

Overview

LPR is one of several methods available for sending files to the Codonics NP-1600 printer. LPR utilizes the TCP/IP networking protocol and is most commonly used in UNIX, and to a lesser extent, in MS-DOS/Windows and other environments. Most LPR implementations have easy-to-use commands for sending files to the printer, but require set up by the System Administrator for correct operation.

The **lpr** command and the UNIX System V **lp** command, are used to send image files to the printer. They are easier to use than FTP and require no user interaction so they may be used from applications and shell commands. Not all System V LP implementations support the LPR transfer protocol which is used by the printer. Consult your documentation.

The internal operating system on the printer acts as a remote LPD host, allowing various printer formatting functions to be accessed by different remote printer names.

Set Up Overview

Throughout your network there may be many printers; laser printers, dot matrix, dye diffusion, all of which are used for various purposes. Most LPR systems allow the user to set up a default printer. Unless you do strictly imaging, you would probably not want this to be your Codonics NP-1600 printer. A more logical choice for the default printer would most likely be a laser printer.

Sending the right type of file to a particular printer is fundamental in producing the result that is desired. For example, if you were to send a PostScript file to a dot matrix printer, it would print the file as ASCII, not interpreted PostScript.

The Codonics NP-1600 is configured as a combination of several logical printer types and each is known by a different printer name, or "Logical Device". To get the desired output, you need to connect to the right Logical Device. If you were sending a TIFF image file, you would most likely want to be connected to the "Scaled Device". This will scale the image to make the output as large as possible. If you sent the TIFF file to the "Unscaled Device", the printer will produce an output that is probably not what you would want. It would render the image 1:1 at 300 dpi; so if you have a 640 by 480 pixel image, it would print an image approximately twice the size of a postage stamp. Unless you are a philatelist (one who collects stamps), this is probably not the output you wanted.

Why Use LPR?

The **lpr** and **lp** commands provide an easy way to send files to the various Logical Devices that exist on the printer. It is the preferred way of sending files over a TCP/IP network since the printer has internal queuing and spooling for all of the internal print queues. Each of the internal printer Logical Devices may be set up on remote systems to allow for printing of Scaled, Unscaled, and Bracketing images.

Multiple images can also be assembled on one page by using the Caption, Variable Multiformating, and Fixed Multiformating Devices. Getting the desired output can be accomplished very easily by following two general rules:

If you wish to print a single image on a page, you should:

1. Send all raster image files (TIFF, BMP, PCX, PPM, etc.) to the Scaled Device.
2. Send PostScript files to the Unscaled Device.

You can also set up other printer devices with very descriptive names to simplify their use. For example, a printer name such as "6up" could be used to specify the "Fixed Multiformating Device 23". This Logical Device will put six different images on a single page; simply send six image files to this device to produce the "6up" output. Many Fixed Multiformating Devices are available and you may set up as many of these as you wish.

LPR and LP Command Comparison

lpr is a UNIX BSD command. UNIX System V uses an **lp** command which is similar.

An example and comparison of equivalent commands can be seen in Table 1.

BSD	System V	What it Does
<code>lpr -Pnp2 file</code>	<code>lp -dnp2 file</code>	Print scaled
<code>lpr -Pnp2 -#5 file</code>	<code>lp -dnp2 -n5 file</code>	Print 5 copies
<code>lpr -Pnp2 -m file</code>	<code>lp -dnp2 -m file</code>	Send mail when done
<code>lpq -Pnp2</code>	<code>lpstat -p np2</code>	Check queue
<code>lprm -Pnp2 job#</code>	<code>cancel np2-job#</code>	Cancel print job

Table 1: Comparison of BSD and System V Print Commands

Administration and Set Up

The NP-1600 uses an internal UNIX operating system. It controls all of the local queuing to the internal Logical Devices. Each of these devices is assigned a Logical Device number, an alias name, and each appear as separate printers on the network. The only items that need to be configured on remote systems are the hostname or IP Address of the printer, and the names of all of Logical Devices that the user wishes to use.

UNIX BSD and System V Examples

On most systems, the hostname and IP Address must be added to the `/etc/hosts` file. Set up is the same for both UNIX BSD and System V workstations.

		# Comments
198.30.220.1	zontar	# Sun Workstation
198.30.220.137	np1600	# Codonics NP-1600

Note: If your systems use Domain Name Service (DNS), see your network administrator.

The only other item to be configured on the workstation is in the `/etc/printcap` file. Note that the `sd=/usr/spool` line in each entry allows the user to specify the spool directory. Frequently, the `/usr/spool` directory shown in this sample printcap file does not have sufficient space available to hold large image files. Please check the system you intend to use and select a filesystem with enough space to hold the largest image file or files. Change `sd=/usr/spool` to the appropriate directory.

