CHAPTER 7

IP Commands

This chapter describes the commands you use to configure Internet Protocol (IP) routing, such as IP static routes, Routing Information Protocol (RIP), and IP filters.

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 ip filter

To delete an existing IP filter, use the **reset ip filter** command.

REset **IP FI**lter <**filter id**> | **AL**l

Syntax Description

filter id (Optional) Clears the IP filter with this identification number, which was assigned by the router when the filter was created.

all (Optional) Clears all IP filters.

Default

None

Command Mode

Profile mode

Usage Guidelines

Use this command to delete IP filters that have been entered with the **set ip filter** command.

Examples

The following example deletes an IP filter with the identification number of 8 for profile 2503:

```
Host:2503> reset ip filter 8
```

The following example deletes all IP filters for profile 2503:

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

reset ip route

To delete an IP static route, use the **reset ip route** command.

REset **IP ROUTE <AL**l> | **DE**stination | <**network**> [/<**bits**>] **[GA**teway <**next hop**>]

Syntax Description

all	Deletes all static routes.
destination	IP address of the network or host to which the packet is being sent in four-part dotted decimal format.
bits	(Optional) Number of network bits in the destination network's IP address, counting from the left.
next hop	IP address of the static route default gateway in four-part dotted decimal format.

Default

None

Command Mode

Profile mode

Examples

The following example deletes a static route for profile 2503:

```
Host:2503> reset ip route destination 250.250.250.1 gateway 150.150.150.1
```

The following example deletes all static routes for profile 2503:

```
Host:2503> reset ip route all
```

Related Command

set ip route

set gateway

Use the **set gateway** command to set a static default route pointing at the internal router profile's connection interface.

SEt **GA**teway <**ip address**>

Syntax Description

ip address IP address of the internal profile's interface in four-part dotted decimal format.

Default

The default address is 0.0.0.0

Command Mode

System level

Example

The following example configures a default static route to the internal profile's connection:

```
Host> set gateway 150.150.10.10
```

set ip address

To set the IP address for any connection, use the **set ip address** command. To delete the IP address for a connection, use this command with 0.0.0.0 as the IP address.

SEt IP ADdress <ip address>

Syntax Description

ip address IP address for the interface in four-part dotted decimal format.

Default

The default IP address is 0.0.0.0

Command Mode

Profile mode

Example

The following example configures the profile 2503 connection with an IP address:

```
Host:2503> set ip address 150.150.10.17
```

set ip cost

To set the cost metric to the next destination, use the **set ip cos**t command.

SEt **IP CO**st <**value**>

Syntax Description

value Number of routers between this router and the destination network.

Default

The default cost value is 1.

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the cost to that profile's connection. Entering this command at the system level applies the cost to the internal profile.

Example

The following example configures profile 2503 with a cost parameter of 2:

```
Host:2503> set ip cost 2
```

set ip filter

To create an IP filter, use the **set ip filter** command.

SEt **IP FI**lter [**<type>**] **IN** | **OU**t [**SO**urce = [**NOT**] <**address**>] [**DE**stination= **[NOT]** <**address**>] **BL**ock | **AC**cept

Syntax Description

type	(Optional) One of the following keywords corresponding to an IP packet type: • **icmp**—Internet Control Message Protocol (ICMP) packets. • **icmpxrd**—ICMP packets, except redirect packets. • **icmprd**—ICMP redirect packets. • **tcp**—Transmission Control Protocol (TCP) packets. • **tcpsyn**—TCP SYN (connection establishment) packets. • **tcpxsyn**—TCP packets, except SYN. • **udp**—User Datagram Protocol (UDP) packets. If no packet type is specified, the filter is applied to packets of any type.
in	Filters on incoming packets.
out	Filters on outgoing packets.
source address	(Optional) Filters all packets from this address. Using the **source not address** keyword applies the filter to any packet that is not from the IP address specified in the command.
destination address	(Optional) Filters all packets destined for this address. Using the **destination not address** keyword applies the filter to any packet that is not destined for the IP address specified in the command.

address IP address must be entered in the following format:

ip_address [/<bits>] [<loport>] [+ | –] [<hiport>]

- ip-address—The source or destination IP address. Use a 32-bit quantity in four-part dotted decimal format.
- /bits—The number of significant bits in the IP address, counting from the left.
- low-port—The lowest port number that will be matched by the filter.

