



Connectware™

RealPort

on

AIX

Setup Guide

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Purpose

Use this guide for the following:

- An introduction to RealPort, how to install, configure and use RealPort and, how to troubleshoot should you encounter a problem
- Configuration examples
- Administration procedures

Audience

This manual is intended for the person responsible for configuring and administering RealPort. This person should have experience configuring network devices and be familiar with networking concepts.

Conventions

Following are the conventions used in this document:

Special Fonts

A special font is used for any input you need to enter. For example,

```
set config
```

Square Brackets

Optional parameters are displayed within square brackets. For example,

```
set config [dhcp=on]
```

Note: The square brackets themselves are not actually part of the command, and should not be entered.

Italics

Variables are displayed in italics. For example,

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

Note: Substitute an appropriate IP address for *ip-address* in the above command.

Vertical Bar

A vertical bar character (|) is used to denote a choice (logical "or"). For example,

```
set flow=on|off
```

Note: The above command would be entered as either:

```
set flow=on or set flow=off
```

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Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- It is important to read any release notes that may be included with the installation media.
- The RealPort device driver software for AIX is an Optional Program Product requiring the TCP/IP Runtime System. The presence of the TCP/IP Runtime System can be verified by viewing installed software in smit.

Information to Gather

Before you install RealPort, you need to determine:

- The hostname or IP address to assign each unconfigured Digi device.
- The number of ports for each Digi device. Include any Xem PORTS Module ports that are attached to the Digi device.
- Determine the link speed between the host machine and the Digi device if a slow WAN link (for example, a 56K leased line) connects them.

Configuring a Digi One RealPort, Digi One IA RealPort or PortServer for RealPort

Use this procedure to configure a Digi One RealPort, Digi One IA RealPort or PortServer for use with Digi RealPort drivers.

Note: See the appropriate Command Reference or Configuration and Administration Guide for information on how to perform the steps below.

Procedure

1. Access a root prompt on the Digi device.
2. Set the Digi device's IP address.
3. Verify that the RealPort TCP port number is set to 771. Change if necessary.
4. For all ports that will be using RealPort, set the device type to rp. The following example configures ports 2 through 16 of a PortServer for RealPort:

```
set ports range=2-16 dev=rp
```

Configuring EtherLite for RealPort

Use this procedure to install and configure an EtherLite Terminal Server for use with Digi RealPort drivers.

Procedure

1. Attach the EtherLite module to the network using an appropriate cable.
2. Assign an IP address to the EtherLite module (see the following topic).

Assigning an IP Address

EtherLite IP addresses may be set by either of two methods:

- `dgipserv`, a UNIX utility for setting EtherLite IP addresses (see below)
- EtherLite Boot Console (see the EtherLite Administration Card)

Using `dgipserv` to Assign an IP Address

`dgipserv` is a Digi utility used to set the IP addresses for Digi devices. It will also set the gateway and subnet mask addresses when needed to upgrade the Digi device's firmware. For more information on `dgipserv` consult the man pages.

Note: `dgipserv` will only work with firmware version 7.9 or later.

Procedure

1. Enter the command:

```
dgipserv
```

2. To store an IP addresses in your Digi device enter:

```
dgipserv -store MAC_address(IP_address)
```

where the MAC address and the IP address are the addresses of the Digi device. An example of this command is:

```
dgipserv -store 10:e0:f7:15:20:8g 143.182.5.63
```

Related Documentation

PortServer Documentation

- PortServer Configuration and Reference Guide
- Digi One/PortServer Cable Guide

PortServer II Documentation

- PortServer II Hardware Installation Guide
- PortServer II Command Reference
- PortServer II Configuration and Administration Guide
- Digi One/PortServer Cable Guide
- Digi Port Authority--Remote Device Monitor Setup Guide

PortServer TS 8/16 Documentation

- PortServer TS 8/16 Command Reference
- PortServer TS 8/16 Configuration and Administration Guide
- Digi One/PortServer Cable Guide
- Digi Port Authority--Remote Device Monitor Setup Guide

