Dell™ Systems

CONSOLE REDIRECTION

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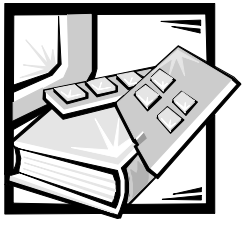
February 2001 P/N 8D923 Rev. A00



Console Redirection

Console redirection allows you to maintain a server from a remote location by redirecting keyboard input and text output through the serial port. Graphic output is not redirected. Console redirection can be used under the disk operating system (DOS) for tasks such as setting up a common basic input/output system (BIOS) configuration or setting up a redundant array of independent disks (RAID) configuration. In a typical installation, the system is connected to a port concentrator that allows you to connect several systems via a shared modem. After you use a modem or other remote connection to log into the port concentrator, you can select which system you want to manage with console redirection. This document describes the simplest connection possible: connecting to a system with a null modem cable.

Minimum Hardware and Connection Requirements

To use console redirection, you must have the following:

- An available serial port (COM port) on a client system (This port must not conflict with any other ports on the system.)
- Available serial port 1 (COM 1) on the server
- A null modem cable to connect the server to the client system

Software Requirements

Your remote terminal emulation software should meet the following specifications:

- American National Standards Institute (ANSI) or VT100/220 terminal emulation with a window size of 80 x 25 characters
- 9600, 19.2K, 57.6K, or 115.2K bits per second (bps) via serial (COM) ports
- Recommended: the ability to create keyboard command macros

All versions of the Microsoft® Windows® operating systems come with HyperTerminal terminal emulation software. However, the version of HyperTerminal included with most Windows operating systems does not provide the correct screen size, the arrow and function keys do not work, and there is no method of creating

macros. Dell recommends that you either upgrade your version of HyperTerminal to HyperTerminal Private Edition 6.1 or later or select new terminal emulation software. You may be eligible for a free upgrade from your current version of HyperTerminal from Hilgraeve at **http://www.hilgraeve.com**.

Configuring Console Redirection on the Server System

Console redirection is configured through the system setup program. The **Console Redirection** field allows you to select only the terminal type. The options available are listed in Table 1.

Table 1. Terminal Emulation Types

Terminal Type	Terminal Emulation
ANSI	ANSI. Used for utility partition applications or DOS.
VT100/220	VT100/220. Used for utility partition applications or DOS.
ANSI POST	ANSI. Used for POST. No operating system support.
VT100/220 POST	VT100 or VT220. Used for POST. No operating system support.

If you select **VT100/220** but not all the characters are visible on the screen, you should go back to the system setup program and select **ANSI** as your terminal type. ANSI can display the full set of ASCII characters.

Configuring Console Redirection on the Client System

NOTE: The examples in this document assume that you have upgraded to Hilgraeve's HyperTerminal Private Edition 6.1 or later. If you are using other terminal emulation software, see the help file for that software.

Configuring the Ports

1. Click **Start**, point to **Programs—> Accessories—> Communications**, and click **HyperTerminal**.
2. Enter any name for the new connection and select any icon.
3. Click **OK**.

4. From the **Connect to** pull-down menu, select a COM port available on your Dell™ client system and click **OK**.

   If no COM port is available and you do not have a Dell system, you will need to contact technical support for your client system.

   After you have selected an available COM port, the COM port properties window is displayed.

5. Select **Bits per second**.

   Console redirection supports 9600, 19.2K, 57.6K, or 115.2K bps.

6. Set **Data bits** to **8**.

7. Set **Parity** to **None**.

8. Set **Stop bits** to **1**.

9. Set **Flow control** to **Hardware**.

10. Click **OK**.

Configuring the Terminal Settings

After you configure the ports, configure the terminal settings by performing the following steps:

1. In HyperTerminal, click **File**, click **Properties**, and select the **Settings** tab.

2. Make sure that the **Function, arrow, and ctrl keys act as** field is set to **Terminal Keys**.

3. Make sure that the **Backspace key sends** field is set to **Ctrl+H**.

4. Change the **Emulation** setting from **Auto detect** to **ANSI** or **VT100/220.**

   This setting should be the same as the setting you selected for the **Console Redirection** field on the server.

   When you click **Terminal Setup**, you should see a setting for the number of rows and columns.

5. Change the number of rows from 24 to 25 and leave the number of columns at 80. If you do not have these settings, this is an indication that you must upgrade your terminal emulation software.

Rebooting the Server

Console redirection is designed to yield control of the serial ports to the operating system. This allows serial debugging and redirection of the operating system to function correctly without interference from the system BIOS.

To use console redirection to shut down a system and troubleshoot it or to change small computer system interface (SCSI) BIOS configurations, perform the following steps:

1. Restart the system. See "Configuring Special Keys," found later in this document, for a recommendation on how to do this.

