word, means all the undesignated x.121 address.
port	Encapsulated as port X.25

default

None

Command mode

global configuration mode

Explanation

When you configure the exchange list, the exchange port should be encapsulated as X.25.

No command means to delete a PVC connection route, otherwise means add one.

Example

Set the s1/0, s1/1 port as X.25, add svc connection in the X.25 exchange list: 1111->s1/0, 2222->s1/1, then the two hosts can communicate directly on X.25 through calling 1111, 2222, meanwhile to complete the IP packet exchange.

```
Router_config#int s1/0
Router_config_s1/0#enca x25
Router_config_s1/0#x25 interface dce
Router_config_s1/0#quit
Router_config#int s1/1
Router_config_s1/1#enca x25
Router_config_s1/1#x25 interface dce
Router_config_s1/1#quit
Router_config#x25sw destination 1111 s1/0
Router_config#x25sw destination 2222 s1/1
```

2.1.36 x25switch xot pvc

This command is used to configure the X25 over TCP based on PVC.

Syntas

x25switch xot pvc

Parameter

Parameter	Description
local-interface	Local interface
local-pvc-number	Local pvc number
remote-interface	Remote interface
remote-pvc-number	remote pvc number
remote-ip-address	remote ip address
source interface	source interface

default

None

Command mode

global configuration mode

Explanation

You cannot establish TCP connection on the first configured interface, you must wait until the other interfaces are configured and then initiate the connection request on the other side to establish a connection. When configuring this command, you should notice the pvc number on both interfaces or the crossing of the IP address.

Example

The following configuration set the X25 packet on pvc2 of local serial 1/0 to the remote 192.168.20.92 through TCP, the packet will be forwarded to PVC 3 of serial 1/0 on the remote side.

```
Router_config#x25switch xot pvc serial 1/0 2 serial 1/0 3 192.168.20.92
```

Related commands

show_x25_xot

debug_x25

2.1.37 x25switch xot svc

This command is used to configure the X25 over TCP based on SVC.

Syntas

x25switch xot svc

Parameter

Parameter	Description
X.121-address	remote X.121 address
remote-ip-address	Remote IP address
source interface	Source interface

default

None

Command mode

global configuration mode

Explanation

After local configuration, TCP is established when it receives calls to remote destination (X.121-address); when it disables the configuration or receives the information to clear the connection, the TCP connection disconnects.

Example

the following example configures to receive the calls to destination 1760001, and forwards to the remote 192.168.20.92 through TCP connection.

Router_config#x25switch xot svc 1760001 192.168.20.92

Related commands

show_x25_xot

debug x25

2.1.38 x29 profile

Configure the x3 related parameter used by pad operation.

Syntas

x29 profile default [[*x3-param*:*x3-value*]…]

x29 profile *profile-number* [[*x3-param*:*x3-value*]…]

Parameter

Parameter	Description
default	Configure the X3 parameter used by x29d
profile-number	Configure the X3 parameter of designated profile number
x3-param	X3 parameter serial
x3-value	X3 parameter value

default

X3 parameters of x29 and x29d are the same

1:1 2:1 3:66 4:0 5:0 6:5 7:0 8:0 9:0 10:0 11:14

12:0 13:0 14:0 15:1 16:0 17:0 18:0 19:0 20:0 21:0 22:0

Command mode

Configuration mode

Explanation

You can input as many parameter value pairs as you want during the configuration process, for the same parameter serial, use the last pair arisen.

Example

Router_config# x29 profile default 3:2

2.1.39 clear x25

Clear the certain X25 exchange virtual circuit (SVC).

Syntas

clear x25 *port vc-number*

Parameter

Parameter	Description
port	X25 port number
vc-number	SVC serial between 1 and 1024,(this is the default value, the upper and lower limit are determined separately with x25 pvc and x25 htc)

command mode

Interface configuration mode

Explanation

This command form is used to force stoppage of service on individual circuits.

Example

The following command clears the no1 SVC on s1/0 interface:

Router#clear x25 s1/0 1

2.1.40 show x25

Show the version information of X25.

Syntas

show x25

Parameter

none

Command mode

Configure mode

Explanation

command show x25 shows the following information:

- Version information of X25;
- Version information of XOT;

Example

The following is the example of command show x25 output:

Router# show x25
X.25 software, Version 2.0.1d
XOT software, Version 1.0.1d

2.1.41 show x25 tcp

Show the established information of x25-tcp.

Syntas

show x25 tcp

Parameter

None

Command mode

supervisor mode

Explanation

Command show x25 tcp shows the following information:

- x25-tcp PVC exchange information established
- x25-tcp SVC exchange information established

(This function is not provided in the formal version, it is currently only provided in some trial version).

Example

The following is the example of command show x25 tcp output:

```
Router#show x25 tcp
Serial1/0 PVC 1: Connected
  TCP: [192.168.20.73,2000/192.168.20.70,1672]
  X25: Is521/0, Os1/0
  TCP: Is1/525, Os1/0
Serial1/0 SVC 3: From 1111 Connect To 4444
  TCP: [192.168.20.73,2000/192.168.20.70,3840]
  X25: Is2084/0, Os1/0
  TCP: Is1/2100, Os1/0
```

2.1.42 show x25 xot

Show the configured xot information.

Syntas

show x25 xot

Parameter

None

Command mode

supervisor mode

Explanation

Command show x25 vc shows the following information:

- The configured XOT PVC exchange routing information;
- XOT SVC exchange routing information using

Example

The following is the example of command x25 XOT output:

```
Router#show x25 xot
Serial1/0 SVC 1024, Interface: [192.168.20.78,20011/192.168.20.92,1998]
Connects From 2750 To 1760001
Window size input: 2, output: 2
Packet size input: 128, output: 128
Is 11/6 RESETs 1/0 RNRs 0/0 REJs 1/0 INTs 1/0 Discards 0/0
```

2.1.43 show x25 vc

Show the information of configured X25 exchange list.

Syntas

show x25 vc

Parameter

none

Command mode

supervisor mode

Explanation

Command show x25 vc shows the following information:

- Configured X.25 PVC exchange routing table
- Configured X.25 SVC exchange routing table
- Configured X.25 XOT exchange routing table

Example

The following is the example of command show x25 vc output:

```
Router#show x25 vc
X.25/IP          state          Serial1/0          DOWN          Serial1/1          UP
=========================================================================
=
No.    Port    VC    I/O    State    X.121    Address    IP    Address    XOT
=========================================================================
=01 Serial1/1 11 in clr_out 0.0.0.0
```

2.1.44 show x25switch

Show the information of configured X25 exchange list.

Syntas

show x25switch

Parameter

none

Command mode

supervisor mode

Explanation

Command show x25 switch shows the following information:

- Configured X.25 PVC exchange routing table

- Configured X.25 SVC exchange routing table

Example

The following is the example of command show x25switch output:

```
Router#show x25switch
X.25 switch SVC route table
X.121 address        port
==========================================
1111      -->   Serial0/0
2222      -->   Serial0/1
```

2.1.45 show x29

Show all configuration information of x29 profile.

Syntas

show x29

Parameter

None

Command mode

supervisor mode

Explanation

Command show x29 shows the following information:

- Profile information of x29d
- All profile information of x29

Example

The following is the example of command show x29 output:

```
Router#show x29
X.29d X3 pad parameters:
  1:1   2:1   3:66  4:0   5:0   6:5   7:0   8:0   9:0   10:0  11:14
 12:0  13:0  14:0  15:1  16:0  17:0  18:0  19:0  20:0  21:0  22:0
X.29 X3 pad Profile 0:
  1:1   2:1   3:66  4:0   5:0   6:5   7:0   8:0   9:0   10:0  11:14
 12:0  13:0  14:0  15:1  16:0  17:0  18:0  19:0  20:0  21:0  22:0
X.29 X3 pad Profile 1:
  1:1   2:1   3:66  4:0   5:0   6:5   7:0   8:0   9:0   10:0  11:14
 12:0  13:0  14:0  15:1  16:0  17:0  18:0  19:0  20:0  21:0  22:0
```

2.1.46 debug lapb

Show the LAPB interactive information. Such as sending SABM frame, receiving UA frame, sending I frame, receiving I frame or so. When the router and the host can not communicate through X.25 protocol, it can be used to analyze LAPB interactive information.

Syntas

[**no**] **debug lapb** [**iframes** | **sframes**| **uframes** | **raw**] *serial*

Parameter

Parameter	Description
serial	The port name requires opening debug information. This port can be physical port or E1 mapped port.
Iframes	Only display I frame.
Sframes	Only display S frame.
Uframes	Only display U frame.
raw	Show the raw frame to send and receive.

If the port name is not input, then it will open the LAPB debug information of all X.25 ports.

Command mode

supervisor mode

Explanation

The related commands of debug x25 tcp are not provided in the formal version, but only provided in some trial versions.

Example

(3) Show all sent and received frames of s1/1.

```
Router#debug lapb s1/1 uframes s1/0
Router#debug lapb s1/1 iframes s1/0
Router#debug lapb s1/1 sframes s1/0
LAPB Serial1/1: TX -> SABM abyte=01 cbyte=3f P=1
LAPB Serial1/1: RX <- UA abyte=01 cbyte=73 F=1
LAPB Serial1/1: TX -> I(0,0) abyte=01 cbyte=00 P=0
LAPB Serial1/1: RX <- RR(1) abyte=01 cbyte=21 PF=0
LAPB Serial1/1: RX <-I(0,1) abyte=03 cbyte=20 P=0
LAPB Serial1/1: TX -> RR(1) abyte=03 cbyte=21 PF=0
```

The first line indicates that LAPB sends a SABM frame and the address is 01 (DCE), the control field is 3f, placed in the exploration position.

The second line indicates that LAPB receives UA response frame, its address is 01 (DTE), control filed is 73, placed at responding position. This means that x25 protocol from both sides successfully handshakes.

The third line indicates that LAPB transmits I frame, the transmit serial is 0, receiving serial is 0 also. For detailed information in this frame, you should consult debug of X.25.

The forth line indicates that LAPB has received RR responding frame, indicates that it has received the frames before serial 1.

The fifth line indicates that LAPB receives I frame, the sending serial is 0 and receiving serial is 1.

The sixth line indicates that LAPB sends RR responding frame, and has received the frames before serial 1.

(4) Do not show the interactive information of U frame of S1/1 port LAPB.

Router#no debug lapb uframes s1/1

2.1.47 debug x25

Syntas

[**no**] **debug x25** [**events** | **normal** | **packet** | **tcp** |**xot**] *serial*

Parameter

Parameter	Description
serial	Port name requires opening debug information. This port can be physical port or E1 mapped port.
events	Show all calls, remove the lines, reenable, reset, diagnosis and register the grouping.
normal	Show all data groupings.
packet	Show HEX form of all X25 packets.
tcp	Show the establishment, dismantlement of connection information, link mode and data packets of X25-TCP.
xot	Show all received XOT data packet (this command does not aim at port, it is global)

If the port name is not input, then it will open the X.25 debug information of all X.25 ports.

Command mode

supervisor mode

Explanation

Show X.25 layer interactive information. Such as sending re-enable request, receiving dismantlement request, receiving data grouping, sending reset request or so. When the router and the host can not communicate through X.25 protocol, and can be used to analyze the X.25 interactive information. Use no debug x25 to stop showing the information.