  If followed by a+ , all ports greater than this port will be matched by the filter.

  If followed by a– , all ports between this port and the high port will be matched by the filter.
- high-port—The highest port number that will be matched by the filter.

Low port and high port arguments can only be used if the packet type is set to **tcp** or **udp**.

block Prevents the packets defined in the filter from being sent on to the connection.

accept Allows the packets defined in the filter to be sent on to the connection.

Default

No IP filters are configured.

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the IP filter to that profile's connection. Entering this command at the system level applies the IP filter to the internal profile.

Examples

The following example configures profile 2503 with an IP filter that accepts incoming packets addressed to TCP port 25:

```
Host:2503> set ip filter tcp in 198.95.216.1:25 accept
```

The following example configures profile 2503 with an IP filter that blocks the establishment of outgoing TCP connections:

```
Host:2503> set ip filter tcpsyn out block
```

Related Command

reset ip filter

Refer to the appendix "TCP Port Assignments" and the appendix "UDP Port Assignments" for further information.

set ip framing

To set the type of encapsulation used for IP packets, use the **set ip framing** command.

SEt **IP FR**aming **ET**hernet_II | **NO**ne

Syntax Description

ethernet_II Number of routers between this router and the destination network. Use this keyword when connecting to a remote bridge.

none Sets packet framing to Internet Protocol Control Protocol (IPCP). Use this keyword when using Point-to-Point Protocol (PPP).

Default

ethernet-II

Command Mode

Profile mode

Example

The following example configures profile 2503 for IPCP packet framing:

```
Host:2503> set ip framing none
```

set ip netmask

To set the subnet mask for the internal interface, use the **set ip netmask** command. To delete the subnet mask for the internal interface, enter this command with 0.0.0.0 as the IP address. This command should only be used if IP routing is not going to be used.

SEt **IP NE**tmask **<mask>**

Syntax Description

mask Subnet mask for the profile interface. Use a 32-bit quantity in four-part dotted decimal format.

Default

0.0.0.0 (This IP address applies the default subnet mask for Class A, B, and C networks.)

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the IP netmask to the connection created for that user. Entering this command at the system level applies the IP netmask to the internal profile.

Example

The following example configures the subnet mask for profile 2503:

```
Host:2503> set ip netmask 255.255.255.0
```

Related Command

set subnet mask

set ip propagate

To set whether a route over the Ethernet interface is propagated in Routing Information Protocol (RIP) broadcast messages, use the **set ip propagate** command.

SEt **IP PRO**pagate **ON** | **OF**f

Syntax Description

on Routes over the profile's interface will be propagated in RIP broadcast messages whenever the connection is active.

off Routes over the profile's interface will not be propagated in RIP broadcast messages.

Default

on (disabled)

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the IP propagate parameters to that profile's connection. Entering this command at the system level applies the IP propagate parameters to the internal profile.

Example

The following example configures any route over the profile 2503 connection to be propagated in RIP broadcast messages:

```
Host:2503> set ip propagate on
```

set ip rip receive

To set whether RIP packets are received, use the **set ip rip receive** command.

SEt **IP RI**p **RE**ceive **BO**th | **V1 | V2 | OF**f

Syntax Description

both	Both versions 1 and 2 packets will be received.
1	RIP version 1 packet will be received.
2	RIP version 2 packet will be received.
off	RIP packets will not be received on the profile's interface.

Default

off

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the RIP receive parameters to that profile's connection. Entering this command at the system level applies the RIP receive parameters to the internal profile.