The following example shows an NP-1600 printcap configuration for a UNIX environment:

```
# Codonics Printer - Logical Devices Used
#
# For printing images 1:1, and for PostScript images.
#
np1|unscaled:\
    :lp=:rp=1:rm=np1600:sd=/usr/spool/np1:\
    :lf=/usr/adm/lpd-errs:mx#0:
#
# For printing image files scaled to fit page.
#
np2|scaled:\
    :lp=:rp=2:rm=np1600:sd=/usr/spool/np2:\
    :lf=/usr/adm/lpd-errs:mx#0:
#
# For printing bracketing image for TCR and gamma.
#
np9|bracket:\
    :lp=:rp=9:rm=np1600:sd=/usr/spool/np9:\
    :lf=/usr/adm/lpd-errs:mx#0:
#
```

```
# For printing 2 columns by 3 rows of images.
#
np23|6up:\
    :lp=:rp=23:rm=np1600:sd=/usr/spool/np23:\
    :lf=/usr/adm/lpd-errs:mx#0:
```

A typical `/etc/printcap` entry breaks down as follows:

<code>lp=</code>	Printer is not attached to a physical I/O port.
<code>rm=np1600</code>	IP Address of printer (usually from <code>/etc/hosts</code>).
<code>rp=1</code>	Logical Device name.
<code>lf=filename</code>	Path of file to log errors into.
<code>sd=directory</code>	Path of directory to spool images into.
<code>mx=#0</code>	Disable maximum file size check when printing images.

In the previous `/etc/printcap` example, the names assigned to the printers were selected to indicate the function which is performed by the NP-1600. Two names are specified for each printer. The first name was chosen to be a shorthand method of selecting the printer. The second name is more verbose and gives a better indication of the function performed.

Once the `/etc/printcap` file has been set up, the last step is to create the spooling directories. The spooling directories are specified by the `sd=directory_name` command in the `/etc/printcap` entries. It is necessary to create the directories in the appropriate locations using the `mkdir` command. The example shows the spool directories under the `/usr/spool` directory. You should pick a location on your system which has enough free space to hold a reasonable number of image files.

Once you have found an area to put the spool directories, issue the following commands:

```
mkdir dir1 dir2 ...
chmod 755 dir1 dir2 ...
chown root dir1 dir2 ...
chgrp daemon dir1 dir2 ...
```

Where dir1, dir2, etc. are the names of the directories referenced in the `/etc/printcap` file.

The command's directory, owner, and group may change on different systems. Check the ownership of other spooling directories or contact your System Administrator for help.

SunOS/Solaris Example

For SunOS/Solaris 2.x UNIX System V, use the Administration Tool and select the following:

In the Printer Manager: Access the **Remote Printer** window and set the following:

Printer Name: **np2**
Printer Server: **np1600!2**
Printer Server OS: **BSD**
System Default: **No**

Note: The **2** after the **!** is the Logical Device on the printer. **2** is the Scaled Device.

Using LPR in a UNIX Environment

Printing to the NP-1600 using the Remote Printer Protocol is usually accomplished with the **lpr** command. LPR is supported in most UNIX environments and some PC networking packages. Consult the documentation provided with the networking software being used on your host system to understand exact details of LPR usage. The information provided here will overview LPR use as supported on many UNIX systems.

The **lpr** command supports a number of options to control functions, such as, destination printer, number of copies, spooling, etc. Options and filenames are specified on the command line. This discussion of **lpr** command will focus on basic command usage and three useful options for controlling the NP-1600 and improving print performance.

The structure of the **lpr** command is:

```
lpr { -options } { filename ... }
```

The options relevant to the NP-1600 are:

-P Select logical printer.
-# Specify number of copies.
-s Do not spool file, send directly to the NP-1600.

Using LPR to send image files to the NP-1600 is a straight forward process. The first consideration is which Logical Device within the NP-1600 is to receive the image. The actual names of the Logical Devices are assigned when LPR is set up on the host system (see the beginning of this section). The selected LPR printer will forward image data to one of the Logical Devices supported by the NP-1600. The following LPR examples show how to send images to the printer using names in the sample `/etc/printcap` file.

```
lpr -Pscaled image.tif  
lpr -Pnp1 picture.gif  
lpr -Punscaled screendump
```

The **-#** option is used to specify the number of prints to generate. If the option is not included, one print is output. The number of prints can range from 1 to 99.

```
lpr -Pscaled -#3 image.tif  
lpr -Pnp1 -#1 castle.ppm  
lpr -Punscaled -#99 screendump
```

The **-s** option is used to stop the **lpr** command from making a copy of the image in the spool directory. This is an optimization which can save time by sending the image immediately. Be aware that the image can not be erased until it is entirely sent to the NP-1600.

```
lpr -Pnp1 -s /u/myname/image.tif  
lpr -Pnp2 -s -#3 another.gif
```

Using LPQ and LPRM in a UNIX Environment

The NP-1600 supports the full LPR protocol including LPQ and LPRM. These utilities allow monitoring and control of the jobs in the printer queue. The exact details on LPQ and LPRM should be documented in the manual describing your network software. This section will demonstrate basic command usage and give common examples.

