Command Reference

BLACK BOX
NETWORK SERVICES

Black Box Device Servers

Single-Port Device Server
2-Port Device Server
4-Port Device Server

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Contents

Chapter 1 Configuration Tasks

Chapter 2 Command Descriptions

Chapter 1 Configuration Tasks

This chapter shows how to perform common device configuration tasks from the command line.

Quick Reference for Configuring Features

The following table shows common features that can be configured, the Device Servers in which the features are supported, the commands used to configure each feature, and where to find more information in this chapter.

In this table, the “Device Server Family” includes the following devices:

- Single-Port Device Server
- 2-Port Device Server
- 4-Port Device Server

Feature/Task	Device Servers supported	Commands	See pages
RealPort	Device Server Family		See the RealPort Setup Guides for details on configuring this feature.
Point-to-Point Protocol (PPP) connections	2-Port Device Server 4-Port Device Server	set ports set flow set user set filter set route set forwarding set device set ippool	16, 141, 106, 181, 102, 150, 110, 96, 129
Modem emulation	2-Port Device Server 4-Port Device Server	set ports dev=pm field AT commands	25, 141 See also the *AT Command Reference* for AT command descriptions.
Autoconnection	Device Server Family	set ports set user	29, 141, 181
IP routing	Device Server Family	set route set forwarding set user	30, 150, 110, 181

Feature/Task	Device Servers supported	Commands	See pages
Security / access control features			
Control access to configuration	Device Server Family	set user	38, 181
Control access to inbound ports	Device Server Family	set ports - dev field set logins set user	39, 141, 135, 181
Control access to outbound ports	Device Server Family	set ports - dev field	40, 141
Restrict access to outbound ports	Device Server Family	set auth	40, 84
Use CHAP authentication for PPP users	Device Server Family	set user	40, 181
Control user access to the command line	Device Server Family	• Through autoconnect by port: set ports • Through autoconnect by user: set user • Through menus: set menu	40, 141, 181, 137
Issue user passwords	Device Server Family	• To enable/disable password for a user: set user • To issue new password to user: newpass	41, 181, 69
Configure SSH Version 2 for secure communication	2-Port Device Server 4-Port Device Server	• To configure password protection: set user - name and password fields, and newpass command • To use a public key: set user - name and loadkey fields • To make reverse SSH connections to ports: ssh *base_port*+ 500 + *port_number*	42, 181, 69
Industrial Automation (IA)	Device Server Family	set ia	23, 116
Domain Name Server (DNS)	Device Server Family	set config set host	34, 91, 114
Simple Network Management Protocol (SNMP)	Device Server Family	set snmp	36, 162

Feature/Task	Device Servers supported	Commands	See pages
Power Over Ports	2-Port Device Server 4-Port Device Server	• To display status of circuit breaker: display circuitbreaker or set config print • To reset circuitbreaker: set config circuitbreaker=reset	44, 58, 91
User attributes			
Set common user features	Device Server Family	set user - name field	45, 181
Assign a password	Device Server Family	newpass	45, 69
Configure a user for a menu	2-Port Device Server 4-Port Device Server	set user defaultaccess=menu	45, 181
Automatically connect a user	Device Server Family	set user autoconnect=on	45, 181
Remove a user from the user table	Device Server Family	remove	45, 76
Configuration management			
Upgrade firmware	Device Server Family	boot	47, 52
Copy configuration to and from a remote host	Device Server Family	cpconf	47, 57
Reset configuration to defaults	Device Server Family	revert or: boot action=factory	47, 52, 77

Commands and Device Server Support

The following table lists all the commands in this manual, the Device Servers in which the commands are supported, and where to find the command description.

Command	Device Servers Supported in	Description on page
admin	Device Server Family	51
boot	Device Server Family	52
close	Device Server Family	55
connect	Device Server Family	56
cpconf	Device Server Family	57
display	Device Server Family	58
display buffers	2-Port Device Server 4-Port Device Server For details on the required hardware and firmware versions required for each device in order to use the display buffers command, see page 60.	60
exit	Device Server Family	62
help	Device Server Family	63
info	Device Server Family	64
kill	Device Server Family	66
mode	Device Server Family	67
newpass	Device Server Family	69
ping	Device Server Family	70
power	2-Port Device Server 4-Port Device Server	72
quit	Device Server Family	74
reconnect	Device Server Family	75
remove	Device Server Family	76
revert	Device Server Family	77
rlogin	Device Server Family	80
send	Device Server Family	81
set altip	Device Server Family	82
set arp	Device Server Family	83
set auth	2-Port Device Server 4-Port Device Server	84

Commands and Device Server Support

Command	Device Servers Supported in	Description on page
set buffers	2-Port Device Server 4-Port Device Server For details on the required hardware and firmware versions required for each device in order to use the display buffers command, see page 60.	87
set chat	2-Port Device Server 4-Port Device Server	89
set config	Device Server Family.	91
set device	2-Port Device Server 4-Port Device Server	96
set dhcp	Device Server Family	98
set ethernet	Device Server Family	100
set filter	2-Port Device Server 4-Port Device Server	102
set flow	Device Server Family	106
set forwarding	2-Port Device Server 4-Port Device Server	110
set host	Device Server Family	114
set ia	2-Port Device Server 4-Port Device Server	116
set ippool	2-Port Device Server 4-Port Device Server	129
set keys	Device Server Family	130
set line	Device Server Family	132
set logins	Device Server Family	135
set menu	2-Port Device Server 4-Port Device Server	137
set modem	2-Port Device Server 4-Port Device Server	139
set ports	Device Server Family	141
set powerunit	2-Port Device Server 4-Port Device Server	147
set route	Device Server Family	150
set script	2-Port Device Server 4-Port Device Server	152

Command	Device Servers Supported in	Description on page
set secureaccess	2-Port Device Server 4-Port Device Server	158
set service	Device Server Family	160
set snmp	2-Port Device Server 4-Port Device Server	162
set socketid	Device Server Family	165
set tcpip	Device Server Family	167
set telnetip	Device Server Family	169
set terms	Device Server Family	171
set trace	Device Server Family	173
set udpdest	Device Server Family	177
set udpserial	Device Server Family	179
set user	Device Server Family	181
show	Device Server Family	193
status	Device Server Family	195
telnet	Device Server Family	196
traceroute	Device Server Family	197
uptime	Device Server Family	198
wan	2-Port Device Server 4-Port Device Server	199
who	Device Server Family	201

Access the Command Line

To configure devices using commands, you must first access the command line, either from a locally connected terminal or a Telnet session, and then log on as root from the command line.

From a Locally-Connected Terminal

To access the command line and the configuration from a terminal connected to one of the device server's serial ports, follow these steps.

1. Connect a terminal or PC to a serial port on the device server. For a Windows HyperTerminal connection, use the cable that came in the package.
2. Configure the parameters of the terminal or terminal emulation software to work with the Device Server's serial port. The default port settings are:
   - VT 100 emulation
   - 9600 baud
   - 8-bit character
   - 1 stop bit
   - No parity
3. Log on as the **`root`** user. The default password is **`dbps`**.

From a Telnet Session

Use this procedure to access the command line and the configuration from a Telnet session. This procedure assumes that you have configured the Device Server with an IP address already. See "Configure an IP Address" on page 15.

1. To Telnet to the device server, enter the following command from a command prompt on another networked device, such as a server:

   ```
   telnet ip-address
   ```

   where *ip-address* is the device server's IP address. For example

   ```
   telnet 192.3.23.5
   ```
2. Log on as the **`root`** user. The default password is **`dbps`**.

If You Cannot Access the Command Line

If you cannot access the command line, your user access permissions may be set to disable access to the command line. See Control User Access to the Command Line on page 40.

Configure RealPort

RealPort is a feature that allows network-based host systems to use the ports of the device server as though they were the host system's own ports, appearing and behaving as local ports to the network-based host.

For further configuration details, see the User Guide's chapter on setting up RealPort.

Configure an IP Address

To configure an IP address, mask, and default gateway for the device server's Ethernet interface, use the set config command.

Procedure

1. To ensure that the IP address you configure is permanent, turn DHCP off by entering the following command:

   ```
   set config dhcp=off
   ```

2. Configure an IP address for the Ethernet interface by entering the following command:

   ```
   set config ip=ip-address
   ```

   where *ip-address* is the IP address for the Ethernet interface. For example:

   ```
   set config ip=191.143.2.154
   ```

3. Configure a subnet mask by entering the following command:

   ```
   set config submask=mask
   ```

   where *mask* is the subnet mask for this subnetwork. For example:

   ```
   set config submask=255.255.255.0
   ```

4. To configure a default gateway, enter the following command:

   ```
   set config gateway=ip-address
   ```

   where *ip-address* is the IP address of the default gateway. For example:

   ```
   set config gateway=191.143.2.46
   ```

5. Reboot the Device Server at the prompt using the following command:

   ```
   boot action=reset
   ```

Example

In this example, set config commands configure the Ethernet interface and the boot command reboot the Device Server, which is required for the address change to take effect.

```
set config ip=192.150.150.10 submask=255.255.255.0 dhcp=off
set config gateway=192.150.150.11
boot action=reset
```

See also

For more information, see these command descriptions:

- set config on page 91
- boot on page 52

Configure Serial Port Settings

Configuring serial port settings involves setting the following options for a port:

- Point-to-Point (PPP) connections
- Industrial automation (IA)
- Modem emulation
- TCP socket communication
- UDP Multicast communication
- Autoconnection

Configure PPP Connections

Configuring Point-to-Point Protocol (PPP) connections includes:

- Configuring inbound PPP connections
- Configuring outbound PPP connections
- Using filters on the PPP connections, as needed

Configure Inbound PPP Connections

To configure simple inbound PPP connections from the command line, follow these steps.

Regarding inbound PPP connections:

- For information on fine-tuning PPP connections, see the set user command.
- CHAP authentication works between two Device Servers. CHAP will be negotiated to PAP for all other connections

1. To configure the port for a modem, enter the following command:

   ```
   set ports range=range dev=device
   ```

   where *range* is the port or ports and *device* is one of the following:

   - min for inbound-only modem connections.
   - mio for bidirectional modem connections.

   For example:

   ```
   set ports range=3 device=min
   ```

2. To configure flow control for the ports, enter the following command:

   ```
   set flow range=range flow-control-scheme
   ```

   where *range* is the port or ports and *flow-control-scheme* is the flow control required for this connection. There are several options for establishing a flow-control scheme on set flow. Typically, for modem connections RTS and CTS are on. The following example shows a typical flow-control scheme for a modem:

   ```
   set flow range=3 ixon=off ixoff=off rts=on cts=on
   ```

3. To configure the baud rate for this connection, enter the following command:

   ```
   set line range=range baud=bps
   ```

   where *range* is the port or ports to configure and *bps* is the line speed in bits-per-second. Typically, you can set this to 115000 bps for modem connections.

   For example:

   ```
   set line range=3 baud=115000
   ```

4. To create an inbound PPP user, enter the following command:

   ```
   set user name=name protocol=ppp netservice=on
   defaultaccess=netservice
   ```

   where *name* is a name to assign to the PPP user. For example:

   ```
   set user name=pppin protocol=ppp netservice=on
   defaultaccess=netservice
   ```

5. To configure an IP address for the remote PPP user, enter the following command:

   ```
   set user name=name ipaddr=ip-address
   ```

   where:

   - *name* is the user's name
   - *ip-address* is one of the following: (a) A standard IP address in dotted decimal format. (b) 0.0.0.0, which means the remote user will supply the IP address. (c) ippool, which means that the user will be assigned an IP address from an IP address pool. See set ippool on page 129.

   For example:

   ```
   set user name=pppin ipaddr=ippool
   ```

6. If you used the IP address pool option in the previous step, specify the following subnetwork mask using the following command: (a mask of 255.255.255.255 is required)

   ```
   set user ipmask=255.255.255.255
   ```

7. To configure an IP address for the local end of the PPP connection, enter the following command:

   ```
   set user name=name localipaddr=ip-address
   ```

   where *name* is the user's name and *ip-address* is the IP address to assign to the local end of the PPP connection. This address must be unique. That is, no other user can be assigned this address and it cannot be the IP address for the Ethernet interface. For example:

   ```
   set user name=pppin localipadr=199.1.1.2
   ```

Example

This example shows a very simple PPP inbound configuration with the following properties:

- The port is set up for inbound connections (dev=min).
- RTS and CTS are used for flow control.
- The baud rate has been set to 115000 bps.
- The user has been configured to use an IP address pool

```
set ports range=3 device=min

set flow range=3 ixon=off ixoff=off rts=on cts=on

set line range=3 baud=115000

set user name=pppin protocol=ppp netservice=on
  defaultaccess=netservice

set user name=pppin ipaddr=ippool

set user name=pppin localipadr=199.1.1.2
```

See also

For more information, see these command descriptions:

- set ports on page 141
- set flow on page 106
- set line on page 132
- set user on page 181

Configure Outbound PPP Connections with Filters

To configure outbound-only PPP connections with filters, or the outbound portion of bidirectional connections with filters, follow the steps below.

Regarding outbound PPP connections:

- If you do not require filters for your outbound PPP connection, you may use this procedure, but omit step 1. If there is no filter, when the dialout connection is turned on, the device will automatically dial out.
- For dialout outbound connections to a device other than a Black Box Device Server, select authentication type=none. CHAP authentication works between two Device Servers.
- If you change a filter type after an initial configuration, you must reboot for the filter to take effect.

1. To set the filter for the outbound connection, enter:

   ```
   set filter name="<filter name>" s1="dst/<IP Address>/
   <Subnetmask>
   ```

   See "set filter" on page 102 for more details on filters.

2. To set the flow control to hardware, enter:

   ```
   set flow range=1 ixon=off ixoff=off rts=on cts=on
   ```

3. To configure the user for the outbound PPP connection:

   ```
   set user name="<username>" protocol=ppp
   ```

4. To set up the user for the PPP environment, including such items as the local IP address, the devices, and telephone number, enter the following commands:

   ```
   set user name="<username>" ipaddr=negotiated
   ipmask=255.255.255.255
   ```

   For a description of the options for specifying the IP address, see "ipaddr" on page 186 of the set user command description.

   ```
   set user name="<username>" defaultaccess=netservice
   autoport=513 password=on
   ```

   ```
   set user name="<username>" outgoing=on autoservice=default
   ```

   ```
   set user name="<username>" bringup="<filter name>"
   ```

   ```
   set user name="<username>" device="gendialer"
   ```

5. To assign the dialscript to which the port the modem is connected, enter the following command:

   ```
   set device name="gendialer" baud=no dialer=genmdm chat=no
   port=1
   ```

   For more information on the configuring the port, see "set device" on page 96.

6. To set up routing for the PPP connection enter the following commands:

   ```
   set forwarding state=active splithorizon=off poisonreverse=off
   set route net=<IP Address> mask=<Subnetmask> metric=1
   wanname="<username>"
   ```

   The wanname command must match the set username command. In this example, the username is “<username>”, as in step 2.

7. To enable the new wan interface, enter the following command:

   ```
   set user name="<username>" dialout=on
   ```

Example

The following example shows a simple outbound PPP configuration with filters and the following properties:

- The port is set up for outbound connections.
- Flow control is set to Hardware.
- Default device and scripts are used.

```
set filter name="<filter name>" s1="dst/<IP Address>/<Subnetmask>

set flow range=1 ixon=off ixoff=off rts=on cts=on

set user name="<username>" protocol=ppp

set user name="<username>" ipaddr=negotiated
  ipmask=255.255.255.255

set user name="<username>" defaultaccess=netservice autoport=513
  password=on

set user name="<username>" outgoing=on autoservice=default

set user name="<username>" bringup="<filter name>"

set user name="<username>" device="gendialer"

set device name="gendialer" baud=no dialer=genmdm chat=no port=1

set forwarding state=active splithorizon=off poisonreverse=off

set route net=<IP Address> mask=<Subnetmask> metric=1
  wanname="<username>"

set user name="<username>" dialout=on
```

Filters for PPP Connections

Filters are used to manage and control PPP connections. You can design a filter to do any of the following:

- Bring up a connection
- Allow certain types of packets to use the connection and keep certain types of packets from using it
- Keep a connection up
- Send a message to the log file when a specified event occurs on the connection

You might, for example, develop a filter that brings up a connection on an outbound port only when device server handles a packet carrying a particular destination IP address.

The set user command has fields that define how a filter functions, that is, whether it is the type of filter that accepts or blocks packets, brings up a connection, keeps up a connection, or sends a message to the log file. The following table describes each of the set user fields related to filtering.

set user Field	Description	Example
passpacket	Causes a packet to be passed or blocked.	Filter causes incoming packets from an IP address to be accepted and packets from all other IP addresses to be blocked.
keepup	Causes the idletimeout timer to be reset and a connection maintained.	Filter that causes the connection to be maintained as long as there is any packet traffic except RIP packets.
bringup	Causes the Device Server to establish a connection.	Filter that causes an outgoing connection to be initiated whenever a packet specifying a particular IP address is handled.
logpacket	Causes the Device Server to send a message to the log file.	Filter that notifies the log anytime an ICMP packet is handled.

For more information about using filters, see "set filter" on page 102, and "set user" on page 181

Configure Industrial Automation (IA)

To configure how devices in an industrial automation (IA) environment communicate, use the following command:

```
set ia
```

The syntax for set ia varies according to the IA device being configured: serial port-connected devices, network-based masters, network-based slaves, and serial master routes. The set ia command description on page 116 shows these syntax variations, the effects of the command fields for each variation, and examples of configuring several IA devices. See set ia on page 116 for command syntax, field descriptions, and examples.

Protocols for IA Devices

IA devices can use either of the following communication protocols:

- Modbus protocol
- A “user-defined” protocol

Following are guidelines on configuring devices to use each protocol.

Modbus Configuration Guidelines

When using the set ia command to configure devices that will run the Modbus protocol, follow these guidelines:

- Configure the serial port for the serial communication parameters (baud rate, data bits, parity and stop bits) required by the connected IA device.
- Choose Modbus ASCII or Modbus RTU as the serial port protocol, depending on the requirements of the IA device connected to the port.
- If you configure the port for a slave, you do not have to configure a network-based master. Communication with the master just works. (If the master is connected to a serial port, it must be configured, however.)
- If you configure a port for a master and the slaves are located on the network, TCP sockets, UDP sockets, and Modbus/TCP are all supported. Use the protocol required by the master.

User-Defined Protocol Configuration Guidelines

2-Port and 4-Port Device Servers support “user-defined” protocol, which is any IA serial-port protocol with the following attributes:

- All message packets are bounded by fixed header and trailer strings.
- Each protocol request is followed by a single response.

When using the set ia command to configure devices that will run the user-defined protocol, follow these guidelines:

- Configure the serial port for serial communication parameters (baud rate, data bits, parity and stop bits) required by the connected IA device.
- Choose User-defined as the serial-port protocol.
- If you configure the port for a slave, you do not have to configure a network-based master. Communication with the master just works. (If the master is connected to a serial port, it must be configured, however.)
- If you configure a port for a master and the slaves are located on the network, TCP sockets and UDP sockets are supported options.

Configure Modem Emulation

Modem emulation enables a system administrator to configure a networked Device Server to act as a modem. The Device Server emulates modem responses to a serial device and seamlessly sends and receives data over an Ethernet network instead of a PSTN (Public Switched Telephone Network). The advantage for a user is the ability to retain legacy software applications without modification and use a less expensive Ethernet network in place of public telephone lines.

To use a Device Server for modem emulation, do the following:

- Use a cable with the correct wiring pinouts (see "Modem Emulation Cable Signals" on page 27).
- Configure the serial ports and device type with the Web Interface.

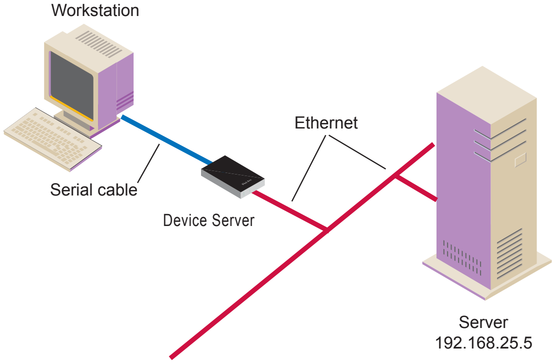
  Note: Before AT commands are accepted, DSR must go high on the Device Server.

The AT commands used with modem emulation are described in the AT Command Reference.

Common User Scenarios

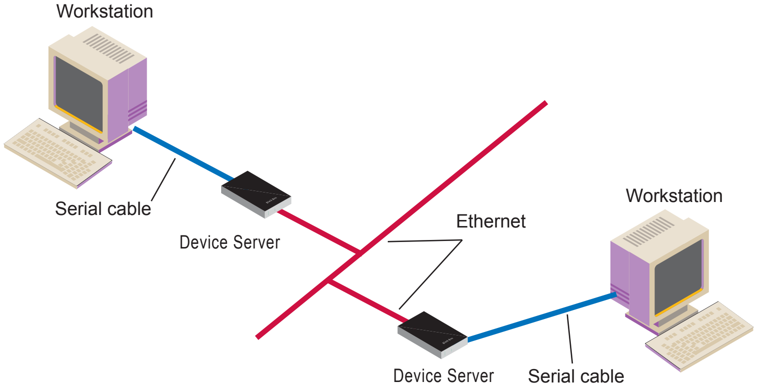
The Device Server in modem emulation mode allows for the easy replacement of modems in almost any environment where there is a LAN or WAN.

User Scenario - Diagram A



In Diagram A, the Device Server replaces a modem connected to a workstation running an application. The Device Server allows for the use of software applications without modification by responding to all the AT commands configured in the workstation application. The Device Server connects to the IP Address of the server when an `ATDT` *`ipaddress:port`* (`ATDT 192.168.25.5:50001`) command is issued. Once the remote device establishes the TCP connection, a CONNECT message is sent to the serial port and only then does the Device Server switch from AT command mode to data mode. Using the modem escape sequence or dropping DTR on either side terminates the connection. A DISCONNECT message will be sent to the application if the remote side closes the TCP connection.

User Scenario - Diagram B



In Diagram B, two Device Servers will replace modems on both sides of the connection. The initiation of the connection occurs with either of the Device Servers. If both ends are Device Servers, the TCP listening port number is 50001 for port 1. An example of the connection command is `ATDT 192.168.25.30:50001`. Upon establishing a successful TCP connection, a CONNECT message is sent to the serial port and only then does the Device Server switch from AT command mode to data mode. After the CONNECT is received, the transmission of data begins. Using the modem escape sequence or dropping DTR on either side terminates the connection.

Modem emulation has the ability to communicate to an infinite number of other devices.

Modem Emulation Cable Signals

Use the following signal assignments to make a cable connecting the Device Server to a serial device.

Note: DSR and DTR on the serial device side are connected to the DSR signal of the Device Server.

Serial Device		Device Server
CTS (in)	←	RTS (out)
RTS (out)	→	CTS (in)
DSR (in)	←┬→	DSR (in)
DTR (out)	→┘	
DCD (in)	←	DTR (out)
TX (out)	→	RX (in)
RX (in)	←	TX (out)
GND	—	GND

Originating, Answering, and Disconnecting Calls

Originating Calls

To send data to a Device Server, enter the following information for your application replacing the telephone number with the Device Server’s IP address and TCP port number. Enter the following command:

```
ATDT ipaddress:tcp_port#
```

For example:

```
ATDT 146.135.13.5:50001
```

Answering Calls

The Device Server listens on a pre-defined TCP port to receive data. When the Device Server receives a call notification (RING) through a serial port to begin a TCP connection, it needs to reply with an ATA or a pre-configured Auto-Answer to answer the call.

