

Linux Installation

CIS 2230 Linux System Administration

Lecture 2

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Review

- 2 main threads of UNIX:
- The inventor of Linux is:
- The logo for Linux is:
- How many 'flavors' of Linux? (ballpark)
- Name 2 popular ones:
- What features of Linux makes it a superior OS for servers, even 90% of the world's supercomputers, including IBM's Watson?
- Name 2 elements of the Unix Philosophy?
- What are the 2 primary GUIs for Linux?
- GPL stands for:
- Another name for GPL is:
- GNU stands for:
- Ubuntu releases how many times per year?
- The Ubuntu releases are named by what 3 things:
- For Ubuntu, LTS stands for:
- How would you describe the prof's standard for lab writeups?

Linux Environment Choices

- You have to make three choices ...
 - ✓ *Note:* You *can* change mid-course. No problem.
 - 1. Which computer to use: your own or a VTC lab computer
 - 2. Which method for running Linux
 - 3. Which Linux distro to use
- My recommendations:
 - #1 – your own laptop is the most convenient
 - #3 – Use latest LTS Ubuntu – 16.04.3 Xenial Xerus
(or get the latest distro – 17.04 Zesty Zapus)

#2 Which method of running Linux

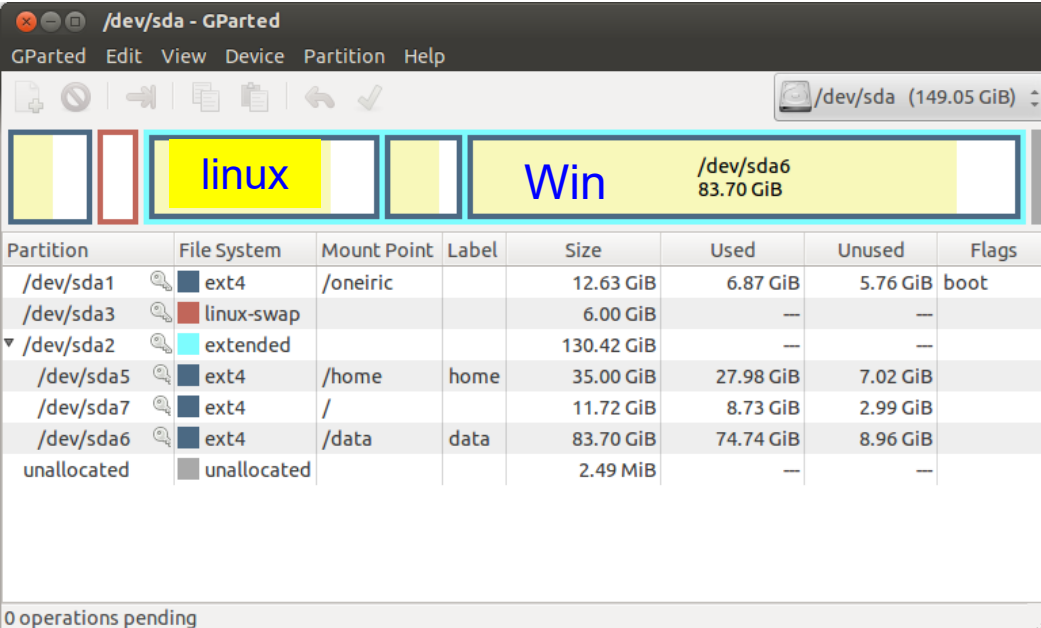
- #2 is a little more complicated
- There are 3 options for running Linux...
- Option 1: *'Live Boot'*
 - i.e.* Put Linux OS on a CD or USB drive
 - + same image each time
 - - terribly slow (much slower than HD)
 - - can't easily save work week to week

#2 Which method of running Linux cont'd

- Option 2: *Dual Boot*

i.e. create multiple partitions and select Linux at reboot

- + Linux runs native (fast)
- - can't do in VTC lab
- - tedious to reboot
- - repartitioning to create a new partition can be problematic



Partition	File System	Mount Point	Label	Size	Used	Unused	Flags
/dev/sda1	ext4	/oneirc		12.63 GiB	6.87 GiB	5.76 GiB	boot
/dev/sda3	linux-swap			6.00 GiB	---	---	
▼ /dev/sda2	extended			130.42 GiB	---	---	
/dev/sda5	ext4	/home	home	35.00 GiB	27.98 GiB	7.02 GiB	
/dev/sda7	ext4	/		11.72 GiB	8.73 GiB	2.99 GiB	
/dev/sda6	ext4	/data	data	83.70 GiB	74.74 GiB	8.96 GiB	
unallocated	unallocated			2.49 MiB	---	---	

```
Ubuntu 8.04, kernel 2.6.24-16-generic
Ubuntu 8.04, kernel 2.6.24-16-generic (recovery mode)
Ubuntu 8.04, memtest86+
Other operating systems:
Windows Vista/Longhorn (loader)
```

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the
commands before booting, or 'c' for a command-line.

The highlighted entry will be booted automatically in 5 seconds.

Example bootloader

linux

Win

Partition	File System	Mount Point	Label	Size	Used	Unused	Flags
/dev/sda1	ext4	/oneirc		12.63 GiB	6.87 GiB	5.76 GiB	boot
/dev/sda3	linux-swap			6.00 GiB	—	—	
▼ /dev/sda2	extended			130.42 GiB	—	—	
/dev/sda5	ext4	/home	home	35.00 GiB	27.98 GiB	7.02 GiB	
/dev/sda7	ext4	/		11.72 GiB	8.73 GiB	2.99 GiB	
/dev/sda6	ext4	/data	data	83.70 GiB	74.74 GiB	8.96 GiB	
unallocated	unallocated			2.49 MiB	—	—	

