Digi One and PortServer TS Family

This manual applies to:

Digi One Family products

PortServer TS Family products:

- PortServer TS Family (RS-232 only) Products:
- PortServer TS 1/2/4 Family Products
- PortServer TS 8/16 Family Products

PortServer TS MEI Products

Digi Remote Power Manager (Digi RPM)

Command Reference

Revision history—90001535

Revision	Date	Description
R	January 2014	Added information on the port logging feature and improved screen captures.
S	February 2014	Clarified information about product model support of port sharing feature. Added European compliance information in certifications section.
T	December 2016	Updated the cover page and removed references to the DF1 half duplex protocol.
U	January 2020	Updated to document initial default passwords.
V	October 2020	Command changes.

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Contents

Chapter 1 Command Line Configuration Tasks

Quick Reference for Configuring Features 7
Access the Command Line 12
Commands for Managing Connections and Sessions 13
Users and User Permissions 14
Configure RealPort 15
Configure an IP Address 16
Configure Serial Port Settings 17
Configure Port Logging 27
Configure Network Settings 28
Configure Security Features 35
Configure Power Over Serial Ports 43
Configure User Attributes 44
Configure Embedded Modem 46
Configuration Management 47

Chapter 2 Command Descriptions

Basic Command Information 50
Commands for Managing Connections and Sessions 53
admin 54
boot 55
close 58
connect 60
cpconf 62
display 63
display buffers 65
exit 66
help 67
info 68
kill 70
mode 71
newpass 73
ping 74
power 76

quit 79
reconnect 80
remove 81
revert 83
rlogin 87
send 89
set altip 91
set arp 93
set auth 94
set buffer 98
set chat 99
set config 101
set consmenu 107
set device 109
set dhcp 111
set embmodem 113
set ethernet 114
set filter 116
set flow 121
set forwarding 125
set host 129
set ia 130
set ippool 152
set keys 153
set line 155
set logins 158
set logport 161
set mei 164
set menu 165
set modem 168
set netlogins 170
set netport 173
set pmodem 174
set ports 175
set powerunit 181
set profiles 184
set radius 187
set rloginoption 190
set route 191
set rpauth 193
set script 194
set secureaccess 200

set service 202
set sharing 204
set snmp 208
set snmpauth 211
set sntp 213
set socketid 215
set switches 217
set tcpip 221
set telnetip 224
set terms 226
set time 228
set timezone 229
set trace 231
set udpdest 232
set udpserial 234
set user 237
set web 250
show 251
status 254
telnet 255
traceroute 257
uptime 258
wan 259
who 261

Chapter 3 Modem Emulation Commands

What Is Modem Emulation? 263
Modem Emulation Cable Signals 263
Modes of Operation 263
Common User Scenarios for Modem Emulation 264
Connection Scenarios for Modem Emulation 266
About the Commands in this Chapter 267
Accepted But Ignored AT Commands 267
Modem Emulation AT Command Set 268
S-Register Definitions 271
Result Codes 273

Index 275

Chapter 1 Command Line Configuration Tasks

This chapter introduces the command-line interface and 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 Digi devices in which the features are supported, the commands used to configure each feature, and where to find more information in this chapter.

Feature/Task	Digi Devices supported in	Commands, discussion, examples
Autoconnection	All	• "Configure Autoconnection" on page 24 • "set ports" on page 176 • "set user" on page 238
Configuration management:		
• Backup/Restore configuration	All	• "cpconf" on page 62
• Upgrade firmware	All	"Upgrade Firmware" on page 48
• Copy configuration to and from a remote host	All	• "Copy the Configuration to and from a Remote Host (Backup/Restore)" on page 48 • "cpconf" on page 62
• Reset configuration to defaults	All	• "Reset the Configuration to Defaults" on page 48 • "revert" on page 83 or: • "boot" on page 55 (**boot action=factory**)
Domain Name Server (DNS)	All	• "Configure Domain Name System (DNS)" on page 33 • "set config" on page 100 • "set host" on page 128
Embedded Modem	PortServer TS M MEI Family	• "Configure Embedded Modem" on page 47 • "set embmodem" on page 112 • "set ports" on page 176; **dev** option, where **dev=min**, **mout**, or **mio**

Feature/Task	Digi Devices supported in	Commands, discussion, examples
Industrial Automation (IA):		
• Protocol conversion between Modbus, Allen-Bradley, and ASCII device	Digi One IAP	• "Configure Industrial Automation (IA)" on page 23 • "set ia" on page 129 • For additional information on configuring Industrial Automation, go to the Digi website, www.digi.com and search on **Industrial Automation** or **IA**
• Allen-Bradley Ethernet-to-Serial Bridging	Digi One IAP	
• Omron Hostlink Multi-Master	Digi One IAP	
• Modbus Ethernet-to-Serial Bridging	Digi One IA Digi One IAP PortServer TS Family	
• Custom (user-defined) Multi-Master Protocol	Digi One IAP PortServer TS Family	
IP routing	All	• "Configure IP Routing" on page 29 • "set route" on page 192 • "set forwarding" on page 124 • "set user" on page 238
MEI	PortServer TS 8/16 ME Family	• "set mei" on page 165 • "set switches" on page 218
Modem emulation	Digi One SP Digi One IA PortServer TS Family	• "Configure Modem Emulation" on page 23 • "set pmodem" on page 175 • "set ports" on page 176; **dev=pm** option • AT commands: See "Modem Emulation Commands" on page 263
Point-to-Point Protocol (PPP) connections	PortServer TS Family	• "Configure PPP Connections" on page 18 • "set ports" on page 176 • "set flow" on page 120 • "set user" on page 238 • "set filter" on page 115 • "set route" on page 192 • "set forwarding" on page 124 • "set device" on page 108 • "set ippool" on page 152
Port buffering	PortServer TS Family	• "display buffers" on page 65 • "set buffer" on page 97
Port logging	Digi One IAP PortServer TS Family	• "Configure Port Logging" on page 28 • "set logport" on page 161
Port profiles	All devices that support the default Web user interface	• "set profiles" on page 185

Feature/Task	Digi Devices supported in	Commands, discussion, examples
Port sharing This is an advanced serial-port setting that allows more than one client to open a serial port through RealPort, reverse Telnet, reverse SSH, or connect.	All PortServer TS Family products. All Digi One products **except** Digi One IAP. The console menu feature and the Console Management port profile are available on PortServer TS Family devices only. When used with RealPort, the port sharing feature is formally tested with the Windows RealPort driver only, and not with Unix/Linux driver versions.	• "Configure Port Sharing" on page 25 • Configure port-sharing options: "set sharing" on page 205 • Display port-sharing options: "set sharing" on page 205“or "show" on page 252 (**show sharing** option). • Use the **set profile profile=consmenu** command to enable the console menu feature, which in turn allows for port sharing. • Set up the console menu options, for displaying current users, disconnecting other sessions, displaying entries in the port buffer, or accessing the command line: "set consmenu" on page 106.
Power Features:		
• Power through Integrated Remote Power Management (RPM)	PortServer TS Family	• "power" on page 76 • "set powerunit" on page 182
• Power Over Ethernet (POE)	Digi One IAP PortServer TS P MEI Family	This is a hardware feature. There are no configurable software settings for this feature.
• Power Over Ports/Power Over Serial	PortServer TS P MEI Family	This is a hardware feature. Enabling it involves changing a jumper inside the device. See "Configure Power Over Serial Ports" on page 44. • Display status of circuit breaker: “display circuitbreaker” (See "display" on page 63) or “set config print” • Reset circuitbreaker: • “set config circuitbreaker=reset” (See "set config" on page 100)
RealPort	All	• See also the RealPort Setup Guides for details on configuring this feature. • To configure RealPort authentication options, see "set rpauth" on page 194.
Remote login (rlogin)	All	• "rlogin" on page 87 • "set rloginoption" on page 191
Revert configuration settings	All	"revert" on page 83

Feature/Task	Digi Devices supported in	Commands, discussion, examples
Security, users, and access control features:		
• Control user access to configuration settings	All	• "Control Access to the Configuration" on page 36 • "set user" on page 238
• Control user access to inbound and outbound ports	All	• "Control Access to Inbound Ports" on page 37 • "Control Access to Outbound Ports" on page 38 • "set ports" on page 176; **dev** option • "set logins" on page 158 • "set user" on page 238
• Control user access to the command line	All	• "Control User Access to the Command Line" on page 38 • Through autoconnect by port: "set ports" on page 176 • Through autoconnect by user: "set user" on page 238 • Through menus: "set menu" on page 166
• Restrict access to outbound ports	All	• "Restrict Access to Outbound Ports" on page 38 • "set auth" on page 94
• Use CHAP authentication for PPP users	All	• "Use CHAP Authentication for PPP Users" on page 38 • "set user" on page 238
• Use RADIUS to authenticate users	PortServer TS Family	• "Use RADIUS to Authenticate Users" on page 39 • "set radius" on page 188 • "set filter" on page 115
• Issue user passwords	All	• "Issue User Passwords" on page 41 • To enable/disable password for a user: "set user" on page 238 • To issue new password to user: "newpass" on page 73 • "Configure User Attributes" on page 45

Feature/Task	Digi Devices supported in	Commands, discussion, examples
Security, users, and access control features (continued):		
• Configure SSH Version 2 for secure communication	Digi One IAP PortServer TS Family	• "Configure SSH Version 2 Encryption for Secure Communication" on page 42 • Configure password protection: "set user" on page 238; **name** and **password** options, and "newpass" on page 73 • Use a public key: "set user" on page 238; **name**, **loadkey**, and **public_key** options • Make reverse SSH connections to ports: **ssh *base_port*+ 500 + *port_number***
• Configure a custom menu to be displayed to a user	PortServer TS Family	• "Configure User Attributes" on page 45 • "set user" on page 238; **defaultaccess=menu**
• Automatically connect a user	All	• "Configure User Attributes" on page 45 • "set user" on page 238; **autoconnect=on**
• Delete a user definition (Remove a user from the user table)	All	• "Configure User Attributes" on page 45 • "remove" on page 81 • Note that the **root** user cannot be deleted.
• Set common user features (user attributes)	All	• "Configure User Attributes" on page 45 • "set user" on page 238; **name** option
• Use a RADIUS server to set user attributes	PortServer TS Family	• "Configure User Attributes" on page 45 • "set radius" on page 188 • "set filter" on page 115
Simple Network Management Protocol (SNMP)	All	• "Configure SNMP" on page 34 • "set snmp" on page 209 • "set snmpauth" on page 212
TCP Socket Communication	All	"set tcpip" on page 222
Time-related features, including Simple Network Time Protocol (SNTP) client configuration	PortServer TS 8/16 Family PortServer TS 8/16 MEI Family	• "set sntp" on page 214 • "set time" on page 229 • "set timezone" on page 230
UDP Multicast Communication	All	• "set udpdest" on page 233 • "set udpserial" on page 235
Web interface	All devices that support the default Web user interface	• "set netport" on page 174 • "set web" on page 251

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 options of the terminal or terminal emulation software to work with the Digi serial port. The default port settings are:
   - VT 100 emulation
   - 9600 baud
   - 8-bit character
   - 1 stop bit
   - No parity
3. Log in as the **root** user.

   Note: The default user name is root. The default password is printed on the device label. If a password is not on the label, the default password is **dbps**. If neither default password works, the password may have been updated. Check with your system administrator.

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 configure the Digi device with an IP address already. See "Configure an IP Address" on page 17.

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 in as the **root** user.

   Note: The default user name is root. The default password is printed on the device label. If a password is not on the label, the default password is **dbps**. If neither default password works, the password may have been updated. Check with your system administrator.

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 38.

Commands for Managing Connections and Sessions

These commands are used to manage connections and sessions:

- **close**: Closes active sessions that were opened by **connect**, **rlogin**, and **telnet** commands.
- **connect**: Makes a connection, or establishes a connection, with a serial port.
- **exit** and **quit**: These commands terminate a currently active session.
- **who** and **kill**: The **who** command displays a global list of connections. The list of connections includes those associated with a serial port or the command-line interface. who is particularly useful in conjunction with the kill command, which terminates active connections. Use who to determine any connections that are no longer needed, and end the connections by issuing a kill command.
- **mode**: Changes or displays the operating options for a current Telnet session.
- **ping**: Tests whether a host or other device is active and reachable.
- **reconnect**: Reestablishes a previously established connection; that is, a connection opened by a **connect**, **rlogin**, or **telnet** command; the default operation is to reconnect to the last active session.
- **rlogin**: Performs a login to a remote system.
- **send**: Sends a Telnet control command, such as break, abort output, are you there, escape, or interrupt process, to the last active Telnet session.
- **status**: Displays a list of sessions, or outgoing connections made by **connect**, **rlogin**, or **telnet** commands for a device. Typically, the **status** command is used to determine which of the current sessions to close.
- **telnet**: Makes an outgoing Telnet connection, also known as a session.

Users and User Permissions

Digi One and PortServer TS products have two types of users, with different user permissions that influence the commands that the users can issue.

The “root” User

A **root** user exists in all products. This root user has permissions to execute all commands, except **admin**, which is used to give a normal user temporary administrative privileges. The root user can configure settings as well as display current settings. This root user definition cannot be changed or deleted.

“Normal” Users

You can define additional users for your Digi products using the **set user** command, known as “normal” or “customer-defined” users. These users have limited user permissions for executing commands that cannot be altered.

“Required Permissions” Statements in Command Descriptions

Each command description has a **Required permissions** statement that defines which users can use the command, and how they can use it. For example:

- **Root privileges are required to use this command** means that only the root user can issue the command.
- **Anyone can use this command** means that root and normal users can issue the command.
- For **set** commands that configure features, the root user can issue commands to configure the features, but normal users can display current settings for the feature only.

Increasing Security for Digi Device Users

As needed, you can enforce additional security for device users by either of these methods:

- Custom menus: You can create a custom menu displayed to device users at login that offers a limited subset of commands. The **set menu** command is used to create custom menus. See "set menu" on page 166.
- Using the autoconnect feature, where after login the user is automatically connected to another system without accessing the Digi device’s command line and password requirements. You can configure autoconnection by port or by user. See "Configure Autoconnection" on page 24.

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.

The **set rpauth** command sets authentication options for RealPort. RealPort has a challenge-authentication protocol that, if enabled, allows only hosts that authenticate to use ports on the Digi device. This authentication protocol is supported for both encrypted and unencrypted versions of RealPort.

In order to use RealPort authentication, it must be enabled in both the driver and the Digi device.

For further configuration details, see "set rpauth" on page 194 and the *Digi One and PortServer TS Family 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.

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

   ```
   #> set config dhcp=off
   ```

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

   ```
   #> 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:

   ```
   #> 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:

   ```
   #> 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 Digi device at the prompt by entering:

   ```
   #> boot action=reset
   ```

For more information, see "set config" on page 100 and "boot" on page 55.

Example

The two **set config** commands configure the Ethernet interface. The **boot** command reboots the Digi device, 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
```

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
- Port sharing

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 the steps below. Regarding inbound PPP connections:

- For information on fine-tuning PPP connections, see "set user" on page 238.
- CHAP authentication works between two Digi devices. CHAP will be negotiated to PAP for all other connections

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

   ```
   #> set ports range=range dev=device
   ```

   where ***range*** is the port or ports and ***device*** is **min** for inbound-only modem connections, or **mio** for bidirectional modem connections.

   For example:

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

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

   ```
   #> 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:

   ```
   #> 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:

   ```
   #> 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:

   ```
   #> set user name=name ipaddr=ip address
   ```

   where ***name*** is the user's name, and ***ip address*** is one of the following:

   - A standard IP address in dotted decimal format.
   - 0.0.0.0, which means the remote user will supply the IP address.
   - The keyword **ippool**, which means the user will be assigned an IP address from an IP address pool. See "set ippool" on page 152.

   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 (a mask of 255.255.255.255 is required) by entering:

   ```
   #> set user ipmask=255.255.255.255
   ```

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

   ```
   #> 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 where:

- 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 176
- "set flow" on page 120
- "set line" on page 155
- "set user" on page 238

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 non-Digi device, select a PPP authentication type of none, using the **set user** option **pppauth=none**. CHAP authentication works between two Digi devices.
- If you change a filter type after an initial configuration, existing PPP sessions must be terminated and reestablished For the new filter settings 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 115 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
   ```

   Note: PortServer TS 1/3+Modem flow control default is Hardware.

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

   ```
   #> 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:

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

   For a description of the options for specifying the IP address, see "ipaddr=***ip addr***" on page 244 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:

   ```
   #> 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 108.

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

```
#> set forwarding state=active splithorizon=off poisonreverse=off
#> set route net=ip address mask=subnetmask metric=1 wanname="username"
```

The value of the **wanname** option must match the value of the **username** option in step 2.

7. To enable the new WAN interface, enter:

```
#> 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 (for the PortServer TS 1/3+Modem, the default is 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 Point-to-Point Protocol (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 up a connection.
- Send a message to the log file when a specified event occurs on the connection.

For example, you might 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 options 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 options related to filtering.

"set user" Option	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 Digi device 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 Digi device to send a message to the log file.	Filter that notifies the log anytime an ICMP packet is handled.

When Changes to Filter Definition Settings Take Effect

The **set filter** command can be used at any time to change and display filters. However, the results of any changes to filter definition settings take effect on subsequent PPP connections only. Any PPP connections established prior to a given filter change will continue to operate using the previous filter definition settings. For the new filter settings to take effect, existing PPP sessions must be terminated and reestablished.

More Information on Filters

For more information about using filters, see "set filter" on page 115, and "set user" on page 238.

Configure Industrial Automation (IA)

To configure how devices in an industrial automation (IA) environment communicate, use the **set ia** command.

See "set ia" on page 129 for command syntax, option descriptions, and examples. The syntax for “set ia” varies according to the IA device being configured: serial port-connected devices, network-based masters, network-based slaves, and destination tables for forwarding messages. The **set ia** command description shows these syntax variations, the effects of the command options for each variation, and examples of configuring several IA devices.

Protocols for IA Devices

IA devices can use various communication protocols, including Modbus variations (Modbus/RTU, Modbus/ASCII, and Modbus/TCP), AB/DF1 Full-Duplex, Hostlink, AB/Ethernet (CSP), Ethernet/IP, and a Custom (or “user-defined”) protocol.

Recommendations on Configuring Industrial Automation

Due to the flexibility involved, manual configuration of IA scenarios by command line is recommended for advanced users only. New users are encouraged to use the Industrial Automation Wizard under the Applications section of the Web Browser interface.

Where to Find More Information on Industrial Automation

Besides the **set ia** command description, additional information on configuring Industrial Automation is available in the Application Notes at the following URL:

https://www.digi.com/support/productdetail/documentation

Configure Modem Emulation

Modem emulation enables a system administrator to configure a networked Digi device server to act as a modem.

See "Modem Emulation Commands" on page 263 for more information on modem emulation.

Configure TCP Socket Communication

Transmission Control Protocol (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** option on the **set config** command. See "set config" on page 100.

Configure UDP Multicast Communications

User Datagram Protocol (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. See "set udpdest" on page 233.

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**, specifying the options **auto**, **autoservice**, **dest**, **dev**, and **dport**. See "set ports" on page 176.
- **set user**, specifying the options **name**, **autoconnect**, **autohost**, **autoport**, and **defaultaccess**. See "set user" on page 238.

Examples

Configure an autoconnect port

In this example, **set ports** configures the port so that all incoming users are automatically connected via Telnet to the host specified on the **dest** option. 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, **set user** configures the user **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 Port Sharing

A Digi device enabled for port sharing allows more than one client to open a port through RealPort, reverse Telnet, reverse SSH, or connect. All clients that share a port will read the same data from the serial port; the data is duplicated and sent to each client. All clients that share a port will have the data they write merged and sent out the serial port. The serial port options, such as baud rate and flow control, can either be shared by all clients or be controlled exclusively from the Digi device alone. If there is only one client, then RealPort, reverse Telnet, reverse SSH, and connect will work normally.

Digi Products Supporting Port Sharing

Port sharing is supported in the following products:

- All PortServer TS Family products.
- All Digi One products **except** Digi One IAP.

The console menu feature and the Console Management port profile are available on PortServer TS Family devices only.

When used with RealPort, port sharing feature is formally tested with the Windows RealPort driver only, and not with Unix/Linux driver versions.

Device Types that Allow Port Sharing

Port sharing is only available for device types **rp**, **prn**, and **mout**, as specified by the **set ports dev=*device*** option. Configuring port sharing

Configuring port sharing involves specifying how many clients are allowed to share the port, whether control should be shared by all clients or controlled exclusively by the Digi device, and the flow control timeout. These options can be configured independently for each port. The command for configuring port sharing is set sharing (see "set sharing" on page 205).

Configuring a Console Menu for Use with Port Sharing

The Console Menu feature of the Digi PortServer TS allows you to see who is already connected to a port, disconnect other sessions, display the last entries of the port-buffer or branch out to the command line of the unit. The console menu is configured using the **set consmenu** command. See "set consmenu" on page 106.

Displaying Port-Sharing Settings

Port-sharing settings are displayed by either of the following commands:

- **set sharing** - display variation (see "set sharing" on page 205)
- **show** - display variation (see "display" on page 63)

The port-sharing settings are displayed in four columns: **current clients**, **max clients**, **control**, and **timeout**.

The **current clients** column shows how many clients are currently sharing the port. The **max clients**, **control**, and **timeout** columns show the value set with the **clients**, **control**, and **timeout** options.

When Changes to Port-Sharing Settings Take Effect

Some changes will not take effect until all clients have closed a port. If this is the case, the **set sharing** command will print a warning message saying:

```
"Warning: Some port sharing parameter changes will not take effect until
all clients have closed the port."
```

Some changes take effect immediately, for example, changing the control, changing the timeout value, or increasing the maximum number of clients if the **clients** option is already larger than 1 (so that port sharing is already on).

About Flow Control on Shared Ports

All open shared ports share the same underlying input data buffers, so they must remain roughly in sync in the input data stream. For example, if one client stops reading data, the other clients sharing that same physical port can only read one buffer full of data ahead before they must wait for the first client to catch up.

To overcome this limitation that all clients must remain roughly in sync when reading data, a user-configurable timeout can be set by the **set sharing timeout** option. If one client is waiting for the other clients to read, it only has to wait until the timeout expires and then it will be allowed to continue reading. The other clients, that is, ones that are not reading data, will lose data from the time the timeout expires until they begin reading again. This timeout will not be set by default.

Considerations and Cautions for Port Sharing

There are several caveats when using port sharing:

- When clients send data to the ports, their data will be intermixed; that is, there is no synchronization of the data. If two clients send data at the same time, the data from one client might appear in the middle of the other client's data.
- If one client stops reading data, the input will be flow-controlled for all clients. Clients will only be able to read data at the rate of the slowest client. (There is a timeout to override this, as described above.)
- Incoming opens, persistent opens, and immediate opens may not behave as expected when multiple clients are opening the port at the same time.
- The modem control lines are not dropped until all clients have closed the port.
- When multiple clients share control of the serial port options, such as baud rate, data size, parity, flow control, etc., the last options set will take effect. The serial port options could be changed unexpectedly by another client. This could leave the RealPort driver confused about the correct serial port settings. Different RealPort drivers might react differently to these unexpected changes in serial port settings.

- When multiple clients share control of the serial port options, and a new client opens a port, that new client might momentarily set the options to default values before the application can set the options correctly. This might momentarily disrupt communication with the other clients.

  Depending on the operating system used by the client, it is possible to set the default serial port options to match the options required by the application. Then, there will be no disruption.
- When multiple clients share control of the serial-port options, some serial-port options, such as case conversion, carriage return, newline mapping, etc., might be handled on the client system. Therefore, these options would apply to the client that set these options only.
- When the Digi device exclusively controls the serial port settings, any attempt to change the serial port settings from a client will be silently ignored. The client will believe the settings have been changed, when in fact they have not. The only way to change the serial port settings is through the command line on the Digi device or through the web UI.
- With reverse Telnet, reverse SSH, and connect, it is possible for a single client machine to open a single shared port multiple times by using multiple telnet or ssh sessions.

  However, with RealPort, it is not possible for a single client machine to open the same RealPort multiple times and use port sharing. Windows simply prevents one machine from opening a RealPort more than once. Unix does allow a single machine to open a RealPort more than once, but the sharing is happening on that Unix machine, not on the Digi device.

  Unix sharing does merge data written to the port and shares control of the port. However, it does not duplicate the incoming data to all programs that have opened the same RealPort. Instead, the incoming data is arbitrarily divided among the programs.

  It is possible for one machine to use port sharing with RealPort, but only by configuring the RealPort driver multiple times for the same Digi device.
- Windows RealPort explicitly forces DTR and RTS to drop when it closes a port. This could prevent other clients sharing that port from sending or receiving data, depending on the configuration. If this is a problem, set the shared port for exclusive control. Unix RealPort does not have this problem.

Examples

The example "Display and Change Port-Sharing Settings" on page 207 shows how to use the **show sharing** and **set sharing** commands to display current port-sharing settings, configure port-sharing settings, and display the changed settings.

Configure Port Logging

The port logging feature passively logs data going into or out of a serial port. This means that you can be using a standard reverse or RealPort session on a port, and all the data from that session can be sent to a configurable server.

To configure port logging, use **set logport** command. See "set logport" on page 161.

To revert the port-logging settings to defaults or to the latest configuration stored in NVRAM, use the **revert logport** command. See "revert" on page 83.

Configure Network Settings

Configuring network settings involves setting network parameters, configuring IP routing, setting up a Domain Name Server (DNS). and setting up Simple Network Management Protocol (SNMP).

Configure Network Parameters

The **set config** command configures network parameter, and includes several options for optimizing your network for better Ethernet/IP performance. See "set config" on page 100.

The **set ethernet** command sets Ethernet options. See "set ethernet" on page 113.

Configure IP Routing

Configuring IP routing involves these tasks:

- Configure static routes using the “set route” command (see "set route" on page 192).
- Configure dynamic routes using the **set forwarding** command (see "set forwarding" on page 124).
- Configure Proxy ARP using the **set forwarding** command.

Configure Static Routes

To configure a static route over a PPP link, enter:

```
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 hops to the destination.
- **wanname** is the interface to use for this route.

  For routes over a PPP link, use the name of a PPP user that was defined in a previously issued **set user** command, for example **ppp1** or **link1**. (See "set user" on page 238 for information on and options for defining PPP users.)

  For routes over the Ethernet interface, use **ether**.
- **gateway** is the IP address of the device that is the next hop to the destination. If there is no next hop destination, set the gateway to the device IP address.

For more information on static routes, see "set route" on page 192.

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** option is a subnetwork address, not the IP address of a specific device.
- The **wanname=ether** option, indicating that this route is over the Ethernet interface.
- The **metric** option indicates that packets to this subnet will pass through two routers.
- The **gateway** option 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** option is IP address of a specific device, not a subnetwork address.
- The **wanname** option is the name of a PPP use, indicating that this route is over a PPP interface.
- The **metric** option indicates that packets to this subnet will pass through two routers.
- The **gateway** option 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
```

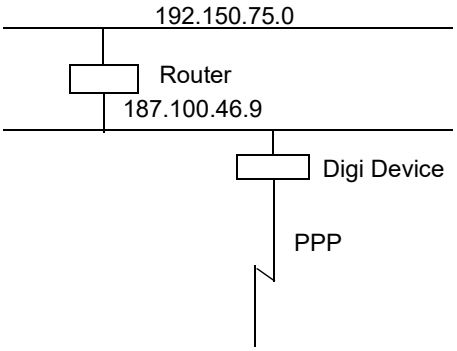
Configure Dynamic Routes Using RIP

To configure the device server for dynamic routing using the Routing Information Protocol (RIP), use the **set forwarding** command. See "set forwarding" on page 124.

You should be signed on as **root** and have configured 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” option 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**.

This example shows only those commands and command options pertinent to routing. The 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**.



The commands to configure this setup are:

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

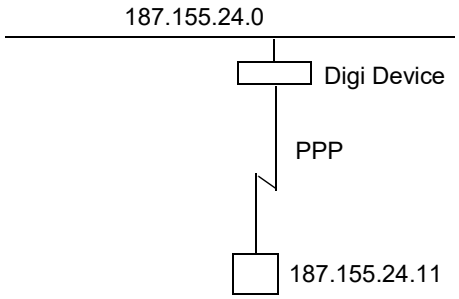
Configure Proxy ARP

To configure the device server for Proxy ARP, use the **set forwarding** command. See "set forwarding" on page 124.

This procedure assumes that you have signed on as **root** and have configured 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** option) 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 options:
   - **state=passive**
   - **proxyarp=on**

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



The commands to configure this setup are:

```
#> 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 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 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, and cache information for future use.

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.

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.

Following is an example of a domain name. **mn07** is part of the higher-level domain called **amalgamated.com**. Note that labels are separated by periods:

```
#> mn07.amalgamated.com
```

Configure a DNS Server

To configure a DNS server, enter:

```
#> 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=digi.com myname=poe dns=204.221.1.4
```

For more information, see "set config" on page 100.

Configure the Host Table

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

```
#> 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 128.

