Getting Started with GNU/Linux (Attempt 2)

Bayview Computer Club - Meeting #3, October 24th, 2018

At the beginning, there was UNIX.

Before people each had their own computers, universities would each have a large mainframe computer.

These computers typically ran UNIX, an early operating system. UNIX influenced essentially all modern operating systems.

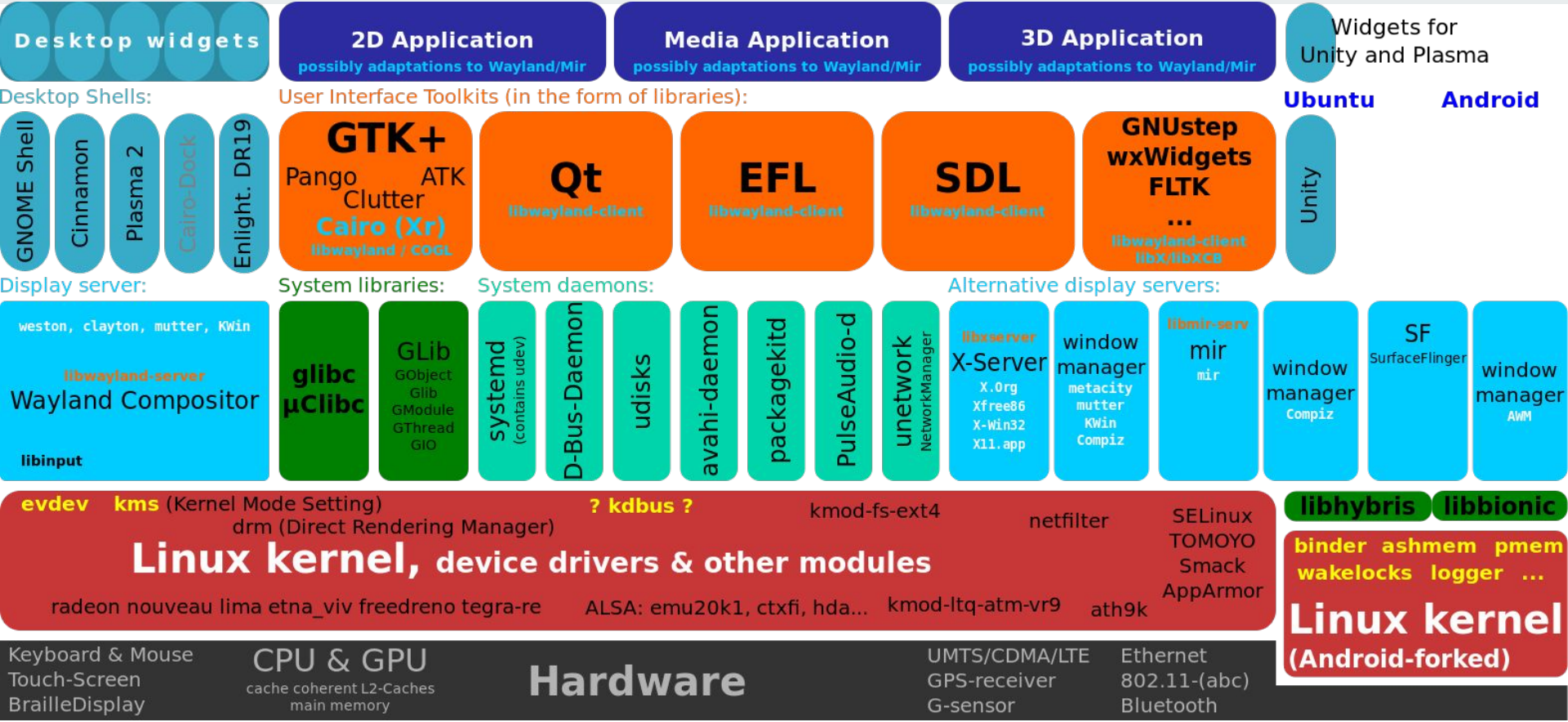
Students in the university would connect to this large mainframe using their own terminal, and would be able to then do all their computational needs.

Communities started to form around these mainframes (and eventually the mainframes in different universities would be connected together using the ARPANET, an early version of the internet).

What is Linux?