Example

The following example configures the connection for profile 2503 to block RIP packets:

```
Host:2503> set ip rip receive off
```

set ip rip snapshot client

To set up the snapshot client parameters for a given profile, use the **set ip rip snapshot client** command.

SEt **IP RI**p **SN**apshot **Cl**ient **AC**tive <**minutes**> **QU**iet <**minutes**> **UP**date <**ON** | **OF**f>

Syntax Description

minutes	The duration in minutes for the active period when routing information is exchanged or the quiet period when no routing information is exchanged. Range is 1 - 70,000 minutes
update on	Update On configures the client to send routing information as soon as it enters the active period.
update off	Update Off configures the client to wait for the periodic update to send the routing information after it enters the active period.

Default

None

Command Mode

Profile mode

Usage Guidelines

Entering this command sets up the client snapshot parameters for a given profile. These values will be used when the **set ip rip update** command is set to snapshot.

Sample Display

The following sample display shows the configuration of the profile user 1 as a snapshot client that has an active period of 10 minutes and a quiet period of 60 minutes and sends routing information as soon as it enters the active period.

```
Host> cd user1
Host> set ip rip snapshot client act 10 quiet 60 update on
```

Related Command

set ip rip update

set ip rip snapshot server

To set up the snapshot server parameters for a given profile, use the **set ip rip snapshot server** command.

SEt **IP RI**p **SN**apshot **SE**rver **AC**tive <**minutes**> **UP**date <**ON** | **OF**f>

Syntax Description

minutes The duration in minutes for the active period when routing information is exchanged. Range is 1 - 70,000 minutes

update on Update On configures the server to send routing information as soon as it enters the active period.

update off Update Off configures the server to wait for the periodic update to send the routing information after it enters the active period.

Default

None

Command Mode

Profile mode

Usage Guidelines

Entering this command sets up the server snapshot parameters for a given profile. These values will be used when the **set ip rip update** command is set to snapshot.

Sample Display

The following sample display shows the configuration of the profile user 1 as a snapshot server that has an active period of 10 minutes and a quiet period of 60 minutes and sends routing information as soon as it enters the active period.

```
>cd user1
>set ip rip snapshot server active 10 update on
```

Related Command

set ip rip update

set ip rip update

To specify when RIP packets will be sent, use the **set ip rip update** command.

SEt **IP RI**p **UP**date **OF**f | **PE**riodic | **DE**mand | **SN**apshot

Syntax Description

off RIP packets are not sent.

periodic RIP packets are sent both periodically and whenever there is a change in the RIP table. Use this keyword for the LAN profile so that RIP information is passed to the LAN at regular intervals.

demand RIP packets are sent both when the ISDN line first connects and when a change occurs in the RIP table. Use this keyword for WAN connections to avoid bringing up the Integrated Services Digital Network (ISDN) line unnecessarily.

snapshot The two periods for routing updates are quiet and active. During the active period routing updates or exchanges are in a normal process, over a particular interface. Once the active period expires, the quiet period begins and the routing table is frozen in that state. There is no activity until the quiet period expires.

Default

off (disabled)

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the IP update parameters to that profile's connection. Entering this command at the system level applies the IP update parameters to the internal profile.

Example

The following example configures profile 2503 for sending RIP packets on demand:

```
Host:2503> set ip rip update demand
```

set ip rip version

To specify which version of IP RIP (1 or 2) packets are used when sending RIP packets, use the **set ip rip version** command.

SEt **IP RIp VE**rsion **1** | **2 | BO**th

Syntax Description

1	Sends RIP version 1 packets.
2	Sends RIP version 2 packets.
both	Sends Both version 1 and 2 packets.

Default

Rip version 1 packets.

Command Mode

Profile mode

Example

The following example configures profile 2503 to send RIP version 2 packets:

```
Host:2503> set ip rip version 2
```

Related Command

set ip route

set ip route

To define a static IP route, use the command **set ip route**.

