CHAPTER 9

Transparent Bridging Commands

This chapter describes the commands you use to configure transparent bridging, such as filtering and address learning.

Note The command syntax includes a combination of bold and regular uppercase and lowercase alphanumeric characters. You can enter commands in full or you can enter abbreviated forms of many commands. The abbreviated form consists of the first characters in each word of the syntax that appear in bold uppercase type in command syntax in this chapter. These characters represent the minimum you must enter for the command to be recognized and executed.

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reset address

To delete one or all of the manually entered Ethernet addresses stored in the filtering table with the **set address** command, use the **reset address** command.

REset **AD**dress <**address**> | **AL**l

Syntax Description

address Deletes an Ethernet address that has been previously entered with the **set address** command. Must be entered as 12 contiguous hexadecimal characters (no spaces).

all Deletes all Ethernet addresses that have been entered with the **set address** command.

Command Mode

Profile mode

Example

The following example deletes one static address from the profile 2503:

```
Host:2503> reset address 00000c00755d
```

Related Command

set address

reset filter

To delete one or all user-defined bridge filters, use the **reset filter** command.

REset **[**<**id**>**] FI**lter = **[AL**l**]**

Syntax Description

id Deletes filters based on the identification number assigned to the filter when the filter is created with the **set filter** command.

all Deletes all filters.

Note Use the **show filter** command to determine filter ID numbers.

Default

None

Command Mode

System level or profile mode

Examples

The following example deletes the filter with the identification number 4 from profile 2503:

```
Host:2503> reset 4 filter
```

The following example deletes all filters from profile 2503:

```
Host:2503> reset filter all
```

Related Commands

set filter

show filter

reset pattern

To delete one or all bridge filtering patterns, use the **reset pattern** command.

REset **[<patternname>]PAT**tern **= [AL**l**]**

Syntax Description

patternname	Deletes pattern based on the pattern name which was assigned with the **set pattern** command.
pattern all	Deletes all patterns.

Default

None

Command Mode

System level

Example

The following example deletes a pattern called arp from profile 2503:

```
Host:2503> reset arp pattern
```

The following example deletes all patterns from profile 2503:

```
Host:2503> reset pattern all
```

Related Commands

set pattern

show pattern

reset type

To delete one or all bridge type filters, use the **reset type** command.

REset **TY**pe **=** <**type**> | **AL**l

Syntax Description

type Deletes a type filter based on the packet type defined with the **set type** command. Must be in the form of a four-digit hexadecimal number with no spaces between the digits.

all Deletes all type filters.

Default

None

Command Mode

System level

Examples

The following example deletes a type filter based on packet type:

```
Host> reset type 0806
```

The following example deletes all type filters:

```
Host> reset type all
```

Related Command

set type

set address

To add an Ethernet address to a profile's static address table, use the **set address** command.This command applies only to bridging.

SEt **AD**dress = <**address**>

Syntax Description

address Adds the specified Ethernet address to the profile's static address table. Must be entered as 12 contiguous hexadecimal characters (no spaces). The Ethernet address cannot exist on the same network as the router.

Static addresses are associated with the profile's connection. Packets received from the LAN or ISDN line that contains a static address as a destination address will be forwarded to the connection of the profile containing that static address.

Default

No static addresses are configured.

Command Mode

Profile mode

Usage Guidelines

To delete an address entered with this command, use the **reset address** command. The Cisco RO version routers can store up to 1500 Ethernet address in a combination of learned and static addresses. The Cisco Small Office Home Office (SOHO) version routers can only store 4 Ethernet addresses.

Example

The following example adds a static Ethernet address to the profile 2503:

```
Host:2503> set address 00000c1235ff
```

Related Command

reset address

Note Static addresses are stored in nonvolatile random access memory (NVRAM). When there is no more NVRAM available, a warning will be displayed. A static address entered after this warning has been displayed will be stored in RAM and lost when the router is powered down.

