LPR, LPQ, LPRM
Network Printing Utilities
(for MS-DOS Computers)

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Introduction

These utilities allow access to printers attached to remote computer systems via a TCP/IP network. They are implementations of the like named Unix utilities.

Things You Will Need

You will need to have access to a computer that will accept print jobs from you. It must be accessible from the network and support the Berkeley Line Printer protocol (available on most Unix systems).

Your computer must have a suitable network connection. Either

1 An Ethernet connection with one of the supported adapter boards. For an IBM PC, XT, AT, PS/2 model 30, or compatible, the supported ethernet adapter boards are:
   - 3COM 3C501 Etherlink
   - MICOM NI5210
   - Ungermann-Bass PC-NIC
   - Western Digital WD8003E

   For IBM PS/2 models, 50, 60, 70, or 80, or compatible, the supported boards are:
   - Ungermann-Bass NICps/2
   - 3COM 3C523 Etherlink/MC

2 A hard-wired serial port supporting the SLIP protocol. A serial connection is slower than an Ethernet connection, but may still be adequate.

Getting Started

The software is available by anonymous FTP from mtsg.ubc.ca. Use binary mode to get the file LP.EXE from the PC1: directory.

Instructions on how to install these utilities are in the appendix.

Problem Reports

Problem reports may be sent to Paul_Hilchey@mtsg.ubc.ca.

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Printing a File

To print a file, enter the **lpr** command followed by the name of the file. For example, if you had a file called **readme.txt** that you wanted to print, you would use

```
lpr readme.txt
```

If all goes well, the file will be sent over the network and then printed. When **lpr** has finished sending the file, it reports **done** and returns to the DOS prompt.

Printing multiple copies

You can print more than one copy of a file by specifying the **-#** option. For example:

```
lpr -#3 readme.txt
```

will produce three copies of **readme.txt**. Note that the remote computer you are sending your print files to may impose limits on how many copies you can produce.

Printing files with page breaks and page titles

To have your document broken up into pages and printed with page titles, use the **-p** option. For example:

```
lpr -p readme.txt
```

In this example, each page would have **readme.txt** as the title. If you want a title other than the file name, use the **-T** option. For example:

```
lpr -p -T top_secret sdi.doc
```

The pages would be titled with **top_secret**. Note that there must not be any spaces within your title. The **-T** option is only of use in combination with the **-p** option.

You can also specify the page width to use with the **-w** option. For example:

```
lpr -p -w72 readme.txt
```

will format the text into lines of up to 72 characters. The **-w** option only works in combination with the **-p** option.

Indenting

To have your output shifted away from the left margin, use the **-i** option. For example:

```
lpr -i readme.txt
```

The printout will be shifted to the right by eight spaces. For different indents, you can specify the number of spaces to use:

```
lpr -i4 readme.txt
```

will indent by four spaces. There must not be a space between the **-i** and the number.

Printing TeX

If you use the TeX text processing package, you can use **lpr** to print your .DVI files. To do so, you must use the **-d** option. For example:

```
lpr -d sample.dvi
```

The remote computer that is doing your printing for you may or may not be able to print DVI files; check with the system administrator to find out. Note also that there will be no opportunity for you to do a font substitution when the DVI file is interpreted, so you must not use any fonts that are not available on the printer.

Printing PostScript

If the printer you will be using understands PostScript, it should automatically recognize the '%!' signature found at the start of most PostScript files and print them correctly. You don't need to specify any formatting options.

Printing several files

You can print more than one file at a time; just include each file name with the lpr command. For example:

```
lpr -p c:\autoexec.bat c:\config.sys -d -#2 thesis.dvi
```

As you can see in the example, you can intermix formatting options in with the files to be printed. The options and file names are processed from left to right. Whichever formatting options are currently in effect when lpr finds a file name are the ones that are used for that file. Once an option has been set, it remains in effect until changed or over-ridden by another option.

Using a different printer

Your output is normally sent to the printer identified by the PRINTER and SERVER environment variables (see part 4 of the appendix). You can use a different printer and/or print server by giving the **-P** and/or **-S** options. The **-P** option changes the name of the printer to use. The **-S** option changes the address of the print server computer to use. For example:

```
lpr -P LW-407 -S havarti lp.doc
```

output will be sent to the printer called LW-407 attached to the computer called havarti.

When you use the **-P** and **-S** options, they apply only to that command. They don't change the PRINTER and SERVER environment variables. If the

PRINTER and SERVER environment variables have not been set, you must use the **-P** and **-S** options.