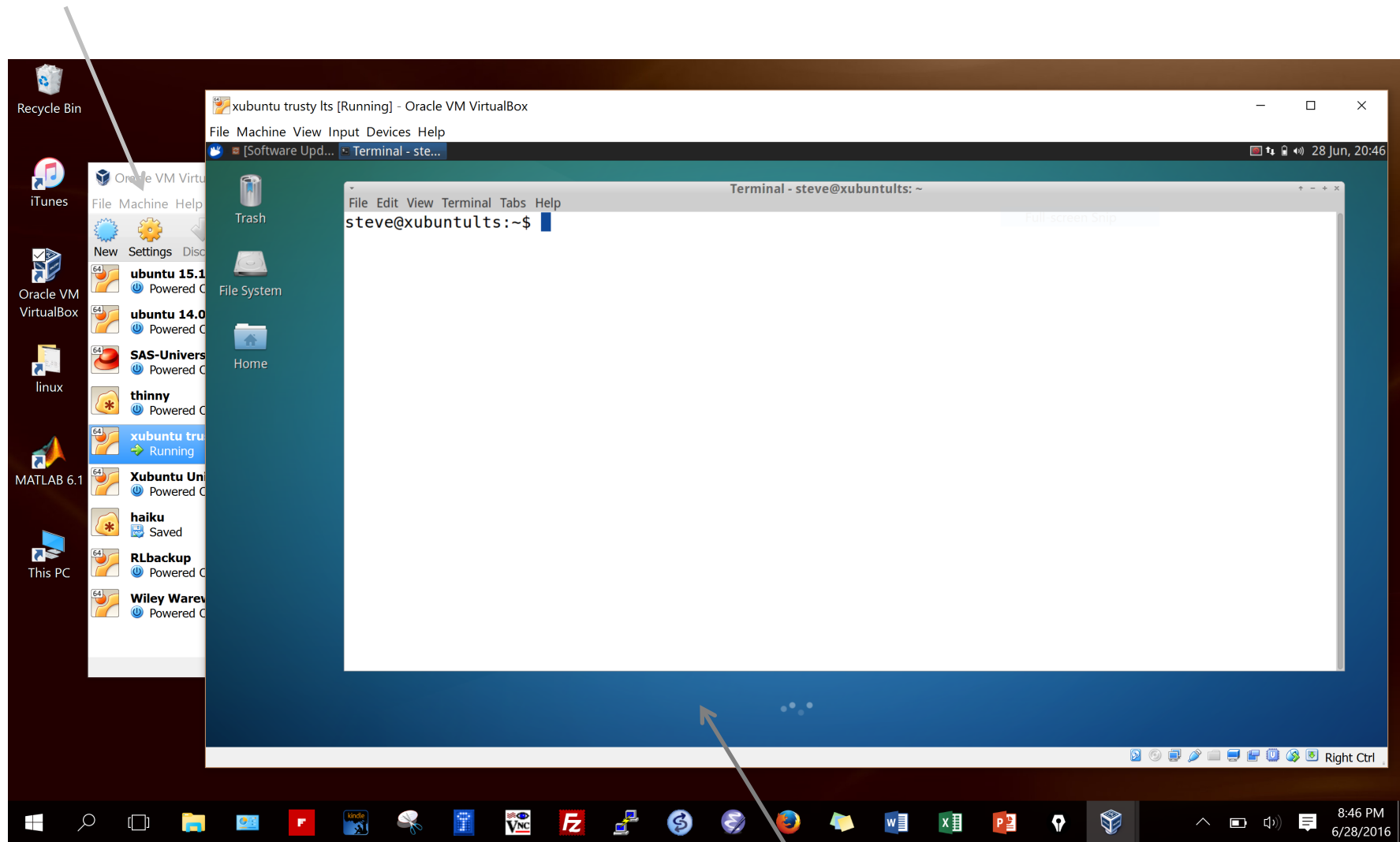
0 operations pending

#2 Which method of running Linux

- Option 3: *Virtualization*

- “host” = the 'normal' or 'regular' boot OS
- “guest” = whatever other OS you want to run
- The guest OS “*thinks*” is running on it's own HW. Of course, it's not. It's 'sharing' with the host OS.
 - Guest file system is actually a large, single file in host OS
 - + no changes to host OS
 - + start and stop guest OS as desired
 - + can share files between OS's
 - - shared resources and virtualization, so somewhat slower
- 2 'main' free virtualization applications
 - Oracle VirtualBox
 - VMware Player

Oracle VirtualBox on Win 10 host OS, running linux Ubuntu guest OS.



“host” OS – how the machine booted (win 10)

“guest” OS – running inside a “window”
(It thinks it's running in its own computer.)

Oracle Virtualbox



The screenshot shows the Oracle VM VirtualBox website in a web browser. A blue arrow points to the address bar, which displays the URL <https://www.virtualbox.org>. The browser's address bar also shows a search bar and various icons. The website's header features the VirtualBox logo and the text "VirtualBox". Below the header, there is a "Welcome to VirtualBox.org!" section. To the left of this section is a sidebar with links: "About", "Screenshots", "Downloads", "Documentation", "End-user docs", "Technical docs", "Contribute", and "Community". The main content area contains a large blue button that says "Download VirtualBox 5.1". To the right of the button is a "News Flash" section with several news items. At the bottom of the page, there is a "Hot picks:" section with a list of links. The Oracle logo is visible at the bottom center of the page.

Oracle VM VirtualBox

<https://www.virtualbox.org>

Google, goo.gl, dell, gb, gb+, Cal, Pan, spotify, Groups, Keep, wu, remote, edX, Coursera, LI, my-peoples

VirtualBox

search...
Login Preferences

Welcome to VirtualBox.org!

VirtualBox is a powerful x86 and AMD64/Intel64 [virtualization](#) product for enterprise as well as home use. Not only is VirtualBox an extremely feature rich, high performance product for enterprise customers, it is also the only professional solution that is freely available as Open Source Software under the terms of the GNU General Public License (GPL) version 2. See "[About VirtualBox](#)" for an introduction.

Presently, VirtualBox runs on Windows, Linux, Macintosh, and Solaris hosts and supports a large number of [guest operating systems](#) including but not limited to Windows (NT 4.0, 2000, XP, Server 2003, Vista, Windows 7, Windows 8, Windows 10), DOS/Windows 3.x, Linux (2.4, 2.6, 3.x and 4.x), Solaris and OpenSolaris, OS/2, and OpenBSD.

VirtualBox is being actively developed with frequent releases and has an ever growing list of features, supported guest operating systems and platforms it runs on. VirtualBox is a community effort backed by a dedicated company: everyone is encouraged to contribute while Oracle ensures the product always meets professional quality criteria.

Download VirtualBox 5.1

News Flash

- New August 3rd, 2017**
VirtualBox 5.2 Beta 1 available for testing!
Oracle today starts Beta-testing for the upcoming new minor release, VirtualBox 5.2. See [this announcement](#) for details.
- New July 27th, 2017**
VirtualBox 5.1.26 released!
Oracle today released a 5.1 maintenance release which improves stability and fixes regressions. See the [Changelog](#) for details.
- Important! December 2nd, 2016**
We're hiring!
Looking for a new challenge? We're looking for a [System administrator\(Germany\)](#).
- New July 12th, 2016**
VirtualBox 5.1 released!
Many enhancements and improvements. Read more in the [announcement](#).