Example

Router#debug x25 events s1/0

X25 Serial1/0: TX -> RESTART, cause 0, diag 0
X25 Serial1/0: RX <- RESTART CONFIRM
X25 Serial1/0: TX -> CALL on vc 1, From: 2222 To: 1111
X25 Serial1/0: RX <- CLEAR on vc 1, cause 0, diag 47

The first line means that the interface sends re-enable request grouping, cause is 0 and diagnose code is 0.

The second line means that the interface receives re-enable authentication grouping.

The third line means that the interface sends establish link request, virtual circuit number is 1, main calling address is 2222, called address is 1111, no configuration of

D byte, call grouping is 0. The forth line is the detail information of grouping.

The forth line means that the interface receives clear virtual circuit request, the virtual circuit number is 1, cause is 0, diagnosis code is 47.

The fifth line means that the interface sends a clear virtual circuit confirmation, the virtual circuit number is 1, cause is 8, diagnosis code is 68.

Chapter 3 PAD Configuration Command

This chapter describes the command used to configure interoior grouping assembling/disassembling, PAD is used to connect the remote device of X.25 protocol.

Use the following command to configure interoior PAD:

Use pad command to access and use pad standard interface. Enters pad mode after execution of pad command, the router prompts change as signal of greater, you can configure X.3 PAD parameter under this mode.

Notes:

About configuration tasks and examples, please refer to chapter “configure the PAD of X.25”.

3.1.1 pad

To log on to PAD, use EXEC command of pad user:

Syntas

pad svc *x121-address* [*profile-number* [**r**|**w**]]

pad pvc *interface-number pvc-number* [*profile-number* [**r**|**w**]]

Parameter

Parameter	Description
svc	Use svc to call.
pvc	Use pvc to perform pad operation.
x121-address	Designates X.121 address of X25 host.
Interface-number	Designate the interface of pvc pad.
Pvc-number	Pvc number used by pad.
profile-number	Use X3 parameter provided by this profile to perform responsion request
r	X3 parameter provided by profile is read-only.
w	X3 parameter provided by profile is rewritable.

Command mode

User mode or management mode

Explanation

You can simultaneously allow many PAD connections to open and switch between them, you can also quit connection and returns to user mode prompt at any locations.

In order to quit the session, simply stop the connection with remote system, then input command exit to stop active session.

PAD mode is tagged with greater mark router prompt, after enter this mode, you can use standard PAD user interface (except transferred meaning sequence). You can use X.3 parameter to configure PAD device or access X.25 from this interface.

In PAD mode, you can use standard or extension command to configure PAD command signal. For example, you can input command clr or clear to clear virtual calls. The command designated with standard command grammar is only the brief version of extension grammar version.

Use pad operation of PVC to send reset request packet and enable a session, send or receive reset packet to stop a session.

Table1 List the usable command in standard and extension command grammar.

Parameter	Description
Standard grammar	Description
Clr	Clear virtual calls.
Help	Display help information.
Int	Send interrupt grouping
par? Par	Display current value of local parameter (please refer to table 2)
Prof	Load a standard or name the profile value
Reset	Reset the calls.
Set	Change local parameter value. (please refer to table 2).
Set?	Change and read the parameter value.
Stat	Request link mode
Quit	Quit PAD connection.

The following table lists the various parameter types can be configured with command signal **set** *parameter-number*： *new-value* PAD in PAD mode.

Figuer 3-3 PAD parameter

Parameter number	Function	Parameter value	Description
1	PAD mode change character		Use a character to transfer PAD mode Minimum value: 0; maximum value: 126, default: 1
2	Local callback	0 1	no local callback (incoming Pad connection by default) Local callback enable (outgoing connection by default) Minimum value: 0, maximum value:1; default: 1
3	Data transferring character	0 1 2 4 8 16 32 64	No data transferring character. Arabic number character Enter<CR>(outgoing connection by default) ESCAPE ` BEL ` ENQ或 ACK ESCAPE ` BEL ` ENQ or ACK DEL ` CAN or DC2 ETX or EOT HT ` LT ` VT or FF all other characters Data selection of transferring character: minimum value: 0; maximum value: 255; default: 126

4	Leisure timer delay	0 1-255	no timer, it does not function Time delay value, unit is 50ms (the default value of two connection types is 1) Select minimum value of leisure timer delay: 0; maximum value: 25; default: 0.
5	Assistant device control		The volume control character of transfer control terminal and data stream during data transferring session Minimum value of assistant device control: 0; maximum value: 2; default:1
6	Service signal control		Do not support. PAD service signal control. Minimum value: 0; maximum value: 255; default: 2
7	The operation after receiving the break signal from DTE	0 1 2 4 8 16 21	After receiving the signal of stopping <Break>, PAD does no operations. Send interrupt grouping to inform remote DTE or PAD to produce stop signal on remote port Transfer reset grouping to reset virtual circuit. Send X.29 pause to remote DTE or PAD (outgoing connection by default). Depart from data transferring session and enter command waiting mode. Give up output to local terminal, set parameter 8 to 1. Effective combination (1+4+16) (incoming connection by default). The operation after receiving the pause signal. Minimum value: 0; maximum value: 31; default: 2.
8	Give up output	0 1	Send data to local terminal in normal mode (outgoing connection by default) Give up outputting data to local terminal; configure with parameter 7. minimum value: 0; maximum value: 1; default: 0
9	The filling after the “enter” character		Whether to provide filling character after enter <CR> character receives (from remote DTE) PAD (insert filter character). Added bytes after the “enter”. Minimum: 0; maximum value: 255; default: 2
10	Line break		Not support

11	Binary rate on the interface	10 5 9 0 1 6 8 2 4 3 7 11 12 13 14 15 16 17 18	50 bits 75bits 100 bits 110 bits 134.5 bits 150 bits 200 bits 300 bits 600 bits 1200 bits 1800 bits 75/1200 bits 2400 bits 4800 bits 9600 bits 19200 bits 48000 bits 56000 bits 64000 bits Binary system rate of enable and stop mode DTE Minimum value: 0; maximum value: 18; default: 14
12	Execute volume control from DTE		This parameter determines whether to transfer XON/XOFF character to PAD on terminal of enable and stop mode at data transferring session PAD volume control. Minimum value: 0; maximum value: 1; default: 1
13	Insert newline after character “enter”	0 1 2 4	Do not insert <LF> after <CR>(outgoing connection by default) Insert <LF> after <CR> sent to the terminal Insert <LF> after <CR> from the terminal Insert <LF> after <CR> of callbacking <CALLBACK> data sent to the terminal Insert newline after “enter” Minimum value: 0; maximum value: 7; default: 0.
14	The fillin of newline		This parameter determines the number of <LF> character inserted by PAD after sending <LF> character to terminal during data transferring session. Minimum value: 0; maximum value: 255; default: 0.
15	Local edit	0 1	Do not provide edit function Provide edit function Minimum value: 0; maximum value: 1; default : 0
16	Delete the character	0-127	Select a ASCII character ASCII 127(Del) by default Minimum value: 0; maximum value: 127; default: 127.
17	Delete the line	0-127	Select a ASCII character by default ASCII 21 (Ctrl-U) by default. Minimum value: 0; maximum value: 127; default: 24.

18	Show line	0-127	Select a ASCII character, ASCII18 (Ctrl-R) by default. Minimum value: 0; maximum value: 127; default: 18.
19	Edit PAD service signal		Not support Minimum value: 0; maximum value: 126; default: 2.
20	Callback shield		Not support. Minimum value: 0; maximum: 255; default: 0.
21	Odd and even process		Not support
22	Page wait		Not support

(5) 600 is the first to rely on value of PAD type

(6) 275 is from PAD; 1200 to PAD.

Default

For PAD outgoing connection, default value of X.3 parameter is as follows:

2 : 1, 3 : 2, 4 : 1 , 7 : 4 , 16 : 127, 17 : 21, 18 : 19

Default value of all other parameters are 0, but can be changed with command “set”.

For incoming PAD connection, the soft sending X.29 set parameter grouping only configures the following parameters:

2 : 0 , 4 : 1 , 7 : 21 , 15 : 0

Example

The following example enables a PAD session:

Router A# pad 123456789
Trying 123456789…Open
Router B>

Relevant command

x29 profile

show x29

Chapter 4 PPP Configuration Command

4.1 PPP Command

Command in this chapter configures PPP for dial-up WAN on the router.

For information about configuration of ppp on the router, please refer to chapter “configuration of PPP”.

For more information about PPP, please refer to RFC 1661. for more information about MLP, please refer to RFC 1717.

For more information about PAP, please refer to RFC 1334. For more information about CHAP, please refer to RFC 1994.

4.1.1 encapsulation ppp

To configure PPP encapsulation on serial interface or ISDN interface, you can use interface configuration command “encapsulation ppp”. Use “no encapsulation ppp” to disable PPP encapsulation.

Syntas

encapsulation ppp

no encapsulation ppp

Parameter

none

Default

在 Use PPP encapsulation on Asynchronous serial interface, use HDLC encapsulation on Synchronous serial interface.

Command mode

Interface configuration mode

Explanation

In order to use PPP encapsulation, the router should use IP routing protocol configuration.

Example

The following example activates PPP encapsulation on serial interface serial 1/0:

```
interface s1/0
encapsulation ppp
```

Relevant command

ppp authentication

4.1.2 interface multilink

In order to establish a multilink bundle or enter into mutlink interface configuration mode, use command “interface multilink”. Use “no interface multilink” to delete this interface.

Syntas

interface multilink *group－number*

no interface multilink

Parameter

Parameter	Description
group-number	The number of multilink bundle.

default

none

Command mode

global configuration mode

Explanation

This command firstly appears in version 1.2.4.

When multilink interface first establishes, it is automatically encapsulated as PPP protocol by default and enables Multilink.

Example

The following example establishes “multilink bundle 1” and configures IP address.

```
interface multilink 1
ip address 192.168.20.100 255.255.255.0
```

Relevant command

multilink-group

4.1.3 ip local pool

Use global configuration command “ip local pool” to configure a local address pool, allocate IP address to the distant port connects to point-to-point interface. Use “no ip local pool” to delete a local address pool.

Syntas

ip local pool {**default** | *pool-name begin-ip-address* [*ip-address-number*]}

no ip local pool {**default |** *poolname*}

Parameter

Parameter	Description
default	Default local address pool before naming other address pools
pool-name	Local address pool name designated
begin-ip-address	Initial IP address in the address pool
ip-address-number	(Optional) the number of IP address in address pool. If the parameter does not include this value, then there is only address begin-ip-address in address pool. 1024 IP addresses maximum in each address pool.

default

Address pool not configured

Command mode

global configuration mode

Explanation

Use command “ip local pool” to generate one or more local address pools, when one host dials in, it allocates one IP address for it from these address pools. In order to use a certain named address pool on the interface, use interface configuration command “peer default ip address pool”.

Use command “show ip local pool” to check the address pool.

Example

The following example generates a local IP address pool named mypool, IP address included ranges from 172.16.23.0 to 172.16.23.255:

ip local pool mypool 192.168.23.0 255

Relevant command

show ip local pool

4.1.4 multilink bundle-name

Command “multilink bundle-name” is used to designate the naming mode of “multilink bundle”. “no” form of this command is used to reset default naming mode.

