Linux

July 7th 2017

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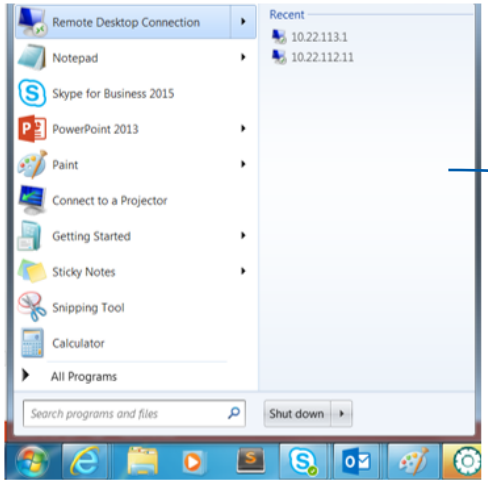
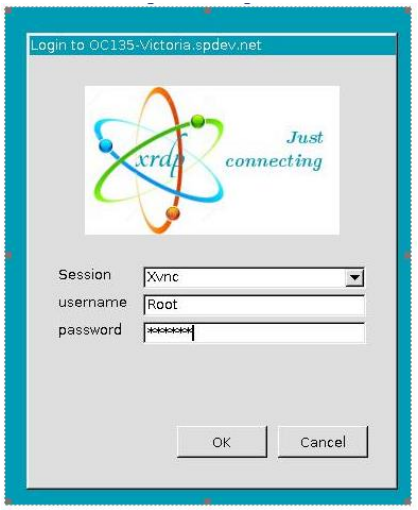
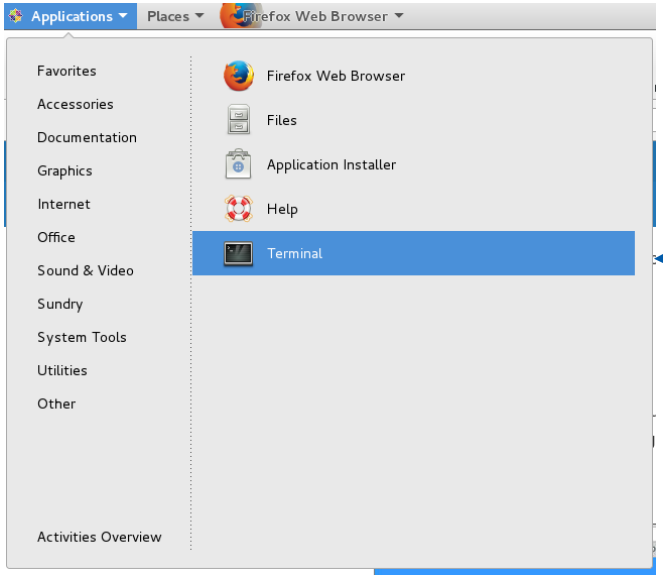
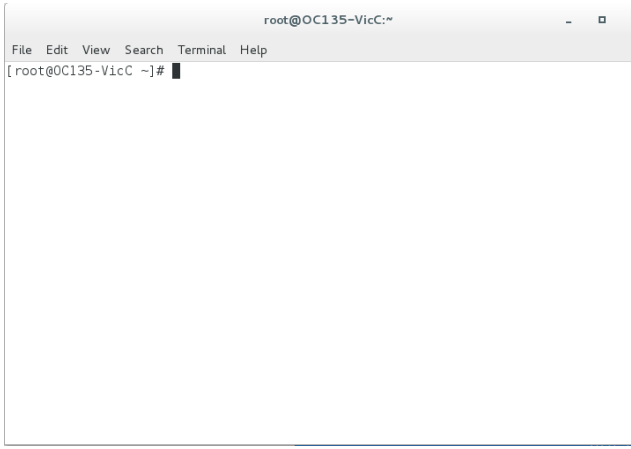
Getting to your linux terminal









Overview

What is Linux?
It is a UNIX based operating system.

How do I use Linux?
You type commands into a terminal that does things for you

What commands do I need to know from Linux?
You really only need 3 cd, ls, and vi to navigate and create files within your own filesystem for the purpose of a webapp.
There are others tho like rm, mv, cat, pwd, touch, ps –ef, netstat –tulpn, etc. but you will probably discover these on your own as you ask yourself questions about what you need.

How do I install things on Linux?
Sudo apt-get install <insert thing to install here> or yum install for CentOS

What do I do when linux won't let me do stuff?
Sudo or you could change the permissions with chmod, chown and such but probably just sudo should suffice since you all have root access to your virtual machines.

Why Linux?
Windows isn't the best. But if you really want to know here's a good article:
http://www.techrepublic.com/blog/10-things/10-things-linux-does-better-than-windows/

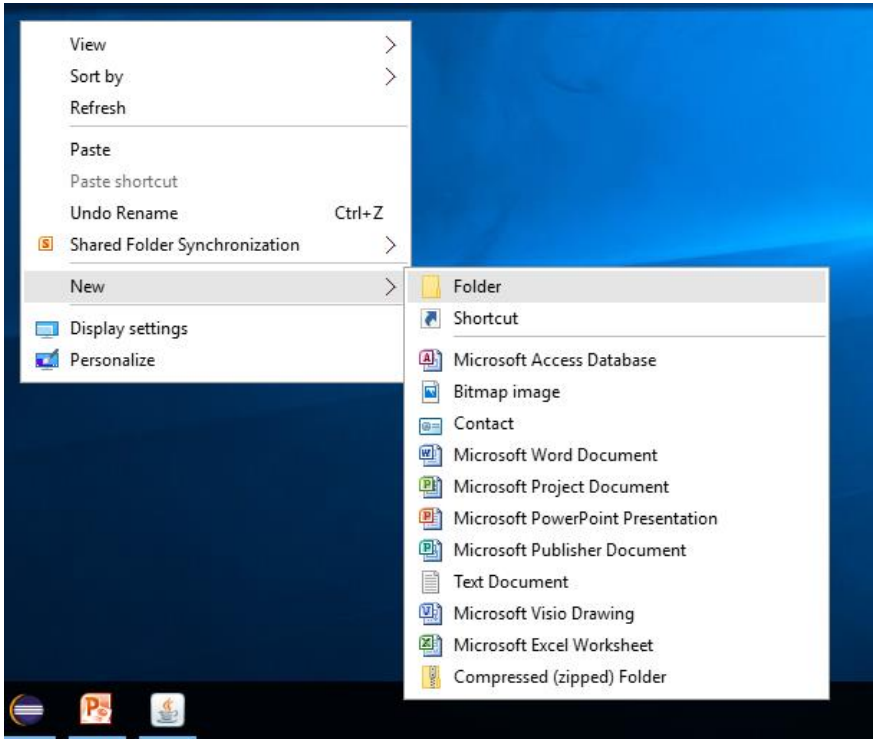
A simple follow along tutorial on linux

- How do I navigate my file system?
  - Commands covered:
    - cd
    - ls
    - vi
    - rm
    - mv
    - mkdir
    - touch
    - man
- How do I install stuff?
  - Commands covered:
    - Apt-get install
    - Apt-get purge
    - Apt-get remove
    - Apt-get update
    - Apt-get upgrade
    - Sudo
    - Pwd
    - Ctrl-c,ctrl-z,ctrl-d
- How do I get more points on my next CyberPatriot competition involving linux?
  - Commands covered:
    - netstat –tulpn
    - ps-ef
    - | less
    - cat
- How do I do fancy stuff like shell scripts, bashrcs, vimrcs, and cronjobs, and what do all these filenames mean
  - Commands covered
    - Cron?
    - tmux?
- How do I customize my terminal?
  - Commands covered
    - Alias
    - Bashrcs
    - Apt-get install sl