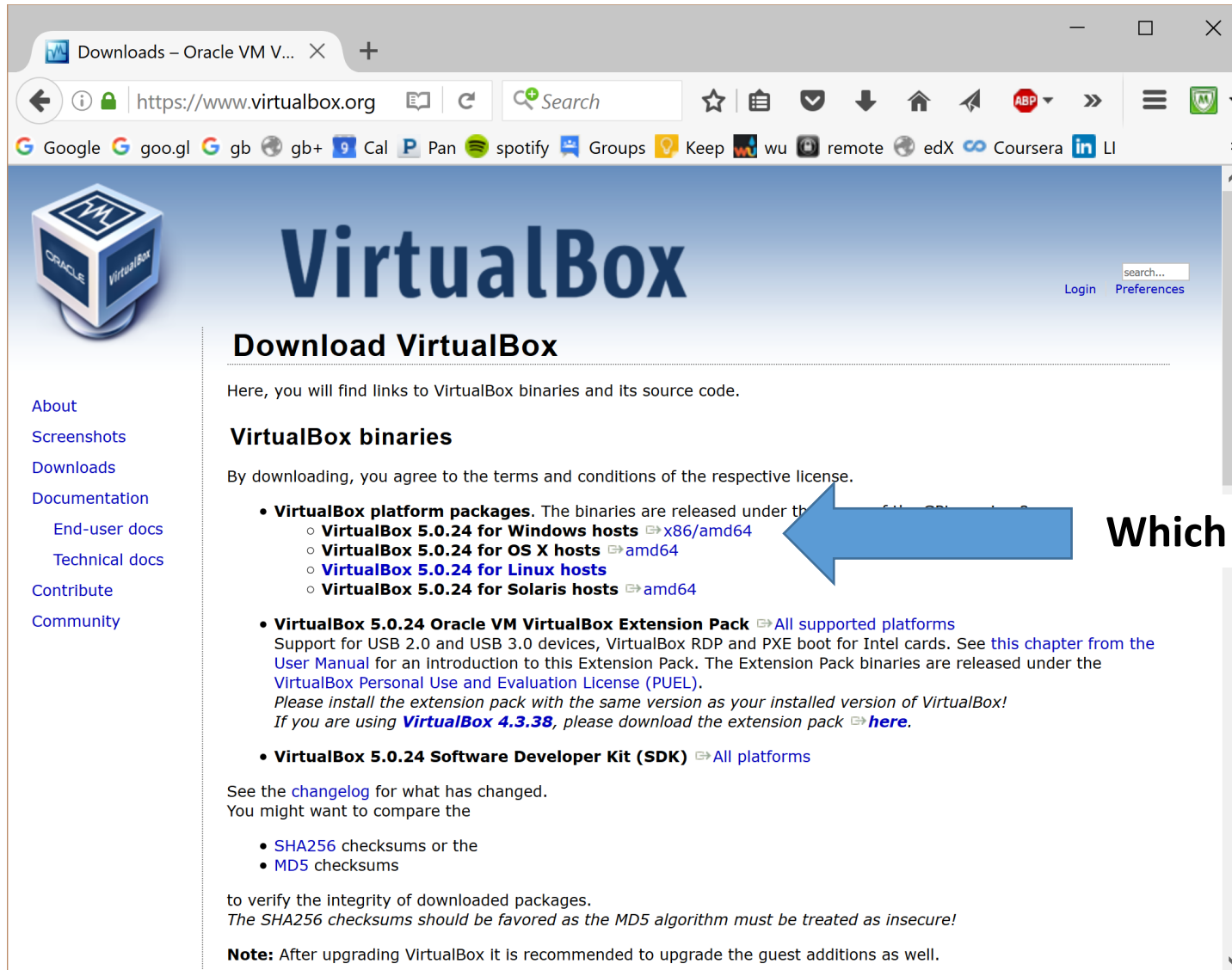
[More information...](#)

Hot picks:

- Pre-built virtual machines for developers at [Oracle Tech Network](#)
- Hyperbox** Open-source Virtual Infrastructure Manager [project site](#)
- phpVirtualBox** AJAX web interface [project site](#)
- IQEmu** automated Windows VM creation, application integration <http://mirage335-site.member.hacdc.org:6380/wiki/Category:IQEmu>

ORACLE

Oracle Virtualbox



Downloads – Oracle VM V... X +

https://www.virtualbox.org

Google goo.gl gb gb+ Cal Pan spotify Groups Keep wu remote edX Coursera LI

VirtualBox

Login Preferences

Download VirtualBox

Here, you will find links to VirtualBox binaries and its source code.

VirtualBox binaries

By downloading, you agree to the terms and conditions of the respective license.

- **VirtualBox platform packages.** The binaries are released under the following licenses:
 - **VirtualBox 5.0.24 for Windows hosts** → x86/amd64
 - **VirtualBox 5.0.24 for OS X hosts** → amd64
 - **VirtualBox 5.0.24 for Linux hosts**
 - **VirtualBox 5.0.24 for Solaris hosts** → amd64
- **VirtualBox 5.0.24 Oracle VM VirtualBox Extension Pack** → All supported platforms
Support for USB 2.0 and USB 3.0 devices, VirtualBox RDP and PXE boot for Intel cards. See [this chapter from the User Manual](#) for an introduction to this Extension Pack. The Extension Pack binaries are released under the [VirtualBox Personal Use and Evaluation License \(PUEL\)](#).
Please install the extension pack with the same version as your installed version of VirtualBox!
*If you are using **VirtualBox 4.3.38**, please download the extension pack [here](#).*
- **VirtualBox 5.0.24 Software Developer Kit (SDK)** → All platforms

See the [changelog](#) for what has changed.
You might want to compare the

- [SHA256](#) checksums or the
- [MD5](#) checksums

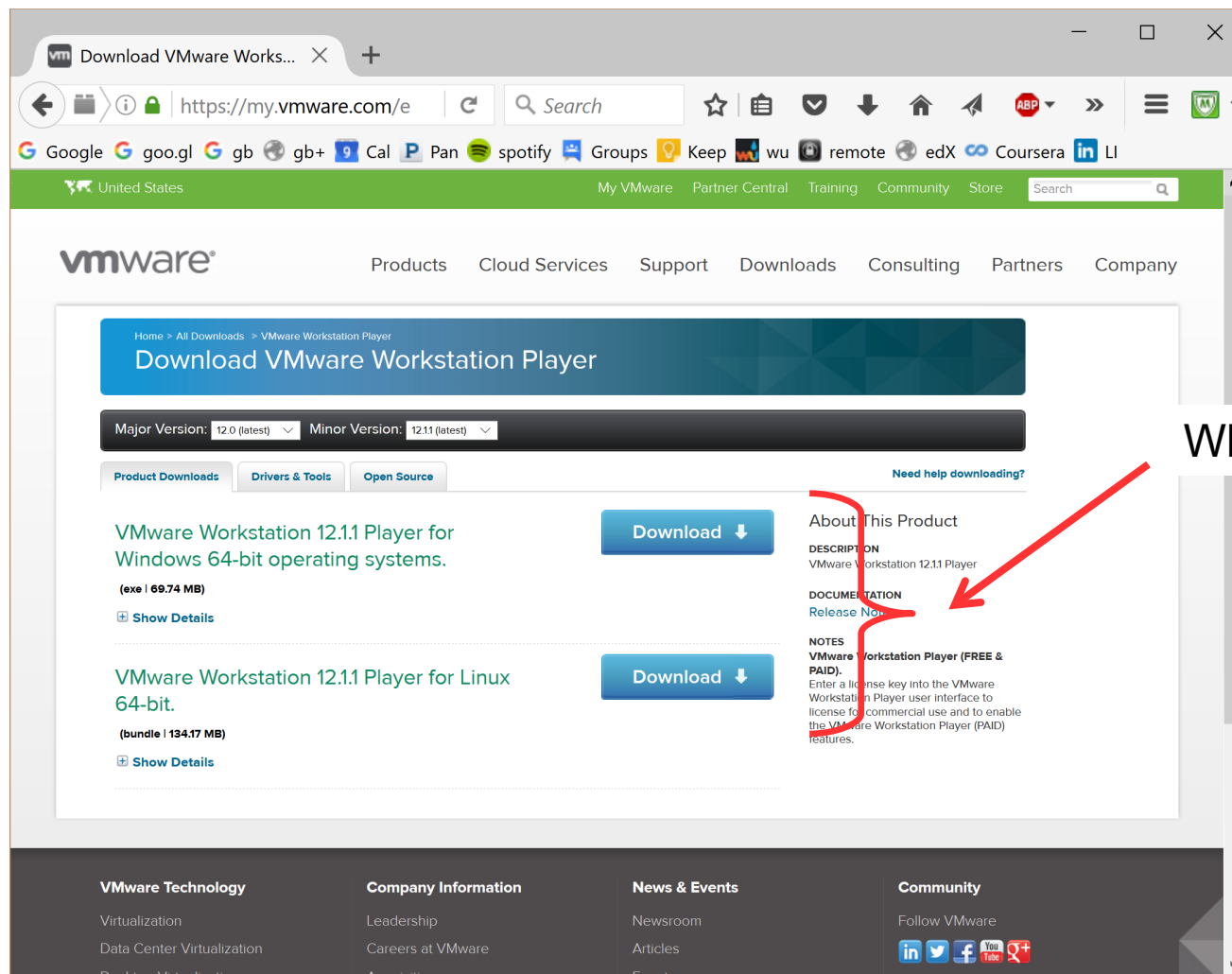
to verify the integrity of downloaded packages.
The SHA256 checksums should be favored as the MD5 algorithm must be treated as insecure!