Note: The TCP ports assigned to the serial ports are as follows:
Serial port 1 listens on TCP port 50001
Serial port 2 listens on TCP port 50002
Serial port 3 listens on TCP port 50003
Serial port 4 listens on TCP port 50004

Disconnecting Calls

The TCP connection disconnects by either dropping the DTR signal on the serial port or sending the escape sequence <P>+++<P> to the Device Server. <P> represents a one second pause.

Disconnecting Calls-Device Server

The Device Server sends a NO CARRIER response to the serial port when the network connection is dropped.

Configure TCP Socket Communication

TCP socket communication enables serial devices to communicate with each other over an Ethernet network as though they were connected by a serial cable.

To configure TCP socket communications, use the sockets field on the set config command. See set config on page 91.

Configure UDP Multicast Communications

UDP multicast is used to send serial data over an Ethernet cable to one or many hosts at the same time.

To configure UDP multicast communications, use the set udpdest command. set udpdest on page 177.

Configure Autoconnection

The autoconnection feature allows you to configure a user to access the device server and then be automatically connected to a host on the LAN.

You can implement autoconnection in the following ways:

- By port, where all port users are automatically connected to the same host. The device server is completely transparent to them.
- By user, where a user is required to log on and may be required to supply a password. Once the user is authenticated, an automatic connection to a host is made.

To configure autoconnection, either by port or by user, use the following commands:

- set ports - auto, autoservice, dest, dev, and dport fields. See set ports on page 141.
- set user - name, autoconnect, autohost, autoport, and defaultaccess fields. See set user on page 181.

Examples

Configure an autoconnect port

In this example, the set ports command configures the port so that all incoming users are automatically connected via Telnet to the host specified on the dest field. The port is also available for outgoing connections.

```
set ports range=1 auto=on dest=199.125.123.10 dev=mio dport=23
```

Configure an autoconnect user

In this example, the set user command configures user4 to be automatically connected via Telnet to a host at address 199.193.150.10.

```
set user name=user4 autoconnect=on autohost=199.193.150.10
autoport=23 defaultaccess=autoconnect
```

Configure Network Settings

Configuring network settings involves the following:

- IP routing
- Domain Name Server (DNS)
- Simple Network Management Protocol (SNMP)

Configure IP Routing

Configuring IP routing involves these tasks:

- Configure static routes using the set route command
- Configure dynamic routes using the set forwarding command
- Configure Proxy ARP using the set forwarding command

Configure Static Routes

To configure a static route over a PPP link, enter the following command:

```
set route net=addr mask=mask metric=hops wanname=interface
   gateway=gateway
```

where:

- net is either the IP address of a system to be reached over this route or the network address of the subnet that is to be reached on this route.
- mask is the mask to use for interpreting the IP address.
- metric is the number of hop to the destination.
- wanname is the interface to use for this route, which is one of the following:
  - For routes over a PPP link: The name of a set user command that defines a PPP user.
  - For routes over the Ethernet interface: ether.

gateway is the IP address of the device that is the next hop to the destination. For more information, see set route on page 150.

Example: Route Using the Ethernet Interface

In this example, a route to a subnet is created over the Ethernet interface. Key features include the following:

- The address on the net field is a subnetwork address, not the IP address of a specific device
- The wanname=ether, indicating that this route is over the Ethernet interface
- The metric field indicates that packets to this subnet will pass through two routers
- The gateway field indicates that all packets using this route are to be forwarded to the device at IP address 191.21.21.2.

```
set route net=199.21.33.0 mask=255.255.255.0 metric=2
  wannname=ether gateway=199.21.21.2
```

Example: Route Using a PPP Link

In this example, a route to a subnet is created over a PPP interface. Key features include the following:

- The address on the net field is IP address of a specific device, not a subnetwork address
- The WAN name is the name of a PPP user.
- The metric field indicates that packets to this subnet will pass through two routers
- The gateway field indicates that all packets using this route are to be forwarded to the device at IP address 191.21.21.2.

```
set route net=199.21.33.44 mask=255.255.255.255 metric=2
  wannname=ppp1 gateway=199.21.21.2
```

Configure Dynamic Routes Using RIP

To configure the device server for dynamic routing using the Routing Information Protocol (RIP), enter the following command:

```
set forwarding
```

For more information, see set forwarding on page 110.

Procedure

This procedure assumes that you have signed on as root and have or will configure modems, modem scripts, devices, and filters for routes that use serial lines.

1. Configure the links over which routed packets and RIP updates will be sent.
   - To enable routing over the LAN to which device server is attached, no routing-specific configuration is required.
   - To enable routing over PPP links be sure to use the netrouting field on the set user command to configure how device server handles RIP updates. You can configure the link so that device server does any of the following with RIP updates:

     - Both sends and receives them (netrouting=both)

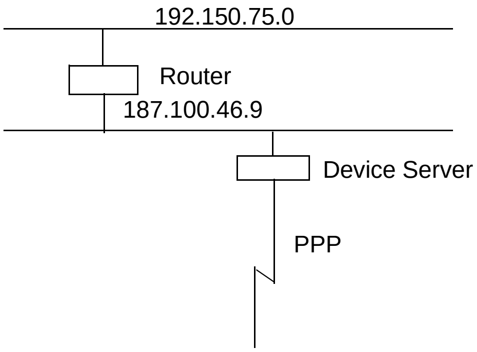
     - Sends them only (netrouting=send)

     - Receives them only (netrouting=receive)

     - Neither sends nor receives them (netrouting=off)
2. Configure the device server for dynamic routing with a set forwarding command that specifies state=active.

Example

In this example, which shows only those commands and command fields pertinent to routing, device server is configured for dynamic routing using RIP. But to prevent RIP updates from being sent across the PPP link, the set user command that defines the link specifies netrouting=off.



```
set forwarding state=active poisonreverse=on splithorizon=on
set user name=link1...netrouting=off
```

Configure Proxy ARP

To configure the device server for Proxy ARP, enter the following command:

set forwarding

For more information, see set forwarding on page 110.

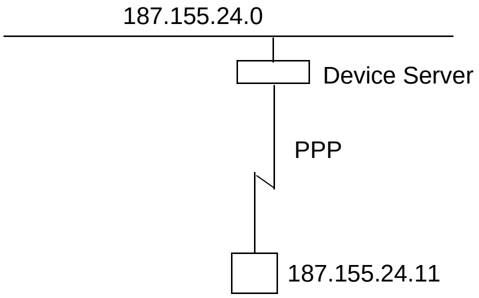
Procedure

This procedure assumes that you have signed on as root and have or will configure modems, modem scripts, devices, and filters for routes that use serial lines.

1. Configure the links over which packets will be routed using a set user command. This command must specify (on the ipaddr field) a specific IP address for the remote system using the Proxy ARP service.
2. Configure the device server for Proxy ARP by supplying a set forwarding command that specifies the following:
   - state=passive
   - proxyarp=on

Example

In this example, the device server provides Proxy ARP services to a remote host.



```
set user name=link1...ipaddr=187.155.24.11
set forwarding state=passive proxyarp=on
```

Configure Domain Name System (DNS)

The domain name system (DNS) maps domain names to information associated with these names, such as IP addresses. Configuring the DNS involves the following tasks:

- Configure a DNS server
- Configure the host table

DNS Components

DNS components include:

- A distributed database consisting of domain names and associated information.
- A hierarchical system of domain name servers that maintain the database and use it to respond to requests for information about a particular domain name, such as its IP address
- Domain name resolvers that do the following:
    - Accept requests from users.
    - Satisfy information requests by building and submitting properly formulated queries to one or more name servers or by retrieving information from a local host file.
    - Return information to users.
    - Cache information for future use.

Name Server Types

There are two types of name servers in the domain name system:

- *Local servers* maintain information for resources within a local zone. It is up to individual network administrators to determine the scope of a local zone.
- *Root servers* maintain information in higher-level domains than do local servers.

Typically, when a user requires information about a domain name, the resolver queries a local server. If local servers cannot provide the information, root servers are queried next.

Naming Conventions

Each node in the domain name system has a globally unique domain name that consists of its own name, which is called a label, and the labels of all superior nodes.

DNS Name Example

Following is an example of a domain name. Note that labels are separated by periods:

```
mn07.amalgamated.com
```

In this example, mn07 is part of the higher-level domain called amalgamated.com.

Configure a DNS Server

To configure a DNS server, enter the following command:

```
set config domain=domain myname=name dns=ip-address
```

where:

- *domain* is the domain in which the device server will reside
- *name* is a DNS name for device server
- *ip-address* is the IP address of a name server

For example:

```
set config domain=deviceserver.com myname=poe dns=204.221.1.4
```

For more information, see set config on page 91.

Configure the Host Table

To configure the host table, which maps IP addresses to host names, enter the following command:

```
set host name=name ip=ip-address
```

where:

- *name* is the name the host
- *ip-address* is the IP address of the host

For example, the following commands configure three IP address-to-name mappings:

```
set host name=poe ip=204.221.110.200
```

```
set host name=gary ip=204.221.110.202
```

```
set host name=toni ip=204.221.110.203
```

For more information, see set host on page 114.

Configure SNMP

Simple Network Management Protocol (SNMP) is the network management protocol that governs the exchange between nodes and stations.

Network Management Components

The TCP/IP network management architecture contains the following components:

- Managed nodes such as host systems, routers, terminal and communications servers (such as device server) and other network devices.
- One or more network managers (also called network management stations), which are the points from which the network is managed
- Agents that reside on managed nodes and retrieve management information and communicate this information to network managers.
- The network management protocol, SNMP, which governs the exchange of information between the nodes and stations.
- Management information, which is the database of information about managed objects. This database is called the *management information base* (MIB).

Each managed node contains at least one agent—a component that responds to requests from the network manager—that retrieves network management information from its node and notifies the manager when significant events occur.

Traps

A mechanism defined by SNMP is called a trap, which is a report or “alarm” from a managed node to an SNMP manager that a significant event has occurred.

MIBs

The SNMP management agent supports the following MIBs:

- Read-write for MIB II (RFC 1213), which is an Internet-standard MIB, consisting of managed objects from the systems, interfaces, IP, ICMP, TCP, UDP, transmission, and SNMP group
- Read-write for the character-stream devices using SMIv2 MIB (RFC 1658)
- Read-write for the RS-232-like hardware devices MIB (RFC 1659)
- Read-write for the device server IP Network Control Protocol of the Point-to-Point Protocol MIB (RFC 1473)

Supported Trap Messages

The SNMP agent supports the Set, Get, GetNext, and Trap messages as defined in RFC 1157. These messages are used as follows:

- Set, which means set the value of a specific object from one of the supported MIBs
- Get, which means retrieve the value of a specific object form one of the supported MIBs
- GetNext, which means retrieve the value of the next object in the MIB
- Trap, which means send traps to the manager when a particular type of significant event occurs

The agent can send traps when any of the following occur:

- Cold starts (device server initializes)
- Authentication failures
- Login attempts

Command for Configuring SNMP

To configure SNMP, enter the following command:

set snmp

For more information, see set snmp on page 162.

Example

The following command configures SNMP with all trap options

```
set snmp run=on trap_dest=190.175.178.73 auth_trap=on
cold_start_trap=on link_up_trap=on curr_thresh_exc_trap=on
temp_thresh_exc_trap=on
```

Configure Security Features

From the command line, you can configure several security-related features to do the following:

- Control access to the configuration
- Control access to inbound ports
- Control access to outbound ports
- Restrict access to outbound ports
- Use CHAP authentication for PPP users
- Control user access to the command line
- Issue user passwords
- Configure SSH Version 2 for secure communication

Control Access to the Configuration

Access to the configuration can be controlled by either of the following methods:

- Through user attributes; that is through various fields on the set user command
- Through network settings; that is, through the network field on the set user command

Controlling access of the device server restricts access to the configuration by defining the following types of users:

- The root user, who has unlimited access to device server commands. He or she can view any configuration table and change any configuration parameter. The root is identified by the user name **`root`** and must supply a password to be authenticated. The default root password is **`dbps`**. You should change this password immediately.
- Regular users, who have much more restricted access to device server commands. Regular users can view some configuration tables and can change some configuration parameters related to their own sessions and passwords. For information on the limitations placed on regular users for each command see set user on page 181.

Control Access to Inbound Ports

An inbound port is one defined on the `dev` field of the set ports command for one of the following device types:

- term, for terminal connections
- min, for incoming modem connections)
- mio, for bi-directional modem connections)
- hdial, hio, for computer connections)

The default configuration for inbound ports is that a login and password are required to access them.

The login and password requirement for inbound ports can be changed by configuring either of the following:

- The port, so that it does not require a login and password. In this case, no one is required to supply a login or password.
- Specific users, so that they do not require a password. In this case, some users do not supply passwords and others are required.

For more information, see set ports on page 141.

Change a Port’s Access Requirements

To configure a port so that no one has to login or specify a password, supply a set logins command that specifies the following:

```
set logins range=range login=off passwd=off
```

For example:

```
set logins range=1-2 login=off passwd=off
```

For more information, see set logins on page 135.

Change a User’s Access Requirements

To configure a user so that they do not have to specify a password when accessing an inbound port, supply a set user command that specifies the following:

```
set user name=name password=off
```

where *name* is a name to identify the user.

For example:

```
set user name=user1 password=off
```

For more information, see set user on page 181.

Control Access to Outbound Ports

An outbound port is one defined on the dev field of the set ports command for one of the following device types:

- prn, for printer connections
- mout, for outbound modem connections
- mio, for bi-directional modem connections
- host, for host connections)
- ia, for industrial automation devices

The default for outbound ports is unlimited access.

Restrict Access to Outbound Ports

Use the set auth command to restrict access to outbound ports.

Use CHAP Authentication for PPP Users

CHAP authentication can be used to restrict PPP user access to outbound ports. For more information on CHAP configuration, see the set user command.

Control User Access to the Command Line

You can restrict user access to the device server command line through the following methods:

- Using the autoconnection feature
- Using menus

Using the Autoconnection Feature

The autoconnection feature allows you to configure a user to access the device server but then be automatically connected to a host on the LAN.

You can implement autoconnection in the following ways:

- By port, where all port users are automatically connected to the same host. The device server is completely transparent to them. Use set ports command, with the auto, autoservice, dest, dev, and dport fields. See set ports on page 141.
- By user, where a user is required to login and may be required to supply a password, but once the user is authenticated, an automatic connection to a host is made. Use the set user command, with the name, autoconnect, autohost, autoport, and defaultaccess fields. See set user on page 181.

Using Menus

Menus select destination systems without having to access the device server command line. Menus are created using the set menu command. For information on configuring menus, see set menu on page 137.

Issue User Passwords

To establish passwords for users, and issue them to users, use the following commands:

- set user, with the password field - To require a password of a user. See set user on page 181.
- newpass - To create or change a user’s password. See newpass on page 69.

Procedure

This procedure assumes that you have signed on as root and already used the set user command to configure the user to whom you will be issuing a password.

The Advanced tab under User allows you to set Escape characters for Connect, Telnet, Rlogin, and Kill as well as an SSH Public Key. Click **Apply** to save the settings.

1. Issue a newpass command that identifies the user (on the name field) to whom this password will be issued.
2. When the system prompts you for a new password, type in the password and then press Enter.
3. When the system prompts you to enter the new password again, type it in and then press Enter.

Configure SSH Version 2 Encryption for Secure Communication

Users can be configured to use SSH version 2 encryption for secure communication. SSH keys need to be generated from your SSH client.

Devices support for SSH

SSH version 2 encryption is only available for the following devices.

- 2-Port Device Server
- 4-Port Device Server

Configure Password Protection for an SSH User

To configure simple password authentication for an SSH user, no SSH-specific configuration is required. Simply configure a user by entering the following commands:

```
set user name=name password=on
newpass name=name
```

where *name* is a user name. For example:

```
set user name=ssh-user1
newpass name=ssh-user1
```

For more information, see set user on page 181, and newpass on page 69.

Use a Public Key

To enable public key authentication and to associate a public key with a user, enter the following command:

```
set user name=name loadkey=host:key
```

where

- *name* is the name of a user
- *host* is either an IP address or DNS name of a host running TFTP that holds
- *key* is the name of a file that contains the DSA public key. If your host's implementation requires a complete path to the file, specify the path here as well. SSH keys need to be generated from your SSH client.

For example:

```
set user name=secure loadkey=143.191.2.34:ssh-file
```

See set user on page 181 for more information.

Make Reverse SSH Connections to Ports

The convention used to identify a port for a reverse SSH connection to a Device Server is to use *base_port*+ 500 + *port_number*. The *base_port* is pre-configured as 2000, so by default, the *base_port* value is 2500+*port.* For example:

- Reverse SSH connection to Port 1: `ssh 192.1.2.3 2501`
- Reverse SSH connection to Port 4: `ssh 192.1.2.3 2504`

Control Access to Services

You can disable services, such as Telnet and Rlogin, for inbound users, which means that users cannot access the Device Server using those services. This feature allows you to turn off individual services or to specify a security level, which means that all services **not** included in that level are turned off.

To control access to services for inbound users, use the set secureaccess command. See set secureaccess on page 158.

Services that Can Be Disabled

The following services can be disabled:

- HTTP
- RealPort
- Reverse TCP
- Reverse Telnet
- Remote login
- Remote shell
- SNMP
- SSH
- Telnet

Service Levels

The service levels, or levels of secure access, are as follows:

- Secure, which means that SSH is the only service available to inbound users
- High, which means that SSH, HTTP, SNMP, and RealPort services are available to inbound users
- Normal, which means all services are available
- Custom, which means you can select services to turn off.

The default service level is normal, which means that all services are available.

Examples

Disable inbound Telnet connections

```
set secureaccess telnet=off
```

Disable all services except SSH

```
set secureaccess level=secure
```

Configure Power Over Serial Ports

Power over serial ports is only available for the following devices:

- 2-Port Device Server
- 4-Port Device Server

Power over serial ports is a hardware feature. Enabling this feature involves changing a jumper inside the device. See the Device Server Family User Guide’s chapter on power over ports for more details.

From the command line, the only power-related task you can perform is to reset the circuit breaker.

Reset the Circuit Breaker

1. Display the status of the circuit breaker by entering:

   ```
   display circuitbreaker
   ```

   or

   ```
   set config print
   ```

2. Reset the circuit breaker by entering:

   ```
   set configuration circuitbreaker=reset
   ```

For more information, see display on page 58, and set config on page 91.

Configure User Attributes

Although it is not required, the device server is often configured to accommodate the requirements of particular users. Typical configurable user attributes include:

- Whether the user is required to supply a password
- Autoconnection attributes, such as the system to which the user should be automatically connected at login
- The interface the device presents the user, such as a menu or command line
- Whether the user has access to outbound ports

Commands for Configuring a User

User attributes are configured by the following commands:

To:	Use this command:
Set common user-related features	set user (name=) Common user-related features are described in "Common Configurable User Features" on page 46.
Assign a password to a user	newpass
Configure a menu to be automatically displayed for a user	set user defaultaccess=menu
Automatically connect a user	set user autoconnect, autoconnect, autohost, autoport, autoservice fields
Defines the number of outbound ports a user connected over the LAN can access at one time.	maxsessions
remove a user from the user table	remove

Common Configurable User Features

The following table describes common user-related features that can be configured by fields on the set user command. For a complete list of features, see the set user on page 181.

Feature	Description	set user Field
accesstime	Determines the times and days the user can access the device server.	accesstime
autoconnect	Automatically connects the user to the host specified on the autohost field using the service (TCP port) defined on the autoport or autoservice fields. Autoconnection can also be implemented by port instead of by user.	autoconnect autohost autoport autoservice
Default access type	Defines the type of access the user is restricted to. Menu, command line, autoconnect, and outgoing and netservice are the types.	defaultaccess
Menu access	Defines the menu that is to be presented to a user with menu access.	menu
Port access	Defines the number of outbound ports a user connected over the LAN can access at one time.	maxsessions
PPP	Defines PPP-related parameters for the user.	There are too many fields to list here. See the set user command for more information.
Routing updates	Defines whether RIP routing updates are forwarded over the link to this user.	netrouting

Configuration Management

Configuration management tasks performed from the command line include:

- Upgrading firmware
- Copying the configuration to and from a remote host
- Resetting the configuration to defaults

Upgrade Firmware

To upgrade firmware, use the following command:

boot

See boot on page 52.

Copy the Configuration to and from a Remote Host

To use the command line to copy the configuration to and from a remote host, use the following command:

cpconf

See cpconf on page 57.

Reset the Configuration to Defaults

To reset the configuration to factory defaults or the latest version stored in NVRAM, use the revert command, as follows:

```
revert all=factory
```

or:

```
revert all=nvram
```

Alternatively, you can use the boot command, as follows:

```
boot action=factory
```

The revert command allows you more control over which portion of the configuration is restored. That is, you can also use the revert command’s range field to define a range of ports with the serial, port, line, flow, keys, and login options. For more details, see revert on page 77.

Chapter 2 Command Descriptions

This chapter provides the following:

- Basic information that applies to all commands, including navigation and editing keys, displaying online help, abbreviating commands, and syntax conventions.
- A description of each command.

Basic Command Information

Navigation and Editing Keys

Use the keys listed in the table to navigate the command line and edit commands:

Action	Keys
Move the cursor back one space	Ctrl b
Move the cursor forward one space	Ctrl f
Delete the character to the left of the cursor	Back space or Ctrl h
Delete the character under the cursor	Delete
Scroll back through commands	Ctrl p
Scroll forward through commands	Ctrl n
Execute the command	Enter

Displaying Online Help

Help is available for all commands. The table describes how to access it.

For information on ...	Type
All commands	? (with no additional parameters)
A specific command	The command and then ? **Example:** info ? **Example:** set user ?

Abbreviating Commands

All commands can be abbreviated. Simply supply enough letters to uniquely identify the command.

Syntax Conventions

Presentation of command syntax in this manual follows these conventions:

- Brackets [ ] surround optional material.
- Braces { } surround entries that require you to chose one of several options, which are separated by the vertical bar |.
- Non-italicized text indicates literal values, that is, fields or values that must be typed exactly as they appear. Yes and no options are examples of literals.
- Italicized text indicates that a type of information is required in that field. For example, *filename* means that the name of a file is required in the field.

admin

Purpose

Used to temporarily access commands reserved for administrators (root) when logged in as a normal (non-root) user.

After issuing the admin command, the following occurs:

1. A prompt requesting the root password appears.
2. You enter the root password.
3. If the password is accepted, the device displays the root prompt, indicating that you can issue commands reserved for administrators. If the password is not accepted, the device displays the message, “Incorrect password.”

Device support

This command is supported in all devices.

Required privileges

Only normal users can use the admin command.

Syntax

```
admin
```

Example

```
admin
```

See also

For information on ending temporary root sessions, see the following commands:

- exit on page 62
- quit on page 74

boot

Purpose

Performs the following functions:

- Reboots the device server.
- Restores the configuration to defaults.
- Loads a new firmware into flash ROM from a TFTP host.

Device support

This command is supported in all devices.

Users must be very careful with the load option. If this operation fails and then you reboot, the unit may not work. To ensure success, do the following:

1. Attempt to boot from a remote firmware image before issuing the boot load command. See set config on page 91 for more information.
2. After issuing the boot load command, ensure that you receive the message “The image in flash now appears valid.” If you do **not** receive this message, do **not** reboot. Call technical support for instructions on what to do next.

Required privileges

Root privileges are required to use this command.

Syntax

Reboot the device server

```
boot action=reset
```

Restore configuration defaults

```
boot action={eewrite|factory|reset} switch={factory|user}
```

Load new firmware from a TFTP host

```
boot load={host-ip-address|host-name}:[load-file]
```

Fields

action

The action to be performed.

eewrite

Resets all but the network-related parts of the configuration to defaults. Ports, users, passwords, and most other features are reset.

factory

Resets the entire configuration to defaults.

reset

Reboots the device.

load

The firmware to be loaded.

{host-ip-address* | *host-name}

The IP address or host name of a host with new firmware, which is then burned into flash ROM. The host must be running TFTP.

