Chapter 5

Troubleshooting

This chapter discusses some troubleshooting tips for problems arising with peripheral devices. It contains the following sections:

- "Troubleshooting Your Modem Setup"
- "Troubleshooting Your Printing System"
- "Troubleshooting Inaccessible Tape Drives"

Troubleshooting Your Modem Setup

If there are any problems with the *cu* dial-out process, you may want to use the **-d** option to *cu* to instruct the system to print diagnostic messages to your system console and the **-l** option to connect directly to the modem (if you added the "Direct" statement in the *Devices* file).

To test the modem connection on port 2, type:

```
cu -d -lttyd2
```

- The `Connected` message should display on the console. Type **`AT`** and the `OK` message should display. If not, the modem is not correctly configured or there is a problem with the cable.
- If `Connected` does not display, check the debugging messages to determine where the connection failed.

Additionally, double-check that all your hardware connections are secure and that you are using a Silicon Graphics modem cable, or one made to the specifications described in "Serial Port Pin Signal Tables" on page 20.

Troubleshooting Your Printing System

If you send a print request to a printer with *lp* and do not receive any output, use the checklists below to make sure your system is ready for printing. Use these lists as a supplement to the troubleshooting information in the manufacturer's hardware manual.

Hardware Troubleshooting Checklist

Use the following list of questions to determine if your printer hardware is working as designed:

- Is the printer turned on?

  Printers do not always indicate clearly if they are turned on. Make sure the printer is plugged into the power socket and the power switch is on.

- Does the printer have paper?

  Frequently, printers run out of paper in a high-volume situation.

- Is there a paper jam?

  Make sure the entire paper pathway is clear of sheets or fragments of paper. Refer to your printer hardware documentation before attempting to put any unusual paper or other media through your printer.

- Is the printer set to the correct baud?

  Be sure the baud rate of the printer matches that of the serial port.

- Is the serial cable attached correctly?

  Often, reseating the serial cable where it connects to the printer restores correct operation.

- Is the correct cable being used?

  The use of the pins in serial cables varies somewhat in different applications. Cables designed for specific hardware may or may not function correctly with different hardware. Check your system *Owner's Guide* and the documentation supplied with your printer and cable to determine if the cable is correct for your hardware.

Software Troubleshooting Checklist

The *lp* scheduler is the program in charge of spooling your files to the printer, and it is invoked whenever you use the *lp* print command. The scheduler can be in a number of states, and each printer registered with *lp* can be in a number of states as well.

To check on the complete status of the *lp* system, type:

```
lpstat -t
```

This gives you a complete description of the status of *lp*. You may also want to examine the contents of the file */var/spool/lp/log*. Use the information you find to answer the following questions:

- Is your printer registered with *lp*?

  If you do not see the name of your printer in the list of information produced by *lpstat*, then you must register your printer with *lp*.

- Is the printer enabled?

  If your printer is not enabled, the *lpstat* listing contains this line:

  `printer` *yourprinter* `disabled since...`

  In order to enable the printer, type:

  `enable` *yourprinter*

  lp sometimes disables a printer automatically if it is unable to send a file to a print server, so a disabled printer often indicates a hardware problem, such as a host that is not communicating with the network.

- Is the printer accepting requests?

  If the printer is not accepting requests, the *lpstat* listing contains this line:

  yourprinter `not accepting requests since...`

  You must use the *accept* command for that printer destination. Become the superuser (with *su*) and type:

  `/usr/lib/accept` *yourprinter*

- Is the *lp* scheduler running?

  If the scheduler is not running, the *lpstat* listing contains the message:

  ```
  scheduler is not running
  ```

  To restart the *lp* scheduler, become superuser (with *su*) and type:

  /usr/lib/lpsched

- Did you specify the right printer?

  If your system has more than one printer, and you wish to send a job to a printer other than the default, remember to use the **-d** option:

  lp –d*otherprinter*

Troubleshooting Network Printers

If you are having trouble with a printer you are accessing over a network, check the status of the *lp* scheduler on your workstation the print server's host system.