Note: After upgrading VirtualBox it is recommended to upgrade the guest additions as well.

Which host OS?

VMware Player

- Google: “vmware player download”
- <https://www.vmware.com/go/downloadplayer>



Which “*host*” OS?

Prof Recommendation

→ Oracle VirtualBox (Vbox) running LTS Ubuntu on your own laptop

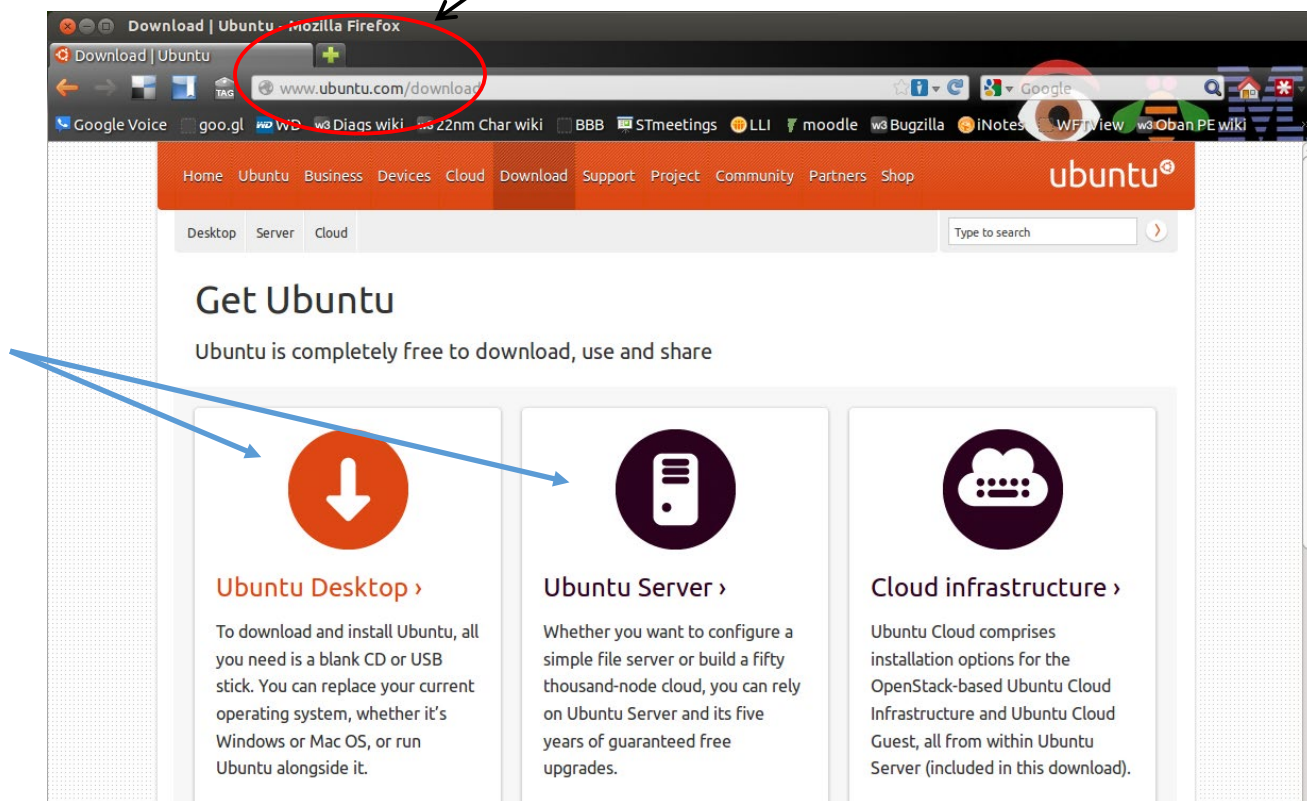
- It seems to me that VirtualBox is more 'popular' in classrooms, but VMware might be more stable.
- If you don't have your own laptop, that's OK.
 - Use VBox “**appliance**” and a memory stick
 - Keep your Linux env on this “appliance” file and have it travel with you.
 - Use it on *any* computer in the lab (or anywhere there is VBox).
 - 5 min setup to copy from USB to that computer, then run VBox on that computer

Download Ubuntu Desktop iso

- Whether you use VBox or VMware, you will install linux in the VM.
- Linux is free → *no need* to go to Best Buy and purchase install disks!!!
- Just download the iso from the 'net.
- What's an iso?

