Unix Workshop

Antwane Mason, Yuriy Stejko

<2016-12-05 Mon>

Outline

Introduction

What is UNIX?

- 1970s Bell Labs
- Influenced Mac OSX and Linux

What is the command-line?

- Interactive
- Text-based
- Bash, Bash for Windows 10, Cygwin

Objective

- Teach fundamentals of using UNIX command-line

Why Important?

- Computer power-tools
- Efficient computer interaction
- Automation

Tab Completion of File Names

Commands

- cd <folder>
- change directory
- mkdir <folder>
- make directory

Example

```
mkdir folder8274916273
cd fol<tab>
```

Copying & Removing Files

Commands

- rm [-r] <file>
- remove
- cp [-r] <file>
- copy

Example

```
cp test test.backup
rm -r testdir
```

Scrolling through Command History

- Up Key shows previous commands in command history
- Down Key shows more recent in command history

Long Running Processes on Server

Commands

- ssh <user>@<hostname>
- secure shell
- screen

Usage

- Ctrl-a d detach a shell

Example

```
ssh masona5@linux.cs.rpi.edu
screen
python loop.py
```

Finding a process's id to kill it

Commands

- ps
- processes
- kill <pid>

Example

```
ps

 PID TTY          TIME CMD
3037 ?        00:00:00 systemd
3040 ?        00:00:00 (sd-pam)
3046 ?        00:00:00 gnome-keyring-d
3048 ?        00:00:00 upstart
3127 ?        00:00:00 upstart-udev-br
3135 ?        00:00:06 dbus-daemon
3148 ?        00:00:00 window-stack-br
3176 ?        00:00:01 upstart-dbus-br
3178 ?        00:00:02 upstart-dbus-br
```

Finding a process's id to kill it (continued)

Example

```
kill 3037
```

Finding Most Recent File in Directory

Commands

- ls [-l] [-t]
- list directory

Example

```
ls -tl

total 158400
-rw-rw-r-- 1 antwane antwane     6119 Dec  5 17:51 unix-worksho
-rw-rw-r-- 1 antwane antwane   262228 Dec  5 17:49 unix-worksho
drwxrwxr-x 2 antwane antwane     4096 Dec  5 17:49 auto
-rw-rw-r-- 1 antwane antwane     7238 Dec  5 17:49 unix-worksho
-rw-rw-r-- 1 antwane antwane     6036 Dec  5 17:49 unix-worksho
-rw-rw-r-- 1 antwane antwane     7056 Dec  5 17:48 unix-worksho
-rw-rw-r-- 1 antwane antwane     5825 Dec  5 17:47 unix-worksho
```