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set age

To specify the maximum amount of time that a learned Ethernet address will remain in the address table, use the **set age** command.

SEt **AG**e = <**seconds**> | **OF**f]

Syntax Description

seconds The amount of time in seconds that any inactive learned Ethernet address will remain in the address table. Must be be between 1 and 1,000,000.

When the router receives a packet with a source address matching a learned address, the age time for that address is reset to 0.

off Learned Ethernet addresses remain in the address table indefinitely.

Default

off

Command Mode

System level

Example

The following example configures the router to delete learned Ethernet addresses after one hour of no activity from the address:

```
Host> set age 3600
```

set filter

To create a user-defined bridge filter, use the **set filter** command.

SEt **[id] FI**lter **[<patternname>]^8 [BL**ock | **ACcept] [DE**mand | **IG**nore**]**

Syntax Description

id The filter ID argument is assigned by the router, and is not used to create a filter. It is used to modify existing filter configurations.

To display filter IDs, use the **show filter** command.

patternname Reference to a pattern created with the **set pattern** command. Filters are composed of patterns. This argument can consist of 1 to 8 pattern names.

If you are using more than one pattern in a filter, all patterns must use the same (**from)** value in the **set pattern** command.

block Prevents packets that match the filter from being forwarded to the connection. Although multiple filters can be defined, either as accept or block, the most recently defined filter determines which set of filters (either those set to block or those set to accept) are used.

accept Allows only packets that match the filter from being forwarded to the connection. Although multiple filters can be defined, either as accept or block, the most recently defined filter determines which set of filters (either those set to block or those set to accept) are used.

demand Packets that match the filter are counted in the threshold values that keep the ISDN line connected. Although multiple filters can be defined, either as demand or ignore, the most recently defined filter determines which set of filters (either those set to demand or those set to ignore) are used.

ignore Packets that match the filter are not counted in the threshold values that keep the ISDN line connected. Although multiple filters can be defined, either as demand or ignore, the most recently defined filter determines which set of filters (either those set to demand or those set to ignore) are used.

Default

No filters are configured.

Command Mode

System level or profile mode

Usage Guidelines

Filters defined at the system level will be used by all profiles. Filters defined while in profile mode will be used by that profile only. Filters apply to packets received from the connection associated with the profile in which the filters are defined.

Example

The following example configures a filter that will be used by all profiles:

```
Host> set filter arp demand
```

Related Commands

reset filter
set pattern

set learn

To enable or disable the Ethernet address learning function, use the **set learn** command.

SEt **LE**arn **ON** | **OF**f

Syntax Description

on Enables Ethernet addresses learning. Addresses are associated with a profile connection and are used for making bridge filtering decisions.

off Disables Ethernet address learning. Only addresses entered with the **set address** command are used to make bridge filtering decisions.

Default

on (Disabled)

Command Mode

Profile mode

Usage Guidelines

This command applies only when bridging is enabled with the **set bridging** command.

Example

The following example enables Ethernet address learning on profile 2503's connection:

```
Host:2503> set learn on
```

Related Commands

set address
set bridging
set mode

set mode

To configure packet forwarding for bridging, use the **set mode** command

SEt **[WAN | LAN] MO**de = **AN**y **| ON**ly

Syntax Description

wan Applies the configuration to packets received from the LAN and destined for the ISDN line.

lan Applies the configuration to packets received from the ISDN line and destined for the LAN.

any Packets with unknown destination addresses are forwarded to all active connections.

only Packets with unknown destination addresses are discarded.

Defaults

wan only
lan any

Command Mode

System level

Usage Guidelines

Addresses are learned either by enabling learning with the **set learn** command or by entering them manually with the **set address** command.

Note Broadcast and multicast packets are always forwarded unless filters are configured to block them.

Example

The following example configures the router to forward any packets with unknown destination addresses from the LAN to the ISDN line:

```
Host> set wan mode any
```

Related Commands

set address
set learn

set passthru

To configure packet bridging between ISDN connections, use the **set passthru** command.