Configure SNMP

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

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.

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.

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)

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 SNMP agent can generate and send traps to a destination IP address when any of the following occur:

- Authentication failures
- Login attempts
- Cold starts (when the Digi device initializes)
- Link up (when a network link comes up)
- For Digi devices connected to a Digi RPM power controller, when the Digi RPM exceeds the current and temperature thresholds.

“set snmp”Command

To configure SNMP, use the **set snmp** command. For more information, see "set snmp" on page 209.

For example, the following **set snmp** 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.
- Use RADIUS to authenticate users.
- Issue user passwords.
- Configure SSH Version 2 for secure communication.

Control Access to the Configuration

User access to Digi device configuration settings can be controlled by either of the following methods:

- Through user attributes configured by various **set user** command options.
- Through network settings configured by the **set user network** option.

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. This **root** user can view any configuration table and change any configuration option. The root is identified by the user name **root** and must supply a password to be authenticated. The default username is **root** and the default password is printed on the device label. If a password is not on the label, the default password is dbps. If neither default password works, the password may have been updated. Check with your system administrator..
- Regular users, who have much more restricted access to device server commands. Regular users can view some configuration tables and can change some configuration options related to their own sessions and passwords. For information on the limitations placed on regular users for each command see "set user" on page 238.

Control Access to Inbound Ports

An inbound port is one defined on the “**dev**” option 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** or **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 176.

Change a Port’s Access Requirements

To configure a port so that no one has to login or specify a password, enter:

```
#> 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 158.

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, enter:

```
#> 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 238.

Control Access to Outbound Ports

An outbound port is one defined on the **set ports dev**” option, where “dev” is set to 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. See "set auth" on page 94.

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 "set user" on page 238.

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 the **set ports** command, with the options **auto**, **autoservice**, **dest**, **dev**, and **dport**. See "set ports" on page 176.
- 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 options **name**, **autoconnect**, **autohost**, **autoport**, and **defaultaccess**. See "set user" on page 238.

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 166.

Use RADIUS to Authenticate Users

The RADIUS feature is available on all PortServer TS Family products only. It is not supported on Digi One Family devices.

RADIUS (remote authentication dial-in user service) is a method of maintaining a database of profiles of dial-in users. These profiles can include login and password information, as well as other user attributes.

The device server can be configured to use RADIUS. Digi device and terminal servers are capable of authenticating reverse Telnet users with RADIUS. The Service-Type attribute of the RADIUS server must be defined correctly for the Digi devices to grant access.

RADIUS requires two components: an authentication host server, and client protocols. The device server implements the client protocol. A host must implement the authentication server application.

When a device server is configured for RADIUS, the authentication process is as follows:

- A user logs into device server.
- The device server collects login information and then checks to see if the user is in the local database of users.
- If the user is in the local database, device server handles authentication.
- If the user is not in the local database, device server submits an authentication request to the RADIUS server.
- If the user is validated, the RADIUS server passes this information to other devices and the user is permitted access. If the user is not validated, the RADIUS server returns an access reject message to device server, which then denies access to the user.

The “set radius” Command

To configure device server to function as a RADIUS client, enter a **set radius** command that specifies the following:

- **run=on**
- The IP address of the primary RADIUS server, on the **primary** option. The primary server is the first server to which authentication requests are sent.
- A password (on the **secret** option)

For example:

```
#> set radius run=on primary=199.123.15.129 secret=J9CxegpP
```

For more information, see "set radius" on page 188.

Using a Secondary RADIUS Server

To use a secondary RADIUS server, supply a second **set radius** command that specifies “**run=on**,” the IP address of the secondary server (on the **secondary** option) and another password for the secondary server (on the **secret** option).

RADIUS Table Key

The numbers in the following tables have the following meaning:

#	Meaning
0	This attribute **must not** be present.
0+	Zero or more instances of this attribute **may** be present.
0-1	Zero or one instance of this attribute **may** be present.
1	Exactly one instance of this attribute **must** be present.

RADIUS Attributes (RFC 2138) Supported

The following attributes are supported in the Digi device server RADIUS client implementation.

Request	Accept	Reject	Challenge	#	Attribute
1	0	0	0	1	User-Name
0-1	0	0	0	2	User-Password
0-1	0	0	0	3	CHAP-Password
0-1	0	0	0	4	NAS-IP-Address
0-1	0	0	0	5	NAS-Port
0-1	0-1	0	0	6	Service-Type
0-1	0-1	0	0	7	Framed-Protocol
0-1	0-1	0	0	8	Framed-IP-Address
0-1	0-1	0	0	9	Framed-IP-Netmask
0	0-1	0	0	10	Framed-Routing
0	0+	0	0	11	Filter-Id
0	0-1	0	0	12	Framed-MTU
0+	0+	0	0	13	Framed Compression
0+	0+	0	0	14	Login-IP-Host
0	0-1	0	0	15	Login-Service
0	0-1	0	0	16	Login-TCP-Port
0	0-1	0	0-1	27	Session-Timeout
0	0-1	0	0-1	28	Idle-Timeout

RADIUS Accounting Attributes (RFC 2139)

The following RADIUS accounting attributes are supported in the Digi device server.

#	Attribute	#	Attribute
0-1	User-Name	0-1	Login-TCP-Port
0	User-Password	0-1	Session-Timeout
0	CHAP-Password	0-1	Idle-Timeout
0-1	NAS-IP-Address	1	Acct-Status-Type
0-1	NAS-Port	0-1	Acct-Delay-Time
0-1	Service-Type	0-1	Acct-Input-Octets
0-1	Framed-Protocol	0-1	Acct-Output-Octets
0-1	Framed-IP-Address	1	Acct-Session-Id
0-1	Framed-IP-Netmask	0-1	Acct-Authentic
0-1	Framed-Routing	0-1	Acct-Session-Time
0+	Filter-Id	0-1	Acct-Input-Packets
0-1	Framed-MTU	0-1	Acct-Output-Packets
0+	Framed-Compression	0-1	Acct-Terminate-Cause
0+	Login-IP-Host	0-1	Port-Limit
0-1	Login Service		

Issue User Passwords

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

- **set user** with the **password** option to require a password of a user. See "set user" on page 238.
- **newpass** to create or change a user's password. See "newpass" on page 73.

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.

1. Issue a **newpass** command that identifies the user (on the **name** option) 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. SSH is supported in Digi One IAP and all PortServer TS Family products.

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

```
#> 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 238, and "newpass" on page 73.

Use a Public Key

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

```
#> 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 ECDSA 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=192.168.2.34:ssh-file
```

See "set user" on page 238 for more information.

Make Reverse SSH Connections to Ports

The convention used to identify a port for a reverse SSH connection to a Digi device 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 Digi device 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, see "set secureaccess" on page 201.

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** means that SSH is the only service available to inbound users.
- **high** means that SSH, HTTP, SNMP, and RealPort services are available to inbound users.
- **normal** means all services are available.
- **custom** means you can select services to turn off.

The default service level is **normal**.

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 PortServer TS P MEI Family. Power over serial ports is a hardware feature. Enabling this feature involves changing a jumper inside the device. See the *Digi One and PortServer TS Family User Guide's* chapter on power over ports for more details.

Reset the Circuit Breaker

From the command line, the only power-related task you can perform is to 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 63, and "set config" on page 100.

Configure User Attributes

Although not required, a Digi device is often configured to accommodate 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; and whether the user has access to outbound ports.

User attributes are configured by the following commands:

To:	Use This Command:
Set common user-related features	set user 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 option
Automatically connect a user	set user - autoconnect, autohost, autoport, autoservice options
Defines the number of outbound ports a user connected over the LAN can access at one time.	set user - maxsessions option
Remove a user from the user table	remove
Use a RADIUS server to set user attributes	set radius

Common Configurable User Features

Here are common user-related features configurable by **set user** command options. For a complete list of features, see "set user" on page 238.

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

Configure Embedded Modem

Configure the embedded modem with the **set embmodem** command. For more information see "set embmodem" on page 112.

The embedded modem feature can be configured from the Web interface (enter the IP address in the URL address bar of your browser, and log in with user name root). **Note:** The default username is **root** and the default password is printed on the device label. If a password is not on the label, the default password is dbps. If neither default password works, the password may have been updated. Check with your system administrator.

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 **boot** command. See "boot" on page 55.

Copy the Configuration to and from a Remote Host (Backup/Restore)

To use the command line to copy the configuration to and from a remote host, use the **cpconf** command. See "cpconf" on page 62.

Reset the Configuration to Defaults

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

```
#> revert all=factory
```

or:

```
#> revert all=nvram
```

Alternatively, you can use the “boot” command:

```
#> 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** option to define a range of ports with the **serial**, **port**, **line**, **flow**, **keys**, and **login** options. For more details, see "revert" on page 83.

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 ? For example:
	`#> info ?`
	`#> set user ?`

Verifying Device Support for Commands

For verification that a device supports a particular command, you can enter several commands. For example:

- **help** displays all supported commands for a device.
- **?** displays all supported commands for a device.
- **set ?** displays the syntax and options for the **set** command. You can use this to determine whether the device includes a particular **set** command variant.
- **help set** displays syntax and options for the **set** command.
- **set service ?** displays the syntax and options for the **set service** command.
- **help set service** displays the syntax and options for the **set service** command.

Some options may become available in new firmware revisions or before new documentation is released.

Some commands relate only to particular features unique to specific devices. Other commands may have options that are specific to features that are not available on all devices. These device-specific commands and options are noted in the command descriptions.

Abbreviating Commands

All commands can be abbreviated by suppling 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, options or values that must be typed exactly as they appear. **yes** and **no** option values are examples of literals.
- Italicized text indicates that a type of information is required in that option. For example, ***filename*** means that the name of a file is required in the option.

Entering Special Characters in String Values

s have options that are string values. String values may involve special characters or be subject to length limitations.

Escape Sequences for Special Characters

Special characters can be entered in strings using the following escape sequences:

Escape Sequence	Processed as:
*	Match any character.
\a	Alert character.
\b	Backspace character.
\f	Form-feed character.
\n	New-line character.
\r	Carriage-return character.
\s	Acts as a separator between characters. This sequence allows entering a string such as **\xB8\s4** where B8 should be translated as a hexadecimal character separate from the numeric character 4.
\t	Horizontal tab character.
\v	Vertical tab character.
\\	Backslash character (\ ).
\x*N*	A hexadecimal number, where N is up to 20 hexadecimal digits. For example: **\x10\x2**
N	An octal byte, where N is up to 3 octal digits. For example: **\2** or **\208**

Length Limitations on String Vales

String values for certain command options have specific limitations on the maximum total string value including special characters, and the maximum parsed value (that is, the character-string length when any escape sequences in the string are processed). The option descriptions note these maximum lengths.

Octal values are limited to a byte (/377). For example, **/377** is translated as octal 377 (equal to \xff), but **/378** is translated as octal 37 (\x1f), then an 8 character.

Commands for Managing Connections and Sessions

These commands are used to manage connections and sessions:

- **close**: Closes active sessions that were opened by **connect**, **rlogin**, and **telnet** commands.
- **connect**: Makes a connection, or establishes a connection, with a serial port.
- **exit** and **quit**: These commands terminate a currently active session.
- **who** and **kill**: The **who** command displays a global list of connections. The list of connections includes those associated with a serial port or the command-line interface. who is particularly useful in conjunction with the kill command, which terminates active connections. Use who to determine any connections that are no longer needed, and end the connections by issuing a kill command.
- **ping**: Tests whether a host or other device is active and reachable.
- **reconnect**: Reestablishes a previously established connection; that is, a connection opened by a **connect**, **rlogin**, or **telnet** command; the default operation is to reconnect to the last active session.
- **rlogin**: Performs a login to a remote system.
- **send**: Sends a Telnet control command, such as break, abort output, are you there, escape, or interrupt process, to the last active Telnet session.
- **status**: Displays a list of sessions, or outgoing connections made by **connect**, **rlogin**, or **telnet** commands for a device. Typically, the **status** command is used to determine which of the current sessions to close.
- **telnet**: Makes an outgoing Telnet connection, also known as a session.

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**.

Required Permissions

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 66.
- "quit" on page 79.

boot

Purpose

Performs the following functions:

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

Users of PortServer TS Family and Digi One IAP devices must be very careful with the load option. If this operation fails and then you reboot the device, 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 100 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. Contact Digi technical support for instructions on what to do next.

Required Permissions

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]
```

Load New POST Code (Digi One and PortServer TS Only)

```
boot load-post=tftp server ip:filename
```

Load New Boot Code (PortServer TS 8/16 Only)

```
boot load-boot
```

Options

action={eewrite|factory|reset}
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. This option does **not** apply to the PortServer TS 8/16.

factory
Resets the entire configuration to defaults. For PortServer TS 8/16, this option also reverts to the factory EOS.

reset
Reboots the device.

load={*host ip address*|*host name*}:[*load file*]
The firmware to be loaded.

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

{*host ip address*|*host name*}
The IP address or host name of the TFTP server with new firmware that is to be burned into flash ROM.

[*load file*]
The firmware file. The firmware must be renamed first by removing the **_** (82000774e.bin).

load-post=*tftp serverip*:*filename*
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.

switch={factory|user}
Determines the firmware to use on reboot. This option applies to PortServer TS 8/16 only.

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 Parts of the Configuration Except Network Settings to Defaults

This example does **not** apply to PortServer TS 8/16.

```
#> 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 62 for information on saving the current configuration to a host prior to restoring the configuration to defaults.
- "revert" on page 83 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

Required Permissions

Anyone can use this command.

Syntax

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

Options

*****
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

- "Commands for Managing Connections and Sessions" on page 53
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70. 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.
- "mode" on page 71.
- "quit" on page 79.
- "reconnect" on page 80.
- "rlogin" on page 87.

- "send" on page 89.
- "set user" on page 238 for information on defining escape keys for Telnet, Rlogin, and connect sessions.
- "status" on page 255 to display status information on active sessions.
- "rlogin" on page 87.
- "telnet" on page 256.
- "who" on page 262.

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.

Required Permissions

Anyone can use this command.

Syntax

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

Options

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=*group*** command.

id name
The name of the port, defined on the **set ports** command, on which to establish a connection.

Example

The following command creates a connection to port 1:

```
#> connect 1
```

See Also

- "close" on page 58.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71
- "quit" on page 79.
- "reconnect" on page 80 for information on reestablishing a port connection.
- "rlogin" on page 87.
- "send" on page 89.
- "set user" on page 238 for information on defining an escape character.
- "set ports" on page 176 for information on defining a hunt group.

- "status" on page 255 to display status information on active sessions.
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

cpconf

Purpose

Used to:

- Copy a configuration to and from a remote host (backup/restore)
- Display the configuration on a terminal.

Required Permissions

Root privileges are required to use this command.

Syntax

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

Options

fromhost=*host*[:*file*]

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* options by colons.

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

tohost={*host*[:*file*]

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 file name is not specified, the default file name, **config.ps3**, is used.

TFTP must be running on the host. For transfers to the Digi device, 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 Digi devices that use dip-switch settings to enable multiple electrical interface (MEI) on serial ports.
- Display power information for the Digi devices that support the Power Over Ethernet feature.
- Display the contents of a port buffer. This command variation is covered separately; see "display buffers" on page 65.

Required Permissions

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
```

Options

port
Displays signal state for the ports specified on the range option. There is only one port on Digi One Family devices.

range=*port-port*
A range of ports. There is only one port on the Digi One Family devices.

error
Clears all errors from the errors list when the **clear** option is specified, or displays a list of errors when the **clear** option is not specified.

power
Displays status of power sources for the Digi devices that support the Power Over Ethernet option. This option applies to the PortServer TS P MEI Family and Digi One IAP only.

switches
Displays dip switch settings for devices supporting MEI.

circuitbreaker
Displays status of the circuit breaker.

clear
When used with the **error** option, clears the errors list.

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 65 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 68.
- "status" on page 255.

display buffers

Purpose

Used to:

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

Required Permissions

Root privileges are required to use this command.

Syntax

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

Options

range=*range*
The port or ports to which the command applies.

screen
Displays the contents of the port buffer on the screen.

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

tail=*number*
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*:*filename*

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 buffer" on page 97

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.

Required Permissions

Anyone can use this command.

Syntax

```
exit
```

Example

```
#> exit
```

See Also

- "admin" on page 54 for information on starting a temporary root session.
- "close" on page 58.
- "connect" on page 60.
- "kill" on page 70.
- "mode" on page 71.
- "quit" on page 79 for an alternate method of ending a root session.
- "reconnect" on page 80.
- "rlogin" on page 87.
- "send" on page 89.
- "status" on page 255.
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

help

Purpose Displays information on commands.

Required Permissions Anyone can use this command.

Syntax

```
help
```

Example

```
#> help
```

See Also "Displaying Online Help" on page 50.

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.

Required Permissions

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}
```

Options

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 syntax options and results are:

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 69.	info serial:1
info ia:*protocol* where *protocol* is one of the following: Compoway/F, df1fullduplex, fins, hostlink, modbus, userdefined.	IA protocol statistics are displayed.	info ia:modbus
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"

The statistics displayed by **info serial** include data, event, and error counts, described below. These statistics are useful in understanding how the device is operating and can be helpful in finding problems. In particular, if an error counter is found to be increasing, there may be a problem in the device. 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 63.
- "status" on page 255

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.

Required Permissions

Root privileges are required to use this command.

Syntax

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

Options

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 58, to close sessions for the current connection.
- session.
- "connect" on page 60.
- "mode" on page 71.
- "quit" on page 79 for an alternate method of ending a root session.
- "reconnect" on page 80.
- "rlogin" on page 87.
- "send" on page 89.
- "status" on page 255.
- "telnet" on page 256.
- "who" on page 262, for information on determining current users.
- "Commands for Managing Connections and Sessions" on page 53.

mode

Purpose

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

Required Permissions

Anyone can use this command.

Syntax

Change Telnet Options

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

Display Telnet Options

```
mode
```

Options

bin={on|off}

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={on|off}

Specifies whether line feeds replace received carriage returns.

on

Specifies that line feeds replace received carriage returns.

off

Specifies that line feeds do not replace received carriage returns. The default is **off**.

crlf={on|off}

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
```

See Also

- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "quit" on page 79.
- "reconnect" on page 80.
- "rlogin" on page 87.
- "send" on page 89.
- "status" on page 255
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

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.

Required Permissions

Any user can change their own password. Root privileges are required to change someone else's password or the root password.

Syntax

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

Option

name=*username*

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

"set user" on page 238 for information on configuring users.

ping

Purpose

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

Required Permissions

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]
```

Options

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

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

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

intv=*msec*
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** option is reached.

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

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

pksiz=*bytes*
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** command include their IP addresses in the echo reply.

strict_sroute=*ip addr*,*ip addr*...
Specifies that the **ping** command should 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** command, 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** command 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** command passes through the routers identified on the **strict_sroute** option, 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

Manages power controllers attached to the PortServer TS device. This command can control the power state of specific ports on PortServer TS devices or devices connected to the ports, display the power state of specific ports on the PortServer TS devices, and 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.

Required Permissions

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** options.

Options

action={clear|on|off|reboot|show}
The action to be performed, used in conjunction with **range**, **outlet**, **id**, or **group** options.

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=*port#*
Performs the specified action on the power unit with the specified index.

outlet=*outlet#*
Performs the specified action on the device with specified index.

id=*powerdeviceid*
Performs the specified action on the device unit with the specified ID. This option must be used with the **action** option.

group=*group#*
Performs the specified action on an outlet with the specified group number.

Examples

Display Outlet Status

This 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 range=2 outlet=3
```

Display Power Unit Status

This example displays the status a power controller that is connected to a Digi PortServer TS device but not fully configured yet. 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

unit                        : 1
status                      : NOT CONFIGURED

unit                        : 2
type                        : digi_rpm
model                       : RPM10 (   v1.0.0 )
size                        : 10
Circuit Breaker status  -   :    Good
Voltage                 V   :   121.0
RMS Current             Amps:     0.0
Max Current Detected    Amps:     0.0
Alarm Threshold         Amps:    99.0
Temperature             C   :    27.0
```

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
```

See Also

- "set powerunit" on page 182.
- The *Digi One and PortServer TS Family User Guide's* chapter on Digi Remote Power Manager (Digi RPM).

quit

Purpose

Ends 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.

Required Permissions

Anyone can use this command.

Syntax

```
quit
```

Example

```
#> quit
```

See Also

- "admin" on page 54 for information on temporarily accessing commands reserved for the administrator.
- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "reconnect" on page 80.
- "rlogin" on page 87.
- "send" on page 89.
- "status" on page 255
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

reconnect

Purpose

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

Required Permissions

Anyone can use this command.

Syntax

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

Options

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 60 for information on establishing a connection on a selected port.
- "close" on page 58 for information on ending a connection.
- "exit" on page 66.
- "kill" on page 70.
- "quit" on page 79.
- "mode" on page 71.
- "rlogin" on page 87.
- "status" on page 255 for information on gathering status on current connections.
- "send" on page 89.
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

remove

Purpose

Removes entries from configuration tables.

Required Permissions

Root privileges are required to use this command.

Syntax

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

Options

table name

One of the following configuration table names:

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

range=*range*

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

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.

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.

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=192.168.2.120
```

Remove an Entry from altip Table by Index Number

```
#> remove altip range=3
```

See Also

The **set** commands used to add or display values in the configuration tables.

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.

Required Permissions

Root privileges are required to use this command.

Syntax

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

Options

***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 *option*=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	Reverts this part of the configuration:
all	Entire configuration, except network connectivity parameters.
altip	**set altip** configuration.
arp	**set arp** configuration.
auth	**set auth** configuration.
buffers	**set buffer** command.
chat	**set chat** configuration.
config	**set config** configuration.
consmenu	**set consmenu** configuration.
device	**set device** configuration.
dhcp	**set dhcp** configuration.
embmodem	**set embmodem** configuration.
ethernet	**set ethernet** configuration.
filter	**set filter** configuration.
flow	**set flow** configuration.
forwarding	**set forwarding** configuration.
host	**set host** configuration.
ia	**set ia master**, **set ia serial**, and **set ia table** configuration.
ippool	**set ippool** command.
keys	**set keys** configuration.

option	Reverts this part of the configuration:
line	**set line** configuration.
login	**set login** configuration.
logport	**set logport** configuration.
menu	**set menu** configuration.
mei	**set mei** configuration
modem	**set modem** configuration.
netlogin	**set netlogins** configuration.
netport	**set netport** configuration.
network	**altip**, **arp**, **host**, **route**, **snmp**, **tcpip**, and **telnetip** configuration. Not related to network connectivity.
pmodem	**set pmodem** configuration.
port	**set ports** configuration.
powerunit	**set powerunit**. Applies to PortServer TS 8/16 Family devices only.
profiles	**set profiles** configuration.
radius	RADIUS configuration. Applies to PortServer TS 8/16 Family devices only.
rloginoption	**set rloginoption** configuration.
route	**set route** configuration.
rpauth	**set rpauth** configuration
script	**set script** configuration.
secureaccess	**set secureaccess** configuration.
security	**set auth**, **set logins**, **set radius**, and **set secureaccess** configuration
serial	**set flow**, **set line**, and **set ports** configuration; **set powerunit** configuration (PortServer TS 8/16 Family devices only).
service	**set service** configuration.
sharing	**set sharing** command.
snmp	SNMP configuration.
snmpauth	**set snmpauth** configuration: access permissions for SNMP sets and gets in the snmpauth table.
sntp	**set sntp** configuration.
switches	**set switches** configuration.
system	**set config**, **set ethernet**, **set keys**, **set menu**, **set service**, **set terms**, **set trace**, and **set user** configuration.
tcpip	**set tcpip** configuration.

option	Reverts this part of the configuration:
telnetip	**set telnetip** configuration.
terms	**set terms** configuration.
timezone	**set timezone** configuration.
trace	Trace settings configured by **set trace**.
udpdest	**set udpdest** command.
udpserial	**set udpserial** command.
users	**set user** configuration.
wan	The configuration settings set by **set chat**, **set device**, **set ippool**, **set modem**, **set script**, **set filter**.
webui	**set web** command.

range

A range of ports to which the command applies. This option is valid when used with the following values for ***option***:

- buffers
- flow
- keys
- line
- login
- port
- profiles
- serial
- sharing
- socketid

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:

   ```
   #> 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 55. Issuing a **boot action=factory** command resets the configuration to factory defaults.
- The **set** commands for which settings are being reverted.

rlogin

Purpose

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

Required Permissions

Anyone can use this command.

Syntax

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

Options

esc=*char*
A different escape character than the ~ (tilde) character, which will be used for the current rlogin session. Used for suspending a session from the remote host to return to the device server command line.

hostname*|*host ip addr
The name of a host or IP address 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

- "set rloginoption" on page 191.
- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "reconnect" on page 80.
- "send" on page 89.
- "status" on page 255
- "telnet" on page 256.
- "set user" on page 238 for information on configuring a user-specific Rlogin escape character.

- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

send

Purpose

Sends a control command to a the current escaped Telnet session.

Required Permissions

Anyone can use this command.

Syntax

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

Options

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** signal 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

- "set rloginoption" on page 191.
- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "reconnect" on page 80.

- "status" on page 255
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

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.

Required Permissions

The root user can configure altip settings. Normal users can display altip settings.

Syntax

Configure Alternate IP Address

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

Display altip Table Entries

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

Options

group={*port#*|*group#*}
A port or group of ports.

ip=*ip addr*
Assigns an IP address to the ports or group of ports (hunt group) specified on the **group** option.

mode={raw|telnet|ssh}
The type of connection.

raw
Raw socket connection.

telnet
Telnet connection.

ssh
SSH (encrypted) connection.

range=*range*
A range of index entries in the altip table.

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

- "remove" on page 81 to remove values from the altip table.

- "revert" on page 83. The **revert altip** option reverts the **set altip** configuration.
- "set config" on page 100. The **sockets** option configures the base TCP socket service.

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.

Required Permissions

The root user can configure ARP table entries. Normal users can display ARP table entries.

Syntax

Configure ARP Table Entries

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

Display ARP Table Entries

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

Options

ether=*etaddr*
The Ethernet address of a device.

ip=*ipaddr*
The IP address of a device.

range=*range*
A range of table entries, which are identified by the **index** option in the ARP table.

tim2liv=*time*
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
```

See Also

- "remove" on page 81 to remove values from the arp table.
- "revert" on page 83. The **revert arp** option reverts the **set arp** configuration.

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 access permission 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** option 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** option.

The auth table is limited to 20 entries.

Required Permissions

The root user can configure access permissions. Normal users can display access permissions.

