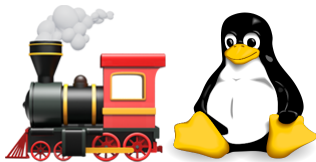


Linux101 Express

Introduction to GNU/Linux/Bash

DaVinciCode

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- A5 IOS
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- created in 1991 by Linus Torvalds
- GNU/Linux: most used operating system on servers
- Open source

- Born Again SHell
- interpreter
- textual interface with your computer

Getting the context

Where am I?

```
pwd
```

Getting the context

```
# Who am i?
```

```
id
```

```
whoami
```

Getting the context

What's in my directory?

ls

Getting the context

What am I connected to?

```
uname -a
```


Getting the context

What am I connected to?

```
ip a
```

Read the f(ancy|ucking) manual

Almost all commands display help when you type:

```
man bash
```

or

```
bash --help
```

Moving around directories

```
cd /home/louis # Change Directory  
cat, xxd, head, tail, diff, less  
mkdir  
touch, rm  
cp  
mv  
nano, vim
```

Ownership and permissions

Use the **sudo** prefix to execute the command as the superuser (admin).

```
sudo  
chmod  
chown
```

Finding files

```
find  
locate  
which  
grep # Find inside a file
```

Piping



You can pipe commands together and use the output of a command into another command:

```
grep -v '#' main.py | wc -l
```

Stream redirection

- two primary streams: stdin (input) and stdout (output)

```
echo 'hello' > summary.txt
```

```
base64 -w 0 < summary.txt > summary.txt.b64
```

Installing programs (Debian/Ubuntu)

```
apt update # download packages information  
apt install vim
```


Compressing and archiving

```
tar xvf archive.tar.gz  
gzip -d archive.gz  
unzip archive.zip
```

Never forgetti

If you forget a command that you already typed, check your history!

```
history  
history | grep 'ssh'
```

You can also use Ctrl+R to search in your history directly from the command line.

Networking

```
ping # send ICMP requests  
nc # raw TCP sessions  
ssh # Secure SHell  
curl # send HTTP requests  
wget # send HTTP requests  
traceroute # see the route of a TCP packet to a given host  
nslookup # send DNS requests  
dig # send DNS requests
```

Processes

```
ps # list all processes
```

```
pstree # list all processes with parents/children
```

```
systemctl # service manager
```

Bash scripting

```
for offset in {1..100}
do
    curl http://images.amazing.school/?image=$offset
done
```

- **EVERYTHING** is a file
 - e.g. keyboard events are accessible @ `/dev/input/event0`, the brightness of your screen @ `/sys/class/backlight`
- a file is a collection of data stored in one unit

Going further

- *The Missing Semester of Your CS Education* at <https://missing.csail.mit.edu/>