SEt **Passthru ON | OF**f

Syntax Description

on Enables individual remote routers to bridge to each other through the Cisco 750 or Cisco 760 series router.

off Remote routers can only bridge to devices on the same LAN as the Cisco 750 or Cisco 760 series router.

Default

off-(Disabled)

Command Mode

System level.

Example

The following example enables individual remote routers to bridge to each other through the Cisco 750 or Cisco 760 series router:

```
Host> set passthru on
```

set pattern

To create a pattern that will be used in user-defined bridge filters, use the **set pattern** command.

SEt <**patternname**> **[PA**ttern = <**hexpattern**> <**binarypattern**> <**decimalpattern**> [**OF**fset = <**number**>**] [FR**om=**BEGINNING** | **TYPEFIELD] PATTERNN**ame = <**patternname**>]

Syntax Description

patternname	Name of the pattern. Can consist of 1 to 7 characters.
pattern	Value of the pattern. Must be between 1 and 6 bytes, separated by spaces.
hexpattern	Bit or byte pattern in hexadecimal format. A wildcard in the form **X** can be used in place of a digit.
binarypattern	Bit or byte pattern in binary format. Will be displayed in hexadecimal format with the **show pattern** command. A wildcard in the form **X** can be used in place of a digit.
decimalpattern	Bit or byte pattern in decimal format. Will be displayed in hexadecimal format with the **show pattern** command.
offset	Number of bytes from the pattern reference point that indicate where the pattern starts. Must be between 0 and 127. The offset value and the pattern value cannot be more than 128 bytes. If you do not enter a value, defaults to 0.
from	Pattern reference point, from where the offset value is counted. Can be beginning or typefield. If you do not enter one, the default is beginning.
beginning	The beginning of the packet.
typefield	The beginning of the packet typefield.

Default

No patterns are configured.

Command Mode

System level

Usage Guideline

Patterns can be used by all profiles.

Examples

The following example creates a pattern test1:

```
host>set test1 offset 10 from typefield pattern 00 5a 2c
```

The following example changes the offset on the pattern test1 to 6 bytes:

```
host>set test1 off 6
```

The following example changes the pattern name from test1 to test2:

```
Host>set test1 pattern test2
```

Related Commands

reset pattern
set filter
show filter
show pattern

set type

To create a bridge filter based on packet type, use the **set type** command.

SEt **TY**pe=<**type**> **[AC**cept | **BL**ock**] [IG**nore **| DE**mand**]**

Syntax Description

type Ethernet packet type. Up to four hexadecimal digits with no spaces between digits.

accept Only packets with this packet type are forwarded on to the connection. Although multiple type filters can be defined, either as accept or block, the most recently defined type filter determines which type filters (either those set to accept or those set to block) will be used.

block Packets of this type are not sent to the connection. Although multiple type filters can be defined, either as accept or block, the most recently defined type filter determines which type filters (either those set to accept or those set to block) are used.

ignore Packets of this type are not counted in the demand and timeout calculations that bring the ISDN line up and disconnect it. Although multiple type filters can be defined, either as demand or ignore, the most recently defined type filter determines which type filters (either those set to demand or those set to ignore) are used.

demand Only packets of this type are counted in the demand and timeout calculations that bring the ISDN line up and disconnect it. Although multiple type filters can be defined, either as demand or ignore, the most recently defined type filter determines which type filters (either those set to demand or those set to ignore) are used.

Default

No type filters configured.

Command Mode

System level or profile mode

Usage Guidelines

Type filters configured at the system level will be used by all profiles. Type filters configured at the profile level will be used by that profile only.

By default, type filters apply only to broadcast and multicast packets. If unicast filtering is enabled with the **set unicast filtering** command, type filters apply to broadcast, multicast, and unicast packets.

Type filtering is independent of Ethernet address filtering. Packets must match address filters and also type filters before being forwarded to or blocked from the ISDN line.

