

Fundamentals of UNIX
Lab 11.3.2 – Command Line Printing
(Estimated time: 30 min.)

Objectives:

- Develop an understanding of UNIX command line printing
- Review UNIX printing environment components
- Print files with the `lp` command
- Monitor print jobs and queue status
- Cancel print requests

Background:

In this lab you will work with UNIX printing commands to send jobs to printers and manage print queues. Printing services are an essential component of any network operating system. UNIX provides local and remote printing capabilities. You will review the major component of the UNIX printing environment and will work with the command line method of printing using the `lp` command. The `lpstat` command is used to determine the status and availability of network printers you can print to. You will also monitor the print queue status, determine print request IDs and remove print requests using the `cancel` command.

Tools / Preparation:

- a) Before starting this lab, review Chapter 11, Section 1 – The UNIX Printing Environment, Section 2 – Command Line Printing and Section 3 Managing Print Queues.
- b) You will need the following:
 1. A login user ID (e.g. user2) and password assigned by your instructor.
 2. A computer running the UNIX operating system
 3. Networked computers in classroom with class file system installed
 4. Network printer available and print server running

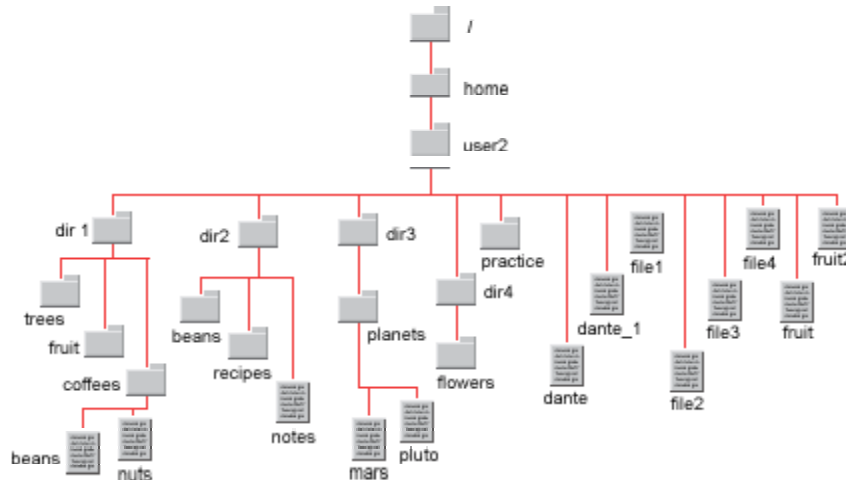
Notes:

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Worksheet

Use the diagram of the sample Class File System directory tree to assist with this lab.

Class File Tree Structure



Step 1. Log in to CDE

Login with the user name and password assigned to you by your instructor in the CDE entry box.

Step 2. Access the Command Line

Right click on the **workspace** backdrop and click on **Tools**. Select **Terminal** from the menu to open a terminal window.

Step 3. Review UNIX Printing Environment Components

With the UNIX printing environment, users can have local printers attached to their workstations and can also print to remote network printers. The system administrator sets up the printing environment by installing printers and defining print queues and servers to support them. There are three main components in the UNIX printing environment:

Printer - The printer is a **physical** printing device. The printer may be attached to a workstation or a network server or they can be attached directly to the network using a hub or switch.

Printer Name (queue) - The printer name is the name of a print queue associated with the physical printer. It is a **logical** name for the printer, which is assigned by the system administrator. This is the name the users print to. A print queue is a directory on the hard disk of a computer where print requests from users are stored.

Print Server - The print server is the computer that manages incoming print requests and releases them when the printer is ready. Print servers run the printer daemon **lpsched**, which manages print requests. The print queue is located in the hard disks of the print server. Print requests or print jobs are stored on the hard disk until they are printed and then they are deleted or purged. A print server can be a workstation or a network server. The local computer can act as the print server for a local printer. Network print servers are usually centralized and can handle multiple printers and queues.

Use the terms: **printer**, **printer name**, and **print server** to fill in the blanks for the following questions.

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a. A device that runs the lpsched daemon and holds the print in print queues on its hard disk is a:

b. A _____ is a physical device that outputs the printed material.

c. The logical name that the user prints to is a _____.

Step 4. Print Files with the lp Command

Printing of ASCII text or PostScript™ files can be done from the command line using the **lp** (Line Printer) command. Do not use this method to print data files (files created in applications like FrameMaker or Sun's Star Office) or binary files. The function of the **lp** command is to queue data for printing. The format of the lp command with options available is shown below.