Digi One RealPort/PortServer TS 2/4 Documentation

- Digi One/PortServer TS 2/4 Quick Reference Card
- Digi One/PortServer TS 2/4 Command Reference
- Digi One/PortServer TS 2/4 Configuration and Administration Guide
- Digi One/PortServer Cable Guide
- Digi Port Authority--Remote Device Monitor Setup Guide

Digi One IA RealPort Documentation

- Digi One/PortServer TS 2/4 Command Reference
- Digi One/PortServer TS 2/4 Configuration and Administration Guide
- Digi One/PortServer Cable Guide
- Digi Port Authority--Remote Device Monitor Setup Guide

EtherLite Documentation

- EtherLite Hardware Information Guide
- EtherLite Administration Card
- EtherLite Cable Guide

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Master Setup Process

Use this process to install and configure the AIX RealPort driver.

1. Read any release notes that may be included with the installation media. Also read Requirements and Considerations, on page 2-2.
2. Gather information necessary for installation. See Information to Gather, on page 2-2.
3. Install the RealPort driver. See Installing the Driver: CD or Installing the Driver: Downloaded, below.
4. Configure the Digi device for RealPort. See Configuring a Digi One RealPort, Digi One IA RealPort or PortServer for RealPort, on page 2-2, or Configuring EtherLite for RealPort, on page 2-3.
5. Add the Digi device with smit. See Adding a Digi Device Using smit, on page 3-5.
6. Configure the Digi device with smit. See Configuring a Digi Device with smit, on page 3-5.
7. Configure the TTY Devices as necessary. See the TTY configuration topics in this chapter.
- 8.

Installing the Driver: Downloaded

Use this procedure to install a downloaded RealPort AIX driver with smit.

Procedure

1. Choose Software Installation and Maintenance > Install and Update Software > Install/Update Selectable Software (Custom Install) > Install/Update from All Available Software.
2. When smit prompts you for the input device and directory for software, specify the path and file name and then press Enter.
3. At the prompt "Software to install", choose all and then press Enter twice.

Uninstalling RealPort

Use this procedure to uninstall the AIX RealPort driver.

Note: Before uninstalling the RealPort driver, users in most instances should remove the TTY devices and the Digi RealPort device. Not removing the devices leaves files in the system's object database.

Procedure

1. Log onto the system as superuser (root).
2. Disable login on any RealPort TTY device with a login enabled on it.
3. Kill any processes open on any RealPort TTY or lp device.
4. Determine the Digi device sa device(s). At the command prompt, enter:

```
smit devices
```

and choose Digi Ethernet-based Serial Device.

5. Use the `rmdev` command to remove all the RealPort sa TTY, and lp devices.

```
rmdev -l [sa device] -R -d
```

Note: The `-R` option, when used to remove an sa device, will delete the sa device specified and all the TTY and lp devices assigned to it. This is useful if there are many RealPort devices to remove from the system. If you wish to remove individual TTY and lp devices with the `rmdev` command, the `-R` option should not be used.

6. Enter the command:

```
smit install_remove
```

A dialog panel appears.

7. Alter the field SOFTWARE name to:

```
digiasync.ncxa.obj
```

8. Alter the field PREVIEW only to:

```
no
```

9. Choose OK.

This prompt appears: Are You Sure?

10. Choose OK.

The uninstallation should proceed to a successful conclusion.

Creating and Configuring TTYs

Use this procedure to create and configure TTY devices in AIX. The procedure for creating and configuring TTY devices for Digi serial ports is similar to the procedure used to create standard AIX TTY devices. For complete information, refer to your AIX documentation.

Note: The Digi device must be added (see Adding a Digi Device Using smit, on page 3-5) either in the "Defined" or "Available" state before attempting to configure TTYs attached to that device.

Procedure

Repeat this procedure for each TTY device.