Examples

The following example configures profile 2503 to prevent broadcast and multicast from activating the ISDN line (however, if the ISDN line already connected, the packets will be forwarded on to the line):

```
Host:2503> set type 1 accept
Host:2503> set type demand
```

Because there are no Ethernet packets of type 1, this command will block all broadcast and multicast traffic.

Refer to the appendix “Ethernet Packet Types” for further information.

set unicast filtering

To enable or disable unicast filtering, use the **set unicast filtering** command.

SEt **UN**icastfilter **ON** | **OF**f

Syntax Description

on Enables unicast filtering.

off Disables unicast filtering.

Default

off

Command Mode

System level

Usage Guidelines

Unicast filtering applies to type filters configured with the **set type** command and to user-defined filters configured with the **set filter** command.

Example

The following example enables unicast filtering for the router:

```
Host> set unicast on
```

Related Commands

set type
set filter
show filter

show address

To display information about the router's system and profile address configurations, use the **show address** command.

SHow [<**connection**>] **AD**dress

Syntax Description

When a connection number is specified the address associated with the connection is displayed

Default

None

Command Mode

System level or profile mode

Examples

The following example shows the output of the **show address** command at the system level:

```
Host> show address

Number of Ethernet Addresses: 0
IP Address: 0.0.0.0
Ethernet Address: 00 00 00 00 00 00
Subnet Mask: 0.0.0.0
Default Gateway: 0.0.0.0
```

The following example shows the output of the **show address** command for the profile 2503:

```
Host:2503> show address

2 00 40 f9 ff ff ff  Static
2 00 40 f9 12 34 56  Static
Number of Ethernet Addresses: 2
Ethernet address: 00 40f9 0036 AD
```

If the user profile “2503” has a connection number, then entering the command **show connection address** would display the router’s profile address configuration.

Table 9-1 describes the fields shown in the display.

Table 9-1 Show Address Field Descriptions System Level

Field	Description
INT	Ethernet address of the internal profile
LAN	Ethernet address of the LAN profile.
Number of Ethernet addresses	The number of Ethernet addresses associated with the system level.
IP Address	IP address of the system level.
Ethernet Address	Ethernet address of the router.
Subnet Mask	Subnet mask of the system level.
Default Gateway	Default gateway of the system level.

show filter

To display user-defined filters, use the **show filter** command.

SHow **[<id>] FI**lter

Syntax Description

id (Optional) The ID number assigned to the filter by the router. Displays that filter only, including all patterns that make up the filter.

Default

None

Usage Guidelines

At the system level, this command displays all filters configured at the system level. In profile mode, this command displays filters configured at the system level and filters defined while in profile mode. This command also indicates whether unicast filtering is enabled.

Sample Display

The following sample display shows output from the **show filter** command:

```
Host> show filter
Unicast Filtering OFF
Filters
1 Filter BLOCK arp
3 Filter ACCEPT DEMAND john
```

Related Commands

set filter
set unicast filtering

show pattern

To display all patterns configured with the **set pattern** command, use the **show pattern** command.

SHow [<**patternname**>] **PAT**tern

Syntax Description

patternname (Optional) Displays a specific pattern by the name assigned with the **set pattern** command.

Default

None

Command Mode

System level

Usage Guidelines

Patterns can be used by all profiles.

Sample Display

The following sample display shows output from the **show pattern** command:

```
6544> sh pat
Patterns
Name    Offset   From      Pattern
patta        6   BEGINNING 00 03
pattb        0   BEGINNING 08 09
pattc        0   BEGINNING 55 66
pattd        0   BEGINNING 01 0d
6544>
```

Table 9-2 defines the field shown in the display.

Table 9-2 Show Pattern Field Descriptions

Field	Description
Name	Name of the pattern.
Offset	Number of bytes from the pattern's reference point where the pattern starts.
From	Lists the pattern starting reference point. Can be BEGINNING or TYPEFIELD.
Pattern	Byte pattern.