TEXAS
The University of Texas at Austin

WHAT STARTS HERE CHANGES THE WORLD

Working Remotely

EE 107S: Introduction to Linux

Lecture 3

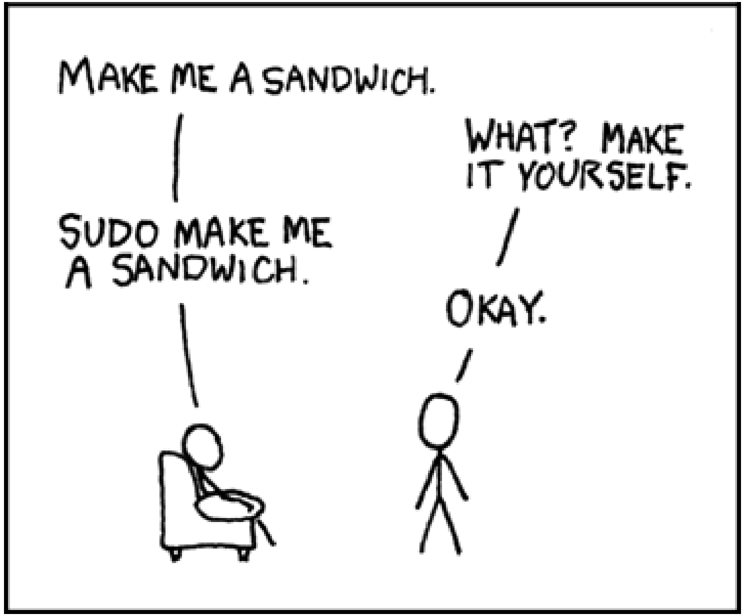
Logging in remotely: `ssh`

- Specify a remote machine to log in to
- Log in using username and password for remote machine
- Can set up special files to allow easier access (SSH keys)