SEt **IP ROUTE DE**stination **<network>** [/<**bits**>] **GA**teway **<nexthop>** [**PR**opagate **=ON | OF**f] [**CO**st **=<value**>]

Syntax Description

destination network	Static route's destination network address.
bits	(Optional) Number of network bits in the destination address, counting from the left. This information will be propagated only if RIP Version 2 is being used for RIP broadcasts.
gateway nexthop	IP address of the router that receives the packet for this network or host. This address must be in the same network as the IP address for the interface.
propagate on | off	(Optional) Whether the static route defined by this command will be propagated in RIP packets.
cost value	(Optional) Cost metric for the route.

Default

No static routes are defined.

Command Mode

Profile mode

Example

The following example configures a static IP route for profile 2503:

```
Host:2503> set ip route destination 198.95.217.0 gateway 198.95.216.2
propagate on cost 2
```

Related Command

reset ip route

set ip routing

To enable or disable IP routing, use the **set ip routing** command.

SEt **IP RO**uting **ON** | **OF**f

Syntax Description

on	Enables IP routing on the profile's interface.
off	Disables IP routing on the profile's interface.

Default

Off (disabled)

Command Mode

Profile mode

Usage Guidelines

Any profile that has IP routing enabled must have a network address assigned using the **set ip address** command.

Example

The following example enables IP routing for profile 2503:

```
Host:2503> set ip routing on
```

Related Command

set ip address

set subnet mask

To set the subnet mask for an interface, use the **set subnet mask** command. To delete the subnet mask for an interface, use this command with 0.0.0.0 as the IP address.

SEt **SUB**net **<ip address mask>**

Syntax Description

ip address mask Subnet mask for the profile's interface in the form of an IP address.

Default

The default IP address is 0.0.0.0. This IP address applies the default subnet mask for Class A, B, and C networks.

Command Mode

System level or profile mode

Usage Guidelines

Entering this command while in profile mode applies the subnet mask to that profile's interface. Entering this command at the system level applies the subnet mask to the internal profile.

Example

The following example configures the subnet mask for profile 2503:

```
Host:2503> set ip netmask 255.255.255.0
```

Related Command

set ip netmask

show ip configuration

To display the IP configuration for one or all profiles, use the **show ip configuration** command.

SHow **IP COnfiguration** [**AL**l]

Syntax Description

all (Optional) Displays the IP configuration for all profiles.

Command Mode

System level or profile mode

Usage Guidelines

Use this command while in profile mode to display the IP configuration for that profile. Use this command at the system level or with the keyword **all** to display the IP configurations for all profiles.

Sample Display

The following sample display shows the output of the **show ip configuration** command for profile 2503:

```
2865_66> sh ip config
Profile  Routing Frame IP Address Netmask RIP TX  RX  Prop Cost
Internal ON ETH2  192.168.100.56  255.255.255.0   V1  PER V1  ON   1
6544     ON IPCP  198.1.2.10      255.255.255.0   V1  DEM V1  ON   1
dms16045 ON IPCP  198.1.2.3       255.255.255.0   V1  DEM V1  ON
```

Table 7-1 describes the fields shown in the display.

Table 7-1 Show IP Configuration Field Descriptions

Field	Description
Profile	Profile that is being displayed. If you are in profile mode, this field displays the name of the profile.
Routing	Indicates if IP routing is enabled for the profile.
Frame	IP framing type used for the profile.
IP Address	IP address for the connection.
Netmask	IP netmask (subnet mask) used for the connection.
RIP	RIP version packets used for the profile.
TX	RIP update used for the profile—Off, Demand, or Periodic.
RX	RIP receive configuration for the profile—On or Off.
Prop	RIP propagate configuration for the profile—On or Off.
Cost	Cost metric of the route.