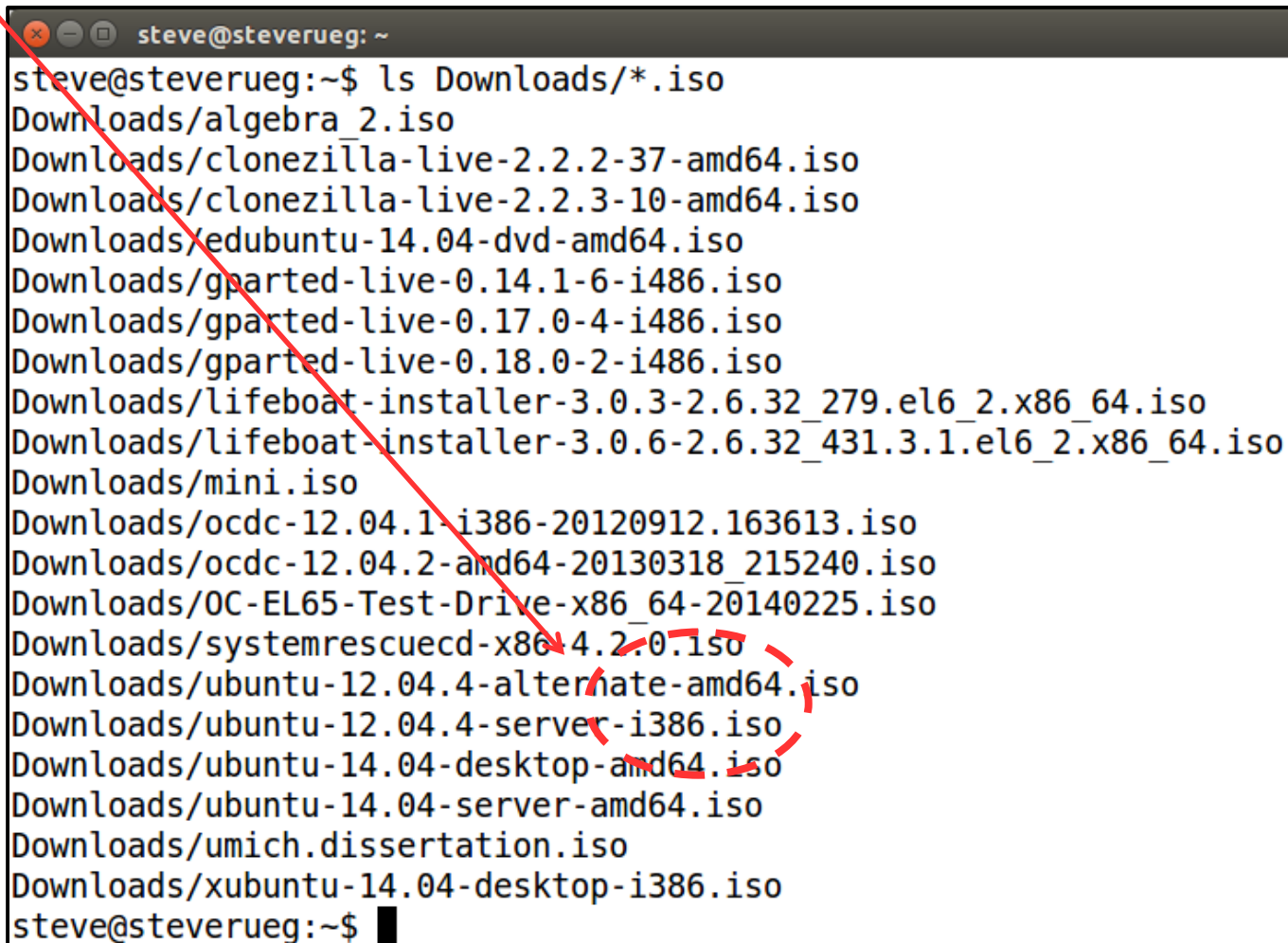
Ubuntu vs mirror (local)?

What's the diff between Desktop vs Server?



Lots-o-iso's

What is i386 vs amd64?



```
steve@steverueg: ~  
steve@steverueg:~$ ls Downloads/*.iso  
Downloads/algebra_2.iso  
Downloads/clonezilla-live-2.2.2-37-amd64.iso  
Downloads/clonezilla-live-2.2.3-10-amd64.iso  
Downloads/edubuntu-14.04-dvd-amd64.iso  
Downloads/gparted-live-0.14.1-6-i486.iso  
Downloads/gparted-live-0.17.0-4-i486.iso  
Downloads/gparted-live-0.18.0-2-i486.iso  
Downloads/lifeboat-installer-3.0.3-2.6.32_279.el6_2.x86_64.iso  
Downloads/lifeboat-installer-3.0.6-2.6.32_431.3.1.el6_2.x86_64.iso  
Downloads/mini.iso  
Downloads/ocdc-12.04.1-i386-20120912.163613.iso  
Downloads/ocdc-12.04.2-amd64-20130318_215240.iso  
Downloads/OC-EL65-Test-Drive-x86_64-20140225.iso  
Downloads/systemrescuecd-x86_4.2.0.iso  
Downloads/ubuntu-12.04.4-alternate-amd64.iso  
Downloads/ubuntu-12.04.4-server-i386.iso  
Downloads/ubuntu-14.04-desktop-amd64.iso  
Downloads/ubuntu-14.04-server-amd64.iso  
Downloads/umich.dissertation.iso  
Downloads/xubuntu-14.04-desktop-i386.iso  
steve@steverueg:~$
```