- It is a kernel
- The base for operating systems to be developed on
- Abstracts core functions to allow software to run on top without directly touching the hardware

- You can also refer to Linux as the entire “system”, with all of the other components creating the operating system, however the correct way to refer to the full system is GNU/Linux



AAAAAAAAAAAAAAAAAA… no you don’t need to memorize this

GNU and the Userspace

- Back in the day there was UNIX…
- The GNU project implements the so-called UNIX userspace.
  - These are the fundamental pieces that run on the Linux kernel, and make a computer useful.
- The userspace is the collection of applications that make up an operating system (on the kernel)

Without Linux, GNU is pretty useless. Without GNU, Linux is pretty useless.

They work together! You will be using the GNU coreutils and various applications on our server.

What is the server for, anyway?

- Getting to know UNIX/POSIX
- Using the terminal/bash
- Coding! C++, Web Sites
  - You'll make your own personal website!
- And more… You can do pretty much whatever you want, too!

You will get a personal account on the Linux server, and it will be an integral part of the club.

We will give you pretty much free reign to do whatever you want… just please don't break the server!

Let’s Get Started!

Time to Connect!

Commands:

```
ssh YOUR_USERNAME@10.240.73.206
```

Password is 1234

Welcome to bash!

The best shell language. Period.

What is a shell?

The shell is the part of the userspace that your interact with. It is a wrapper, or a shell, around the kernel and rest of the userspace (ie. all your files, commands/programs, etc)

The most common shell program is bash, and that is what we are using.

Bash is just another program on a GNU/Linux system.

First things first... let's change your password.

Since you are now at a bash prompt, you can type commands to do whatever you want.

The first thing we will do is change your password. Type the following command in, then press enter.

passwd

It will prompt for a password. Type a password in, but note that **you will not see anything type in. This is normal and how password prompts in the terminal act.**

Where am I?

Like on any computer, there are files and folders. When you first logon to the server, you are placed in your home.

“~” - The tildae represents your home. This is the beginning of where you can place files and folders.

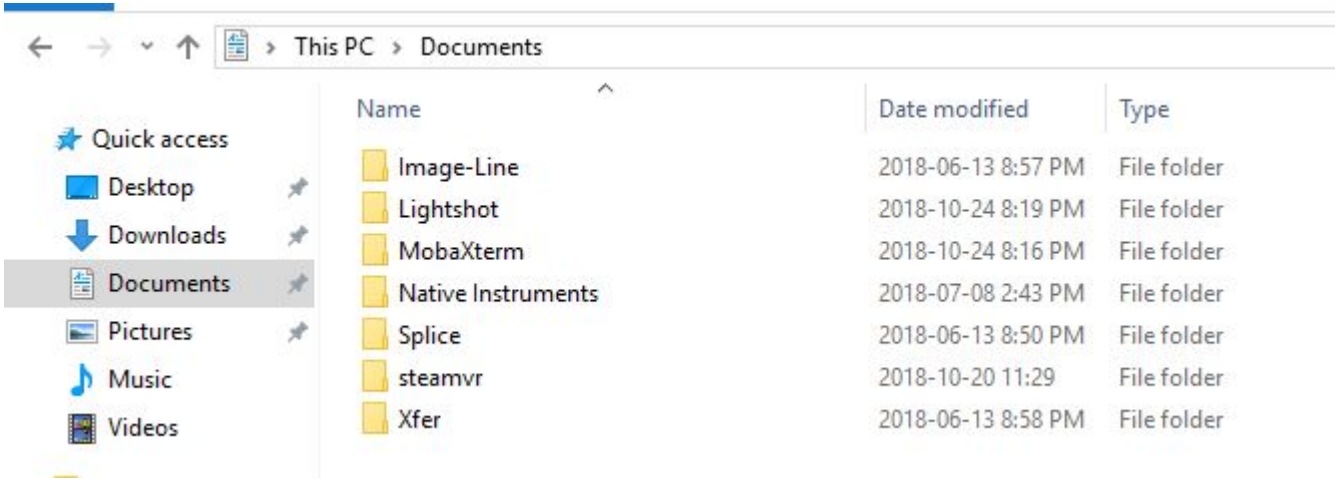
Try this:

```
ls
```

Terminal

```
[2018-10-24 20:17.47]  /mnt/c/Users/Devin/Documents
[Devin.DESKTOP-TOC2RR3] ▸ ls    <-- command
Image-Line          My Pictures         Splice              steamvr
MobaXterm           My Videos           Xfer
My Music            Native Instruments  desktop.ini
```

File Explorer



Making files.

