

# ULI101: INTRODUCTION TO UNIX / LINUX AND THE INTERNET

## WEEK 5: LESSON 2

---

### PIPELINE COMMANDS

### MULTIPLE / MULTILINE COMMANDS

PHOTOS AND ICONS USED IN THIS SLIDE SHOW ARE LICENSED UNDER [CC BY-SA](#)

# LESSON 2 TOPICS

---


## Redirection – Part 2

- Purpose of **Pipeline Commands**
- Linux Pipeline Command Syntax: |
- **tee** Command

## Multiple / Multi-Line Commands

- Multiple Linux Commands using Semicolon ";" and Grouping: ()
- Issuing Large Linux Commands over Multiple Lines

## Perform **Week 5** Tutorial

- Investigations 2 and 3
  - Review Questions (Questions 5 – 12)
- 

# PIPELINE COMMANDS

---

**Pipeline Commands** use a meta symbol “|” (called a pipe) to allow a command’s **standard output** to be redirected into the **standard input** of other commands **WITHOUT** having to use **temporary** files.

Therefore, a few simple commands can be **combined** to form a more powerful pipeline command.

*Examples:*

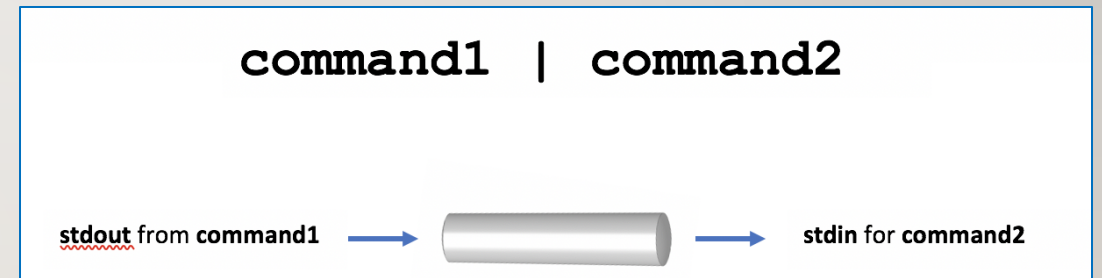
```
ls -al | more
```

```
ls | sort -r
```

```
ls | sort | more
```

```
ls -l | cut -d" " -f2 | tr 'a-z' 'A-Z'
```

```
ls | grep Linux | head -5
```



# PIPELINE COMMANDS

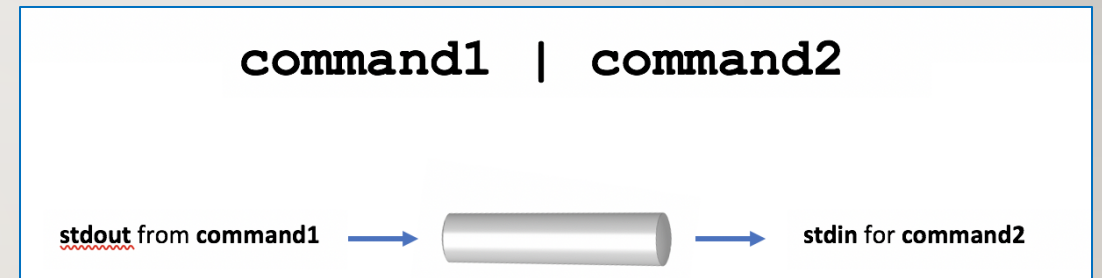
---

## Filters

Commands to the **right** of the pipe symbol are referred to as **filters**.

They are called *filters* since those commands are used to **modify** the stdout of the previous command.

Many commands can be "piped" together, but these commands (filters) must be chained in **a specific order**, depending on what you wish to accomplish.



# PIPELINE COMMANDS



---

## Instructor Demonstration

Your instructor will now demonstrate how to issue  
**Pipeline Commands.**

# PIPELINE COMMANDS

---

The **tee** utility can be used to split the flow of standard output between a **text file** and the **terminal screen**.