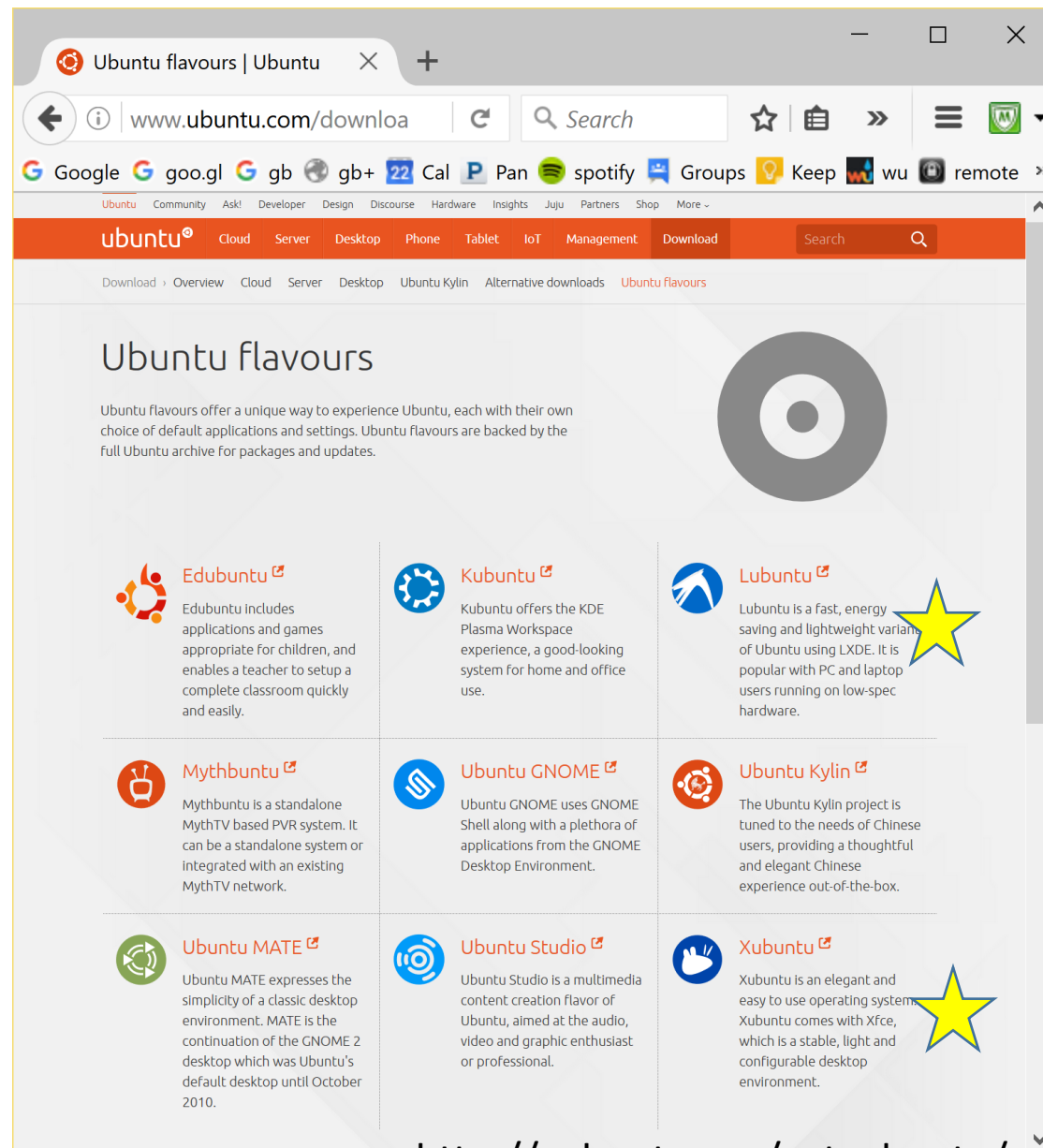

Ubuntu “flavors”

- Xubuntu

- Ubuntu built with XCFE UI.
- Rather simple. (Still 1Gb)
- Doesn't take too much CPU.
- My choice this semester.

- Lubuntu

- Built on LXDE.
- Very simple.
- (a little too simple for me)



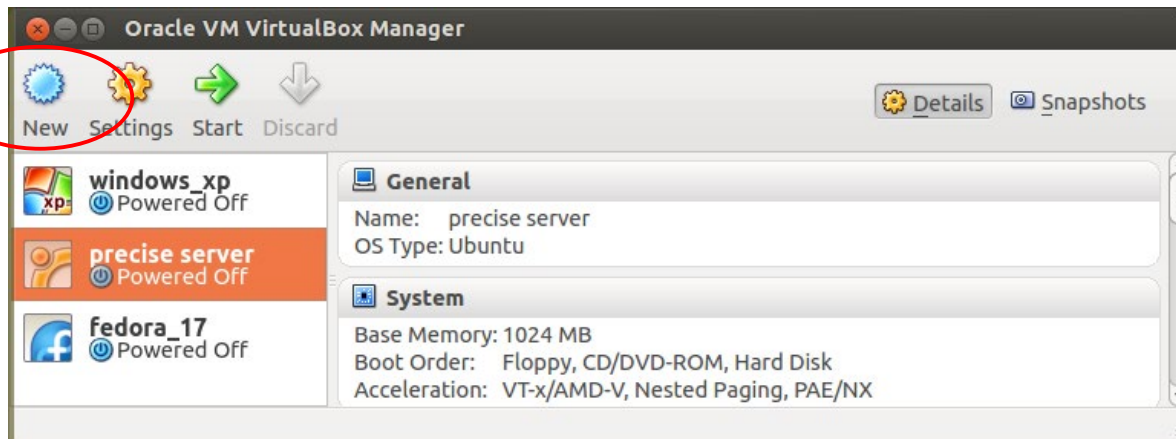
<http://xubuntu.org/getxubuntu/>

Notes on Ubuntu GUI 'flavors'

- Google “ubuntu derivatives”
<http://www.ubuntu.com/about/about-ubuntu/derivatives>
- Default Desktop Environment GUI is Unity
 - + Most complex, 'prettiest'
 - - Takes most CPU resources = slowest
- Kubuntu (& Mint)
 - KDE – medium complexity
- Xubuntu
 - XFCE – lightweight
- Lubuntu
 - LXFE – super lightweight
- Recommendations:
 - If you don't have an i7 (4-core), you might not want Unity
 - Therefore, you *might* want to start with Xubuntu. I am.

Let's do Lab 1

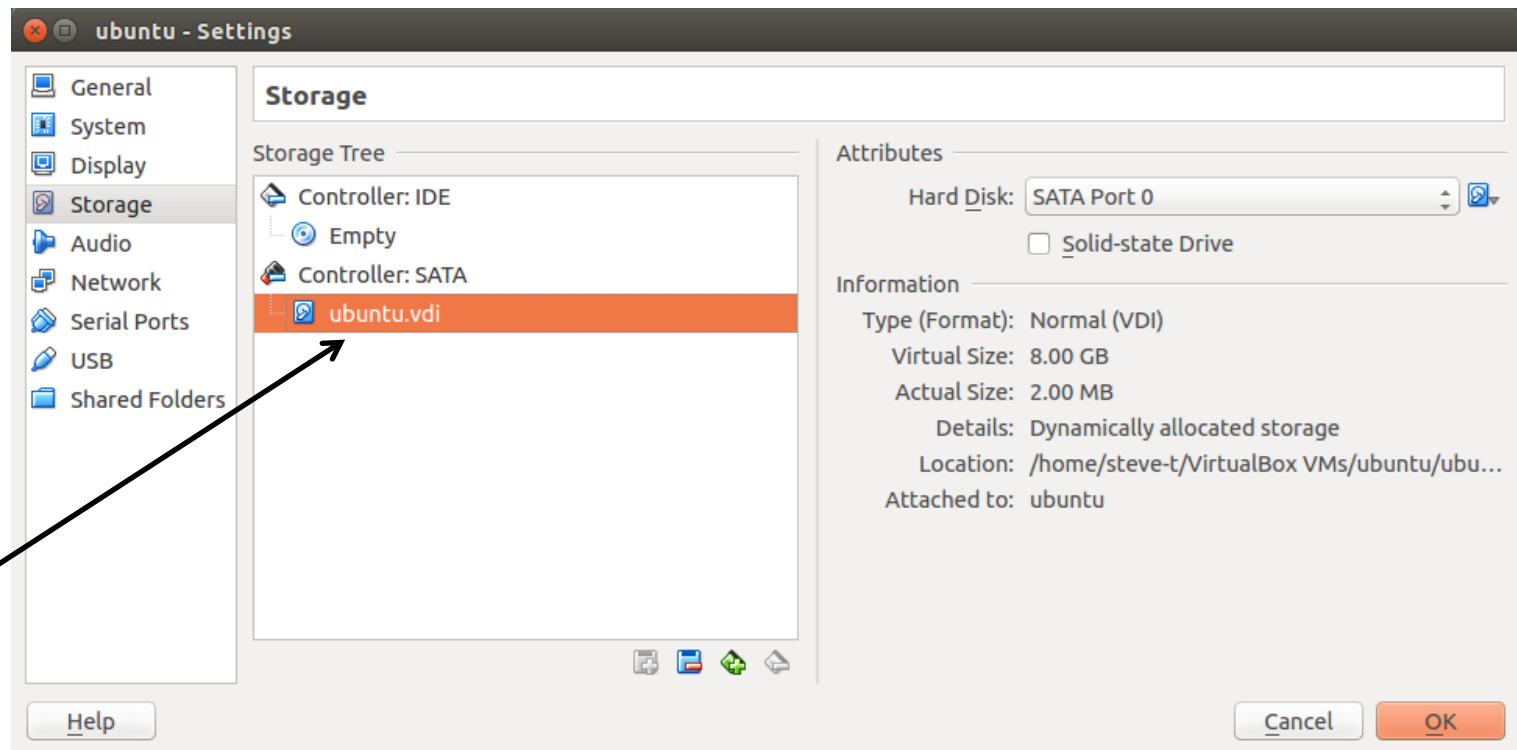
Start VB app and create new virtual machine (VM)