The firmware must be renamed first by removing the "_" (82000774E.bin).

Next, the path to the boot file must be specified by issuing a set config command, for example:

```
set config bootfile=C:\DeviceServer\82000774E.bin
```

Windows users may need to download file TFTPD.exe and put in the same directory as the firmware. Execute it before entering the boot load command.

[file]

The firmware file.

load-post

The POST or boot code to be loaded.

tftp-server-ip

The IP address of a server running TFTP.

post-file-name

The file that holds the new POST or Boot code.

factory

The firmware that shipped with the device.

user

The most recent firmware upgrade.

Examples

Reload firmware and reset configuration to defaults

```
boot action=factory
```

Reset all-but the network-related parts of the configuration to defaults

```
boot action=eewrite
```

Reboot device and use current firmware and configuration

```
boot action=reset
```

Load firmware using a boot host

The command loads the firmware stored on the host into flash ROM. A reboot is required to use the new firmware.

```
boot load=198.150.150.10:os-1
```

See also

- cpconf on page 57 for information on saving the current configuration to a host prior to restoring the configuration to defaults.
- revert on page 77 for information on restoring configuration defaults to the latest configuration stored in NVRAM.

close

Purpose

Closes active connect, Rlogin, and Telnet sessions; that is, sessions opened by connect, rlogin, or telnet commands. The close command is associated with the sessions displayed by the status command. That is, you can only close sessions that are displayed by the status command by issuing a close command, and not by the kill command. A close command issued without options closes the current connection.

To issue the close command, you must escape the active session. To do this, press the escape key defined for your session type. The following table lists default escape keys.

Session Type	Default Escape Keys
Connect	Ctrl [Enter
Rlogin	~ Enter
Telnet	Ctrl] Enter

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
close [{* | connection-number}]
```

Fields

*****
Closes all active sessions.

connection-number
Identifies the session to close by its session number.

Examples

Close a session identified by number

```
close 1
```

Close the current session

```
close
```

See also

- kill on page 66. The kill command has a broader effect than close, and lets you kill connections from the global list. That is, it is not limited to sessions associated with the current connection.
- set user on page 181 for information on defining escape keys for Telnet, Rlogin, and connect sessions.
- status on page 195 for information on displaying status information on active sessions.
- connect on page 56
- rlogin on page 80
- telnet on page 196

connect

Purpose

Initiates a local connection on a port.

There are several ways of using the connect command:

- To make multiple connections, issue multiple connect commands.
- To temporarily suspend a connection, escape the active session by pressing the escape character defined on the set user command. The default escape character is Ctrl [(Control key and left bracket).
- To temporarily suspend a connection and return to the command line, press the escape character and then the Enter key.
- To switch between active sessions (without first escaping to the command line), press the escape character and then the number of the session you wish to enter. Pressing the connect escape character twice causes the next session to appear, enabling you to easily page through sessions.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
connect {serial_port | hunt_group | id-name}
```

Fields

serial_port
The number of the port on which to establish a connection.

hunt_group
Identifies a hunt group, which is defined by the set ports group command.

id-name
The name (defined on the set ports command) of the port on which to establish a connection.

Example

The following command creates a connection to port 1:

```
connect 1
```

See also

- close on page 55 for information on ending a session.
- reconnect on page 75 for information on reestablishing a port connection.
- set user on page 181 for information on defining an escape character.
- set ports on page 141 for information on defining a hunt group.

cpconf

Purpose

Used to:

- Restore the configuration from a remote host.
- Copy the configuration to a remote host.
- Display the configuration on a terminal.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

```
cpconf {fromhost=host[:file] | tohost={host[:file] | term}}
```

Fields

fromhost

Copies the configuration from the host and file specified. Be sure to:

- Identify the host by either its IP address or DNS name.
- Separate host and file fields by colons.

If you do not specify a file, the default, config.ps3, is used.

tohost

Copies the configuration to the host and file specified. Be sure to:

- Identify the host by either its IP address or DNS name
- Separate the host and file information by a colon.

If the filename is not specified, config.ps3 is used.

TFTP must be running on the host. For transfers to the Device Server, the file must be in the TFTP directory and assigned read-write permissions for all users.

term

Displays the configuration file on the terminal that issued the command.

Examples

Copy configuration from a host

```
cpconf fromhost=190.150.150.10:ps-cnfg1
```

Copy configuration to a host

```
cpconf tohost=190.150.150.10:ps-cnfg1
```

Copy configuration to a terminal

```
cpconf term
```

display

Purpose

Used to:

- Display the status of the EIA-232 signals on serial ports.
- Display a list of errors.
- Clear the errors list.
- Display information on Device Servers that use dip switch settings to enable multiple electrical interface (MEI) on serial ports.
- Display power information for the Device Servers that support the powered Ethernet feature.

To display the contents of a port buffer, use the display buffers command instead. See display buffers on page 60.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command to display information. Root privileges are required to clear the errors list.

Syntax

Display information

```
display {port range=port-port | error | power | switches
   |circuitbreaker}
```

Clear errors

```
display error clear
```

Fields

circuitbreaker
Displays status of the circuit breaker.

clear
Clears the errors list.

error
Does one of the following:

- Clears all errors from the errors list when the clear option is specified.
- Displays a list of errors when the clear option is **not** specified.

port
Displays signal state for the ports specified on the range option. There is only one port on the Single-Port Device Server.

power
Displays status of power sources for the Device Servers that support the powered Ethernet option. This option does not apply to the Single-Port Device Server.

range
A range of ports. There is only one port on the Single-Port Device Server.

switches
Displays dip switch settings for devices supporting MEI.

Examples

Display configuration information on a port

```
display port range=1
```

Display configuration information on a range of ports

```
display port range=1-2
```

Display a list of errors

```
display error
```

Display information on dip switch settings

```
display switches
```

Display power information

```
display power
```

Clear errors

```
display error clear
```

See also

- display buffers on page 60 to display the contents of a port buffer.

The display command's focus is on real-time information. In contrast, the info command displays statistical information about a device over time, while the status command displays the status of outgoing connections (connections made by connect, rlogin, or telnet commands). For more information, see these commands:

- info on page 64.
- status on page 195

display buffers

Purpose

Used to:

- Display the contents of a port buffer.
- Transfer the contents to a server running TFTP.
- Configure the screen parameters.

Device support

The following table lists the devices to which this command applies:

Device	Required Hardware	Required Firmware
Single-Port Device Server	Not supported.	Not supported.
2-Port Device Server	50000771-02A or higher	82000747A or higher
4-Port Device Server	50000771-03A or higher	

Required privileges

Root privileges are required to use this command.

Syntax

```
display buffers [range=range] {screen [lines=number]
   [tail=number] | tftp=server:filename}
```

Fields

lines
The number of lines of data to display at a time when the screen option is specified. Use 0 to indicate continuous flow.

range
The port or ports to which the command applies.

screen
Displays the port buffer contents on the screen.

tail
The total number of lines in the buffer to be displayed. The number is calculated from the end of the buffer counting back.

tftp

server
The IP address or DNS name of a server running TFTP to which buffer information should be transferred.

filename
The name to use for the file that will be transferred to the TFTP server.

Examples

Display port buffering information on the screen

```
display buffers range=2 screen lines=32 tail=30
```

Output buffering information to a TFTP server

```
display buffers range=2 tftp=stambrose:port_ouput
```

See also

- set buffers on page 87
- show on page 193

exit

Purpose

Used to terminate either of the following sessions:

- Your current session.
- A temporary root session. If you are in a root session, the exit command returns you to a regular session.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
exit
```

Example

```
exit
```

See also

- admin on page 51 for information on starting a temporary root session.
- quit on page 74 for an alternate method of ending a root session.

help

Purpose Displays information on commands.

Device support This command is supported in all devices.

Required privileges Anyone can use this command.

Syntax

```
help
```

Example

```
help
```

See also "Displaying Online Help" on page 49.

info

Purpose

Displays or clears statistics, including protocol, interface, IA, serial, and UDP over serial. The statistics displayed are those gathered since the statistics tables were last cleared.

Device support

This command is supported in all devices.

Required privileges

Normal users can view statistics tables. Root privileges are required to clear them.

Syntax

Clear statistics

```
info clear {protocol | network | serial:port | ia:protocol
   |sou:range}
```

Display statistics

```
info {protocol | {network | serial:port | ia:protocol /
   sou:range}
```

Fields

info clear

Clears all the statistics tables. This command resets all the counts in the statistics tables to zero.

info {*protocol* | network | serial:*port* | ia:*protocol* | sou*:range*}

Displays one or more statistics tables, depending on the option specified. The following table describes the syntax options and results:

Syntax	Result	Example
info clear	All statistics are cleared.	info clear
info *protocol* where *protocol* is one of the following: frame, modbus, ip, icmp, ethernet tcp, or udp.	frame, modbus, ip, icmp, tcp, or udp tables are displayed.	info ip
info network	All network interface statistics are displayed.	info network
info serial:*port* where *port* the port number.	Port statistics are displayed. For descriptions of these statistics, see About the port statistics displayed by info serial on page 65.	info serial:1
info ia:*protocol* where *protocol* is one of the following: Compoway/F, df1fullduplex, df1halfduplex, fins, hostlink, modbus, userdefined.	IA protocol statistics are displayed.	info ia:fins
info sou:*range* where *range* is the port or ports.	Serial over UDP statistics associated with a serial port are displayed.	info sou:2

About the port statistics displayed by info serial

When you enter an info serial command, the statistics displayed and their meanings are as follows. Note that these statistics are the *number* of changes for each statistic. They are not a *value* of the statistics themselves. The numbers on these statistics will only increase from their previous counts, unless you set the count back to zero by issuing an info clear command.

Statistic	Description
rbytes	The number of bytes received.
tbytes	The number of bytes transmitted.
sigchange	The number of times the signals have changed states.
norun	The number of times FIFO has overrun.
noflow	The number of times the Received buffer has overrun.
nframe	The number of framing errors detected.
nparity	The number of parity errors detected.
nbreak	The number of breaks detected.

Examples

Display the IP table

```
info ip
```

Display Modbus information

```
info ia:modbus
```

Display serial over UDP statistics for port 1

```
info sou:1
```

Clear all network statistics tables

```
info clear
```

See also

The info command displays statistical information about a device over time. In contrast, the display command’s focus is on real-time information, while the status command displays the status of outgoing connections (connections made by connect, rlogin, or telnet commands). For more information, see these commands:

- display on page 58.
- status on page 195

kill

Purpose

Clears or resets sessions on ports.

The kill command is associated with the connections displayed by the who command. That is, you can only close connections that are displayed by the who command by issuing a kill command, and not by the close command.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

```
kill {tty=tty-number | tty=tty-range} | tty-number |
  tty-range}
```

Fields

tty=*tty-number*
A port on which to clear a session. Number = 1.

tty=*tty-range*
A range of ports on which to clear sessions. Range = 1.

tty-number
An alternate method of specifying the number of the port on which to clear a session. Number = 1.

tty-range
An alternate method of specifying a range of ports on which to clear sessions. Range = 1.

Examples

Kill a session on a specific port

```
kill tty=1
```

Kill a session on a range of ports

```
kill tty=1-2
```

See also

- close on page 55, to close sessions for the current connection.
- who on page 201, for information on determining current users.

mode

Purpose Changes or displays the operating options for a current Telnet session.

Device support This command is supported in all devices.

Required privileges Anyone can use this command.

Syntax

Change Telnet options

```
mode [bin={on|off}] [crmod={on|off}] [crlf={on|off}]
```

Display Telnet options

```
mode
```

Fields

bin

Specifies whether binary mode is enabled.

on

Turns on binary mode, which means that all transmitted and received characters are converted to binary during this Telnet session.

off

Turns off binary mode off for this Telnet session. The default is off.

crmod

Specifies whether line feeds are added to received carriage returns.

on

Specifies that line feeds are added to received carriage returns.

off

Specifies that line feeds are **not** added to received carriage returns. The default is off.

crlf

Specifies whether line feeds are added to transmitted carriage returns.

on

Specifies that line feed characters are added to transmitted carriage returns.

off

Specifies that line feed characters are **not** added to transmitted carriage returns. The default is off.

Examples

Turn on binary mode

```
mode binary=on
```

Add line feed characters

```
mode crmod=on crlf=on
```

Display operating options

```
mode
```

newpass

Purpose

Used to create or change your own password (if you are logged in under your own name); the root password, or another user's password (if you are logged in as root).

When you enter the newpass command, a series of prompts guide you through the process of changing a password.

Device support

This command is supported in all devices.

Required privileges

Anyone can change his or her own password. Root privileges are required to change someone else's password or the root password.

Syntax

```
newpass [name=username]
```

Field

name

The name of the user (configured with the set user command) whose password will be created or changed. This option is available only if you have root privileges.

Example

The following command initiates a dialog that changes the user's password:

```
newpass
```

See also

See set user on page 181 for information on configuring users.

ping

Purpose

Tests whether a host or other device is active and reachable.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
ping [continuous][fill=char] {hostname | ip-addr} [intv=msec]
   [loose_sroute=ip-addr,ip-addr...] [npkts=num] [pksiz=bytes]
   [record_route] [strict_sroute=ip-addr,ip-addr...] [verbose]
```

Fields

continuous
Specifies that pings be sent continuously until stopped. (Press the interrupt keys to stop continuous pings. The default interrupt keys are <Ctrl-C>.)

fill
Specifies characters to include in the data portion of the echo reply.

intv
The interval in milliseconds between pings. The range is -1 to 60,000. The default is 1000 milliseconds (one second). A value of -1 means that echoes will be continuously sent until the value in the npkts field is reached.

ip-addr* | *hostname
Identifies the target of the ping by an IP address or domain name.

loose_sroute
Specifies that the ping should pass through the routers indicated on its way to the target host. These routers are identified by their IP addresses.

npkts
The number of packets to include with each ping. The range is 1 to 30,000. The default is 1.

pksiz
The size of the ping packet in bytes. The range is 0 to 20000. The default is 56.

record_route
Specifies that routers handling the ping include their IP addresses in the echo reply.

strict_sroute
Specifies that the ping pass through the routers indicated—and only those indicated—on its way to the target host. Routers are identified by their IP addresses.

verbose
Specifies that echo replies include statistics associated with the ping, such as round-trip time and number of packets transmitted and received.

Examples

Specify a simple ping

The ping command determines whether the specified host can be reached.

```
ping 199.150.150.10
```

Specify loose source routing

The command specifies that the ping must pass through the routers identified on the loose_sroute option but may pass through additional routers as well.

```
ping 199.150.150.10 loose_sroute=199.150.160.10,190.150.161.10
```

Specify strict source routing

The command specifies that the ping pass through the routers identified on the strict_sroute field and only those routers. If it cannot reach the destination along this path, the destination is regarded as unreachable.

```
ping 199.150.150.10 strict_sroute=199.150.160.10,190.150.161.10
```

power

Purpose

The power command can be used to perform the following actions:

- Control the power state of specific ports on the 2-Port and 4-Port Device Servers or devices connected to the ports.
- Display the power state of specific ports on the 2-Port and 4-Port Device Servers.
- Display the status of a power unit.

This command is context-sensitive. The action specified will determine whether it applies to a power unit or a device connected to a power unit.

Device support

This command applies to the 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges, users with command line access or users with specific menu access on ports are required to view or change states.

Syntax

```
power [action={clear|on|off|reboot|show}] [range=(port#)]
   [outlet=outlet#)] [id=powerdeviceid] [group=group#)]
```

An outlet can be specified either by entering an outlet number or by using the id and/or group fields.

Fields

action

Used in conjunction with range, outlet, id, or group fields. This field can be set to the following values:

clear

Clears the maximum detect current parameter of the specified power control unit.

on

The outlet or outlets configured to the device will receive power.

off

The outlet or outlets configured to the device will not receive power.

reboot

The outlet or outlets configured to the device will be power cycled with a 10 second wait until the user is prompted again. This command only works if the outlets are already receiving power.

show

Displays the status of the unit and/or devices connected for the specified range.

range

Performs the specified action on the power unit with the specified index.

outlet

Performs the specified action on the device with specified index.

id

Performs the specified action on the device unit with the specified ID. This field must be used with the action field.

group

Performs the specified action on an outlet with the specified group number.

Examples

Display outlet status

In this example, the power command displays the status of the outlets, including whether they are on or off, their IDs, and the group number.

```
power action=show range=2 outlets=3
```

Or:

```
power power range=2 outlet=3
```

Display power unit status

This example displays the status of two remote power control devices connected to Device Server. The items to be displayed include:

- Remote Power Control Unit ID (or which port it is on)
- Average Power
- Apparent Power
- True RMS Voltage
- True RMS Current
- Maximum Current Detected
- Internal Temperature
- Outlet Circuit Breaker Status
- Alarm Threshold

```
power action=show range=7-8
```

Control power to a port

This example turns off the power to all outlets affiliated with group 3.

```
power group=3 action=off
```

Clear the maximum current detected

This example clears the maximum current detected variable for the power unit on port 8.

```
power action=clear range=8
```

Control a device with a device range

This example turns on the power to the device on the unit 2 connected to the outlet 3.

```
power action=on range=2 outlet=3
```

Control a device with an ID

In this example, the power to all outlets affiliated with a device named “Router” will be rebooted. This command will only work if the outlets are all currently on.

```
power action=reboot id=Router
```

quit

Purpose

Used to end the following types of sessions:

- The current session. If you are in a regular or root session, quit closes the session.
- A temporary root session. If you are in a root session started with the admin command, quit returns you to a regular session.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
quit
```

Example

```
quit
```

See also

See admin on page 51 for information on temporarily accessing commands reserved for the administrator.

reconnect

Purpose

Reestablishes a previously established connection. This command applies only to sessions that have been backed-out of, but not close.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
reconnect [{serial-port | p=serial-port | s=session}]
```

Fields

serial-port

The serial port to which this command applies.

p=*serial-port* | s=*session*

The serial port or session to which this command applies.

Example

Reconnect to the last port used

```
reconnect
```

See also

- connect on page 56 for information on establishing a connection on a selected port
- close on page 55 for information on ending a connection
- status on page 195 for information on gathering status on current connections

remove

Purpose

Removes entries from configuration tables.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

```
remove table-name {range=range | name=name | ip=ip-address}
```

Fields

ip=*ip-address*
Removes an entry from a configuration table based on the IP address specified. This form of the command works only on entries that can be identified by an IP address, such as entries in the auth or altip tables.

name=*name*
Removes an entry from a configuration table based on the name specified. This form of the command works only on entries that can be identified by name, such as entries in the user table.

range=*range*
Removes entries from one of the device server configuration tables based on the range of table index entries

table-name
One of the following configuration table names:

- altip
- arp
- auth
- chat
- device
- filter
- host
- ippool
- menu
- powerunit
- route
- script
- service
- telnetip
- term
- user

Examples

Remove an entry from user table by name

```
remove user name=martymertz
```

Remove an entry from altip table by IP address

```
remove altip ip=143.191.2.120
```

Remove an entry from altip table by index number

```
remove altip range=3
```

revert

Purpose

Restores the configuration to defaults or to the latest configuration stored in NVRAM.

The revert command does not restore **network-related parts of the configuration** to defaults.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

```
revert option={factory | nvram} [range]
```

Fields

***option*={factory | nvram}**

Sets one of the configuration options either to the factory defaults or to the latest version of the configuration stored in NVRAM.

A revert nvram command is only useful if a set conf save=off command was previously issued to the device. See the command examples for more information.

The following table lists the allowable values for *option*, and their effect on the configuration.

option	Then this part of the configuration reverts ...
all	Entire configuration, except network connectivity parameters.
altip	set altip configuration
arp	set arp configuration
auth	set auth configuration
config	set config configuration
filter	set filter configuration
flow	set flow configuration
host	set host configuration
ia	set ia netmaster, set ia netslave, set ia serial, and set iaroute configuration
ianetmaster	set ia netmaster configuration.
ianetslave	set ia netslave configuration.
iaroute	set ia route configuration.
iaserial	set ia serial configuration.
keys	set keys configuration
line	set line configuration
login	set login configuration

option	Then this part of the configuration reverts ...
menu	set menu configuration
network	altip, arp, host, route, snmp, tcpip, and telnetip configuration. Not related to network connectivity.
port	set ports configuration
powerunit	set powerconfig. This option applies to the 2-Port and 4-Port Device Servers only.
routed	Routing configuration
script	set script configuration
secureaccess	set secureaccess configuration
security	set auth, set logins, and set secureaccess configuration
service	set service configuration
snmp	SNMP configuration
system	set config, set ethernet, set keys, set menu, set service, set terms, set trace, and set user configuration
tcpip	set tcpip configuration
telnetip	set telnetip configuration
terms	set terms configuration
trace	Trace settings
users	set user configuration

range

A range of ports to which the command applies. This field is valid when used with serial, port, line, flow, keys and login options.

Examples

Reset the port configuration to defaults

```
revert port=factory range=1
```

Reset network-related settings

The configuration is reset to the latest user configuration saved in NVRAM.

1. First, turn off saving configuration changes to NVRAM by issuing the following command:

   ```
   set config save=off
   ```

2. Change the baud rate of port 8 to 115200:

   ```
   set line baud=115200 ra=8
   ```

3. Run a test of serial port 8 at 115200 baud.
4. Once testing is complete, return port 8 to normal:

   ```
   revert line=nvram
   ```

5. Turn on saving configuration changes:

   ```
   set config save=on
   ```

See also

boot on page 52. Issuing a boot action=factory command resets the configuration to factory defaults.

rlogin

Purpose

Performs a login to a remote system, also referred to as an rlogin.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
rlogin [esc=(char)] {hostname|host-ip-addr}
   [{user=user-name | -l user-name}]
```

Fields

esc

A different escape character than the ~ (tilde) character, which will be used for the current Rlogin session. This character is used for suspending a session from the remote host to return to the device server command line.

hostname

The name of a host to log into*.*

host-ip-addr

The IP address of a host to log into.

user=*user-name* | -l *user-name*

The user name to use on the remote system. If you do not specify a name, your device server user name will be used. The -l user-name option is for compatibility with the UNIX rlogin command.

Examples

Remote login using a host name

```
rlogin host1
```

Remote login using an IP address

```
rlogin 192.192.150.28
```

Remote login using a host name and user name

The rlogin command establishes an Rlogin session using a host name. The command also supplies the name that identifies the user on the host.

```
rlogin host1 user=fred
```

See also

See set user on page 181 for information on configuring a user-specific Rlogin escape character.

send

Purpose

Sends a control command to a Telnet peer.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
send {ao|ayt|brk|ec|el|escape|ga|ip|nop|synch}
```

Fields

ao
Sends the “abort output” signal to discard output buffered on the peer.

ayt
Sends the “are you there” signal to test whether a host is still active.

brk
Sends the “break” signal to interrupt the executing application.

ec
Sends the “erase character” to delete the previous character.

el
Sends the “erase line” signal to delete the entire current line.

escape
Sends the “escape” character.”

ga
Sends the “go ahead” signal.

ip
Sends the “interrupt process” signal to terminate the program running on the peer.

nop
Sends the “no option” signal to the peer.

synch
Sends the “synchronize process” signal to the peer.

Examples

Send an “interrupt process” signal

```
send ip
```

Send an “are you there” signal

```
send ayt
```

See also

See telnet on page 196 for information on establishing Telnet sessions.

set altip

Purpose

Configures a serial port or group of serial ports with an alternate IP address, or displays current entries in the alternate IP address (altip) table.

Alternate IP addresses enable routing of traffic from the LAN to serial ports or group of ports using IP addresses. By associating ports with IP addresses, Telnet users on the LAN can use IP addresses, rather than port numbers, to specify a port or range of ports in their Telnet calls.

Up to 64 alternate IP address entries are permitted.

Device support

This command is supported in all devices.

Required privileges

Normal users can display altip information. Root privileges are required to change altip settings.