Miscellaneous options

Print jobs are normally separated by a 'burst page' which identifies the owner of the output. Printed on the burst page are the **job classification** and the **job name**. The job classification defaults to your machine name unless set with the **-C** option. The job name defaults to the name of the file being printed unless set with the **-J** option. For example:

```
lpr -C my_output -J beaujolais wine.lst
```

The job classification and job name must not contain any spaces. If a burst page is not necessary, you can use the **-h** option to prevent it from being printed.

The **-f** option is used if the your file is formatted with FORTRAN carriage control characters. FORTRAN carriage control is seldom used on micro-computers.

The **-l** option is used if your file contains non-printing control characters that the printer can understand.

Checking the Status of Your Print Jobs

Since several people may want to use the same printer at the same time, and each job may take a length of time to print, a job that you send may not be printed immediately. Instead, it may have to wait in a queue until the printer is available. To find out if your output has been printed, enter the **lpq** command. The remote computer will be queried and the status of the jobs it is processing will be displayed. For example,

```
lpq
Owner  Files      Job#   Job Name  Status         Size
kent   champagne  34702  caviar    Printing       19192
sue    smongo.c   31241  smongo.c  Printed        27182
paul   games.txt  34789  games     Awaiting Print 84456
```

As you can see in the example, the status display includes other peoples' jobs. To check the status of your jobs only, add your name to the lpq command:

```
lpq paul
```

Only jobs owned by the user paul would be displayed.

Periodic update

To have the status display updated every few seconds, use the + option:

```
lpq +
```

The status will be displayed and then refreshed every few seconds. To stop the display, press any key on your keyboard. It will stop automatically when there are no jobs to report on. You can also set a particular delay interval:

```
lpq +5
```

will wait five seconds between display refreshes.

Using a different printer

As with the lpr command, lpq normally uses the printer identified by the PRINTER and SERVER environment variables (see part 4 of the appendix), but you can use the **-P** and **-S** options to select a different printer. **lpq** only checks the queue for the printer selected.

Cancelling Output

If you change your mind after sending a file for printing, but before it has actually been printed, you can cancel it with the **lprm** command. For example:

```
lprm 34789
```

would cancel job 34789. The job number (34789 in this example) is assigned when you submit the file for printing, and can be obtained with the **lpq** command (described above). You can only cancel your own jobs.

If you want to cancel all of your jobs that are awaiting print, use the **-** option in place of the job number:

```
lprm -
```

would cancel any of your jobs that had not yet been printed. **lprm** will report the names of any files it removes.

Using a different printer

As with the lpr and lpq commands, lprm normally uses the printer identified by the PRINTER and SERVER environment variables, but you can use the **-P** and **-S** options to select a different printer.

Appendix A - Installation

These installation instructions assume you have a moderate amount of technical knowledge of PC's, MS-DOS, and local area networks. You should have correctly configured and installed your Ethernet adapter before beginning with these instructions.

1. Unpack archive file

LP.EXE is a self-extracting archive of the files you will need. Simply enter **LP** to extract the files:

lpr.exe	- program for printing files
lpq.exe	- program to check on print status
lprm.exe	- program to cancel a print job
config.tel	- network configuration file
slip8250.com	- packet driver for serial port
manual.doc	- this manual
manual.ps	- this manual, in PostScript

After unpacking the archive, you will want to move the lpr.exe, lpq.exe, and lprm.exe files to a directory along your search path.

2. Install SLIP packet driver

If you do not have an Ethernet connection, but do have an asynchronous serial port connection that supports SLIP (the serial line internet protocol), you can still use this software. You will, however, have to install an extra program called a packet driver. If you are using an Ethernet connection, skip this section.

The packet driver you need to install is in the file slip8250.com. It is a Terminate and Stay Resident (TSR) type program; running the program will install it. You will want to run the program from within your autoexec.bat file so it is loaded every time you re-boot your machine. To do so,

1 Copy the slip8250.com file to a directory in your search path.

2 Choose an available interrupt number in the range 0x60 to 0x7f. On most machines, interrupt 0x60 is probably available and can be used.

3 Determine which serial port (COM1 or COM2) you are going to use and at what baud rate.

4 The command to install the packet driver is of the form

```
slip8250 <interrupt number> slip <irq number>
        <port address> <baud rate>
```

If you are using serial port COM1, the correct values for <irq number> and <port address> are 4 and 0x3F8. For COM2, the correct values are 3 and 0x2F8. For example, to install the packet driver using COM1 at 9600 baud, you would add the line

```
slip8250 0x60 slip 4 0x3f8 9600
```

to your autoexec.bat file.