Syntas

multilink bundle-name *name-method*

no multilink bundle-name

Parameter

Parameter	Description
authenticated	User name naming used by remote authentication

both	The user name or its end tagging naming the remote authentication used
endpoint	Use remote end to tag naming (remote end tag is acquired by PPP during LCP negotiates)

default

The user name used with remote authentication

Command mode

global configuration mode

Explanation

This command first appears in version 1.2.4.

Example

The following example uses the user name for remote authentication and its end tagging naming mechanism to name the bundle.

multilink bundle-name both

Relevant command

interface multilink

ppp multilink

multilink virtual-template

4.1.5 multilink-group

In order to designate an interface as part of Multilink special line bundle, use command “multilink-group” in interface configuration mode.

Use “no” form of this command to delete the interface from the bundle.

Syntas

multilink-group *group-number*

no multilink-group

Parameter

Parameter	Description
group-number	Number of multilink bundle

default

Not enableed

Command mode

Interface configuration mode

Explanation

Use this command to designate that all interfaces in the same bundle should have the same bandwidth. When using command “multilink-group”, if the corresponding multilink interface has not been established, it will automatically establish a multilink interface. After using command “multilink-group”, all PPP commands on this interface will not be able to configure, but via “multilink interface” to automatically clone to it until disableing this command. So the configuration on this interface will permanently be Synchronous with the configuration on designated multilink interface.

Example

The following example sets serial1/0 as part of multilink bundle 1.

```
interface serial1/0
encapsulation ppp
multilink-group 1
```

Relevant command

interface multilink

4.1.6 multilink max-fragments

In order to designate the maximum fragment number of each transfer packet on designated multilink bundle, use command “multilink max-fragments under interface configuration mode. Use “no” form of this command to reset the default value of the maximum fragment number.

Syntas

multilink max-fragments *fragment-number*

no multilink-group

Parameter

Parameter	Description
fragment-number	Fragment number (1-16)

default

16

Command mode

Interface configuration mode

Explanation

This command first appears in version 1.2.4.

This command only applies on the virtual interface related with multilink.

Example

The following example sets the maximum fragment number on interface multilink 1 to 10.

```
interface multilink 1
multilink max-fragments 10
```

Relevant command

interface multilink

interface virtual-template

interface dialer

4.1.7 multilink max-links

In order to designate the upper limit of the link number on multilink bundle interface, use command “multilink max-links” under interface configuration mode. Use “no” form of this command, to reset the upper limit of link number to default value.

Syntas

multilink max-links *link-number*

no multilink-group

Parameter

Parameter	Description
links-number	Fragment number (1 – 255).

default

255

Command mode

Interface configuration mode

Explanation

This command first appears in version 1.2.4.

This command only applies to the related virtual interface with multilink.

Example

The following example sets the upper limit of link number to 100 on interface multilink 1.

```
interface multilink 1
multilink max-links 100
```

Relevant command

interface multilink

interface virtual-template

interface dialer

user username user-maxlinks

4.1.8 multilink min-links

In order to set the lower limit of link number on designated multilink bundle interface, use command “multilink min-links” under interface configuration mode. Use “no” form of this command to reset the default value of lower limit of link number.

Syntas

multilink min-links *link-number*

no multilink-group

Parameter

Parameter	Description
links-number	Fragment number (0 – 255) .

default

0

Command mode

Interface configuration mode

Explanation

This command first appears in version 1.2.4.

This command only applies to the related virtual interface with multilink.

Example

The following example sets the lower limit of link number on interface multilink 1 to 2.

```
interface multilink 1
multilink min-links 2
```

Relevant command

interface multilink

interface virtual-template

interface dialer

4.1.9 peer default ip address

Use interface configuration command to designate an IP address for the remote side connecting this interface or acquire IP address from certain IP address pool or DHCP mechanism. Use “no peer default ip address” to disable the remote IP address pool’s original configuration on the interface.

Syntas

peer default ip address {*ip-address* | **dhcp**| **pool** [*pool-name*]}

no peer default ip address

Parameter

Parameter	Description
ip-address	Allocate an IP address for the remote port dialed in on the interface. In order to prevent the allocation of repeated IP address on the interface, this parameter cannot be used on dialer rotary group and ISDN interfaces.
dhcp	Use interaction of DHCPprotocol to allocate an IP address to the client.
pool	If the pool-name is not designated, you can use global default mechanism defined by “ip address-pool”.
pool-name	(Optional) Use the local address pool name generated by command” ip local-pool”. Acquire one address from this address pool, and neglect the configuration of bglobal default mechanism.

default

Address pool not configured

Command mode

Interface configuration mode

Explanation

The administrator can use this command to configure all possible address pool mechanism for every interface.

- For those interfaces not configured with “peer default ip address” mechanism, the router can use global default mechanism defined by command “ip address-pool”.
- If peer default ip address pool pool-name is used, the router will use this local configured address pool on this interface yet neglect any address pools.
- If peer default ip address ip-address is used, this designated IP address will be allocated to the remote port connected with the interface, yet neglect any global default mechanism.

Example

The following example designates the interface to use local IP address pool named “mypool”.

peer default ip address pool mypool

The following example designates the interface to use the IP address 192.168.3.29

peer default ip address 192.168.3.29

The following example designates the interface to use global default mechanism again:

peer default ip address pool

Relevant command

encapsulation ppp

ip local pool

4.1.10 peer neighbor-route

Under interface configuration mode, use command “peer neighbor-route” can reactivate the generation of host router on default interface which disables the generation of host router. Use no peer neighbor-route to disable the default act that generates neighbour router on opposite port of point-to-point interface.

Syntas

peer neighbor-route

no peer neighbor-route

Parameter

none

Default

After negotiation of PPP IPCP, it generates a route to the remote address of point-to-point interface.

Command mode

Interface configuration mode

Explanation

Only when default act causes a problem in your network, use command “no peer neighbor-route”.

Example

The following example reactivates default acts on the interface:

peer neighbor-route

4.1.11 ppp authentication

Use interface configuration command “ppp authentication” to designate the sequence of using CHAP or PAPprotocol on designated interface, use “no ppp authentication to disable authentication.

Syntas

ppp authentication {**chap**|**ms-chap**|**pap**}[[*list-name*|**default**][**callin**]

no ppp authentication

Parameter

Parameter	Description
chap	Activate CHAP on the serial interface
pap	Activate PAP on serial interface
ms-chap	Activate MS-CHAP on serial interface
list-name	(Optional) Use together with AAA/TACACS+, designate the TACACS+ method list name used during the execution of authentication. If the list name is not designated, the systeme will use default list. Use command “aaa authentication ppp” to create the list.
default	(Optional) Use together with AAA/TACACS. Use command “aaa authentication ppp” to createdefault list.

During PPP authentication, you should choose one from chap, ms-chap and pap, or the three combined randomly.

Default

Do not execute PPP authentication.

Command mode

Interface configuration mode

Explanation

Once you activate one, two or all of CHAP, MS-CHAP and PAP authentication, the local router demands to authenticate its identity before local router permits the remote device to transfer data.

- PAP authentication demands the remote device to send a name/password pair to authenticate whether there is one matching item in local user database or remote TACACS/TACACS+ database.
- CHAP authentication send a challenge to the remote device, the remote device must possess a public key to encrypt challenge and return the encryption result and self name to local router in the form of response packet. Local router uses remote device name in local user database or remote TACACS/TACACS+ database to fine the corresponding key, use it to encrypt the initial challenge, and authenticates whether this encryption result is the same as what remote device returns.

You can activate PAP, MS-CHAP and CHAP in any sequence. If two methods are all activated, then use the first method to advance request during link negotiation session. If the remote port suggests using the second method or simply refuses the first method, use the second method. Some remote devices only support CHAP or only support PAP. As to the designation of the sequence of the two authentication methods, it is based on the estimation of the ability for you to correctly negotiate, and the consideration of data line security. The user name and password is sent as plain text and may be captured or reused; and CHAP clears most security problems currently known.

Activate or disable ppp authentication will not influence whether local router should authenticate itself to remote device.

Example

The following example activates CHAP authentication on interface s1/0 and uses authentication list access1:

interface s1/0
encapsulation ppp
ppp authentication chap *access1*

Relevant command

aaa authentication ppp

encapsulation ppp

username password

4.1.12 ppp authorization

In order to activate AAA authorization on the designated interface, use command “ppp authorization” under interface configuration mode, use command “no” to disable the authorization.

Syntas

ppp authorization [**default** | *list-name*]

no ppp authorization

Parameter

Parameter	Description
default	(optional) the method list created with command “aaa authorization”.
list-name	*(optional)* Designate the authorization list name. If not designated, use default value.

default

Authorization not enableed

Command mode

Interface configuration mode

Explanation

After enabling command “aaa authorization” and defines authorization method list (or uses default method list), there should be authorization corresponds the above authorization list on proper interface. Using command “ppp authorization” is to apply the designated method list on designated interface (if there isn’t designated list, use default list)

Example

Use method list sun on interface s1/0:

interface s1/0

encapsulation ppp
ppp authorization sun

Relevant command

aaa authorization

4.1.13 ppp callback

Use interface configuration command “ppp callback” to receive callback request from opposite port or request opposite callback.

Use command “no ppp callback” to disable the configuration of “PPP callback”.

Syntas

ppp callback {**accept** | **initiate** | **request**}

no ppp callback

Parameter

Parameter	Description
accept	Accept the callback request of PPP client.
initiate	Without the negotiation of PPP callback, actively initiate callback to the ppp client dialed on the interface.
request {**cbcp**}	Send callback request to PPP opposite port (if cbcp is attached, then use CBCPprotocol to perform callback negotiation).

default

Do not accept the callback request of opposite port

Command mode

Interface configuration mode

Explanation

In order to accept an callback request from the client, you should first configure “ppp callback accept” or “ppp callback initiate”, and configure CHAP or PAP to authenticate the client, during the passing of the authentication, send callback to the client.

IF you want to use CBCP to prosecute callback negotiation, you should configure ppp callback request cbcp on one side of the caller (if you require the caller to designate the telephone number, you should configure dialer caller xx). At answerer side except the requirement of configuring ppp callback accept, if there is no need to callback, there is no need to configure the callback number; if the callback number is designated by the caller, you should configure user xx password xx callback-dialstring *or dialer called *; if the callback telephone number is designated by the answerer, you need to configure user xx password xx callback-dialstring xx; If you want the caller to select one from a group of telephone number provided by the answerer, you should configure dialer called xx ；xx；xx.

You should first enquire user xxx password xx callback-dialstring xx, then enquire dialer called xx. In addition, telephone exchange number is separated from extension number with “,”, use “;” to separate a group of telephone numbers.

Example

The following example accepts the callback request of PPP client:

ppp callback accept

The following example sends callback to the opposite port without the negotiation of ppp callback;

ppp callback initiate

The following example sends callback request to the opposite port:

ppp callback request

The following example use 12345 to callback with the designated telephone number by the answerer:

Caller configuration:

ppp callback request cbcp

Answerer configuration:

user sun password sun callback-dialstring 12345

Enter interface configuration mode, input:

ppp callback accept

Relevant command

ppp authentication

username

4.1.14 ppp chap echo

After passing CHAP authentication, configures the interval to carry out CHAP authentication.