Syntax

Configure alternate IP address

```
set altip group={port# | group#} ip=ip-addr mode={raw|telnet}
```

Display altip table entries

```
set altip [range=range]
```

Fields

group

A port or group of ports.

ip

Assigns an IP address to the ports or group of ports (hunt group) specified on the group field.

range

A range of index entries in the altip table.

mode

Either raw or Telnet, which is used to determine a connection type for reverse Telnet connections.

Examples

Display entire altip table

```
set altip
```

Display several entries in altip table

```
set altip range=1-4
```

Configure an entry in altip table

```
set altip ip=198.150.150.10 group=65
```

See also

See set tcpip on page 167 (the sockets option) for information on configuring the base option.

set arp

Purpose

Manually configures an entry in the Address Resolution Protocol (ARP) table, or displays the contents of the ARP table.

The ARP table contains the Ethernet-to-IP address mappings of other devices on the LAN, which is required to communicate with these devices. The ARP protocol updates this table automatically, so manual modification is seldom required.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change ARP table entries.

Syntax

Configure ARP table entries

```
set arp ether=etaddr ip=ipaddr [tim2liv=time]
```

Display ARP table entries

```
set arp [range=range]
```

Fields

ether
The Ethernet address of a device.

ip
The IP address of a device.

range
A range of table entries, which are identified by the index field in the ARP table.

tim2liv
The time, in seconds, to keep an entry in the ARP table. The range is 0 to 1200 seconds. The default is 0, which means the entry will never time out.

Examples

Display a range of entries in ARP table

```
set arp range=1-4
```

Display all entries in ARP table

```
set arp
```

Configure an entry in ARP table

```
set arp ip=198.150.150.10 ether=08:00:20:05:0b:da tim2liv=900
```

set auth

Purpose

Configures or displays access permissions to serial ports for LAN users.

The set auth command is a very powerful tool for limiting LAN users' access to ports. To produce the intended configuration results, follow these principles:

- The default for a port is unrestricted access. This means that all IP addresses have unrestricted access to a port unless you use the set auth command to place restrictions on port use.
- You can configure a new default by removing the default entry in the auth table (the entry that specifies an IP address of 0.0.0.0 and mask of 0.0.0.0). Then, the default becomes no access for any IP address. You can then use the command to permit access for particular IP addresses.
- In addition to unrestricted access, there are three types of restricted access:
  - — Login access. The user of an IP address must log in before access to the port is granted.
  - — RealPort access. Only the RealPort application can use the port.
  - — No access. The user of the IP address cannot access the port.
- The most reliable way to use the command for configuration is to explicitly specify the type of access for each port on each command.

  In the examples that follow, which use an 8-port device, the "right" command accounts for all ports, and the "wrong" one does not:

  Right:
  ```
  set auth ip=192.10.10.10 realport=1-3 login=4-5
  unrestricted=6-8
  ```

  Wrong:
  ```
  set auth ip=192.10.10.10 realport=1-3 login=4-5
  ```
- When the only option specified on the set auth command is an IP address, that IP address loses all access rights to all outbound ports.
- When you use the set auth command to change access permissions for a particular IP address (or range of addresses), all other IP addresses are unaffected by the command.
- The mask field extends the scope of the set auth command to a range of IP addresses. In each mask position that a binary 1 appears, the incoming address must match perfectly with the address specified on the ip field.

The auth table is limited to 20 entries.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Normal users can display information. Root privileges are required to change auth table entries.

Syntax

Configure access permissions

```
set auth ip=ipaddress [login={range | none}] [mask=mask]
   [realport={range | none}] [unrestricted={range | none]
```

Display access permissions

```
set auth [range=range]
```

Fields

ip

The IP address of the device to which this set auth command applies.

login

Requires that users of the IP address specified log in. A value of none indicates that users of the IP address specified have login access to none of the ports.

mask

Specifies an IP mask used to extend the scope of this set auth command to a range of IP addresses. The following table provides examples of how the mask field works:

IP Address	Subnet Mask	set auth mask	Result
143.191.0.0	255.255.0.0	255.255.0.0.	All users on this class B network are included in the restrictions applied to the outbound ports.
192.10.10.0	255.255.255.0	255.255.255.0	All users on this class C network are included in the restrictions applied to the outbound ports.
192.10.10.0	255.255.255.240	255.255.255.240	All users on this subnetted class C network are included in the restrictions applied to the outbound ports.

range

Specifies a range of auth table entries, identified by an index number, to which this command applies.

realport

Configures port access for RealPort running on the devices identified by the ip and mask fields. Use this option to grant access to RealPort but restrict access to other users of the IP address.

unrestricted

Configures unrestricted access for the IP address specified to the range of ports specified.

Examples

Display entire auth table

```
set auth
```

Display a range of entries in auth table

```
set auth range=1-2
```

Configure no access for an IP Address

```
set auth ip=199.150.10.12 mask=255.255.255.255 login=none
   realport=none unrestricted=none
```

Configure mixed access

In this example, an 8-port device server is configured for mixed access.

```
set auth ip=199.150.10.12 mask=255.255.255.255 realport=1-4
   login=5-6 unrestricted=7-8
```

Configure access for two IP addresses

This example requires three set auth commands:

- The first removes the default entry from the auth table, which changes the default setting from unrestricted access to all 8 ports for all IP addresses to no access to any ports for any IP addresses.
- The second and third commands restore unrestricted access to all ports for the IP addresses specified.

```
set auth ip=0.0.0.0 rmauth=on

set auth ip=199.22.33.4 realport=none login=none unrestricted=1-8

set auth ip=199.22.33.8 realport=none login=none unrestricted=1-8
```

Use the mask field to extend the command

In this example of a TCP/IP Class C network, the set auth commands configure RealPort running on any host on network 199.150.150.0 with access to ports 1 and 2. The other ports are not available to users of the IP address specified.

```
set auth ip=199.150.150.10 mask=255.255.255.0 realport=1-2 logon=none
   unrestricted=none
```

See also

- set ports on page 141 for information on defining ports.
- set user on page 181 for information on configuring a user for outbound port access.

set buffers

Purpose

Configures buffering parameters on a port, or displays the port buffer configuration on all ports.

Device support

The following table lists the devices to which this command applies:

Device	Required Hardware	Required Firmware
Single-Port Device Server	Not supported	Not supported
2-Port Device Server	50000771-02A or higher	82000747A or higher
4-Port Device Server	50000771-03A or higher	

Required privileges

Root privileges are required to use this command.

Syntax

Configure port buffering

```
set buffer [clear] [range={number}] [size={number}]
   [state={on|off|pause}]
```

Display the port buffering configuration

```
set buffer [range=range]
```

Fields

clear
Clears the contents of the specified buffer.

range
The port or ports to which the command applies.

size
The size in kilobytes to configure the buffer. The default is 32k and the maximum is 64k. Settings are configurable in 2k increments.

state
The buffering state, which can be any of the following:

on
The data will be buffered.

off
The data will not be buffered and all data will be cleared from the buffer.

pause
The data will not be buffered, but data in the buffer will not be cleared.

Examples

Display port buffer configuration for all ports

```
set buffer
```

Configure buffers

In this example, the set buffer command sets the buffer state for port 1 to on mode and the buffer size to 64 kilobytes.

```
set buffer range=1 state=on size=64
```

See also

- display buffers on page 60.
- show on page 193.

set chat

Purpose

Used to configure, display, remove, or rename entries in the chat table. Chat table entries provide telephone number string translation and can be accessed by any configured script. The chat table holds a maximum of 12 entries.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure chat table entries

```
set chat [delay=string][name=chat-name] [range=range]
   [retry=number] [wait=string]
```

Display chat table entries

```
set chat [range=range]
```

Remove chat table entries

```
set chat {rmchat=on range=range | rmchat=chatname}
```

Rename a chat table entry

```
set chat name=name newname=new-name
```

Fields

delay

A string of up to 24 characters to substitute into telephone numbers in place of the delay character.

name

Configures a name for the chat table entry.

range

One of the following:

- A range of ports to which the chat table entry will apply (only 1 for the Single-Port Device Server).
- A range of chat table index numbers, which identify chat table entries.

retry

The number of times to retry a call. The range is 0 to 99 times.

rmchat

Removes the chat table entry specified on the range or name field.

wait

A string of up to 24 characters to substitute into telephone numbers in place of the wait character.

Examples

Display entire chat table

```
set chat
```

Configure a chat table entry

```
set chat name=chat1 star=4452624
```

Remove an entry from chat table

```
set chat rmchat=chat1
```

Rename a chat table entry

```
set chat name=chat1 newname=chat2
```

See also

See set script on page 152 for information on creating scripts that use telephone string translation.

set config

Purpose

Configures or displays entries in the network parameters configuration table. The network parameters configuration table holds the following information

- Network-related parameters, such as an IP address, mask, and default gateway.
- Information on how ICMP redirect messages are handled.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

Configure network parameters

```
set config [bootfile=file] [boothost=host-ipaddr]
   [circuitbreaker=reset] [dhcp={on|off}] [dns=ip-addr]
   [domain=domain] [gateway=ip-addr]
   [ip=ip-addr] [optimize={latency|throughput}] [myname=name]
   [ramsize=show] [realport=tcp-port] [redirect={listen|ignore}]
   [save={on|off} [securerealport=tcp-port] [sockets=socket-num]
   [submask=mask] [tbreak={std|any|none}]
   [tftpboot={yes|no|smart}]
```

Display network parameters

```
set config
```

Fields

bootfile
The name of a boot file on a TFTP host. Specify the full path to the file if this is required to satisfy the host’s TFTP implementation.

boothost
The IP address of a host from which the device server can boot using TFTP.

circuitbreaker=reset
Resets the circuit breaker.

dhcp
Enables or disables DHCP (Dynamic Host Configuration Protocol). Turning DHCP on causes the device server to obtain an IP address from a DHCP server. The default is on.

dns
The IP address of a domain name server. This parameter cannot be changed if dhcp=on.

domain
The name of device server’s domain.

gateway
The IP address of the default gateway.

ip

The device server’s IP address.

myname

The device server’s DNS name. This option does **not** apply to the Single-Port Device Server.

nameserv

The IP address of a name server in the device server’s domain. This option does **not** apply to the Single-Port Device Server.

optimize

Configures how the Device Server handles network latency.

latency

Choose latency if the Device Server will handle delay-sensitive data.

throughput

Choose throughput if overall network throughput is more important than latency. The default is throughput.

redirect

Specifies how routing redirect messages should be handled.

listen

Accept ICMP routing redirect messages. Use this option only if you have not configured the device server to forward RIP packets.

ignore

Discard ICMP routing redirect messages

The default is ignore.

realport

The TCP port number used for RealPort connections. The default is 771.

save

Specifies whether configuration changes are saved. On saves configuration changes to flash memory. Off means that changes will be discarded when the device server is reset. The default is on.

securerealport

The TCP port number used for secure RealPort connections. The default is 1027.

sockets

Sets the base TCP socket service. TCP socket communication enables serial devices to communicate with each other over an Ethernet network as though they were connected by a serial cable.

Configuring TCP socket communications involves configuring the Device Server for the following types of connections:

- Inbound connections, that is, connections that are initiated by the device on the other side of the network.
- Outbound connection, that is, connections that are initiated by the device connected to the serial port.

The base TCP socket service is used in reverse Telnet, raw, SSH, and SSL/TLS connections to identify the connection type (Telnet, raw, SSH, or SSL/TLS) and a particular port. The base socket can be any number between 2000 - 50,000.

Once the base socket is set, the port accessed and the connection type are determined by the command the user issues to access the port. The formulas for issuing commands are as follows:

Connection Type	Formula
Telnet	base socket + port number
Raw	base socket + 100 + port number
SSH	base socket + 500 + port number
SSL/TLS	base socket + 600 + port number

The following examples illustrate how these formulas work

If Base Sockets is ...	And the user specifies ...	Example	Then, the user establishes ...
1000	telnet *ip-address* 1002	telnet 192.1.1.1 1002	A Telnet connection to port 2
	telnet *ip-address* 1102	telnet 192.1.1.1 1102	A raw connection to port 2
	telnet *ip-address* 1502	telnet 192.1.1.1 1502	An SSH connection to port 2
	telnet *ip-address* 1602	telnet 192.1.1.1 1602	A SSL/TLS connection to port 2
1121	telnet *ip-address* 1122	telnet 192.1.1.1 1122	A Telnet connection to port 1
	telnet *ip-address* 1222	telnet 192.1.1.1 1222	A raw connection to port 1
	telnet *ip-address* 1622	telnet 192.1.1.1 1622	An SSH connection to port 1
	telnet *ip-address* 1722	telnet 192.1.1.1 1722	A SSL/TLS connection to port 1

submask

The subnet mask for the subnetwork.

tbreak

Sets the Telnet break keystroke.

Once a Telnet connection is initiated, but before the connection is established, the connection can be broken by entering a designated keystroke. This keystroke is determined by these settings.

std

Configures tbreak so only ^] (control right bracket) will break a Telnet connection. Example: `set config tbreak=std`

any

Configures tbreak so any keystroke will break a Telnet connection. For example: `set config tbreak=any`

none

Configures tbreak so no keystroke will break a Telnet connection. For example: `set config tbreak=none`

The default is std.

tftpboot

Specifies booting conditions for the device server.

yes

Always boot from the TFTP host identified on the boothost field.

smart

If the device server cannot boot from the TFTP host identified on the boothost field, boot from the device server's internal flash ROM instead.

no

Boot the device server from internal flash ROM.

The default is no.

Example

Display the network parameter configuration table

```
set config
```

set device

Purpose

Used to:

- Configure devices used for outbound connections to use dialer scripts and chat table entries.
- Configure a different baud rate (line speed) for modems and other devices used for outgoing connections than the rate defined on the set line command.
- Display the contents of the device table.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure devices

```
set device [baud={no|rate}] [chat={no|index-num|chat-name}]
   [dialer={no|index-num|script-name}] name=name ports=range
   [newname=newname] [p{1-9}] [save={on|off}] [show=on]
```

Display device table information

```
set device [{range=range|name=name}]
```

Fields

baud

Specifies the baud rate for the device.

no

The baud rate specified on the set line command will be used.

rate

The baud rate (line speed) when this device is used. This field overrides the baud rate (for this device) defined on the set line command. The range is 300 to 115,200 bps.

The default is no.

chat

Specifies whether a chat table entry is associated with this device.

no

A chat table entry is **not** associated with this device.

index-num

A chat table entry (index number) associated with this device.

chat-name

The name of a chat table entry.

The default is no.

dialer

Specifies whether a dialer script is associated with this device.

no

A dialer script is not associated with this device.

index-num

A script table entry (index number) associated with this device.

script-name

The name of a script.

The default is no.

name

A user-defined name for the device.

newname

A new name for a previously defined device.

p{1-9}

Integers (1-9) that can be used in the variable fields of login or dialer scripts.

ports

The port or range of ports available to this device. For the Single-Port Device Server ,this parameter is limited to a value of 1.

range

A device table entry or range of entries (identified by their index numbers).

Examples

Display entire device table

```
set device
```

Display a range of entries in the device table

```
set device range=4-7
```

Configure a device

In this example, the set device command configures a device to use a dialer script and to override the baud rate specified on the set line command.

```
set device name=OutDev ports=3-5 dialer=modemscp baud=19200
```

See also

- set chat on page 89
- set line on page 132
- set script on page 152
- set user on page 181

set dhcp

Purpose

Used to:

- Enable/disable DHCP (Dynamic Host Configuration Protocol). Enabling DHCP causes the device server to obtain an IP address from the host server. If DHCP is disabled, a static IP address must be defined for the device server.
- Renew the IP address of the device server. This causes the device server to discard its current IP address and obtain a new one from the host server.
- Display the lease information for the current IP address.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure DHCP

```
set dhcp [client_identifier=string][client_id_type=type]
   [keepalive={accept|ignore}] [run={on|off}]|[renew]
```

Display lease information for current IP address

Enter the set dhcp command with no parameters to display the lease information for the current IP address.

```
set dhcp
```

Fields

client_identifier

A text string consisting of 30 or fewer characters, which must be surrounded by quotation marks if it contains spaces. The default is an empty string. To enter non-printable characters, use hexadecimal format, which is \x*n*, where *n* is a hexadecimal value (0- F). To use the backslash character as the string, use two consecutive backslashe characters (\\).

client_id_type

A number between 0 and 255 that can be used to define the type of information in the client_identifier string. For example, all routers could be assigned 11 as the client_id_type.

keepalive

Determines which TCP keep-alive attributes are used, those set by the DHCP server or those specified on the set tcpip command.

accept

The DHCP server settings are used, and the set tcpip settings are not used.

ignore

The set tcpip settings are used, and the DHCP server settings are ignored.

The default is accept. If the DHCP client feature is disabled, this setting has no effect.

run

Turns DHCP on or off. The default is on.

You must reboot the device server before this change takes affect.

renew

Renews the IP address of the device server.

Examples

Enable DHCP

```
set dhcp run=on
```

Renew the IP address

```
set dhcp renew
```

See also

See set config on page 91 for information on configuring the IP address manually.

set ethernet

Purpose

Sets and adjusts Ethernet communications parameters.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

```
set ethernet [duplex={half|full|auto}] [speed={10|100|auto}]
```

Fields

duplex

Determines the mode the Device Server uses to communicate on the Ethernet network. Specify one of the following:

half

The device communicates in half-duplex mode.

full

The device communicates in full-duplex mode.

auto

The device senses the mode used on the network and adjusts automatically.

The default is half.

The value you specify for this field must match the option used by the peer. In other words, if the other side is using auto (negotiating), this device must use auto. If the other side is set for half-duplex, this side must use half-duplex.

speed

Configures the throughput rate the Device Server will use on the Ethernet network. Specify an appropriate setting for your Ethernet network, which can be one of the following:

10

The device operates at 10 megabits per second (Mbps) only.

100

The device operates at 100 Mbps only.

auto

The device senses the throughput rate of the network and adjust automatically.

The default is auto.

The value you specify for this field must match the option used by the peer. In other words, if the other side is using auto (negotiating), this device must use auto. If the other side is set for 100 Mbps, this side must use 100 Mbps.

Examples

Configure 100 Mbps throughput

```
set ethernet speed=100
```

Configure full-duplex mode

```
set ethernet duplex=full
```

See also

set config on page 91.

set filter

Purpose

Manages filters that control and record traffic over PPP connections. With the set filter command, you can

- Create filters, which in turn creates entries in the filter table. The filter table holds a maximum of 64 entries.
- Display entries in the filter table
- Display the contents of a filter

Use filters to trigger the following actions on PPP connections:

- Block or pass packets
- Bring up or reject connections
- Reset the idle timeout timer
- Send information to the log file

When creating filters, follow these rules:

- The action a filter takes depends on the contents of the filter and on the type of filter it is defined as on the set user command. If the filter is referenced on the:
  - passpacket field, it will allow packets that meet filter criteria to pass through a serial port and block all others.
  - bringup field, it will bring up a connection when the port handles a packet that meets filter criteria.
  - keepup field, it will reset the timer defined on the set user idletimeout field when the port handles a packet that meets filter criteria.
  - logpacket field, it will send a message to the log file when the port handles a packet that meets filter criteria.
- Filters are made up of 1 to 32 stanzas, each of which expresses filtering criteria.
- Filter criteria are called tokens. Examples of tokens include IP addresses, TCP or UDP port numbers, whether a packet is incoming or outgoing, and several others.
- Tokens must be separated by slashes (/).
- Stanzas are processed in order. That is, first S1 (stanza 1) is processed and then S2, and so on.
- As soon as a stanza's criteria is **completely** satisfied, filtering action occurs and subsequent stanzas are ignored. For example, if S1 specifies an IP address of 190.159.146.10 and an ICMP message type 7, a packet from that IP address carrying that ICMP message type will trigger filtering action. Subsequent stanzas will not be processed. Consequently, you must specify **and** relationships (all criteria must be satisfied) in the same stanza and **or** relationships (any of the criterion must be satisfied) in different stanzas.

- The exclamation mark (!) at the beginning of a stanza changes how the filter acts. When a packet is encountered that meets stanza criteria, the filter does **not** execute the filter function (for example, bringing up a connection) and it does **not** process any more stanzas.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Create filters, add stanzas, or rename filters

```
set filter name=name [newname=name] [s#=token\token\token...]
```

Display filter table entries

```
set filter [range=range]
```

Display filter stanzas

```
set filter name=name show=on
```

Fields

name

A name for the filter.

newname

A new name for a previously defined filter.

range

An entry or range of entries in the filters table.

show

on

Stanzas from the filter identified on the name field will be displayed.

off

Stanzas from the filter identified on the name field will **not** be displayed.

The default is off.

s#=*token/token/token...*

#

The number of a stanza, which can be from 1 to 32.

token/token/token...

1-32 tokens, which are the criteria by which filtering is accomplished. Separate tokens by a forward slash (/). Tokens can consist of any of the following:

Token Value	Filter Criteria
servicename	A name in the service table that identifies a particular process, such as Telnet (see set service on page 160).
hostname	The name of a host defined in the host table (see set host on page 114).
protocol-number	The number in an IP packet that identifies the protocol to which IP should pass the packet. Use one of the following: 1 for ICMP, 2 for IGMP, 6 for TCP, and 17 for UDP.
ip-addr	An IP address.
ip-mask	An IP mask that modifies the meaning of the *ip-addr* field.
port-num	A TCP or UDP port number.
port-num-port-num	A range of TCP or UDP port numbers.
rcv	Incoming packets.
send	Outgoing packets.
dst	Destination IP packet fields within the IP packet, such as destination IP addresses, ports, and host names.
src	Source IP packet fields, such as IP addresses, ports, or host names.
syn	Start filtering when the start of a TCP data stream is encountered. This option is always used with the fin option and is used to trigger logging (logpacket field on the set user command).
fin	Stop filtering when the end of a TCP data stream is encountered. This value is always used with the syn option and ends logging (logpacket field on the set user command.).
tcp	TCP packets.
udp	UDP packets.
icmp	ICMP packets. You can also specify a type of ICMP packet. To do so, specify s1=*type*/icmp, where *type* is the identifier type of ICMP packet, which can be any of the following identifiers: • Echo reply: 0 • Destination unreachable: 3 • Source quench: 4 • Redirect: 5 • Echo request: 8 • Time exceeded for a datagram: 11 • Parameter problem on a datagram: 12 • Timestamp request: 13 • Timestamp reply: 14 • Address mask request: 17 • Address mask reply: 18

Token Value	Filter Criteria
! (exclamation)	When a packet is encountered that meets stanza criteria, the filter does not execute the filter function (for example, bringing up a connection) and it does not process any more stanzas.

Examples

Display the filter table

```
set filter
```

Display filter stanzas

```
set filter name=filter1 show=on
```

Remove a filter from the filter table

```
set filter rmfilter=filter1
```

Create a filter on a Source IP Address

```
set filter name=filter1 s1=src/199.86.8.3
```

Create a filter on an ICMP packet type

In this example the set filter command creates a filter that uses an ICMP type 13 packet (destination unreachable) as filter criterion.

```
set filter name=filter1 s1=13/icmp
```

See also

See set user on page 181 for information on associating a filter with a particular user.

set flow

Purpose

Configures or displays flow control options for the device server’s EIA-232 serial ports.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure flow control options

```
set flow [aixon={on|off}][altpin={on|off}] [cts={on|off}]
   [dcd={on|off}] [dsr={on|off}] [dtr={on|off}]
   [forcedcd={on | off}] [itoss={on|off}] [ixany={on|off}]
   [ixoff={on|off}] [ixon={on|off}] [pre-delay=milliseconds]
   [post-delay=milliseconds] [range=range] [ri={on|off}]
   [rts={on|off|toggle}]
```

Display flow control options

```
set flow [range=range]
```

```
set flow [range=range] show=rtstoggle
```

Fields

aixon

Determines whether the auxiliary flow control characters defined on the set keys command are used for output flow control:

on

Auxiliary flow control characters are used.

off

Auxiliary flow control characters are not used.