Emergency Measures

If none of the above procedures work, there are several "last resort" procedures:

1. Stop the *lp* scheduler and then restart it. As root, type the following sequence of commands:

   /usr/lib/lpshut

   Then kill any jobs running as *lp*. You can identify these processes with the command:

   ps –fu lp

   Then type the command:

   /usr/lib/lpsched

2. Remove the offending printer destination from the *lp* scheduler, and then register it again. Before you can do this you must either cancel any print requests going to the printer or move them to another print destination (if you have more than one).
3. As an absolute last resort, remove all printers from the *lp* system, reboot the computer, and register them all once again.

Troubleshooting the BSD lpr Spooling System

If your print request does not make it to the queue, then:

- Check for error messages.
- Double-check the command that you entered.
- Try submitting the */etc/group* file to the queue.

The file you submitted may not be in the proper format for the print server to print your request.

If your print request makes it to the queue and never gets to the print server, then:

- Do you have the print server system's IP address and hostname in the */etc/hosts* file?
- Does the print server system name match the name in the */etc/hosts* file? Do they match the hostname of the print server system?
- Did you get this error message? `Waiting for remote queue to be enabled`.

  This message usually means that your hostname is not in the print server system's */etc/hosts.equiv* file. If your print request disappears from the queue, and doesn't print or prints incorrect information, then:

  1. Become root and enter the commands:

     `/usr/etc/lpc stop lp` (or your printername)
     `lpr /etc/group`
     `cd /usr/spool/lpd` (or your spool directory)
     `ls -l`

     Your system should return something similar to:

     ```
     -rw-rw---- 1 root lp 69 Aug 23 14:02 cfA117tls
     -rw-rw---- 1 root lp 227 Aug 23 14:02 dfA117tls
     -rwxr----- 1 root lp 0 Aug 23 14:01 lock
     -rw-rw-r-- 1 root lp 25 Aug 23 14:46 status
     ```

  2. Check the contents of the control file with the following command:

     `cat cfA117tls`

Your system should return something similar to:

```
Htls H the hostname that sent the print request
Proot P the person who sent the request
Jgroup J the jobname
Ctls C class/hostname
Lroot L the person who sent the request
fdfA117tls f name of the file to print
UdfA117tls U name of the file to remove after printing

N/etc/group N the original file name
```

3. Check the copy of the print file.

   It is recommend that you use the *more* command just in case your test file is not as short as the */etc/group* file. The *df* file should look exactly like the file you attempted to print. In this case, the file *dfA117tls* should be exactly the same as the */etc/group* file.

   `more dfA117tls`

   The system should return something similar to:

```
sys::0:root,bin,sys,adm
root::0:root
daemon::1:root,daemon
bin::2:root,bin,daemon
adm::3:root,adm,daemon
mail::4:root
uucp::5:uucp
rje::8:rje,shqer
lp::9:
nuucp::10:nuucp
user::20:
other::995:
demos:*:997:
guest:*:998:
```

   Now that you have verified that the request is properly spooling on the local system, check the print server system. First, you may need to contact the System Administrator of the print server system. You need the root password, and once you enter the *stop* command on that system, no print requests are printed. Instead, they remain in the queue. Make sure that there are no requests in the queue that are currently printing.

4. On the print server system, log in as root and enter the command:

   /usr/etc/lpc stop lp

5. On the local system, enter the command:

   /usr/etc/lpc start lp

6. On the print server system, *cd* to the spool directory.

   If you do not know where the spool directory is, use the *cat* or *more* command with the */etc/printcap* file to look at what is set in the sd: variable.