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]
```

Options

ip=*ipaddress*
The IP address of the device to which this **set auth** command applies.

login={*range*|none}
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=*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** option works:

IP Address	Subnet Mask	"set auth" mask	Result
192.168.0.0	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.

realport={*range*|none}
Configures port access for RealPort running on the devices identified by the **ip** and **mask** options. Use this option to grant access to RealPort but restrict access to other users of the IP address.

unrestricted={*range*|none}
Configures unrestricted access for the IP address specified to the range of ports specified.

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

rmauth=on
Removes the auth table entries specified by the **range** option.

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
#> 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" Option 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

- "remove" on page 81 to remove values from the auth table.
- "revert" on page 83. The **revert auth** command reverts the **set auth** configuration.
- "set ports" on page 176 for information on defining ports.
- "set user" on page 238 for information on configuring a user for outbound port access.

set buffer

Purpose

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

Required Permissions

The root user can configure port buffering. Normal users can display current settings.

Syntax

Configure Port Buffering

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

Display the Port Buffering Configuration

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

Options

clear
Clears the contents of the specified buffer.

range=*range*
The port or ports to which the command applies.

size=*kbytes*
The size in kilobytes to configure the buffer. Settings are configurable in 2-kilobyte increments. The maximum size is1024 kilobytes (1 Megabyte). The default is 32 kilobytes.

state={on|off|pause}
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

This example 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 65.
- "revert" on page 83. The **revert buffers** command reverts the **set buffer** configuration.
- "set logport" on page 161.

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.

The **set chat** command is not related to the chat protocol supported under the **set ia** command. See "set ia" on page 129 for details on configuring the chat protocol.

Required Permissions

The root user can configure, remove, or rename chat table entries. Normal users can display chat table entries.

Syntax

Configure chat Table Entries

```
set chat [delay=string]
   [name=chat name]
   [newname=new name]
   [range=range]
   [retry=number]
   [star=string]
   [pound=string]
   [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
```

Options

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

name=*chat name*
Configures a name for the chat table entry.

newname=*new name*
Used to change the chat name.

range=*range*
One of the following:

- A range of ports to which the chat table entry will apply. (For Digi One products, the only value is 1.)
- A range of chat table index numbers, which identify chat table entries.

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

star=*string*
A string of characters that will replace the ***** character in the chat script.

pound=*string*
A string of characters that will replace the **#** character in the chat script.

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

rmchat=on range=*range*|rmchat=*chatname*
Removes the chat table entry specified on the **range** or **name** option.

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

- "remove" on page 81 to remove values from the chat table.
- "revert" on page 83. The **revert chat** command reverts the **set chat** configuration.
- "set script" on page 195 for information on creating scripts that use telephone string translation.

set config

Purpose

Configures or displays network settings. These settings are stored in the network parameters configuration table.

The **optimize={latency|throughput}** option can be used to optimize your network for better Ethernet/IP performance.

Required Permissions

The root user can configure network parameters. Normal users can display network parameters.

Syntax

Configure Network Parameters

```
set config [bootfile=file]
   [boothost=host ipaddr]
   [cache_dns={on|off}]
   [circuitbreaker=reset]
   [dhcp={on|off}]
   [dns1=ip addr]
   [dns2=ip addr]
   [dns3=ip addr]
   [domain=domain]
   [gateway=ip addr]
   [hostname=name]
   [ip=ip addr]
   [nameserv=ip addr]
   [optimize={latency|throughput}]
   [ping-arp={on|off}]
   [rarp={on|off}
   [realport=tcp port]
   [redirect={listen|ignore}]
   [rpkeepalives={on|off}]
   [save={on|off}]
   [securerealport=tcp port]
   [sockets=socket num]
   [submask=mask]
   [tbreak={std|any|none}]
   [tftpboot={yes|no|smart}]
```

Display Network Parameters

```
set config
```

Options

bootfile=*file*
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. This option does **not** apply to PortServer TS 8/16.

boothost=*host ipaddr*
The IP address of a host from which the device server can boot using TFTP. This option does **not** apply to PortServer TS 8/16 devices.

cache_dns={on|off}
Controls whether the device server checks its DNS cache during a DNS lookup.

on
The default/normal behavior. When the device server needs to do a DNS lookup (translate a hostname into an IP address), it first checks its DNS cache to determine whether the hostname-to-IP address mapping exists. If the mapping does not exist, the device server issues a DNS query to the DNS server to get this mapping. The device server caches this mapping for the time-to-live value specified in the DNS response.

off
Prevents the device server from using the cache. The device server will always issue a DNS query whenever it must do a DNS lookup.

circuitbreaker=reset
Resets the circuit breaker.

dhcp={on|off}
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**.

dns1=*ip addr*
dns2=*ip addr*
dns3=*ip addr*
The IP address of the primary, secondary, and tertiary domain name servers.

If **dhcp=on**, these DNS settings can be changed, but they will not persist after the next reboot if the DHCP server provides these settings.

The secondary domain name server cannot be specified unless a primary domain name server is specified, and the tertiary domain name server cannot be specified unless a secondary domain name server is specified. The primary domain name server cannot be removed (set to 0.0.0.0) if a secondary domain name server is specified, and the secondary domain name server cannot be removed if a tertiary domain name server is specified.

domain=*domain*
The name of device server's domain.

gateway=*ip addr*
The IP address of the default gateway.

hostname=*name*
The device server's DNS name. This option does **not** apply to Digi One IA and SP devices.

ip=*ip addr*
The device server's IP address.

nameserv=*ip addr*
The IP address of a name server in the device server's domain. This option does **not** apply to PortServer TS 8/16, Digi One IA, and Digi One SP devices.

optimize={latency|throughput}
Configures how the Digi device handles network latency.

latency
Choose latency if the Digi device will handle delay-sensitive data.

throughput
Choose throughput if overall network throughput is more important than latency. For Digi One IAP, the default is **latency**. For all other models, the default is **throughput**.

ping-arp={on|off}
Enables or disables the ping-arp protocol to set the IP address.

rarp={on|off}
Enables or disables the RARP protocol to set the IP address.

realport=*tcp port*
The TCP port number used for RealPort connections. The default is **771**.

redirect={listen|ignore}
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**.

rpkeepalives={on|off}

Enables or disables sending of RealPort keep-alives. RealPort keep-alives are messages inside the RealPort protocol, sent approximately every 10 seconds, to tell whoever is connected that the connection is still alive. RealPort keep-alives are different from TCP keep-alives, which are done at the TCP layer, and configurable.

As RealPort keep-alives generate additional traffic--several bytes every 10 seconds--this option allows you to turn them off. In situations such as cellular/mobile wireless communications, when you are paying by the byte, such additional traffic is undesirable when a TCP keep-alive can do the same job, and only when the connection is idle.

If you want to have the RealPort keep-alive set to **off**; consider using a TCP keep-alive instead. This is because if the link is not closed properly, you could end up with your port being “locked up” with a dead TCP session, which is why RealPort keep-alives were implemented in the first place.

save={on|off}

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=*tcp port*

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

sockets=*socket num*

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 Digi device for inbound connections (connections initiated by the device on the other side of the network) and outbound connections: connections 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 range varies by device. Enter **set config ?** to see the base socket range for your device. 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.

Base Socket	Example	Connection Established
1000	`telnet 192.168.1.1 1002`	A Telnet connection to port 2
	`telnet 192.168.1.1 1102`	A raw connection to port 2
	`ssh root@192.168.1.4 -p 1502`	An SSH connection to port 2
	`openssl s_client -connect 192.168.1.4:2604 1602`	A SSL/TLS connection to port 2
1121	`telnet 192.168.1.1 1122`	A Telnet connection to port 1
	`telnet 192.168.1.1 1222`	A raw connection to port 1
	`ssh root@192.168.1.4 -p 1622`	An SSH connection to port 1
	`openssl s_client -connect 192.168.1.4:2604 1722`	A SSL/TLS connection to port 1

submask=*mask*

The subnet mask for the subnetwork.

tbreak={std|any|none}

Sets the Telnet break keystroke (tbreak).

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 the **^]** (control right bracket) keystroke will break a Telnet connection.

any
Configures tbreak so any keystroke will break a Telnet connection.

none
Configures tbreak so no keystroke will break a Telnet connection.

The default is **std**.

tftpboot={yes|no|smart}

(This option does not apply to PortServer TS 8/16)

Specifies booting conditions for the device server.

yes
Always boot from the TFTP host identified on the **boothost** option.

smart
If the device server cannot boot from the TFTP host identified on the **boothost** option, 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
```

See Also

- "revert" on page 83. The **revert config** command reverts the **set config** configuration.
- The *Digi One and PortServer TS Family User Guide's* chapter on latency tuning.

set consmenu

Purpose

Configures or displays console menu options.

The Digi PortServer TS device supports multiple connections to a port simultaneously. The **set consmenu** command may be used with the port sharing feature (see "Configure Port Sharing" on page 25 and "set sharing" on page 205). When port sharing is enabled, it can be useful to see who else is connected to a port before making a connection.

The Console Menu feature allows you to see who is already connected to a port, disconnect other sessions, display the last entries of the port-buffer or branch out to the command line of the unit.

When in the console menu, entering a **?** character displays a help screen.

Required Permissions

The root user can configure console menu options. Normal users can display console menu options.

Syntax

Configure Console Menu Options

```
set consmenu [range=port#-port#]
   [state={off|on|always}]
   [break={standard|menu}]
```

Display Console Menu Options

```
set consmenu
```

Options

range=*port#-port#*
The port or range of ports to which this command applies.

state={off|on|always}
Specifies whether and how the console menu is displayed.

off
No console menu is displayed.

on
The console menu is displayed upon connecting to the port if there is at least one other active connection to the port open.

always
The console menu is displayed upon connecting to the port always.

break={standard|menu}
Specifies how breaks are handled.

standard
A break sent to the port will be sent as normal.

menu
Sending a break will invoke the menu (the break will not be sent to the port). Breaks can be sent from the console menu.

Examples

Following is a sample of a menu displayed upon connecting to a port using reverse telnet, reverse SSH:

```
[Port 1 Console Menu] - <enter> to connect
Port 1 connected sessions:

TTY  user          connected from
9    root          10.49.1.1
10                 10.49.1.12       (current connection)

console 1>
```

At this stage, you can execute console commands. For example:

```
<enter>      Connect to port
connect      Connect to port
exit|quit    Disconnect
who          List connections to the port
kill (range)  Kill connections to the port (admin)
break        Sends a break to the port (admin)
buffer (L)(N) Displays the last L lines of the port buffer N at a time (admin)
?            Display this help

console 1>
```

See Also

- "Configure Port Sharing" on page 25 for more details on port sharing, including the caveats involved.
- "revert" on page 83. The **revert consmenu** command reverts the **set consmenu** configuration.
- "set sharing" on page 205 for details on configuring port sharing.
- "show" on page 252. The **show sharing** command displays the current port-sharing settings.

set device

Purpose

Configures devices used for outbound connections to use dialer scripts and chat table entries; configures a different baud rate (line speed) for modems and other devices used for outgoing connections than the rate defined on the **set line** command; or displays the contents of the device table.

Required Permissions

The root user can configure devices. Normal users can display device table entries.

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}]
```

Options

baud={no|*rate*}

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 option 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={no|*index num*|*chat name*}

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={no|*index num*|*script name*}
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=*name*
A user-defined name for the device.

ports=*range*
The port or range of ports available to this device.

newname=*newname*
A new name for a previously defined device.

p{1-9}
Integers that can be used in the variable options of login or dialer scripts.

save={on|off}
Determines if changes are saved into NVRAM.

show=on
Displays the current contents of the device table--the same operation as entering **show device** or **set device** without options.

{range=*range*|name=*name*}
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

This example configures a device to use a dialer script and override the baud rate specified on the **set line** command.

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

See Also

- "remove" on page 81 to remove entries from the device table.
- "revert" on page 83. The **revert device** command reverts the **set device** configuration.
- "set chat" on page 98.
- "set line" on page 155.
- "set script" on page 195.
- "set user" on page 238.

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.

Required Permissions

The root user can configure DHCP. Normal users can display DHCP settings.

Syntax

Configure DHCP

```
set dhcp [client_fdqn={on|off}]
   [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
```

Options

client_fdqn={on|off}

Used to turn on the DHCP option 81 titled Client FQDN (Fully Qualified Domain Name). This option allows the device to send its host name and domain name to the DHCP server when requesting network settings. The intention is that the DHCP server will use this information to determine the IP address that it will assign to the device. Use the **set config hostname=*string*** option to set the host name that will be passed to the DHCP server, and optionally use the **set config domain=*string*** option to set the domain name that will be passed to the server. If the **domain** part is not set, then only the host name will be passed to the DHCP server.

client_identifier=*string*

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 from 0 through F. To use the backslash character as the string, use two consecutive backslashe characters (\\).

client_id_type=*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={accept|ignore}
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={on|off}|[renew]
Turns DHCP on or off, and optionally renews the IP address of the device server.

on
Turns DHCP on.

off
Turns DHCP on or off. The default is **on**.

renew
Renews the IP address of the device server.

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

Examples

Enable DHCP

```
#> set dhcp run=on
```

Renew the IP Address

```
#> set dhcp renew
```

See Also

- "revert" on page 83. The **revert dhcp** command reverts the **set dhcp** configuration.
- "set config" on page 100 for information on configuring the IP address manually.
- "set tcpip" on page 222.

set embmodem

Purpose

Configures the embedded modem on PortServer TS M MEI devices, or displays current embedded-modem settings.

Required Permissions

The root user can configure the embedded modem. Normal users can display embedded modem settings.

Syntax

Configure Embedded Modem

```
set embmodem [reset]
   [init_string="ATcommand"]
```

Display Current Modem Settings

```
set embmodem
```

Options

reset

Resets the modem, then sends the initialization string specified by the **init_string** option, or an **init_string** that was set previously.

init_string="ATcommand"

An AT command that is sent to the modem after it is reset. The string must be enclosed in double quotes. The default parameter is "**ATSO=1**" (autoanswer on).

Examples

Configure Device with Embedded Modem for Autoanswer On

```
#> set embmodem init_string="ATSO=1"
```

Reset an Embedded Modem

The following command resets an embedded modem, and sends the initialization string that was set in the previous command.

```
#> set embmodem reset
```

See Also

- "revert" on page 83. The **revert embmodem** reverts the **set embmodem** command.
- "Modem Emulation Commands" on page 263

set ethernet

Purpose

Configures and adjusts Ethernet communications options, and displays current Ethernet options.

Required Permissions

The root user can configure Ethernet options. Normal users can display Ethernet options.

Syntax

Configure and Adjust Ethernet Communications Parameters

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

Display Current Ethernet Parameter Settings

```
set ethernet
```

Options

duplex={half|full|auto}

Determines the mode the Digi device 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 option 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**.

speed={10|100|auto}

Configures the throughput rate the Digi device 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 option 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**.

Examples

Configure 100 Mbps Throughput

```
#> set ethernet speed=100
```

Configure Full-Duplex Mode

```
#> set ethernet duplex=full
```

See Also

- "revert" on page 83. The **revert ethernet** command reverts the **set ethernet** configuration.
- "set config" on page 100.

set filter

Purpose

Manages filters. Filters can be used with PPP and RADIUS.

- For PPP, filters can control and record traffic over PPP connections.
- When using RADIUS, the RADIUS server can send to the RADIUS client (that is, a Digi product) a filter ID attribute, meaning a filter name that is used in authenticating the connection. The **set radius** command has an **ignorefilterid={on|off}** option. If **ignorefilterid=on**, the Digi product ignores any filter names that are not defined, but will process normally all filters that are defined. If **ignorefilterid=off**, the absence of a filter that matches the RADIUS-provided filter ID results in authentication failure.

With the **set filter** command, you can

- Create filters, which in turn creates entries in the filter table. The maximum number of entries in the filter table varies by device. For example, the maximum entries for PortServer TS Family devices is 8, and the maximum entries for PortServer TS 8/16 Family devices is 16.
- Display entries in the filter table.
- Display the contents of a filter.

Uses for Filters

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.

Rules for Creating Filters

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** option, it will allow packets that meet filter criteria to pass through a serial port and block all others.
  - **bringup** option, it will bring up a connection when the port handles a packet that meets filter criteria.
  - **keepup** option, it will reset the timer defined on the **set user idletimeout** option when the port handles a packet that meets filter criteria.
  - **logpacket** option, 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.

When Changes to Filter Definition Settings Take Effect

The **set filter** command can be used at any time to change and display filters. However, the results of any changes to filter definition settings take effect on subsequent PPP connections only. Any PPP connections established prior to a given filter change will continue to operate using the previous filter definition settings. For the new filter settings to take effect, existing PPP sessions must be terminated and reestablished, for example, by rebooting the PortServer reboot or by issuing the **kill tty** command.

Required Permissions

The root user can configure filters. Normal users can display filter settings.

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|off}
```

Options

name=*name*

A name for the filter.

newname=*name*

A new name for a previously defined filter.

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 203).
hostname	The name of a host defined in the host table (see set host on page 128).
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* option.
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 options within the IP packet, such as destination IP addresses, ports, and host names.

Token Value	Filter Criteria
src	Source IP packet options, 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** option 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** option 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
! (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.

range=*range*

An entry or range of entries in the filters table.

show={on|off}

on

Stanzas from the filter identified on the **name** option will be displayed.

off

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

The default is **off**.

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
```

Set Filter and Use on Other Commands

The **set filter** command configures filter that defines tcp packets going to a destination. The **set user** command associates the filter to a user. This command sets conditions to bring up the connection when the traffic matches the filter and keep up the connection on the same basis until idletimeout; that is, keep the connection open for 120 seconds after there is no more data. The **set route** command makes the connection the default route out; therefore, if there is traffic to anywhere not defined in the existing routing table, use the **wanname**, which in turn triggers bringing up the connection in the filter.

```
#> set filter name=upfilter s1=dst/192.168.1.40/255.255.255.0/tcp
#> set user name=icallyou bringup=upfilter idletimeout=120 keepup=upfilter
dialout=on
#> set route net=192.168.1.40 mask=0.0.0.0 gateway=192.168.1.40 metric=2
wanname=icallyou
```

See Also

- "Filters for PPP Connections" on page 22.
- "remove" on page 81 to remove entries from the filter table.
- "revert" on page 83. The **revert filter** command reverts the **set filter** configuration.
- "set radius" on page 188 for information on using the **ignorefilterid** option for connections with a RADIUS server.
- "set user" on page 238 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. Several options related to the RTS toggle feature are hidden by default, and can be displayed by using the **show=rtstoggle** option.

Required Permissions

The root user can configure flow control options. Normal users can display flow control options.

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|power}]
   [rts={on|off|toggle}]
```

Display Flow Control Options

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

Display Hidden RTS Toggle Flow Control Options

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

Options

aixon={on|off}

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={on|off}
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={on|off}
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={on|off}
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={on|off}
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={on|off}
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={on|off}
Determines whether the port acts as though DCD were always high. The primary implications is that autoconnections are launched as soon as the Digi device completes booting when this option is on and an appropriate incoming device type (see the **set ports** command's **dev** option) is defined for the port. The default is **off**.

itoss={on|off}
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={on|off}
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={on|off}
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={on|off}
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=*milliseconds*
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. This option does not apply to PortServer TS 8/16 devices.

post-delay=*milliseconds*
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. This option does not apply to PortServer TS 8/16 devices.

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

ri={on|off|power}
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.

power
This option is available on select Digi products. When used, the RI signal is no longer used for ring indicator, but it is instead turned into an output and a voltage is applied so that devices can be set up to draw their power from that pin.

The default is **off**.

rts={on|off|toggle}
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

- "revert" on page 83. The **revert flow** command reverts the **set flow** configuration.
- "set keys" on page 153.
- "set line" on page 155.
- "set ports" on page 176.

set forwarding

Purpose

Configures or displays IP routing, or forwarding, options. The **set forwarding** command can be used to configure a Digi device in the following ways:

- 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.

Required Permissions

The root user can configure IP routing options. Normal users can display IP routing options.

Syntax

Configure IP Routing Options

```
set forwarding [advertise=time]
   [breakoutsubnets={on|off}]
   [icmpdiscovery={on|off}]
   [icmpsendredirects={on|off}]
   [icmpmaskserver={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
```

Options

advertise=*time*

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

breakoutsubnets={on|off}

Controls how addresses are handled in the routing table when the Digi device receives RIP routing information.

on

When the Digi device receives an RIP entry that describes a network that is already subnetted in the routing table, do not add the entry.

off

When the Digi device receives an RIP entry that describes a network that is already subnetted in the routing table, add the entry to the larger network in the table, and keep the old, smaller subnet entry.

When leaking routes, and **breakoutsubnets** is on, the Digi device sends each known individual subnet. If **breakoutsubnets** is off, the Digi device sends out a single entry for the larger network, rather than describing each individual subnet route.

icmpdiscovery={on|off}

on
Send and answer ICMP Router Discovery packets.

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

The default is **off**.

icmpsendredirects={on|off}

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**.

icmpmaskserver={on|off}

on
Act as an ICMP mask server.

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

The default is **off**.

poisonreverse={on|off}
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={on|off}
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={on|off}
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={on|off}
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={off|passive|active}
The state of routing for the device server.

off
Limits routing to static routes defined in the route table. See "set route" on page 192.

passive
Configures the Digi device 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=*time*

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** option. 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

- "revert" on page 83. The **revert forwarding** command reverts the **set forwarding** command.
- "set route" on page 192 for information on creating static routes.

set host

Purpose

Configures or displays the host table, containing host name-to-IP address mappings. The Digi 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. Using the host table is a convenience only. If you do not configure the host table or DNS, users identify hosts by IP addresses. If the Digi device can access a DNS server, there is no reason to configure the host table. The PortServer TS 8/16 host table can hold up to 64 entries. The host table for other devices can hold up to 20 entries.

You can configure either of the following:

- A host table *and* DNS, where the Digi device attempts to satisfy a request by first searching the host table and then the DNS server.
- Either the host table *or* DNS.

Required Permissions

The root user can configure host table entries. Normal users can display host table entries.

Syntax

Configure Host Table

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

Display Host Table Entries

```
set host
```

Options

ip=*ip addr*
The IP address to map to the name specified on the **name** option.

name=*host name*
The name to map to the IP address specified on the **ip** option.

range=*index#-index#*
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

- "remove" on page 81 to remove entries from the host table.
- "revert" on page 83. The **revert host** command reverts the **set host** configuration.
- "set config" on page 100 for configuring a Digi device to use a DNS server.

set ia

Purpose

Configures Digi devices to support Industrial Automation (IA) protocols. **set ia** configures serial port-connected devices, network-based masters, destination tables, route entries within destination tables, or control behavior of specific protocols.

set ia is supported in the following Digi products. The extent of Industrial Automation (IA) protocol support varies among products; for more details, see "Communication Protocols Supported in Devices" on page 130.

Protocol support	Devices supported in
Protocol conversion between Modbus, Allen-Bradley, and ASCII device	Digi One IAP
Allen-Bradley Ethernet-to-Serial Bridging	Digi One IAP
Omron Hostlink Multi-Master	Digi One IAP
Modbus Ethernet-to-Serial Bridging	Digi One IA Digi One IAP PortServer TS Family
Custom (user-defined) Multi-Master Protocol	Digi One IAP PortServer TS Family

Recommendations on Configuring Industrial Automation

The manual configuration of Industrial Automation in the current firmware is much more flexible than past versions, which also means that manual configuration through the Command-Line interface is much more complex. New users are advised to use the Web Browser interface to rough out your configuration first, as documented in the *Digi One and PortServer TS Family User Guide*, and then examine and fine-tune the configuration from the Command Line if required. For more information on Industrial Automation, go to www.digi.com and search on the keywords **Industrial Automation** or **IA**.

Communication Protocols Supported in Devices

IA devices can use various communication protocols, which vary by device. See "Configure Protocol-Specific Options" on page 132 and "Options for Configuring Protocols" on page 140 for more information.

Protocol	Devices supported in
Modbus/ASCII	Digi One IA Digi One IAP PortServer TS Family
Modbus/RTU	Digi One IA Digi One IAP PortServer TS Family
Modbus/TCP	Digi One IA Digi One IAP PortServer TS Family
Modbus Ethernet-to-Serial Bridging	Digi One IA Digi One IAP PortServer TS Family
Allen-Bradley/DF1 Full-Duplex	Digi One IAP
Allen-Bradley Ethernet-to-Serial Bridging (AB/Ethernet (CSP))	Digi One IAP
Hostlink (Omron Hostlink Multi-Master)	Digi One IAP
Ethernet/IP	Digi One IAP
Custom (user-defined) Multi-Master	Digi One IAP PortServer TS Family

Required Permissions

The root user can configure IA options. Normal users can display IA options.

Syntax

Configure Serial Port-Connected Devices

```
set ia serial range={port#|port#-port#}
   [chartimeout=3-65535ms]
   [messagetimeout=10-65535ms]
   [slavetimeout=10-65535ms]
   [lineturndelay={0=disabled|5-65535ms}]
   [table=1..32]
   [type={master|slave}]
   [protocol=protocol]
```

For **protocol**, See "Configure Protocol-Specific Options" on page 132. See “Options for Configuring Serial Port-Connected Devices” on page 134.

To set the baud rates for the port, see "set line" on page 155.

To enable the IA protocols for this port, see "set ports" on page 176.

Configure Network-Based Masters

This syntax is for configuring network-based message sources other than encapsulated serial protocols on TCP ports 20xx, 21xx, or Digi RealPort.

```
set ia master range=1..32
   [active=(on|off)]
   [chartimeout=3-65535ms]
   [command=destroy]
   [ipport=0-65535]
   [type={tcp|udp}]
   [table=1..32]
   [messagetimeout=10-65535ms]
   [idletimeout=10-65535sec]
   [permit={all|readonly|rdwrdata}]
   [priority={high|medium|low}}
   [protocol=protocol]
```

For **protocol**, see "Configure Protocol-Specific Options" on page 132. See "Options for Configuring Network Masters–Incoming Message Sources" on page 135.

Configure Destination Tables

```
set ia table=1..32
       [command=destroy]
       [name=string]
       [addroute=route index]
       [removeroute=route index]
       [moveroute=(from_route_index, to_route_index)]
```

See "Options for Configuring Destination Tables" on page 137.

Configure Route Entries within Destination Tables

```
set ia table=1..32
   route=1..128
   [active={on|off}]
   [connect={active|passive}]
   [protaddr=protocol address range]
   [type={discard|dns|ip|mapto|nopath|serial}]
   [port=serial port]
   [transport=(tcp|udp)]
   [ipaddress=ip address]
   [ipport=ip port]
   [filterip={on|off}]
   [replaceip={on|add|sub|off}]
   [splitip=(on|off)]
   [splitdivisor=1-255]
   [splitbase={0|1}]
   [name=dns name]
   [mapto=protocol address]
   [messagetimeout=10-65535 msec]
   [idletimeout={0=disabled|1-65535 seconds}]
   [reconnecttimeout=0-65535 seconds]
   [protocol=protocol]
```

For **protocol**, see "Configure Protocol-Specific Options" on page 132. See "Options for Configuring Routes in Destination Tables" on page 137.

Configure Protocol-Specific Options

These options configure behavior of specific protocols. To use, specify the **protocol** option, for example, **protocol=modbusrtu**, and one or more options. Descriptions are on page 140.

Option	Applies to these protocols
acktimeout=10-65535	df1fullduplex, hostlink
acklimit=0-255	df1fullduplex, hostlink
addextfunc=N,M,…	modbusrtu, modbusascii, modbustcp
ansiescape={on|off}	custom
broadcast={on|off|replace}	modbusrtu, modbusascii, modbustcp
buffer	custom
checksum={bcc|crc}	df1fullduplex
class={ucmm|cm3}	ethernetip
connpath=”*path*”	ethernetip
dontecho={on|off}	chat
duplex={half|rcv_only|xmt_only}	custom, ascii_import
duplicatedetection={on|off}	df1fullduplex
end=”*pattern*”	custom, ascii_import, chat
eoln_form={auto|cr|nl|crnl|nlcr|time|pattern}	ascii_import
errorresponse={on|off}	modbusrtu, modbusascii, modbustcp, df1fullduplex, abethernet
exttimeout={10-65535}	modbusrtu, modbusascii, modbustcp
fixedaddress={auto|1-255} (Modbus) fixedaddress={auto|0-255} (Rockwell)	modbusrtu, modbusascii, modbustcp
fixedsource={auto|1-255} (Modbus) fixedsource={auto|0-255} (Rockwell)	modbusrtu, modbusascii, modbustcp
mapping=”{string}”	df1fullduplex, abcsp, ethernetip
naklimit=0-255	df1fullduplex
packing={direct|swap|ch_pad|pad_ch}	ascii_import
pad_char={none|0-255|\\x00-\\xFF}	ascii_import
prewrite1=”*pattern*”	ascii_importi
prewrite2=”*pattern*”	ascii_import
polltimeout=10-65535	df1halfduplex
polllimit=0-255	df1halfduplex
rmextfunc=N,M,…	modbusrtu, modbusascii, modbustcp
srvecho={on|off}	chat
start=”*pattern*”	custom

Option	Applies to these protocols
`target={cif,slc5,plc5}`	df1fullduplex, abethernet, ethernetip

Display Current IA Settings

To display current IA settings, use the **show** command instead of a **set ia** command with no options:

```
show ia all
```

Options for Configuring Serial Port-Connected Devices

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

chartimeout=3-65535 milliseconds (applies to master or slave)
After a first byte is received, this is the time to wait for additional bytes to either consider the message complete or to be aborted. The default is protocol-specific, but usually 50 milliseconds. The time tags **ms**, **sec**, and **min** can be used, so entering **5sec** results in a setting of 5000 milliseconds.

Note: the effective settings here are affected by the hardware model and the baud rate. Setting this option to too low of a value on a busy device could cause premature timeouts.

- Single-port products, such as Digi One IA, and Digi One IAP, can handle very low values such as 3-5 msec.
- Multi-port products, such as the PortServer TS2 and PortServer TS4, will not effectively handle times shorter than 10 msec.
- The large-port products, such as the PortServer TS8 and PortServer TS16, need this value to be 75 msec or higher.

lineturndelay={0=disabled|5-65535ms} (applies to slave only)
For slave devices that turn their serial port from transmit to receive slowly, this parameter forces a delay between receipt of the last byte of previous response from slave and the first byte of next request to slave. The default is 0 (disabled). The range is 0 to 65535 milliseconds and the time tags **ms**, **sec**, and **min** can be used.

messagetimeout=10-65535 milliseconds (applies to master only)
When messages are received from remote clients, this is the time to allow the message to wait to be answered. This includes both the queuing and slave response delays, and this should be set to slightly less than the timeout of the remote client. After this time, the Digi device assumes the remote client no longer wants a response. The default is 2500 milliseconds. The range is 10 to 65535 milliseconds and the time tags **ms**, **sec**, and **min** can be used.

range (applies to master or slave)
The port to which the device is connected. If a range is used, then the settings apply to the range of ports. The default is port 1.

slavetimeout=10-65535 milliseconds (applies to slave only)
After all bytes of the message have been sent to the slave device, this is the time to wait for the first byte of a response. Note that the serial shift times are not included within this timeout. The default is 1000 milliseconds. The range is 10 to 65535 milliseconds and the time tags **ms**, **sec**, and **min** can be used.

table (applies to master only)
Defines which table is used to route messages to their destination. This applies only to master-attached devices.

type={master|slave}
Defines whether the serial device configured with this command is a master or a slave device. For peer support, such as DF1 Full Duplex, set this option to **master**.