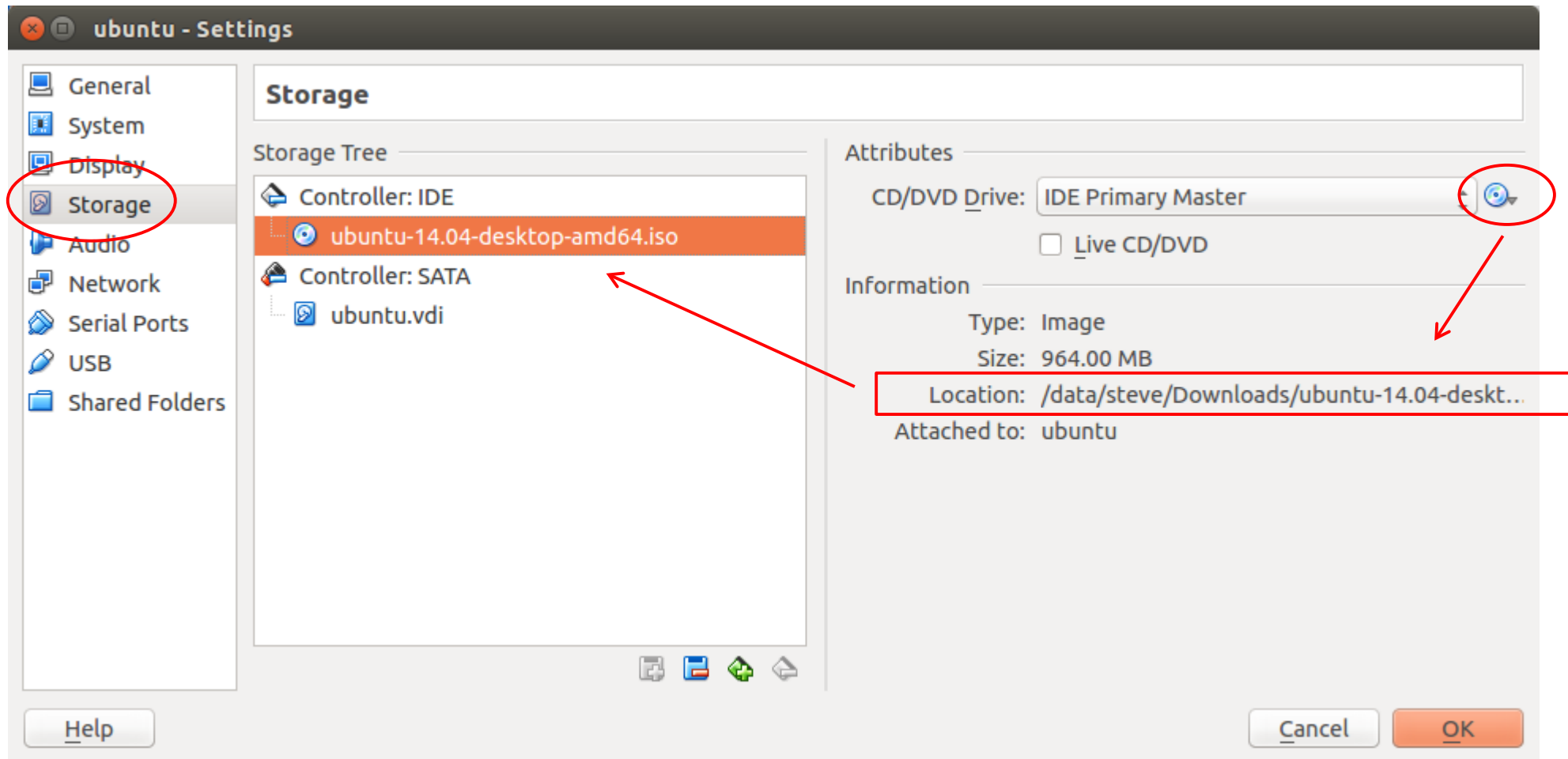
Suggest:
1Gb mem (1024Mb)
12 Mb video RAM
8Gb VDI harddrive