7. On the print server system (after step 6), enter the following command:

   ls -l

   The print server system should return something similar to:

   ```
   -rw-r----x 1 root 4 Aug 15 10:27 .seq
   -rw-rw---- 1 root 69 Aug 23 14:02 cfA117tls.csd.sgi.com
   -rw-rw---- 1 root 227 Aug 23 14:02 dfA117tls
   -rwxr------ 1 root 0 Aug 23 14:01 lock
   -rw-rw-r-- 1 root 25 Aug 23 14:46 status
   ```

8. Check the contents of the control file.

   cat cfA117tls.csd.sgi.com

   The print server system should return something similar to:

   ```
   Htls H the hostname that sent the print request
   Proot P the person who sent the request
   Jgroup J the jobname
   Ctls C class/hostname
   Lroot L the person who sent the request
   fdfA117tls f name of the file to print
   UdfA117tls U name of the file to remove after printing
   N/etc/group N the original file name
   ```

9. Examine the *df** file by entering the following command:

   more dfA117tls

   The system should return something similar to:

```
sys::0:root,bin,sys,adm
root::0:root
daemon::1:root,daemon
bin::2:root,bin,daemon
adm::3:root,adm,daemon
mail::4:root
uucp::5:uucp
rje::8:rje,shqer
lp::9:
nuucp::10:nuucp
user::20:
other::995:
demos:*:997:
guest:*:998:
```

   The *df* file should look exactly like the file you attempted to print. In this case, the print server system's *dfA117tls* file should be exactly the same as the *dfA117tls* file that was on your system.

10. On the print server system, enter the following command:

    /usr/etc/lpc start lp

    Your file should now print on the printer. It should look exactly like the output of the *more* command. If it doesn't then contact the System Administrator of the print server system.

Troubleshooting Inaccessible Tape Drives

Note: This section does not allow for customized installations and does not address complex multiple tape drive issues. You should take care not to violate your maintenance agreements.

Checking the Hardware

Use the *hinv* command to see if the operating system recognized the tape drive at boot time. This is one of the most basic and critical tests to check hardware. (An output similar to the following is returned with the *hinv* command):

```
Iris Audio Processor: version A2 revision 4.1.0
1 100 MHZ IP22 Processor
FPU: MIPS R4010 Floating Point Chip Revision: 0.0
CPU: MIPS R4000 Processor Chip Revision: 3.0
On-board serial ports: 2
On-board bi-directional parallel port
Data cache size: 8 Kbytes
Instruction cache size: 8 Kbytes
Secondary unified instruction/data cache size: 1 Mbyte
Main memory size: 64 Mbytes
Integral Ethernet: ec0, version 1
Integral SCSI controller 0: Version WD33C93B, revision D
CDROM: unit 4 on SCSI controller 0
Disk drive: unit 1 on SCSI controller 0
Graphics board: Indy 24-bit
Vino video: unit 0, revision 0, Indycam connected
```

If *hinv* does not report an attached tape drive, then your operating system can not use the drive. You need to check the installation of the hardware. What you can do at this time depends on what you can do with your computer given your maintenance support agreements.

Simple hardware checks are:

- If the tape drive is an external unit, does it have power? Simply powering it on does not cause it to be seen by the computer. The system must be shut down, power cycled, then rebooted.
- During the boot phase, do you see the access light on the tape drive light up at all? If it doesn't flash at all, chances are the operating system is still not seeing the drive.
- Is the SCSI cabling and termination correct? If visual inspection shows nothing obvious, try resetting the connectors. Any movement of hardware or cabling must be done with the system powered off.

If nothing that you do here causes *hinv* to report the tape drive, then the most likely problem is faulty hardware. Contact your support provider.

Checking the Software

If you are reasonably sure the tape drive is correctly installed on the computer, but your software does not seem to be able to use it, a possible cause for the problem is that the tape device's SCSI address changed when other SCSI devices were added to your system.

The system assumes that if */dev/nrtape* exists and appears to be a tape drive of some kind, then it doesn't need to remake the default tape drive links of */dev/tape*, */dev/nrtape*, and so on. It also assumes that the first tape drive that it finds is the main tape drive. It searches for devices starting at the highest SCSI ID numbers, so the tape device on SCSI ID 7 gets the default links before a tape device on SCSI ID 3.

The default tape drive for most commands is */dev/tape*. If the tape drive installation proceeded correctly, you should have at least */dev/tape* and */dev/nrtape* special device files. You may have several others, depending on the type of tape drive.