The default is off.

altpin

Determines whether the altpin option, which swaps DCD with DSR so that eight-wire RJ-45 cables can be used with modems, is used:

on

The altpin option is used.

off

The altpin option is **not** used.

The default is off.

cts

Determines whether CTS (clear to send) is used for output flow control:

on

CTS is used for output flow control.

off

CTS is **not** used for output flow control.

The default is off.

dcd

Determines whether DCD (data carrier detect) is used for output flow control:

on

DCD is used for output flow control.

off

DCD is **not** used for output flow control.

The default is off.

dsr

Determines whether DSR (data set ready) is used for output flow control.

on

DSR (data set ready) is used for output flow control.

off

DSR is **not** used for output flow control.

The default is off.

dtr

Determines whether DTR (data terminal ready) is used for input flow control.

on

DTR is used for input flow control.

off

DTR is **not** used for input flow control.

The default is off.

forcedcd

Determines whether the port acts as though DCD were always high. The primary implications is that autoconnections are launched as soon as the Device Server completes booting when this field is on and an appropriate incoming device type (see the set ports dev field) is defined for the port. The default is off.

itoss

Used only with software flow control (XON\XOFF) and only if ixany=on:

on

The character that resumes output is discarded.

off

The character that resumes output is **not** discarded.

The default is off.

ixany

Used only with software flow control.

on

Any received character can restart output when output has been stopped because of software flow control. Specify “on” only when communicating with devices, such as printers and terminals that use software flow control (XON\XOFF).

off

Output will resume only when the XON character is received.

The default is off.

ixoff

Determines whether to use input software flow control.

on

Use input software flow control.

off

Do **not** use input software flow control.

The default is on.

ixon

Determines whether to use output software flow control.

on

Use output software flow control.

off

Do **not** use output software flow control.

The default is on.

pre-delay

Specifies the time in milliseconds to wait after the RTS signal is turned on before sending data. The range is 0 to 5000 milliseconds, and the default is 0.

post-delay

Specifies the time in milliseconds to wait after sending data before turning off the RTS signal. The range is 0 to 5000 milliseconds, and the default is 0.

range

A port or range of ports to which this set flow command applies

ri

Determines whether RI (ring indicator) is used for output flow control:

on

Use RI for output flow control.

off

Do **not** use RI for output flow control.

The default is off.

rts
Determines whether RTS (request to send) is used for output flow control:

on
Use RTS for output flow control.

off
Do not use RTS for output flow control.

toggle
RTS is turned on when transmitting.

The default is off.

show=rtstoggle
Displays settings related to the RTS toggle feature, which includes information on rts=toggle, post-delay, and predelay.

Examples

Display flow control settings

```
set flow range=1
```

Configure flow control settings

```
set flow range=1 cts=on rts=on ixoff=off ixon=off
```

See also

- set keys on page 130
- set line on page 132
- set ports on page 141

set forwarding

Purpose

Configures or displays IP routing options.

The device server can be configured in the following ways using this command:

- To function as an IP router using Routing Information Protocol (RIP) to dynamically maintain routes.
- To perform Proxy ARP services.
- To handle various ICMP-related functions.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure IP routing options

```
set forwarding [advertise=time] [breakoutsubnets={on|off}]
   [icmpdiscovery={on|off}] [icmpsendredirects={on|off}]
   [icmpmaskserver={on|off}] [igmp={on|off}]
   [poisonreverse={on|off}] [proxyarp={on|off}]
   [save={on|off}][state={off|passive|active}]
   [splithorizon={on|off}] [timeout=time]
```

Display IP routing options

```
set forwarding
```

Fields

advertise

The interval at which the device server advertises its routes. This field is used only if state=active. The range is 10 to 180 seconds. The default is 30 seconds.

icmpdiscovery

on

Send and answer ICMP Router Discovery packets.

off

Do **not** send and answer ICMP Router Discovery packets.

The default is off.

icmpmaskserver

on

Act as an ICMP mask server.

off

Do **not** act as an ICMP mask server.

The default is off.

icmpsendredirects

on

The device server sends ICMP redirect messages when it detects a host is using a non-optimal route, such as when the host uses the device server to route to a destination that can be reached more efficiently using another router or when the destination host can be reached directly (that is, without the services of any router).

off

Do **not** send ICMP redirect messages.

The default is off.

igmp

on

The device server announces itself as a router when it initializes. This means that the device server will be included in the IGMP router's group broadcasts.

off

The device server does not announce itself as a router when it initializes and will not be included in IGMP router's group broadcasts

The default is off.

poisonreverse

Specifies whether the poisonreverse option is on or off.

on

The poisonreverse option is on. When this option is on, learned routes **are** propagated over the same interface on which they are learned, but the destination specified in those routes are advertised as unreachable. The splithorizon option must be on if poisonreverse is on.

off

The poisonreverse option is off.

The default is off.

proxyarp

Specifies whether proxy ARP services are enabled. Proxy ARP is a technique in which a router answers ARP requests intended for another system. By pretending to be the other system, the router accepts responsibility for forwarding packets to that system. Use proxy ARP to route packets to and from serial routes on the same IP subnetwork as the device server's Ethernet interface.

on

Provide proxy ARP services.

off

Do **not** provide proxy ARP services.

The default is off.

splithorizon

Specifies whether the splithorizon option is enabled.

on

The splithorizon option is on. When this option is on, learned routes are **not** propagated from the interface on which they are learned. Use this option only if state=active.

off

The splithorizon option is off.

The default is on.

save

Specifies whether the configuration will be saved.

on

The configuration will be saved.

off

The configuration will not be saved, which means that configuration changes will be lost the next time the device server re-initializes.

The default is on.

state

The state of routing for the device server.

off

Limits routing to static routes defined in the route table. See set route on page 150.

passive

Configures the Device Server to use the routing information protocol (RIP) to learn routes but not to propagate them.

active

Configures the device server to use RIP to both learn and propagate routing information.

The default is off.

timeout

The time in which an entry in the routing table must be updated. If an entry exceeds the value specified here, it will be discarded. This value must be at least six times the advertise value.

The range is 60 to 1080 seconds. The default is 180 seconds.

Examples

Display the IP routing table

```
set forwarding
```

Configure proxy ARP

```
set forwarding proxyarp=on
```

Configure RIP

In this example, the set forwarding command configures device server to:

- Listen for and advertise RIP routing information every 45 seconds.
- Discard this route from the routing table if a routing update is not received within 270 seconds. This value is derived from the value on the advertise field. The timeout value must be **at least** 6 times the advertise value. Since no timeout is specified, the default (6 times the advertise value) is used.
- Implement split horizon.

```
set forwarding state=active advertise=45 splithorizon=on
```

See also

See set route on page 150 for information on creating static routes.

set host

Purpose

Configures the host table, which contains host name-to-IP address mappings, or displays entries in the host table.

The device’s IP component can use the host table and a DNS server to map host names to IP addresses. These mappings allow users to identify hosts by user-friendly names, instead of IP addresses.

Use of the host table is a convenience only. If you do not configure the host table or configure DNS, users identify hosts by IP addresses.

If the device server can access a DNS server, there is no reason to configure the host table. The host table can hold up to 20 entries.

You can configure either of the following:

- A host table and DNS
- Either the host table or DNS

If you configure a host table and a DNS server, the device server will attempt to satisfy a request by first searching the host table and then the DNS server.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure host table

```
set host ip=ip-addr name=host-name range=<index#>-<index#>
```

Display host table entries

```
set host
```

Fields

ip
The IP address to be mapped to the name specified on the name field.

name
The name to be mapped to the IP address specified on the ip field.

range
One or a range of index numbers that identify entries in the host table.

Examples

Display the entire host table

```
set host
```

Display an entry in the host table

```
set host range=1
```

Configure a name-to-IP address mapping

```
set host ip=190.150.150.10 name=server1
```

See also

See set config on page 91 for information on configuring the device server to use a DNS server.

set ia

Purpose Configures Device Servers for industrial automation (IA) protocols.

Device support The following table provides information on Device Server support for this command:

Device	Protocol Support
Single-Port Device Server	IA protocols are not supported; therefore this command cannot be used in this device.
2-Port Device Server 4-Port Device Server	Modbus and User Defined protocols are supported.

Required privileges Root privileges are required to use this command.

Syntax

There are several variants of syntax for the set ia command, depending on whether it is being used for serial port-connected devices, network-based masters, or serial master routes.

Syntax: Serial Port-Connected Devices

```
set ia serial [acktimeout=time-out] [acktimeoutlimit=retries]
   [addextfunc={(range of functions)|all}]
   [ansiescape={on|off}] [broadcast={on|off|replace}]
   [checksum={bcc|crc}] [duplicatedetection={on|off}] [end=end]
   [errorresponse={on|off}] [exttimeout={0-65535ms}]
   [fixedaddress={auto|(1-255)}] [messagetimeout=time-out]
   [naktimeoutlimit=retries] [polltimeout=milliseconds]
   [polltimeoutlimit=retries] protocol=protocol [range=range]
   [rmextfunc={(range_of_functions)|all}]
   [rtutimeout=time-out] [start=start] [type={master|slave}]
```

See field descriptions on page 118.

Syntax: Network-Based Masters

To configure a network-based master, use this syntax. This syntax is required only if you want to do the following:

- Configure one of the timeout values that will be used for communication with a network master (usually, the defaults work).
- Deactivate a class of network masters that use a specific protocol.

```
set ia netmaster protocol
   [addextfunc={(range_of_functions)|all}] [active={on|off}]
   [broadcast={on|off|replace}] [connecttimeout=time-out}
   [errorresponse={on|off}] [exttimeout={0-65535ms}]
   [messagetimeout=time-out]
   [rmextfunc={(range_of_functions)|all}]
```

See field descriptions on page 123.

Syntax: Network-Based Slaves

To configure a network-based slave, use this syntax:

```
set ia netslave [active={on|off}] [encoding={tcp|udp}]
   [ip=ip-address] port=num protocol=protocol range=range
   [reconnecttime=time]
```

See field descriptions on page 124.

Syntax: Serial Master Routes

To configure either a network or serial route for a serial master, use this syntax:

```
set ia route [active={on|off}] [encoding={tcp|udp}]
   [fixedaddress={auto|(1-255)}] [ip=ip-address] [port=num]
   [protaddr=protocol-address] [protocol=protocol]
  range=range [reconnecttime=time] table=range
   [type={network|serial|empty}]
```

See field descriptions on page 126.

Fields

Fields for Serial Port-Connected Devices

The following command fields apply to configuring serial port-connected devices.

set ia serial
Specifies that this command configures a serial port-connected master or a slave.

acktimeout
Applies to the DF1 Full-Duplex, DF1 Half-Duplex, FINS, and Hostlink protocols. The period to wait for an acknowledgment from the connected device after sending a message. When this period is exceeded, the Device Server re-sends the message. The range is 0 to 60000 milliseconds. The default is 250 milliseconds.

acktimeoutlimit
Applies to the DF1 Full-Duplex, DF1 Half-Duplex, FINS, and Hostlink protocols. The number of times that the acktimeout timer can expire before the Device Server discards a message as undeliverable. The range is 0 to 255. The default is 3.

addextfunc
Applies to the Modbus RTU and Modbus Ascii protocols. Used to add to the list of Modbus functions that will use the exttimeout instead of the messagetimeout. See the exttimeout command for more details.

ansiescape
Applies to the user-defined protocol. Used to handle protocols that have an ANSI escape character as the first character in the end string (see end command) used to recognize a complete message. The typical example of this is a protocol with a start string (0x10 0x2), the end string (0x10 0x3), and the escape character 0x10 where (0x10 0x10) in the body of a message is used to specify a single 0x10. If a request is:

0x10 0x2 0x10 0x10 0x03 0x10 0x3

with the ansiescape setting to “on,” this message would get recognized correctly. With the ansiescape feature “off” (0x10 0x2 0x10 0x10 0x3), would get incorrectly recognized as the message and the rest of the message would get thrown away. This happens because the 0x10 0x3 end string is found in the message body and accidently recognized as the end of the message.

broadcast

Applies to the Modbus RTU and Modbus ASCII protocols. Specifies how to handle an incoming Modbus request with a unit ID equal to 0 (the Modbus broadcast address).

on

Tells the Device Server to send requests to the destination device and not expect a response message in return.

off

Tells the Device Server to throw away the broadcast request.

replace

Changes a broadcast request to a normal request by replacing the unit id 0 with a value of 1.

The default is replace.

checksum

Applies to the DF1 Full-Duplex and DF1 Half-Duplex protocols. The error-checking method to use on this serial connection. Choose the method required by the device connected to the serial port.

duplicatedetection

Applies to the DF1 Full-Duplex and DF1 Half-Duplex protocols.

on

Filters out consecutive requests that have identical command, source, and tns bytes. This behavior is necessary for compliance with the DF1 specification.

off

Detection of duplicate requests is off.

The default is on.

end

Applies to the user-defined protocol. The character string that tells the Device Server that the protocol message is complete. Rules and guidelines for specifying this string are as follows:

- The string can be between 1 and 4 characters long.
- The string can be made up of printable or unprintable characters.
- To use an unprintable character, enter the character in hexadecimal format, that is, \x*hh*, where *hh* is replaced with a hexadecimal number.
- Several unprintable characters can be entered using a shortcut, enabling you to avoid entering hexadecimal digits. They are: \t (tab), \r (carriage return), \n (line feed).
- To use the backslash character as a delimiter, enter two backslashe characters (\\).
- To indicate that the last character should be ignored when determining the end of a message, use a * (backslash asterisk). To indicate that two characters should be ignored, use ** and so on.

errorresponse

Applies to the DF1 Full-Duplex, DF1 Half-Duplex, Modbus RTU, and Modbus ASCII protocols. This parameter specifies whether the Device Server sends back an error response for a request that can not be routed to the destination device or has timed out. The default for the DF1 protocols is on. The default for the Modbus protocols is off.

exttimeout

Applies to the Modbus RTU and Modbus ASCII protocols and is used in place of the messagetimeout setting to handle Modbus requests that have special timing requirements. This field is typically used to accommodate Modbus requests with functions that take a long time to complete. The addextfunc and rmextfunc fields are used to add and remove from the list of Modbus functions that will use the exttimeout setting. The default setting is 15,000ms.

fixedaddress

Applies to the Modbus RTU and Modbus Ascii protocols. Used to override the Modbus protocol address (unit id) with a fixed address. A value of auto indicates the protocol address will not be overwritten. The default setting is auto.

messagetimeout

Applies to all the serial IA protocols. The period in milliseconds to wait for a response to a request before discarding the message. The range is 0 to 60000 milliseconds. The default is 1000 milliseconds.

naktimeoutlimit

Applies to the DF1 Full-Duplex protocol. The number of negative acknowledgments (Naks) the Device Server can receive from the device connected to the serial port before discarding the message as undeliverable. The range is 0 to 255. The default is 3.

polltimeout

Applies to the DF1Half-Duplex protocol. The period a master waits for a response to a poll before either polling again (see the polltimeoutlimit field) or giving up on getting a response. The range is 0 to 60000 milliseconds. The default is 250 milliseconds.

polltimeoutlimit

Applies to the DF1 Half-Duplex protocol. The number of polltimeouts allowed before the master gives up on getting a response to a poll. The range is 0 to 255. The default is 3.

protocol

The protocol to use for communication between the serial port and the device connected to it. Use the protocol required by the connected device. Specify one of the following:

compowayf

The connected device requires the Omron Compowayf protocol.

df1fullduplex

The connected device requires the Allen-Bradley DF1 Full-Duplex protocol.

df1halfduplex

The connected device requires the Allen-Bradley DF1 Half-Duplex protocol.

fins

The connected device requires the FINS protocol.

hostlink

The connected device requires the Hostlink protocol.

modbusascii

The connected device requires the Modbus ASCII protocol.

modbusrtu

The connected device requires the Modbus RTU protocol.

userdefined

The connected device requires a serial protocol not explicitly supported by the Device Server, that is, any of the protocols listed in this discussion. This protocol must meet the following conditions: (1) Each message starts with a fixed header string and ends with a fixed trailer string to differentiate messages. (2) Each protocol request is followed by a single response.

range

The port to which the master or slave device is connected. The default is port 1.

rmextfunc

Applies to the Modbus RTU and Modbus ASCII protocols. Used to remove from the list of Modbus functions that will use the exttimeout instead of the messagetimeout. See the exttimeout field for more details.

rtutimeout

Applies to the Modbus RTU protocol. The period in milliseconds to wait for additional characters before determining that a message is complete. The default is 20 milliseconds, and the range is 0 to 60000 milliseconds. Specifying 0 disables this timer.

start

Applies to the user-defined protocol. The character string that tells the Device Server that the protocol message has started. Rules and guidelines for specifying this string are as follows:

- The string can be between 1 and 4 characters long.
- The string can be made up of printable or unprintable characters.
- To use an unprintable character, enter the character in hexadecimal format, that is, \x*hh*, where *hh* is replaced with a hexadecimal number.
- There are several unprintable characters that can be entered using a shortcut, enabling you to avoid entering hexadecimal digits. They are: \t (tab), \r (carriage return), \n (line feed).
- To use the backslash character as a delimiter, enter two backslashe characters (\\).
- To indicate that the first character should be ignored when determining the start of a message, use a * (backslash asterisk). To indicate that two characters should be ignored, use ** and so on.

type

Defines whether the serial entity configured with this command is a master or a slave device.

Fields for Network-Based Masters

The following command fields apply to configuring network-based masters.

set ia netmaster

Specifies that this command configures a master that is located on the network.

protocol

One of the following:

- abethernet, for Allen-Bradley Ethernet.
- ethernetip, for Ethernet/IP.
- modbustcp, for Modbus/TCP.

active

Determines whether this network master accepts incoming connections. The default is on.

addextfunc

Applies to the Modbus TCP protocol. Used to add to the list of Modbus functions that will use the exttimeout instead of the messagetimeout. See the exttimeout field for more details.

broadcast

Applies to the Modbus TCP protocol. Specifies how to handle an incoming Modbus request with a unit id equal to 0 (the Modbus broadcast address).

on

Tells the Device Server to send requests to the destination device and not expect a response message in return.

off

Tells the Device Server to throw away the broadcast request.

replace

Changes a broadcast request to a normal request by replacing the unit id 0 with a value of 1.

The default is replace.

connectiontimeout

Defines the time in milliseconds to wait before closing an idle connection to a master. The range is 0 to 60000 milliseconds. The default is 0, which means this timer is disabled.

errorresponse

Applies to the Allen-Bradley Ethernet and Modbus TCP protocols. This parameter specifies whether the Device Server sends back an error response for a request that can not be routed to the destination device or has timed out. The default for all protocols is on.

exttimeout

Applies to the Modbus TCP protocol and is used in place of the messagetimeout setting to handle Modbus requests that have special timing requirements. This is typically used to accommodate Modbus requests with functions that take a long time to complete. The addextfunc and rmextfunc fields are used to add and remove from the list of Modbus functions that will use the exttimeout setting. The range is 0-65,535 milliseconds. The default setting is 15,000ms.

messagetimeout

The period to wait for a response to a request from this master to a slave connected to the serial port before discarding the message. The default is 1000 milliseconds, and the range is 0 to 6000 milliseconds.

rmextfunc

Applies to the Modbus TCP protocol. Used to remove from the list of Modbus functions that will use the exttimeout instead of the messagetimeout. See the exttimeout field for more details.

Fields for Network-Based Slaves

The following command fields apply to configuring network-based slaves.

active

Determines whether this network slave is active. The default is on.

encoding

Determines the transport service--either TCP or UDP--for communication with the network slave. Use this option only when the protocol=socket field is also specified.

tcp

Use for connection-oriented service.

udp

Use for connectionless service. If you choose UDP, packet delivery is not guaranteed.

The default is tcp.

ip

The IP address of a network slave.

port

The TCP or UDP port number to use when communicating with the network-based slave. The following are default port numbers:

- 502, for Modbus/TCP.
- 2222, for Allen Bradley Ethernet.
- 2101, for TCP or UDP socket connections.
- 44818, for Ethernet/IP.

protocol

The network protocol to use to communicate with the slave defined with this command. Use the protocol required by the network-based slave. Specify one of the following:

abethernet

The network slave uses the Allen-Bradley Ethernet protocol.

ethernetip

For communication with a network-based device that communicates using Ethernet/IP.

modbustcp

The network slave uses the Modbus/TCP protocol.

socket

The network slave uses TCP or UDP socket communication.

range

An identifying number for this slave. Use numbers 1 through 8.

reconnecttime

The time to wait between attempts to initialize communication with this slave. The range is 0 to 60000 milliseconds. The default is 4000 milliseconds. Specifying 0 means that the device server does not wait between attempts to initialize communication.

Fields for Serial Master Routes

The following command fields apply to configuring a serial master routes.

protaddr

Used to accept or ignore messages for a given route based on the protocol address contained in a message. The following lists the valid range of protocol addresses supported by each protocol:

Protocol	Range of Protocol Addresses
Modbus RTU Modbus ASCII	0 to 255
DF1 Full-Duplex and Half-Duplex	0 to 255
Omron Hostlink FINS	0 to 99

CompoWay/F does not support protocol addressing.

range

Identifies the route being configured. Use numbers 1 through 12.

table

Specifies the route table to configure, which corresponds to a serial port. For one-port devices, this field is optional.

type

Specifies the type of route to configure.

network

Use network to configure a route to a network based device.

serial

Use serial for routes to a serial based device.

empty

Use empty to remove a route entry from the route table.

Fields for Network-Based Routes

The following command fields are used for configuring a network-based route.

active

Determines whether a network route is active.

on

Messages will be forwarded to this route. For TCP based network routes, setting active to on initiates a TCP connection to the device specified by the network route.

off

Messages will not be forwarded to this route.

encoding

Determines the transport service--either TCP or UDP--for communication with the device specified by the network route. Use this option only when the protocol=socket is also specified.

tcp

Use for connection-oriented service.

udp

Use for connectionless service. If you choose UDP, packet delivery is not guaranteed.

The default is tcp.

fixedaddress

Applies to the Modbus TCP protocol. Used to override the Modbus protocol address (unit id) with a fixed address. A value of auto indicates the protocol address will not be overwritten. The default setting is auto.

ip

Specifies the IP address of the network route.

port

The TCP or UDP port number to use when communicating with the device specified by the network route. The following are default port numbers:

- 502, for Modbus/TCP.
- 2222, for Allen Bradley Ethernet.
- 2101, for TCP or UDP socket connections.
- 44818, for Ethernet/IP.

protocol

The network protocol to use to communicate with the device specified by the network route. Specifying socket implies using the same protocol that is being used for the serial port associated with this route. Specify one of the following:

abethernet

The network slave uses the Allen-Bradley Ethernet (sometimes called CSP) protocol.

ethernetip

For communication with a network-based device that communicates using Ethernet/IP.

modbustcp

The network slave uses the Modbus/TCP protocol.

socket

The network slave uses TCP or UDP socket communication.

reconnecttime

For a TCP based route, this field specifies the time to wait between attempts to establish a TCP connection with the device specified by the route. The range is 0 to 60000 milliseconds. Specifying 0 means that the Device Server does not wait between attempts to establish a connection. The default is 4000 milliseconds.

Fields for Serial-Based Routes

The following command fields are used for configuring a serial-based route.

port

The serial port number to which messages are routed. The set ia serial command configures the serial port itself.

Examples

Modbus RTU over a TCP tunnel

In this example, set ia commands configure a Modbus master, which is connected to serial port 1 of a Device Server, to communicate with a Modbus slave, which is connected to serial port 1 of another Device Server. The serial protocol for both connections is Modbus RTU, and the network provides a TCP tunnel connection.