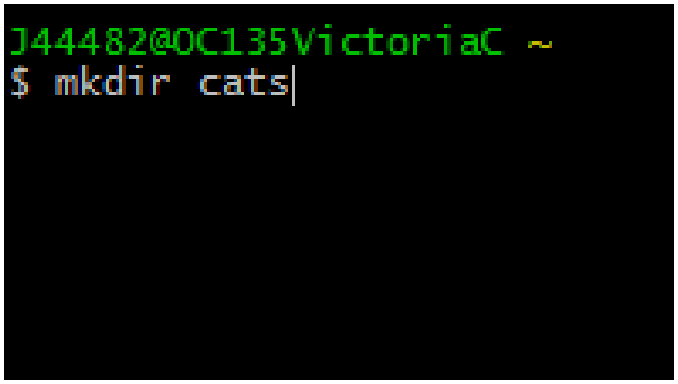
Navigating your file system.

mkdir- make a directory

Windows



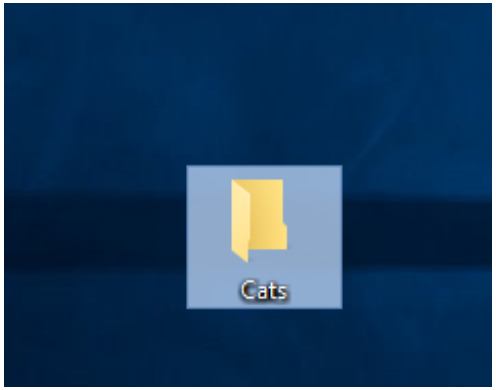
Linux

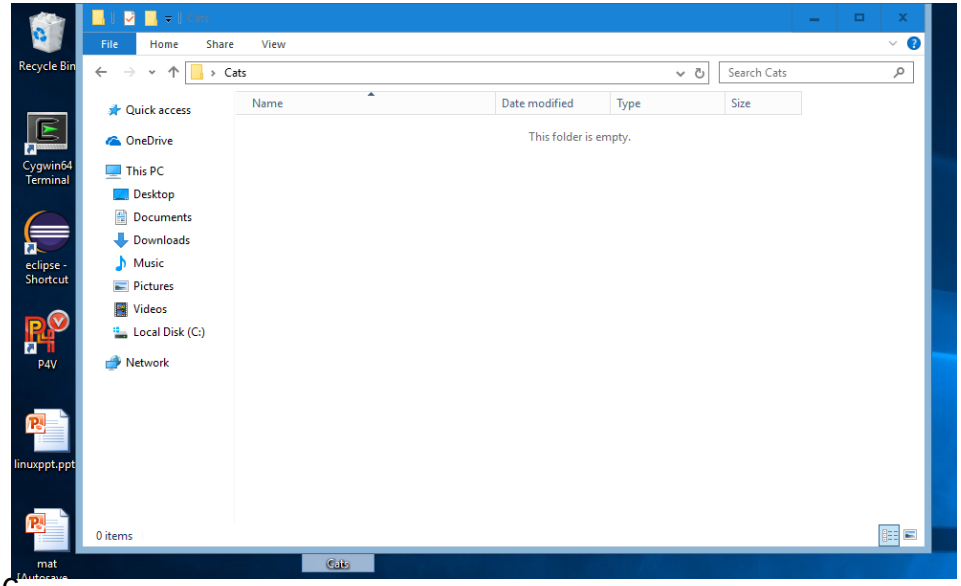


Navigating your file system.

cd- enter a directory

Windows





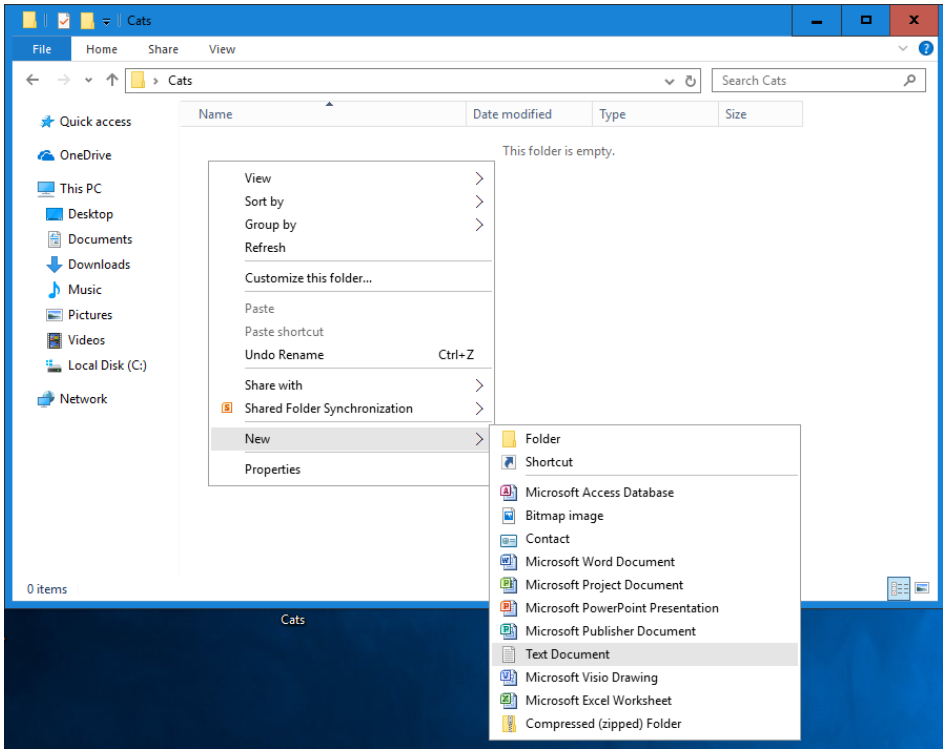
Linux

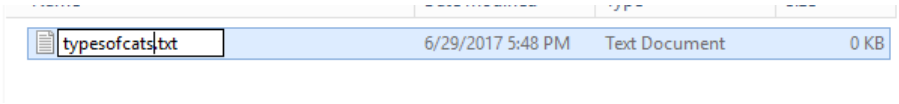
```
J44482@OC135VictoriaC ~
$ cd cats

J44482@OC135VictoriaC ~/cats
$
```

Navigating your file system.