Syntas

ppp chap ehco *seconds*

Parameter

The interval of CHAP authentication, range from 0 second to 2147483647 seconds

Default

No timing CHAP authentication by default, 0 second by default.

Command mode

Interface configuration mode

Explanation

When configuring CHAP timing authentication, you should configure the second as greater than 0.

Example

When configuring the interface serial 1/0 to carry out CHAP timing authentication, local router named as routerA, callback timing is 10 second.

```
interface s1/0
encapsulation ppp
ppp authentication chap
ppp chap hostname routerA
ppp chap echo 10
```

Relevant command

ppp authentication

ppp authentication

ppp chap hostname

4.1.15 ppp chap hostname

Use interface configuration command “ppp chap hostname” to create a routerchap host name. To disable, use command “no ppp chap hostname”.

Syntas

ppp chap hostname *hostname*

no ppp chap hostname *hostname*

Parameter

Parameter	Description
hostname	Sent names in the CHAP challenge packet.

default

This function not enableed. Send host name of the router in all CHAP challenges.

Command mode

Interface configuration mode

Explanation

This command usually applies to local CHAP authentication (to authenticate the opposite port), but it can also be used for remote CHAP authentication.

Example

Command in the following example encapsulates PPP on interface dialer 0. CHAP only authenticate the received calls. User name guest will be sent with all CHAP challenge and response packets:

```
interface dialer 0
encapsulation ppp
ppp authentication chap callin
```

ppp chap hostname guest

Relevant command

aaa authentication ppp

ppp authentication

ppp chap password

ppp pap

4.1.16 ppp chap refuse

Refuse to use CHAP to authenticate local on opposite port.

Syntas

ppp chap refuse

Parameter

none

Default

Do not refuse to use CHAP to authenticate local by default

Command mode

Interface configuration mode

Explanation

After the configuration of ppp chap refuse, it will refuse all users to use CHAP to authenticate local (including legal users).

Example

Configure the interface serial 1/0 to refuse CHAP authentication.

interface s1/0
encapsulation ppp
ppp chap refuse

Relevant command

ppp authentication

4.1.17 ppp ipcp rfc-default

Set the IPCP negotiation option as PPPprotocol default value, do not negotiate all IPCP options.

Syntas

ppp ipcp rfc-default

Parameter

none

Default

The IPCP negotiation option is not the default value of protocol, which is, negotiate the IPCP option.

Command mode

Interface configuration mode

Explanation

Generally, this command does not need to configure. Only applies to the situation of test or that the opposite port does not support IPCP negotiation.

Example

Configure IPCP negotiation as default protocol.

ppp ipcp rfc-default

Relevant command

encapsulation ppp

4.1.18 ppp lcp echo

Configure the interval for LCP to send echo packets.

Syntas

ppp lcp echo *seconds*

Parameter

Interval to send LCP callback request packets range from 0 to 2147483647

Default

10 seconds

Command mode

Interface configuration mode

Explanation

You should configure the second as greater than 0 when you require sending LCP callback request packets.

Example

Configure ICP callback on interface serial 1/0, timing is 10 second.

```
interface s1/0
encapsulation ppp
ppp lcp echo 10
```

Relevant command

encapsulation ppp

4.1.19 ppp lcp enddisc-type

Select multilink ppp symbol type.

Syntas

ppp lcp enddisc-type [**null** | **local** | **ip** | **ieee8021** | **ppp** | **psdn**]

Parameter

none

Command mode

Interface configuration mode（ multilink interface ）

Explanation

Select interrupting point symbol type when the protocol is negotiating for multilink ppp.

Example

```
37DE_config_m1#ppp lcp enddisc-type ppp
37DE#debug ppp negotiate
  PPP Serial0/1: LCP  Listen  ; RX <- Config Req, id: 182, len: 32
2003-4-28 11:36:19     making Magic Number: 0xc69038e7
2003-4-28 11:36:19     making Protocol compression
2003-4-28 11:36:19     making Addr/Ctl compression
2003-4-28 11:36:19     making MRRU: 1524
2003-4-28 11:36:19     making ENDDISC: class 4 ,address "000000e3"
2003-4-28 11:36:19
PPP Serial0/1: LCP  Listen  ; TX -> Config Req, id: 8, len: 25
2003-4-28 11:36:19     checking Magic Number: 0xcff04a72
2003-4-28 11:36:19        result Config Ack, option 5, length 6
2003-4-28 11:36:19        making Magic Number: 0xcff04a72
2003-4-28 11:36:19     checking Protocol compression
2003-4-28 11:36:19        result Config Ack, option 7, length 2
2003-4-28 11:36:19        making Protocol compression
2003-4-28 11:36:19     checking Addr/Ctl compression
2003-4-28 11:36:19        result Config Ack, option 8, length 2
2003-4-28 11:36:19        making Addr/Ctl compression
2003-4-28 11:36:19     checking MRRU: 1524
2003-4-28 11:36:19        result Config Ack, option 17, length 4
2003-4-28 11:36:19        making MRRU: 1524
2003-4-28 11:36:19     checking ENDDISC: class 1 ,address "BD-00000059" ,len 11 ,toss(11-
>0)
2003-4-28 11:36:19        result Config Ack, option 19, length 14
2003-4-28 11:36:19        making ENDDISC: class 1 ,address "BD-00000059"
```

In the above example, the “lcp config request” sent by local port contains enddisc negotiating content. The type is 4, or “enddisc type ppp”. Negotiating packets sent by port on the other end contains enddisc type 1, or “enddisc type local”.

The following is the relations of enddisc type number and type name .

class	name
0	null
1	local
2	ip
3	ieee8021
4	ppp
5	psdn

4.1.20 ppp lcp rfc-default

Configure LCP negotiation option as PPP protocol default value, do not negotiation all LCP options

Syntas

ppp lcp rfc-default

Parameter

none

Default

LCP negotiation option is not protocol default value, which is negotiation LCP option.

Command mode

Interface configuration mode

Explanation

Generally, this command does not need to be configured. Only applies to the situation of test or that the opposite port does not support LCP negotiation.

Example

Set LCP negotiation as default protocol.

ppp lcp rfc-default

Relevant command

encapsulation ppp

4.1.21 ppp lcp

Syntas

ppp lcp [**close** | **listen** | **open**]

Carry out “open, close, listen” operation toward LCP connection.

Parameter

Parameter	Description
close	Close LCP connection
listen	Set LCP as monitoring mode
open	Establish LCP connection

default

LCP as monitoring mode

Command mode

Interface configuration mode

Explanation

When using command “ppp lcp close” to close the current PPP connection, LCP turns into closed mode. There after even it dials from remote port, no connection will be established. You should enable it through ppp lcp listen or ppp lcp open, among them ppp lcp open actively sends LCPprotocol request packet.

Example

Close LCP connection

ppp lcp close

Relevant command

encapsulation ppp

4.1.22 ppp max-bad-auth

Use interface configuration command “ppp max-bad-auth” to configure a point-to-point interface to enable it not to reset immediately after failure of authentication, and permit a certain time of authentication. Use command “no ppp max-bad-auth” to reset immediately after failure of authentication.

Syntas

ppp max-bad-auth *number*

no ppp max-bad-auth

Parameter

Parameter	Description
number	Designate times of repeat authentication(1-255), 5 by default

default

5

Command mode

Interface configuration mode

Explanation

This command applies to any serial interface using PPP encapsulation. (Asynchronous serial interface, Synchronous serial interface or ISDN interface)

Example

The following example sets the interface BRIO as that after the failure of the first authentication there are still 2 authentications permitted (3 tries of authentication in all)

interface bri 0
encapsulation ppp
ppp authentication chap
ppp max-bad-auth 3

Relevant command

encapsulation ppp

4.1.23 ppp multilink

Interface configuration command “ppp multilink” to enable multilink PPP. Use command “no ppp multilink” to close multilink ppp.

Syntas

ppp multilink

no ppp multilink

Parameter

None

Default

Multilink not enableed

Command mode

Interface configuration mode

Explanation

This command applies to any serial interface adopts PPP encapsulation (Asynchronous serial interface, Synchronous serial interface or ISDN interface).

Example

```
interface Dialer0
ip address 99.0.0.2 255.0.0.0
encapsulation ppp
dialer idle-timeout 500
dialer map 99.0.0.1 name dialname1 broadcast 81012345678901
dialer load-threshold 30 either
dialer-group 1
ppp authentication chap
ppp multilink
```

Relevant command

encapsulation ppp

4.1.24 ppp pap refuse

Refuse to use PAP to authenticate local on opposite port.

Syntas

ppp pap refuse

Parameter

none

Default

Do not refuse the opposite port to use PAP to authenticate local by default.

Command mode

Interface configuration mode

Explanation

After configures ppp pap refuse, it will refuse all users to use PAP authentication local (including legal user).

Example

Configure the interface serial1/0 to refuse PAP authentication.

```
interface s1/0
encapsulation ppp
ppp pap refuse
```

Relevant command

ppp authentication

4.1.25 ppp pap sent-username

Use interface configuration command “ppp pap sent-username” to activate remote

PAP support on the interface and use sent-username and password in PAP authentication request packets. Use “no ppp pap sent-username” to prohibit the support of remote PAP.

Syntas

ppp pap sent-username *username password*

no ppp pap sent-username

Parameter

Parameter	Description
username	Send the user name in PAP authentication request.
password	Send the password in |PAP authentication request.

default

Prohibit remote PAP support

Command mode

Interface configuration mode

Explanation

Use this command to activate remote PAP support (such as: response to opposite port ’s request of using PAP authentication) meanwhile designate the parameter to send PAP authentication request.

Example

The following example configures the dialup interface 0 as the dialing group head and to activate PPP encapsulation on the interface. CHAP or PAP only authenticates the received calls. When remote port request the router to use PAP for authentication, user name “guest1”, password “mykey” are sent to the remote port:

```
interface dialer0
encapsulation ppp
ppp authentication chap pap callin
ppp chap hostname guest1
ppp pap sent-username guest1 mykey
```

Relevant command

aaa authentication ppp

ppp authentication

ppp chap hostname

4.1.26 ppp timeout authentication

Configure the PPP authentication timeout.

Syntas

ppp timeout authentication *seconds*

Parameter

Parameter	Description
seconds	Negotiate timeout, unit is second

default

Default PPP authentication timeout is 3 seconds.

Command mode

Interface configuration mode

Explanation

During PPP authentication process, if it does not receive response packets from opposite port within this interval, then PPP will resend authentication packet sent last time.

Example

Configure the PPP authentication timeout as 10 seconds.

ppp timeout authentication 10

Relevant command

encapsulation ppp

ppp authentication

4.1.27 ppp timeout ncp

Configure the PPP NCP negotiation timeout.

Syntas

ppp timeout ncp *seconds*

Parameter

Parameter	Description
seconds	Timeout negotiates for NCP, unit is second.

default

Default PPP NCP negotiation timeout is 3 seconds.

Command mode

Interface configuration mode

Explanation

During PPP NCP negotiation, if it does not receive response packets of opposite port within this interval, than PPP will resend the packets sent last.

Example

Configure the PPP NCP negotiation timeout as 10 seconds.

ppp timeout ncp 10

Relevant command

encapsulation ppp

4.1.28 ppp timeout lcp

Configure the PPP LCP negotiation timeout.

