RealPort on Solaris

Setup Guide

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Contents

chapter 1

About This Guide

In This Chapter

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`

chapter 2

Planning and Requirements

In This Chapter

Requirements and Considerations

Read this section before beginning the RealPort driver installation.

- The Solaris RealPort device driver works with Solaris (SPARC) and Solaris (Intel) operating systems. The earliest versions of Solaris the device driver supports are Solaris 2.3 on the SPARC platform and Solaris 2.4 on the Intel platform. For the latest versions of Solaris supported, see the Release Notes.
- Installing the RealPort software on a Solaris host where RealPort has already been installed will overwrite the existing RealPort configuration on that host.
- The Digi RealPort device driver for Solaris is an installable device driver; the software development system is not required to create a new kernel.

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

chapter 3

RealPort Setup

In This Chapter

Master Setup Process

1. Read any release notes that may be included with the installation media.
2. Gather information necessary for installation. See Information to Gather, on page 2-2.
3. Install the RealPort driver. See Installing the Driver: CD, on page 3-2 or Installing the Driver: Downloaded, on page 3-2.
4. Configure the PortServer 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 Digi devices to the RealPort configuration with drpadmin. See Adding a Digi Device with drpadmin, on page 3-3.

Installing the Driver: CD

Use this procedure to install software or a driver from the Digi CD. You should have already started the Digi CD front-end program.

Procedure

1. Choose an operating system.
2. Choose the Hardware product name.
3. Choose the software or driver you wish to install.
4. Choose Install Software.
5. Follow the prompts.
6. Reboot your system if necessary.

Installing the Driver: Downloaded

Use this procedure to install a downloaded Solaris device driver.

Procedure

1. Download the appropriate driver file.
2. If you have downloaded the driver file from a system other than the Solaris system, copy the file to the Solaris system.
3. Log onto the console as superuser (root).
4. Enter this command:

   ```
   pkgadd -d path-filename
   ```

   where *path-filename* is the path to and the name of the downloaded driver file.
5. Follow the prompts.

Uninstalling the Driver

Use this procedure to remove the RealPort driver from your system.

Procedure

1. Delete any configured Digi devices before uninstalling the RealPort driver. See Deleting a Digi Device with drpadmin, on page 3-3.
2. Enter the following command at a root prompt:

   ```
   pkgrm realport
   ```
3. Follow the prompts.

Adding a Digi Device with drpadmin

Use this procedure to create RealPort devices and start the RealPort daemons.

Procedure

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Answer the prompts as appropriate.

When Prompted to:	Action:
Select an option	Choose add.
Enter the node name or IP address for this Digi device	If an IP address is used, make sure it is unique and does not conflict with any other network device. If a name is entered, the name must be registered in /etc/hosts or with an accessible nameserver.
Enter the number of ports on the Digi device	Enter the number of ports for this Digi device. The installation will prompt to confirm this number. Note: If PORTS/Xem (EBI) modules will be attached to a PortServer II module, include these ports.
Enter TTY device ID letter(s)	Enter one or two letters. These letters will be used to create the RealPort device names.
Enter WAN speed if the connection between the Digi device and HP-UX system includes a WAN link slower than 1 MB	Enter the WAN speed if this is the case. Otherwise, choose Enter to continue.
Confirm the configuration	Enter `y` to proceed or `n` to reenter the information.
Select an option	Enter a to add another Digi device. Enter `s` to show configured Digi devices. Enter `q` to exit drpadmin.

Deleting a Digi Device with drpadmin

Use this procedure to delete a Digi device.

Procedure

1. Enter this command at a root prompt:

```
/usr/sbin/drpadmin
```

2. Enter s to show all installed Digi devices.

3. Note the number of the Digi devices to delete.

4. Choose Enter to make the options prompt reappear.

5. Enter d (delete).

6. Enter the Digi device number to delete.

7. Enter y to confirm the deletion.

RealPort Devices

The RealPort installation creates four different devices for each port.

- Standard device
- Modem device
- Standard transparent print device
- Modem transparent print device.

Device Name Format

The devices are named according to the following conventions:

a-z	The Digi device letter ID. Legal letters are a-z.
001-096	The port number on the individual Digi device.
s	At the end of a device name indicates a standard device.
m	At the end of a device name indicates a modem device.