Master Side	Slave Side

`set ia serial`
`protocol=modbusrtu type=master`
`range=1`
	`set ia serial`
	`protocol=modbusrtu type=slave`
	`range=1`

`set ia route ip=192.1.1.2`
`protocol=socket active=on`
`range=1 table=1 protaddr=0-255`	

Modbus ASCII slave

In this example, a set ia command configures a serial port-connected Modbus slave. The slave uses the Modbus ASCII protocol. Configuration of a network protocol is not required.

```
set ia serial range=1 protocol=modbusascii type=slave
```

DF1 full-duplex slave

In this example, a set ia command configures a serial port-connected DF1 Full-Duplex slave. Like the previous example, configuration of the network protocol is not required.

```
set ia serial range=1 protocol=df1fullduplex type=slave
```

DF1 full-duplex master

In this example, set ia commands configure a serial port-connected DF1 Full-Duplex master. Two network-based slaves using Allen Bradley Ethernet are also configured.

```
set ia serial range=1 protocol=df1fullduplex type=master

set ia route table=1 range=1 protocol=abethernet ip=192.2.2.1
  active=on

set ia route table=1 range=2 protocol=abethernet ip=192.2.2.2
  active=on

set ia route table=1 range=1-2 protaddr=0-255
```

See also

See set config on page 91 for information on configuring device server to use a DNS server.

set ippool

Purpose

Creates a pool of IP addresses for serial ports. This command can be used for configuring IP addresses for PPP connections.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

```
set ippool count=num-ip-addr ip=1st-ip-addr
```

Fields

count
The number of IP addresses in the pool. The count can be from 1 to 64.

ip
The first IP address in the pool.

Example

In this example, the set ippool command configures a pool of four IP addresses. These are 190.175.175.20, 190.175.175.21, 190.175.175.22, and 190.175.175.23.

```
set ippool ip=190.175.175.20 count=4
```

See also

- set user on page 181 for information on linking a user to the IP address pool.
- "Configure Inbound PPP Connections" on page 17.

set keys

Purpose

Changes the key or key sequences used to generate certain characters and command functions, or displays current key mappings for these characters and functions.

Use the carat character (^) to indicate that the Ctrl key should be held while pressing another key.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure key sequences

```
set keys function=keys [range=range]
```

Display current key mappings

```
set keys [range=range]
```

Fields

function

One of the following characters or control functions (where ^ means “press and hold the Ctrl key”):

backchar
The back character. The default is ^b.

eof
The end of file character. The default is ^d.

erase
The erase command. The default is ^h.

forwchar
The forward key (move cursor forward). The default is ^f.

intr
The interrupt command. The default is ^c.

kill
The kill character. The default is ^u.

lnext
The literal next character (interpret the next character literally). The default is ^v.

nextcmd
Scroll forward through command history. The default is ^n.

prevcmd
Scroll backward through command history. The default is ^p.

xon
The XON character. The default is ^q.

xoff
The XOFF character. The default is ^s.

xona
The auxiliary XON character. The default is ^q.

xoffa
The auxiliary XOFF character. The default is ^s.

range
A range of ports. If you issue the command from a Telnet session, you must specify the range field. If you issue the command from an attached terminal, the command will work for the port to which the terminal is attached unless you use the range field to specify a different port.

Examples

Display the key table

In this example, the set keys command, issued from an attached terminal, displays key mapping information for the port on which the terminal is attached.

```
set keys
```

Change a key

In this example, the set keys command changes the key that generates an end of file character (eof) for port 1.

```
set keys eof=^h range=1
```

set line

Purpose

Configures or displays options associated with a serial line.

Device support

This command is supported in all devices.

Required privileges

Normal users can display port information. Root privileges are required to change settings.

Syntax

Configure line options

```
set line [baud=bps] [break={ignore|send|escape}]
   [csize={5|6|7|8}] [error={ignore|null|parmrk|dos}]
   [inpck={on|off}] [istrip={on|off}] [onlcr={on|off}]
   [otab={on|off}] [parity={o|e|n|m|s}] [range=range]
   [stopb={1|2}]
```

Display line options

```
set line [range=range]
```

Fields

baud

The line speed (bps) for this line. Use one of the following values: 50, 75, 110, 134, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 76800, 115200, 230400.

The default is 9600.

break

Specifies how the Telnet break signal is handled.

ignore

The Telnet break signal is ignored.

send

Send the Telnet break signal on the serial line when the device server receives a break signal.

escape

Send the escape sequence on the serial line when the device server receives a break signal.

The default is ignore.

csize

The character size, which can be 5, 6, 7, or 8 bits. The default is 8.

error
Determines how the device server handles parity errors on the line.

ignore
The device server ignores errors.

null
The device server changes the error character to a null character.

parmrk
The device server “marks” the error with FF (16450 error byte).

dos
The device server marks the error with an error character.

The default is ignore.

inpck
Specifies whether input parity checking is on or off.

on
Input parity checking is turned on.

off
Input parity checking is turned off.

The default is off.

istrip
Specifies handling of the high-order bit.

on
The high-order bit is stripped from each byte.

off
The high order bit is **not** stripped from each byte.

The default is off.

onlcr
Specifies handling of new-line characters.

on
New-line characters are mapped to carriage return/line feed characters.

off
No mapping of new-line characters occurs.

The default is off.

otab
Specifies handling of output tabs.

on
means that output tabs are converted to eight spaces.

off
Output tabs are **not** converted.

The default is off.

parity
The parity used for the line.

o
Odd parity.

e
Even parity.

n
No parity.

m
Mark parity.

s
Space parity.

The default is n (no parity).

range
The port or range of ports to which this command applies.

stopb
The number of stop bits per character to use on this line. The value used here must match the setting on the device connected to this port. Use 1 or 2 stop bits.

The default is 1 stop bit.

Examples

Display serial line options

```
set line
```

Configure baud, parity, and stop bits

```
set line range=1 baud=150 parity=e stopb=2 csize=6
```

See also

See the following related commands for information on configuring serial ports:

- set ports on page 141
- set flow on page 106

set logins

Purpose

Use the set logins command to:

- Configure the sequence of events that occurs when a user logs into a port. This includes information the user supplies and prompts and responses.
- Display current login settings.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure login sequence

```
set logins [cmdprompt=string] [logprompt=string]
   [login={on|off}] [passwd={on|off}] [passprompt=string]
   [range=range] [rootprompt=string] [verbose={on|off}]
   [write={on|off}]
```

Display login settings

```
set logins [range=range]
```

Fields

cmdprompt

The prompt displayed to a regular user who has logged in. The maximum length is 31 characters. Enclose this string in quotation marks if it includes spaces.

The default is `#>` for root users.

login

Specifies whether a user must log into the port.

on

A user must log into the port.

off

A user is not required to log into the port.

The default is on for inbound dev types. This field is disabled when the port is configured as an auto port. See set ports on page 141 for more information.

logprompt

The login prompt displayed. The maximum length is 10 characters. Enclose this string in quotation marks if it includes spaces. The default login prompt is login:

passprompt

The password prompt displayed. The maximum length is 10 characters. Enclose this string in quotation marks if it includes spaces. The default is password:

passwd

Specifies whether users are required to supply a password to access the ports specified by the range field.

on

Users are required to supply a password to access the ports specified by the range field.

off

Users do not supply a password.

The default is on. This field is disabled when the port is configured as an auto port (see set ports on page 141).

range

The range of ports addressed by this set logins command. When the set logins command is issued from a Telnet session, this field is required in order to identify the port to which it applies. When set logins issued from an attached terminal, the command applies to the port which the terminal is attached, unless the range field is used to specify another port.

verbose

Specifies whether the device server displays connection status messages to users before the login prompt.

on

The device server displays connection status messages before the login prompt.

off

The device server does **not** display connection status messages before the login prompt.

The default is off.

write

Specifies whether configuration changes made by regular users can be saved and used for subsequent sessions by that user.

on

Configuration changes made by regular users can be saved.

off

Configuration changes made by regular users are **not** saved.

set menu

Purpose

Use the set menu command to:

- Create menus for users.
- Display menu table entries.
- Display lines of a menu.
- Remove a line from a menu.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Create a menu

```
set menu [c#=command] [m#=string] [range=range] [t#=string]
   [name=string]
```

Display menu table entries

```
set menu [range=range]
```

Display lines of a menu

```
set menu range=range [show={on|off}]
```

Remove a line from a menu

```
set menu range=range rmentry=line-num
```

Fields

c#=command

A command that is executed when a user selects this menu line.

c

Specifies that this is a command that is executed when a user selects this menu line.

#

A line number. Lines appear in numeric order on the menu.

command

Any command. Enclose commands containing spaces in quotation marks.

name

A name for the menu. If this parameter is not used, menus are named menu*X*, where *X* is the index number of the menu specified on the range field.

Names may be up to 16 characters long. Enclose names containing spaces in quotation marks.

range

A port or range of ports.

rmentry

Removes the specified line from the menu.

m#=string

A text or informational line for the menu.

m

Specifies that this is a text or informational line.

#

A line number for the menu. Lines appear in numeric order on the menu.

string

A text string. Enclose strings with spaces in quotation marks.

show=on

Displays menu entries identified on the range field.

t#=string

A title line for the menu.

t

Means that this is a title line.

#

A line number for the menu. Each menu can have two title lines (t1 and t2).

string

A text string. Enclose strings with spaces in quotation marks.

Examples

Create a menu

In this example, set menu commands create a menu with active fields that enable users to start connections to hosts named server1 and server2.

```
set menu range=4 t1=”Welcome to the Communications Server”
set menu range=4 t2=”Make Selection”
set menu range=4 m1=”Connect to Server1” c1=”connect 1”
set menu range=4 m2=”Connect to Server2” c2=”connect 2”
```

Display the menu table

```
set menu
```

Display the contents of a menu

```
set menu ra=1 show=on
```

See also

See set user on page 181 (the menu and defaultaccess fields) for information on setting up a user to use a menu.

set modem

Purpose

Use the set modem command to:

- Configure an association between a port and modem test and initialization scripts.
- Display the modem table.
- Clear the association between ports and modem test and initialization scripts.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure association between a port and test/initialization scripts

```
set modem [init={no|script|index-num}] [range=range]
   [test={no|script|index-num}]
```

Display modem table entries

```
set modem [range=range]
```

Clear association between ports and test/initialization scripts

```
set modem [init=no] [test=no]
```

Fields

init

One of the following:

- The name of an initialization script (created with the set scripts command).
- The index number of an initialization script in the scripts table.
- The keyword no, which clears an association between a port and an initialization script.

range

The range of ports to which this command applies.

test

One of the following:

- The name of a test script (created with the set scripts command).
- The index number of a test script in the scripts table.
- The keyword no, which clears an association between a port and a test script.

Examples

Display the current port’s scripts

In this example, the set modem command displays the script table.

```
set modem
```

Display names of scripts associated with a range of ports

```
set modem range=1-16
```

Configure an association between a port and test and initialization scripts

```
set modem test=test1 range=1 init=init1
```

Clear association between a port and test and initialization scripts

```
set modem range=1 test=no init=no
```

See also

See set script on page 152 for more information on creating modem scripts.

set ports

Purpose

Configures or displays a port’s operating parameters.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure operating parameters of a port

```
set ports [auto={on|off}] [autoservice={default|raw|rlogin|telnet}
   [bin={on|off}] [dest={ip-adr/none] [dev=device]
   [dport=tcp-port/none] [edelay=milliseconds]
   [flushstchar={default|on|off}] [flushstchar={default|on |off}]
   [group={none|group] [id={id-name|none}] [keepalive={on|off}]
   [p[1-9]=script-param][range=range] [scriptname=name]
   [sess=sessions] [termtype=type] [uid={id/none}]
```

Display operating parameters of a port

```
set ports [range=range] [show={script|id|autoconnect}]
```

Fields

auto

Determines whether users of the port will bypass device server’s login and password sequence and be automatically connected to the destination defined on the dest field.

on

Users are automatically connected to a destination.

off

Users are **not** automatically connected to a destination.

The default is off.

autoservice

Specifies the autoconnection service for this port, which is only used if auto=on. Choose one of the following:

default

Normally means the Device Server uses the Telnet service. The exception is if the dport field is 0 or 513. In that case, rlogin is used.

raw

Data is passed between the serial port and the TCP stream without modification.

rlogin

The Device Server uses the remote login (rlogin) service.

telnet

The Device Server uses the Telnet service.

bin

Determines whether Telnet users of the port are provided with Telnet binary connections.

on

Telnet users are provided with Telnet binary connections.

off

Telnet users are provided with normal (ASCII) connections.

The default is off.

dest

The IP address of the destination system to which port users will be routed if auto=on. To disable the field, specify the keyword none.

dev

The device type, which defines the device connected to the port. Typically, you can use the following to define the devices listed:

Device Type	dev value
Power units	dev=power
Most printers	dev=prn
Most dumb terminals	dev=term
Most incoming modem connections	dev=min
Most outgoing modem connections	dev=mout
Most bidirectional modem connections	dev=mio
Most RealPort connections	dev=rp
Most reverse Telnet connections	dev=prn
Modem emulation	dev=pm

If the device you are configuring is not one of these listed or requires unusual flow control attributes, use the information in the table to define a device type:

Device Type	Attributes
hdial	• The device generates a login when carrier is detected (DCD high) and data is received. • The device closes the port at carrier loss (DCD low). • DTR and RTS are low when the connection is idle. • This type does **not** support reverse Telnet or RealPort. • This type requires 10-pin cables with DCD and DTR cross-connected or an altpin cable.
hio	• The device generates a login when carrier is detected (DCD high) and data is received. • The device closes the port at carrier loss (DCD low). • DTR and RTS are low when the connection is idle. • This type requires 10-pin cables with DCD and DTR cross-connected or an altpin cable.
host	• The device does not generate a login. • The device opens the port at DCD high and closes the port at carrier loss (DCD low). • DTR and RTS are low when the connection is idle. • This type supports reverse Telnet and RealPort. • This type requires a cable that supports carrier detect (DCD).
ia	• The device never generates a login. • This type usually requires cable support for transmit, receive, and ground only, which means a 3-wire crossover cable will work. Six, eight, and ten wire crossover cables work as well. • Specifying dev=ia enables port support for industrial automation. See "set ia" on page 116.
min	• The device server generates a login when carrier is detected (DCD high). • The device server closes the port at carrier loss (DCD low). • DTR and RTS are high when the connection is idle. • This type requires a 10-pin straight-through cable or an altpin cable. • Do not use dev=min for RealPort and reverse Telnet connections.
mio	• The device generates a login when carrier is detected (DCD high). • The device closes the port at carrier loss (DCD low). • DTR and RTS are high when the connection is idle. • This type requires a 10-pin straight-through cable or an altpin cable.

Device Type	Attributes
mout	• The device never generates a login. • The device closes the port at carrier loss (DCD low). • DTR and RTS are low when the connection is idle. • This type requires a 10-pin straight-through cable or an altpin cable. • dev=mout supports RealPort and reverse Telnet.
pm	• The device never generates a login. • This device’s characteristics are specific to modem emulation settings for a given port. • DTR and RTS are low when the connection is idle. • Use dev=pm when initiating communication with the device.
power (2-Port and 4-Port Device Servers only.)	• The device never generates a login. • This device’s characteristics are specific to power management settings for a given port. • DTR and RTS are low when the connection is idle. • Use dev=power when initiating communication with the power device. • Change from dev=power to other device name to stop communication with power unit.
prn	• The device never generates a login. • device server ignores carrier. • DTR and RTS are low when the connection is idle. • This type usually requires cable support for transmit, receive, and ground only, which means a 3-wire crossover cable will work. 6-, 8-, and 10-wire crossover cables work as well. • Use dev=prn for reverse Telnet connections.
rp	• The device never generates a login. • The device ignores carrier. • DTR and RTS are low when the connection is idle. • This type usually requires cable support for transmit, receive, and ground only, which means a 3-wire crossover cable will work. 6-, 8-, and 10-wire crossover cables work as well. • Use dev=rp for RealPort connections.
term	• The device generates a login when it receives data. • The device ignores loss of carrier (DCD low). • DTR and RTS are high when the connection is idle. • This type usually requires cable support for transmit, receive, and ground only, which means a 3-wire crossover cable will work. 6-, 8-, and 10-wire crossover cables work as well. • Do **not** use dev=term for RealPort and reverse Telnet connections.

The default is term.

With mio, mout, min, host, and hdial device types, device server lowers DTR at disconnect and holds it low for two seconds to ensure a clean disconnection.

dport

The TCP port for users of autoconnect ports, which is one of the following:

- For Telnet, use 23.
- For Rlogin, use 513.
- For a physical port on the device server, use the base TCP socket number and then the port number. For example (if you use the default base TCP socket number), to indicate an autoconnect Telnet connection to port 12, specify dport=2012. Similarly, to indicate an autoconnect raw connection to port 12, specify dport=2112. If you specify 0, Rlogin is used.
- None, which disables the field.

The default is 0.

flushstchar

Determines whether the first character of an autoconnection is discarded. If you specify flushstchar=default, the first character will be discarded for Telnet and Rlogin connections and will not be discarded for raw connections.

group

Assigns a group number to this port, which means that this port is part of a hunt group. Outgoing calls specifying this hunt group can then use any available port in the group. Use numbers that will not cause conflicts with regular port numbers. For example, on a four-port device, use numbers 5 to 99. The default is none.

id

Specifies a character string for the port, which can be used in console management applications to identify the device connected to the port. If there are spaces in the string, enclose this string in quotation marks.

keepalive

Determines whether the keepalive function is implemented with autoconnections. The default is off.

p[1-9]=*script-param*

Letters and numbers that can be used in the variable fields of login or dialer scripts. This field is used only when the port-based autoconnect feature is on. (See the dest option.)

range

The port or range of ports to which this command applies.

scriptname

The name of a script (defined with the set script command) to use with auto connections to automatically log on to a host or run a script on a host.

sess

The maximum number of sessions any user can run through this port. The range is 1-9. The default is 4.

show={autoconnect | *id* | *script*}
Displays autoconnect and script configuration information for the port specified and information on who is using the port.

termtype
The type of terminal assigned to the port. This information is used during multiscreen and multisession operations and is passed to the host during Telnet negotiations. Use a terminal type that is valid with the host operating system.

uid
An index number in the user table that identifies a particular user for this port. If you use this field, calls from others attempting to use this port will be rejected. Specify none to disable the field.

Examples

Display attributes of the current port

```
set ports
```

Display attributes for a range of ports

```
set ports range=1
```

Configure an autoconnect port

In this example, the set ports command configures the port so that all incoming users are automatically connected via Telnet to the host specified on the dest field. The port is also available for outgoing connections.

```
set ports range=1 auto=on dest=199.125.123.10 dev=mio dport=23
```

See also

See the following commands for more information on configuring serial ports:

- set line on page 132
- set flow on page 106
- set keys on page 130
- set logins on page 135
- set powerunit on page 147

set powerunit

Purpose

Configures, displays, or clears a power-management configuration.

Device support

Applicable to 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure power management

```
set powerunit
   [alarm1=alarm_threshold...alarm4=alarm_threshold]
   [group=group#] [id=device_id] [outlet=outlet#] [range=port]
   [size=number_of_outlets]
   [temp1threshold=threshold...temp4threshold=threshold]
   [type=powerunit_manufacturer]
   [users=user_index-user_index#]
```

Display power management configuration

```
set powerunit [range=port][range=port group=group]
[range=port id=id][range=port outlet=outlet]
```

Clear Power Management Configuration

```
set powerunit clear=on range=port
```

Fields

alarm1=*alarm_threshold*...alarm4=*alarm_threshold*

Configures electrical current thresholds at which alarms will be generated. You can set up to four thresholds, depending on the number of current sensors on the power control unit. Alarm1 corresponds to the first sensor on the power control unit, alarm2 to the second, and so on. If the threshold is exceeded, the power unit will emit an audible alarm and an SNMP trap will be generated (if the SNMP agent is configured for this feature). Specify thresholds in tenth of an Amp increments.

group

A group number, used to assign several power control devices or several outlets to a group that can then be managed as a single entity. Use group numbers 1 through 8.

id

A text string that can be used to identify individual managed devices (for example, a server or a router) or a group of devices. If you give the same id to multiple devices, they can be managed as a single entity.

outlet

A particular outlet or range of outlets on the power control unit.

range

Identifies the port or ports to which the specified power control unit is connected. You can specify ports using an individual port number, a list of ports separated by commas, or a range of ports using a dash. See the examples that follow.

Example	Range value
Individual port	range=2
List of ports	range=1,3,5
Range of ports	range=1-5

size

The number of outlets on the power control unit.

tempthreshold1=*threshold*, ... tempthreshold4=*threshold*

Configures temperature thresholds at which SNMP traps will be generated. You can set up to four thresholds, depending on the number of temperature sensors on the power control unit. tempthreshold1 corresponds to the first sensor on the power control unit, tempthreshold2 to the second, and so on. If the threshold is exceeded, an SNMP trap will be generated (if the SNMP agent is configured for this feature). Specify thresholds in tenths of a degree Celsius.

type

Specifies a power control unit device manufacturer. The only value for this field is baytech.

users

Used to assign a user permission to control the outlet. Use the user index number to assign a user to the outlet.

Examples

Display entire power management configuration

This example displays the entire power-management configuration.

```
set powerunit
```

Displaying power management configuration for a port

This example displays the power-management configuration for port 7.

```
set powerunit range=7
```

Display configuration for an outlet

This example displays user permissions for outlet 6.

```
set powerunit range=7 outlet=3
```

Configure remote power control device (basic)

This example produces a simple power-management configuration.

```
set powerunit range=8 type=baytech size=10
```

Configure a current threshold

This example configures the current threshold for 15 Amps.

```
set powerunit range=8 alarm1=15
```

Configure a temperature threshold

This example configures the temperature threshold for 32 degrees C.

```
set powerunit range=8 temp1threshold=32
```

Configure an ID

In this example, all the devices connected to outlets 1-4 are assigned an ID, allowing them to be managed as a single unit.

```
set powerunit range=8 outlet=1-4 id=Routers
```

Configure a group

```
set powerunit range=8 outlet=1-4 group=3
```

See also

See power on page 72 for information on managing power-management devices.

set route

Purpose

Use the set route command to

- Manually configure IP routes.
- Remove routes from the route table.
- Display the contents of the route table.

The route table holds up to 50 entries.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure or remove IP routes

```
set route gateway=ip-adr wanname=name mask=mask metric=hops
  net=net-adr range=range
```

Display route table

```
set route
```

Fields

gateway

The IP address of the router that is the next hop to the destination network defined on the net field. Use this field if this router is on the LAN.

You can specify any legitimate or non-legitimate gateway, as long as the IP address for the gateway is not 0.0.0.0.

mask

The subnet mask used by the destination network.

metric

The number of routers through which a datagram must pass before reaching the destination network defined on the net field.

net

The IP network address of the destination network.

wanname

The interface to use for this route, which is one of the following:

- For routes over a PPP link: The name of a set user command that defines a PPP user.
- For routes over the Ethernet interface: ether.

Examples

Display entire route table

```
set route
```

Display a range of route table entries

```
set route range=3-5
```

Remove an entry from the route table

```
set route rmroute=on range=2
```

Configure a route over a WAN connection

```
set route net=199.150.144.8 mask=255.255.255.0 metric=3
  wanname=user998 gateway=199.150.100.2
```

See also

See set forwarding on page 110 for information on configuring device server to use dynamic IP routes maintained by RIP.

set script

Purpose

Use the set script command to:

- Define a modem or login script.
- Display entries in the script table.
- Display all stanzas of a script.
- Delete a script from the script table.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Configure or edit a modem or login script

```
set script [name=name] [newname=new-name]
  s{1-24}=”stanza-content”
```

The *stanza_content* value is enclosed in quotation marks.