SSH Clients

- Windows: MobaXterm
- macOS: built-in terminal

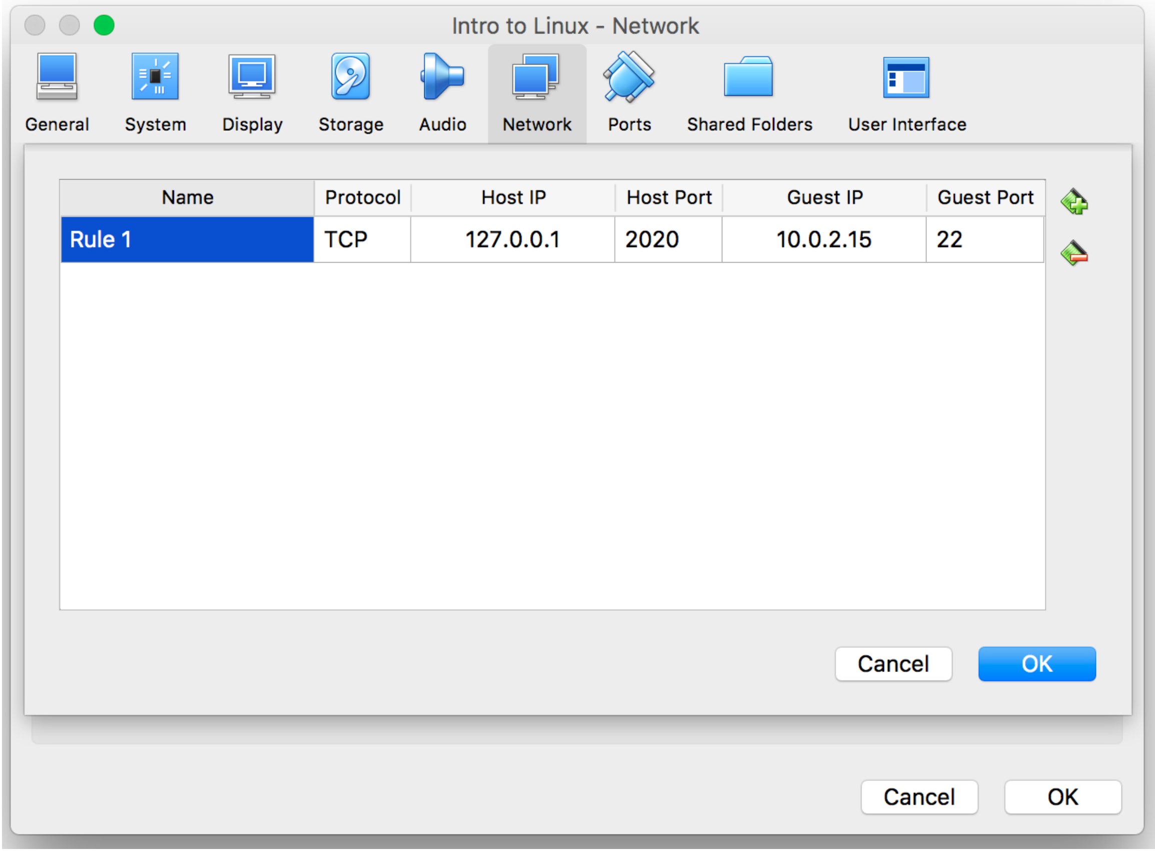
Quick intro to sudo



source: https://xkcd.com/149/

Setting up SSH with VirtualBox

```
sudo apt install openssh-server
ssh chirag@127.0.0.1
ip addr | grep inet
```



Name	Protocol	Host IP	Host Port	Guest IP	Guest Port
Rule 1	TCP	127.0.0.1	2020	10.0.2.15	22

Setting up SSH with VirtualBox

Trimming the fat

- Now that you're becoming command line masters, you don't need the GUI at all!
  - `sudo systemctl disable lightdm`

Transferring files: `scp`

- Arguments are the same as `cp` (`src dest`)
  - Remote machine is specified as: `chirag@127.0.0.1:~/path/to/file`
- `scp` should be run from **local machine**, regardless of direction of transfer
  - Remote path can be `src` (getting file from remote) or `dest` (sending file to remote)

Download a sample C file

```
wget \
    https://raw.githubusercontent.com/vim/vim/master/src/main.c
```

Editing text in a terminal: `vim`

- Fully terminal-based (editing without a mouse?!?)
- Available on most fresh installations of Linux distributions (maybe just `vi`)
  - `sudo apt install vim`

Vim modes

- Normal mode (start off in this mode)
- Insert mode
- Replace mode
- Visual mode
- Ex mode

The Vim mindset

- Commands perform an action
- Motions move the cursor
- In normal mode, enter a series of commands
  - Some commands must be followed by a motion
- It’s not really easy to learn Vim, but once you do you’ll be a better person

Common commands

- `i` - enter insert mode
- `d` - delete (requires motion)
- `x` - delete a single character
- `r` - replace a single character
- `c` - change (requires motion)
- `y` - yank/copy (requires motion)
- `p` - paste

Common motions

- `w` - move forward a word
- b - move back a word
- Preface a motion with a number
  - 3`w` - move forward 3 words

What's going on?

- `ggdG` - delete all the lines in a file
- `0c$` - change the line (also `cc`)
- `di{` - delete everything within curly braces
- `87(ctrl+a)` - increase the next number by 87
- `:%!sort` - sort all the lines in a file

Most basic usage

- `i` - insert mode
- `<ESC>` - return to normal mode
- `:wq` - save and quit

Navigating in normal mode

- `h` - left one character
- `j` - down one line
- `k` - up one line
- `l` - right one character
- The idea is that you don’t need to move your fingers away from the home row to the arrows

Spicing it up

- From normal mode, `d` is a delete command
  - You need to specify a motion for the delete command (i.e. what do you want to delete?)
  - `dj` - delete from the current line and then down one line
- From normal mode, `x` deletes a single character (the same as `dl`)

More insert modes

- Press a to start insert mode one character to the right of the cursor
  - What's the point? You could do `l` then `i`. Efficiency.
- Press A to move to the end of the line and go into insert mode in one command
- Press `I` to move to the start of the line and go into insert mode in one command

History

- `u` - undo
- `ctrl+r` - redo

Searching and replacing

- / - puts you into search mode (just start typing a regex)
  - Case sensitive by default
  - n to go to next match, N to go to previous match
- `:%s/regex/replacement/g` - search and replace
  - Similar to `sed`

Useful resources

- `vimtutor` command
- http://vim-adventures.com/
- Command cheat sheet