Options for Configuring Network Masters–Incoming Message Sources

The following command options apply to network listeners.

active={on|off}
Enables or disables the network listener that accepts network connections.

chartimeout=3-65535 milliseconds
After a first byte is received, this is the time to wait for additional bytes to either consider the message complete or to be aborted. The default is protocol-specific, but usually 50 milliseconds. The time tags **ms**, **sec**, and **min** can be used, so entering **5sec** results in a setting of 5000 milliseconds.

command=destroy
Destroys, or deletes, this master entry. This stops the network listener and the protocol connection will no longer be accepted.

idletimeout=1-65535 seconds
The master aborts a connection after the remote client has been idle for this time. The time is saved in seconds, and the best use for this timeout is to speed up fault recovery. For example, many wide-area networks can suffer shutdowns without the Digi device detecting it. Using the idle timeout will speed up detection of lost TCP connections. The default is **5 minutes**. The range is 1 to 65535 seconds and the time tags **ms**, **sec**, and **min** can be used.

ipport=0-65535
Defines the UDP or TCP port to listen for protocol messages on. Modbus/TCP defaults to TCP port **502**. AB/Ethernet defaults to TCP port **2222**. Ethernet/IP defaults to TCP port **44818**.

messagetimeout=10-65535 milliseconds
When messages are received from remote clients, this is the time to allow the message to wait to be answered. This includes both the queuing and slave response delays, and this should be set to slightly less than the timeout of the remote client. After this time, the Digi device assumes the remote client no longer wants a response. The default is **2500**

milliseconds. The time tags **ms**, **sec**, and **min** can be used.

permit={all|readonly|rdwrdata} (Modbus only)
Allows the Digi device to block or allow specific Modbus commands. Since more than one Modbus master can be defined, you can use standard network firewalls to enable “safe” incoming Modbus/TCP paths that cannot modify device memory.

all
Allows all commands through the Digi device. Nothing is blocked.

readonly
Only commands that read normal operational data are allowed through the Digi device. All writes or special commands are blocked. Only Modbus commands 1-4 are allowed.

rdwrdata
Only commands that read or write normal operational data are allowed through the Digi device. All special commands are blocked. Only Modbus commands 1-6, 15, and 16 are allowed.

The default is **all**.

priority={high|medium|low}
Enables a serial master to have adequate bandwidth, which is critical if a Digi device is added in pass-through mode to share serial devices between a serial master and network masters. Since up to 64 network masters could compete with a single serial master, without a priority setting, the serial master could get less than 2 percent of the bandwidth. For example, set the serial master to **high** and the network masters to **medium**.

high
A high-priority master can get up to 50 percent of the bandwidth–of course you cannot have too many high-priority masters. All high-priority masters get one message serviced before any low or medium priority masters get any service.

medium
If a high-priority master exists, then one medium-priority master gets one message serviced before all the high-priority masters are serviced again. If only medium-priority masters exist (which is the default setting), then all masters are serviced in a round-robin manner.

low
Low-priority masters only get service when no high- or medium-priority master has messages to service.

The default is **medium**.

range
The slot in the table of masters. Used to select one or a range of master entries to display or configure.

table (applies to master only)
Defines which table is used to route messages to their destination. This applies only to master-attached devices.

type={tcp|udp}
Defines whether the incoming connection is TCP (connected) or UDP (unconnected). The default is **tcp**.

Options for Configuring Destination Tables

The following command options are used to configure destination tables:

addroute=N
Creates a new route in this entry in the table.

command={destroy}
Destroys, or deletes, this master entry. This stops the network listener and the protocol connection will no longer be accepted.

moveroute=N,M
Move the destination route from slot N to slot M.

name=*string*
A useful name for the destination table. Default names are **table1**, **table2**, etc. This option gives you the option to rename the table for convenience. Note that tables are still handled internally by number.

removeroute=N
Destroys this entry in the table.

Options for Configuring Routes in Destination Tables

The following command options are used to configure destination tables:

active={on|off}
Enables or disables the route in the table.

connect={active|passive}
Defines whether the Digi device attempts immediately to connect to a remote device (**active**), or waits and only connects on demand (**passive**). The default is **active**.

filterip={on|off}
Valid for destination entries of type **ip**. The default is **off**. When **filterip=on**, the Digi device's IP is used to fill in any zero octets in the remote IP.

idletimeout=1-65535 seconds
The master aborts a connection after the remote client has been idle for this time. The time is saved in seconds. The best use for this timeout is to speed up fault recovery. For example, many wide-area networks can suffer shutdowns without the Digi device detecting it. Using the idle timeout will speed up detection of lost TCP connections. The default is 5 minutes. The range is 1 to 65535 seconds. The time tags **ms**, **sec**, and **min** can be used.

ipaddress=*ip address*
The destination IP address of the entry.

ipport=0-65535
The UDP or TCP port on which to listen for protocol messages. Modbus/TCP defaults to TCP port **502**. AB/Ethernet defaults to TCP port **2222**. Ethernet/IP defaults to TCP port **44818**.

mapto=N
Used for destination entries of type **mapto**. This option defines the protocol address for which to reevaluate this message.

messagetimeout=10-65535 milliseconds
When messages are received from remote clients, this is the time to wait to allow the message to be answered. This time includes both the queuing and slave response delays, and this should be set to slightly less than the timeout of the remote client. After this time, the Digi device assumes the remote client no longer wants a response. The default is **2500 milliseconds**. The time tags **ms**, **sec**, and **min** can be used.

name=*string*
Used to set a useful name for this entry. Default names are **route1**, **route2**, etc. This name gives you the option to rename the entries for convenience. This name is also used as the DNS name when appropriate.

port={N}
Defines the serial port for a destination entry type **serial**.

protaddr={N|N-M}
Defines the protocol address(es) that will be forwarded to this destination entry in the table.

reconnecttimeout=10-65535 milliseconds
If the connection to the remote node fails, this reconnect time is used to delay attempts to reconnect. The default is **2500 milliseconds**. The time tags **ms**, **sec**, and **min** can be used.

replaceip={on|off|add|sub}
This option is valid for destination entries of type **ip**. The default is **off**. When **on**, the protocol address is used to replace the last octet of the IP address. For example, if the table IP is 192.168.1.75 and the protocol address of this message is 23, the message will be forwarded to the remote IP 192.168.1.23. If the **add** or **sub** value is set, the protocol address is added or subtracted from the final octet of the IP address. In the above example, the result would be 192.168.1.98 or 192.168.1.52, respectively.

splitip={on|off}
splitdivisor=1-255
splitbase=0|1
These settings enable a message forwarding scheme similar to the Modicon BM-85.

splitip={on|off}
Enables or disables this message forwarding mode.

splitdivisor=1-255
Defines how the protocol address is split.

splitbase=0|1
Defines whether or not the result is incremented by 1.

For example, suppose a destination route entry exists for protocol addresses 100 to 255, with a split divisor of 10, a split base of 0, and a remote IP address of 192.168.1.0. A message for slave 171 would be forwarded to IP address 192.168.1.17 to slave address 1. A message for slave 176 would be forwarded to IP address 192.168.1.17 to slave address 6. A message for slave 211 would be forwarded to IP address 192.168.1.21 to slave address 1.

transport={tcp|udp}
Defines whether the outgoing connection is TCP (connected) or UDP (unconnected). The default is **tcp**.

type={discard|dns|ip|mapto|nopath|serial}
Defines the type of destination for this route.

discard
Messages destined for this route entry are discarded without error.

dns
Messages destined for this route entry are forwarded to the entered DNS name.

ip
Messages destined for this route entry are forwarded to the entered IP address. If you enter the IP address as 0.0.0.0, the Digi device's IP address is used to fill in the IP address, and the **replaceip** function is applied. For example, if the IP is 0.0.0.0, the Digi device's IP address is 192.168.23.199, and the protocol address of the message is 45, then the remote IP address used will be 192.168.23.45.

mapto
Messages destined for this route entry are reevaluated as-if having the protocol address configured within this entry.

nopath
Messages destined for this route entry are returned to sender with a protocol-defined error message.

serial
Messages destined for this route entry are forwarded to a serial port.

Options for Configuring Protocols

These options apply to specific protocols and are not available on all products. The protocols are noted in parentheses after the option name.

protocol=*protocol*

Specifies which protocol is being used. One of the following protocol names or short names may be specified:

***protocol* value**	**Short Name**	**Description**	**Digi Devices Supported in**
abethernet	abcsp	Allen-Bradley (AB)/Client-Server Protocol; older port 2222 protocol.	Digi One IAP
ascii_import	ascii	ASCII devices.	Digi One IAP
chat		Multi-client Telnet.	PortServer TS 8/16 Family PortServer TS 8/16 MEI Family
custom		User-defined protocol.	Digi One IAP PortServer TS Family
df1fullduplex	df1fd	AB/DF1 Full Duplex.	Digi One IAP
ethernetip	eip	ODVA Ethernet/IP for PCCC encap.	Digi One IAP
hostlink		Hostlink protocol.	Digi One IAP
modbusascii	mbasc	Modbus/ASCII.	Digi One IA Digi One IAP PortServer TS Family
modbusrtu	mbrtu	Modbus/RTU.	Digi One IA Digi One IAP PortServer TS Family
modbustcp	mbtcp	Modbus/TCP.	Digi One IA Digi One IAP PortServer TS Family

Protocol-Specific Options

acktimeout
(df1fullduplex, hostlink)
The period to wait for an acknowledgment from the connected device after sending a message. When this period is exceeded, the Digi device re-sends the message. The range is 0 to 65535 milliseconds. The default is **250 milliseconds**.

acklimit
(df1fullduplex, hostlink)
The number of times that the **acktimeout** timer can expire before the Digi device discards a message as undeliverable. The range is 0 to 255. The default is **3**.

addextfunc
(modbusrtu, modbusascii, modbustcp)
Used to add Modbus function codes to the list that will use the **exttimeout** instead of the messagetimeout. See the **exttimeout** option for more details.

ansiescape={on|off}
(custom)
Indicates the protocol uses an ANSI escape character as the first character in the end pattern (see the **end** option).

The typical example is a protocol with a start pattern of 0x10 0x02, an end string of 0x10 0x03, and an escape sequence of 0x10 0x10, used to specify a single 0x10 data byte. If a request is: 0x10 0x02 0x10 0x10 0x03 0x10 0x03 with **ansiescape=on**, this message would get recognized correctly. With the **ansiescape=off**, (0x10 0x2 0x10 0x10 0x3) would be incorrectly recognized as the message, and the rest of the message would be thrown away. This happens because the 0x10 0x3 end string is found in the message body and accidentally recognized as the end of the message.

broadcast={on|off|replace}
(modbusrtu, modbusascii, modbustcp)
Specifies how to handle incoming requests with a slave address set to the broadcast value. For Modbus, this is 0. The default is to replace 0 with 1, which was selected to overcome the fact that most Modbus/TCP clients default to send requests to unit ID zero (0) when not sending a broadcast.

on
Tells the Digi device to send requests as broadcast to the destination device(s) and not expect any response message.

off
Tells the Digi device 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.

buffer={32-8190}
(custom)
Allows tuning the allocated buffer size. The default is **530**.

checksum={bcc|crc}
(df1fullduplex)
Selects the checksum or error-detection method used by the attached device. DF1 supports both a 16-bit CRC (**crc**) and an 8-bit Block Check Code (**bcc**). Rockwell 'C*Logix' processors default to **bcc**, while MicroLogix and other PLC families tend to default to **crc**. The Digi device default is **crc**.

class={ucmm|cm3}
(ethernetip)
Selects either Unconnected (**ucmm**) or Connected Class 3 (**cm3**) explicit messaging for client (ODVA 'Originator') connections to remote slaves (ODVA 'Targets').

Since only PCCC messages are currently supported, the CIP service Exec_PCCC (0x4B) is used to the Rockwell PCCC Object. To communicate to a ControlLogix, this option must be set to **cm3**, and the **connpath** option must be set. The default is **cm3**.

connpath="*path*"
(ethernetip)
Defines an optional ForwardOpen connection path for client (ODVA 'Originator') connections to remote slaves (ODVA 'Targets'). To communicate to a ControlLogix processor, you will need to enter the slot number the form **s*N***, where ***N*** is the number such as **s0** or **s7**. The default is no path or "".

dontecho={on|off}
(chat)
Tells the Digi device to echo (**on**) or not echo (**off**) bytes directly to attached Telnet clients. This compensates for the fact that most systems rely on the attached serial device to echo data, but since within the CHAT protocol, it holds all client bytes until the end-of-line is detected. The default is **off**.

duplex={half|rcv_only|xmt_only}
(custom, ascii_import)
Defines message behavior per the port to the server device.

half
Specifies poll/response behavior. A poll is sent and the Digi device waits strictly for a response from the slave device.

rcv_only
The Digi device only receives data from the attached device. No data is transmitted and any received for transmit is discarded.

xmt_only
The Digi device only send data to the attached device. Any data received is discarded.

The default is **half**.

duplicatedetection={on|off}
(df1fullduplex)
Filters out consecutive requests that have identical command, source, and TNS bytes. This behavior is necessary for compliance with the DF1 specification. The default is **on**.

end="*pattern*"
(custom, ascii_import, chat)
The Digi device uses this character pattern to detect an end of a message. The default is **""** or no pattern. Rules and guidelines for specifying this character pattern string are:

- 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. For example: **\x03** or **\x7E**.
- These special characters can be entered using a shortcut: **\t** (tab), **\r** (carriage return), **\n** (line feed).
- To use the backslash character as a delimiter, enter two backslash 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.
- The quote marks are optional, but use “” to disable the end pattern.

eoln_form={auto|cr|nl|crnl|nlcr|time|pattern}
(ascii_import)
Defines how the chat protocol engine detects end-of-line (EOLN) behavior. Client messages are only forwarded after EOLN behavior is detected. The chat protocol also attempts to correct mismatched EOLN between clients and servers.

auto
The Digi device attempts to detect the EOLN as CR, NL, CRNL, or NLCR.

cr
The <CR> or \x0D byte is used to detect the EOLN.

crnl
The <CR><NL> or \x0D\x0A byte pair is used to detect the EOLN.

nl
The <NL> or \x0A byte is used to detect the EOLN.

nlcr
The <NL><CR> or \x0A\x0D byte pair is used to detect the EOLN.

time
The **chartimeout** option is used to detect a time-gap as the EOLN.

pattern
The end pattern specified on the **end** option is used to detect the

EOLN.

The default is **auto**.

errorresponse={on|off}
(modbusrtu, modbusascii, modbustcp, df1fullduplex, abcsp)

Controls behavior for common run-time errors such as no response from the slave device. By default, **errorresponse=on**, which means return an error response – except for Modbus/RTU and ASCII protocols, where by default, **errorresponse** should be **off**. This option exists because different clients handle error response and no response differently. In the case of Modbus, **errorreponse=on** causes return of exception codes 0x0A and 0x0B, which most Modbus serial masters **do not** understand.

exttimeout={10-65535}
(modbusrtu, modbusascii, modbustcp)

Allows an alternative messagetimeout setting for selected Modbus commands, such as vendor specific commands. The **addextfunc** and **rmextfunc** options are used to add and remove from the list of Modbus functions that will use the exttimeout setting. The default setting is **15,000 milliseconds**.

fixedaddress={auto|1-255} (Modbus)
fixedaddress={auto|0-255} (Rockwell)
fixedsource={auto|1-255} (Modbus)
fixedsource={auto|0-255} (Rockwell)
(modbusrtu, modbusascii, modbustcp)

The fixed source/destination address. Used to override the Modbus protocol address (unit ID) with a fixed address. Rockwell protocols (DF1, AB/Enet, ENet/IP) include a source and destination byte with the PCCC message. Some Masters allow you to set these as desired, but many offer no control of the values. Additionally, when multiple Masters are “sharing” a single slave, the DOIAP by default changes the “source address” to be unique since the PLC uses this to lock resources during programming. These two parameters allow you to force specific values on the outgoing PCCC link. For example, some DF1 to DH+ gateways use the “source address” as their DH+ MAC address, which means multiple Masters with multiple source addresses confuses the DH+ bus. Note that destination 255 is a “broadcast” in DF1 and various AB PLC models behave differently when they see it.

auto

When set to **auto**, the protocol address will not be overwritten.

0-225
1-255

Setting the fixed source/destination address to a fixed number from 0-255 (for Rockwell protocols) or 1-255 (for Modbus protocols) forces this value to be used for all Modbus requests.

The default setting is **auto**.

mapping="*string*"
(df1fullduplex, abcsp, ethernetip)
Normally Allen-Bradley PLC data file types are assumed from the access method, so a bit read assumes binary type and word read assumes integer type. Thus, a bit read to N9 will be rejected by the AB PLC, while a word read will succeed. To override this behavior, enter a string such as "**N9,B13,L20,F210**, which instructs the Digi One IAP to always, for example, treat file 9 as integer regardless of the access command, and so on. Supported types are B for 16-bit Binary, N for 16-bit integer, L for 32-bit integer, and F for 32-bit floating point.

naklimit=0-255
(df1fullduplex)
The number of negative acknowledgments (Naks) the Digi device 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**.

packing={ch_pad|direct|swap|pad_ch}
(ascii_import)
Defines how ASCII characters are packed into word registers.

ch_pad
One character is placed into the low-byte of each register, with a pad byte placed in the high-byte. How this appears within the protocol is protocol-specific. Use **pad_ch** if this sequence is wrong.

direct
Characters are packed directly into the registers exactly as received. How this appears within the protocol is protocol-specific. Use **swap** if this sequence is wrong.

swap
Characters are swapped as packed into the registers. How this appears within the protocol is protocol-specific. Use **direct** if this sequence is wrong.

pad_ch
One character is placed into the high-byte of each register, with a pad byte placed in the low-byte. How this appears within the protocol is protocol-specific. Use **ch_pad** if this sequence is wrong.

pad_char={none|0-255|\\x00-\\xFF}
(ascii_import)
Defines the characters used to pad registers when the ASCII message does not fill the entire register space. This value is also used in the **pad_ch** and **ch_pad** packing sequences.

prewrite1="pattern"
prewrite2="pattern"
(ascii_import)
Defines the string used to poll an ASCII device in half-duplex mode for the first two buffers. The pattern is defined the same as for the **end** option.

polltimeout=10-65535
(df1halfduplex)
The period a master waits for a response to a poll before either polling again (see the **polllimit** option) or giving up on getting a response. The range is 0 to 60000 milliseconds. The default is **250 milliseconds**.

polllimit=0-255 (df1halfduplex)
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**.

rbx={off|half}
(modbusrtu--(slave only))
Enables the serial slave driver to handle Report-By-Exception (XMIT) writes between polls.

A pilot Report-By-Exception (or XMIT) handler has been added to the Modbus/RTU serial slave driver. The Digi device pauses between slave polls to receive potential “Master Requests” initiated by the slave. Just as with a serial Master-attached configuration, the Modbus/RTU “slave address” is used with the IA route table to determine the remote destination.

Behavior is assumed to be half-duplex, and the exact behavior of the slave device after a collision where both units try to send a request at the same time is unpredictable. The Digi device will normally ignore the XMIT request and treat its own request as a timeout.

Using the **rbx**: option and Report-by-Exception writes involves several requirements:

- The port must be set to **type=slave** and the protocol to **protocol=modbusrtu.**
- Only one slave may be present on the serial line; multi-drop is not permitted.
- The **fixedaddress** option must be set to address of the slave. All other values are assumed to be XMIT transactions.
- XMIT requests MUST NOT use the fixed address of the slave.
- The **lineturndelay** option must be set to at least 50 milliseconds to provide a window of opportunity for the XMIT function to send a request.

rmextfunc=N,M,…
(modbusrtu, modbusascii, modbustcp)
Used to remove Modbus function codes from the list of those using the **exttimeout** option instead of the **messagetimeout** option. See the **exttimeout** option for more details.

rtutimeout (obsolete)
This option is obsolete. Instead, use the **chartimeout** option, described in "Options for Configuring Serial Port-Connected Devices" on page 134.

srvecho={on|off}
(chat)
Tells the chat protocol engine whether the attached device will echo messages. If the attached device echoes, then the chat protocol engine does not forward client messages to other clients. If the attached device does not echo, the chat protocol engine must forward a copy of client messages to other clients. The default is **on**.

start="*pattern*"
(custom)
The Digi device uses this character pattern to detect an start of a message. Refer to the **end** option for the rules and guidelines for specifying this string. The default is **“”** or no pattern.

target={…}
(df1fullduplex, abethernet, ethernetip)
Used in protocol conversion to select the format of protocol commands to accommodate different processors. To understand and use protocol conversion, refer to the IA support documentation on the Digi website. Go to www.digi.com and search on the keywords **Industrial Automation** or **IA**.

cif
Uses PLC2/Common Interface File style Unprotected Read/Write - PCCC/DF1 commands 1 and 8 (see Rockwell Publication 1770-6.5.16 pages 7-31 & 7-32).

slc5
Uses SLC500 style Protected Logical Read/Write with 3 Address Fields - PCCC/DF1 functions 0xA2 and 0xAA (see Rockwell Publication 1770-6.5.16 pages 7-17 & 7-18).

plc5
Uses PLC3/PLC5 style Word Range Read/Write - PCCC/DF1 functions 0x00 and 0x01 (see Rockwell Publication 1770-6.5.16 pages 7-34 & 7-35).

The default is **cif**.

Examples

Here is an example of setting up Industrial Automation configurations. It includes commands used to clear any existing settings before configuring new settings.

Getting Started

To fully clear all IA settings, issue the following command:

```
#> revert ia=factory
```

See "revert" on page 83.

The **revert** command clears all IA settings for serial ports, masters and tables. This command also disables the IA engine. Therefore, to reenable the IA engine on specific serial ports, issue the following command:

```
#> set ports ra=1 dev=ia
```

See "set ports" on page 176.

To set baud rate and other serial port settings, issue the following command:

```
#> set line ra=1 baud=9600
```

See "set line" on page 155.

To enable RTS/CTS flow control for radio modems or half-duplex RS485 converters, use the command:

```
#> set flow ra=1 rts=toggle
```

See "set flow" on page 120.

Note that the pre-delay and post-delay settings for set flow can be used to delay transmission after RTS rises and before RTS drops respectively.

Setting up a Modbus/TCP to RTU Bridge with Slave(s) Attached

Because of the increased flexibility of IA configuration in this firmware release, creating a simple Modbus bridge by command line requires more steps than previous firmware. This example defines the message source (the ia master), a message destination (the ia serial), and how messages are forwarded. In this example, all incoming messages are forwarded to serial port 1.

```
#> set ports ra=1 dev=ia
#> set ia master=1 protocol=mbtcp active=on
#> set ia serial=1 protocol=mbrtu
#> set ia table=1 addroute=1 active=on
#> set ia table=1 route=1 type=serial port=1 protocol=mbrtu
```

Adding a Second Serial Port with More Modbus Slaves Attached

Because the DigiOne IAP includes two serial ports, a second multi-drop of serial slaves can be added. Because the messages can be “routed” to one of the two ports, multiple masters can use both ports concurrently. To define the first port as having slaves 1 to 8, the second port as having slaves 9 to 14, and slaves 15-255 to be rejected, enter the following commands:

```
#> set ports ra=1-2 dev=ia
#> set ia master=1 protocol=mbtcp active=on
#> set ia serial=1 protocol=mbrtu
#> set ia serial=2 protocol=mbrtu
#> set ia table=1 addroute=1 active=on
#> set ia table=1 route=1 type=serial port=1 protocol=mbrtu protaddr=1-8
#> set ia table=1 addroute=2 active=on
#> set ia table=1 route=2 type=serial port=1 protocol=mbrtu protaddr=9-14
#> set ia table=1 addroute=3 active=on
#> set ia table=1 route=3 type=nopath protaddr=15-255
```

Using the Second Serial Port in Pass-Thru Mode for a Serial Modbus Master

Another use for the second serial port of the DigiOne IAP is to allow a serial master to share serial slaves 1-8 with the network. Because of the destination table, the serial master can be allowed to access Modbus/TCP network slaves. Since **route=2** has **ip=0.0.0.0**, this means DigiOne IAP will use its own IP address and the slave address to construct an IP address. Therefore, if the DigiOne IAP’s IP address is 192.168.1.37 and the Modbus slave address is 99, a remote Modbus/TCP slave at IP address 192.168.1.99 will be accessed.

```
#> set ports ra=1-2 dev=ia
#> set ia master=1 protocol=mbtcp active=on
#> set ia serial=1 protocol=mbrtu
#> set ia serial=2 protocol=mbrtu type=master
#> set ia table=1 addroute=1 active=on
#> set ia table=1 route=1 type=serial port=1 protocol=mbrtu protaddr=1-8
#> set ia table=1 addroute=2 active=on
#> set ia table=1 route=2 type=ip protocol=mbtcp protaddr=9-255
ipaddress=0.0.0.0
```

Setting Up a AB/DF1 PLC with Pass-Thru for Local HMI display

Suppose a simple AB PLC has a single serial port already attached to a local Human Machine Interface (HMI). Using the DigiOne IAP Pass-Thru port, we can network enable the PLC and still have our local HMI. This configuration defines two message sources (the AB/Ethernet or CSP protocol and the second serial port), one message destination (serial port 1), and the destination table that forwards all messages to serial port 1. Because RSLinx does not support setting the DST byte in DF1 or CSP, you will not be able to access two PLCs by one Digi device.

```
#> set ports ra=1-2 dev=ia
#> set ia master=1 protocol=abethernet active=on
#> set ia serial=1 protocol=df1fd type=master
#> set ia serial=2 protocol=df1fd type=master
#> set ia table=1 addroute=1 active=on protaddr=0-255
#> set ia table=1 route=1 type=serial port=1 protocol=df1fd
```

Enabling Outgoing MSG Blocks in Above AB PLC

Because DigiOne IAP now supports bi-direction messaging with DF1 Full-Duplex, the PLC can be enabled to use MSG blocks to query remote AB/CSP PLC such as PLC5E, SLC5/05, or more DigiOne IAP devices. Since **route=2** has **ip=0.0.0.0**, this means DigiOne IAP will use its own IP address and the slave address to construct an IP address. Therefore, if the DigiOne IAP's IP address is 192.168.1.37 and the DF1 DST byte is 7, a remote CSP slave at IP address 192.168.1.7 will be accessed.

```
#> set ports ra=1-2 dev=ia
#> set ia master=1 protocol=abethernet active=on
#> set ia serial=1 protocol=df1fd type=master
#> set ia serial=2 protocol=df1fd type=master
#> set ia table=1 addroute=1 active=on
#> set ia table=1 route=1 type=serial port=1 protocol=df1fd protaddr=0-1
#> set ia table=1 addroute=2 active=on
#> set ia table=1 route=2 type=ip protocol=abcsp protaddr=2-255 ipaddress
=0.0.0.0
```

See Also

- "set config" on page 100 to configure a Digi device to use a DNS server.
- "revert" on page 83 for information on reverting IA configurations.
- "set ports" on page 176.
- "set line" on page 155.
- "set flow" on page 120.
- "show" on page 252 for displaying the current IA configuration settings.
- The Web user interface's help for IA configuration. Go to **Applications** > **Industrial Automation** and click **How to Configure Industrial Automation**.

- For more detailed help on IA configurations, go to www.digi.com and search on the keywords **Industrial Automation** or **IA**.Rockwell users can also find the correct EDS files on the Digi website.

set ippool

Purpose

Creates a pool of IP addresses for serial ports, or displays the currently defined pool of IP addresses. This command can be used for configuring IP addresses for PPP connections.

Required Permissions

The root user can configure a pool of IP addresses. Normal users can display the currently defined pool of IP addresses.

Syntax

Create a Pool of IP Addresses for Serial Ports

```
set ippool count=num ip addr ip=first ip addr
```

Display Currently Defined Pool of IP Addresses

```
set ippool
```

Options

count=*num ip addr*
The number of IP addresses in the pool. The allowed range varies by device. Enter **set ippool ?** to see the allowed range for your device.

ip=*first ip addr*
The first IP address in the pool.

Example

In this example, the **set ippool** command configures a pool of four IP addresses: 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

- "remove" on page 81 to remove entries from the ippool table.
- "revert" on page 83. The **revert ippool** command reverts the **set ippool** configuration.
- "set user" on page 238 for information on linking a user to the IP address pool.
- "Configure Inbound PPP Connections" on page 18.

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.

Required Permissions

The root user can configure key sequences. Normal users can display key mappings.