Here are examples of the devices created for the first port of a Digi device with the identification letter "a".

Device	Path/Name Example
Actual Standard Device (terminal)	/dev/dty/a001s
Actual Modem Device	/dev/dty/a001m
Standard Device Link (terminal)	/dev/cua/a001 (linked to /dev/dty/a001s)
Modem Device Link	/dev/term/a001 (linked to /dev/dty/a001m)
Standard Transparent Print Device	/dev/dpr/a001s
Modem Transparent Print Device	/dev/dpr/a001m

Standard Device

Example: /dev/dty/a001s

A standard Digi device uses an identification letter "s" in its name. The default handshake method is XON/XOFF. Data Carrier Detect (DCD) need not be present to open the device.

Once a connection is established and DCD becomes active, standard devices behave in the same way as modem devices--subsequent loss of the Data Carrier Detect signal will cause active processes on the port to be killed and the user will be automatically logged off.

Modem Device

Example: /dev/dty/a001m

Digi device modem devices use an identification letter "m" in their names. They are sometimes referred to as "dial-in" devices.

Modem devices are traditional UNIX ports with modem control. They require Data Carrier Detect to be high before they will operate. RTS/CTS handshaking is enabled by default. When used with a modem, the ports will wait for DCD before sending out the login prompt.

When used with a terminal or other device, it is usually wise to wire the Digi DCD signal to the terminal's Data Terminal Ready (DTR) line. When the terminal is turned on, the system outputs a login prompt. When the terminal is turned off, any associated jobs are killed, and the user is logged out.

Transparent Print Devices

Examples: /dev/dpr/a001s and /dev/dpr/a001m

The transparent print devices can be used with auxiliary printer ports on terminals. Output directed to a dpr device goes out the auxiliary port of a terminal while you continue to use the terminal normally.

Use /dev/dpr/a001s if the terminal device is /dev/dty/a001s or /dev/cua/a001 (standard device); use /dev/dpr/a001m if the terminal device is /dev/dty/a001m or /dev/term/a001 (modem device).

Setting Device Options with ditty

With the ditty command, display options such as flow control settings, speed and transparent print settings can be configured for your RealPort TTY devices. For detailed information on the ditty command, refer to the Solaris man pages and Setting TTY Options, on page 3-8.

Note: To use the man pages for the first time, the path /usr/share/man must be added to the system MANPATH. Here is an example of such a command that is sufficient in most cases. At a root prompt on the system, enter:

```
MANPATH=$MANPATH:/usr/share/man
```

ditty commands should be manually inserted in the startup file /etc/rc2.d/S99ditty (or any other file beginning with "S99" in the same directory) so they are executed every time the system is booted.

Configuring a Device with admintool

The Solaris system administration utility, admintool, can be used to configure RealPort devices.

Note: In order to use admintool, The Digi devices need to be linked to devices in /dev/term and /dev/cua. These links are normally created when the driver is installed. If these links are not there, they can be created manually.

Procedure

1. Access admintool through a window interface, or entering this command at a root prompt:

   ```
   admintool
   ```

2. From the admintool window, select Browse>Serial Ports.
3. Select a device.
4. Select Edit > Modify.
5. Configure the port as needed.

Configuring a Device for a Terminal

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

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

Procedure

1. Connect a proper cable between the port and terminal.
2. Invoke admintool either through the window interface, or by entering this command at a root prompt:

   ```
   admintool
   ```

3. Select Browse > Serial Ports.
4. Select a device.
5. Select Edit > Modify.
6. Configure the device parameters. Typically a terminal device is set to Terminal-Hardwired and Service Enabled.

7. Set the Baud Rate.

   Note that the default admintool baud rates cycle, meaning the speed at the end of the corresponding /etc/ttytype entry is different than the speed at the beginning of the entry. It preferable to configure a device to a fixed rate.

   As an example, this line can be added to /etc/ttytype and used as a fixed rate for devices:

   ```
   38400N:38400 hupcl:38400 hupcl::38400N
   ```

   If a custom /etc/ttytype entry is created and used, set Baud Rate to Other and enter the /etc/ttytype identifier (e.g. 38400N).