After you have added this line to your autoexec.bat file, you must re-boot your machine to have it take effect.

3. Modify configuration file

If you use the NCSA Telnet program on your PC, you already have a config.tel file and should use that instead of the one unpacked from the archive. The only change you may need to make is to define the 'myname' entry, which specifies the name that your machine is known by. Once you have done that, skip to section 4.

If you do not already have them, obtain an IP address, a subnet mask, and a name for your machine from your local network administrator.

Next, edit the config.tel file to reflect the above information, and also the type and configuration of your network connection. Only seven of the entries in the config.tel file are essential:

`myname=fred.phys.ubc.ca`

Your machine must have a name that it is to be known by. Check with your local network administrator to find a suitable name.

`myip=128.189.123.456`

Your machine must have a unique address. Using an incorrect address can cause problems for other people on the network, so be careful. See your local network administrator if you need help.

`netmask=255.255.0.0`

Again, see your network administrator.

`hardware=wd8003`

This entry identifies the type of Ethernet adapter you have, or if you are using a packet driver.

Value	Ethernet Board	Requires
3C501	3COM 3C501 Etherlink	interrupt, ioaddr
PCNIC	Ungermann-Bass PC-NIC	address, ioaddr
NI5210	Micom NI5210	address, ioaddr
WD8003	Western Digital WD8003E	address, ioaddr
NICps2	Ungermann-Bass NICps/2	address
3C523	3COM 3C523 Etherlink/MC	address, ioaddr
packet	FTP packet driver	address, ioaddr

Depending on the Ethernet adapter type, you may need to set the interrupt, ioaddr, and address entries as indicated above.

`interrupt=5`

The hardware interrupt vector number that your Ethernet adapter was configured for (Only required for 3C501 adapter).

```
address=d000
```

The segment address of the Ethernet board's shared memory, entered as four hexadecimal digits. Set to the value that your Ethernet adapter is configured for. If you are using a packet driver interface, set to 0.

```
ioaddr=360
```

The I/O base address of the Ethernet board in hexadecimal. Set to the value that your Ethernet adapter is configured for. If you are using a packet driver interface, set to the interrupt number (do not include the 0x prefix).

Edit your autoexec.bat file to the set the environment variable CONFIGTEL to be the location of your config.tel file. For example:

```
set configtel=c:\utility\config.tel
```

Complete documentation on the configuration file can be found in chapter 6 of *NCSA Telnet for the PC, Version 2.2TN and Version 2.2D.*

4. Set up a default printer and server

In order to use these utilities you need to specify the name or address of a print server, the computer that receives files from you and prints them. Since a print server may have several printers attached to it, you also need to specify the name of the printer that you want to use. You obtain this information from the system administrator of the machine that is to be your print server.

You could give the printer name and server address each time you use one of the printing utilities, but it is usually more convenient to put them in the PRINTER and SERVER environment variables. The SERVER environment variable, if defined, gives the name or Internet address of the print server to use. The PRINTER environment variable gives the name of the printer on the server machine that is to be used. You will probably want to set the PRINTER and SERVER variables to suitable values in your autoexec.bat file. For example:

```
set printer=cntr
set server=128.189.103.1
```

If you later have a file that you want printed on a different printer, you can either set PRINTER and/or SERVER to that printer, or use the **-P** and/or **-S** options with the lpr, lpq, and lprm commands.

Appendix B - Notes for System Administrators

These notes are directed to the administrator of a Unix system who wishes to allow use of the system as a print server. They briefly describe the steps needed under Sun OS, but other Unix systems should be similar. You should also refer to sections 12.3 (etc/hosts), 19.4 (hosts.lpd) and chapter 22 (name server) of the SunOS System & Network Administration manual.

The first step is to add entries in the LPD access file, /etc/hosts.lpd, for the machines that are to have access. Edit the file and insert the names of the machines, one per line. Note that an IP address is not acceptable, so all microcomputers that are to have access must be assigned a name.

The second step is to add entries to either the /etc/hosts file (if you are not using a domain name server) or to the name server database (if you are using a name server). Entries in the /etc/hosts file consist of IP addresses and names, one entry per line.

If you are using a name server, list your named.boot file to find out what the relevant hosts and rev.hosts files are called. Next, edit those files, being sure to update the serial numbers at the start of them. To make the changes take effect, use the Unix command:

```
kill -HUP `cat /etc/named.pid`
```

This will cause the name server daemon to re-read the files.