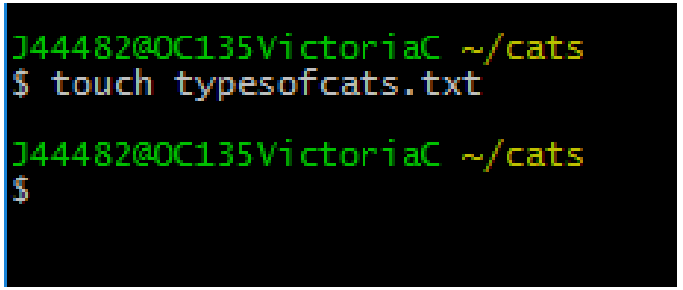
Touch- creating a file

Windows





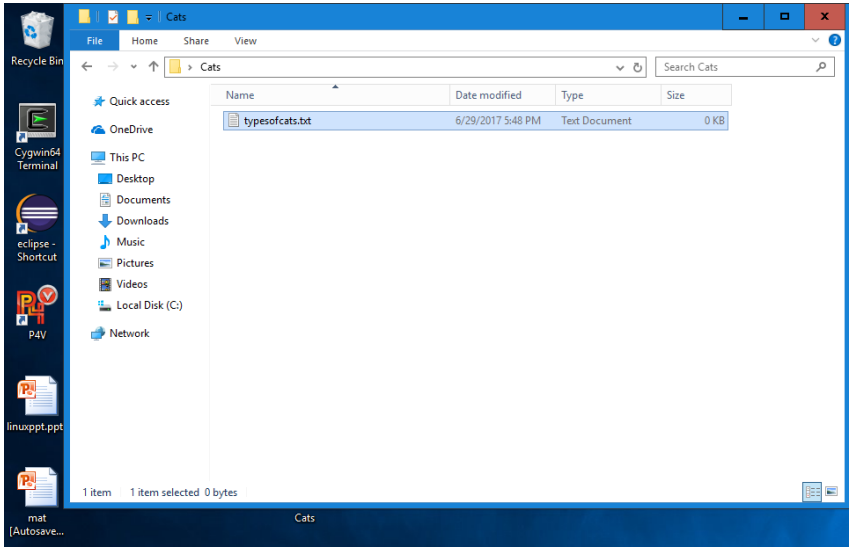
Linux



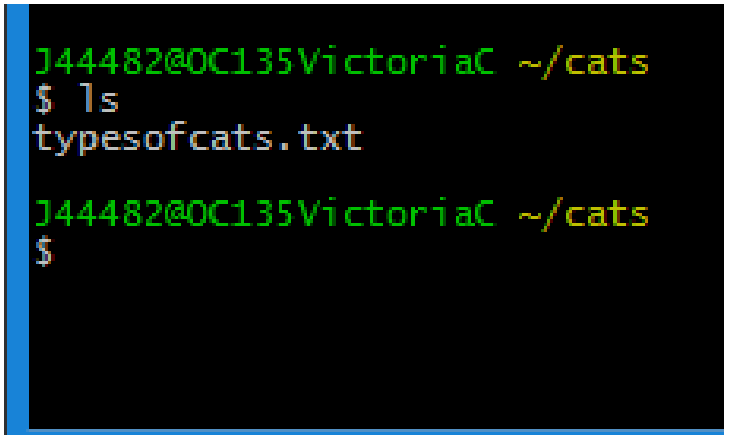
Navigating your file system.

ls- see what is inside a directory

Windows



Linux

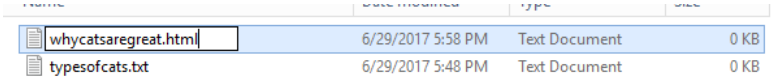


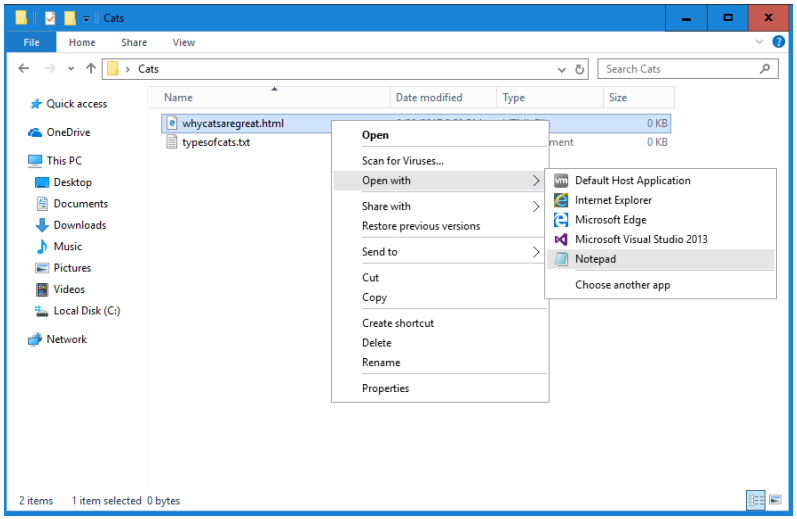
Navigating your file system.

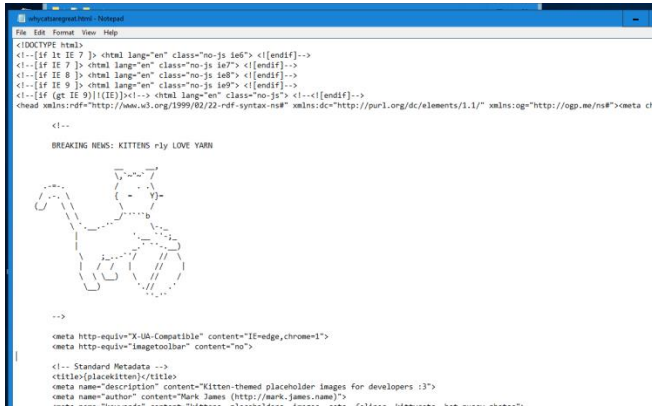
vi-make,edit, save a file

You can substitute vi with gedit, nano, emacs, etc.