As you know, make files and documents is a pretty important thing to do. Most of us are used to opening up something like notepad to write documents.

Let’s make our first text document! Run the following command:

nano hello.txt

You will be greeted with a new screen. What just happened? Well, the first part of the command launched “nano”, a terminal based text editor. The second part is an argument. It told nano to open and create a new file, hello.txt.

Using Nano

Using nano is pretty simple. Just type whatever you want, and use the arrow keys to move the cursor around.

Try typing in something like “Hello world!”.

When you are ready to save and quit, Press the Control Key and X together. On the bottom you will see nano confirming to save. Press “y” to save, or “n” to not save.

nano

To save the file, press **Control - X**, and confirm (**y**).

Think of **nano** as being similar to **notepad** in Windows, or **TextEdit** in macOS.

Looking at the file

Now try “ls”, and notice a new file has showed up!

ls

You can print out the contents of a file using “cat”. Nothing to do with the pet, however!

cat hello.txt

Making folders (and getting around)

We already made a file, now let's make some folders!

mkdir test

```
[ 0 20:48:42 seshpenguin ~ ] $ mkdir test
[ 0 20:48:44 seshpenguin ~ ] $
```

Like when we used nano, the "mkdir" takes an argument, in this case a name of the folder. Now, let's go to that folder (think: double clicking on the folder icon). "mkdir" has no output.

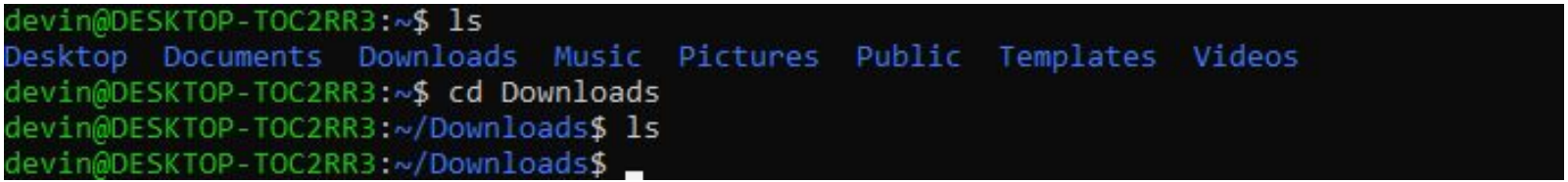
cd test

"Cd" (or change directory), will move us into the new folder. Notice how the bash prompt now has the folder we are in. This lets you know how what folder you are in.

Moving around

cd [directory]

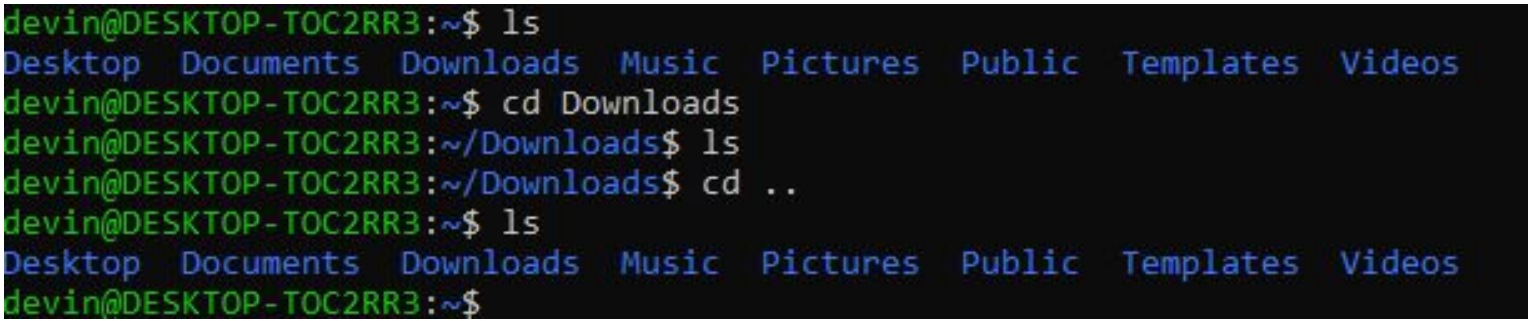
This command allows you to change your location (move between folders).