Syntas

ppp timeout lcp *seconds*

Parameter

Parameter	Description
seconds	LCP negotiation timeout, second is the unit.

default

Default PPP LCP negotiation timeout is 3 seconds.

Command mode

Interface configuration mode

Explanation

During PPP LCP negotiation process, if it does not receive response packet from opposite port within this interval, then PPP will resend the packet sent last.

Example

Configure PPP LCP negotiation timeout to 10 seconds.

ppp timeout lcp 10

Relevant command

encapsulation ppp

4.1.29 show ip local pool

Use show ip local pool to show the statistic information of IP address pool.

Syntas

show ip local pool

Parameter

none

Command mode

Privilege EXEC mode

Explanation

The soft will show the general list and corresponding IP address of all defined address pool.

Example

Here is the example of command “show ip local pool”:

```
Router# show ip local pool
Name   Begin          End            Number
sun    192.168.0.1    192.168.0.10   10
```

Relevant command

ip local pool

4.1.30 show ppp

Syntas

show ppp { **multilink** |**queue**| **status** | **version** }

Parameter

Parameter	Description
multilink	Show related information of PPP multilink
queue	Show the number of unprocessed information in PPP queues
Mode	Show the related interface mode information to configure PPP
version	PPP module version

command mode

Non-user mode

Explanation

This command is used to show PPP related information.

Example

Here is the example of command showing interface mode information:

```
Router# show ppp sta
PPP status information:
   5 links (total)
   1 links (protocol up)
   4 links (protocol down)
Protocol up:
   Name      ID Type   Status          Uptime       Peer
   S2/0       2 ALGC   Network Phase   0:04:32:01   1.0.0.2
Protocol down:
   Name      ID Type   Status          Downtime
   a0/0       1 ADC    Link Dead       0:04:48:15
   vt1        4 LVT    Link Dead       0:04:48:07
   d1         6 D      Link Dead       0:04:48:07
   m1         7 LMU    LCP Phase       0:04:48:07
```

The above tags that the router has altogether 5 interfaces that configures PPP, only s2/0 is in the mode of protocolUp, time of protocolUp is 4 hours 32 minutes and 1 second. The opposite port address is 1.0.0.2. Other ports are in the mode of “down”.

Relevant command:

None

4.1.31 username

Use global configuration command to designate a password, which is used in PPP CHAP caller tag and PAP.

Syntas

username *name* **password** *secret*

Parameter

Parameter	Description
name	Host name, server name, User ID or naming name
secret	Regarding CHAP: designate key password for local router, access server, or remote device. This key can be saved in local router or access server after encryption; this can prevent the embezzlement of te key. Key password is consisted of 11 printable ASCII characters at most, but can not include space or underline. No limit for the number of username/password pair, permit any number of remote devices to be authenticated.

Default

No pre-defined password

Command mode

global configuration mode

Explanation

To add a name entry for each remote system needs to be authenticated on local router or access server.

As part of the configuration authentication protocol (such as CHAP and PAP), command “username” is necessary. If you require authentication for each remote system communicates with local router or access server, you should add a username entry.

Example

The following example starts CHAP on serial interface 0. It defines a password for local serverAdam and remote serverEve:

```
hostname Adam
interface s1/0
encapsulation ppp
ppp authentication chap
username Eve password theirsystem
```

Relevant command

hostname

4.1.32 debug ppp

Show PPPprotocol parameter negotiation, authentication, packet sending, receiving process and error information.

Syntas

debug ppp [**authentication** | ***cbcp*** | **error** | ***multilink*** | **negotiation** | **packet** | **raw**] [*interface*]

Parameter

Parameter	Description
authentication	Enable the debug switch for PPP authentication
cbcp	Enable the debug switch for PPP callback control protocol
error	Enable the debug switch of PPP error information
negotiation	Enable the debug switch for PPP parameter negotiation
packet	Enable the debug switch for PPP input & output packets
raw	Enable the debug switch for PPPAsynchronous input & output original packet
interface	Interface that requires PPP debug information

command mode

supervisor mode

Explanation

After opening the switch of PPP debug information, it outputs PPP protocol parameter negotiation process, authentication process, packet sending, receiving process and error information and helps the user in PPP trouble diagnosis.

Note:

raw is only effective on Asynchronous interface.

Use command "**no debug ppp"** to stop displaying the information.

Example

The following example describes the situation of debugging PPP receiving and sending of packets:

```
Router#debug ppp packet s1/2
PPP Serial1/2: TX -> packet, len=88, protocol: LCP
FF 03 00 21 45 00 00 54 00 2F 00 00 FF 01 3E F1   ...!E..T./....>.
01 00 00 0C 7B 7B 00 02 08 00 CB 37 00 12 00 00   ....{{.....7....
00 02 37 A5 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F   ..7.............
10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F   ................
PPP Serial1/2: RX <- packet, len=85
21 45 00 00 54 9E 73 00 00 FF 01 A0 AC 7B 7B 00   !E..T.s.....{{.
02 01 00 00 0C 00 00 D3 37 00 12 00 00 00 02 37   ........7......7
A5 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12   ................
13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22   ............. !"
```

Domain	Description
PPP	PPPprotocol is debugged currently
Serial1/2	Current debug interface
TX -> packet	PPP transmitting packet
Len=85	Length of transmitted packet
protocol: LCP	Sub-protocol encapsulated in the current PPPprotocol
FF 03 00 21 45 00 00 54 00 2F 00 00 FF 01 3E F1 01 00 00 0C 7B 7B 00 02 08 00 CB 37 00 12 00 00 00 02 37 A5 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F	The first 4 bytes are PPP frame heads, the the latter are data.
...!E..T./....>. ....{{.....7.... ..7.....	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in "."
RX <- packet	PPP packet received.
Len=88	Length of packet received
21 45 00 00 54 9E 73 00 00 FF 01 A0 AC 7B 7B 00 02 01 00 00 0C 00 00 D3 37 00 12 00 00 00 02 37 A5 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22	First byte 0X21, is the value of IPprotocol and PFC compress in ppp, originally 0X0021. the rear part are data

!E..T.s.....{{. .....7.....7 .... !"	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in “.”

The following example describes the simplified process of debug PPPprotocol parameter negotiation

Router#debug ppp negotiation s1/2
PPP Serial1/2: LCP Listen ; Start
PPP Serial1/2: LCP Listen ; TX -> Config Req, id: 52, len: 14
PPP Serial1/2: LCP Req Sent; RX <- Config Ack, id: 52, len: 14
PPP Serial1/2: LCP Ack Rcvd; RX <- Config Req, id: 88, len: 14
PPP Serial1/2: LCP Ack Rcvd; TX -> Config Ack, id: 88, len: 14
PPP Serial1/2: LCP Ack Rcvd; Opened
PPP Serial1/2: IPCP Listen ; Start
PPP Serial1/2: IPCP Listen ; TX -> Config Req, id: 53, len: 10
PPP Serial1/2: IPCP Req Sent; RX <- Config Req, id: 89, len: 16
PPP Serial1/2: IPCP Req Sent; TX -> Config Ack, id: 89, len: 16
PPP Serial1/2: IPCP Ack Sent; RX <- Config Ack, id: 53, len: 10
PPP Serial1/2: IPCP Ack Sent; Opened.

Domain	Description
Serial1/2	Current debug interface
PPP	PPP protocol
LCP	Link control protocol
IPCP	IP control protocol
Listen `Req Sent `Ack Rcvd ` Ack Sent	PPPprotocol mode
id: 53	Packet identification
len:10	Length of packet

4.2 PPPoE configuration command

PPPoE command include:

- pppoe-client dialer number
- clear pppoe
- debug pppoe data
- debug pppoe error
- debug pppoe event
- debug pppoe packet
- pppoe-server virtual-template
- show pppoe session
- show pppoe control
- show pppoe group
- clear pppoe session

4.2.1 pppoe-client dialer number

This command is used to show the function of PPPoE Client.

[**no**]**pppoe-client dialer** *number* [ddr]

Parameter

Parameter	Description
number	Associated Dialer interface °
ddr	dial on demand request

Command mode

Interface configuration mode

Example

routera_config_e1/1#pppoe-client dialer1
no routera_config_e1/1#pppoe-client dialer1
routera_config_e1/1#pppoe-client dialer1 ddr
no routera_config_e1/1#pppoe-client dialer1 [ddr]

4.2.2 clear pppoe

This command is used to disaplasis all links of PPPoE.

clear pppoe

parameter

none

command mode

management mode

4.2.3 debug pppoe data

this command is used to show the message exchange of Session in PPPoE conversation.

Parameter

none

Command mode

management mode

Example

2002-4-9 13:34:33 PPPoE Ethernet1/1 Tx DATA id:0001 len:42,
00 01 42 89 75 50 08 00 3E 56 33 45 88 64 11 00 ..B.uP..>V3E.d..
00 01 00 16 C0 21 09 4F 00 14 55 17 32 DC 00 00 .....!.O..U.2...

00 00 7D 3D 7D 20 26 7D 22 7D ..}=} &}"}
2002-4-9 13:34:33 PPPoE Ethernet1/1 Rx DATA id:0001 len:42
08 00 3E 56 33 45 00 01 42 89 75 50 88 64 11 00 ..>V3E..B.uP.d..
00 01 00 16 C0 21 0A 4F 00 14 62 46 FA C3 00 00 .....!.O..bF....
00 00 7D 3D 7D 20 26 7D 22 7D ..}=} &}"}

4.2.4 debug pppoe error

this command is used to show the error towards PPPoE.

debug pppoe error

parameter

none

command mode

management mode

4.2.5 debug pppoe event

this command is used to show the event in PPPoE conversation.

debug pppoe event

parameter

none

command mode

management mode

example

router#debug pppoe event
RouterA#debug pppoe da
RouterA_config_e1/1#pppoe d1
RouterA_config_e1/1#2002-4-9 14:19:16 PPPoE Ethernet1/1 Created L:0800.3e56.3345
2002-4-9 14:19:16 PPPoE Ethernet1/1 Starting L:0800.3e56.3345
2002-4-9 14:19:16 PPPoE Ethernet1/1 Tx PADI L:0800.3e56.3345 R:ffff.ffff.ffff
2002-4-9 14:19:16 PPPoE Ethernet1/1 Rx PADO L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Tx PADR L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Rx PADS L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Opening
2002-4-9 14:19:16 PPPoE Ethernet1/1 Opened L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 Line on Interface Virtual-access0, changed state to up
2002-4-9 14:19:16 Line protocol on Interface Virtual-access0, changed state to up

4.2.6 debug pppoe packet

this command is used to show the protocol alternation in Discovery of PPPoE conversation.