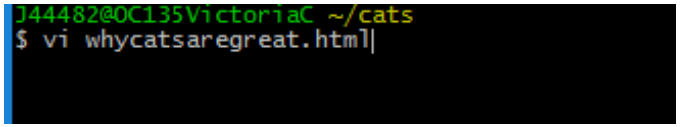
Windows

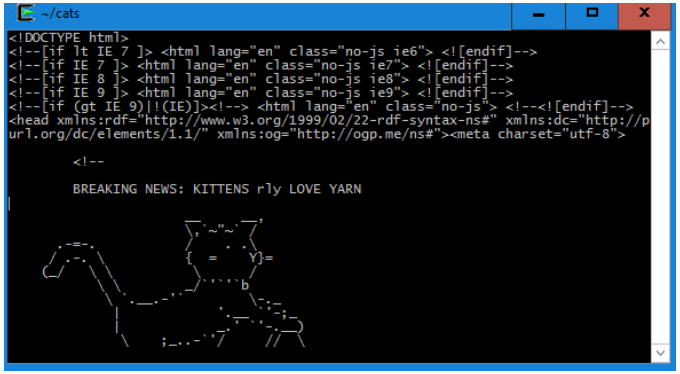






Linux





A short detour to vim

Vi/m is a text editor sort thing that is somewhat wonky. However, I strongly urge you to learn it because it is highly customizable and when you customize it and master it you will be able to code much faster.

Vim has an insert mode.
You press “i” and then you can type, but unless your vim is customized you wont be able to use arrow keys and your backspace will be wierd.

When you are done typing press escape and you will be able to use arrow keys again and you can press x to delete things you don’t like and dd to delete entire lines

Other ways to enter insert mode include
a- puts you in insert mode in the space after the cursor
o-puts you in insert mode in the space under your cursor

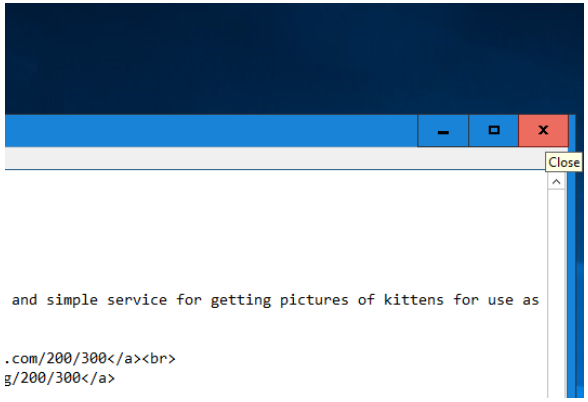
When you are done and need to save and quit, press escape to get out of insert mode and then type “:wq”. You can also just save with “:w” or just quit with “:q” if you don’t want to save your changes you can exit with “:q!” you may have to do so anyway because vim won’t let you quit without telling it whether or not you are going to save your changes.

Of course vim is the superior text editor, but if you really hate it, you can always use nano, gedit, or any other text editor available to you.

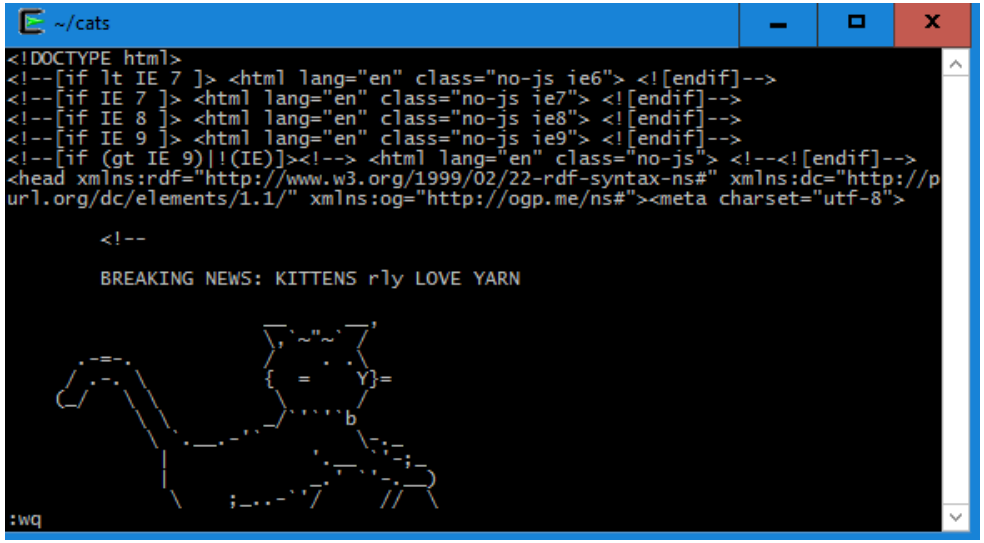
Navigating your file system.

ESC-:wq(not a terminal command)- saving and exiting your text editor

Windows



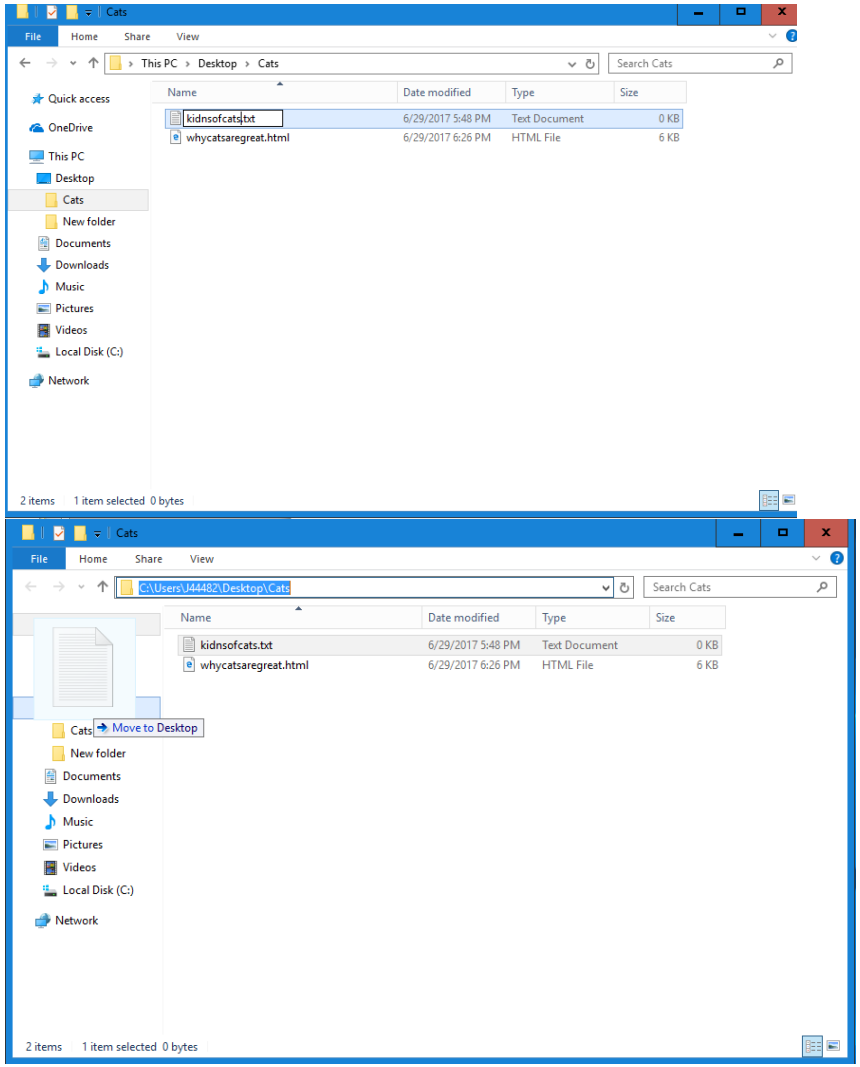
Linux



Navigating your file system.

