File Redirection

Introduction and/or Background

When executing commands in Linux, the <u>default</u> is to send the output to the screen (aka STDOUT). Redirection provides the ability to change where to send the output of a command. Command output from a file, command, program, script, or even code block within a script is sent as input to another file, command, program, or script.

Objectives

In this project/lab the student will:
- Use work with redirection to send commands out to other files/commands.

Equipment/Supplies Needed
- As specified in Lab 0.0.1.

Procedure

Perform the steps in this lab in the order they are presented to you. Answer all questions and record the requested information. Use the Linux Virtual Machine to perform lab activities as directed. Unless otherwise stated, all tasks done as a non-root user. If root access is needed use the sudo command.

Assignment

Standard Input (STDIN), Standard Output (STDOUT), Standard Error (STDERR), are Pipes.

The standard input (STDIN) is the keyboard (i.e. commands are entered via the keyboard. Standard output writes the data that is generated by a program. When the standard output stream is not redirected, it will output text to the terminal *(STDOUT* as defined for Linux*).* With redirection, the output of commands can redirect the output of many commands to files, devices, and even to the input of other commands, for further processing.

STDOUT. The **echo** command displays any argument that is passed to it on the command line. An argument is something that is received by a program. Send a message to the terminal using the **echo** command.

1. **echo** I sent this to the terminal using standard output

   Record a screenshot of the output.

STDERR. Standard error writes the errors generated by a program that has failed at some point in its execution. The default output is terminal. Become root user and go to directory /var/log Send (create) an error message by entering the following incorrect command:

2. ls % 2>> faillog || cat faillog

Repeat it again 3 times,

3. cat faillog

Record a screenshot of the output.

The data streams STDOUT, STDIN and STDERR are redirected using redirection operators. Review the slides to answer the following:

What operator redirects stdout to a file, creating or overwriting an existing file?
What operator redirects stdout to a file, and appends or creates a new file?
What operator redirects stderr to a file, creating or overwriting an existing file as needed?
What operator sends the output from one program to another?

File Redirection

The output of a command can be redirected to a file.

Send output of commands to a file.

Exit root user and from a terminal window enter the command

3. ls -l

you should get a directory listing, displayed to stdout or the display.

Use the command

4. ls -l > *test.stdout*.

Record a screenshot of the output

Where did the output go?

Use the command

5. cat test.stdout, what are the contents of the file ?

Enter the command

6. ls -l */etc/* > *test.stdout*

View the contents of **test.stdout**. Did the contents change ?

The contents of **test.stdout** should be different, why did the contents of **test.stdout** change?

Append to an existing file or create a new file if it does not exist.

Enter the command

    7. ls -l /var/log/* >> test.stdout

View the contents of **test.stdout**, what are the contents of **test.stdout**?

You should see the that the output of **ls -l /var/log/* >> test.stdout** was added or appended at the end of the test.stdout file.

Concatenate/Combine Files

Enter the command

    8. cd /home/user1/Documents (If Documents does not exist, create it)

Using a text editor (nano) create 3 files named **file1**, **file2**, **file3** in the Documents directory. In each, enter the line "**Start of File1**", then type in a few lines of whatever you like.

Enter the command

    9. cat *file1*

You should see what you typed in file1.

Enter the command

10.   cat *file2*

You should see what you typed in file2.

Enter the command

11.   cat *file3*

You should see what you typed in file3.

Enter the command

12.   cat *file1 file2 file3 > all3files*

Enter the command

13.   cat *all3files*

What is the content of all3files?

Enter the command

14.   cat *file1 >> all3files*

What did this do to the contents of ***all3files*** file?

Pipes, Filters

The Pipe command (|) allows sending the output of two or more commands as input to the next. When a program takes its input from another program, it performs some operation on that input, and writes the result to the standard output. It is also referred as a filter.

   From the home directory, enter

15.   ls

   command to view what is in the directory.

   Enter the following command to view only the files with a *.txt* file extension.

16.   ls | grep "*.txt*"

  Count the number of items with a .txt extension.

17.   ls | grep "*txt*" | wc –l

   As root user, enter the command

18.   cat */var/log/messages*

   To search syslog via stdout, pipe and filter. As root user enter the commands

19.   dmesg > dmesg

20.   cat /var/log/dmesg | grep x86/

   Record a screenshot of the output [The output should be "filtered" showing only lines from ***/var/log/dmesg*** that contain the text x86/.]

   Exit root.

Lab Submissions Proof: Provide screenshots as indicated in the lab; upload your proof to Canvas for grading.

Rubric

Checklist/Single Point Mastery

Concerns Working Towards Proficiency	Criteria Standards for This Competency	Accomplished Evidence of Mastering Competency
	Criteria #1:Recorded output of echo I sent this to the terminal using standard output command (7 points)	
	Criteria #2: Recorded output of ls % command (7 points)	
	Criteria #3: Answered question What operator redirects stdout to a file, creating or overwriting an existing file? (7 points)	
	Criteria #4: Answered question What operator redirects stdout to a file, and appends or creates a new file? (7 points)	
	Criteria #5: Answered question What operator redirects stderr to a file, creating or overwriting an existing file as needed? (7 points)	
	Criteria #6: Answered question What operator sends the output from one program to another? (7 points)	
	Criteria #7: Recorded output of ls -l > test.stdout command (7 points)	
	Criteria #8: Recorded contents of cat test.stdout file (7 points)	
	Criteria #9: Recorded where contents of cat test.stdout file went (7 points)	
	Criteria #10: Identified why contents of test.stdout changed (7 points)	
	Criteria #11: Recorded contents of test.stdout (7 points)	
	Criteria #12: Identified content of all3files (7 points)	
	Criteria #13: Answered question What did this do to the contents of all3files file (7 points)	
	Criteria #14: Recorded output of cat /var/log/dmesg	grep dmesg command (9 points)	