debug pppoe packet

parameter

none

command mode

user management mode

example

```
RouterA_config_e1/1#2002-4-9 13:42:12 PPPoE Ethernet1/1 Tx PADT L:0800.3e56.3345
 R:0001.4289.7550
00 01 42 89 75 50 08 00 3E 56 33 45 88 63 11 A7   ..B.uP..>V3E.c..
00 01 00 00
RouterA_config_e1/1#2002-4-9 13:42:41 PPPoE Ethernet1/1 Tx PADI L:0800.3e56.3345
 R:ffff.ffff.ffff
FF FF FF FF FF FF 08 00 3E 56 33 45 88 63 11 09   ........>V3E.c..
00 00 00 0C 01 01 00 00 01 03 00 04 00 00 3F 54   ..............?T
2002-4-9 13:42:41 PPPoE Ethernet1/1 Rx PADO L:0800.3e56.3345 R:0001.4289.7550
08 00 3E 56 33 45 00 01 42 89 75 50 88 63 11 07   ..>V3E..B.uP.c..
00 00 00 2C 01 01 00 00 01 03 00 04 00 00 3F 54   ...,..........?T
01 02 00 08 47 4B 2D 43 49 53 43 4F 01 04 00 10   ....GK-CISCO....
91 5A D4 BE D5 27 87 03 43 DC 6A F0 09 6B 54 19   .Z...'..C.j..kT.
2002-4-9 13:42:41 PPPoE Ethernet1/1 Tx PADR L:0800.3e56.3345 R:0001.4289.7550
00 01 42 89 75 50 08 00 3E 56 33 45 88 63 11 19   ..B.uP..>V3E.c..
00 00 00 20 01 01 00 00 01 03 00 04 00 00 0F F6   ... ............
01 04 00 10 91 5A D4 BE D5 27 87 03 43 DC 6A F0   .....Z...'..C.j.
09 6B 54 19                                       .kT.
2002-4-9 13:42:41 PPPoE Ethernet1/1 Rx PADS L:0800.3e56.3345 R:0001.4289.7550
08 00 3E 56 33 45 00 01 42 89 75 50 88 63 11 65   ..>V3E..B.uP.c.e
00 01 00 20 01 01 00 00 01 03 00 04 00 00 0F F6   ... ............
01 04 00 10 91 5A D4 BE D5 27 87 03 43 DC 6A F0   .....Z...'..C.j.
09 6B 54 19
```

4.2.7 pppoe-server virtual-template

this command is used to setting the Ethernet port to **server**.

pppoe-server virtual-template *virtual-template-number*

no pppoe-server virtual-template *virtual-template-number*

parameter

Parameter	Description
virtual-template-number	Establisn VT port.

default

none

command mode

port configuration mode

explanation

This command setting the Ethernet port to PPPOE SERVER port. virtual-template-number must be established VT port.

Example

router_config#int virtual-template 1
router_config_if#ip addr 4.1.1.1 255.255.255.0
router_config_if#int f0/0
router_config_if#pppoe-server virtual-template 1

router_config_if#no pppoe-server virtual-template 1

4.2.8 show pppoe session

This command is used to show the current conversation connecting of PPPoE.

show pppoe session

parameter

none

default

none

command mode

management mode, global configuration mode, interface configuration mode

explanation

show all conversation connecting

example

router>enable
router#config
router_config#show pppoe session
PPPOE session information:

---

session 1
attach to Ethernet2/1(host)
associate VA port is Virtual-access0
remote mac is 00 e0 0f 22 00 40
send packet 1909, send total length 139180
receive packet 1911, receive total length 112638

if at server, “attach to Ethernet2/1(host)” will show “attach to Ethernet2/1 (AC)”.

4.2.9 show pppoe control

This command is used to show the control part of PPPOE,

show pppoe control

parameter

none

default

none

command mode

management mode, global configuration mode, interface configuration mode

explanation

show all control part information

example

```
router>enable
router#config
router_config#show pppoe control

PPPOE control block information:
---------------------------------------------
Ethernet2/1 configue as host
attach to group 5
session_id is 1
remote mac is 00 e0 0f 22 00 40
clone id is 6
va id is 8
---------------------------------------------
```

4.2.10 show pppoe group

This command is used to show the group information of PPPOE.

show pppoe group

parameter

none

default

none

command mode

management mode, global configuration mode, interface configuration mod

explanation

show all workgroup information of PPPOE.

example

```
router>enable
router#config
router_config#show pppoe group

        PPPOE group information:
---------------------------------------------
GROUP 2
configue as AC
attach to clone port 7
---------------------------------------------
GROUP 5
configue as HOST
attach to clone port 6
```

4.2.11 clear pppoe session

This command is used to cleanup the conversation command of PPPOE.

Clear pppoe session *etherport-name*

Parameter

none

Default

none

Command mode

management

explanation

This command will cleanup all PPPOE conversation in some Ethernet port, and rebuild the process of PPPOE conversation.

The parameter is some difference with old edition.

Example

```
router>enable
router#clear pppoe session f0/0
```

Chapter 5 SLIP Configuration Command

5.1.1 debug slip

Show SLIPprotocol packet sending, receiving process and error information. Use command “no debug slip” to stop showing information.

Syntas

[**no**] **debug slip** [**error**|**events**|**packet**] [*interface*]

Parameter

Parameter	Description
interface	The interface to show SLIP debug information
error	Enable the debug switch of SLIP error information
events	Enable the debug switch of SLIPprotocol event
packet	Enable the debug switch of SLIP receiving/sending packet

command mode

supervisor mode

Explanation

After opening the SLIP debug information switch, it outputs SLIP sending and receiving packet information or error information, and helps the user in SLIP trouble diagnosis.

Example

The following example describes the situation of debugging SLIP receiving packet:

```
Router#debug slip packet s1/2
Router#
SLIP Serial1/2: RX <- packet, len=1
C0                                      .
SLIP Serial1/2: RX <- packet, len=62
45 00 00 3C D5 CD 00 00 7F 01 9B 3A DB DC A8 00   E..<.......:....
10 0A 00 00 01 08 00 18 5C 02 00 33 00 61 62 63       ........\..3.abc
64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73      defghijklmnopqrs
74 75 76 77 61 62 63 64 65 66 67 68 69 C0           tuvwabcdefghi.
```

Domain	Description
SLIP	SLIP protocol is currently debugged
Serial0/2	Current debug interface
RX <- packet	SLIP receives the packet
len=1	Length of packet received
C0	Initial delimiter of SLIP frame

45 00 00 3C D5 CD 00 00 7F 01 9B 3A DB DC A8 00 10 0A 00 00 01 08 00 18 5C 02 00 33 00 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74 75 76 77 61 62 63 64 65 66 67 68 69 C0	Hex system denotation of packet received
E..<.....:.... .....\..3.abc defghijklmnopqrs tuvwabcdefghi.	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in "."

The following example describes the situation of debugging SLIP sending packet:

Router#debug slip packet s1/2
Router#
SLIP Serial1/2: TX -> packet, len=86
C0 45 00 00 54 00 0A 00 00 FF 01 A7 9C 0A 00 00 .E..T.....
01 0A 00 00 02 08 00 39 55 00 0D 00 00 00 01 C9 .....9U.....
8D 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 .....
13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22 ..... !"

Domain	Description
SLIP	SLIPprotocol is currently debugged
Serial1/2	Current debug interface
TX -> packet	SLIP packet currently sending
len=86	Length of packet sent
C0 45 00 00 54 00 0A 00 00 FF 01 A7 9C 0A 00 00 01 0A 00 00 02 08 00 39 55 00 0D 00 00 00 01 C9 8D 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 20 21 22	Hex system denotation to send the packet
.E..T..... .....9U..... .... !"	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in "."

5.1.2 encapsulation slip

Interface encapsulation SLIP. No to cancel the encapsulation.

Syntas

encapsulation slip

no encapsulation slip

Parameter

none

Default

none

Command mode

Interface configuration mode

Explanation

Use “no” to cancel encapsulation and back to encapsulation PPP mode. It is suggested that before you change the encapsulation type, you should use command “no” to close the interface. Although this is not necessary, this operation is safer

Example

The following example configures SLIP encapsulation mode on serial s1/1:

```
interface s1/1
encapsulation slip
```

Chapter 6 HDLC Configuration Command

6.1.1 debug hdlc

Show the packet sending and receiving process of HDLCprotocol. Use command “no debug hdlc” to stop showing information.

Syntas

[**no**] **debug hdlc** [**packet** | **error**] [i*nterface*]

Parameter

Parameter	Description
interface	To show the interface of HDLC debug information
packet	Enable the debug switch of HDLC sending/receiving packet
error	Enable the debug switch of HDLC error information

command mode

supervisor mode

Explanation

After turning on HDLC debug information switch, outputs HDLC receiving/sending packet and error information, helps the user in HDLC trouble diagnosis.

Example

The following example describes the situation when debugging HDLC receiving/sending packet:

```
Router#debug hdlc packet s1/2
Router#
Serial1/2 HDLC RX <- packet, len=64
0F 00 08 00 45 00 00 3C BE 4A 00 00 7F 01 B2 BD   ....E..<.J......
C0 A8 00 10 0A 00 00 01 08 00 19 5C 02 00 32 00   ..........\..2.
61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70   abcdefghijklmnop
71 72 73 74 75 76 77 61 62 63 64 65 66 67 68 69   qrstuvwabcdefghi
Serial0/2 HDLC RX <- link check frame, len=22
8F 00 80 35 00 00 00 02 00 00 00 33 00 00 00 C7   ...5.......3....
FF FF 00 00 0B DE                                 ......
```

Domain	Description
HDLC	HDLCprotocol is currently debugged
Serial0/2	Current debug interface
RX <- packet	IP packet HDLC received
len=64	Length of packet received

0F 00 08 00 45 00 00 3C BE 4A 00 00 7F 01 B2 BD C0 A8 00 10 0A 00 00 01 08 00 19 5C 02 00 32 00 61 62 63 64 65 66 67 68 69 6A 6B 6C 6D 6E 6F 70 71 72 73 74 75 76 77 61 62 63 64 65 66 67 68 69	The first 4 bytes are HDLC frame head, the rest are data
....E..<.J..... .....\..2. abcdefghijklmnop qrstuvwabcdefghi	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in "."
RX <- link check frame	HDLC receives link check frame
len=22	Length of link check frame
8F 00 80 35 00 00 00 02 00 00 00 33 00 00 00 C7 FF FF 00 00 0B DE	Hex system denotation of link check frame
...5.....3....	ASCII code denotation of link check frame. Those out of the denotation range of ASCII code are shown in "."

HDLC Serial0/2: TX -> packet, len=88

0F 00 08 00 45 00 00 54 00 07 00 00 FF 01 A7 9F ....E..T.....
0A 00 00 01 0A 00 00 02 08 00 00 03 00 0A 00 00 .....
00 01 02 E3 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F .....
10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F .....
HDLC Serial0/2: TX -> link check frame, len=24
8F 00 80 35 00 00 00 02 00 00 01 15 00 00 00 42 ...5.....B
FF FF 30 2E 33 B9 53 01 ..0.3.S.

Domain	Description
HDLC	HDLCprotocl is currently debugged
Serial1/2	Current debug interface
TX -> packet	HDLC is sending IP packet
len=88	Length of sent packet
0F 00 08 00 45 00 00 54 00 07 00 00 FF 01 A7 9F 0A 00 00 01 0A 00 00 02 08 00 00 03 00 0A 00 00 00 01 02 E3 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F	First 4 bytes are HDLC frame head, rest are data
....E..T.....	ASCII code denotation of sent packet. Those out of the denotation range of ASCII code are shown in "."
TX -> link check frame	HDLC is sending link check frame
len=24	Length of the link check frame

8F 00 80 35 00 00 00 02 00 00 01 15 00 00 00 42 FF FF 30 2E 33 B9 53 01	Hex system denotation of link check frame
...5.....B ..0.3.S.	ASCII code denotation of link check frame. Those out of the denotation range of ASCII code are shown in "."