1. Log onto the system as super-user (root).
2. Enter this command: `smit mktty`
The Add a TTY menu appears.
3. Choose Add a TTY.
A list of TTY types appears.
4. From the list, choose `tty rs232 Asynchronous Terminal`.
A list of sa devices appears.
5. Choose the item that identifies the Digi device. It will be similar to:
`sa3 Available Digi PortServer II 16`.
A dialog panel appears with fields to configure the port.
6. Configure the fields as necessary. The only required entry is the PORT number field.
7. If the Data Carrier Detect signal is not wired between the port and the peripheral device attached to it, set Force Carrier to enable.
8. Choose Enter to complete the TTY addition. The name of the TTY that was created will be displayed when smit command processing has completed.

Adding a Digi Device Using smit

Use this procedure to add a Digi device to an AIX system using smit.

Procedure

1. Log onto the console as super-user (root).
2. Enter the following command:

```
smit devices
```
3. Choose Digi Ethernet-based Serial Products > Add Digi Ethernet-based Serial Products.
4. Choose the appropriate Digi device type to be added.
5. Enter the Digi device's IP address in the IP Address field.
An sa device will be created for the Digi device.
6. Initialize the new devices. From the Devices menu, select Install > Configure Devices Added After IPL.
7. Verify that the sa device is available by entering this command at a root prompt:

```
lsdev -Cc nts
```

Note: The first character of the above command is the letter, l (ell), and not the numeral, 1 (one).

Following is an example of the output of this command:

```
sa7 Available Digi PortServer 1
```

An error message may display if the Digi device has not been successfully added.

Configuring a Digi Device with smit

Use this procedure to configure or reconfigure a Digi device. The AIX RealPort software should be installed before using this procedure.

Procedure

1. Enter the following command at a root prompt on the AIX console:

```
smit devices
```
2. Choose Digi device.
3. Configure the Digi device as necessary. Follow the smit prompts.
4. Change / Show Characteristics of the Digi device. Below is an example of configuration information.

```
Digi PortServer sa7 +  
Type cts_16 +  
Description Digi PortServer 16 +  
IP Address [ip address]  
STATUS of Device at Config Time up +  
Server Port Number [771]  
WAN Link Speed [ ]
```

Setting TTY Device Options with stty-nxca and chdev

With the stty-nxca command, display attributes such as flow control settings, speed and transparent print settings can be configured for your Digi TTY devices. The stty-nxca program is placed into the directory /usr/sbin/tty when RealPort is installed. This directory is not commonly set as a PATH variable. This means that the entire path has to be entered when using the command, or the directory has to be added to the PATH variable so the command can be entered without the path.

For information about stty-nxca, see Setting TTY Options, on page 3-11.

Note: Many of the same attributes that can be configured with stty-nxca can be configured with smit. See Configuring a Digi Device with smit, on page 3-5.

The stty-nxca command configures device attributes until the system is rebooted. Use a chdev command to **permanently** set device attributes.

```
chdev -l [tty#/lp#] -a [attribute]=[value]
```

where:

[tty#/lp#]	is the name of the device to change.
[attribute]	is the attribute or option to set. This can be any stty-nxca option.
[value]	is the value assigned to the attribute.

Configuring a TTY Device for a Terminal

Use this procedure to configure a RealPort device for a terminal. See your operating system documentation for more information on configuring a serial device for a terminal.

This procedure assumes that a TTY has been created for the terminal. See .

Procedure

1. Connect a proper cable between the port and terminal. See the appropriate cable guide (listed in the table of contents) for more information.
2. At an AIX root prompt, enter this command:

```
smit tty
```

3. Choose Change/Show Characteristics of a TTY.
4. Select a TTY device. Here's an example of a listed device:

```
tty7 Available 00-00-04-02 Asynchronous Terminal
```

In this example, the first 00 is the bus number. This is unused and will always be 00. The second 00 is the slot number. This is unused and will always be 00. The number 04 is the sa device number. The number 02 is the port number.