Display entries in script table

```
set script range=range
```

Display stanzas of a script

```
set script name=name show=on
```

Delete a script

```
set script {rmscript=on name=name|rmscript=name}
```

Fields

name

The name of the script.

newname

A new name for the script, identified either by its old name (on the name option) or by an index number in the script table (on the range option).

range

An index number in the script table (for display).

rmscript

Removes the specified script.

s {1-24}=*stanza-content*

The number of a script stanza (1 through 24) and the contents of the stanza. The contents of a stanza-content field must be enclosed in quotation marks. The contents can include any of the commands listed in the following table:

Command	Description	Example
A*np*	Sets the following: • Character size to *n*, which can be either 7 or 8 bits. • Parity to *p*, which can be one of the following values: 0=no parity, 1=odd 2=even 3=mark	s1=”A70”
B*n*	Transmits a break signal *n* milliseconds long. If *n* is not specified, the length is 250 milliseconds.	s7=”B100”
C*n*	Sets carrier loss detection. If *n*= • 0: carrier loss is not detected. • 1: the modem hangs up if the port loses DCD.	S2=”C1”
D+*m*	Raises a modem signal. If *m* is • 1: DTR is raised. • 2: RTS is raised.	
D-*m*	Lowers a modem signal. If *m* is • 1: DTR is dropped. • 2: RTS is dropped.	
E{*string*}	Writes the string either to • A user terminal, if running interactively. • To a trace buffer, if running in the background. This string can include any of the escape commands listed in “Script Escape Commands”, which follows this discussion.	S10=”E{Please Log In}”
F*n*	Pauses for *n* seconds and flushes input data. The default is 0.	s1=”F10”
G*s*	Immediately does one of the following, depending on the value of *s.* If *s* is: • The number of a stanza: Control is passed to that stanza. • + (plus): The script is exited with a success message from E string. • - (minus): The script is exited with a failure message from E string.	s2=”G7”

Command	Description	Example
H*s*	Sets the carrier lost (hang-up) recovery to stanza *s,* which is the number identifying another stanza or one of the following: • + (plus): Exit, indicating success. • - (minus): Exit, indicating a general failure. • * (star): Indicate that the remote system is busy. • = (equal): Indicate that the remote system is down.	s2=”H+”
M{*string*}	Writes *string* to a modem. This string can include any of the escape commands listed in "Script Escape Sequences" on page 155.	s2=”M{at&f\c}”
N*b*	Changes the baud rate. The range is 50 to 115,200. Rates under 110 bps should be used only on expansion ports.	s4=”N19200”
P*n*	Pauses for *n* seconds. If you do not specify a value for *n*, the default is 1 second.	s5=”P2”
Q*n*	Sets software flow control. If *n* is • 0: Flow control is disabled. • 1: Flow control is enabled.	s5=”Q0”
S*n*	Defines the time to wait (timeout), in seconds, for a modem signal or input data.	s2=”S5”
T*s*	Defines the timeout recovery state. If the timeout is exceeded, control is passed to this stanza.	s2=”T8”
U*n*	Immediately executes the text of stanza *n*, as if it were inserted to replace this command. You can nest this command, up to a maximum of 10.	s2=”U4”
W+*m*	Waits for a modem signal to go high. If *m* is • 1: Wait for DCD to go high. • 2: Wait for CTS to go high.	s6=”W+1”
W-*m*	Waits for a modem signal to go low. If *m* is • 1: Wait for DCD to go low. • 2: Wait for CTS to go low.	s6=”W-1”
[*string*]*s*	Defines the *string* and the stanza to jump to when the *string* is received on a communications line. This string can include any of the escape commands listed in "Script Escape Sequences" on page 155.	s7=”[abort]s22”

Script Escape Sequences

The following table describes the escape sequences you can use in E, M, and [ ] command strings in script commands.

Escape Sequence	Description
^c	This is the character transmitted by an ASCII keyboard when the CTRL key is held down and the c key is pressed.
\b	Backspace
\f	Form feed
\t	Tab
\n	New line
\r	Return
\\	Backslash
\nnn	Octal byte value *nnn*
\x*hh*	Hexadecimal byte value *hh*
%*n*	Is a variable, where *n* is either a telephone number whose value comes from the n*n* field on the set user command, or one of the following special characters: • * (star): Generates a tone equivalent to dialing * on a touch-tone phone. • # (pound): Generates a tone equivalent to dialing # on a touch-tone phone. • =: Causes a pause of 2 seconds. • w: causes a wait for a secondary dial tone. • - (minus): Completely ignored and not passed to the modem.
%*p*	Is a variable, where *p* is an integer from 1 to 9. For login scripts, the value of *p* comes from the p*n* field on the set user command. For dialer scripts, options come from the p*n* field of the set device command.

Examples

Configure a login script

This example defines a login script that does the following things:

- Waits for a login prompt and then supplies a login name.
- Waits for a password prompt and then supplies a password.

The commands to define the login script are as follows:

```
set script name=log1 s1=”P2[ogin:]2 S10 T4”
set script name=log1 s2=”P1 M{user-ejm\r} S1 [sword:]3 T4”
set script name=log1 s3=”M{my-p-word\r} G5”
set script name=log1 s4=”E{login failed} G-”
set script name=log1 s5=”E{login complete} G+”
```

The actions performed by the script are as follows:

- In stanza S1:
  - — P2 means “pause for 2 seconds before executing the rest of the script.”
  - — [ogin:] indicates the string to wait for.
  - — 2 is the stanza to jump to when the string is received.
  - — S10 T4 means “wait up to 10 seconds for the string “ogin:” . If the string does not appear in that time, jump to stanza 4.”
- In stanza S2:
  - — P1 means “pause for 1 second.”
  - — M means “write the string that follows.”
  - — {user-ejm\r}is the string to supply, which is a user name, followed by a carriage return (\r).
  - — S1 means “wait 1 second for additional input, which is a password prompt.”
  - — [password:] 3 is the string to wait for and the number of the stanza to jump to when the string is received.
  - — T4 means “jump to stanza 4 if the S1 period is exceeded.”
- In stanza S3:
  - — M{my-p-word\r} is the string to write, which is a password, followed by a carriage return.
  - — G5 means “jump to stanza 5.”
- Stanza S4 is the “failure” path for the script.
  - — E{login failed} is the string to write to either a terminal or a trace buffer.
  - — G- means “exit the script and send a failure message to the user interface.”
- Stanza S5 is the “success” path for the script.
  - — E{login complete} is the string to write to either a terminal or a trace buffer.
  - — G+ means “exit the script and send a success message to the user interface.”

Configure a dialer script

In this example, a telephone number is passed to the modem.

```
set script name=dialer1 s1=”M{atdt9524452624\r}”
```

Display entire script table

```
set script
```

Display an entry in the script table

```
set script range=4
```

Display all stanzas in a script

In this example, the set script command displays all stanzas of the specified script:

```
set script name=testmodem show=on
```

See also

- set user on page 181 for information on assigning a login script to a user.
- set chat on page 89 for information on telephone number string translation.
- "Filters for PPP Connections" on page 22 for information on using filters for PPP connections.

set secureaccess

Purpose

Disables Device Server services for users of inbound connections.

Device support

This command is supported in 2-Port and 4-Port Device Servers only.

Required privileges

Root privileges are required to use this command.

Syntax

Disable device servers

```
set secureaccess level={secure|high|normal} service={on|off}
```

Display current secure-access settings

```
set secureaccess
```

Fields

level

Determines which group of services are on, or available, for inbound users. Specify one of the following:

secure

SSH is the only service available to inbound users.

high

SSH, HTTP, HTTPS, SNMP, RealPort, Secure RealPort, and SSL services are available to inbound users.

normal

All services are available.

The default is normal, which means that all services are available.

service

Turns a service on or off. *service* can be any of the services listed in the following table:

If you specify ...	This service is turned on or off ...
http	HTTP
https	HTTPS
realport	RealPort
reversetcp	Reverse TCP
reversetelnet	Reverse Telnet
rlogin	Remote login
rsh	Remote shell
securerealport	Secure RealPort
securesockets	Secure Socket Layer (SSL)
snmp	SNMP
ssh	SSH
telnet	Telnet

Examples

Disable inbound Telnet connections

```
set secureaccess telnet=off
```

Disable all services except SSH

```
set secureaccess level=secure
```

Display secure access settings

```
set secureaccess
```

set service

Purpose

Use the set service command to

- Configure, or associate, names with TCP and UDP service ports for use in filters.
- Display entries in the service table.
- Remove entries from the service table.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure/associate names with TCP service ports

```
set service name=name port={udp:port|tcp:port}
```

Display entries in service table

```
set service [range=range]
```

Remove entries from the service table

```
set service [rmservice=name|rmservice=on]
```

Fields

name
The name to assign the service.

port
The TCP or UDP port number for the service.

range
A range of entries in the service table, which is used to identify entries to display or delete.

{rmservice=*name* | rmservice=on}
Removes a service from the service table.

name
The name of a service to be removed from the service table.

on
Remove the service or services from the service table identified on the range field.

Factory Defaults for Service Names and Port Numbers

The following table lists the factory default service names, and the port numbers to which they are assigned. Other service names than these can be added through the set service command.

Service	Port Number
FTP	21
NNTP	119
RIP	520
Login	513
Shell	514
SMTP	25
Telnet	23
TFTP	69

Examples

Display the service table

```
set service
```

Display a range of entries in the service table

In this example, the set service command displays a range of entries in the service table.

```
set service range=2-4
```

Configure an entry in the service table

In this example, the set service command configures a name for HTTP.

```
set service name=http port=tcp:80
```

See also

See set filter on page 102 for information on configuring filters.

set snmp

Purpose

Configures, enables, and disables a device server's SNMP (Simple Network Management Protocol) agent.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Normal user may display information. Root privileges are required to change settings.

Syntax

```
set snmp [auth_trap={off|on}] [cold_start_trap={on|off}
   [contact=administrator]
   [curr_thresh_exc_trap=[on|off][get_request=community]
   [link_up_trap={on|off] [location=location-string]
   [login_trap={on|off}] [name=name-string] [run={off|on}]
   [set_request] [temp_thresh_exc_trap={on|off}
   [trap_dest=ipaddress]
```

Fields

auth_trap

Determines whether an SNMP trap is sent when an authentication error occurs.

on

The agent sends an authentication trap to the SNMP manager when an authentication error occurs.

off

The agent silently ignores SNMP requests that fail authentication.

The default is off.

cold_start_trap

Determines whether an SNMP trap is sent to the SNMP manager when a reboot occurs.

on

The agent sends a trap when a reboot occurs.

off

A trap is not sent when a reboot occurs.

The default is off.

contact

A text string that identifies a contact person, usually an administrator. If there are spaces in the text, the entry must be surrounded by quotation marks.

curr_thresh_exc_trap

Determines whether an SNMP trap is sent to the SNMP manager when the electrical current threshold on a power control device is exceeded.

on

The agent sends a trap when the threshold is exceeded.

off

A trap is not sent when the threshold is exceeded.

The default is off.

get_request

The password required to read device server SNMP managed objects. The default is “public”.

link_up_trap

Determines whether an SNMP trap is sent to the SNMP manager when a network link comes up.

on

The agent sends a trap when the link comes up.

off

A trap is not sent when the link comes up.

The default is off.

location

A text string that describes device server’s location. If there are spaces in the text, the entry must be surrounded by quotation marks.

name

A text string that identifies device server. If there are spaces in the text, the entry must be surrounded by quotation marks.

login_trap

Determines whether the device server sends a trap each time someone attempts to log into the system.

on

Send a trap at each attempt to log in.

off

Do not send a trap each time someone attempts to log in.

The default is off.

run

Specifies whether the SNMP daemon is started.

on

Starts the SNMP daemon.

off

The SNMP daemon will not start.

The default is off.

set_request
Displays a prompt of a password required to write to device server SNMP managed objects. The default is private.

trap_dest
The IP address of the system to which the agent should send traps.

temp_thresh_exc_trap
Determines whether an SNMP trap is sent to the SNMP manager when the temperature threshold on a power control device is exceeded.

on
The agent sends a trap when the threshold is exceeded.

off
A trap is not sent when the threshold is exceeded.

The default is off.

Examples

Display SNMP configuration

```
set snmp
```

Configure all trap options

```
set snmp run=on trap_dest=190.175.178.73 auth_trap=on
  cold_start_trap=on link_up_trap=on curr_thresh_exc_trap=on
  temp_thresh_exc_trap=on
```

set socketid

Purpose

Configures the serial port socket ID feature.

Device servers support reverse Telnet and raw reverse Telnet connections, which enable remote users and applications to manage serial devices connected to device server ports. A socket ID is a text string that is sent at the start of a connection between a Device Server’s serial port and a remote host. This feature enables easier identification of the managed device.

Device support

This command is supported in all devices.

Required privileges

Root privileges are required to use this command.

Syntax

Configure serial port socket ID feature

```
set socketid range=range [state={on|off}
   [string=”character-string”]
```

Display serial port socket ID settings

```
set socketid [range=range] [verbose]
```

Fields

range
The port or ports configured with this command.

state
Turns the serial port socket ID feature on or off for the specified port. The default is off.

string
An identification string, where *character-string* is made up of ASCII characters, surrounded by quotation marks. This string can be 1 to 256 bytes long.

Characters can also be embedded in the string by using escape sequences, as described in the following table:

Embedded character	Escape sequence
Backspace	\b
Form feed	\f
Tab	\t
New line	\n
Return	\r
Backslash	\\
Hexadecimal byte value *hh*	\xhh

verbose

Displays the entire identification string when the string exceeds twenty characters. The verbose option is not necessary for strings under twenty characters.

Examples

Display the socketid configuration for all ports

```
set socketid
```

Display the socketid configuration for a specific port

In this example, the set socketid configuration for port 2 is displayed:

```
set socketid range=1
```

Configure an identification string

```
set socketid range=1 state=on string=”\fDevice 54”
```

Configure a hexadecimal identification string

```
set socketid range=1 state=on string=”\xae”
```

set tcpip

Purpose

Configures or displays operating characteristics of the device server TCP component. Configurable options include:

- The TCP port used by RealPort.
- The interval TCP waits before retransmitting an unacknowledged segment.
- How TCP handles idle connections.
- Socket service values for reverse Telnet connections.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure or change TCP options

```
set tcpip [keepalive_active={on|off}] [keepalive_byte={on|off}]
   [ip_ttl=hops] [keepalive_idle=hours:minutes:seconds]
   [probe_count=probe-count#] [probe_interval=probe-interval#]
   [rto_max=timeout#] [tcp_ttl=hops]
```

Display TCP settings

```
set tcpip
```

Fields

keepalive_active

Enables or disables the keep-alive function.

on

Enables the keep-alive function.

off

Disables the keep-alive function.

The default is off. However, the keep-alive function can be turned on by an application regardless of this setting. When you change this setting, you must reboot the device server.

keepalive_byte

Specifies whether the device server sends a “garbage” byte of data, or a keep-alive byte, to force the device at the other end of the connection to respond to the keep-alive packet.

on

The device server sends a keep-alive byte of data.

off

The device server does not send a keep-alive byte of data.

The default is off. When you change this setting, you must reboot the device server.

ip_ttl

Sets the initial value of the IP time-to-live variable, which defines the maximum number of hops that a packet can survive before being discarded. The default is 64.

keepalive_idle=hours:minutes:seconds

Determines the period a TCP connection has to be idle before the keep-alive option is activated. The range is 10 seconds to 24 hours. The default is 2 hours.

probe_count

The number of times TCP probes the other connection to determine if it is alive after the keep-alive option has been activated. The valid range for probe_count is 5-30. The default is 10.

Black Box recommends that the probe_count default not be changed unless there is a good reason to change it. Changing the value can adversely affect Telnet connections.

probe_interval

The time in seconds between each keep-alive probe. The range is 10-75 seconds. The default is 75 seconds.

Black Box recommends that the probe_interval default value not be changed unless there is a good reason. Changing the value can adversely affect Telnet connections.

tcp_ttl

The initial value of the TCP time-to-live variable, which defines the maximum number of hops that a packet can survive before being discarded. The default is 64.

rto_max

The TCP maximum retransmission time out in seconds. When one side of a TCP connection sends a packet and does not receive an acknowledgment from the other side within the timeout period, the sending station retransmits the packet and sets an exponential backoff timeout. This is done for each successive retransmit until the maximum retransmission timeout is reached. Then, the TCP connection resets.

Examples

Configure keep-alive options

In this example, the device server TCP component is configured to do the following:

- Begin sending keep-alive probes after a TCP connection has been idle for 10 minutes.
- Send up to 15 probes.
- Send a probe every 50 seconds.

```
set tcpip keepalive_active=on keepalive_idle=0:10:0 probe_count=15
```

Configure TCP maximum retransmission timeout value

In this example, the device server TCP component is configured to attempt to reconnect a dormant connection for up to 100 seconds.

```
set tcpip rto_max=100
```

set telnetip

Purpose

Creates, displays, or removes entries in the Telnet IP address table.

- Creates configuration profiles for Telnet communication with particular devices. That is, the set telnetip command links an IP address to particular Telnet operating parameters.
- Displays Telnet IP address table entries.
- Before removing Telnet table entries, it may be helpful to use set telnetip without any options to display the existing Telnet table entries and their corresponding index numbers.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Display current Telnet values for device server

```
set telnetip
```

Add an entry to Telnet table

Use this form of the set telnetip command to add an entry to the Telnet table. The table can hold up to 30 entries.

```
set telnetip ip=ip-addr [mask=mask]
   [mode={none|crbin|telprnt|striplf}] range=port
```

Fields

ip
The IP address to add to the Telnet table.

mask
The value of the mask to use for the IP address entered. The default is 255.255.255.255.

mode
The Telnet mode.

none
No special Telnet mode is set.

crbin
Sets a Telnet binary connection where carriage returns are added with line feeds.

telprnt
Used for a Telnet print connection.

The default is none.

range
The range of index entries to remove.

Examples

Display Telnet table entries

```
set telnet
```

Add an entry to Telnet table

```
set telnet ip=199.86.5.56 mask=255.255.255.0 mode=none
```

set terms

Purpose

Use the set terms command to:

- Define terminal types and the escape sequence a terminal uses when initiating and maintaining multiple sessions.
- Display entries in the term table.

The set terms command configures device server to handle terminals that are **not** connected over a network.

Device support

This command is supported in all devices.

Required privileges

Normal users can display information. Root privileges are required to change settings.

Syntax

Configure terminals

```
set terms [clrseq=escape-seq] [npages=pages]
   [swtseq=SessNumSequence] termtype=type
```

If users are to use the Ctrl key in a key sequence defined by this command, use a carat character (^) in place of the Ctrl key when you configure the sequence.

Display entries in the term table

```
set terms [range=range]
```

Fields

clrseq

The escape sequence that clears the terminal's current screen. This escape sequence should be the one specified by your terminal's manufacturer.

npages

The number of sessions available to this terminal type. This number should be the same as the number of pages of screen memory available on the terminal. The range is 1-9.

swtseq

A number that identifies the session and the escape sequence used to access that session. This number should be the sequence specified by your terminal's manufacturer.

There are no spaces between the number identifying the session and the key sequence used to access that session.

range

The range of term table entries to display or remove.

termtype

A name for the terminal type. This name must match the name specified on the termtype field of the set ports command, and used by hosts on your network for this type of terminal.

The device server provides two default terminal types: wy60 and wy60-e. Use the set terms command to display options associated with these types of terminals.

Examples

Display entire term table

```
set terms
```

Display a range of entries in the term table

```
set terms range=4-6
```

Configure a terminal type

```
set terms termtype=Jet npages=4 clrseq=^! swtseq=1^]
   swtseq=2^[swtseq=3^} swtseq=4^{
```

set trace

Purpose Configures a device server for tracing, or displays tracing information.

Device support This command is supported in all devices.

Required privileges Root privileges are required to use this command.

Syntax

Configure tracing

```
set trace [loghost=ip-addr][mask=type:severity]
   [mode={historical|concurrent]} [state={on|off|dump}]
   [syslog={on|off}]
```

Display status of tracing information

```
set trace
```

Fields

loghost
The IP address of a host to which trace messages should be sent. This host must be running the syslog daemon.

mask=*type:severity*
Specifies the type and severity level of events that should be traced.

type
One of the entries listed in the following table:

Type	Trace events associated with ...
addp	ADDP
arp	Address Resolution Protocol
cache	Routing cache
connect	connect functionality
dhcp	DHCP
dialer	Dial-out ports
dns	Domain Name System
esc	Escape sequence
ether	Ethernet
fwdr	Routing (forwarded IP packets)
ia	Industrial Automation (IA) protocols
icmp	Internet Control Message Protocol
inetd	Internet daemon (based on received packets)
ip	Internet Protocol

Type	Trace events associated with ...
lpd	Line Printer Daemon
lpd_a	Line Printer Daemon (ASCII)
lpd_h	Line Printer Daemon (hex)
netd	Net Daemon
pm	Modem Emulation Module
portsw	Portswitcher software
power	Powerunit (2-Port and 4-Port Device Servers only)
ppp	Point-to-Point Protocol
realp	RealPort
rlogin	Rlogin
routed	Route Daemon
serial	Serial ports
snmp	Simple Network Management Protocol
stream	STREAMS internal data processing methodology
tcp	Transmission Control Protocol
telnet	Telnet
udp	User Datagram Protocol
udpser	Serial over UDP
user	Users
vj	Van Jacobsen header compression
wan	Wide-area network connections
*	All entities listed in this table

severity

The severity level, which can be one of the following:

Severity	Description
+ (plus sign)	Used to add other severity levels to the trace. This can be used to specify multiple severity trace levels on a single command or to specify multiple trace commands that add levels of severity. See the set trace examples for clarification.
- (minus sign)	Used to subtract severity levels from the trace. See the set trace examples for clarification.
critical or c (the default)	Tracing is done on only the most severe events. This level produces the least amount of trace data.
warning or w	Tracing is done on critical events and on less severe events as well. This level produces more trace data than the critical severity level, but less than info severity level.
info or i	Tracing is done on many events. It produces more trace data than previous severity levels.
debug or d	The severity level to use for debugging. Do not use this level for anything but debugging.

mode

Specifies the mode, or handling, of trace messages.

historical

All trace messages stored in the buffer may be displayed by issuing the following command: set trace state=dump.

concurrent

All trace messages are printed to the administrative terminal when state=on.

state

Specifies whether trace messages are displayed.

on

All messages in the trace buffer are displayed. Once the messages are displayed, the state remains on.

off

Tracing is off.

dump

All messages in the trace buffer are displayed. Once the messages are displayed, the state returns to off.

The default is off.

syslog

Specifies whether trace messages are sent to a host.

on

Trace messages are sent to the host identified on the loghost field.

off

Trace messages are not sent to a host.

The default is off.

Examples

Display current trace settings

```
set trace
```

Dump a trace

This example dumps a previously recorded trace of ARP events.

```
set trace mask=arp:warning mode=historical state=dump
```

Configure tracing for future critical events

```
set trace mask=arp:critical mode=concurrent state=on
```

Use the + sign to extend the trace

This example configures tracing for info, warning, and debug trace levels.

```
set trace mask=arp:i+w+d
```

Use the - sign to subtract a severity level

This example subtracts the warning severity level from the trace settings specified in the previous example.

```
set trace mask=arp:-w
```

set udpdest

Purpose

Configures destinations for serial over UDP communication.

The UDP destination table can hold up to 64 entries per port.

The Device Server Family is capable of UDP multicast. UDP multicast is used to send serial data over an Ethernet cable to one or many hosts at the same time. UDP is a connectionless protocol, meaning this type of communication is not controlled by a higher-layer application, but sends data without any form of acknowledgement or error correction. Up to 64 devices can receive a UDP multicast at one time. Both the transmitting and receiving devices must be configured properly for UDP multicast to work.

Configuring UDP multicast communications involves configuring the Device Server for the following types of connections:

- Inbound connections, that is, connections that are initiated by the device on the other side of the network.
- Outbound connection, that is, connections that are initiated by the device connected to the serial port.