6.1.2 encapsulation hdlc

Encapsulate HDLC on the interface. No to cancel the encapsulation.

Syntas

encapsulation hdlc

no encapsulation hdlc

Parameter

none

Default

none

Command mode

Interface configuration mode

Explanation

Use "no" to cancel the encapsulation, yet return to the encapsulated HDLC mode.

Example

The following example configures HDLC encapsulation mode on serial s1/1:

```
interface s1/1
encapsulation hdlc
```

Chapter 7 ISDN BRI Configuration Command

7.1.1 debug isdn

Show ISDN related events, I/O message, trail information of Q931 or Q921 message. Using “no debug isdn” stop to show information.

Syntas

[**no**] **debug isdn** [**event** | **packet** | **q921**| **q931**]

Parameter

Parameter	Description
event	trail information of ISDN events
packet	ISDN input/output message
q921	ISDN trail informatin of Q921 message
q931	Trail information of ISDN Q631 message

command mode

supervisor mode

Explanation

After open ISDN debug switch, it will output ISDN event, original I/O message,trail message of Q931 or Q 921 message, and it can help user to diagnose ISDN trouble.

Example

The following example will introduce conditions of debugging ISDN original I/O message:

```
Router#debug isdn packet
Router#
ISDN BRI0/3: TX -> packet,  length=8
        fc ff 03 0f 61 28 01 ff
 ISDN BRI0/3: RX <- packet,  length=8
        fe ff 03 0f 61 28 02 af
 ISDN BRI0/3: TX -> packet,  length=3
        00 af 7f
ISDN BRI0/3: RX <- packet,  length=3
        00 af 73
```

Domain	Description
ISDN	current debug is ISDN
BRI0/3	current debug interface is BRI 0/3
TX	ISDN transmit message

RX	ISDN receive message
Length	message length
fc ff 03 0f 61 28 01 ff	original I/O message

The following example will introduce conditions of debugging ISDN original I/O message trail:

Router#debug isdn q921
Router#
ISDN BRI0/3: TX -> IDREQ ri = 86 ai = 127
ISDN BRI0/3: RX <- IDASSN ri = 86 ai = 89
ISDN BRI0/3: TX -> SABMEp sapi = 0 tei = 89
ISDN BRI0/3: RX <- UAf sapi = 0 tei = 89
ISDN BRI0/3: TX -> INFOc sapi = 0 tei = 89 ns = 0 nr = 0 i = 0x08010105040288901801832c0438313633
ISDN BRI0/3: RX <- RRr sapi = 0 tei = 89 nr = 1
ISDN BRI0/3: RX <- INFOc sapi = 0 tei = 89 ns = 0 nr = 1 i = 0x08018102180189
ISDN BRI0/3: TX -> RRr sapi = 0 tei = 89 nr = 1

Domain	Description
ISDN	currently debugging is ISDN
BRI0/3	currently debugging interface is BRI 0/3
TX	ISDN transmit message
RX	ISDN receive message
IDREQ `IDASSN `SABME ` UA ` INFO ` RR	The frame types of ISDN Q921: ID requesting ,ID assigning, extensable asynchronous balance mode, no-number affirming response, information frame, being ready for receiving
p/f	request/end
callref	call reference
ri	reference ID
ai	action indicator
sapi	service accessing point indicatoe
tei	terminal point indicator
ns	serial number of transmitting
nr	serial number of receiving
i	Q931 information in information frame

The following example will introduce conditions of debugging ISDN Q931 message trails:

Router#debug isdn q931
Router#
ISDN BRI0/3: TX -> SETUP pd = 8 callref = 0x06
Bearer Capability i = 0x8890
Channel ID i = 0x83
Keypad Facility i = 0x38313633
ISDN BRI0/3: RX <- CALL_PROC pd = 8 callref = 0x86
Channel ID i = 0x89
ISDN BRI0/3: RX <- ALERTING pd = 8 callref = 0x86
ISDN BRI0/3: RX <- CONNECT pd = 8 callref = 0x86
ISDN BRI0/3: TX -> CONNECT_ACK pd = 8 callref = 0x06

ISDN BRI0/3: RX <- DISCONNECT pd = 8 callref = 0x86
Cause i = 0x8090 - Normal call clearing

```
ISDN BRI0/3: TX ->  RELEASE pd = 8  callref = 0x06
      Cause i = 0x8090 - Normal call clearing
ISDN BRI0/3: RX <-  RELEASE_COMP pd = 8  callref = 0x86
```

Domain	Description
ISDN	currently debugging is ISDN
BRI0/3	currently debugging port is BRI 0/3
TX	ISDN transmit message
RX	ISDN receive message
SETUP `CALL_PROC `ALERTING ` CONNECT ` CONNECT_ACK ` RELEASE ` RELEASE_COMP	The types of ISDN Q931: create, call processing, remind, connect, connect affirm, release finishing
pd	protocol distinguish
callref	call reference
Bearer Capability ` Channel ID ` Keypad Facility ` Cause	Message units in ISDN Q931 message: bearer capability, channel ID, keyboard facility,cause

7.1.2 isdn call

Syntas

isdn call Create a ISDN call by hand

isdn call interface bri[x/x] *word*

Parameter

Parameter	Description
word	ISDN phone number

command mode

supervisor mode

Explanation

Create a ISDN call by hand(not according to flow)

Example

The following example willintroduce how to create a ISDN call to 8163 in BRI0/0:

```
Router#isdn call interface bri0/0 8163
```

7.1.3 isdn disconnect

Createa ISDN call by hand.

Syntas

isdn disconnect interface bri[x/x] [**all** | **b1** | **b2**]

Parameter

Parameter	Description
all	cut all calls on channel B
b1	cut calls on channel B1
b2	cut calls on channel B2

command mode

supervisor mode

Explanation

User can create a ISDN call by hand(not according to flow)

Example

The following example will introduce how to cut ISDN call on all channels on BRI 0/0:

Router#isdn disconnect interface bri0/0 all

7.1.4 isdn switch-type

Command “isdn switch-type” chooses the type of ISDN switch, and command “no isdn switch-type” restores default type.

Syntas

[**no**] **isdn switch-type** [**basic-1tr6** | **basic-5ess** | **basic-dms100** | **basic-net3**| **basic-ni**| **basic-ts013** | **kdd** | **ntt** | **vn2** | **vn3**]

Parameter

Parameter	Description
basic-1tr6	1TR6type (German)
basic-5ess	AT&T5ESS Type(America)
basic-dms100	DMS-100Type(north America)
basic-net3	NET3 Type(Britain andEurope)
basic-ni	NationalISDNType(north America)
basic-ts013	TS013Type(Australia)
kdd	KDDType(Japan)
ntt	NTTType(Japan)
vn2	VN2Type(france)
vn3	VN3Type(france)

Default

basic-5ess 。

Command mode

global configuration mode

Explanation

Using this command to set the type of switch connecting BRI interface.

Example

The following example will set the type of overall switch to basic-1 tr6:

Router_config#isdn switch-type basic-1tr6

7.1.5 isdn tei-negotiation

"isdn isdn-negotiation" set TEI negotiation way of ISDN, "no isdn tei-negotiation" can restore default TEI negotiation way.

Syntas

[**no**] **isdn tei-negotiation** [*first-call* | *powerup*]

Parameter

Parameter	Description
first-call	run ISDN TEI negotiation on first-call.
powerup	run ISDN TEI negotiation on powerup.

Default

powerup

command mode

global configuration mode

Explanation

Using this command to set TEI negotiation way of ISDN.

Example

The following example will set to run ISDN TEI negotiation on first-call:

Router_config#isdn tei-negotiation first-call

7.1.6 show isdn

Show ISDN current status and timer information.

Syntas

[**no**] **show isdn** [*status* | *timers*]

Parameter

Parameter	Description
status	show current status of ISDN BRI.
timers	show ISDN timer configuration information.

Default

none

command mode

supervisor mode

explanation

Using this command to show status and timer configurations of ISDN: L 1(line), L2(Q921) and L3(Q931).

Example

The following example will show each layer status of ISDN:

```
Router#show isdn status
Global ISDN Switchtype = basic-5ess
ISDN BRI0/3 interface :
   Layer 1 Status:
      ACTIVE
   Layer 2 Status:
      TEI = 89, State = MULTIPLE_FRAME_ESTABLISHED
   Layer 3 Status:
      No Active Layer 3 Call(s)
   Activated dsl 0 CCBs = 0
Total Allocated ISDN CCBs = 0
```

Domain	Descriptions
Global ISDN Switchtype = basic-5ess	overall ISDN switch type
ISDN BRI0/3 interface	ISDN BRI 0/3 interface
Layer 1 Status	ISDN L1 status
Layer 2 Status	ISDN L2 status
Layer 3 Status	ISDN L3 status
active	L1 is active

TEI = 89	The TE1 value switch allocate to the BRI interface
State = MULTIPLE_FRAME_ESTABLISHED	The second layer is in multiple frame-established state.
No Active Layer 3 Call(s)	There are no active calls on layer 3.
Activated dsl 0 CCBs = 0	Activated DSL is 0, and allocated CCB number is 0.
Total Allocated ISDN CCBs = 0	All allocated CCB number are 0.

The following example displays each ISDN layer's status:

```
Router#show isdn timers
  Global ISDN Switchtype = basic-5ess
    ISDN Layer 2 values:
     K    = 1   outstanding I-frames
     N200 = 3   max number of retransmits
     T200 = 1   seconds
     T202 = 2   seconds
     T203 = 10  seconds
    ISDN Layer 3 values:
     T303 = 4   seconds
     T305 = 4   seconds
     T308 = 4   seconds
     T310 = 60  seconds
     T313 = 4   seconds
     T316 = 120 seconds
     T318 = 4   seconds
     T319 = 4   seconds
```

Domain	descriptions
Global ISDN Switchtype = basic-5ess	Global ISDN Switch Type
ISDN Layer 2 values	ISDN layer 2 values.
ISDN Layer 3 values:	ISDN layer 3 values.
K	The maximum number for unconfirmed I frame.
N200	Maximum recurring number.
T200	The maximum interval between command frame and response frame (or confirmation frame).
T202	The minimum interval for sending TEI identification request.
T203	The maximum allowed time for no frame exchanging.
T303	The maximum interval for the sending start counter to send SETUP message and receive the response message.
T305	The maximum interval for the disconnecting request counter to send DISC message and receive RELEASE (or DISC) message.
T308	The maximum interval for the releasing request counter to send RELEASE message and receive RELEASE_CMP (or RELEASE) message.
T310	The maximum interval for the call –process counter to receive CALL_PROC message and the following messages (ALERT, CONNECT, DISC, PROGRESS).

T313	The maximum interval for the connecting request counter to send CONNECT message and receive CONNECT_ACK message.
T316	The maximum interval for the restarting request counter to send RESTART message and receive RESTART_ACK message.
T318	The maximum interval for the resuming request counter to send RESUME message and receive RESUME_ACK message.
T319	The maximum interval for the suspending request counter to send SUSPEND message and receive SUSPEND or SUSPEND_REJ message.

Chapter 8 WAN Performance Command

8.1.1 Ip fast-switch enable (global configuration mode)

Configure fast switch global mode.