The **tee** option **-a** can be used to add content to the **bottom** of an existing file as opposed to *overwriting* the file's previous contents.

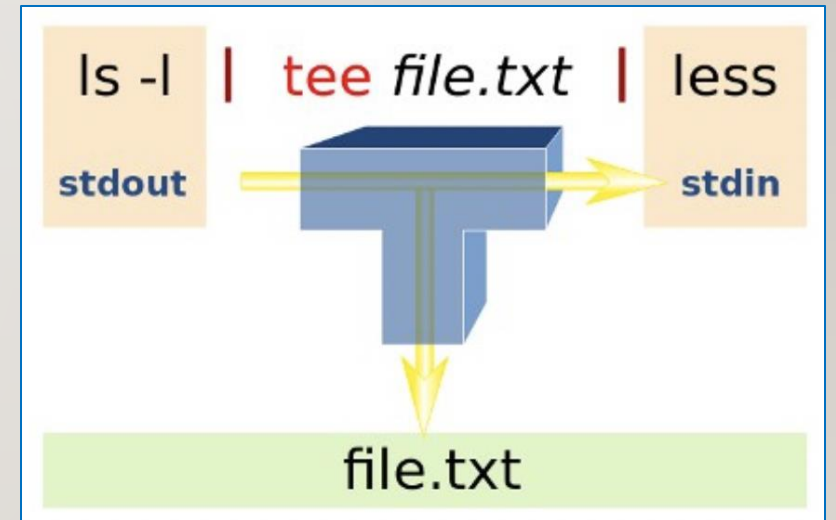
The reason for the name "**tee**" is that the splitting of the flow of information resembles a capital T.

*Examples:*

```
ls | tee unsorted.txt | sort
```

```
ls | grep Linux | tee matched.txt | more
```

```
ls | head -5 | tee -a
```



# PIPELINE COMMANDS



---

## Instructor Demonstration

Your instructor will now demonstrate how to use the **tee** command within a **Pipeline Command**.

# MULTIPLE / MULTI-LINE COMMANDS

---

There are ways that **multiple commands** can be run within a **single** command line.

You can separate commands by using the **semi-colon character “;”**.

`command1 ; command2 ; command3`

*Example:*

`sleep 5; ls`

Multiple commands can also be **grouped** by using **parentheses** to force commands to be run **together** (for example, to redirect **stdout** to a file)

*Example:*

`(echo "Who is logged in: "; who) > whoson`

**(Note:** all command output is sent to a file)



# MULTIPLE / MULTI-LINE COMMANDS

---

Commands may also be **spread-out over multiple lines**, making it easier (for humans) to interpret a long command.

You can add a **backslash** quoting symbol "\" at the end of a line. The \ symbol "*quotes-out*" the meaning of the **ENTER** key as text (i.e. *new-line*) as instead of running the command.

*Example:*

```
echo "This will be split over multiple \  
lines. Note that the shell will realize \  
that a pipe requires another command, so \  
it will automatically go to the next line" \  
| tr '[a-z]' '[A-Z]'
```

```
command1 | \  
command2 | \  
command3
```



# MULTIPLE / MULTI-LINE COMMANDS



---

## Instructor Demonstration

Your instructor will now demonstrate how to issue Multiple Commands / Multi-Line Linux Commands:

- Multiple Linux Commands using semicolon “;”
- Multiple Linux Commands using Grouping ( )
- Multi-Line Linux Commands using Backslash \

# PIPELINE COMMANDS

## MULTIPLE / MULTI-LINE COMMANDS

---

### Getting Practice

To get practice to help perform Assignment #2, perform the online tutorial

**Tutorial 5** (**ctrl-click** to open link):

- [INVESTIGATION 2: REDIRECTION USING PIPES](#)
- [INVESTIGATION 3: ISSUING MULTIPLE UNIX/LINUX COMMANDS](#)
- [LINUX PRACTICE QUESTIONS](#) (Questions 6 – 12)
- Perform Online **Assignment 2: Section 3: Redirection & Pipes**