mv: moving your file/renaming your file

Windows



Linux

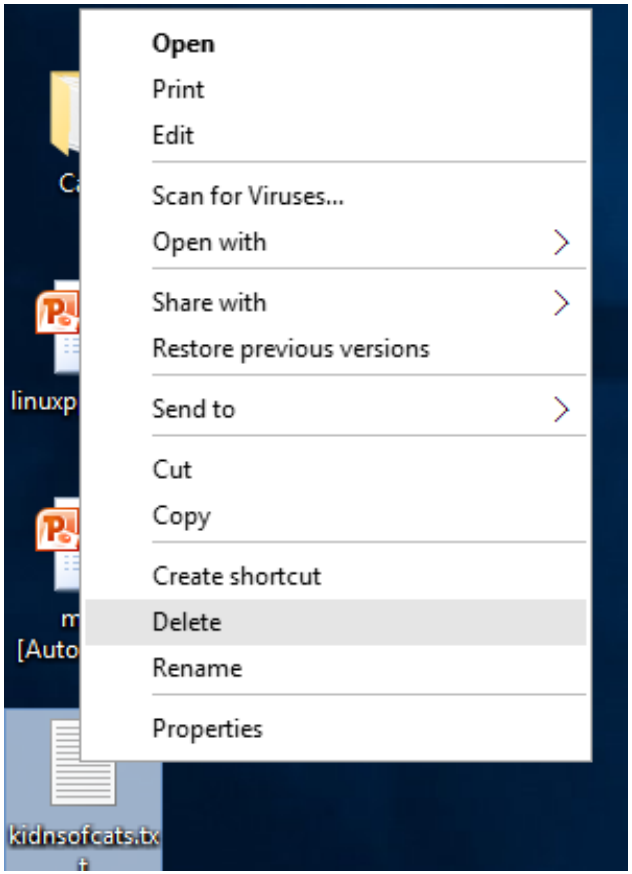
```
J44482@OC135VictoriaC ~/cats
$ mv typesofcats.txt kindsofcats.txt

J44482@OC135VictoriaC ~/cats
$ ls
kindsofcats.txt  whycatsaregreat.html
```

```
J44482@OC135VictoriaC ~/cats
$ mv kindsofcats.txt ../

J44482@OC135VictoriaC ~/cats
$ ls
whycatsaregreat.html

J44482@OC135VictoriaC ~/cats
$ cd ..

J44482@OC135VictoriaC ~
$ ls
cats  kindsofcats.txt
```

Navigating your file system.

rm: remove things

Windows



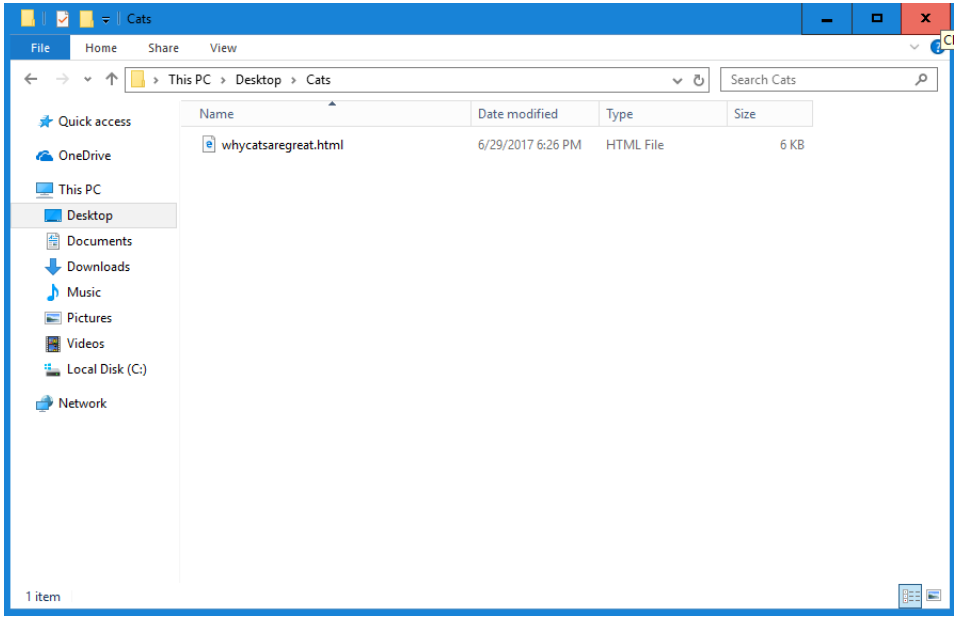
Linux

```
J44482@OC135VictoriaC ~
$ ls
cats  kindsofcats.txt

J44482@OC135VictoriaC ~
$ rm kindsofcats.txt

J44482@OC135VictoriaC ~
$ ls
cats

J44482@OC135VictoriaC ~
$
```

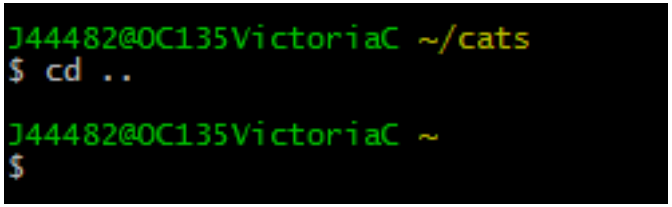
Navigating your file system.