Moving up a Directory

cd ..

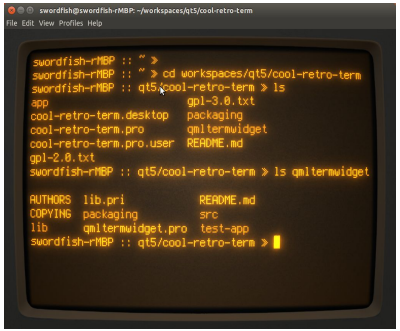
To move up a directory, we can use “..”

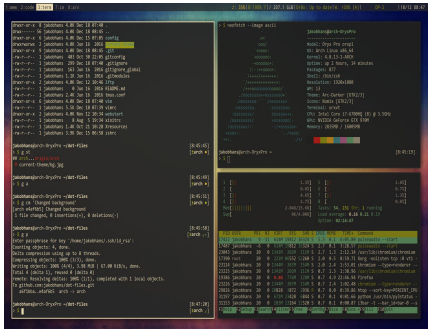


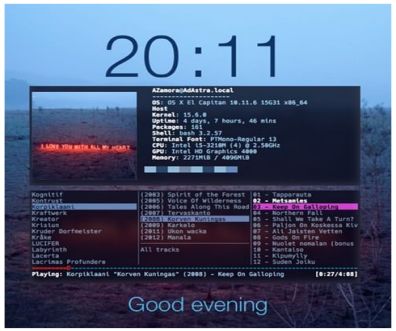
The terminal is not outdated and archaic…

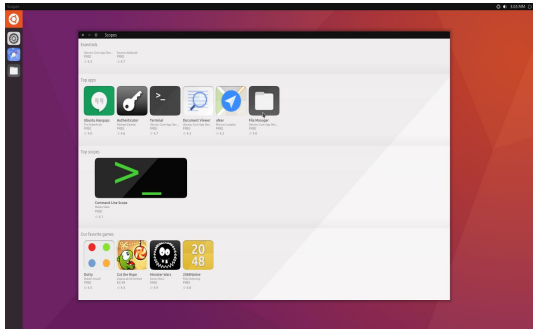
It's actually very powerful, and power users use it all the time in place of standard GUI tools. Of course, Linux does not lack a GUI. Also, you'll be 10x cooler but not actually

Linux's flexibility comes from the shell in conjunction with a GUI. In the future we will tinker with X11 for running graphical applications.









One last thing...

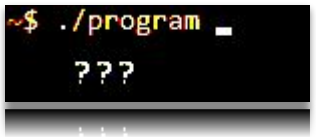
Run these commands:

wget https://hastebin.com/raw/oxukotecan

mv oxukotecan program.cpp

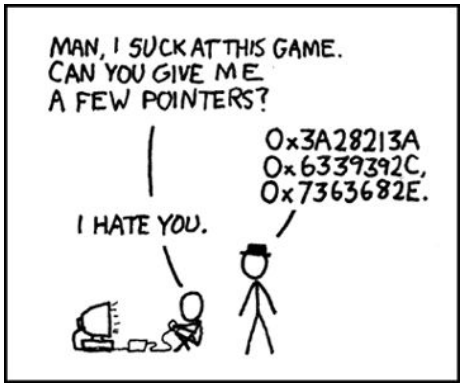
make program

./program

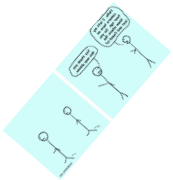


What did we just do?

Stay tuned for next week! We will begin diving into C++ and coding! 🔥




```
while (true)
{
  this.suck();
}
```



Accessing outside of school

If you want to be able to connect to the server from outside of school, we are working on it!

By next meeting, we will tell you how to get connected from outside of the school, so you can access your account from anywhere.

This will be pretty cool when we start making websites!

Overview

“ls” - List all files/folders

“nano filename” - Edit a file

“cat filename” - Print the contents of a folder.