2. When the system begins to reboot, use console redirection to watch and interact with the system during the power-on self-test (POST). While the system is booting, you can do the following:

   - Enter the system setup program.
   - Enter the SCSI setup menus.
   - Run utilities on the utility partition (including Dell Diagnostics and the Resource Configuration Utility ([RCU], if applicable)

NOTE: To use console redirection to run utilities on the utility partition, the utility partition must have been created using Dell OpenManage™ Server Assistant version 6.3.1 or later.

Configuring Special Keys

Console redirection uses ANSI or VT100/220 terminal emulation, which are limited to basic ASCII characters. There are no function keys, arrow keys, or control keys in this character set. However, most BIOS software requires the use of function keys and control keys for ordinary functions. You can emulate a function key or control key by using a special key sequence, called an escape sequence, to represent a specific key.

For console redirection, an escape sequence starts with an escape character. This character can be entered in a number of different ways, depending on the requirements of your terminal emulation software. For example, 0x1b, ^[, and <Esc> all refer to the same escape character. Some terminal software uses predefined macros to send the proper escape sequences. In HyperTerminal, you can define macros by selecting **Key Macros** from the **View** menu. Macros can be assigned to almost any possible key for almost any key combination. Create a macro for each of your function keys. Tables 2 and 3 list the escape sequence that must be sent to represent a special key or command.

NOTES: When defining macros in HyperTerminal, you must press <Ins> before <Esc> to signify that you are sending an escape sequence rather than escaping out of the dialog box.

Table 2. VT100/220 Supported Escape Sequences

Key	Supported Sequences	Terminal Emulation
Up arrow	<Esc> [<Shift>a	VT100/220
Down arrow	<Esc> [<Shift>b	VT100/220
Right arrow	<Esc> [<Shift>c	VT100/220
Left arrow	<Esc> [<Shift>d	VT100/220
F1	<Esc> <Shift>op	VT100/220
F2	<Esc> <Shift>oq	VT100/220
F3	<Esc> <Shift>or	VT100/220
F4	<Esc> <Shift>os	VT100/220
F5	<Esc> <Shift>ot	VT100
F6	<Esc> <Shift>ou <Esc> [1 7 ~	VT100 VT100/220
F7	<Esc> <Shift>ov <Esc> [1 8 ~	VT100 VT100/220
F8	<Esc> <Shift>ow <Esc> [1 9 ~	VT100 VT100/220
F9	<Esc> <Shift>ox <Esc> [2 0 ~	VT100 VT100/220
F10	<Esc> <Shift>oy <Esc> [2 1 ~	VT100 VT100/220
F11	<Esc> <Shift>oz <Esc> [2 3 ~	VT100 VT100/220
F12	<Esc> <Shift>oa <Esc> [2 4 ~	VT100 VT100/220
Home	<Esc> [1 ~	VT220
End	<Esc> [4 ~	VT220
Insert	<Esc> [2 ~	VT220
Delete	<Esc> [3 ~	VT220
Page Up	<Esc> [5 ~	VT220
Page Down	<Esc> [6 ~	VT220
Shift-Tab	<Esc> [<Shift>z <Esc> [0 <Shift>z	VT100 VT220

Table 3. ANSI Supported Escape Sequences

Key	Supported Sequences
Up arrow	<Esc> [<Shift>a
Down arrow	<Esc> [<Shift>b
Right arrow	<Esc> [<Shift>c
Left arrow	<Esc> [<Shift>d
F1	<Esc> <Shift>op
F2	<Esc> <Shift>oq
F3	<Esc> <Shift>or
F4	<Esc> <Shift>os
F5	<Esc> <Shift>ot
F6	<Esc> <Shift>ou
F7	<Esc> <Shift>ov
F8	<Esc> <Shift>ow
F9	<Esc> <Shift>ox
F10	<Esc> <Shift>oy
F11	<Esc> <Shift>oz
F12	<Esc> <Shift>oa

After you create these macros, pressing <F1> on the keyboard while running the terminal emulation software sends <Esc><Shift>op to the server. When these three characters are transmitted, the server interprets them as <F1>. You need this functionality to change the settings in the system setup program or to continue if there is an error on your system and you are prompted to press <F1>.

In addition to macros for the function keys, Dell recommends that you set up macros for the additional escape sequences listed in Table 4.

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Table 4. Additional Escape Sequences

Key Combination	Supported Sequence
<Alt>*key*	<Esc> *key*
<Ctrl><Alt><Del>	<Esc> <Shift>r <Esc> r <Esc> <Shift>r (This reboots the server.)
<Ctrl><Shift>i	<Esc> <Ctrl><Shift>i
<Ctrl><Shift>j	<Esc> <Ctrl><Shift>j
<Ctrl><Shift>h	<Esc> <Ctrl><Shift>h
<Ctrl><Shift>m	<Esc> <Ctrl><Shift>m
<Ctrl>2	<Esc> <Ctrl>2