cd..: Getting out of a file

Windows



Linux



Another useful thing

Now try removing the directory you made earlier with rm?
Doesn't work right?
Now run a man rm and this should show up

```
~
RM(1)                          User Commands                          RM(1)

NAME
       rm - remove files or directories

SYNOPSIS
       rm [OPTION]... [FILE]...

DESCRIPTION
       This  manual  page  documents  the  GNU version of rm.  rm removes each
       specified file.  By default, it does not remove directories.

       If the -I or --interactive=once option is given,  and  there  are  more
       than  three  files  or  the  -r,  -R, or --recursive are given, then rm
       prompts the user for whether to proceed with the entire operation.   If
       the response is not affirmative, the entire command is aborted.

       Otherwise,  if  a file is unwritable, standard input is a terminal, and
       the -f or --force  option  is  not  given,  or  the  -i  or  --interac-
       tive=always  option is given, rm prompts the user for whether to remove
       the file.  If the response is not affirmative, the file is skipped.
```

Scroll Down and this should show up →

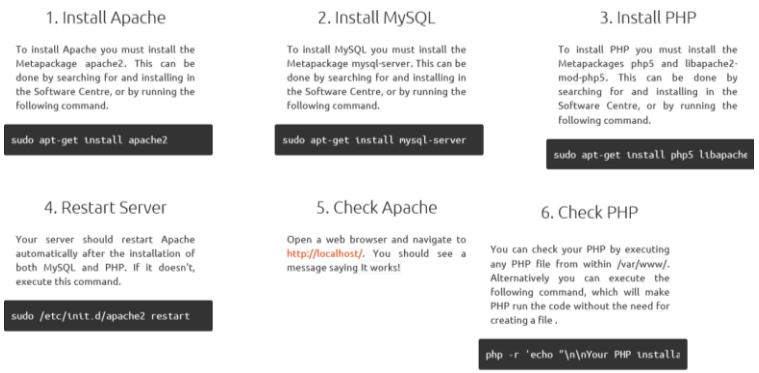
We now see that we can use rm –r to recursively delete
A folder and all the things inside it.

Try it!

```
OPTIONS
       Remove (unlink) the FILE(s).

       -f, --force
              ignore nonexistent files and arguments, never prompt

       -i     prompt before every removal

       -I     prompt once before removing  more  than  three  files,  or  when
              removing recursively; less intrusive than -i, while still giving
              protection against most mistakes

       --interactive[=WHEN]
              prompt according to WHEN: never,  once  (-I),  or  always  (-i);
              without WHEN, prompt always

       --one-file-system
              when  removing  a hierarchy recursively, skip any directory that
              is on a file system different from  that  of  the  corresponding
              command line argument

       --no-preserve-root
              do not treat '/' specially

       --preserve-root
              do not remove '/' (default)

       -r, -R, --recursive
              remove directories and their contents recursively

       -d, --dir
              remove empty directories

       -v, --verbose
              explain what is being done

       --help display this help and exit

       --version
              output version information and exit

       By default, rm does not remove directories.  Use the --recursive (-r or
       -R) option to remove each listed directory, too, along with all of  its
       contents.

       To  remove a file whose name starts with a '-', for example '-foo', use
       one of these commands:

              rm -- -foo

              rm ./-foo

       Note that if you use rm to remove a  file,  it  might  be  possible  to
       recover  some  of its contents, given sufficient expertise and/or time.
       For greater assurance that the contents are truly  unrecoverable,  con-
       sider using shred.
```

Installing stuff

Ubuntu: Apt-get install



CentOS: yum install

```
[root@0C135-VicC ~]# yum install httpd mysql-server php php-mysql
Loaded plugins: fastestmirror, langpacks
base                                                     | 3.6 kB     00:00
extras                                                   | 3.4 kB     00:00
nux-dextop                                               | 2.9 kB     00:00
updates                                                  | 3.4 kB     00:00
(1/3): nux-dextop/x86_64/primary_db                        | 1.6 MB   00:00
(2/3): updates/7/x86_64/primary_db                         | 7.7 MB   00:07
(3/3): extras/7/x86_64/primary_db                          | 188 kB   00:07
Determining fastest mirrors
 * base: centos.mbni.med.umich.edu
 * epel: archive.linux.duke.edu
 * extras: centos-distro.cavecreek.net
 * nux-dextop: li.nux.ro
 * updates: centos-distro.lgservers.com
No package mysql-server available.
Resolving Dependencies
--> Running transaction check
---> Package httpd.x86_64 0:2.4.6-45.el7.centos.4 will be installed
--> Processing Dependency: httpd-tools = 2.4.6-45.el7.centos.4 for package: httpd-2.4.6-45.el7.centos.4.x86_64
--> Processing Dependency: /etc/mime.types for package: httpd-2.4.6-45.el7.centos.4.x86_64
---> Package php.x86_64 0:5.4.16-42.el7 will be installed
--> Processing Dependency: php-common(x86-64) = 5.4.16-42.el7 for package: php-5.4.16-42.el7.x86_64
--> Processing Dependency: php-cli(x86-64) = 5.4.16-42.el7 for package: php-5.4.16-42.el7.x86_64
---> Package php-mysql.x86_64 0:5.4.16-42.el7 will be installed
--> Processing Dependency: php-pdo(x86-64) = 5.4.16-42.el7 for package: php-mysql-5.4.16-42.el7.x86_64
--> Running transaction check
---> Package httpd-tools.x86_64 0:2.4.6-45.el7.centos.4 will be installed
---> Package mailcap.noarch 0:2.1.41-2.el7 will be installed
---> Package php-cli.x86_64 0:5.4.16-42.el7 will be installed
---> Package php-common.x86_64 0:5.4.16-42.el7 will be installed
--> Processing Dependency: libzip.so.2()(64bit) for package: php-common-5.4.16-42.el7.x86_64
---> Package php-pdo.x86_64 0:5.4.16-42.el7 will be installed
--> Running transaction check
---> Package libzip.x86_64 0:0.10.1-8.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

================================================================================
 Package            Arch         Version                    Repository     Size
================================================================================
Installing:
```

Other stuff you need to know

Deleting:
Apt-get purge
Apt-get remove

Updating (ask first?):
Apt-get upgrade
Apt-get update

Starting and stopping:
Service thing start
Service thing stop

Miscellaneous:
Pwd- shows you where you are in the file system
Ctrl-c, ctrl-d, ctrl-z – stop stuff
When in doubt restart your terminal

CyberPatrioting

sudo netstat –tulpn- gives you a list of things that are running

Ps –ef- gives a list of tasks, like task manager on windows

Kill- kill a task

|less –lets you read files with a lot of text with ease

Cat: prints all the stuff on a file, use with pipe to less → cat file |less

And of course all the commands you learned so far.

Cyberpatrioting

Okay, I kinda lied about getting more points in cyberpatriots. These are just more commands that may be useful to you.