Finding Pictures on Your Computer

Commands

- find <base-dir> -name <pattern> -print

Example

```
find / -name *.gif -print
```

Looking into Text File

Commands

- less <file>
- less is more

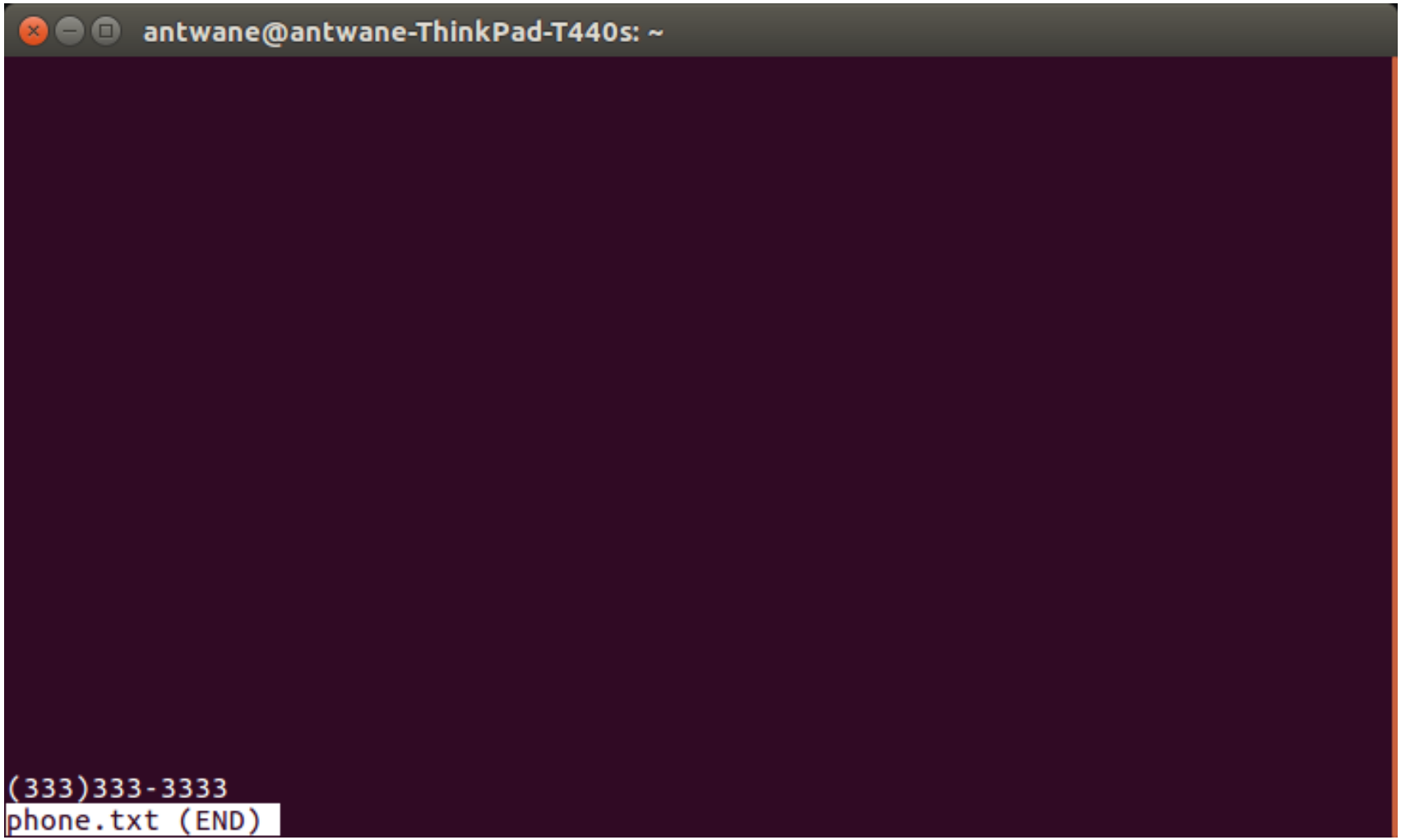
Usage

- Scroll up Ctrl-Up
- Scroll down Ctrl-Down
- Quit q

Example

```
less phone.txt
```

Looking into Text File (continued)



Quick Editing of Text File

Command

- nano <file>

Usage

- ^ means Ctrl key

Example

```
nano phone.txt
```

Quick Editing of Text File (continued)

Running Program on Server

Commands

- scp [-r] <src> <dst>
- secure copy
- Remote format <user>@<hostname>:<file-name>

Example

```
scp hello.py masona5@linux.cs.rpi.edu:home/
ssh masona5@linux.cs.rpi.edu
```

On Remote Machine

```
cd home
python hello.py
```

Checking word count of Text File

Commands

- wc [-l] [-w] [-c] <file>
- word count
- 1st number lines
- 2nd number words
- 3rd number characters

Example

```
wc -lwc unix-workshop.org

74  205 1677 unix-workshop.org
```

Download File from Internet

Commands

- wget <url>
- web get

Example

```
wget http://releases.ubuntu.com/16.04.1/ubuntu-16.04.1\
-desktop-amd64.iso?_ga=1.197864874.446561195.1480889433
```

Download File from Internet (continued)

```
antwane@antwane-ThinkPad-T440s: ~
antwane@antwane-ThinkPad-T440s:~$ ssh masona5@linux.cs.rpi.edu
masona5@linux.cs.rpi.edu's password:
Permission denied, please try again.
masona5@linux.cs.rpi.edu's password:
Your account has expired; please contact your system administrator
Connection to linux.cs.rpi.edu closed by remote host.
Connection to linux.cs.rpi.edu closed.
antwane@antwane-ThinkPad-T440s:~$ wget wget http://releases.ubuntu.com/16.04.1/u
buntu-16.04.1-desktop-amd64.iso?_ga=1.197864874.446561195.1480889433
--2016-12-05 16:55:39--  http://wget/
Resolving wget (wget)... failed: Name or service not known.
wget: unable to resolve host address ‘wget’
--2016-12-05 16:55:39--  http://releases.ubuntu.com/16.04.1/ubuntu-16.04.1-deskt
op-amd64.iso?_ga=1.197864874.446561195.1480889433
Resolving releases.ubuntu.com (releases.ubuntu.com)... 2001:67c:1360:8001::1c, 9
1.189.92.151
Connecting to releases.ubuntu.com (releases.ubuntu.com)|2001:67c:1360:8001::1c|:
80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1513308160 (1.4G) [application/x-iso9660-image]
Saving to: ‘ubuntu-16.04.1-desktop-amd64.iso?_ga=1.197864874.446561195.148088943
3’

197864874.446561195   2%[                    ]  38.13M  3.10MB/s    eta 6m 13s
```

Zip & Unzip Files

Commands

- zip [-r] <archive-name> <dir>
- zip <archive-name> <file> ...

Example 1

```
zip -r backup backup
zip backup1 backup/test1.txt backup/testdir/test2.txt
```

Example 2

```
unzip backup1.zip
```

Automating Program Input

Usage

- "<" redirect STDIN to file
- ">" redirect STDOUT to file

Example

```
python test.py < input.txt > output.txt
```

Count Number of Folders

Usage

- "|" takes STDOUT of first cmd to STDIN of second cmd

Example

```
cd /bin
ls | wc -l
```

Figuring Out What Command to Use

Commands

- appropos <keyword> ...

Example

```
apropos download

arm2hpdl (1)          - Add HP download header/trailer to an ARM
git-fetch (1)         - Download objects and refs from another r
git-http-fetch (1)    - Download from a remote Git repository vi
hp-firmware (1)       - Firmware Download Utility
hp-plugin (1)         - Plugin Download and Install Utility
lwp-download (1p)     - Fetch large files from the web
update-pciids (8)     - download new version of the PCI ID list
update-usbids (8)     - download new version of the USB ID list
wget (1)              - The non-interactive network downloader.
```