Related Commands

set user
set ip routing
set ip framing
set ip address
set ip netmask
set subnet mask
set ip rip version
set ip rip update
set ip rip receive
set ip propagate
set ip cost

show ip filter

To display the IP filters for one or all profiles, use the **show ip filter** command.

SHow **IP FI**lter [**AL**l]

Syntax Description

all (Optional) Displays IP filters for all profiles.

Default

None

Command Mode

System level or profile mode

Usage Guidelines

Use this command while in profile mode to display IP filters for that profile. Use this command at the system level or with the keyword **all** to display IP filters for all profiles.

Sample Display

The following is a sample display t of the **show ip filter** command for profile 2503:

```
Host:2503> show ip filter

Profile ID Dir Type Action Addresses
2503 2 IN ID ACCEPT DST 150.150.150.1/24
```

Table 7-2 describes the fields shown in the display.

Table 7-2 Show IP Filter Field Descriptions

Field	Description
Profile	Profile that is being displayed. If you are in profile mode, this field displays the name of the profile.
ID	The identification number assigned by the router when the filter is created.
Type	Packet type to which the filter applies. If no packet type is specified in the filter, IP is displayed.
Action	Indicates the action to be taken for packets that match the filter (block or accept).
Addresses	Destination and/or source addresses of the packets to which the filter applies.

Related Command

set ip filter

show ip rip snapshot

To display the current snapshot parameters use the command **show ip rip snapshot.**

SHow **IP RIp SN**apshot **[AL**l**]**

Syntax Description

all (Optional) Displays current snapshot parameters for all profiles.

Default

None

Command Mode

Profile mode

Usage Guidelines

System level or profile mode

Sample Display

The following sample display shows the output from the **show ip rip snapshot** command:

```
Host> show ipx rip snapshot
```

Table 7-3 describes snapshot parameters field descriptions.

Table 7-3 Snapshot Parameters Field Descriptions

Field	Description
Profile	The profile that the parameters apply to.
Snapshot	Specifies whether snapshot is Off (none) or is acting as a client or a server for this connection.
Active	The active period in minutes.
Quiet	The quiet period in minutes.
Update	Could be On or Off. Update On configures the client or server to send routing information as soon as it enters the active period. Update Off configures the client or server to wait for the periodic update to send the routing information after it enters the active period.
State	There are four states: pre-active, active, post-active, and quiet.

show ip route

To display IP static routes for one or all profiles, use the **show ip route** command.

SHow **IP RO**ute [**AL**l]

Syntax Description

all (Optional) Displays IP static routes for all profiles.

Default

None

Command Mode

System level or profile mode

Usage Guidelines

Use this command while in profile mode to display IP static routes for that profile. Use this command at the system level or with the keyword **all** to display IP static routes for all profiles.

Sample Display

The following is a sample display of the **show ip route all** command:

```
Host> show ip route all

Profile Type Destination Bits Gateway Prop Cost Source Age

JohnS NET 150.150.217.0 24 1.1.1.5 ON 3 RIP 0
JohnS NET 150.150.219.0 24 1.1.1.5 ON 3 RIP 0
JohnS NET 150.150.216.0 24 1.1.1.5 ON 2 RIP 0
JohnS NET 177.3.0.016 1.1.1.5 ON 3 RIP0
Internal NET 149.7.0.0 16 DIRECT ON 1 DIRECT 0
```

Table 7-4 describes the fields shown in the display.

Table 7-4 Show IP Route Field Descriptions

Field	Description
Profile	Profile that is being displayed. If you are in profile mode, this field displays the name of the profile.
Type	Interface for the route; either NET or WAN.
Destination	Static route's destination address.
Bits	Number of bits in the destination address.
Gateway	Local-network gateway for the route.
Propagate	Indicates if the route is propagated in RIP packets.
Cost	Cost value for the route's destination address.
Source	Source of information about this route.
Age	Number of minutes the route remains in the table without being updated.

Related Command

set ip route