There is no singular command you can use to earn more points in CyberPatriot although you probably already knew that

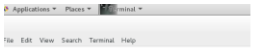
So to make up for that, here is the complete list of all the linux things we did when I was a CyberPatriot take a look at it on your own time:

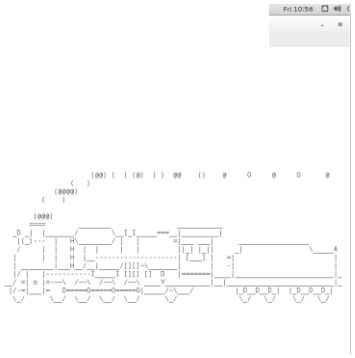
Fancy stuff

Cronjobs- jobs linux does daily
Scripting-
Quick demo:
vi midnightTrain in your cronjobs.daily

```
File  Edit  View  Search  Terminal  Help
a=0
while [ "$a" -lt 100 ]    # this is loop1
do
    sl
done
```

Chmod 755 ./midnightTrain
Crontab –e
Change * * * * * to 0 0 * * * path to file to be executed
Will execute at midnight 100 times





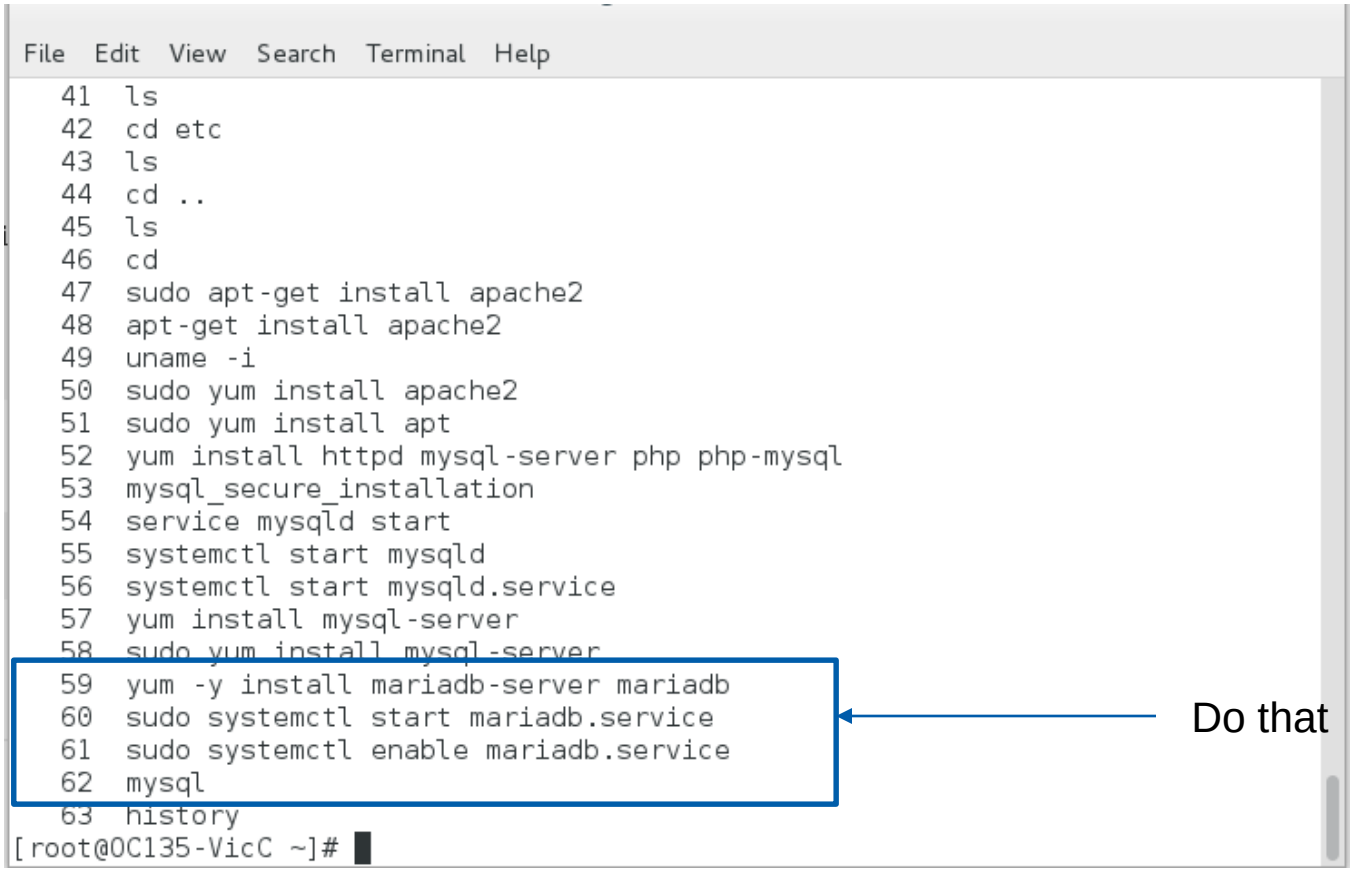
Fancy stuff

Bashrcs- configuration stuff found in your home folder
Edit to set permanent aliases, change the thing that's always there before your commands in the terminal bash prompt? I think it's called and do other cool stuff you should research on your own

Vimrc- configure your vim things. Look online for good examples. Can also make you look like a linux master.

Tmux- the terminal that allows you to terminal while you terminal more terminals
Learn it for fun, and to look like a linux master in college

Database Set up



Database Demo: create and show database

```
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 3
Server version: 5.5.52-MariaDB MariaDB Server

Copyright (c) 2000, 2016, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> show databases
    -> ;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| test               |
+--------------------+
4 rows in set (0.00 sec)

MariaDB [(none)]> create database demoDatabase
    -> ;
Query OK, 1 row affected (0.00 sec)
```

Database Demo: putting stuff into your database

```
MariaDB [(none)]> use demoDatabase
Database changed
MariaDB [demoDatabase]> select cats
    -> ;
ERROR 1054 (42S22): Unknown column 'cats' in 'field list'
MariaDB [demoDatabase]> select *
    -> ;
ERROR 1096 (HY000): No tables used
MariaDB [demoDatabase]> CREATE TABLE CUSTOMERS(
    ->    ID   INT              NOT NULL,
    ->    NAME VARCHAR (20)     NOT NULL,
    ->    AGE  INT              NOT NULL,
    ->    ADDRESS  CHAR (25) ,
    ->    SALARY   DECIMAL (18, 2),
    ->    PRIMARY KEY (ID)
    -> );
Query OK, 0 rows affected (0.01 sec)

MariaDB [demoDatabase]> INSERT INTO CUSTOMERS (ID,NAME,AGE,ADDRESS,SALARY)
    -> VALUES (1, 'Ramesh', 32, 'Ahmedabad', 2000.00 );
Query OK, 1 row affected (0.01 sec)

MariaDB [demoDatabase]> select *
    -> ;
ERROR 1096 (HY000): No tables used
MariaDB [demoDatabase]> select * From customers
    -> ;
ERROR 1146 (42S02): Table 'demoDatabase.customers' doesn't exist
MariaDB [demoDatabase]> select * From CUSTOMERS
    -> ;
+----+--------+-----+-----------+---------+
| ID | NAME   | AGE | ADDRESS   | SALARY  |
+----+--------+-----+-----------+---------+
|  1 | Ramesh |  32 | Ahmedabad | 2000.00 |
```

Database Demo: exiting the database

```
MariaDB [demoDatabase]> exit
Bye
```

Tips for database design

Design it first before making it

Draw the charts and tables if needed

Ask questions like:
What do I need to store,
How do I plan to design the tables (what information to store together, what information to store separately),
Do I need to assign ids to the things I am storing? (ex: usernames and passwords although this is kind of insecure so probably don’t do it (if you are given a database to work with and you see things like qid, pid, they are probably ids for the information in that row))

MySQL is literally just charts and tables that your program can read.