Syntax

Configure Key Sequences

```
set keys function=keys
   [range=range]
```

Display Current Key Mappings

```
set keys [range=range]
```

Options

function=keys

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=*range*
A range of ports. If you issue the command from a Telnet session, you must specify the **range** option. 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** option 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
```

See Also

"revert" on page 83. The **revert keys** command reverts the **set keys** configuration.

set line

Purpose

Configures or displays options associated with a serial line.

Required Permissions

The root user can configure line options. Normal users can display line options.

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]
```

Options

baud=*bps*

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, 115200, 230400. In addition, PortServer TS 8/16 Family devices support 100, 3600, and 460800 bps.

The default is **9600**.

break={ignore|send|escape}

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={5|6|7|8}

The character size, which can be 5, 6, 7, or 8 bits. The default is **8**.

error={ignore|null|parmrk|dos}
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={on|off}
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={on|off}
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={on|off}
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={on|off}
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={o|e|n|m|s}
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=*range*
The port or range of ports to which this command applies.

stopb={1|2}
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.

For serial lines configured with 5 data bits (**csize=5**) and 2 stop bits (**stopb=2**), a value of 1.5 stop bits is automatically used, and overrides any other value entered for this option.

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

- "revert" on page 83. The **revert line** command reverts the **set line** configuration.
- "set ports" on page 176.
- "set flow" on page 120.

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.

Required Permissions

The root user can configure login sequences. Normal users can display login settings.

Syntax

Configure Login Sequence

```
set logins [cmdprompt=string]
   [logprompt=string]
   [login={on|off}]
   [passwd={on|off}]
   [passprompt=string]
   [premessage=string]
   [range=range]
   [rootprompt=string]
   [verbose={on|off}]
   [write={on|off}]
```

Display Login Settings

```
set logins [range=range]
```

Options

cmdprompt=*string*

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 or colons.

The default is **digi>** for normal users, and **#>** for root users.

logprompt=*string*

The login prompt displayed. The maximum length is 10 characters. Enclose this string in quotation marks if it includes spaces or colons. The default login prompt is **login**:

login={on|off}

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 option is disabled when the port is configured as an auto port. See "set ports" on page 176 for more information.

passwd={on|off}
Specifies whether users are required to supply a password to access the ports specified by the **range** option.

on
Users are required to supply a password to access the ports specified by the **range** option.

off
Users do not supply a password.

The default is **on**. This option is disabled when the port is configured as an auto port (see "set ports" on page 176).

passprompt=*string*
The password prompt displayed. The maximum length is 10 characters. Enclose this string in quotation marks if it includes spaces or colons. The default is **password**.

premessage=*string*
A message string that precedes any action, such as a login prompt or autoconnect. The string can contain escape characters. The maximum length after string processing is 63 characters. The default is **no message**.

range=*range*
The range of ports addressed by this **set logins** command. When the **set logins** command is issued from a Telnet session, **range** is required in order to identify the port to which it applies. When **set logins** is issued from an attached terminal, the command applies to the port which the terminal is attached, unless the **range** option is used to specify another port.

rootprompt=*string* (PortServer TS 8/16 Family only)
The prompt displayed to the root user who has logged in. The maximum length is 31 characters. Enclose this string in quotation marks if it includes spaces or colons. The default is **#>**.

verbose={on|off}
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={on|off}
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.

Examples

Display Login Information on All Ports

```
#> set logins
```

Display Login Information on a Range of Ports

```
#> set logins range=1
```

Configure a Port for User Configuration

In this example, the **set logins** command configures a port so that users can save their login-related configuration changes and use them in future sessions:

```
#> set logins write=on range=1
```

Configure the Command Prompt

In this example, the **set logins** command configures the command prompt. Since there are spaces and a colon in the new command prompt, the entry is enclosed in quotation marks.

```
#> set logins cmdprompt=”Ent Cmd:” range=1
```

See Also

"revert" on page 83. The **revert login** option reverts the **set logins** configuration.

set logport

Purpose

Configures or displays the port-logging feature, also known as logport. The port-logging feature passively logs data going into, out of, or both on a serial port. This means that you can be using a standard reverse or RealPort session on a port, and all the data from that session can be sent to a configurable server.

Port Logging Mechanics and Memory Use

The port buffer is a FIFO circular buffer; as new input arrives at the port, older contents will be purged.

The displayed information, from the command line or web interface, is port data. In the web interface, the Refresh button performs the equivalent of entering a **set logport** command without options.

The size of the port data log is set by the **set buffer** command's **size** option; see "set buffer" on page 97. When the log size is changed, the change is not implemented until the unit is rebooted. This reboot clears the contents of the port buffer.

The space for port logs is set on a per-port basis. Port logging uses the overall memory on the unit (maximum 16 MB). The amount of memory that can be used for port logging depends on how much memory is being used on the unit overall.

There is a hard limit on the amount of available memory on the unit for storing this data. For intense logging, Digi recommends setting up a syslog server to have the data logged there instead of on-board individual PortServer devices.

The **set buffer** command's **clear** option clears the contents of the specified buffer.

The **set buffer** command's **state** option sets 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.

Required Permissions

The root user can configure port logging. Normal users can display port logging settings.

Syntax

Configure Port-logging Feature

```
set logport [range=port#-port#]
   [state={off|rx|tx|both}]
   [mode={raw|syslog}]
   [pri=0-65535]
   [ipaddress=ipaddress]
   [udpport=1-65535]
   [rtime=0-65535]
   [rmax=1-65535]
   [stripdelimiter={on|off}]
   [delimiter=string]
```

Display Current Port-Logging Settings

```
set logport
```

Options

range=*port#-port#*
A range of port numbers to which to apply the settings. For example: **range=1-16**

state={off|rx|tx|both}
Specifies how data should be handled.

off
Do not send port logging data.

rx
Send data received on the serial port.

tx
Send data transmitted by the serial port.

both
Send data received and transmitted (rx+tx).

The default is **off**.

mode={raw|syslog}
Specifies whether the data is sent as raw data or in syslog format.

raw
Sends data to the server as it is seen on the port.

syslog
The serial data is encapsulated in syslog format.

The default is **syslog**.

pri=0-65535
The syslog priority, which instructs the syslog server how to prioritize this packet. This option applies only if **mode=syslog**.

ipaddress=*ipaddress*
The IP address to which packets are sent.

udpport=1-65535
The UDP port to which packets are sent. The default is **514** (syslog).

rtime=0-65535
The time in milliseconds to wait before sending out a packet, if there is

data. The default is **0**, which means that this **rtime** option is ignored.

rmax=1-65535
The amount of data to collect before sending a packet. The default is **1024**.

stripdelimiter={on|off}
Specifies whether delimiters encountered in the data stream are sent as-is to the server or stripped from the data before sending.

off
If a delimiter is encountered in the stream, it is sent to the server.

on
If a delimiter is encountered in the data, it is removed before the data is sent.

The default is **off**.

delimiter=*string*
The string in the serial data that tells the Digi device that the message is complete and should be forwarded to the destination. If you do not specify a delimiter, the Digi device will forward a message based on the number of bytes accumulated in the buffer (specified by the **rmax** option) and on the period to wait for the buffer to fill (specified by the **rtime** option).

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 backslash characters (****).

There is no default delimiter.

Examples

To enable logging to a syslog server (in the receive and transmit directions):

```
#> set logport range=1-16 state=both mode=syslog ipaddress=190.175.175.20
udpport=514
```

To enable logging to a UDP server for receive direction only:

```
#> set logport range=1-16 state=rx mode=raw ipaddress=190.175.175.20
udpport=514
```

See Also

- "revert" on page 83. The **revert logport** command reverts to the port-logging settings to defaults or to the latest configuration stored in NVRAM.

- "set buffer" on page 97.
- "set line" on page 155.

set mei

Purpose

Controls global Multiple Electrical Interface (MEI) configuration settings. The system configuration MEI settings for baud rate range are only valid for EIA-422/485 ports when automatic transmitter control is active.

Required Permissions

The root user can configure MEI settings. Normal users can display MEI settings.

Syntax

Configure Global MEI Settings

```
set mei {[minbaud=baudrate]|[maxbaud=baudrate]}
   [allenables={on|off}]
```

Display Current Configuration Settings

```
set mei
```

Options

About the Baud Rate Options

The MEI baud rate settings are only valid for EIA-422/485 multi-drop ports. Supported baud rates for EIA-422/485 with automatic transmitter control are limited. The **minbaud** and **maxbaud** options allow you to adjust the range to your requirements. Select the minimum or maximum required baud rate to adjust the window; defaults for **minbaud** and **maxbaud** allow you to select any baud rate between 3600 and 230400. Only **minbaud** or **maxbaud** should be specified, but not both. Whichever baud-rate option is specified automatically computes the other. The relationship of **minbaud** to **maxbaud** is: **minbaud** * 64 = **maxbaud**.

minbaud=*baudrate*
The minimum baud rate. The default is 3600.

maxbaud=*baudrate*
The maximum baud rate. The default is 230400.

allenables={on|off}
Enables or disables serial-port transmitters.

on
Enables serial-port transmitters.

off
Disables serial-port transmitters.

The default is **on**.

Examples

```
#> set mei allenables=on
```

See Also

- "revert" on page 83. The **revert mei** command reverts the MEI configuration settings.
- "set switches" on page 218. That command configures MEI settings on a per-port basis.

set menu

Purpose

Creates and modifies custom menus. 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.

Required Permissions

The root user can configure menus. Normal users can display menu 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
```

Options

c#=command

A command that is executed when a user selects this menu line, where:

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.

m#=*string*
A text or informational line for the menu, where:

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.

range=*range*
A port or range of ports.

t#=*string*
A title line for the menu, where:

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.

name=*string*
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** option.

Names may be up to 16 characters long. Enclose names containing spaces in quotation marks.

rmentry=*line num*
Removes the specified line from the menu.

show={on|off}
Displays (on) or hides (off) menu entries identified on the **range** option.

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

- "remove" on page 81 to remove entries from the menu table.
- "revert" on page 83. The **revert menu** command reverts the **set menu** configuration.
- "set user" on page 238 (the **menu** and **defaultaccess** options) 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.

Required Permissions

The root user can configure modem settings. Normal users can display modem settings.

Syntax

Configure Association between a Port and Test/Initialization Scripts

```
set modem [init={script|index num|no}]
   [range=range]
   [test={script|index num|no}]
```

Clear Association between Ports and Test/Initialization Scripts

```
set modem [init=no] [test=no]
```

Display Modem Table Entries

```
set modem [range=range]
```

Options

init={|*script*|*index num*|no}
One of the following:

script
The name of an initialization script, created with the **set scripts** command.

index num
The index number of an initialization script in the scripts table.

no
Clears an association between a port and an initialization script.

range=*range*
The range of ports to which this command applies.

test={*script*|*index num*|no}
One of the following:

script
The name of a test script, created with the **set scripts** command.

index num
The index number of a test script in the scripts table.

no
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 for the current port.

```
#> 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

- "revert" on page 83. The **revert modem** command reverts the **set modem** configuration.
- "set script" on page 195 for more information on creating modem scripts.

set netlogins

Purpose

Use the **set netlogins** command to:

- Configure the sequence of events that occur when a user logs into a server over the network (netlogin).
- Display current netlogin settings.

Required Permissions

The root user can configure netlogins. Normal users can display netlogin settings.

Syntax

Configure netlogin

```
set netlogins [cmdprompt=string]
   [login={on|off}]
   [logprompt=string]
   [passprompt=string]
   [passwd={on|off}]
   [premessage=string]
   [rootprompt=string]
   [verbose={on|off}]
   [write={on|off}]
```

Display Current netlogin Settings

```
set netlogins
```

Options

cmdprompt=*string*

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 **digi>** for normal users, and **#>** for root users.

login={on|off}

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 device types. This option is disabled when the port is configured as an auto port. See "set ports" on page 176 for more information.

logprompt=*string*

The login prompt displayed. The maximum length is 10 characters. Enclose this string in quotation marks if it includes spaces. The default is **login**:

passprompt=*string*
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={on|off}
Specifies whether users are required to supply a password to access the ports specified by the **range** option.

on
Users are required to supply a password.

off
Users do not supply a password.

The default is **on**. This option is disabled when the port is configured as an auto port (see "set ports" on page 176).

premessage=*string*
A message string that precedes any action, such as a login prompt or autoconnect. The string can contain escape characters. The maximum length after string processing is 63 characters. The default is **no message**.

rootprompt=*string*
The prompt displayed to the root user who has logged in. The maximum length is 31 characters. Enclose this string in quotation marks if it includes spaces.

The default is **#>**

verbose={on|off}
Specifies whether the device server displays connection status messages to users before the login prompt.

on
The device server displays connection status messages to users before the login prompt.

off
The device server does not display connection status messages to users before the login prompt.

The default is **off**.

write={on|off}
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.

Examples

Display Network Login Information on All Ports

```
#> set netlogins
```

Display Network Login Information on a Range of Ports

```
#> set netlogins range=1-2
```

Configure a Port for User Configuration

In this example, the **set netlogins** command configures a port so that users can save their login-related configuration changes and use them in future sessions:

```
#> set netlogins write=on range=1
```

Configure the Command Prompt

In this example, the **set netlogins** command configures the command prompt. Since there are spaces in the new command prompt, the entry is enclosed in quotation marks.

```
#> set netlogins cmdprompt=”Ent Cmd:” range=1
```

See Also

- "revert" on page 83. The **revert netlogin** command reverts the **set netlogins** configuration.
- "set logins" on page 158.

set netport

Purpose

Changes the netport, or port number used for the webserver (HTTP) service to a different port than the default, which is 80. The new port must not already be in use by another service.

Required Permissions

The root user can configure the netport for the webserver service. Normal users can display the current netport number.

Syntax

Change the Port Number for the Webserver Service

```
set netport [http=port number]
```

Display Current Port Number for the Webserver Service

```
set netport
```

Options

http=*port number*

The port number used for the webserver (HTTP) service. The port must not already be in use by another service, for example, RealPort on port 771.

Examples

```
#> set netport http=82
```

See Also

"revert" on page 83. The **revert netport** command reverts the **set netport** configuration.

set pmodem

Purpose

Used to configure options for modem emulation over TCP/IP, or display current modem-emulation settings.

Required Permissions

The root user can configure modem emulation settings. Normal users can display modem emulation settings.

Syntax

Configure Modem Emulation Settings

```
set pmodem [pmtelnet={on|off}]
   [range=range]
   [sN=value]
```

Display Modem Emulation Settings

```
set pmodem
```

Options

pmtelnet={on|off}

on
Disables the standard Telnet command-line interface for the device. This means that the device connects to a pmodem pool of serial ports, and will connect to the first of these serial port that has pmodem enabled.

Setting this option to **on** means that the device has no command-line interface. To enable the Telnet command-line interface, you must reset the device configuration.

off
Enables the standard Telnet command-line interface for the device.

range=*range*
The range of serial ports to which this command applies.

sN=value
An S-register value, where sN is s-register, ranging from s0 to a maximum number. S-register values are described in "Modem Emulation Commands" on page 263.

See Also

- "set ports" on page 176.
- "Modem Emulation Commands" on page 263.

set ports

Purpose

Configures or displays a port's operating parameters.

Required Permissions

The root user can configure port parameters. Normal users can display port parameters.

Syntax

Configure Operating Parameters of a Port

```
set ports [auto={on|off}]
   [autoservice={default|raw|rlogin|telnet}]
   [bin={on|off}]
   [dest={ip adr|hostname|none]
   [dev=device]
   [dport={tcp port|none}]
   [flushstchar={default|on |off}]
   [group={none|group}]
   [id={id name|none}]
   [idletime=0-60000]
   [keepalive={on|off}]
   [nlines=0-10]
   [p[1-9]=script param]
   [range=range]
   [scriptname=name]
   [sess=sessions]
   [show={autoconnect|id|script}]
   [termtype=type]
   [uid={id|none}]
```

Display Operating Parameters of a Port

```
set ports [range=range]
   [show={script|id|autoconnect}]
```

Options

auto={on|off}

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** option.

on

Users are automatically connected to a destination.

off

Users are **not** automatically connected to a destination.

The default is **off**.

autoservice={default|raw|rlogin|telnet}
Specifies the autoconnection service for this port, which is only used if **auto=on**. Choose one of the following:

default
Normally means the Digi device uses the Telnet service. The exception is if the **dport** option 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 Digi device uses the remote login (rlogin) service.

telnet
The Digi device uses the Telnet service.

bin={on|off}
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={*ip adr*|*hostname*|none}
The IP address or DNS host name of the destination system to which port users will be routed if **auto=on**. To disable this option, specify **none**.

dev=*device*
The device type, which defines the device connected to the port. Typically, you can use the following to define the devices listed. The default is **term**.

For most:	Use this dev=*device* 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
Industrial Automation (IA)	dev=ia

If the device you are configuring does not fit into the device types listed in the previous table, or requires unusual flow control attributes, use the information in the following table to define a device type.

Note that for **mio**, **mout**, **min**, **host**, and **hdial** device types, the device lowers DTR at disconnect and holds it low for two seconds to ensure a clean disconnection.

Device Type	Use for Devices with These 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 129.
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.
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.

Device Type	Use for Devices with These Attributes
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 (PortServer TS 8/16 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.

dport={*tcp port*|none}

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 option.

The default is **0**.

flushstchar={default|on|off}
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={none|*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={*id name*|none}
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.

idletime=0-60000
This option allows users to override how and when serial data received is sent over the network. The value is in milliseconds.

If set to 0, then Digi's standard algorithm is used; which is designed to lower data latency by sending smaller packets more frequently.

If set from 1 to 60000, then the serial port driver waits for at least the configured milliseconds with no more data received before sending the data on the network. This increases the probability (but does *not* guarantee) complete serial messages get sent as a single network packet.

The buffered data is always processed when it reaches the *defined maximum, which defaults* to 1024 bytes (1K).

There are several caveats to using this timeout option:

- Setting this option to a non-zero value adds to CPU load, so only use if required.
- Setting this option adds the value set (that is, the milliseconds specified in the 1-60000 range) plus an extra 1 to 2 milliseconds to every serial response due to the measuring of this idle time. As a result, a setting of 1 millisecond can cause a 7- or 8-millisecond latency, not 1 millisecond. The actual latency varies by product and the number of serial ports involved. That is, the added latency for a Digi One SP will differ from a PortServer TS 16.

keepalive={on|off}
Determines whether the keep-alive function is implemented with autoconnections. The default is **off**.

nlines=0-10
The number of lines of serial data to be displayed at a time.

p[1-9]=*script param*
Letters and numbers that can be used in the variable fields of login or dialer scripts. This option is used only when the port-based autoconnect feature is on. (See the **dest** option.)

range=*range*
The port or range of ports to which this command applies.

scriptname=*name*
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=*sessions*
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=*type*
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={*id*|none}
An index number in the user table that identifies a particular user for this port. If you use this option, calls from others attempting to use this port will be rejected. Specify **none** to disable the option.

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** option. 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

- "revert" on page 83. The **revert port** command reverts the **set ports** configuration.
- "set line" on page 155.
- "set flow" on page 120.
- "set keys" on page 153.
- "set logins" on page 158.
- "set powerunit" on page 182.

set powerunit

Purpose

Configures or displays power management options. This command is used to configure Digi RPM power controllers for use with a PortServer TS device to manage power for other connected devices.

Required Permissions

The root user can configure power-management options. Normal users can display power-management options.

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={baytech|digi_rpm}]
   [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]
```

Options

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.

This option sets the current alarm thresholds only. To actually generate an SNMP trap when a current alarm threshold is exceeded, SNMP must be configured to generate the trap, using the **set snmp** command option **curr_thresh_exc_trap=on**.

group=*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=*device_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=*outlet#*

A particular outlet or range of outlets on the power control unit.

range=*port*
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.

For:	range value
An individual port	range=2
A list of ports	range=1,3,5
A range of ports	range=1-5

size=*number_of_outlets*
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.

This option sets the temperature thresholds only. To actually generate an SNMP trap when a temperature threshold is exceeded, SNMP must be configured to generate the trap, using the **set snmp** command option **temp_thresh_exc_trap=on**.

type={baytech|digi_rpm}
Specifies the manufacturer of the power unit.

users=*user_index-user_index#*
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
```

Display 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

- "power" on page 76 for information on managing power-management devices.
- "remove" on page 81 to remove entries from the powerunit table.
- "revert" on page 83. The **revert powerunit** command reverts the **set powerconfig** configuration.
- "set snmp" on page 209 to enable the SNMP traps for current and temperature thresholds being exceeded.
- The *Digi One and PortServer TS Family User Guide's* chapter on Digi Remote Power Manager (Digi RPM).

set profiles

Purpose

Sets the particular port configuration profile for a serial port.

The **set profiles** command may be used for two purposes:

- Used with the default Web interface to set the particular profile for a serial port.
- Used to set the default parameters for a specific profile. When the profile is changed, the serial settings are reverted to their defaults and the profile-specific defaults are set (these defaults depend on the profile). The **set profiles** command allows command-line interface users to quickly set up serial ports.

Devices in the Digi One and PortServer TS Family support several port profiles. The set of available profiles depends on each device. The help for the **set profiles** command, displayed by entering **set profiles ?** displays the list of supported profiles. The complete set of profiles is:

- **Console Management profile**: Allows you to access a device's console port over a network connection, and to use the port sharing feature.
- **Industrial Automation (IA) profile**: Configures the serial port for use in an Industrial Automation (IA) environment.
- **Modem Emulation profile**: Allows you to configure the serial port to act as a modem.
- **Modem profile**: Allows you to connect a modem to the serial port to establish or receive connections from other systems and modems.
- **Power Management profile**: Allows you to control and manage a power controller to turn on and off outlets and devices.
- **Printer profile**: Allows you to connect a printer to the serial port.
- **RealPort profile**: Allows you to map a COM or TTY port to the serial port.
- **TCP Sockets profile**: Allows a serial device to communicate over a Transmission Control Protocol (TCP) network.
- **Terminal profile**: Allows you to connect a terminal to the serial port.
- **Tunneling profile, also known as the Serial Bridge profile**: Configures one side of a serial bridge. A serial bridge connects two serial devices over the network, as if they were connected with a serial cable.
- **UDP Sockets profile**: Allows a serial device to communicate using the Universal Datagram Protocol (UDP).
- **Custom profile**: An advanced option to allow full configuration of the serial port. This profile allows you to view all settings associated with the serial port.

- **Internal Modem (or Embedded Modem) profile**: Configures the internal modem of this device. The Internal Modem Profile is used for serial ports that contain an internal modem to configure both the serial port and the modem.
- **Chat profile**: Allows multiple clients to simultaneously connect and manage a server connected to a serial port. Use this profile if multiple clients need to share a single server/slave resource. This profile acts similar to a typical chat room, where each client is able to send a message to the server and all other clients are able to view the message as well as the server's response. This is useful when multiple clients or systems need to cooperatively control a device or when an external system wants to monitor and log all client data accessing the serial device.

Required Permissions

The root user can configure port profiles. Normal users can display port profile settings.

Syntax

Configure a Profile for a Port

```
set profiles range=range
  profile={console|ia|modem_emulation|modem|power|printer|
  realport|tcpsockets|terminal|tunneling|udpsockets|custom|
  modem_embedded|chat}
```

Display Current Profile Settings

```
set profiles
```

Options

range=*range*

The serial port number or range of serial ports associated with the port profile. Required when configuring port profiles.

profile={console|ia|modem_emulation|modem|power|printer|realport|tcpsockets|terminal|tunneling|udpsockets|custom|modem_embedded|chat}

The port profile to use for the serial port. Required when configuring port profiles. Choosing a particular port profile causes the serial port's configuration to be reset to defaults, and then for the default settings for that port profile to take effect.

Depending on the choices available for the device, the value of **profile** can be one of the following:

console

Associates the Console Management port profile with the port.

ia

Associates the Industrial Automation port profile with the port.

modem_emulation

Associates the Modem Emulation port profile with the port.

modem

Associates the Modem port profile with the port.

power
Associates the Power port profile with the port.

printer
Associates the Printer port profile with the port.

realport
Associates the RealPort port profile with the port.

tcpsockets
Associates the TCP Sockets port profile with the port.

terminal
Associates the Terminal port profile with the port.

tunneling
Associates the Tunneling (Serial Bridge) port profile with the port.

udpsockets
Associates the UDP Sockets port profile with the port.

custom
Associates the Custom port profile with the port.

modem_embedded
Associates the Embedded Modem port profile with the port.

chat
Associates the Chat port profile with the port.

Examples

Configure a Profile for a Port

This **set profile** command configures the first serial port for console management by allowing serial access to the console device attached to the first serial port.

```
#> set profile range=1 profile=console
```

See Also

- "revert" on page 83. **revert profiles** reverts all profiles to their default settings.
- "set ports" on page 176: the settings on this command typically correlate to the default settings for various profiles.
- "set line" on page 155: the settings on this command typically correlate to the default settings for various profiles.
- "set flow" on page 120: the settings on this command typically correlate to the default settings for various profiles.

set radius

Purpose

Use the **set radius** command to:

- Configure a Digi device to use one or more RADIUS (Remote Authentication Dial-In User Service) servers to authenticate and maintain user profiles on dial-in users.
- Display current RADIUS configuration options.

When device server uses a RADIUS server, it authenticates users by first searching its own user table, and then, if the user is not found, searching the RADIUS server.

Required Permissions

The root user can configure RADIUS settings. Normal users can display RADIUS settings.

Syntax

Configure Use of RADIUS Servers

```
set radius [accountingsocket=tcp port]
   [authsocket=tcp port]
   [ignorefilterid={on|off}]
   [primary=ip adr]
   [run={on|off}]
   [secondary=ip adr]
   [secret=password]
   [tolerant={on|off}]
```

Display RADIUS Configuration Status

```
set radius
```

Options

accountingsocket=*tcp port*

The TCP port to use for accounting communication. The default is 1813. The primary and secondary servers are not required to use the same TCP port. However, if they are different, you must issue two **set radius** commands: one to configure the TCP port for the primary RADIUS server, and one to configure the secondary server.

authsocket=*tcp port*

The TCP port to use for authentication communication. The default is 1812. The primary and the secondary servers are not required to use the same TCP port. However, if they are different, you must issue two **set radius** commands: one to configure the TCP port for the primary RADIUS server, and one to configure the secondary server.

ignorefilterid={on|off}
Specifies handling of unknown Filter ID attributes.

Caution: Setting this field to **on** can pose security issues on the Digi device.

on
Ignore Filter ID attributes that are not found in the list of filters on the Digi device. If a Filter ID attribute matches a filter on the Digi device, it is processed normally.

off
Filter ID attributes which do not find a matching filter on the Digi device cause an authentication failure.

primary=*ip adr*
The IP address of the primary RADIUS server. This is the server that the device server queries first. If this server is down or busy, the device server queries the secondary server (if there is one).

run={on|off}
Specifies whether RADIUS authentication is enabled or disabled.

on
Enables RADIUS authentication.

off
Disables RADIUS authentication.

The default is **off**.

secondary=*ip adr*
The IP address of a secondary RADIUS server.

secret=*password*
A password used for encryption of messages between the RADIUS server and the device server. The server and device server must use the same password. The primary and the secondary servers are not required to use the same password. If they are different, however, you must issue two **set radius** commands, one to configure the primary RADIUS server and one to configure the secondary server. See the command example "Configure Two RADIUS Servers" on page 190 for more information.

tolerant={on|off}
Specifies handling of unrecognized RADIUS attributes.

on
Ignore unrecognized RADIUS attributes.

off
The connection is denied if unrecognized RADIUS attributes are present.

Examples

Display Status of the Current RADIUS Configuration

```
#> set radius
```

Configure Device Server to Use a Primary RADIUS server

```
#> set radius run=on primary=199.150.150.10 secret=xyyzzz
```

Configure Two RADIUS Servers

In this example, the first **set radius** command configures the primary RADIUS server. The second **set radius** command configures the secondary server. Two commands are required because the two servers use different passwords (**secret** option).

```
#> set radius run=on primary=199.150.150.10 secret=xyyzzz
#> set radius run=on secondary=199.150.150.22 secret=abbccc
```

See Also

- "revert" on page 83. The **revert radius** command reverts the **set radius** configuration.
- "set filter" on page 115 for information on configuring filters to operate in conjunction with the Filter ID attribute.

set rloginoption

Purpose

For remote login (rlogin) sessions, **set rloginoption** allows or disallows the enabling or disabling of flow control by the rlogin application.

Required Permissions

The root user can configure rlogin flow control. Normal users can display rlogin flow-control settings.

Syntax

Configure Flow Control by rlogin Application

```
set rloginoption [flowChngDisabled={on|off}]
```

Display Current rlogin Flow-Control Settings

```
set rloginoption
```

Options

flowChngDisabled={on|off}

Allows or disallows the enabling or disabling of flow control by the rlogin application.

flowChngDisabled=on

Attempts to enable and disable flow control from the rlogin application are ignored.

flowChngDisabled=off

Attempts to enable and disable flow control from the rlogin application are honored.

The default is **off**.