5. Set Enable LOGIN to enable.
6. Set BAUD rate to match the terminal's baud rate.
7. Set PARITY, BITS per character, and Number of STOP BITS to match the terminal's settings.
8. Set TERMINAL type to match the type of terminal on the port. This is important if you will be using transparent printing on the auxiliary port of the terminal.
9. Set FLOW CONTROL to match the flow control used by the terminal
10. If DCD is not physically wired high in your cable, set Force Carrier to enable.

Configuring a TTY Device for a Printer

Use this procedure to configure a RealPort device for a printer.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding. This procedure assumes that a tty has been created for the printer. See *Creating and Configuring TTYs*, on page 3-4.

Procedure

1. Connect a proper cable between the port and printer. See the appropriate Cable Guide in the online table of contents.
2. At the server, enter this command at a root prompt:

```
smit printer
```
3. Choose Printer/Plotter Device > Add a Printer/Plotter > osp Other serial printer > rs232.
4. Choose an sa device.
5. Enter a port number in the PORT number field.
6. Set BAUD rate, PARITY, BITS per character, and number of STOP BITS to match the settings of the printer.
7. Set FLOW CONTROL to be used to match the flow control used by the printer.
8. If the Data Carrier Detect signal is not wired between the port and the peripheral device attached to it, set Force Carrier to enable.
9. Choose Enter to complete the TTY addition.

Configuring a TTY Device for a Modem

Use this procedure to configure a RealPort device for a Dial-in/Dial-out modem connection. Configuring a device for a modem requires familiarity with both the operating system and the modem being used. While the following procedure is sufficient for most cases, it may be necessary to take additional steps to properly configure your modem or to set up the operating system for a specific application.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding. This procedure assumes that a tty has been created for the modem. See *Creating and Configuring TTYs*, on page 3-4.

Procedure

1. Turn the modem on.
2. Access a root prompt on the AIX system.
3. Add an entry for the device in the file `/usr/lib/uucp/Devices`. The following example allows a connection of 9600 baud to the device:

```
Direct tty3 - 9600 direct
```

4. Use the following command to connect to the modem:

```
cu -ml ttyX
```

In this command, `ttyX` is the device name for the port.

The modem should respond with an AT prompt.

5. Train the modem to the port speed by entering this command at the AT prompt:

```
at&w
```

6. Terminate the connection by entering:

```
~. (a tilde followed by a period)
```

and choosing Enter at the AT prompt.

7. At an AIX root prompt, enter this command:

```
smit tty
```

8. Choose Change/Show Characteristics of a TTY.
9. Choose a TTY device. This is an example of a listed device:

```
tty7 Available 00-00-04-02 Asynchronous Terminal
```

In this example, the first 00 is the bus number. This is unused and will always be 00. The second 00 is the slot number. This is unused and will always be 00. The number 04 is the sa device number. The number 02 is the port number.

10. Set Enable LOGIN to share.
11. Set BAUD rate to the modem's highest configurable baud rate.
12. Set PARITY, BITS per character, and number of STOP BITS to match the settings of the modem.
13. Set FLOW CONTROL to be used to match the flow control used by the modem.

Transparent Printer Setup

About Transparent Printing

Most terminals have an auxiliary port that can be connected to a serial printer. When this port is configured as a transparent printer port, print jobs may be run simultaneously with normal terminal operation.

Data bound for the printer is preceded by a terminal escape sequence which turns on transparent printing, and followed by a sequence which turns transparent printing off.

Set up a transparent printer in the same way you would set up a printer wired directly to a serial port. Data sent to a transparent printer device is automatically "wrapped" in the transparent print on/off command strings for the specified printer.

Configuring Transparent Printers

Use this procedure to set up transparent printers on terminals.

Note: This procedure sets up the communication characteristics for transparent printers. Once a transparent printer has been set up, you can use it as you would a printer connected directly to a serial port. See your UNIX documentation for information on setting up print queues.

