Unix for Telecommunications

Portfolio Task – P-Lab-10-CUPS
Distinction Level Task

I. INTRODUCTION

In this lab you will configure a CUPS server to offer a CUPS based network PDF printer using your RULE host.

II. PURPOSE

To gain and/or enhance the following practical skills:
- Learn how to setup a PDF Printer with CUPS
- Understand how CUPS process a print job
- Understand how CUPS backend and drivers work

III. PREPARATION

You should not attempt this task until you complete the **Pass** level task **P-Lab-10-CUPS-P**.

IV. METHODOLOGY

A. CUPS Introduction

1) Examine the CUPS web site listed above
2) You should obtain a thorough understanding of how CUPS processes a print job from:
   a) Accepting the job from a remote client
   b) Queuing the print job
   c) Building a filter chain to generate a printable format
   d) Passing the final format to the registered backend to print/output the job

B. Creating a PDF Backend

1) After creating a network printer with CUPS, you are now required to create a PDF Backend
2) Carefully read the documentation on the standard techniques for writing a CUPS backend (refer to https://www.cups.org/doc/api-filter.html and https://www.cups.org/doc/man-backend.html)
   - Standard FreeBSD executable (can be a script)
   - Required command line parameters and parameter order
   - Required output (format) from CUPS server backend query
   - Required permissions and locations to install the backend
3) You must now develop a shell script that follows the CUPS specification, the name of this script must be "`pdf`". This script should conform to the CUPS backend specifications and convert an input print job into a PDF output file.
   Hint: *Modern versions of CUPS use PDF internally as document formats so the data delivered to the backed will already be in PDF format, you basically need to only save this data to disk*
   Hint: *Do not use the pre-existing PDF drivers in the ports tree, they cannot be configured to complete this lab task as required*
4) The shell script should save all PDF jobs to disk using the following criteria:
   - PDF file saved in the directory (`/home/PDF/<username>`) where *username* is obtained from the print job
   - Any directories should be automatically created if they don't exist
   - PDF filename should be generated using the print job name and the current date/time
   - All created files and directories must be accessible by the username that generated the print job

C. Testing your CUPS PDF Printer and Backend

While the online marking script can be used to assess your lab, you should not use it for testing purposes. The printer marking script is slow and too many students using it concurrently can cause a backlog causing all assessments to fail and timeout. You should test your marking script from the command line using the command:

`/usr/local/bin/lpr`

You can view the man page for /usr/local/bin/lpr by executing:

`man -a lpr`

Note: *The first* `lpr` *man page shown will be for the default system* `lpr` *command* (`/usr/bin/lpr`) *while the second man page will be for the CUPS* `lpr` *command* (`/usr/local/bin/lpr`)

1) You should test your CUPS PDF printer from both of your allocated RULE hosts
2) Testing should be completed with PostScript files, text files and images
3) You will *not* be able to test from Windows due to you not having permissions to create a Windows printer on the lab machine. If your laptop runs Windows, you can test your printer from there

V. ASSESSMENT

The due date for completion of practical work is **11:00pm**, exactly **six** days after your scheduled class.

Note: *The nominated submission day/time holds regardless of whether that day is a non-teaching day or public holiday*

A. Self Assessment

You can self-assess your progress at any time via the marking script available at http://ruleprimary1.caia.swin.edu.au

B. Completion of task in Doubtfire

Download the PDF output of the marking script from http://ruleprimary1.caia.swin.edu.au and submit it to Doubtfire. Your tutor will confirm completion of the lab by examing the rule marking log files on the rule server.

If you complete the task during class beforehand, you may demonstrate completion in class to your tutor.

Note: *The downloaded PDF is not evidence of successful completion of the lab, it is a document to demonstrate completion within your portfolio. Your tutor will assess the evidence via either direct confirmation via the marking script or via the log files generated when you run the marking script*

C. Tutor Discussion

In order for the submission to be marked as complete, you must discuss your work with the tutor