Examples

Ignore Attempts to Disable and Enable Flow Control from rlogin Application

```
#> set rloginoption flowChngDisabled=on
```

See Also

- "revert" on page 83. The **revert rloginoption** command reverts the **set rloginoption** configuration.
- "rlogin" on page 87.

set route

Purpose

The **set route** command is an advanced feature that is intended to be used by experienced device and network users. Use the **set route** command to

- Manually configure IP routes. The route table holds up to 50 entries.
- Remove routes from the route table.
- Display the contents of the route table.

Required Permissions

The root user can configure IP route settings. Normal users can display route table entries.

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
```

Options

gateway=*ip adr*
The IP address of the router that is the next hop to the destination network defined on the **net** option. Use this option if this router is on the LAN. You can specify any gateway, as long as the IP address for the gateway is not 0.0.0.0.

wanname=*name*
The interface to use for this route, which is one of the following:

- For routes over a PPP link: The user name in a previously issued **set user** command that defines a PPP user.
- For routes over the Ethernet interface: the keyword **ether**.

mask=*mask*
The subnet mask used by the destination network.

metric=*hops*
The number of routers through which a datagram must pass before reaching the destination network defined on the **net** option.

net=*net adr*
The IP network address of the destination network.

range=*range*
The index number of the route you wish to modify or view.

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

- "remove" on page 81 to remove entries from the route table.
- "revert" on page 83. The **revert route** command reverts the **set route** configuration.
- "set forwarding" on page 124 for information on configuring device server to use dynamic IP routes maintained by the Routing Information Protocol (RIP).
- "set user" on page 238 for information on and options for defining PPP users.

set rpauth

Purpose

Sets authentication options for RealPort. RealPort has a challenge-authentication protocol that, if enabled, allows only hosts that authenticate to use ports on the Digi device. This authentication protocol is supported for both encrypted and unencrypted versions of RealPort.

In order to use RealPort authentication, it must be enabled in both the driver and the Digi device.

Required Permissions

The root user can configure authentication options. Normal users can display authentication options.

Syntax

Configure Realport Authentication Options

```
set rpauth state={enabled|disabled} secret="shared secret"
```

Display RealPort Authentication Options

```
set rpauth
```

Options

state={enabled|disabled}

Specifies whether a host must authenticate before using the port on the Digi device.

secret="*shared secret*"

A password that is entered on both the Digi device and in the RealPort driver.

Examples

```
set rpauth state=enabled secret="password"
```

See Also

- "revert" on page 83. The **revert rpauth** command reverts the **set rpauth** configuration.

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.

Required Permissions

The root user can configure, edit, or delete scripts. Normal users can display script settings.

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

There are three ways to delete a script:

```
set script {rmscript={on|name} name=name|rmscript=name}
```

That is:

```
set script rmscript=on range=range
set script rmscript=on name=name
set script rmscript=name
```

Options

name=*name*
The name of the script.

newname=*new name*
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).

s {1-24}=*stanza content*
The number of a script stanza (1 through 24) and the contents of the stanza. The contents of the ***stanza content*** value 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* is: • 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 the E string. • - (minus): The script is exited with a failure message from the E string.	s2=”G7”
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 198.	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”

Command	Description	Example
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 this 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 198.	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*	A variable, where *n* is either a telephone number whose value comes from the **n*n*** option 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.

range=*range*

An index number in the script table (for display).

rmscript={on|*name*}

Specifies that script removal is enabled, or removes the specified script.

Examples

Configure a Login Script

This example defines a login script that waits for a login prompt and then supplies a login name, and waits for a password prompt and then supplies a password. The commands to define the login script are:

```
#> 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+"
```

Actions performed by the script:

- 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

- "Filters for PPP Connections" on page 22 for information on using filters for PPP connections.
- "revert" on page 83. The **revert script** command reverts the **set script** configuration.
- "set user" on page 238 for information on assigning a login script to a user.
- "set chat" on page 98 for information on telephone number string translation.

set secureaccess

Purpose

Sets secure access for Digi devices by disabling them for users of inbound connections.

Required Permissions

The root user can configure and display secure access.

Syntax

Set Secure Access/Disable Device Servers

```
set secureaccess level={secure|high|normal}
  service={on|off}
```

Display Current Secure-Access Settings

```
set secureaccess
```

Options

level={secure|high|normal}

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*={on|off}**

Turns a service on or off. *service* can be any of the services listed:

If you specify...	This service is turned on or off...
http	HTTP
https	HTTPS
lpd	Line Printer Daemon (LPD)
realport	RealPort
reversessh	Reverse SSH
reversetcp	Reverse TCP
reversetelnet	Reverse Telnet
rlogin	Remote login
rsh	Remote shell
securerealport or srp	Secure RealPort
securesockets or ssl	Secure Socket Layer (SSL)
snmp	SNMP
ssh	SSH
ssh-keyauth	The Secure Shell (SSH) keyauth configuration that allows public key authentication. The ssh-keyauth and ssh-pwdauth services can be set in any combination. However, if they are both off, SSH will be unusable to access the device.
ssh-pwdauth	The Secure Shell (SSH) pwdauth configuration that allows password authentication.
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
```

See Also

- "revert" on page 83. The **revert secureaccess** command reverts the **set secureaccess** configuration.
- "set service" on page 203.

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.

Required Permissions

The root user can configure or remove service table entries. Normal users can display service table entries.

Syntax

Configure/Associate Names with TCP and UDP 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

While this command variation removes service table entries, the **remove** command is also available.

```
set service [rmservice=name|rmservice=on]
```

Options

name=*name*
The name to assign the service.

port={udp:*port*|tcp:*port*}
The TCP or UDP port number for the service.

range=*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** option.

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

```
#> 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

- "remove" on page 81 to remove entries from the service table.
- "revert" on page 83. The **revert service** command reverts the **set service** configuration.
- "set filter" on page 115 for information on configuring filters.

set sharing

Purpose

Configures or displays the port sharing feature. A Digi device enabled for port sharing allows more than one client to open a serial port through RealPort, reverse Telnet, reverse SSH, or connect.

All clients that share a port will read the same data from the serial port; the data is duplicated and sent to each client. All clients that share a port will have the data they write merged and sent out the serial port.

The serial port parameters, such as baud rate and flow control, can either be shared by all clients or be controlled exclusively from the Digi device alone.

If there is only one client, then RealPort, reverse Telnet, reverse SSH, and connect will work normally.

Device and Driver Support for the Port Sharing Feature

- The port sharing feature and the **set sharing** command are supported in the following products.
  - All PortServer TS Family products.
  - All Digi One products **except** Digi One IAP.
- The console menu feature and the Console Management port profile can be used to enable the port sharing feature. The console menu feature and Console Manager port profile are available on PortServer TS Family devices only. To configure port sharing for all other devices, use the **set sharing** command.
- When used with RealPort, the port sharing feature is formally tested with the Windows RealPort driver only, and not with Unix/Linux driver versions.

Required Permissions

The root user can configure port sharing. Normal users can display port-sharing settings.

Syntax

Configure Port Sharing

```
set sharing [range=range]
   [clients=clients]
   [control={shared|exclusive}]
   [timeout=timeout]
   [wrpolicy={all|first}]
```

Display Current Port-sharing Settings

```
set sharing [range=range]
```

Or:

```
show sharing [range=range]
```

Options

range=*range*
The range of ports to which the command applies. This parameter is required when configuring port-sharing parameters, and optional when displaying parameters. If it is not specified when displaying port-sharing parameters, the settings for all ports are displayed.

clients=*clients*
The maximum number of clients that are allowed to share the port.

Setting this value to 1 means that port sharing is off; that is, only one client can open the port. Setting this value to 2 means that port sharing is on; that is, the port is enabled to be shared.The maximum value allowed is 4.

There is a slight performance penalty if port sharing is on, even if only one client is using ports. Therefore, this value should be set to 1, unless port sharing is needed.

The default is 1.

control={shared|exclusive}
Specifies whether control should be shared by all clients, or controlled exclusively by the Digi device.

shared
All clients share control of the serial-port parameters, such as baud rate, data bits, parity, flow control, etc. Any changes made to these parameters by one client will affect all clients.

exclusive
The serial port parameters can only be set from the command line or web UI of the device itself. Any attempt by the clients to change serial-port parameters through RealPort will be silently ignored.

The default is **shared**.

timeout=*timeout*
The flow-control timeout, specified in 1/10ths of a second. This parameter specifies how long a fast client will wait for a slower client that has flow-controlled the port (see "About Flow Control on Shared Ports" on page 26 for more information). After this timeout expires, the faster client will be allowed to read ahead in the data stream, and the slower client will begin to lose data.

A value of 0 means there is no timeout; the faster client will wait forever if necessary for the slower client and never timeout. A value of 1 means the faster client will wait only 1/10 of a second for a slower client; which means essentially no waiting. The maximum value is 6000. The default is 0.

wrpolicy={all|first}

Specifies who can transmit on a serial port.

all
Everyone can transmit on the serial port.

first
Only the first module to open the port is allowed to write to the device.

Examples

Display and Change Port-Sharing Settings

This example shows how to use the **show sharing** and **set sharing** commands to first display current port-sharing settings, configure port-sharing settings, and display the changed settings.

```
#> show sharing

        current       max
tty     clients     clients     control     timeout

  1           2           2      shared         100
  2           0           1      shared           0
  3           0           1      shared           0
  4           0           1      shared           0
```

The port-sharing parameters are displayed in four columns. The **current clients** column shows how many clients are currently sharing the port. The **max clients**, **control**, and **timeout** columns show the value set with the **clients**, **control**, and **timeout** options.

Now, the **set sharing** command is issued to change port-sharing parameters, as follows:

```
#> set sharing range=2,4 clients=4 control=exclusive timeout=600
#> show sharing

        current       max
tty     clients     clients     control     timeout

  1           2           2      shared         100
  2           0           4   exclusive         600
  3           0           1      shared           0
  4           0           4   exclusive         600

#> set sharing range=1 clients=1
Warning: Some changes will not take effect until the ports are closed.
#> set sharing range=1-2

        current       max
tty     clients     clients     control     timeout

  1           2           1      shared         100
  2           0           4   exclusive         600
```

At this point, the two clients disconnect from port 1 and a new client connects to port 2.

```
#> show sharing range=1-2

        current       max
tty     clients     clients     control     timeout

  1           0           1      shared         100
```

```
     2          1          4   exclusive        600
```

Note that the warning message indicates that until the two clients disconnect from port 1, the max clients value cannot be reduced to 1.

See Also

- "Configure Port Sharing" on page 25 for more details on port sharing, including the caveats involved.
- "revert" on page 83. The **revert sharing** command reverts the **set sharing** configuration.
- "set profiles" on page 185. For PortServer TS products, the Console Management port profile can be used to enable the port sharing feature (**set profile profile=console**).
- "show" on page 252. The **show sharing** command displays the current port-sharing settings.

set snmp

Purpose

Configures, enables, and disables a device server's Simple Network Management Protocol (SNMP) agent, and displays current SNMP settings.

Devices in the Digi One and PortServer TS Family support SNMP Version 1.

Required Permissions

The root user can configure SNMP. Normal users can display SNMP settings.

Syntax

Configure SNMP Agent

```
set snmp [auth_trap={on|off}]
   [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]
```

Display Current SNMP Settings

```
set snmp
```

Options

auth_trap={on|off}

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={on|off}

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=*administrator*
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={on|off}
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=*community*
The password required to read device server SNMP managed objects. The default is **public**.

link_up_trap={on|off}
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=*location string*
A text string that describes device server's location. If there are spaces in the text, the string must be surrounded by quotation marks.

name=*name string*
A text string that identifies device server. If there are spaces in the text, the string must be surrounded by quotation marks.

login_trap={on|off}
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={on|off}
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=*ipaddress*
The IP address of the system to which the agent should send traps.

temp_thresh_exc_trap={on|off}
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
```

See Also

- "revert" on page 83. The **revert snmp** command reverts the **set snmp** configuration.
- "set powerunit" on page 182. This command configures a Digi RPM power controller, including temperature and current thresholds associated with the temperature and current threshold traps set by this command.
- "set snmpauth" on page 212 for configuring or displaying access permissions for SNMP sets and gets.

set snmpauth

Purpose

Configures or displays access permissions for Simple Network Management Protocol (SNMP) sets and gets.

To produce the intended configuration results, follow these principles:

- The default for SNMP is unlimited access (assuming a valid SNMP community).
- You can configure a new default by removing the default entry in the snmpauth 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.
- To limit SNMP access to a single IP address, specify that IP address with **mask=255.255.255.255**.
- To specify a range of IP addresses, specify an IP address that is in that range, and a mask that has a binary 1 for every bit of the IP address that must match perfectly with the address specified in the **ip** option.

The snmpauth table is limited to 20 entries.

Required privileges

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

Syntax

Configure SNMP Access Permissions

```
set snmpauth ip=ip-addr [mask=mask]
```

Display SNMP Access Permissions

```
set snmpauth [range=range]
```

Options

ip

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

mask

Specifies an IP mask used to extend the scope of this set snmpauth command to a range of IP addresses.

Examples

Display Entire snmpauth Table

```
#> set snmpauth
```

Display a Range of Entries in snmpauth Table

set snmpauth range=1-2

Configure Access for Two IP Addresses

This example requires three commands:

- The first removes the default entry from the snmpauth table, which changes the default setting from unrestricted access to no access.
- The second and third commands restore access for the IP addresses specified. Note that if **mask** is not specified with **ip**, the mask defaults to 255.255.255.255.

```
#> remove snmpauth range=1
#> set snmpauth ip=199.22.33.4
#> set snmpauth ip=199.22.33.8
```

Use the mask Field to Extend the Command

In this example, the command allows access for all IP addresses in the range of 199.150.150.1 to 199.150.150.255

set snmpauth ip=199.150.150.33 mask=255.255.255.0

See Also

- "set snmpauth" on page 212 for information on setting snmp communities.
- "remove" on page 81. The **remove snmpauth** command removes an snmpauth table entry.
- "revert" on page 83. The **revert network** command reverts the settings configured by this command.

set sntp

Purpose

Configures a Simple Network Time Protocol (SNTP) client. The purpose of the SNTP client is to get the current time from a Network Time Protocol (NTP) server and set the device's clock with this time.

Required Permissions

The root user can configure SNTP. Normal users can display SNTP settings.

Syntax

Configure SNTP Client

```
set sntp [state={on|off}]
   [mode={unicast|anycast|multicast}]
   [polltime={10-100000 seconds}]
   [primary={ip address|server hostname}]
   [secondary={ip address|server hostname}]
```

Display SNTP Client Settings

```
set sntp
```

Options

state={on|off}
Enables or disables the SNTP client.

mode={unicast|anycast|multicast}
Indicates how the SNTP client is expected to get the time from a NTP server.

unicast
The SNTP client sends a request to a designated unicast server and expects a reply.

anycast
The SNTP client sends a request to a broadcast address and expects a reply from one or more servers. Upon receiving the first reply, the client will establish unicast communication with the server that sent the reply and ignore responses from all other servers.

multicast
The SNTP client sends no request and waits for a broadcast from a server.

polltime={10-100000 seconds}
Specifies how often an SNTP client will query a server for a time update.

primary={*ip address*|*server hostname*}
The IP address or hostname of the primary NTP server.

secondary={*ip address*|*server hostname*}
The IP address or hostname of the secondary NTP server.

Examples

Display SNTP Configuration

```
#> set sntp
```

Configure SNTP Options

```
#> set sntp state=on primary=192.168.0.15
```

See Also

- "revert" on page 83.
- "set time" on page 229.
- "set timezone" on page 230.

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 Digi device's serial port and a remote host. This feature enables easier identification of the managed device.

Required Permissions

The root user can configure the serial port socket ID feature. Normal users can display serial port socket ID settings.

Syntax

Configure Serial Port Socket ID Feature

```
set socketid range=range
   [state={on|off}
   [string="character string"]
   [verbose]
```

Display Serial Port Socket ID Settings

```
set socketid [range=range] [verbose]
```

Options

range=*range*

The port or ports configured with this command.

state={on|off}

Turns the serial port socket ID feature on or off for the specified port. The default is **off**.

string="*character 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. This 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

This example displays the **set socketid** configuration for port 2:

```
#> set socketid range=2
```

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”
```

See Also

"revert" on page 83. The **revert socketid** command reverts the **set socketid** configuration.

set switches

Purpose

Configures Multiple Electrical Interface (MEI) settings on a per-port basis, and displays current MEI settings.

Required Permissions

The root user can configure MEI settings. Normal users can display MEI settings.

Syntax

Configure MEI Settings

```
set switches [range=range]
   [mode={232|485}]
   [txcontrol={alwayson|auto}]
   [wires={two|four}]
   [termination={on|off}]
   [enable={on|off}]
   [pinout={standard|alternate}]
```

Display Current MEI Settings

```
set switches
```

Options

range=*range*

The port or range of ports to which this command applies.

mode={232|485}

Selects the electrical interface of the serial port.

232

The serial port uses electrical interface EIA-232. This interface uses independent wires to transmit and receive data, which allows data to be sent and received between devices simultaneously.

485

The serial port uses electrical interface EIA-485. This mode can also be used for EIA-422 connections. This interface uses two wires to both transmit and receive data. This interface also allows for multiple transmitters and receivers to be easily connected together.

Several other command options specifically apply to serial ports in EIA-485 mode: **txcontrol**, **wires**, **termination**, and **pinout**.

The default is **232**.

txcontrol={alwayson|auto}

Specifies how the 422/485 drivers should be connected to the lines. As the drivers support Tri-state mode, this option can be set so that transmitter is always on, or actively driving the line, or only on if data is to be transmitted.

This option is only valid for four-wire configurations; that is, if the **wires** option is set to **four**. In two-wire configurations, the PortServer TS MEI always uses **auto**.

alwayson

The transmitter is always actively driving the line. Set this option to **alwayson** if this device is the only one transmitting on a one-wire pair, such as a single master in a master-slave configuration, or if only two devices are attached.

auto

The transmitter is only active when data is sent; otherwise, it is switched to high-impedance mode. Set this option to **auto** if multiple devices need to share the bus in a dual master scenario or if the device is acting as slave in a multidrop environment.

The default for four-wire settings is **alwayson**.

wires={two|four}

Applies when the serial port is running in 485 mode only. Specifies the manner in which the transmit and receive wires are connected.

two

The serial port operates in two-wire mode. This value implies that the **txcontrol** option is set to **auto** at all times.

four

The serial port operates in four-wire mode.

The default is **four**. For a detailed description of the pinouts for an asynchronous port, see the alternate 8-pin settings for the **pinout** option.

termination={on|off}

Applies when the serial port is running in 485 mode only. Determines whether termination resistance is enabled across the lines.

on

Termination resistance is enabled across the lines.

off

Termination resistance is disabled across the lines.

The default is **off**.

enable={on|off}

Enables or disables a serial port’s transmitter.

on

Enables a serial port’s transmitter.

off

Disables a serial port’s transmitter.

The default is **on**.

pinout={standard|alternate}

Allows selection of four-wire pinouts for EIA-422/485 mode.

standard

Use standard 10-pin settings, as shown in the following table.

alternate

Use alternate 8-pin settings, as shown in the following table.

Pin Number	EIA-232 Signal	Standard 10-Pin EIA-422/485 Signal (4/8 Wire)	Optional 8 pin EIA-422/485 Signal (Alt-4Wire)	EIA-485 Signal (2-Wire Mode)
01	RI	TXD- (B)		
02	DSR	RxD- (B)	RxD- (B)	Data- (B)
03	RTS	RTS+ (A)	TxD+ (A)	
04	CGND	CGND	CGND	CGND
05	/TxD	TxD+ (A)		
06	/RxD	RxD+ (A)	RxD+ (A)	Data+ (A)
07	SGND	SGND	SGND	SGND
08	CTS	CTS+		
09	DTR	RTS- (B)	TxD- (B)	
10	DCD	CTS- (B)		

The default is **standard**.

Examples

Configure an Endpoint on a Multidrop Network

The following command configures an endpoint on a EIA-485 multi-drop network:

```
#> set switches ra=2 mode=485 txcontrol=auto wires=2 termination=on
enable=on
```

Configure Port Settings for Master and Slave

On a four-wire multi-drop network, there are two scenarios of devices: the master and the slave. A master gets a dedicated pair of wires to talk to the slaves, so the transmitter can always be active. The slaves share a return pair to the master and need to control their transmitters so that only one device uses that pair at once. This example shows how to configure the port settings for an EIA-485 four-wire scenario, both as a master and a slave.

To configure port settings for a master, issue this command:

```
#> set switches range=<x> mode=485 txcontrol=alwayson wires=four
```

To configure port settings for a slave, issue this command:

```
#> set switches range=<x> mode=485 txcontrol=auto wires=four
```

See Also

- "display" on page 63. The **display switches** command displays the current switch settings that were set by **set switches**.
- "revert" on page 83. The **revert switches** command reverts the **set switches** configuration.
- "set mei" on page 165. The **set mei allenables** command performs much the same action as **set switches enable={on|off}**.

set tcpip

Purpose

Configures or displays operating characteristics of the Transmission Control Protocol (TCP) for the Digi device, including the TCP port used by RealPort, the interval TCP waits before retransmitting an unacknowledged segment, how TCP handles idle connections, and socket service values for reverse Telnet connections. The command options **garp** and **rto_min** can be used to optimize for latency.

Required Permissions

The root user can configure TCP/IP settings. Normal users can display TCP/IP settings.

Syntax

Configure or Change TCP Options

```
set tcpip [arp_ttl=30-1200]
   [garp=30-3600]
   [ip_ttl=hops]
   [keepalive_active={on|off}]
   [keepalive_byte={on|off}]
   [keepalive_idle=hours:minutes:seconds]
   [probe_count=probe count#]
   [probe_interval=probe interval#]
   [rto_min=30-1000]
   [rto_max=1-240]
   [tcp_ttl=hops]
```

Display TCP Settings

```
set tcpip
```

Options

arp_ttl=30-1200

The initial value of the ARP time-to-live variable. When an ARP cache entry first populated, the ARP time-to-live variable is set to this value. When the entry has existed in the table for this long without being updated, another ARP cache request is performed to make sure that there is not a new a new device at that IP.

garp=30-3600

The frequency of Gratuitous ARP (GARP) announcements. A Gratuitous ARP is a broadcast announcement to the network of a device's MAC address and the IP address being used for it. This allows the network to update its ARP cache tables without performing an ARP request on the network.

Gratuitous ARP announcements can affect latency in a limited way, because some systems stall or dispose of data that is transmitted during an ARP cache refresh. If this happens, setting the Gratuitous ARP frequency to be more often than the problem system's time-to-live variable can cause it to refresh the cache without needing to perform a request.

ip_ttl=*hops*
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_active={on|off}
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={on|off}
Specifies whether the device server sends a “garbage” byte of data, known as 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.

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=*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**.

Digi 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=*probe interval#*
The time in seconds between each keep-alive probe. The range is 10-75 seconds. The default is **75** seconds.

Digi recommends that the **probe_interval** default value not be changed unless there is a good reason. Changing the value can adversely affect Telnet connections.

rto_min=30-1000
The lower bound for the TCP retransmission time out (RTO), in milliseconds.

TCP uses progressively larger retransmit values, starting at a minimum value that is calculated from a sliding window of ACK response round-trip times that is bounded at the bottom by **rto_min**. So, essentially, **rto_min** is not necessarily the timeout that will be used as the starting retransmit timeout, but it is the smallest such value that could be used.

This affects latency, because lowering **rto_min** ensures that retransmits take place in less time if they occur. By occurring sooner, the network is able to recover the lost data in less time at the expense of possibly retransmitting data that is still in-flight or successfully received by the other side, but unacknowledged due to a “delayed ACK” mechanism or something similar.

rto_max=1-240
The triggering time for TCP retransmission timeout (RTO), 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.

rto_max does not specify the disconnect interval.The timing of the disconnect is a side-effect of **rto_max** failure and can vary based on the starting retransmit value. It will always be quite a bit more, roughly double, the rto_max value, but the total disconnect time is indeterminate.

tcp_ttl=*hops*
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.

Examples

Configure Keep-Alive Options

In this example, the device server TCP component is configured to begin sending keep-alive probes after a TCP connection has been idle for 10 minutes, send up to 15 probes, and 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 is configured to attempt delivery of a packet until the retransmit interval backs off to 100 seconds.

```
#> set tcpip rto_max=100
```

See Also

- "revert" on page 83. The **revert tcpip** command reverts the **set tcpip** configuration.
- The *Digi One and PortServer TS Family User Guide’s* chapter on latency tuning.

set telnetip

Purpose

Creates and displays entries in the Telnet IP address table. **set telnetip** creates configuration profiles for Telnet communication with particular devices. That is, **set telnetip** links an IP address to particular Telnet operating options. You can also use **set telnetip** to display current Telnet IP address table entries.

Before removing Telnet table entries using the **remove** command, it may be helpful to use **set telnetip** without any options to display the existing Telnet table entries and their corresponding index numbers.

Required Permissions

The root user can configure Telnet IP settings. Normal users can display Telnet IP settings.

Syntax

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 range=index
   [mask=mask]
   [mode={none|crbin|telprnt|striplf}]
```

Display Current Telnet Values for Device Server

```
set telnetip
```

Options

ip=*ip addr*
The IP address to add to the Telnet table.

range=*index*
The range of index entries to remove.

mask=*mask*
The value of the mask to use for the IP address entered. The default is **255.255.255.255**.

mode={none|crbin|telprnt|striplf}
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.

striplf
Strip line feeds.

The default is **none**.

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
```

See Also

- "remove" on page 81 to remove entries from the Telnet table.
- "revert" on page 83. The **revert telnetip** command reverts the **set telnetip** configuration.

set terms

Purpose

The **set terms** command configures a Digi device to handle terminals that are *not* connected over a network. 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.

Required Permissions

The root user can configure terminal settings. Normal users can display terminal 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]
```

Options

clrseq=*escape seq*
The escape sequence that clears the terminal's current screen. This escape sequence should be the one specified by your terminal's manufacturer.

npages=*pages*
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=*SessNumSequence*
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.

termtype=*type*
A name for the terminal type. This name must match the name specified on the **set ports** command's **termtype** option, and used by hosts on your network for this type of terminal. See "set ports" on page 176.

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.

range=*range*
The range of term table entries to display or remove.