Procedure

At the command prompt, enter:

```
stty-ncxa -n ttyname [options]
```

where ttyname is the name of the terminal device and options are selected from the list below..

maxcps <i>n</i>	Limits the maximum printer port character-per-second data rate. <i>n</i> should be set to the minimum character rate the printer can sustain in typical use.
maxchar <i>n</i>	Limits the number of characters queued to the printer ahead of terminal output. Lower numbers increase system overhead, higher numbers result in keystroke echo delays. A value of 50 is generally a good compromise at 9600 baud.
bufsize <i>n</i>	This parameter should be set to a value just below the printer's buffer size. After a period of inactivity, the driver will burst up to this many characters to the printer to fill the print buffer before slowing to the maxcps rate.
onstr " <i>s</i> "	Defines the terminal escape sequence to direct subsequent data to the transparent printer. <i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx. For example, the sequence "<Esc>[5i" would be entered as: "\033[5i".
offstr " <i>s</i> "	Defines the terminal escape sequence to stop directing data to the printer. <i>s</i> is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx. For example, the sequence "<Esc>[4i" would be entered as: "\033[4i".
term <i>t</i>	Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminal types: adm31, ansi, dg200, dg210, hz1500, mc5, vt100, vt220, vt320, vt420, wang2x36, wyse30, wyse50, wyse60 or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets the transparent print on/off strings to the values given by the mc5/mc4 attributes found there.

Configuring Transparent Printers: Examples

Use the `stty-nxca` program to set up your terminal for transparent printing.

Example 1:

The following command configures the transparent print options for a DEC VT100 terminal connected to `/dev/tty1` (note that the printer will be called `/dev/lp1`). `maxcps`, `maxchar` and `bufsize` are left to defaults. Enter:

```
stty-nxca term vt100 /dev/tty1
```

Example 2:

The following example uses `onstr` and `offstr` arguments (this sets the terminal to use the ANSI Standard). Again `maxcps`, `maxchar`, and `bufsize` are defaults. Enter (on a single command line):

```
stty-nxca onstr \033[5i offstr \033[4i /dev/tty1
```

Example 3:

This example command sets the transparent print option for a WYSE30 terminal, with a `maxcps` of 75, a `maxchar` of 100, and a printer buffer size, `bufsize`, of 1000. Enter (on a single command line):

```
stty-nxca term wyse30 maxcps 75 maxchar 100 bufsize 1000 /dev/tty1
```

Setting TTY Options

RealPort UNIX device driver packages include a command, `stty-nxca`, which is a superset of `stty`, and may be used to set and display the device options for Digi RealPort devices.

The general command format is:

```
stty-nxca [-a] [-n ttyname] [option(s)] [ttyname]
```

With no options, `stty-nxca` displays all Digi special driver settings, modem signals, and all standard parameters displayed by `stty(1)` for the TTY device referenced by standard input.

Command options are provided to change flow control settings, set transparent print options, force modem control lines, and display all TTY settings. Any unrecognized options are passed to `stty(1)` for interpretation.

`stty-nxca` commands may be executed from the command line, or placed in a startup script to be run whenever the system is booted.

The options are:

- a Display all of the unique Digi option settings, as well as all of the standard TTY settings reported by `stty -a`.
- n *ttyname* Set and display options for the given TTY device, instead of standard input. This option may be specified multiple times to perform the same operation on multiple TTYs.
- ttyname* Set and display options for the specified TTY device. Replace *ttyname* with the TTY pathname (such as `/dev/ttya01s`, `/dev/term/a01` or `/dev/dty/a001s`, depending on your operating system). This option may be used on a modem control line when no carrier is present.

The following options specify transient actions to be performed immediately:

- `break` Send a 250 MS break signal out on the TTY line.
- `flush` Immediately flush (discard) TTY input and output.
- `flushin` Flush TTY input only.
- `flushout` Flush TTY output only.

The following options specify actions which are not sticky, meaning that the changes are cancelled when the device is closed, and that the device will use the default values the next time it is opened.