“cd directory” - Move to a folder/directory

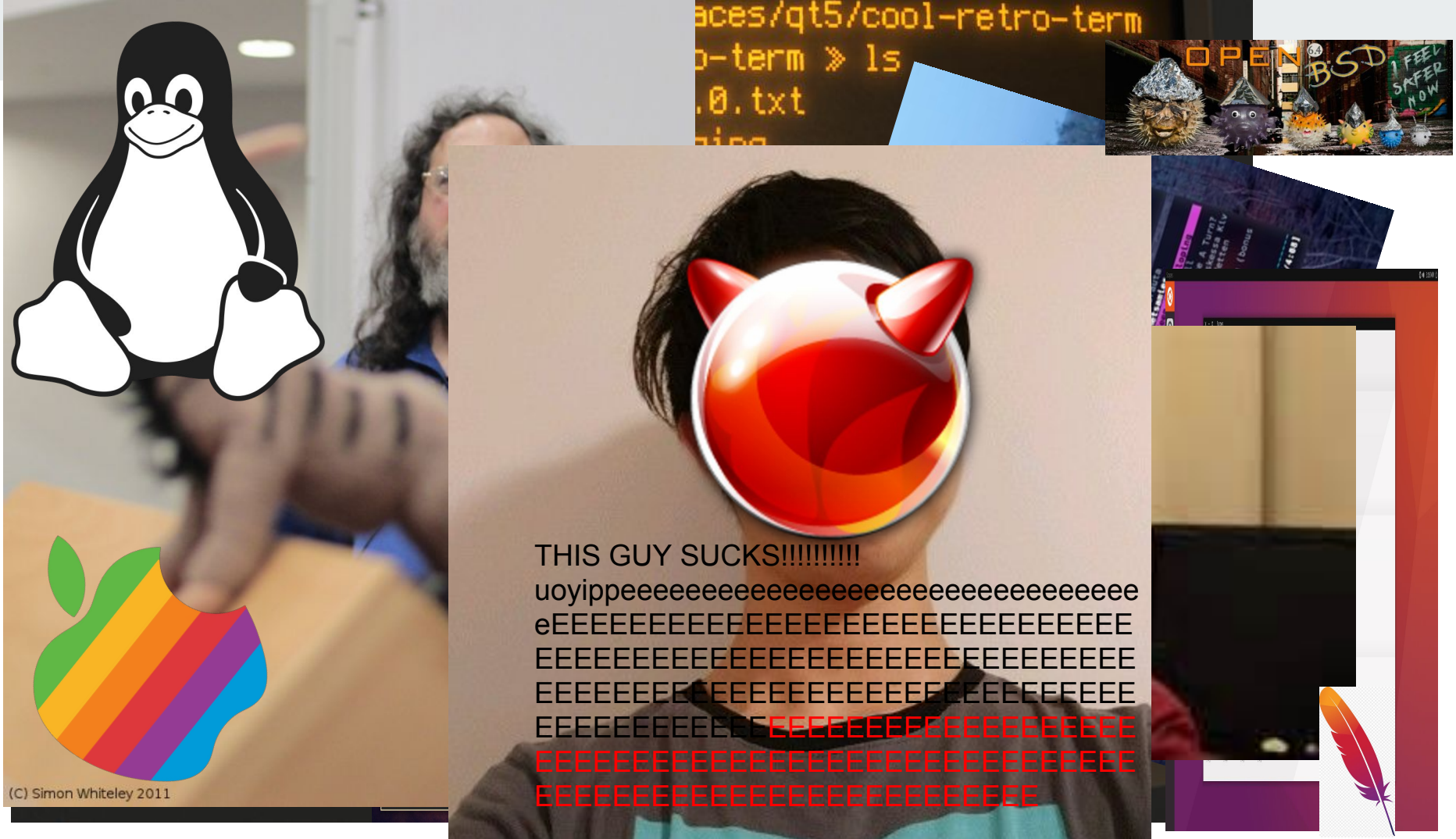
“mkdir directory” - Make a directory

Google “Linux BASH Commands” for more commands!

That’s all for this week!

- Next week we will continue with the Linux server. After that, we will get started with C++!
- Later on, you will be making your own website!

And don’t forget, you don’t need to do exactly what we are doing up here… Feel free to chill and do whatever computer-related things you want. And hey, you get access to a Linux server so you can do all sorts of stuff.


aces/qt5/cool-retro-term
o-term » ls
.0.txt
OPEN BSD
I FEEL SAFER NOW
THIS GUY SUCKS!!!!!!!!!!
uoyippeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
eEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE
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