ULI101: INTRODUCTION TO UNIX / LINUX AND THE INTERNET

WEEK 5: LESSON 1

ADDITIONAL LINUX COMMANDS
REDIRECTION SYMBOLS
/DEV/NULL FILE , THE HERE DOCUMENT

LESSON 5.1 TOPICS

Redirection – Part 1

- Additional Commands (**tr**, **cut**, **wc**)
- Concepts:
  - **Standard Input, Standard Output**, **Standard Error**
- Redirection Symbols: (**<**, **>**, **>>**, **2>**, **2>>**)
- Additional Redirection Concepts:
  - **/dev/null** File, The **Here Document**

Perform Week 5 Tutorial

- Investigation 1

ADDITIONAL FILE MANIPULATION COMMANDS

Additional Text File Manipulation Commands

Here are some additional commands to manipulate content of text files.

Command	Description
`tr`	Used to **translate** characters to different characters. eg. `tr 'a-z' 'A-Z' < filename`
`cut`	Used to **extract** fields and characters from records. The option **-c** option is used to cut by a character or a range of characters. The **-f** option indicates the field number or field range to display (this may require using the **-d** option to indicate the field separator (delimiter) which is tab by default). eg. `cut -c1-5 filename` , `cut -d":" -f2 filename`
`wc`	Displays various **counts** of the contents of a file. The –**l** option displays the number of lines, the **–w** option displays the number of words, and the **–c** option displays the number of characters. eg. `wc filename` ,`wc -l filename` , `wc -w filename`

ADDITIONAL FILE MANIPULATION COMMANDS

Instructor Demonstration

Your instructor will now demonstrate using the following Linux commands:

- **tr**
- **cut**
- **wc**

REDIRECTION

Redirection can be defined as **changing** *from* where commands **read input** *to* where commands **send output**. You can redirect the input and output of a command.

For redirection, **meta characters** are used.

Redirection can be into a **file** (shell meta characters are angle **brackets** '<', '>’) or a **program** (shell meta characters are **pipe** symbol '|’).

Reference: https://www.javatpoint.com/linux-input-output-redirection

REDIRECTION

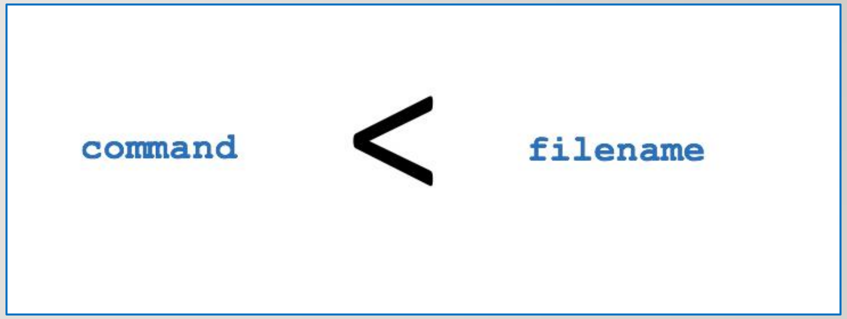
Standard input (**stdin**) is a term which describes from where a command receives **input**.

The meta character "**<**" will redirect **stdin** into a command.

This would only apply to Unix/Linux commands that can **accept** *stdin* like **cat**, **more**, **less**, **sort**, **grep**, **uniq**, ***head***, ***tail***, **tr**, **cut**, and **wc**.

Examples:

```
tr 'a-z' 'A-Z' < words.txt
cat < abc.txt
sort < xyz.txt
```



REDIRECTION

Standard output (**stdout**) describes where a command sends its **output**.

The meta character "**>**" will redirect **stdout** to a file either **creating** a new file if it doesn't exist or **overwriting** the content of an existing file.

The meta characters "**>>**" will redirect **stdout** to a file either **creating** a new file if it doesn't exist or **adding** stdout to the **bottom** to the existing file's contents.

Examples:

```
ls -l
ls -l > detailed-listing.txt
ls /bin >> output.txt
```

```
command     >     filename
```

```
command     >>     filename
```

REDIRECTION

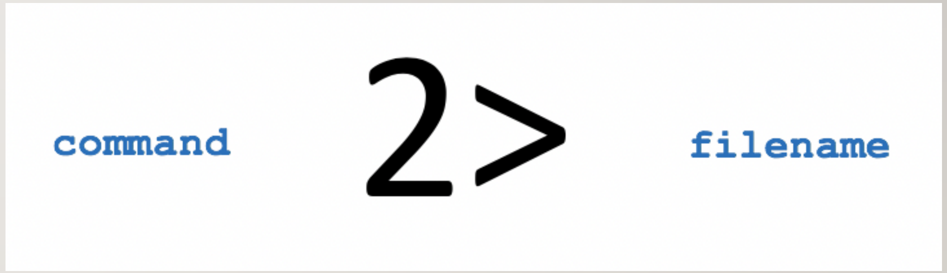
Standard Error (**stderr**) describes where a command sends its **error messages**.

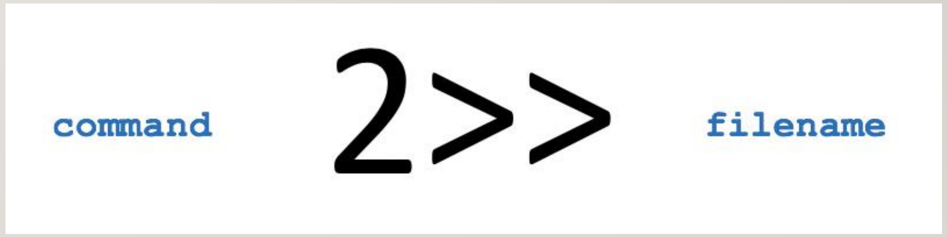
The meta characters "**2>**" will redirect **stderr** to a file either **creating** a new file if it doesn't exist or **overwriting** the content of an existing file.

The meta characters "2**>>**" will redirect **stderr** to a file either **creating** a new file if it doesn't exist or **adding** stdout to the **bottom** to the existing file's contents.

Examples:

```
PWD
PWD 2> error-message.txt
PWD 2 >> error-messages.txt
PWD 2> /dev/null
```





REDIRECTION

The **/dev/null** file (sometimes called the **bit bucket** or **black hole**) is a special system file that **discards** stdout or stderr.

This is useful to "*throw-away*" **unwanted** command output or errors.

Examples:

```
ls 2> /dev/null
ls > /dev/null
find / -name "tempfile" 2> /dev/null
```

REDIRECTION

The **Here Document** allows stdin to be redirected into a command **within** the command-line.

The meta characters "**<<+**" will redirect **stdin** into the command.
The **+** symbol is used to identify the beginning and ending of the stdin.

You can use ANY symbol or series of characters to mark stdin as long as that symbols or characters are IDENTICAL and the ending symbol or characters are on a **separate** line with only that symbol or characters.

Example:

```
cat <<+
Line 1
Line 2
Line 3
+
```

```
command    <<+

   stdin

+
```

REDIRECTION

Instructor Demonstration

Your instructor will now demonstrate redirection:

- Standard Input
- Standard Output
- Standard Error
- Both Standard Output and Standard Error
- Both Standard Input and Standard Output
- Redirecting to **/dev/null**
- The **Here Document**

REDIRECTION

Getting Practice

To get practice to help perform **Assignment #2**, perform **Week 5 Tutorial:**

- INVESTIGATION 1: BASICS OF REDIRECTION
- LINUX PRACTICE QUESTIONS (Questions 1 – 4)