- `stopout` Stop output exactly as if an XOFF character were received.
- `startout` Restart stopped output exactly as if an XON character were received.
- `stopin` Activate flow control to stop input.
- `startin` Release flow control to resume stopped input.
- `[-]dtr` Raise [drop] the DTR modem control line, unless DTR hardware flow control is selected.
- `[-]rts` Raise [drop] the RTS modem control line, unless RTS hardware flow control is selected.

The following options are sticky—the effects continue until the system is rebooted or until the options are changed.

<code>[-]fastbaud</code>	Alter the baud rate tables to permit the use of data rates that are beyond the range supported by the operating system. See fastbaud Data Rate Mapping, on page 3-13.
<code>[-]rtspace</code>	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
<code>[-]ctspace</code>	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
<code>[-]dsrpace</code>	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
<code>[-]dcdpace</code>	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
<code>[-]dtrpace</code>	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
<code>[-]forcedcd</code>	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.
<code>startc <i>c</i></code>	Sets the XON flow control character. The character may be given as a decimal, octal or hexadecimal number. Octal numbers are recognized by the presence of a leading zero, and hexadecimal numbers are denoted by a leading "0x". For example, the standard XON character, <CTRL-Q>, can be entered as "17" (decimal), "021" (octal) or "0x11" (hexadecimal).
<code>stopc <i>c</i></code>	Sets the XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see startc, above, for format of octal and hexadecimal numbers).
<code>astartc <i>c</i></code>	Sets auxiliary XON flow control character. The character may be given as a decimal, octal, or hexadecimal number (see startc, above, for format of octal and hexadecimal numbers).
<code>astopc <i>c</i></code>	Sets auxiliary XOFF flow control character. The character may be given as a decimal, octal, or hexadecimal number (see startc, above, for format of octal and hexadecimal numbers).
<code>[-]aixon</code>	Enables auxiliary flow control, so that two unique characters are used for XON and XOFF. If both XOFF characters are received, transmission will not resume until both XON characters are received.
<code>maxcps <i>n</i></code>	Sets the maximum Characters Per Second (CPS) rate at which characters are output to the transparent print device. The rate chosen should be just below the average print speed. If the number is too low, printer speed will be reduced. If the number is too high, the printer will resort to flow control, and user entry on the terminal will be correspondingly impaired. Default is 100 CPS.
<code>maxchar <i>n</i></code>	Sets the maximum number of transparent print characters the driver will place in the output queue. Reducing this number increases system overhead; increasing this number delays operator keystroke echo times when the transparent printer is in use. Default is 50 characters.
<code>bufsize <i>n</i></code>	Sets the driver's estimate of the size of the transparent printer's input buffer. After a period of inactivity, the driver bursts this many characters to the transparent printer before reducing to the maxcps rate selected above. Default is 100 characters.

- onstr "s"** Defines the terminal escape sequence to direct subsequent data to the transparent printer.
- s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.
- For example, the sequence <Esc>[5i would be entered as: "\033 [5i".
- offstr "s"** Defines the terminal escape sequence to stop directing data to the printer.
- s* is a string of ASCII characters, enclosed in quotes, that command the terminal to enter transparent printing mode. An arbitrary octal character xxx may be given as \xxx.
- For example, the sequence <Esc>[5i would be entered as: "\033 [5i".
- term *t*** Sets the transparent printer on/off strings to values found in the internal default table. Internal defaults are used for the following terminals: adm31, ansi, dg200, dg210, hz1500, mc5, microterm, multiterm, pterm, tvi, vp-a2, vp-60, vt52, vt100, vt220, wyse30, wyse50, wyse60, or wyse75. If the terminal type is not found in the internal default table, then ditty reads the terminfo entry for the terminal type and sets transparent print on/off strings to values given by the mc5/mc4 attributes found there.

fastbaud Data Rate Mapping

Use the table below to see how setting fastbaud affects RealPort data rates.

Specified Data Rate:	Data Rate Mapped to:
50	57600
75	76800
110	115200
134	131657
150	153600
200	230400
300	460800