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^{
```

See Also

- "remove" on page 81 to remove entries from the terms table.
- "revert" on page 83. The **revert terms** command reverts the **set terms** configuration.

set time

Purpose

Configures or displays the time and date in a device.

Required Permissions

The root user can configure the time and date. Normal users can display the current time and date.

Syntax

Configure Time and Date

```
set time [{am|pm}]
   [date=mn.day.yr]
   [hrmode={12|24}]
   [time=hr:mn:sec]
```

Display Current Time and Date

```
set time
```

Options

{am|pm}
The period of the day when **hrmode=12**.

date=*mn.day.yr*
The month (expressed numerically), day, and year (use only two digits for the year), separated by periods.

hrmode={12|24}
Hour mode; specified as either 12 or 24.

time=*hr*:*mn*:*sec*
The hour (24-hour clock), minute, and second, separated by colons.

Examples

Display the Current Time and Date

```
#> set time
```

Set the Time and Date

```
#> set time time=17:05:00 date=12.25.97
```

See Also

- "revert" on page 83.
- "set sntp" on page 214.
- "set timezone" on page 230.

set timezone

Purpose

Sets the time zone information for the device. It is necessary to set the time zone information when daylight saving is desired or when the device is using Simple Network Time Protocol (SNTP). Failure to set time zone when using SNTP will result in time always being set to the UTC/GMT time and not the local time.

You can set the time zone by either using the rules for a given region or city, or by manually entering time-zone offsets and rules. Using the rules for a given region or city is the simpler method.

Required Permissions

The root user can configure time zone settings. Normal users can display time zone settings.

Syntax

Display a List of All of the Time-Zone Regions that Can Be Specified

```
set timezone name
```

Configure Time Zone by Using Rules for a Given Region or City

```
set timezone [name=region/city|name=city]
```

Configure Time Zone by Manually Entering Time-Zone Offsets and Rules

```
set timezone [std_offset=[-]hh:mm:ss]
   [dst_offset=[-]hh:mm:ss]
   [dst_rule=date[/time],date[/time]]
```

Display Time Zone Settings

```
set timezone
```

Options

name=*region*/*city*|name=*city*

The **name** option is provided as a way to automatically fill in the time zone offsets and rules for a given region/city. For example, to set time zone for North America central time zone, you would specify **name=Chicago**. To display a list of all of the time-zone regions that can be specified, enter the command **set timezone name ?**

std_offset=[-]*hh*:*mm*:*ss*

The offset relative to UTC or GMT time when standard time is in effect. For example, for the North America Central time zone, enter **std_offset=-6**

dst_offset=[-]*hh*:*mm*:*ss*

The offset relative to UTC or GMT time when day light saving time is in effect. For example, for the North America Central time zone, use **dst_offset=-5**

dst_rule=*date*[/*time*],*date*[/*time*]

The dates on which Daylight Saving Time (DST) occurs for a given time zone. The ***time*** and ***date*** values are specified as follows:

time

The time at which DST occurs. The time is specified as ***hh*:[*mm*[:*ss*]]** and defaults to 02:00.

date

The date at which DST occurs. The date can be specified using any of the following forms:

`Jn (1<=n<=365)`

Where January 1=1 and December 31=365, and February 29 is not included in the day count.

`n (0<=n<=365)`

Where January 1=0 and December 31=365, and February 29 is included in the day count.

`Mm.n.d (0[Sunday]<=d<=6[Saturday], 1<=n<=5, 1<=m<=12)`

Specifies a particular day of the week, *d*, in week *n* of month *m* of the year, where week 1 is the first week in which day *d* appears. 5 stands for the last week in which day *d* appears (which may be either the 4th or 5th week).

Examples

Configure Time Zone by Using Rules for a Given Region or City

```
#> set timezone name=Chicago
```

See Also

- "revert" on page 83.
- "set sntp" on page 214.
- "set time" on page 229.

set trace

Purpose

Configures a device server for tracing, or displays tracing information.

This command is intended to be used in cooperation with Digi Technical Support.

Required Permissions

The root user can configure trace settings. Normal users can display trace settings.

Syntax

The syntax and available options for **set trace** may vary by product release. Enter the following command to view the current list of options:

```
set trace ?
```

Options

See the results of the **set trace ?** command for available options. Consult Digi Technical Support on recommendations for using the options.

See Also

"revert" on page 83. The **revert trace** command reverts the **set trace** configuration.

set udpdest

Purpose

Configures destinations for serial over User Datagram Protocol (UDP) communication. These destinations are stored in the UDP destination table.

The Digi One and PortServer TS devices are devices 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.

The number of entries allowed in the UDP destination table varies by product.

The number of devices that can receive a UDP multicast varies by product.

- PortServer TS 8/16 Family: up to 16 devices can receive a UDP multicast at one time.
- All other products, including the Digi One Family and PortServer TS 1/2/4: 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 Digi device for the following types of connections:

- Inbound connections: connections initiated by the device on the other side of the network.
- Outbound connections: connections initiated by the device connected to the serial port.

Required Permissions

The root user can configure or remove UDP destinations. Normal users can display UDP destinations.

Syntax

Configure UDP Destinations

```
set udpdest [description="string"]
   [ipaddress=dest ip]
   [ipport=port]
   port=serial port
   range=index
```

Remove UDP Destinations

```
set udpdest rmudp=on range=index port=serial port
```

Display UDP Destinations

```
set udpdest [port=serial port range=index]
```

Options

description=”*string*”
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=*dest ip*
The destination’s IP address.

ipport=*port*
The UDP port number that will be used for communication with the destination.

port=*serial 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=*index*
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** options.

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

- "revert" on page 83. The **revert udpdest** command reverts the **set udpdest** configuration.
- "set udpserial" on page 235.

set udpserial

Purpose

Configures operating options for serial over User Datagram Protocol (UDP) communication, and displays current serial over UDP communication options.

Required Permissions

The root user can configure serial over UDP options. Normal users can display serial over UDP options.

Syntax

Configure Serial over UDP Communication Options

```
set udpserial range=ports
   [closetime=0-66635 milliseconds]
   [delimiters=string]
   [overflowpolicy={forward|flush}]
   [rmax=max]
   [rtime=time]
   [stripdelimiters={on|off}]
```

Display Current Serial over UDP Communication Options

```
set udpserial
```

Options

range=*ports*

The serial port or serial 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
```

closetime=0-66635 milliseconds

The time the serial port will remain in an idle state for use by serial over UDP communication before the port can be closed and made available. This option is helpful when a serial port is used for several purposes. Unlike TCP serial, UDP serial does not automatically detect when the other side has completed the session. Setting this **closetime** option means that the serial port will not remain in an idle state waiting to continue serial over UDP communications indefinitely.

delimiters=*string*

The string in the serial data that tells the Digi device that the message is complete and should be forwarded to the destination. If you do not specify a delimiter, the Digi device will forward a message based on the number of bytes accumulated in the buffer (the **rmax** option.) and on the period to wait for the buffer to fill (the **rtime** option.).

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 backslash characters (****).

There is no default delimiter.

overflowpolicy={forward|flush}

Determines how the Digi device 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 **forward** (forward the data).

rmax=*max*

The maximum number of bytes the buffer can accumulate before the Digi device forwards the contents to the destination. The range is 1 to 65,535 bytes. The default is **1024** bytes.

rtime=*time*

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.

stripdelimiters={on|off}

Determines whether the Digi device 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

- "revert" on page 83. The **revert udpserial** command reverts the **set udpserial** configuration.
- "set udpdest" on page 233.

set user

Purpose

Configures and displays user options. The **set user** command 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. **set user** also displays configuration attributes stored in the user table, such as whether a user must supply a password.

The number of entries that can be stored in the user table varies by device:

- The user table for PortServer TS 8/16 Family devices holds up to 64 entries. To accommodate additional users, PortServer TS 8/16 Family devices can use a RADIUS server.
- The user table for Digi One Family and PortServer TS Family devices holds up to 9 users.

The user option SSH version 2 encryption for secure communication (SSH2) is supported on the server version only, and not on the client version.

Required Permissions

The root user can configure user options. Normal users can display user options.

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={0.0.0.0|ip addr|unnumbered}]
   [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]
[sshbreak=string]
[telnetesc=character]
[vjslots=number]
```

Display a List of Users

```
set user
```

Display Non-Network User Settings

```
set user {name=name|range=range}
```

Display Network User Settings

```
set user {name=name|range=range} network}
```

Remove Entry from User Table

```
set user [range=range] [rmuser={on|name}]
```

Options

accesstime=*time* (PortServer TS 8/16 devices only)

The period in which the user can access the device server. Use the **accesstime** option to restrict the User access to the time specified.

To specify day or days and hours, use the keywords in the following table:

Period	Keyword
Working week (Monday-Friday)	wk
Sunday	su
Monday	mo
Tuesday	tu
Wednesday	we
Thursday	th
Friday	fr
Saturday	sa

Specify hour ranges in the form: ***hr:min-hr:min*** or ***hr-hr***. Use spaces to separate keywords and then enclose the entire string in quotation marks. For example:

Example	Provides access...
accesstime=wk9:00-17:00	Monday through Friday from 9:00 a.m. until 5:00 p.m.
accesstime=”wk9:00-17:00 su0-23”	Monday through Friday from 9:00 a.m. until 5:00 p.m. and all day Sunday.
accesstime=”su mo fr”	All day Sunday, Monday, and Friday.

addrcompress={on|off}

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=*map*
A mask for PPP connections that defines which of the 32 asynchronous control characters to transpose. These characters, in the range 0x00 through 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={on|off}
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 **autoconnect=on**, you should also specify the **autohost** and **autoport** or **autoservice** options.

off
The user will *not* be automatically connected to another system.

The default is **off**.

autohost=*ip addr*
The IP address of a host to which this Telnet or Rlogin user should be automatically connected. Use this option only if you specify **autoconnect=on**.

autoport=*tcp port*
The TCP port to use for the automatic connection. Use this option 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** option, or, if there is no **autoservice** option specified,the default, port **513**, which is Rlogin.

autoservice={default|telnet|rlogin|raw}
An alternate way to specify a TCP port for an autoconnect user (see the **autoport** option). Use this option only if you specify **autoconnect=on**. Specify one of the following services:

default
Normally means the Digi device uses Telnet. The exception is if the **autoport** option is 0 or 513. In that case, rlogin is used.

telnet
Telnet connection.

rlogin
Remote login (rlogin) connection.

raw
Raw socket connection, which means that data is passed between the serial port and the TCP stream without modification.

The default is the value of the **autoport** option.

bringup=*filter*
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 option.

chapid=*id*
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=*key*
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={on|off}
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={vj|none}
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**.

connectesc={off|*esc char*}
The escape character for users using the connect command. The default escape character is **Ctrl [**(Control key and left bracket).

defaultaccess=*service*
Restricts the service accessible to the user. The options for *service* 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** option.

autoconnect
The device server automatically connects the user to the destination specified on the **autohost** option.

netservice
Starts Peer to Peer Protocol (PPP) services. Use this value for PPP users.

outgoing
This user is limited to outgoing connections.

The default is **commandline**.

device=*device name*
The name of a device or a device pool, defined with the **set device** command, used for outbound PPP connections.

dialout={on|off}
Specifies whether an outbound PPP connection is started.

on
Starts an outbound PPP connection. A dialer script requires this option to be on to initiate outbound connections.

off
Disconnects an outbound PPP connection.

The default is **off**.

downdly=*seconds*
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={default|on|off}
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=*time*
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. (Not supported on PortServer TS 8 and PortServer TS16 products.

ipaddr=*ip addr*
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=*mask*
The IP mask to apply to the address specified on the **ipaddr** option. When you specify a specific IP address on the **ipaddr** option, this option modifies the meaning of the IP address for routing purposes. The default is **255.255.255.255**.

keepalive={on|off}
Determines whether the keep-alive function is implemented with autoconnections. The default is **off**.

keepup=*filter*
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=*character*
The kill character, which is used to close sessions. The default is **^u**.

loadkey=*host:key*
Configures an SSH2 public key for use with this user. This option applies to Digi One IAP and PortServer TS Family devices.

host
The IP address or DNS name of a host from which the SSH2 public key will be downloaded (using TFTP) to the Digi device.

key
The name of a ECDSA file on the host, which contains the SSH2 ECDSA public key. If your host's implementation requires a complete path to this file, specify the path here as well.

localbusydly=*seconds*
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={0.0.0.0|*ip addr*|unnumbered}
The IP address of the local end of a PPP link, which can be:

0.0.0.0
For outbound PPP users, specifying 0.0.0.0 means the user will request an IP address from the remote server. Inbound PPP users do not use 0.0.0.0.

***ip addr* - A specific IP address**
For outbound users, specifying a specific IP address means the Digi device 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 it cannot be the IP address of the Ethernet interface.

unnumbered
Specifying the keyword **unnumbered** allows for multiple incoming PPP sessions into the Digi device, using the same login names. This setting instructs the Digi device to assign the local IP address from the range of IP addresses defined in the ippool table. The ippool table address range must be defined so that it can provide adequate IP addresses for the required logins.

loginscript=*script*
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 Digi-device-to-Digi Device connections and the Digi device that is to be accessed requires the user to supply a password and does **not** use RADIUS. To use the generic login script that comes with your Digi device, specify **loginscript=loginscript**. Do not use this script to log into Microsoft Windows systems.

logpacket=*filter*
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=*number*
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** option.

menu={off|*index num*}
Specifies whether a menu is presented to the user, and if so, which menu.

off and 0 (zero)
No menu is presented to the user.

index num
The menu, identified by an index number in the menu table, that will be presented to this user.

The default is **off**.

mtu=*bytes*
The maximum transmission unit (frame size in bytes) to use for this PPP connection. For PPP connections, the MTU is negotiated. Therefore, 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 number*
Up to 10 phone numbers to dial to request a PPP outgoing connection, which dialer scripts reference. If you enter more than one phone number, when the device server encounters a busy signal, it tries these numbers in the order specified on this option. A phone number is required for outbound PPP connections that use modems. You can enter phone numbers as digits only, with dashes (-) separating digits, or with commas.

name=*name*
The name that identifies this user.

netrouting={off|send|rec|both}
Specifies how Routing Information Protocol (RIP) routing updates are handled on connections to this PPP user. Use this option only if the user is an IP router. The default is **off**.

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.

netservice={on|off}
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** option.

newname=*string*
A new name for a previously defined user.

outgoing={on|off}
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 ...=*script parm*
Letters and numbers that can be used in the variable options of login or dialer scripts. **p1** is typically used to supply user names and **p2** passwords.

papid=*id*
A character string that identifies the outbound PPP user using PAP authentication. This option is equivalent to a user name or login name. The string must be 16 or fewer characters and must be recognized by the peer.

pappasswd=*password*
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={on|off}
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=*filter*
The name of a filter designed to allow packets meeting filter criteria to pass through device server serial ports on PPP connections.

password={on|off}
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=*ports*
A port or range of ports that this user can access.

pppauth={none|pap|chap|both}
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 are required.

The default is **none**.

CHAP authentication works between two Digi devices. CHAP will be negotiated to PAP for all other connections.

protocompress={on|off}
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. This setting is required for all PPP users.

range=*range*
Identifies an entry or range of entries in the user table to display or remove.

rloginesc=*char*
A different escape character than the ~ (tilde) character. This character is used for disconnecting from the remote host.

rmkey={on|off}
Enables or disables the SSH2 public key defined on the **loadkey** option.

on
Enables the SSH2 public key defined on the **loadkey** option.

off
Disables the SSH2 public key defined on the **loadkey** option.

The default is **on**.

rmtbusydly=*seconds*
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=*seconds*
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.

sshbreak=*string*
The Secure Shell (SSH) escape character or string for this user.

telnetesc=*character*
The Telnet escape character for this user. Use this option to define a character to escape (shell-out) of a Telnet session without killing the session. The default is **^]** (Ctrl and right bracket).

vjslots=*number*
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 through 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=ippool localipaddr=192.168.3.4
```

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
```

See Also

- "remove" on page 81 to remove entries from the user table.
- "revert" on page 83. The **revert users** command reverts the **set user** configuration.
- "Commands for Managing Connections and Sessions" on page 53.

set web

Purpose

Controls the timeout period for Web UI connections, or resets an active Web UI connection.

The timeout period refers to an inactivity timeout, a configurable period after which a user will be logged out of the Web UI. The timeout is reset every time the user views a page. Inactivity timeouts are useful for security purposes, to ensure that a connection is not left open if a user forgets to log out. Connections can also be manually closed by using the **command=reset** option to cause the current connection to be automatically logged out. This is useful if the current connection was not properly logged out.

Required Permissions

Root privileges are required to use this command.

Syntax

The **set web** options must be used individually and not combined in a single command.

Set the Timeout Period for a Logged-In Session on the Web UI

```
set web [timeout=0-65534]
```

Reset Active Connection

```
set web [command=reset]
```

Options

timeout=0–65534

The timeout period for Web UI connections. Setting the timeout to 0 means that no timeout should be used. In this instance, a Web UI connection will never time out. That means that the only way to close a connection is to either manually log out, or use the **set web command=reset** option. Setting the time to anything over 0 means that after the connection has been idle for the specified seconds, the connection is closed and the user will be forced to log in again. The default value is 600 seconds (5 minutes).

command=reset

Used to force the active connection to be closed and require the user, or any other user, to log in. This is a useful function when a user forgets to log out.

Examples

Set a Timeout Period of 5 Minutes

```
#> set web timeout=600
```

Close the Currently Logged-In Session

```
#> set web command=reset
```

See Also

"revert" on page 83. The **revert web** command reverts the **set web** settings to their default values.

show

Purpose

Displays current configuration settings, and current versions of the Boot, POST, and OS components for a device.

Required Permissions

Anyone can use this command.

Syntax

`show option [range=range]`

Options

option

One of the following options:

Option	Displays events associated with...	Works with "range" Option
altip	**set altip** setting.	yes
arp	**set arp** settings.	yes
auth	**set auth** settings.	yes
boot	The boot version. This option applies to PortServer TS 8/16 devices only.	no
buffers	**set buffer**.	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 master	**set ia master** settings.	no
ia serial	**set ia serial** settings.	yes
ia table	**set ia table** settings.	no
ia all	All **set ia** Industrial Automation settings.	no
ippool	**set ippool** settings.	no
keys	**set keys** settings.	yes
line	**set line** settings.	yes
logins	**set logins** settings.	yes
menu	**set menu** settings.	yes

Option	Displays events associated with...	Works with "range" Option
modem	**set modem** settings.	yes
netlogins	**set netlogins** settings.	no
netports	**set netport** settings.	no
pmodem	**set pmodem** settings.	yes
ports	**set ports** settings.	yes
powerunit	**set powerunit** settings.	yes
profiles	**set profiles** settings.	yes
radius	**set radius** settings.	no
rloginoption	**set rloginoption** settings.	no
route	**set route** settings.	yes
script	**set script** settings.	yes
secureaccess	**set secureaccess** settings.	no
service	**set service** settings.	yes
sharing	Port-sharing settings configured by **set sharing** command.	yes
snmp	**set snmp** settings.	no
sntp	**set sntp** settings.	no
socketid	**set socketid** settings. This option does not apply to PortServer TS 8/16 devices.	yes
strings	This keyword is used for debugging purposes.	
switches	**set switches** settings.	yes
tcpip	**set tcpip** settings.	no
telnetip	**set telnetip** settings.	yes
terms	**set terms** settings.	yes
time	**set time** settings. This option applies to PortServer TS 8/16 devices only.	no
timezone	**set timezone** settings.	no
trace	**set trace** settings.	no
udpdest	**set udpdest** settings.	yes
udpserial	**set udpserial** settings.	yes
users	**set user** settings.	yes

Option	Displays events associated with...	Works with "range" Option
versions	The version of POST, Boot, and EOS running on the device server.	no

range=*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
```

See Also

"revert" on page 83. The **revert** command reverts the settings of various **set** commands.

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.

Required Permissions

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

- "close" on page 58, for information on ending a connection.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "quit" on page 79.
- "reconnect" on page 80
- "rlogin" on page 87.
- "send" on page 89.
- "status" on page 255.
- "telnet" on page 256.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53

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. For more information, see these commands:

- "display" on page 63
- "info" on page 68.

telnet

Purpose

Establishes a Telnet session with a remote system.

To establish a character sequence to escape or shell-out of a Telnet session without killing the session, use the **set user** command's **telnetesc=*character*** option. The default Telnet escape character sequence is **^]** (Ctrl and right bracket).

Required Permissions

Anyone can use this command.

Syntax

```
telnet {hostname|host ip addr} [tcp port]
```

Options

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
```

See Also

- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "quit" on page 79.
- "reconnect" on page 80.
- "rlogin" on page 87.

- "send" on page 89.
- "set user" on page 238. The **telnetesc=*character*** option sets a Telnet escape character sequence.
- "status" on page 255.
- "who" on page 262.
- "Commands for Managing Connections and Sessions" on page 53.

traceroute

Purpose

Displays a list of routers through which an IP packet passes on its way to a particular destination.

Required Permissions

Anyone can use this command.

Syntax

```
traceroute ip addr|name
```

Option

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 to a Host Using a Host Name

```
#> traceroute poe
```

uptime

Purpose Displays the amount of elapsed time since the last reboot.

Required Permissions Anyone can use this command.

Syntax

```
uptime
```

Example

```
#> uptime
Time since last reboot: 36 days, 04:08:54
```

wan

Purpose

Initiates and controls wide-area network (WAN) connections, or displays the status of current WAN connections.

Only incorrectly configured WAN interfaces produce a message in response to this command. If WAN interfaces are configured correctly, no message is returned.

Required Permissions

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]
```

Options

close=*user name*
Closes an outbound connection. The connection is identified by a user name.

initmodem=*range*
Executes the modem initialization script associated with the port or ports specified, where *range* specifies either a port or range of ports.

start=*user name*
Places the connection in the start-up condition. The connection is identified by a user.

testmodem=*range*
Executes the modem test script associated with the port or ports specified. See "set modem" on page 169 for information on test scripts.

verify={all|*user name*}
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.

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 169.
- "set filter" on page 115.

who

Purpose

Displays a list of current users of the Digi device. For each user, information displayed includes from where the user is connected from (**Connected from**), the services to which they are connected (**Connected to**), and the number of connections open.

Required Permissions

Anyone can use this command.

Syntax

```
who [mode={name|numeric}] [range=tty-tty]
```

Options

mode={name|numeric}

How to display the current users in the **Connected from** field. This setting has no effect for users logged in via serial ports.

name

Displays the **Connected from** field as a host name, for example **fred.company.com**.

numeric

Displays the **Connected from** field as a host IP address, for example, **192.168.4.17**.