The **lpq** command will display the printer status and current list of jobs waiting to be printed. **lpq** command usage is similar to **lpr** in that the logical printer to be examined must be specified.

Typical **lpq** usage and printout would be:

```
% lpq -Pnp1
```

```
1 is ready and printing  
Rank Owner Job Files Total Size  
active smith 230 testfile.tif 466600 bytes  
1st jones 231 image1.gif, image2.gif 865100 bytes
```

The first line shows printer status. It will indicate the ready state of the printer and the status of the LPR queueing software. The information starting with the second line shows the list of jobs in the print queue.

Print jobs are assigned unique numbers. The job field shows the number associated with each print job. The job number starts with zero when the **NP-1600 Operating Software** is first installed on the printer and will increase as each print request is received. All received print requests cause the job number to increment, even if the print fails.

The **lprm** command is used to remove jobs from the print queue. This command uses the job number to identify which job is to be removed. Users can only remove jobs which they

own. The **lprm** command is used as follows:

```
lprm -Pnp1 231      Remove job 231 from logical print queue np1.
```

The above example will remove job 231 from the print queue. If the user specifies an active job, the printer will abort printing the job and eject the page currently being printed.

On many systems, the **lprm** command can be run by root to clear the entire print queue. When this is desired, root should run the **lprm** command with no job numbers specified. This will clear all jobs from the queue. Only root can run this command.

```
lprm -Pnp1         Remove all jobs in logical print queue np1.
```

Microsoft DOS/Windows Examples

There are a number of PC application packages that allow for printing across a TCP/IP network. The following samples are for **PC/TCP** from FTP Software: This package permits printing without an explicit set up for the printer. Printing may be accomplished by typing:

```
C:\> lpr -h -v -S hostname -P 2 imagefile
```

The options are defined as follows:

```
-h    Suppress header.  
-S    Remote system name.  
-P    Remote printer name.  
-v    Verbatim (raw data transfer).
```

It is also possible to assign the NP-1600 printer as the default printer by adding the following lines to the **pctcp.ini** file which is part of the **PC/TCP** package:

```
pctcp lpr  
printer=2  
server=hostname or IP Address  
banner=no
```

Examples:

```
C:\> lpr imagefile           To print an image.  
C:\> lpq -S hostname -P 2     To check print queues.  
C:\> lprm -S hostname -P 2 job# To remove print jobs.
```

Print Redirection Under MS-DOS and Windows

It is possible to have output directly sent from an application using similar settings. The major restriction is that the redirection must be made from an "LPT" or "COM" port, and only a fixed number of these ports are available. *Note:* If your TCP/IP package supports this feature, it will be listed under a Printer Redirection section in the package's manual.

HP UNIX System V Example

HP UNIX workstations can be set up easily using the System Administration Manager (SAM). Some of the graphical interfaces will allow users to iconify the printer and send files by using the mouse to "drag-and-drop".

Set up of the **/etc/hosts** file is also the same as on other UNIX System V workstations. Instead of an **/etc/printcap** file, the SAM set up is used.

An example of a typical HP SAM screen:

SAM Add a Remote Printer

```
Printer name . . . . . scaled  
Remote system name . . . . . np1600  
Remote printer name . . . . . 2  
Remote cancel mode . . . . . rcmodel  
Remote status mode . . . . . rsmodel  
Make this the system default printer? (y or n) . . n  
Printer class . . . . . (optional)  
Restrict cancel? (y or n) . . . . . (optional)  
Remote printer on a BSD system? (y or n) . . . . y
```

Important Note: Although the last line reads optional, you must type y.

Fill in or modify the desired fields and then press:

Perform Task

Copyright © 1995, 1998 by Codonics, Inc. Codonics, Codonics logo, and NP-1600 are trademarks of Codonics, Inc. All other registered and unregistered trademarks are the property of their respective owners. Specifications subject to change without notice. Patents Pending. Printed in U.S.A.
CDNX-20-156 Rev. 980130

Get it all with just one call
1-800-444-1198



CODONICS
We bring the future into focus

17991 Englewood Drive
Middleburg Heights, OH 44130 USA
(440) 243-1198
(440) 243-1334 Fax
Email info@codonics.com
www.codonics.com