Customization

Alias and Sl

Alias allows you to choose what commands do. You can alias cd to ls for example and your cd will now do what ls does

This understandably causes problems as now you can't change directories, but not to worry you can exit your terminal and come back and as long as you didn't put the alias permanently in your bashrc your terminal should be back to normal.

A fun thing that sometimes happens is when you want to type ls but accidentally type sl. Linux doesn't understand it and will tell you so, making you type the command again which is moderately annoying

But if for whatever reason you want to make your life more difficult than it already is, you can apt-get install sl (with permission of course) which will make an ascii train run across your screen every time you mistype ls to sl.

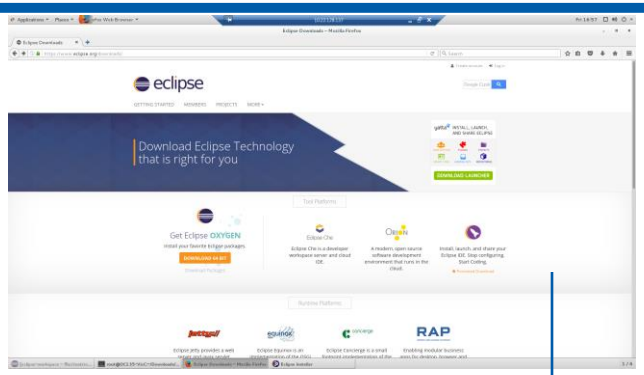
If you want to cause yourself even more pain you can alias ls to sl causing trains to run every time you type sl and ls and also rendering you incapable of listing files in a file directory

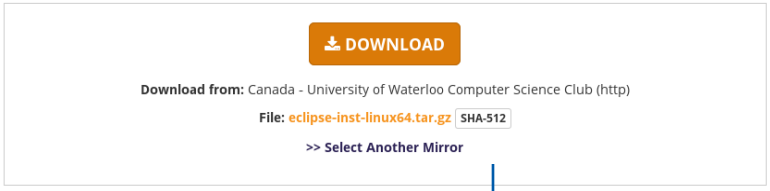
That which can be done to you can be done to others when their computers are unlocked. Lock your computers friends, both here and in college

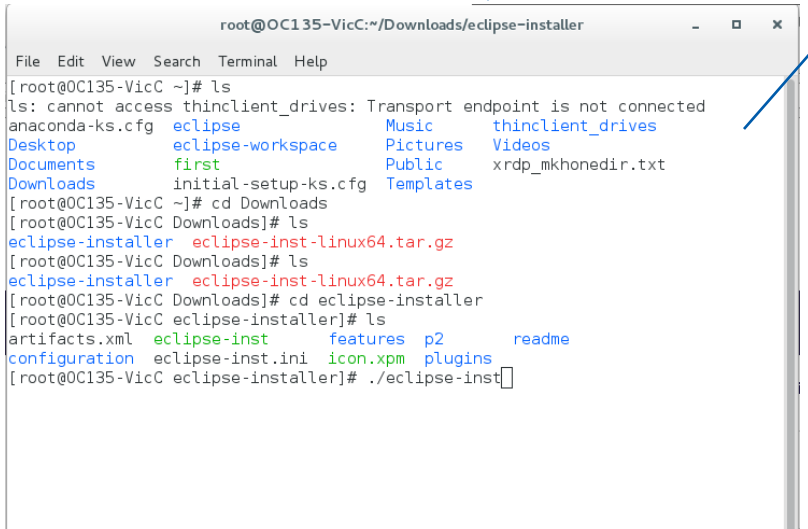
Questions?

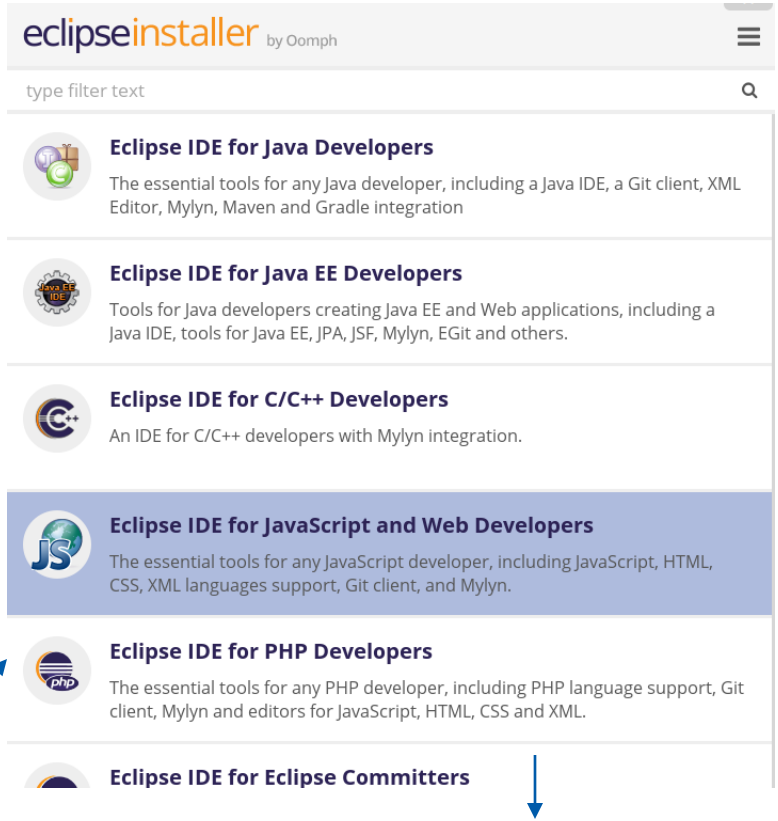
Frank the human boy.
How did you *almost* know my name?!
I have approximate knowledge of many things.
VIA 9GAG.COM

How to install eclipse









Click next install and launch. That should get you to your ide