range=*tty-tty*

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
```

See Also

- "close" on page 58.
- "connect" on page 60.
- "exit" on page 66.
- "kill" on page 70.
- "mode" on page 71.
- "quit" on page 79.
- "reconnect" on page 80.
- "rlogin" on page 87.
- "send" on page 89.
- "set user" on page 238. The **telnetesc=*character*** option sets a Telnet escape character sequence.
- "status" on page 255.
- "telnet" on page 256.
- "Commands for Managing Connections and Sessions" on page 53.

Chapter 3 Modem Emulation Commands

This chapter describes the commands that can be issued when Digi devices are configured in modem emulation mode.

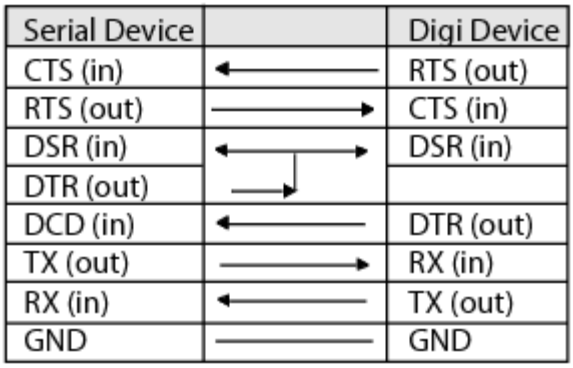
What Is Modem Emulation?

Modem emulation enables a system administrator to configure a networked Digi device to act as a modem. The Digi device 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.

As an aid in configuring modem emulation, the web interface has a serial port profile for modem emulation.

Modem Emulation Cable Signals

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



DSR and DTR on the serial device side are connected to the DSR signal of the Digi device.

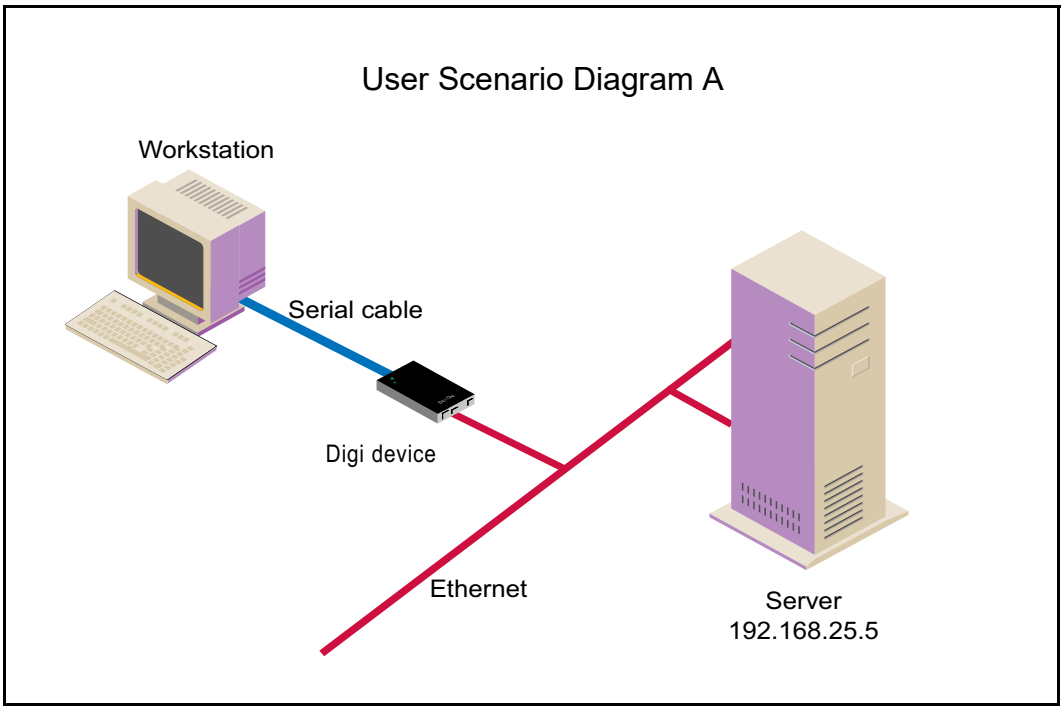
Modes of Operation

There are two modes of operation in modem emulation:

- Command mode: Issuing AT commands to a Digi device.
- Data mode: After a network connection is established, the device switches to data mode.

Common User Scenarios for Modem Emulation

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

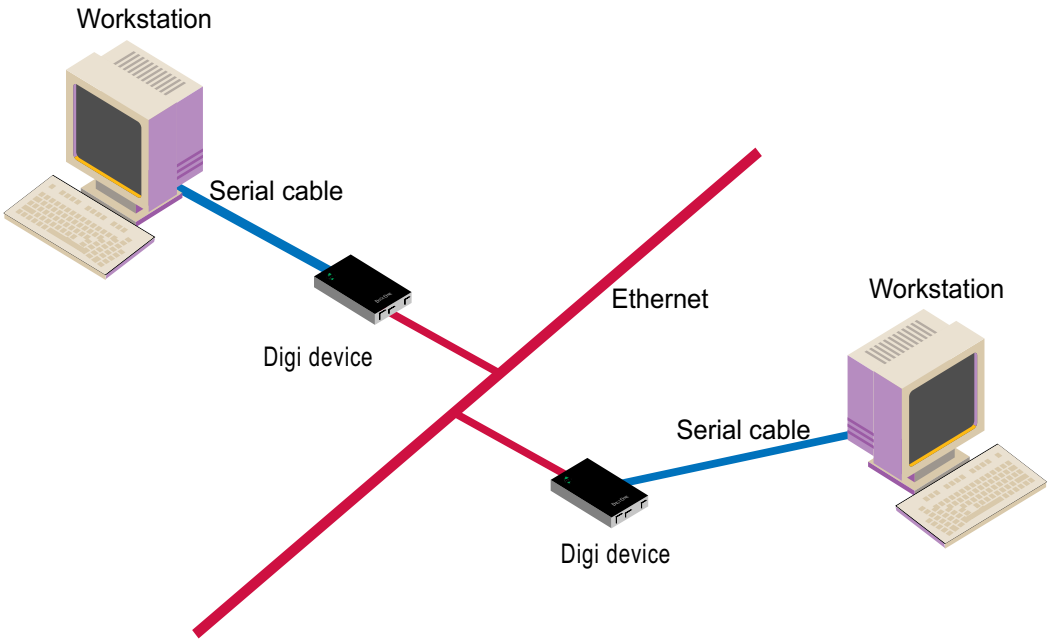


In Diagram A, the Digi device replaces a modem connected to a workstation running an application. The Digi device allows for the use of software applications without modification by responding to all the AT commands configured in the workstation application. The Digi device connects to the IP Address of the server when an ATDT command is issued, for example:

`ATDT ipaddress:port (ATDT 192.168.25.5:50001)`

Once the remote device establishes the TCP connection, a CONNECT message is sent to the serial port and only then does the Digi device 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 Digi devices will replace modems on both sides of the connection. The initiation of the connection occurs with either of the Digi devices. If both ends are Digi devices, 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 Digi device 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.

Connection Scenarios for Modem Emulation

Modem emulation can involve the following types of connection scenarios:

Outgoing Modem Emulation Connection

In an outgoing modem emulation connection, a serial device sends an **ATD*x.x.x.x:y*** command, which triggers the Digi device to establish a connection to destination **IP=*x.x.x.x*, port=*y***.

Incoming Modem Emulation Connection

In an incoming modem emulation connection, a device on the network connects to port 50001 (50000+1 = 1st serial port). This incoming connection triggers the Digi device to generate a RING on the serial port. The device attached to the serial port will answer the RING and the connection is established.

Modem Emulation Pooling

Modem emulation pooling is a combination of Incoming Modem Emulation Connection and a hunt group. A device on the network connects to port 50000. The Digi device checks if a serial port configured for modem emulation is available. If so, it connects to the port, otherwise returns an error.

Modem Emulation Bridge

A modem emulation bridge is combination of Outgoing and Incoming Modem Emulation Connections, in which both serial devices require to talk to a modem. The first serial device connects to the second device using **ATDx.x.x.x:y**, the second device gets a RING and accepts the incoming connection.

About the Commands in this Chapter

This chapter describes the Digi-specific modem emulation commands that have been implemented for Digi Connect devices. It is divided into several sections:

- "Modem Emulation AT Command Set" on page 268. These are commands to perform actions in a modem-emulation connection.
- "S-Register Definitions" on page 271.
- "Result Codes" on page 273, a description of the result codes for the commands.

Accepted But Ignored AT Commands

Any other commands not described in this chapter but in the standard AT command set are accepted but ignored and therefore have no effect. Such commands are pertinent to actual modems, but not to modem emulation.

Modem Emulation AT Command Set

The following commands can be issued to perform actions in a modem-emulation configuration scenario.

AT Command	Function	Result Code
n+++*n*	When in data mode, this command causes the modem to switch to command mode. The value of *n* corresponds to the required delay before and after the escape sequence is entered. The delay can be changed by modifying S-register 12. The escape character can be changed by modifying S-register 2.	
A/	Repeats the last command string.	
AT?	Prints the value of the last-accessed S-register.	
ATA	Answer command: Answers an incoming TCP connection and switches to data mode.	
ATD (*ipaddress*): (*ipport*)	Used to connect to a remote network device. This command directs the Digi device to go on-line, dial according to the IP address entered as follows, and attempt to establish a TCP connection. Dial Modifiers. The valid dial string parameters are described below. Punctuation characters may be used for clarity with parentheses, hyphen, and spaces being ignored. • 0-9: DTMF digits 0 through 9. • . (period): Dot notation used for IP addresses. IP addresses are written as four numbers separated by periods, where the first number is between 1 and 255, and the other three numbers are between 0 and 255. Enter the IP address in the format ***xxx.xxx.xxx.xxx*** • : (colon): Colon notation used for the TCP port. • L: Redial the last number. The modem will reconnect to the last IP address accessed. The L must immediately follow the D, and any following characters are ignored. • P: This command is accepted but not acted on. • T: This command is accepted but not acted on. • R: This command is accepted but not acted on. • , (comma): This command is accepted but not acted on.	
ATE*n*	Command echo. The Digi device enables or disables the echo of characters to the DTE according to the parameter supplied. The parameter value, if valid, is written to S14 bit 1. • E0: Disables command echo. • E1: Enables command echo.	OK n=0 or 1 ERROR Otherwise
ATH	Disconnect (Hang up) command. H0, H1: Hangs up the TCP connection if a connection is active.	OK n=0 or 1 ERROR Otherwise
ATI*n*	Identification command. • I0, I1: Reports product name. • I3: Reports product name and firmware revision. • I4: Reports product configuration. • I6: Reports network connection information.	OK n=0 or 9 ERROR Otherwise

AT Command	Function	Result Code
ATO	Return to on-line data mode. If the modem is in the on-line command mode, the modem enters the on-line data mode. If the modem is in the off-line command mode (no connection), ERROR is reported. • O0, O1: If there is an active connection, switches the modem to data mode.	OKn = 0 or 1 and a connection exists. ERROR Otherwise or if not connected.
ATQ*n*	Quiet results codes control command. The command enables or disables the sending of the result codes to the DTE according to the parameter supplied. The parameter value, if valid, is written to S14 bit 2. • Q0: Enables result code to the DTE (Default). • Q1: Disables result code to the DTE. • Q2: Disables “CONNECT” result codes. • Q3: Disables “CONNECT” result codes on incoming connections.	OK n=0 or 1 ERROR Otherwise
ATS*n*	Read/Write to the specified S-Register. • *n* Establishes S-register *n* as the last register accessed. • *n=v* Sets S-Register *n* to the value *v*. • *n*? Reports the value of S-Register *n*. See "S-Register Definitions" on page 271 for definitions of S-Registers.	OK n=0 or 1 ERROR Otherwise
ATV*n*	The verbose setting for result codes. This command selects the sending of short-form or long-form codes to the DTE. The parameter, if valid, is written to S14 bit 3. • V0: Result codes are issued in numeric or short form. Line feeds are not issued before a short-form result. • V1: Result codes are issued in text or long form. This is the default.	OK n=0 or 1 ERROR Otherwise
ATZ	Load configuration. Reloads the S-register configuration from flash memory. See "S-Register Definitions" on page 271 for definitions of S registers.	OK n=0 or 1 ERROR Otherwise
AT&C*n*	DCD option. The Digi device controls the DCD output in accordance with the parameter supplied. The parameter value, if valid is written to S21 bit 5. • &C0: DCD remains ON at all times. • &C1: DCD follows the state of the connection.	OK n=0 or 1 ERROR Otherwise
AT&D*n*	DTR option. This command interprets the ON to OFF transition of the DTR signal from the DTE in accordance with the parameter supplied. The parameter value, if valid, is written to S21 bits 3 and 4. Also see S25. • &D0: DTR drop is ignored (assumed ON). • &D1: DTR drop is interpreted by the modem as if the asynchronous escape sequence had been entered. The modem returns to command mode without disconnecting. • &D2: DTR drop causes the modem to hang up. (Default.) • &D3: DTR drop causes the modem to do a soft reset, as if the ATZ command was executed.	OK n=0 to 3 ERROR Otherwise
AT&F	Restore factory configuration. The device reloads the factory default S-register configuration from flash memory. The factory defaults are identified for each command and in the S-Register descriptions. A configuration consists of a subset of S-Registers.	OK n=0 or 1 ERROR Otherwise
AT&V	Displays current values and settings. • AT&V0- AT&V5: Displays S-Register/command values for the current and stored configuration. • AT&V6: Displays current network settings.	OK n=0 to 5 ERROR Otherwise

AT Command	Function	Result Code
AT&W*n*	Store configuration. Stores the specified S-registers in flash memory.	OK n=0 or 1 ERROR Otherwise

S-Register Definitions

Following is a description of the S-registers that can be set.

Register	Function	Range	Units	Default
S0	Rings to Auto-Answer. Sets the number of rings required before the Digi device automatically answers a call. Setting this register to Zero disables auto-answer mode.	0-255	Rings	0
S1	Ring Counter. Specifies the current number of rings. S1 is incremented each time the modem detects a ring signal on the telephone line. S1 is cleared when the existing connection is established or dropped.	0-255	Rings	0
S2	Escape Character. S2 holds the value of the ASCII character used as the escape character. The default value corresponds to an ASCII **+** character. A value over 127 disables the escape process. That is, no escape character will be recognized.	0-255	ASCII	43
S3	Carriage Return Character. Sets the value of the carriage return character used when displaying commands or results.	0-127	ASCII	13
S4	Line Feed Character. Sets the character recognized as a line feed when displaying commands or results. If verbose result codes are used, the Line Feed Character is output after the Carriage Return Character.	0-127	ASCII	10
S5	Backspace Character. Sets the character recognized as a backspace, used to erase the last character typed on the command line.	0-32	ASCII	8
S12	Escape Prompt Delay. The amount of time required before and after an escape sequence (**+++**) is entered in order for the modem to transition from data mode to command mode.	0-255	0.02 second, 20 ms	50 1 second
S14	General Options Status. Indicates the status of command options. • Default: 138 (8Ah) (10001010b) • Bit 0: Ignored. • Bit 1: Command echo (E*n*): 0 = Disabled (E0). 1 = Enabled (E1). (Default.) • Bits 2 and 4: Quiet mode (Q*n*): 0 = Display result codes (Q0). (Default.) 1 = Do not display result codes (Q1). 2 = Disables “CONNECT” result codes (Q2). 3 = Disables “CONNECT” result codes on incoming connections (Q3). • Bit 3: Result codes (V*n*): 0 = Display numeric result codes (V0). 1 = Display verbose result codes (V1). (Default.) • Bits 5-7: Ignored.			138 (8Ah)

Register	Function	Range	Units	Default
S21	General Options Status. Indicates the status of command options. • Default: 52 (34h) (00110100b) • Bits 0 - 2: Ignored. • Bits 3-4: DTE's DTR behavior (&D*n*): 0 = DTR drop is ignored (&D0). 1 = DTR drop causes a transition from data to command mode without hanging up an existing connection (&D1). 2 = DTR drop hangs up the existing connection (&D2) (Default.) 3 = DTR drop causes the modem to do a soft reset if the ATZ command was executed (&D3). • Bit 5: Modem's DTR behavior: 0 = The modem's DTR remains on at all times (&C0). 1 = The modem's DTR follows the state of the TCP connection (&C1). (Default.) • Bits 6-7: Ignored.	-	-	52 (34h)
S25	Delay to DTR Off. The amount of time that the modem will delay before taking the action specified by the **AT&D*n*** command.	0-255	s or 0.01 s	5

Result Codes

Following is a description of the return codes returned by modem emulation commands.

Short	Long Form		Short	Long Form		Short	Long Form
0	OK		13	CONNECT 7200		84	CONNECT 33600
1	CONNECT		14	CONNECT 12000		91	CONNECT 31200
2	RING		15	CONNECT 14400		165	CONNECT 32000
3	NO CARRIER		16	CONNECT 19200		166	CONNECT 34000
4	ERROR		17	CONNECT 38400		167	CONNECT 36000
5	CONNECT 1200		18	CONNECT 57600		168	CONNECT 38000
6	NO DIALTONE		19	CONNECT 115200		169	CONNECT 40000
7	BUSY		20	CONNECT 230400		170	CONNECT 42000
8	NO ANSWER		59	CONNECT 16800		171	CONNECT 44000
9	CONNECT 0600		61	CONNECT 21600		172	CONNECT 46000
10	CONNECT 2400		62	CONNECT 24000		173	CONNECT 48000
11	CONNECT 4800		63	CONNECT 26400		174	CONNECT 50000
12	CONNECT 9600		64	CONNECT 28800			

Index

A

AB/Client-Server Protocol 141
AB/DF1 Full Duplex 141
abbreviating commands 51
abcsp 141
abethernet 141
abort output signal 89
access control
  See security features
access permissions
  configuring 95
  displaying 95
access time 239
add line feed characters 72
address compression 239
admin command
  description 54
alert character 52
Allen-Bradley Client-Server Protocol (abethernet) 141
Allen-Bradley/DF1 Full-Duplex Protocol (df1fullduplex) 141
alternate IP addresses 91
altip configuration
  reverting settings 84
altip table
  configuring entries in 91
  displaying entries in 91
  removing entries from 81
are you there signal 89
arp configuration
  reverting settings 84
arp table
  adding ethernet address 93
  configuring entries in 93
  displaying entries in 93
  removing entries from 81
ASCII devices, protocol for 141
ascii_import protocol 141
async map 239
asynchronous control characters 240
AT commands 267, 268
auth table
  configuring entries in 94
  displaying entries in 94
  removing entries from 81
authentication 247
autoconnect
  configuring ports 175
  configuring users 240

B

backslash character 52
backspace character 52
backup and restore configurations 47
backup/restore configurations 62
baud rate, configuring 155
bidirectional modem connections 176
block or pass packets 116
boot command
  description 55
boot version
  displaying current settings 251
break signal 89
break signal handing 155
bring up or reject connections 116
bringup filter 21, 241
buffers 65, 98

C

carriage-return character 52
CHAP authentication 37, 241, 247
character size, configuring 155
chat protocol 141
chat scripts, configuring 99
chat table
  configuring entries in 99
  displaying entries in 99
  how to configure 100
  removing entries from 81, 99
  renaming entries 99
circuit breaker 43, 63, 102
clear errors 63
clear statistics 68
clear the maximum current detected 78
Client FQDN (Fully Qualified Domain Name) 111
close command 13, 53, 58
  description 58
closing a connection 58
closing a WAN connection 260
command line
  accessing 12
  configuring access to 37, 241
  restricting user access to 242
command prompt 158
commands
  abbreviating 51
  descriptions 54–261
  navigation and editing keys 50
  online help for 50
  syntax conventions 51
compression 242
configuration
  displaying 62
configuration management
  copying configuration to and from remote host 47
  copying to a remote host or terminal 62
  displaying configuration 62
  displaying current Boot, POST, and OS components for a device 251
  overview 47
  resetting configuration to defaults 47
  restoring defaults 55
  restoring from a remote host or terminal 62
  upgrading firmware 47
configuration table
  removing entries from 81
configure a device 110
configure access for two IP addresses 97

configure buffers 98
configure mixed access 97
configure no access for an IP Address 97
configuring outbound PPP user 19
connect command 13, 53, 242
  description 60
  relationship to close command 58
connect session status 254
connection management
  from command line 53
connections 259
console menu 107
control a device with a device range 78
control a device with an ID 78
copying the configuration to a host or terminal 62
cpconf command
  description 62
create a menu 167
current time and date 228
Custom protocol
  set ia command 130
custom protocol 141

D

date and time, setting 228
Daylight Saving Time (DST) 230
default gateway, configuring 102
default service for user 242
destination tables
  configuring 132
  configuring route entries within 133
destinations for serial over UDP
    communication 232
device table
  configuring entries in 109
  displaying contents 109
  removing entries from 81
device type
  bidirectional modem connections 176
  default on set ports command 176
  dumb terminals 176
  hdial 177
  hio 177
  host 177
  ia 177
  incoming modem connections 176
  min 176, 177
  mio 176, 177
  modem emulation 176
  mout 176, 177
  outgoing modem connections 176
  parameter on set ports command 176
  pm 176, 178
  power 176, 178
  power units 176
  printers 176
  prn 176, 178
  RealPort connections 176
  reverse Telnet connections 176
  rp 176, 178
  term 176, 178
df1fd 141
df1fullduplex 141
DHCP
  See Dynamic Host Configuration Protocol
dhcp command 13
dialer script 199
dip switches 63
disable device servers 200
disabling inbound Telnet connections 201
disabling services 42, 201
display buffers command
  description 65
display command
  description 63
display configuration 62
display errors 63
display operating options 72
display outlet status 77
display power unit status 77
display statistics 68
displaying attributes ports 180
displaying Boot, POST, and OS components of a
    device 251
displaying current device server users 261
displaying current secure-access settings 200
displaying device configuration settings 251
displaying login information for ports 160
displaying operating parameters of a port 175
displaying the current time and date 228
DNS
  See domain name system
domain name system
  configuring a host file 33
Domain Name System (DNS)
  configuring a host file 33
dumb terminals 176
Dynamic Host Configuration Protocol (DHCP)
  enabling/disabling 111

E

echo replies 74
EIA-232 217
EIA-485 217
eip 141
embedded modem
  configuration 113
  configuring 46
  set embmodem command 113
encryption 41
erase character 89
erase line signal 89
error handling on lines 156
errors
  displaying and clearing 63
escape character 89
escape sequences for special characters in
    strings 52
ethernet connection
  configuring 101
  set ethernet command 114
Ethernet interface
  communications parameters 114
  configuring 16
ethernetip 141
event tracing 231
exit command
  description 66

F

filter
  bringup 21, 241
  configuring 21, 116
  criteria 21
  displaying the filter table 116
  for PPP connections 21

keepup 21, 243
logpacket 21
passpacket 247
using with TCP service ports 202
filter table
creating entries in 116
displaying entries in 116
removing entries from 81
filters
passpacket 21
flow control
configuring 121
displaying current parameters 121
form-feed character 52
forwarding 125
frame protocol 68
FTP service 203

G

go ahead signal 89

H

hdial device type 177
help 50
help command
description 67
hexadecimal numbers in strings 52
high-order bit handling 156
hio device type 177
horizontal tab character 52
host configuration
reverting settings 84
host connection, testing 74
host device type 177
host table
configuring 129
displaying entries in 129
removing entries from 81, 129
hostlink 141
Hostlink protocol 141
hunt group 91, 179

I

ia device type 176, 177
ICMP
configuring ICMP router discovery 126
mask server 126
routing redirect messages 103
idle timeout 243
inbound ports
configuring access to 36
incoming modem connections 176
Industrial Automation (IA)
Adding a second serial port with more Modbus slaves attached 150
clearing all IA settings 149
displaying current settings 135
enabling RTS/CTS control for radio modems or converters 149
setting baud rate and other serial-port settings 149
setting up a Modbus/TCP to RTU bridge 149
Setting up a PLC with Pass-Thru for local HMI display 151
Using the second serial port in Pass-Thru mode for a serial Modbus Master 150
industrial automation (IA)
configuring ports for 176
configuring protocol-specific behavior 133, 141
device type for 177
for destination tables 132, 138
for network-based masters 132, 136
for route entries within destination tables 133, 138
for serial port-connected devices 132, 135
set ia command 130
info command
description 68
initialization script 168
initiate a connection on a port 60
initiating a WAN connection 260
input parity checking 156
interrupt process signal 89
IP address
configuring 16
displaying lease information for 111
for a remote user 243
renewing 111
IP routing
configuring 28, 125
configuring or removing 191
displaying the routing table 125
static routes 191
IP routing table 128
ippool table
configuring entries in 152
removing entries from 81

K

keep-alive function 243
keepup filter 21, 243
keeput filter 243
key mappings 153
kill character 244
kill command 13, 53
description 70

L

lease information for an IP address 111, 113
line options 155
line speed 155
line, configuring 155
load key 244
load new boot code 55
load new firmware from a TFTP host 55
load new POST code 55
logging on to a remote system 87
login
to a remote system 13, 53
login prompt 158
login script 244
Login service 203
logins
configuring 158
displaying current settings 158
over a network (netlogin) 170
prompt for 158
scripts for 194
to remote system 87
logpacket filter 21
logport feature 161
loose source routing 75

M

match any character, escape sequence for 52
mbasc 141

mbrtu 141
mbtcp 141
MEI See Multiple Electrical Interface
menu table
  configuring entries in 165
  displaying entries in 165
  removing entries from 81
menus
  configuring 165
  configuring for users 245
  displaying 165
  removing 165
min device type 176, 177
mio device type 176, 177
Modbus 141
Modbus protocol
  displaying information for 69
  set ia command 130
Modbus/ASCII protocol 141
Modbus/RTU protocol 141
Modbus/TCP protocol 141
modbusascii 141
modbusrtu 141
modbustcp 141
mode command 13
  description 71
modem
  connections for 176
  scripts for 194
  set modem command 168
  test and initialization scripts for 168
modem emulation
  AT commands for 267, 268
  commands 263
  configuring 22
  device type for 176
  result codes for commands 273
  scenarios for 266
  S-Register definitions 271
modem table
  displaying entries in 168
mout device type 176, 177
Multi-client Telnet 141
Multiple Electrical Interface (MEI)
  configuring global settings 164
  configuring per-port settings 217
  pinout details 219
  set mei command 164
  set switches command 217

N

network configuration
  reverting settings 84
network configuration parameters
  displaying 101
network login (netlogin) 170
network parameters
  configuring 101
  displaying 101, 246
network statistic tables 68
network statistics
  clearing and displaying 68
network-based Masters, configuring 132
new-line character 52
new-line character handling 156
newpass command 40
  description 73
NNTP service 203
no option signal 89

O

octal bytes in strings 52
ODVA Ethernet/IP for PCCC encap
    (ethernetip) 141
older port 2222 protocol 141
online help 50, 67
operating system, updating 56
outbound ports
  configuring access to 37
  restricting access to 94
outgoing modem connections 176
output tab handling 157

P

PAP authentication 246, 247
parity 157
passpacket filter 21, 247
password
  configuring for login prompt 159
  creating 73
  issuing 40
  prompt for 159
  requiring of a user 247
ping command 13, 53
  description 74
pm device type 176, 178
Point-to-Point Protocol (PPP)
  configuring connections 17
  configuring users 247
poison reverse, configuring 126
port sharing
  configuring 204
  configuring the console menu 107
  displaying current settings for 252
  set sharing command 204
port statistics displayed by info serial 69
ports
  buffering 98
  buffers 65
  configuring 175
  configuring device types 176
  killing a session on 70
  operating parameters for 175
  reconnecting to 80
power
  command 76
  device type 176, 178
  over serial ports 43
  power-management configuration 181
  units 176
power command
  description 76
powerunit table
  configuring entries in 181
  displaying entries in 181
  removing entries from 81
PPP
  address compression 239
  authentication 247
  closing connections 259
  configuring 17
  configuring connections by set user
      command 237
  configuring inbound PPP user 249
  configuring outbound PPP user 249
  enabling and disabling connections for

users 246
filters for connections 21
inbound connections for 17
initiating connections 259
negotiations 246
outbound connections for 19
protocol compression 247
users 17, 247
printers 176
prn device type 176, 178
protocol
statistics for 68
protocol compression 247
protocols
AB/Client-Server Protocol 141
AB/DF1 Full Duplex 141
Address Resolution Protocol (ARP) 93
ascii_import 141
chat (multi-client Telnet) 141
configuring behavior of specific in Industrial Automation 133, 141
Dynamic Host Configuration Protocol (DHCP) 102, 111
for ASCII devices 141
for industrial automation devices 130
frame 68
Hostlink 141
Modbus 130
Modbus/ASCII 141
Modbus/RTU 141
Modbus/TCP 141
multi-client Telnet 141
ODVA Ethernet/IP for PCCC encap 141
older port 2222 protocol 141
Point-to-Point protocol (PPP) 17, 247
Routing Information Protocol (RIP) 125
Simple Network Management Protocol (SNMP) 33, 208
Simple Network Time Protocol (SNTP) 213
user-defined 130
user-defined (custom)
wlan 68
proxy ARP 31
configuring 127
services 125

Q

quit command 13, 53
description 79

R

RADIUS
set radius command 38, 187
using 38
RADIUS configuration
reverting settings 84
RealPort
access to output ports 97
authentication options for 193
configuring 15
connections 176
RealPort connections 176
rebooting
device server 55
time since last 258
reconnect command 13, 53
description 80
remote login (rlogin) 87
remove command
description 81
reset network-related settings 85
reset the idle timeout timer 116
reset the port configuration to defaults 85
resetting the circuit breaker 43
restoring configuration
from a host or terminal 62
to defaults 55
restoring the configuration to defaults 83
restricting access to the device 238
reverse Telnet connections 176
revert command
description 83
revert entire configuration 83
RIP
See Routing Information Protocol
rlogin command 13, 53
description 87
root session
temporary 54
terminating 79
route configuration
reverting settings 84
route entries within destination tables 133
route table
configuring entries in 191
displaying contents of 191
removing entries from 81
removing routes from 191
routing
configuring dynamic routes 125
configuring static routes 191
tracing of 257
routing configuration
reverting settings 84
Routing Information Protocol (RIP)
configuring 125
configuring dynamic routes using 30
service number for 203
updating 245
rp device type 176, 178

S

script
assigning to ports 168
clearing association with ports 168
creating 194
deleting 194
dialer script 199
displaying 194
login 198, 244
removing from the scripts table 194
script table
configuring entries in 194
deleting scripts from 194
displaying entries in 194
removing entries from 81
secure access 200
secure communication 41
security configuration
reverting settings 84
security features
configuring 35
configuring SSH version 2 encryption 41
controlling access to command line 37
controlling access to inbound ports 36
controlling access to outbound ports 37

controlling access to services 42
controlling access to the configuration 35
issuing user passwords 40
restricting access to inbound ports 37
using CHAP authentication for PPP users 37
using RADIUS to authenticate users 38
send command 13, 53
description 89
send information to the log file 116
separator between characters in escape sequences 52
serial configuration
reverting settings 84
serial line options 155
serial over UDP communication
configuring 234
displaying statistics for 69
operating parameters for 234
serial port
configuring 155
local IP address 244
socket ID feature 215
serial port settings 17
serial port-connected devices, configuring 132
service table
configuring entries in 202
displaying entries in 202
removing entries from 81
services
FTP 203
Login 203
NNTP 203
RIP 203
set service command 202
Shell 203
SMTP 203
Telnet 203
TFTP 203
session
clearing 70
resetting 70
terminating 66, 79
session control
from command line 53
session information (status command) 13, 53
session timeout 248
set altip command
description 91
displaying current settings 91, 251
reverting settings 83
set arp command 93
description 93
displaying current settings 93, 251
reverting settings 83
set auth command
description 94
displaying current settings 95, 251
reverting settings 83, 84
set buffer command
description 98
displaying current settings 98, 251
reverting settings 83
set chat command
description 99
displaying current settings 99, 251
reverting settings 83, 85
set config command 106
description 101
displaying current settings 101, 251
reverting settings 83, 84
set consmenu
displaying current settings 107
set consmenu command
description 107
reverting settings 83
set device command
description 109
displaying current settings 109, 251
reverting settings 83, 85
set dhcp command
description 111
displaying current settings 111, 251
reverting settings 83
set embmodem command
description 113
displaying current settings 113
reverting settings 83
set ethernet command
description 114
displaying current settings 114, 251
reverting settings 83, 84
set filter command
description 116
displaying current settings 118
reverting settings 83, 85
set flow command 121
description 121
displaying current settings 121, 251
reverting settings 83, 84
set forwarding command
description 125
displaying current settings 125, 251
reverting settings 83
set host command
description 129
displaying current settings 129, 251
reverting settings 83
set ia command
description 130
displaying current settings 135, 251
reverting settings 83
set ippool command 152
description 152
displaying current settings 152, 251
reverting settings 83, 85
set keys command
description 153
displaying current settings 153, 251
reverting settings 83, 84
set line command
description 155
displaying current settings 155, 251
reverting settings 84
set login command
reverting settings 84
set logins command
description 158
displaying current settings 158, 251
reverting settings 84
set logport command
description 161
displaying current settings 162
reverting settings 84
set mei command
description 164
displaying current settings 164

reverting settings 84
set menu command 165
description 165
displaying current settings 165, 168, 251
reverting settings 84
set modem command 168
description 168
displaying current settings 252
reverting settings 84, 85
set netlogins command
description 170
displaying current settings 170, 252
reverting settings 84
set netport command
description 173
displaying current settings 173, 252
reverting settings 84
set pmodem command
description 174
displaying current settings 174, 252
reverting settings 84
set ports command
description 175
displaying current settings 175, 252
reverting settings 84
set powerunit command
description 181
displaying current settings 181, 252
reverting settings 84
set profiles command
description 184
displaying current settings 252
reverting settings 84
set radius command
description 187
displaying current settings 187, 252
reverting settings 84
set rloginoption command
description 190
displaying current settings 252
reverting settings 84
set route command
description 191
displaying current settings 191, 252
set rpauth
displaying current settings 193
set rpauth command
description 193
set script command
description 194
displaying current settings 194, 252
reverting settings 84, 85
set secureaccess command
description 200
displaying current settings 200, 252
reverting settings 84
set service command 202
description 202
displaying current settings 202, 252
reverting settings 84
set sharing command
description 204
displaying current settings 204, 252
reverting settings 84
set snmp command
description 208
displaying current settings 208, 252
set snmpauth command
description 211
reverting settings 84
set sntp command
description 213
display current settings 213
displaying current settings 252
reverting settings 84
set socketid command
description 215
displaying current settings 215, 252
set switches command
description 217
displaying current settings 217, 252
reverting settings 84
set tcpip command
description 221
displaying current settings 221, 252
reverting settings 84
set telnetip command
description 224
displaying current settings 224, 252
reverting settings 85
set terms command
description 226
displaying current settings 226, 252
reverting settings 84, 85
set time command
description 228
displaying current settings 228, 252
set timezone
reverting settings 85
set timezone command
description 229
display current settings 229
displaying current settings 252
set trace command
description 231
displaying current settings 252
reverting settings 84
set udpdest command
description 232
displaying current settings 232, 252
reverting settings 85
set udpserial command
description 234
displaying current settings 234, 252
reverting settings 85
set user command
description 237
displaying current settings 238, 252
reverting settings 84, 85
using filters with 21
set web command
description 250
reverting settings 85
Shell service 203
show command 251
displaying Industrial Automation settings 135
show ia all command 251
Simple Network Management Protocol (SNMP)
configuring 208
set snmp command 208
Simple Network Time Protocol (SNTP) 213
simple ping 75
SMTP service 203
SNMP
See Simple Network Management Protocol
SNMP configuration

reverting access permission (snmpauth) settings 84
reverting settings 84
snmpauth table
removing entries from 81
SNTP
See Simple Network Time Protocol
socket ID feature 215
split horizon, configuring 127
S-Register definitions 271
SSH version 2 encryption 41
start bits, configuring 155
statistics 68
status command
description 254
relationship to close command 58
status information 13, 53
stop bits, configuring 155, 157
strict source routing 75
string field values 52
strings
length limitations in 52
synchronize process signal 89
syntax conventions 51
system configuration
reverting settings 84

T

TCP options 221
TCP service ports 202
TCP socket service 105
TCPIP configuration
reverting settings 84
Telnet
binary connections 176
changing options for a session 71
command 13, 53, 255
connection status 255
displaying options for a session 71
displaying status of current session 254
escape character for 248
establishing a connection 255
IP address table 224
sending control command to Telnet peer 89
service number for 203
telnet command
description 255
Telnet IP configuration
reverting settings 84
telnetip table
configuring entries in 224
displaying entries in 224
removing entries from 81
temporary root session 54
temporary root session, initiating 54
term device type 176, 178
term table
configuring entries in 226
displaying 226
displaying entries in 226
removing entries 226
removing entries from 81
terminal types 226
terminals
configuring 226
configuring screen memory 226
escape sequences 226
test script 168
TFTP host, configuring 102
TFTP service 203
time
set sntp command 213
Simple Network Time Protocol (SNTP) 213
time and date, setting 228
trace settings
reverting 85
traceroute command
description 257
tracing a route 257
tracing, configuring 231
turn on binary mode 72

U

UDP destination table 232
configuring entries in 232
displaying entries in 232
removing entries from 232
uptime command
description 258
user attributes
configuring 44, 237
user table
configuring entries in 237
displaying entries in 237
removing entries from 81, 237
users
configuring 237
displaying 238
displaying current users 261
removing 238

V

Van Jacobsen header compression 242, 248
version information
displaying current settings 253
vertical tab character 52
vpn command 13, 53

W

wan command
description 259
WAN connections
closing 259
configuring routes over 192
initiating and controlling 259
who command 13, 53
description 261
wide-area network (WAN) connections 259