The *mt* command can be used to confirm that */dev/tape* exists and that the tape drive is responding. Output similar to the following from the *mt status* command confirms that:

```
Controller: SCSI
Device: ARCHIVE: Python 25601-XXX2.63
Status: 0x20262
Drive type: DAT
Media : READY, writable, at BOT
```

The following output means that you have another process accessing the drive right now:

```
/dev/nrtape: Device or resource busy
```

The following output appears when a special device file does not exist:

```
/dev/nrtape: No such file or directory
```

The output when a device file exists, but no hardware is responding at that address, is:

```
/dev/nrtape: No such device
```

If the hardware appears to be present, but */dev/tape* does not appear to be valid, confirm the file links. Take the device unit number from *hinv* output:

```
Tape drive: unit 3 on SCSI controller 0: DAT
```

In this example the device unit number is 3 (this is likely to be different on your system). Use the following *ls* command to confirm that */dev/tape* is linked to the correct device (change the numeral 3 to the correct numeral for your drive):

```
ls -l /dev/tape /dev/mt/tps0d3*
crw-rw-rw- 2 root sys 23, 96 Sep 21 11:11 /dev/mt/tps0d3
crw-rw-rw- 2 root sys 23, 97 Jun 20 05:55 /dev/mt/tps0d3nr
crw-rw-rw- 2 root sys 23, 99 Jul 8 09:57 /dev/mt/tps0d3nrns
crw-rw-rw- 2 root sys 23,103 Jun 20 05:55 /dev/mt/tps0d3nrnsv
crw-rw-rw- 2 root sys 23,101 Jun 20 05:55 /dev/mt/tps0d3nrv
crw-rw-rw- 2 root sys 23, 98 Jun 20 05:55 /dev/mt/tps0d3ns
crw-rw-rw- 2 root sys 23,102 Jun 20 05:55 /dev/mt/tps0d3nsv
crw-rw-rw- 2 root sys 23,100 Jun 20 05:55 /dev/mt/tps0d3v
crw-rw-rw- 1 root sys 23,102 Jun 23 09:19 /dev/tape
```

The major and minor device numbers are the key here. They are the two numbers separated by a comma (23 and 102):

```
crw-rw-rw- 1 root sys 23,102 Jun 23 09:19 /dev/tape
```

Match these numbers with one of the lines from */dev/mt*. In this example, it should match to:

```
crw-rw-rw- 2 root sys 23,102 Jun 20 05:55 /dev/mt/tps0d3nsv
```

Compare the major and minor device numbers that are reported with */dev/tape* and the ones reported for */dev/mt/tps0dX**. Is there a match? If not, remove */dev/tape* and */dev/nrtape* and run *MAKEDEV* as root from the */dev* directory. Give the command:

```
./MAKEDEV tapelinks
```

The *MAKEDEV* command can be verbose in describing what it is doing. Your output may differ in the number of devices made and the unit number. Once the *MAKEDEV* program has completed, go through these same checks again to be sure of success.

The *MAKEDEV* command does not let you choose which tape device to link to. You must make the links by hand if the *MAKEDEV* program does not default to the drive that you wish to use.

This covers the basic problems that administrators experience regarding missing tape drives. See the following reference pages for more information on the commands used in this section: mt(1), ls(1), hinv(1M). For more technical information about tapes, see mtio(7), tps(7M), or xmt(7).

Troubleshooting Tape Read Errors

Often there is a quick and simple fix for an error message that is caused by a tape drive malfunction or the tape itself. Both recoverable and unrecoverable errors can be caused by something as basic as a dirty read/write head, a poorly tensioned tape, or a dropout, which is a physically bad spot on the tape. An EOT message can also mean that there is no data on the tape.

The following information covers some of the basic tape maintenance/performance functions that should be considered as factors that could either prevent future error conditions from occurring or as aids in recovering from an existing error message:

- Be sure your read/write head is clean.
- Use the *hinv* command to determine which tape drive type is connected to your system.
- Use the *mt stat* command to verify the status of the tape drive and the media.
- Use the *mt ret* command before read or write operations.