Device support

This command is supported in all devices.

Required privileges

Anyone can display the UDP destination table. Root privileges are required to add entries.

Syntax

Configure destinations

```
set udpdest [description=”string”] [ipaddress=dest-ip]
   [ipport=port] port=serial-port range=index
```

Remove destinations

```
set udpdest rmudp=on range=index port=serial-port
```

Display destinations

```
set udpdest [port=serial-port range=index]
```

Fields

description

A description of the destination, used for easy identification. This description can be up to 16 characters long. If it includes spaces, surround the entire string in quotation marks.

ipaddress

The destination’s IP address.

ipport

The UDP port number that will be used for communication with the destination.

port

The port or ports on which the serial device or devices reside. Enter this information in any of the following ways: port=1, port=1-2, port=1,2, port=1,2-4.

range

The index number or numbers that identify entries in the UDP destination table. Enter this information in any of the following ways: range=1, range=1-2, range=1,2, range=1,3-4.

rmudp=on

Removes the entries from the UDP destination table identified on the port and range fields.

Examples

Display entries in the UDP destination table

```
set udpdest port=1-2 range=1,2-4,6
```

Remove entries from the UDP destination table

```
set udpdest rmudp=on port=1-2 range=1,2-4,6
```

Configure entries in the UDP destination table

In this example, two entries are configured for the UDP destination table.

```
set udpdest port=1 range=1,2 ipaddress=192.2.2.2 ipport=50
```

Change an entry in the UDP destination table

In this example, one of the entries configured in the previous example is changed, that is, a different UDP port number is assigned one of the destinations.

```
set udpdest port=1 range=2 ipport=51
```

See also

set udpserial on page 179.

set udpserial

Purpose

Configures operating parameters for serial over UDP communication.

Device support

This command is supported in all devices.

Required privileges

This command requires root privileges.

Syntax

```
set udpserial [delimiters=string]
   [overflowpolicy={forward|flush}] range=ports [rmax=max]
   [rtime=time] [stripdelimiters={on|off}]
```

Fields

delimiters

The string in the serial data that tells the Device Server that the message is complete and should be forwarded to the destination. If you do not specify a delimiter, the Device Server will forward a message based on the number of bytes accumulated in the buffer (rmax field.) and on the period to wait for the buffer to fill (rtime field.).

Rules and guidelines for specifying this string are as follows:

- The string can be between 1 and 4 characters long.
- The string can be made up of printable or unprintable characters.
- To use an unprintable character, enter the character in hexadecimal format, that is, \x*hh*, where *hh* is replaced with a hexadecimal number.
- There are several unprintable characters that can be entered using a shortcut, enabling you to avoid entering hexadecimal digits. They are: \t (tab), \r (carriage return), \n (line feed).
- To use the backslash character as a delimiter, enter two backslashe characters (\\).

There is no default delimiter.

overflowpolicy

Determines how the Device Server responds when the buffer that holds the serial data overflows. Choose one of the following:

forward

Forwards the buffer’s contents to the destination.

flush

Discards the buffer’s content.

The default is to forward the data.

range

The port or ports to which this command applies. Enter this information in any of the following ways: port=1, port=1-2, port=1,2, port=1,2-4.

rmax

The maximum number of bytes the buffer can accumulate before the Device Server forwards the contents to the destination. The range is 1 to 65,535 bytes. The default is 1024 bytes.

rtime

The period to wait for the buffer to fill before forwarding it to its destination. The range is 1 to 60,000 milliseconds. The default is 100 milliseconds.

stripdelimiter

Determines whether the Device Server strips the delimiter string from the message before sending the message to the destination.

Examples

Discard the message when the buffer fills

In this example, the serial message will be forwarded to the destination when two consecutive tab characters are encountered in the data stream. If the buffer fills before this delimiter string is encountered, the message is discarded.

```
set udpserial range=1 delimiter=\t\t overflowpolicy=flush
```

Configure the wait period

In this example, the time to wait for the end of a message is configured for 200 milliseconds, which doubles the default value.

```
set udpserial range=1 rtime=200
```

See also

set udpdest on page 177.

set user

Purpose

Configures and displays user options.

- Configures a range of options associated with users, such as whether the user automatically connects to a host or is required to supply a password.
- Displays configuration attributes stored in the user table, such as whether a user must supply a password.

Note: The user option SSH version 2 encryption for secure communication (SSH2) is supported on the server version only, and not on the client version.

Device support

This command is supported in all devices.

- The Device Server Family user table holds up to 9 users.

Required privileges

Root privileges are required to use this command.

Syntax

Configure user attributes

```
set user [accesstime=time][addrcompress={on|off}][asyncmap=map]
   [autoconnect={on|off}] [autohost=ip-addr] [autoport=tcp-port]
   [autoservice={default|telnet|rlogin|raw}] [bringup=filter]
   [chapid=id][chapkey=key][commandline={on|off}]
   [compression={vj|none}] [connectesc={off|esc-char}]
   [defaultaccess=service] [device=device-name]
   [dialout={on|off}] [downdly=seconds]
   [flushstchar={default|on|off}] [idletimeout=time]
   [ipaddr=ip-addr] [ipmask=mask]
   [keepalive={on|off} [keepup=filter] [killescchar=character]
   [loadkey=host:key] [localbusydly=seconds]
   [localipaddr=ip-addr] [loginscript=script]
   [logpacket=filter] [maxsessions=number]
   [menu={off|index-num}] [mtu=bytes]
   [n1, n2=phone-number] [name=name]
   [netrouting={off|send|rec|both}][netservice={on|off}]
   [network][newname=string] [outgoing={on|off}]
   [p1,p2...=script-parm] [papid=id] [pappasswd=password]
   [passive={on|off}] [passpacket=filter] [password={on|off}]
   [ports=ports] [pppauth={none|pap|chap|both}][protocol=ppp]
   [protocompress={on|off}] [range=range] [rloginesc=char]
   [rmkey={on|off}] [rmtbusydly=seconds]
   [sessiontimeout=seconds] [telnetesc=character]
   [vjslots=number]
```

Display entries from user table

```
{set user {[name=name]|[range=range]} |
   set user name=name network}
```

Remove entry from user table

```
set user [range=range] [rmuser={on|name}]
```

Fields

addrcompress

Specifies whether the device server attempts to negotiate address compression on PPP connections.

on

The device server attempts to negotiate address compression.

off

The device server does **not** attempt to negotiate address compression.

The default is on.

asyncmap

A mask for PPP connections that defines which of the 32 asynchronous control characters to transpose. These characters, in the range 0x00 to 0x1f, are used by some devices to implement software flow control. These devices may misinterpret PPP transmission of control characters and close the link. This mask tells PPP which characters to transpose.

The default is FFFF, which means transpose all 32 control characters. Any combination is valid. The following are the masks most likely used:

FFFFFFFF

Transpose all control characters.

00000000

Transpose none.

000A0000

Transpose Ctrl-Q and Ctrl-S.

autoconnect

Specifies whether the user is automatically connected to another system.

on

A Telnet or Rlogin user will be automatically connected to another system without accessing the device server command line once the user has satisfied login and password requirements. If you specify on, you should also specify the autohost and autoport or autoservice fields.

off

The user will **not** be automatically connected to another system.

The default is off.

autohost

The IP address of a host to which this Telnet or Rlogin user should be automatically connected. Use this field only if you specify autoconnect=on.

autoport

The TCP port to use for the automatic connection. Use this field only if you specify autoconnect=on.

If you specify autoconnect and do not specify a TCP port, the port will be determined by the autoservice field, or—if there is no autoservice field specified—the default, port 513, which is Rlogin.

autoservice

An alternate way to specify a TCP port for an autoconnect user (see the autoport field). Use this field only if you specify autoconnect=on. Specify one of the following services:

- telnet
- rlogin, or remote login
- raw, which means that data is passed between the serial port and the TCP stream without modification.
- default, which normally means the Device Server uses Telnet. The exception is if the autoport field is 0 or 513. In that case, rlogin is used.

The default is the value of the autoport field.

bringup

The name of a filter, defined on the set filter command, that the device server uses to initiate a remote connection to a PPP user. If you do not use a bringup filter, the PPP connection will always be up. If you use a bringup filter, you should also use a keepup filter to ensure that the connection is not closed prematurely. This filter must have been created before you can reference it on this field.

chapid

A character string that identifies the outbound PPP user using CHAP authentication. This is equivalent to a user or login name. The string must be 16 or fewer characters and must be recognized by the peer.

chapkey

A character string that authenticates the outbound PPP user using CHAP authentication. This is equivalent to a password. The string must be 16 or fewer characters and must be recognized by the peer.

commandline

Specifies whether a user can access the device server command line to issue commands.

on

A Telnet, Rlogin, PPP user can access the device server command line to issue commands.

off

A user **cannot** access the command line and **cannot** issue commands.

The default is on.

compression

Specifies whether compression is used on PPP connections.

vj

Van Jacobsen header compression is used on PPP connections.

none

Header compression is not used on PPP connections.

The default is vj, that is, Van Jacobsen Header compression is on.

connectesc

The escape character for users using the connect command. The default escape character is Ctrl [(Control key and left bracket).

defaultaccess

Restricts the service accessible to the user. The options are:

commandline

The device server command line is displayed to the user.

menu

A menu is displayed to the user. If you specify this option, you must also specify a menu number on the menu field.

autoconnect

The device server automatically connects the user to the destination specified on the autohost field.

netservice

Starts PPP services. For inbound PPP users, defaultaccess=netservice is required. Do **not** use netservice for outbound PPP users.

outgoing

This user is limited to outgoing connections.

The default is commandline.

device

The name of a device or a device pool, defined with the set device command, used for outbound PPP connections.

dialout

Specifies whether an outbound PPP connection is started.

on

Starts an outbound PPP connection. A dialer script requires this field to be on to initiate outbound connections.

off

Disconnects an outbound PPP connection.

The default is off.

downdly

The number of seconds the dialer script should delay before attempting to establish a PPP connection with a previously inaccessible host. The range is unlimited. The default is 0, which means do not delay in making the attempt to reconnect.

flushstchar

Determines whether the first character of an autoconnection is discarded. If you specify flushstchar=default, the first character will be discarded for Telnet and Rlogin connections and will not be discarded for raw connections.

idletimeout

The maximum time in seconds that a PPP user's connection can be idle before the user is disconnected. The range is 0 to unlimited. The default is 0, which means that the user will never be disconnected for lack of connection activity.

ipaddr

The remote PPP user's IP address. Outbound PPP users can normally use the default. Possible values are:

A specific IP address, in dotted decimal format

For inbound PPP users, using a specific IP address means that this is the IP address to assign to the client. For outbound PPP users, using a specific IP address means that the server must recognize this address as its own or the call will not be completed.

negotiated or 0.0.0.0

For inbound PPP users, this means that the client will provide an address.

ippool or 255.255.255.254

The device server provides an address for the peer from its IP address pool. This value (ippool) can be used by inbound PPP users only.

The default is negotiated. Normally, outbound PPP users can use the default.

ipmask

The IP mask to apply to the address specified on the ipaddr field. When you specify a specific IP address on the ipaddr field, this field modifies the meaning of the IP address for routing purposes. The default is 255.255.255.255.

keepalive

Determines whether the keepalive function is implemented with autoconnections. The default is off.

keepup

The name of a keepup filter, defined with the set filter command, that the device server uses to maintain PPP connections. A keepup filter is one in which the reception of certain types of packets are indications to device server that the connection should be maintained.

killescchar

The kill character, which is used to close sessions. The default is ^u.

loadkey=*host:key*

This field applies to the devices listed in the following table:

Device	Required Hardware	Required Firmware
Device	**Required Hardware**	**Required Firmware**
2-Port Device Server	50000771-02A or higher	82000747A or higher
4-Port Device Server	50000771-03A or higher	

Where:

host

The IP address or DNS name of a host from which the SSH2 public key will be downloaded (using TFTP) to the Device Server.

key

The name of a DSA file on the host, which contains the SSH2 DSA public key. If your host’s implementation requires a complete path to this file, specify the path here as well.

localbusydly

The number of seconds that device server delays before retrying to establish a PPP connection that could not be made because local ports were unavailable. The range is 0 to an unlimited number of seconds. The default is 0, which means there will be no delay.

localipaddr

The IP address of the local end of a PPP link, which can be one of the following:

0.0.0.0

For outbound PPP users, specifying this value means that the user will request an IP address from the remote server. Inbound PPP users do **not** use 0.0.0.0.

A specific IP address

For outbound users, specifying a specific IP address means that the Device Server will attempt to use this IP address. The remote server must agree to this request. For inbound PPP users, this IP address must be unique. That is, no other user can use this IP address and this **cannot** be the IP address of the Ethernet interface.

loginscript

The name of a script, defined with the set script command, to use to log in to a remote system.

Login scripts are seldom required. Use them when you are configuring Device Server-to-Device Server connections and the Device Server that is to be accessed requires the user to supply a password. If you want to use the generic login script that comes with your Device Server, specify loginscript=loginscript. Do not use this script to log into Microsoft Windows systems.

logpacket

The name of a filter designed to write to the log file whenever device server handles a particular type of packet on PPP connections.

maxsessions

The maximum number of ports that a Telnet or Rlogin user can be logged into at the same time. A value of 0 means that the user can be simultaneously logged into all ports specified on the ports field.

menu

Specifies whether a menu is presented to the user, and if so, which menu.

index-num

The menu, identified by an index number in the menu table, that will be presented to this user.

off and 0 (zero)

No menu is presented to the user.

The default is off.

mtu

The maximum transmission unit (frame size in bytes) to use for this PPP connection. For PPP connections, the MTU is negotiated, so enter 1500, the largest size device server will permit the remote host to send. For PPP users, the range is 128 to 1500 bytes, and the default is 1500 bytes.

n1,n2*...*

Phone numbers (up to 10) to dial to request a PPP outgoing connection, which dialer scripts reference. If you enter more than one number, when device server encounters a busy signal, it tries these numbers in the order specified here. This field is required for outbound PPP connections that use modems. You can enter this number as digits only, with dashes (-) separating digits, or with commas.

name

The name that identifies this user.

netrouting

Specifies how Routing Information Protocol (RIP) routing updates are handled on connections to this PPP user. Use this field only if the user is an IP router.

off

This user is not included in RIP updates.

send

Propagate RIP updates to this user, but do not accept RIP updates from this user.

receive

Accept RIP updates from this user, but do not send RIP updates to this user.

both

RIP updates will be sent to and received from this user.

The default is off .

netservice

Specifies whether PPP connections are allowed.

on

Allows PPP connections for the user.

off

Allows no PPP connections for the user.

To configure inbound PPP users, you must specify netservice=on.

network

Displays network-related options associated with the user specified on the name field.

newname

A new name for a previously defined user.

outgoing

Specifies whether the user can initiate outgoing serial connections.

on

The user can initiate outgoing serial connections. For outbound users, outgoing=on is required.

off

The user cannot initiate outgoing connections

p1, p2 ...

Letters and numbers that can be used in the variable fields of login or dialer scripts. p1 is typically used to supply user names and p2 passwords.

papid

A character string that identifies the outbound PPP user using PAP authentication. This is equivalent to a user (or login) name. The string must be 16 or fewer characters and must be recognized by the peer.

pappasswd

A character string that authenticates the outbound PPP user using PAP authentication. This is equivalent to a password. The string must be 16 or fewer characters and must be recognized by the peer.

passive

Specifies whether the device server waits for the remote system to begin PPP negotiations, or can initiate PPP negotiations on its own.

on

The device server waits for the remote system to begin PPP negotiations.

off

The device server may initiate PPP negotiations.

The default is off .

Do not set both sides of a PPP connection to passive=on.

passpacket

The name of a filter designed to allow packets meeting filter criteria to pass through device server serial ports on PPP connections.

password

Specifies whether a device server password is required of this user.

on

A device server password is required of this user.

off

A password is not required of this user.

The default is on.

ports

A port or range of ports that this user can access.

pppauth

Determines whether authentication is required for inbound PPP connections and, if so, what kind.

none

The remote user does not require PPP authentication.

chap

CHAP authentication is required.

pap

PAP authentication is required.

both

Both CHAP and PAP authentication is required.

The default is none.

CHAP authentication works between two Device Servers. CHAP will be negotiated to PAP for all other connections

protocompress

Specifies whether the device server attempts to negotiate protocol compression on PPP connections.

on

The device server attempts to negotiate protocol compression on PPP connections.

off

The device server will **not** negotiate protocol compression.

The default is on.

protocol=ppp

Specifies that this is a PPP user, which is required for all PPP users.

range

Identifies an entry or range of entries in the user table to display or remove.

rloginesc

A different escape character than the ~ (tilde) character. This character is used for disconnecting from the remote host.

rmkey

Enables or disables the SSH2 public key defined on the loadkey field.

on

Enables the SSH2 public key defined on the loadkey field.

off

Disables the SSH2 public key defined on the loadkey field.

The default is on.

rmtbusydly
The number of seconds that device server delays before reattempting a connection to a remote system that was previously inaccessible. The range is 0 to an unlimited number of seconds. The default is 0, which means no delay.

sessiontimeout
The maximum time in seconds that a user may be connected. The range is 0 to an unlimited number of seconds. The default is 0, which means that there is no limit.

telnetesc
The Telnet escape character for this user. The default is ^] (Ctrl and right bracket).

vjslots
The number of slots used for Van Jacobsen header compression. The number of slots you configure should correspond to the expected maximum number of simultaneous connections using Van Jacobson header compression on this WAN interface. To avoid excessive processor usage, configure only the number you will need.

The default is 16 and the range is 4 to 255.

Examples

Display entire user table

```
set user
```

Display a range of entries in the user table

```
set user range=2-7
```

Display a single user

```
set user ra=1
```

Configure an autoconnect user

```
set user name=user4 autoconnect=on autohost=199.193.150.10
  autoport=23 defaultaccess=autoconnect
```

Configure an inbound PPP user

```
set user name=pppin protocol=ppp defaultaccess=netservice
  netservice=on
```

```
set user name=pppin ippaddr=ip-pool localipaddr=143.191.3.4
```

Configure an outbound PPP user

```
set user name=pppout protocol=ppp papid=pppout pappasswd
```

```
set user name=pppout device=genmdm localipaddr=0.0.0.0 outgoing=on
  n1=4452624
```

show

Purpose

Displays the following information on the Device Servers:

- Configuration settings.
- Current versions of the Boot, POST, and OS components.

Device support

This command applies to all devices.

Required privileges

Anyone can use this command.

Syntax

```
show option [range=range]
```

Fields

option

One of the following options:

Option	Displays events associated with ...	Works with Range Field
altip	set altip setting	yes
arp	set arp settings	yes
auth	set auth settings	yes
buffers	set buffers. This option applies to 2-Port and 4-Port Device Servers only.	yes
chat	set chat settings	yes
config	set config settings	no
device	set device settings	yes
dhcp	set dhcp setting	no
ethernet	set ethernet settings	no
flow	set flow settings	yes
forwarding	set forwarding settings	no
host	set host settings	yes
ia netmaster	set ia netmaster settings	no
ia route	set ia netslave settings	no
ia serial	set ia serial settings	yes
ippool	set ippool settings	no
keys	set keys settings	yes
lines	set line settings	yes
logins	set logins settings	yes
menu	set menu settings	yes

Option	Displays events associated with ...	Works with Range Field
modem	set modem settings	yes
ports	set ports settings	yes
route	set route settings	yes
script	set script settings	yes
secureaccess	set secureaccess settings	no
service	set service settings	yes
snmp	snmp settings	no
socketid	socketid settings.	yes
tcpip	set tcpip settings	no
telnetip	set telnetip settings	yes
terms	set terms settings	yes
trace	set trace settings	no
udpdest	set udpdest settings	yes
udpserial	set udpserial settings	yes
user	set user settings	yes
version	Version of POST, Boot, and EOS running on the device server.	no

range

A configuration table entry or range of entries.

Examples

Display current versions of POST, Boot and EOS

```
show version
```

Display settings for a particular user

```
show user range=3
```

status

Purpose

Displays the current list of sessions. This includes any session that was created by a connect, rlogin, or telnet command. Typically, the status command is used to determine which sessions to close.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
status
```

Example

In this example, the status command provides information on the user’s current Telnet session.

```
status
```

See also

- connect on page 56
- close on page 55, for information on ending a connection.
- rlogin on page 80
- telnet on page 196

The status command displays the status of outgoing connections (connections made by connect, rlogin, or telnet commands). In contrast, the display command displays real-time information about a device, while the info command displays statistical information about a device over time, while. For more information, see these commands:

- display on page 58
- info on page 64.

telnet

Purpose

Establishes a Telnet session with a remote system.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
telnet {hostname|host-ip-addr} [tcp-port]
```

Field Descriptions

hostname

The name of the host to which you want a Telnet session. DNS must be configured on the device server to use this option.

host-ip-addr

The IP address of the host to which you want a Telnet session.

tcp-port

The TCP port assigned the Telnet application on the remote system. The default is 23, the port typically used for Telnet.

Examples

Establish a Telnet session using a host name

In this example, the telnet command establishes a Telnet session using a host name. The default TCP port (23) is used.

```
telnet host1
```

Establish a Telnet session using an IP Address

In this example, the telnet command establishes a Telnet session using an IP address. The default TCP port (23) is used.

```
telnet 192.192.150.28
```

Establish a Telnet session to a device server port from the LAN

In this example, a user on the LAN initiates a Telnet connection to port 4 on a device server named host-1.

```
telnet host-1 2004
```

traceroute

Purpose

Displays a list of routers through which an IP packet passes on its way to a particular destination.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
traceroute ip-addr|name
```

Field

ip-addr* | *name
Either the IP address or the DNS name of the host to which you want a route traced.

Examples

Trace a route using an IP address

```
traceroute 199.150.150.74
```

Trace a route using a name

In this example, the traceroute command traces a route to a host using a host name.

```
traceroute poe
```

uptime

Purpose Displays the amount of elapsed time since the last reboot.

Device support This command is supported in all devices.

Required privileges Anyone can use this command.

Syntax

```
uptime
```

Example

```
uptime
```

wan

Purpose

Initiates and controls wide-area network (WAN) connections, or displays the status of current WAN connections.

Device support

This command is supported on 2-Port and 4-Port Device Servers only.

Required privileges

Anyone can display the status of WAN connections. Root privileges are required to initiate or control WAN connections.

Syntax

Initiate and control WAN connections

```
wan [close=user-name] [initmodem=range] [start=user-name]
   [testmodem=range] [verify={all|user-name}]
```

Display status of WAN connections

```
wan [range=range]
```

Fields

close

Closes an outbound connection. The connection is identified by a user name.

initmodem

Executes the modem initialization script associated with the port or ports specified, where *range* specifies either a port or range of ports.

start

Places the connection in the start-up condition. The connection is identified by a user.

testmodem

Executes the modem test script associated with the port or ports specified. See set modem on page 139 for information on test scripts.

verify

The verification performed by the command.

all

Verifies that all connections are associated with real users, that is, users that are defined in the configuration.

wanname

Verifies that the user has been defined in the configuration.

Only incorrectly configured WAN interfaces produce a message in response to this command. If WAN interfaces are configured correctly, no message is returned.

Examples

Initiate a WAN connection

```
wan start=user-ppp01
```

Close a WAN connection

```
wan close=user-ppp01
```

Display WAN status information

In this example, the wan command displays the status of the connection on port 2.

```
wan range=2
```

See also

- set modem on page 139
- set filter on page 102

who

Purpose

Displays a list of current device server users.

Device support

This command is supported in all devices.

Required privileges

Anyone can use this command.

Syntax

```
who [range=tty-tty]
```

Field

range

Either a tty connection or a range of connections identified by tty connection number.

Examples

Display a list of all current users

```
who
```

Display a range of users

```
who range=5-10
```

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