Syntas

Ip fast-switch enable

no Ip fast-switch enable

Parameter

none

Default

no Ip fast-switch enable

Command mode

global configuration mode

Explanation

This command configures fast switch global mode

Example

router>enable
router#config
router_config#ip fast-switch enable

8.1.2 Ip fast-switch enable (interface configuration mode)

configure fast switch on the interface.

Syntas

Ip fast-switch enable

no Ip fast-switch enable

Parameter

none

Default

no Ip fast-switch enable

Command mode

interface configuration mode

Explanation

This command configures a port to be fast switch. After configuring fast switch in global mode, the command works.

Example

router>enable
router#config
router_config#interface f0/0
router_config_if#ip fast-switch enable

8.1.3 Show ip fast-switch stat

Display fast switch statistics

Syntas

show ip fast-switch stat

Parameter

none

Default

none

Command mode

global configuration mode,interface configuration mode,supervisor mode

Explanation

Only after configuring fast switch, fast switch information will be displayed.

Example

router>enable
router#config
router_config#show ip fast-switch stat
Information will be displayed as follow:
Ethernet1/1 configure fast switch
encasulation ARP
line protocol is up
Total packets with protocol wrong 0
Total packets with version or length wrong 0
Total packets with TTL expiry 0
Total packets forward successly 2378
Total packets receive 4679
Total packets with check sum error 0
Serial 2/0 configure fast switch

encasulation PPP
line protocol is up
Total packets with protocol wrong 0
Total packets with version or length wrong 0
Total packets with TTL expiry 0
Total packets forward successly 2234
Total packets receive 3789
Total packets with check sum error 0

The meaning of the statistic information is as follow:

Total packets with protocol wrong：means the number of the ip packets which protocol type is not equal 46.

Total packets with version or length wrong：means the number of the ip packets which version number is not V4 or the ip header lendth is not 20.

Total packets with TTL expiry：means the number of the ip packets which ttl value is less than 2

Total packets with check sum error：means the number of the ip packets in which there are CRC errors

Total packets forward successly：means the number of the ip packets which have been forworded successfully.

Total packets receive：means the total number of the received ip packets .

8.1.4 show version module fsc

Syntas

show ip module fsc

Parameter

none

Default

none

Command mode

global configuration mode,interface configuration mode,supervisor mode

Explanation

Display fast switch module version information.

Example

router>enable
router#show version module fsc

Chapter 9 PPPoE command

9.1 PPPoE server command

Module PPPoE as server can create virtual port on ether port and communicate with peer virtually, and it can communicate with more than one client. If the Ethernet port has been configged as server，it can not been configged as cient now, and the vice versa。

9.1.1 pppoe-server virtual-template

Ether interface configed as server.

Syntas

pppoe-server virtual-template *virtual-template-number*

no pppoe-server virtual-template *virtual-template-number*

Parameter

Parameter	Description
virtual-template-number	Virtual template number.

default

none

Command mode

Interface configuration mode

Explanation

This command is used to config ether as pppoe server, and the virtual-template-number must be VT port created already.

Example

```
router_config#int virtual-template 1
router_config_if#ip addr 4.1.1.1 255.255.255.0
router_config_if#int f0/0
router_config_if#pppoe-server virtual-template 1
router_config_if#no pppoe-server virtual-template 1
```

9.1.2 show pppoe session

Show current session of PPPoE

Syntas

show pppoe session

Parameter

none

Default

none

Command mode

management mode, Interface configuration mode, global configuration mode

Explanation

show all of the sessions existed

Example

```
    router>enable
router#config
router_config#show pppoe session
PPPoE session information:
-----------------------------------------------
session 1
attach to Ethernet2/1(host)
associate VA port is Virtual-access0
remote mac is 00 e0 0f 22 00 40
send packet 1909,     send total length 139180
receive packet 1911,   receive total length 112638
```

If it is configed as server, the “attach to Ethernet2/1(host)” will be replaced as “attach to Ethernet2/1 (AC)”

9.1.3 show pppoe group

Show information of pppoe group.

Syntas

show pppoe group

Parameter

none

Default

none

Command mode

management mode, Interface configuration mode, global configuration mode

Explanation

show information of all of the group existed

Example

```
    router>enable
router#config
router_config#show pppoe group

      PPPOE group information:
-----------------------------------------------
GROUP 2
configue as AC
attach to clone port 7
-----------------------------------------------
GROUP 5
configue as HOST
attach to clone port 6
-----------------------------------------------
```

9.1.4 show pppoe control

Show PPPoE information of control block.

Syntas

show pppoe control

Parameter

none

Default

none

Command mode

management mode, Interface configuration mode, global configuration mod

Explanation

show pppoe information of all of the control block existed

Example

```
router>enable
router#config
router_config#show pppoe control
```

```
PPPoE control block information:
---------------------------------------------
Ethernet2/1 configue as host
attach to group 5
session_id is 1
remote mac is 00 e0 0f 22 00 40
clone id is 6
va id is 8
---------------------------------------------
```

9.1.5 clear pppoe session

Syntas

Clear pppoe session *etherport-name*

Parameter

none

Default

none

Command mode

management mode

Explanation

This command is used to clear all pppoe sessions attached with the ether interface，and begin with new pppoe session process. This command is different with that in old version manual。

Example

```
router>enable
router#clear pppoe session f0/0
```

9.2 PPPoE client command

9.2.1 pppoe-client dialer number

Syntas

[**no**]**pppoe-client dialer** *number*

Parameter

Parameter	Description
number	Linked Dialer interface

command mode

Interface configuration mode

Explanation

This command is used to enable the display of PPPoE Client function.

Example

RouterA_config_e1/1#pppoe-client Dialer1

9.2.2 pppoe-client mode normal | dial

Syntas

pppoe-client mode [*normal*|*dial*]

Parameter

Parameter	Description
normal	use the normal mode to boot pppoe; that is to say, after config the pppoe client，it will active the line immediately.
dial	use the dial mode to boot pppoe, that is to say,after config the pppoe client，it will active the line when needed.

command mode

Interface configuration mode

Explanation

This command is used to set the option of PPPoE Client's boot mode；when switching the mode the interface should be in the status of shutdown.

Example

RouterA_config_e1/1#shut
RouterA_config_e1/1#pppoe-client mode dial
RouterA_config_e1/1#no shut

9.2.3 clear pppoe

Syntas

clear pppoe

Parameter

none

Command mode

supervisor mode

Explanation

This command is used to reset all PPPoE connection.

9.2.4 debug pppoe data

Syntas

debug pppoe data

Parameter

none

Command mode

supervisor mode

Explanation

This command shows the packet exchange in session phase in PPPoE session.

Example

```
2002-4-9 13 34 33 PPPoE Ethernet1/1 Tx DATA id 0001 len 42,
00 01 42 89 75 50 08 00 3E 56 33 45 88 64 11 00   ..B.uP..>V3E.d..
00 01 00 16 C0 21 09 4F 00 14 55 17 32 DC 00 00   .....!.O..U.2...
00 00 7D 3D 7D 20 26 7D 22 7D                     ..}=} &}"}
2002-4-9 13:34:33 PPPoE Ethernet1/1 Rx DATA id:0001 len:42
08 00 3E 56 33 45 00 01 42 89 75 50 88 64 11 00   ..>V3E..B.uP.d..
00 01 00 16 C0 21 0A 4F 00 14 62 46 FA C3 00 00   .....!.O..bF....
00 00 7D 3D 7D 20 26 7D 22 7D                     ..}=} &}"}
```

9.2.5 debug pppoe error

Syntas

debug pppoe error

Parameter

none

Command mode

supervisor mode

Explanation

This command is used to show the errors appeared in PPPoE opposite process.

9.2.6 debug pppoe event

Syntas

debug pppoe event

Parameter

none

Command mode

supervisor mode

Explanation

This command is used to display the related events during PPPoE session process. (Sending and receiving packets, related timer timeouts)

Example

```
router#debug pppoe event
RouterA#debug pppoe da
RouterA_config_e1/1#pppoe d1
RouterA_config_e1/1#2002-4-9 14:19:16 PPPoE Ethernet1/1 Created L:0800.3e56.3345
2002-4-9 14:19:16 PPPoE Ethernet1/1 Starting L:0800.3e56.3345
2002-4-9 14:19:16 PPPoE Ethernet1/1 Tx PADI L:0800.3e56.3345 R:ffff.ffff.ffff
2002-4-9 14:19:16 PPPoE Ethernet1/1 Rx PADO L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Tx PADR L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Rx PADS L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 PPPoE Ethernet1/1 Opening
2002-4-9 14:19:16 PPPoE Ethernet1/1 Opened L:0800.3e56.3345 R:0001.4289.7550
2002-4-9 14:19:16 Line on Interface Virtual-access0, changed state to up
2002-4-9 14:19:16 Line protocol on Interface Virtual-access0, changed state to up
```

9.2.7 debug pppoe packet

Syntas

debug pppoe packet

Parameter

none

Command mode

supervisor mode

Explanation

This command is used to display the protocol interaction in discovery session happened in PPPoE session process.

Example

```
 RouterA_config_e1/1#2002-4-9 13:42:12 PPPoE Ethernet1/1 Tx PADT L:0800.3e56.3345
 R:0001.4289.7550
00 01 42 89 75 50 08 00 3E 56 33 45 88 63 11 A7   ..B.uP..>V3E.c..
00 01 00 00
RouterA_config_e1/1#2002-4-9 13:42:41 PPPoE Ethernet1/1 Tx PADI L:0800.3e56.3345
 R:ffff.ffff.ffff
FF FF FF FF FF FF 08 00 3E 56 33 45 88 63 11 09   ........>V3E.c..
00 00 00 0C 01 01 00 00 01 03 00 04 00 00 3F 54   ..............?T
2002-4-9 13:42:41 PPPoE Ethernet1/1 Rx PADO L:0800.3e56.3345 R:0001.4289.7550
08 00 3E 56 33 45 00 01 42 89 75 50 88 63 11 07   ..>V3E..B.uP.c..
00 00 00 2C 01 01 00 00 01 03 00 04 00 00 3F 54   ...,..........?T
01 02 00 08 47 4B 2D 43 49 53 43 4F 01 04 00 10   ....GK-CISCO....
91 5A D4 BE D5 27 87 03 43 DC 6A F0 09 6B 54 19   .Z...'..C.j..kT.
2002-4-9 13:42:41 PPPoE Ethernet1/1 Tx PADR L:0800.3e56.3345 R:0001.4289.7550
00 01 42 89 75 50 08 00 3E 56 33 45 88 63 11 19   ..B.uP..>V3E.c..
00 00 00 20 01 01 00 00 01 03 00 04 00 00 0F F6   ... ............
01 04 00 10 91 5A D4 BE D5 27 87 03 43 DC 6A F0   .....Z...'..C.j.
09 6B 54 19                                       .kT.
2002-4-9 13:42:41 PPPoE Ethernet1/1 Rx PADS L:0800.3e56.3345 R:0001.4289.7550
08 00 3E 56 33 45 00 01 42 89 75 50 88 63 11 65   ..>V3E..B.uP.c.e
00 01 00 20 01 01 00 00 01 03 00 04 00 00 0F F6   ... ............
01 04 00 10 91 5A D4 BE D5 27 87 03 43 DC 6A F0   .....Z...'..C.j.
09 6B 54 19
```