Troubleshooting Tips

- If a login does not appear on the terminal, try disabling and reenabling the device in admintool.
- If a cycling baud rate is used and scrambled characters appear on the terminal screen, hitting the Enter key several times at the terminal may cause the port to change baud rates and display a login.
- If a cycling baud rate is used and scrambled characters appear on the terminal screen, change the baud rate to a fixed /etc/ttydef entry matching the terminal's settings.

Configuring a Device for a Printer

Use this procedure to configure a RealPort device for a printer. See your Solaris documentation for more information on configuring a serial device for a printer.

The Digi device and RealPort should be properly installed, configured and functioning before proceeding.

Procedure

1. Connect a proper cable between the port and printer.
2. Set flow control on the port to match the printer settings.

   To set hardware flow control on the port (which is more stable than software flow control), edit the file /etc/rc2.d/S99digi (create it if necessary) and add the following commands:

   ```
   cat < /dev/dty/a001s > /dev/null &
   ditty ctspace -ixon -ixoff -ixany /dev/dty/a001s
   ```

   To use software flow control, edit the file /etc/rc2.d/S99digi (create the file if necessary) and add the following commands:

   ```
   cat < /dev/dty/a001s > /dev/null &
   ditty ixon ixoff -ixany /dev/dty/a001s
   ```

Configuring a 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.

Procedure

1. Connect a proper cable between the port and modem.
2. Connect to the modem with tip.

   ```
   tip -38400 /dev/dty/a001s
   ```

   The speed (38400) and device (/dev/dty/a001s) are used as examples in the previous tip command.

3. Enter one of the following commands depending on your modem:

Command	Comment
`AT&H1&B0&W`	Typically works for a US Robotics modem
`AT&H1&W`	Typically works for a Hayes or other modem

4. Terminate the connection to the modem with a tilde-period command:

```
~.
```

5. Access admintool by entering this command at a root prompt:

```
admintool
```

6. Select Browse > Serial Ports.

7. Select a device.

8. Select Edit > Modify.

9. Configure the device parameters. Typically a terminal device is set to Terminal-Hardwired and Service Enabled.

10. Set the Baud Rate.

    Note that the default admintool baud rates cycle, meaning the speed at the end of the corresponding /etc/ttytype entry is different than the speed at the beginning of the entry. It is often preferable to set them to a fixed rate.

    As an example, this line can be added to /etc/ttytype to configure the device for a 38400 fixed rate.

```
38400N:38400 hupcl:38400 hupcl::38400N
```

    If a custom /etc/ttytype entry is used, set Baud Rate to Other and enter the /etc/ttytype identifier (e.g. 38400N).

11. Edit the file /etc/rc2.d/S99digi (create it if necessary) and add the following command to it:

```
ditty rtspace ctspace /dev/dty/a001m
```

    The device a001m is used as an example in the previous ditty command.

Setting TTY Options

RealPort UNIX device driver packages include a command, ditty, 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:

ditty [-a] [-n *ttyname*] [*option(s)*] [*ttyname*]

With no options, ditty 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.

ditty 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.
clear	Clear the tbusy flag in the channel structure to free the port.
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.

[-]fastbaud	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 3-10.
[-]rtspace	Enable [disable] RTS hardware input flow control, so RTS drops to pause remote transmission.
[-]ctspace	Enable [disable] CTS hardware output flow control, so local transmission pauses when CTS drops.
[-]dsrpace	Enable [disable] DSR hardware output flow control, so local transmission pauses when DSR drops.
[-]dcdpace	Enable [disable] DCD hardware output flow control, so local transmission pauses when DCD drops.
[-]dtrpace	Enable [disable] DTR hardware input flow control, so DTR drops to pause remote transmission.
[-]forcedcd	Disable [re-enable] carrier sense, so the TTY may be opened and used even when carrier is not present.
startc *c*	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).
stopc *c*	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).
[-]aixon	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.
maxcps *n*	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.
maxchar *n*	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.
bufsize *n*	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, pcterm, 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

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:

```
ditty -n ttyname [options]
```

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

maxcps *n*	Limits the maximum printer port character-per-second data rate. *n* should be set to the minimum character rate the printer can sustain in typical use.
maxchar *n*	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 *n*	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 "*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>[4i" would be entered as: "\033[4i".
term *t*	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.