Command Format: ***lp [-options] [filename(s)]***

Below are some examples using the **lp** command with various options to print files. If you do not specify a printer, **lp** will print to your default printer. An administrator must set up the default printer in advance. Although these examples print only one file, it is possible to send multiple files simultaneously to the printer and wildcard metacharacters such as * and ? can also be used.

1) Print file2 in your home directory on the default printer.

\$ lp ~/file2

2) Use the **-d** option to specify another printer (if one is available).

\$ lp -d staffp ~/file2

3) Use the **-o nobanner** option to suppress banner page.

\$ lp -o nobanner ~/file2

4) Use the **-n** option to specify the number of copies.

\$ lp -n 3 ~/file2

a. Change to your home directory. What command did you use _____

b. Send a print request to print the **fruit** file to your default printer. What is the name of your default printer? _____ What command did you use? _____

c. What was the response to your print request? _____

d. Did the fruit file print on the default printer with a banner page showing your user ID?

e. Send a print request to print the **mars** file, which is in the planets directory file to your default printer and suppress the banner page. What command did you use? _____

f. If you had another printer available called **laser5**, what command would you use to send a print request for the fruit2 file to this printer? _____

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g. List the files and subdirectories in your home directory using the **long** listing option and **redirect** (using the > symbol) the output to a file called **userXhomedir.lst** (where userX is your user ID). What command did you use? _____

h. Send a print request to print the file you just created to your default printer. What command did you use? _____

Step 5. Monitor Print Jobs and Queue Status

When you use the **lp** command to send a print request to a printer, you are actually sending it to a print queue. The print queue is a special directory that is stored on the hard disk of your workstation or of a remote network server. Since printers do not have hard disks to store documents, all requests or print jobs must be spooled or go to the queue first. If the printer is available, the request is serviced immediately. If the printer is busy, the request is queued until the printer is available. An administrator can monitor and manage the print queues for multiple printers.

The **lpstat** (line printer status) command is used to display the status of the printer queue. To see the print requests for a specific printer, use the basic form of the command, which specifies the printer name or queue to display. If no printer name is specified, you will see a list of requests on your default printer.

a. If possible, **turn off the printer** or have your instructor **stop the lpsched daemon** on the print server temporarily so that you can see what is in the queue before it is printed.

b. Send **individual** print requests for the files in your home directory that start with 'file' to your default printer. Send them in sequence starting with file1, then file2 etc. What command did you use? **lp file1; lp file2; lp file3; lp file4**

c. Use the following table to record the results of using the **lpstat** command with various options listed after you have sent some print jobs to the queue.

Print Queue Options with lpstat

Option	Meaning	Purpose	Results of Command
Printer Name	Name of printer (queue)	Displays requests for a specific printer's queue	
-p	Printers	Displays status of all printers	
-o	Output (or Outstanding)	Displays status of all output or outstanding print requests	
-d	Default	Displays which printer is the system default	
-t	Tell All	Displays complete status information for all printers	
-s	Summary	Displays a status summary for all printers configured on your system	
-a	Accepting	Displays which printers are accepting requests	

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Step 6. Cancel Print Requests

There are times when you will want to remove a print request from the print queue. If the print job has not already printed and is still in the print queue you can cancel it. You may only cancel those print requests that you have initiated. You cannot remove another user's print requests. Only the system administrator can cancel print jobs for other users.

The cancel command enables you to cancel print requests previously sent with the **lp** command. To do this, you must first use the **lpstat** command to identify the request-ID. If you cancel a print job, it does not affect the request ID numbers of the other jobs still in the queue.

a. Use the **lpstat** command to determine the request-ID of the print jobs in the queue that belong to you. How can you tell if they are your print jobs?

b. Note the request-ID for one of your print requests and use the **cancel** command to remove it from the print queue. What command did you use? _____

c. Use the **lpstat** command again to determine the request-ID of the print job you removed is still there. Is it gone? _____

d. Use the **lpstat** and **cancel** commands to remove all remaining print jobs belonging to you from the print queue.

Step 7 – Remove Files and Directories Created in this Lab

Remove all files and directories created in your home directory during this lab.

Step 8. Close the Terminal Window and Logout

Double click on the dash button in the upper left corner of the screen, then click the **EXIT** icon on the front panel.