↑
3 VM's

“empty HD”
→ won't boot

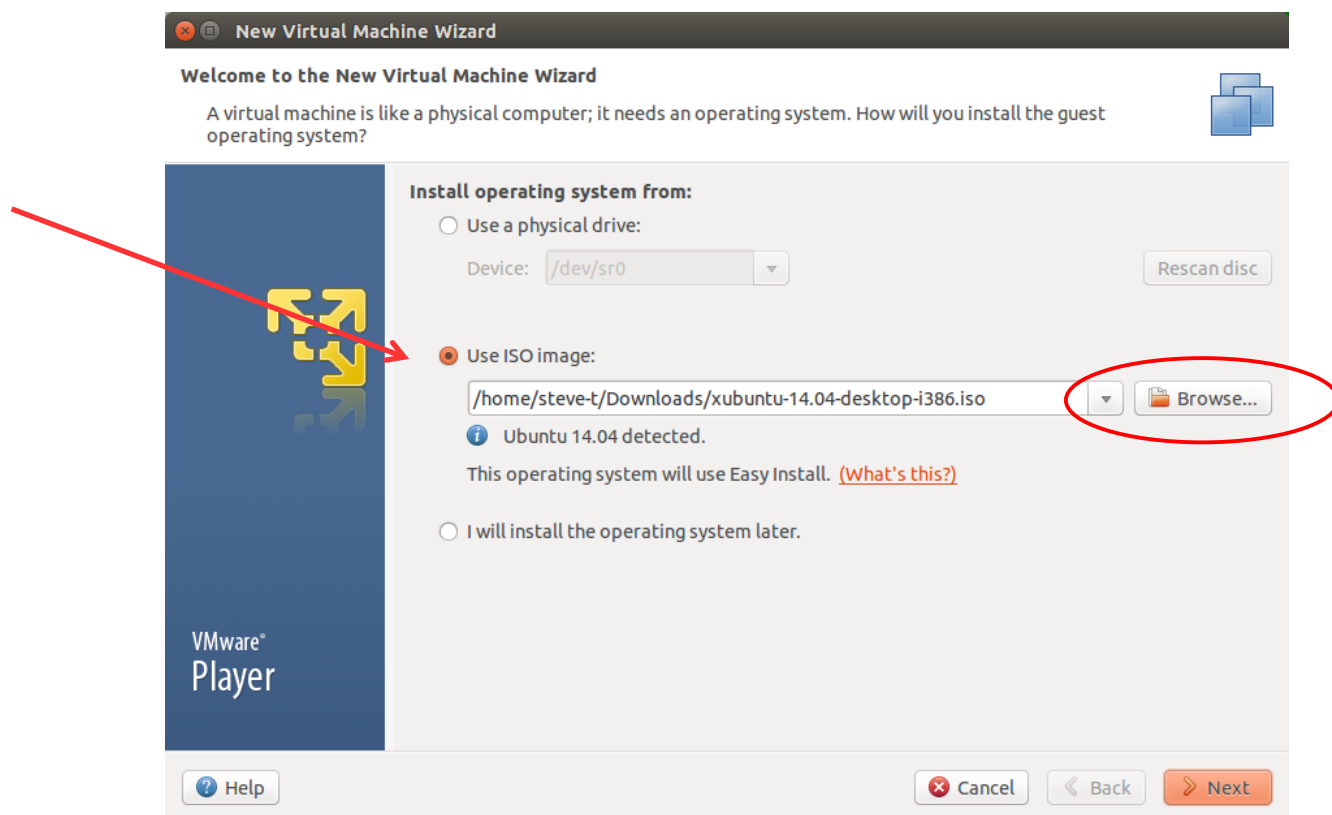


Add the Ubuntu .iso install 'disk' to the CD drive of the VM

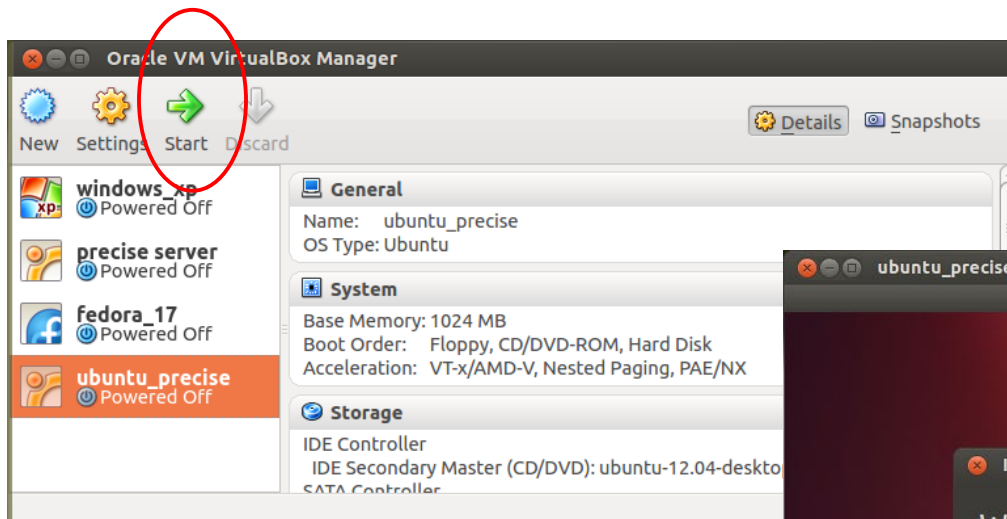


Add the Ubuntu .iso install 'disk' to the CD drive of the VM

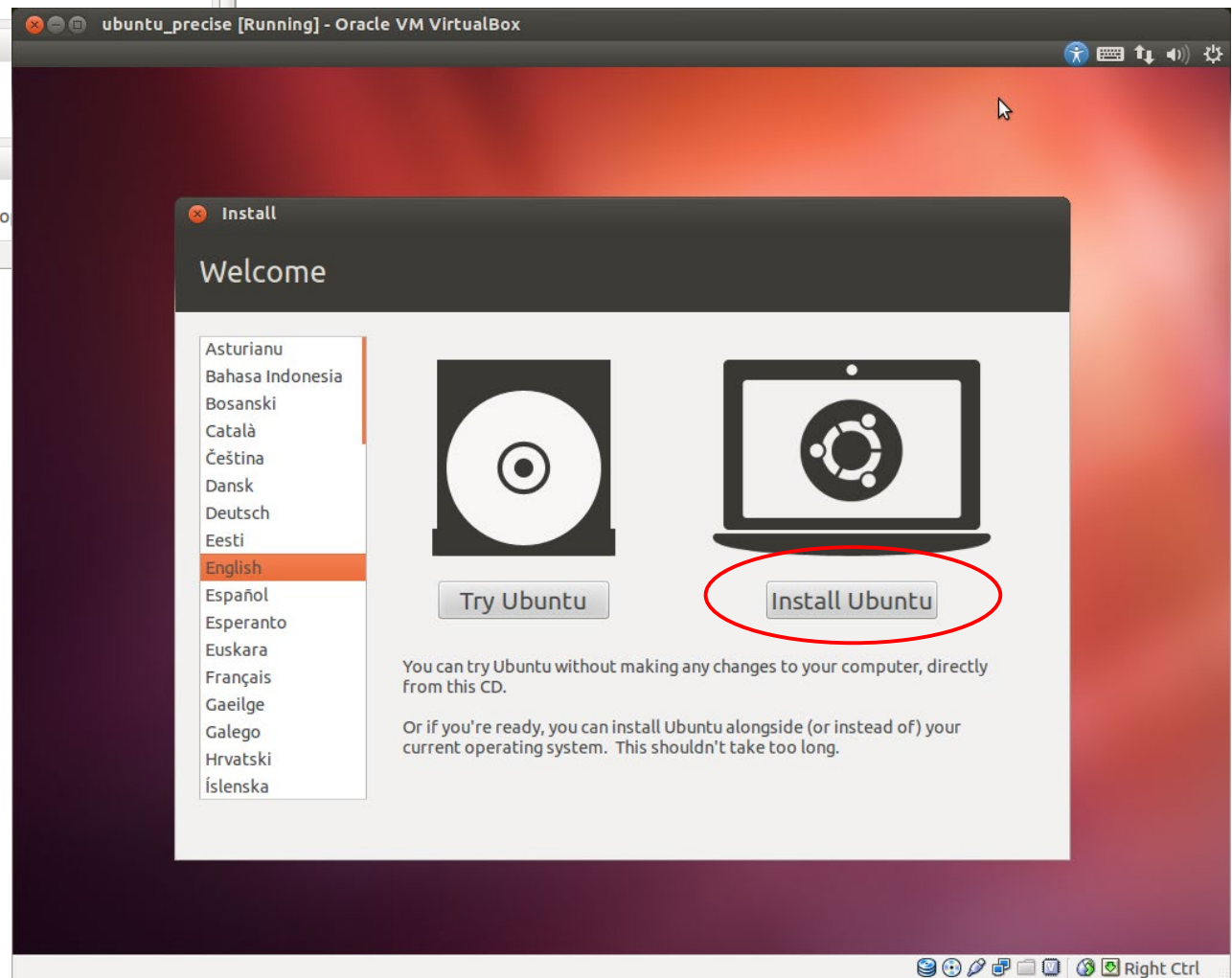
- In VMware Player, when you create a new VM, it asks for the install iso “*right up front*”
- And automatically adds the .iso the virtual CD so the VM starts the install CD all-by-itself



Start the VM and install Ubuntu



Note:
“Right Ctrl” key is the VB
“hot key”

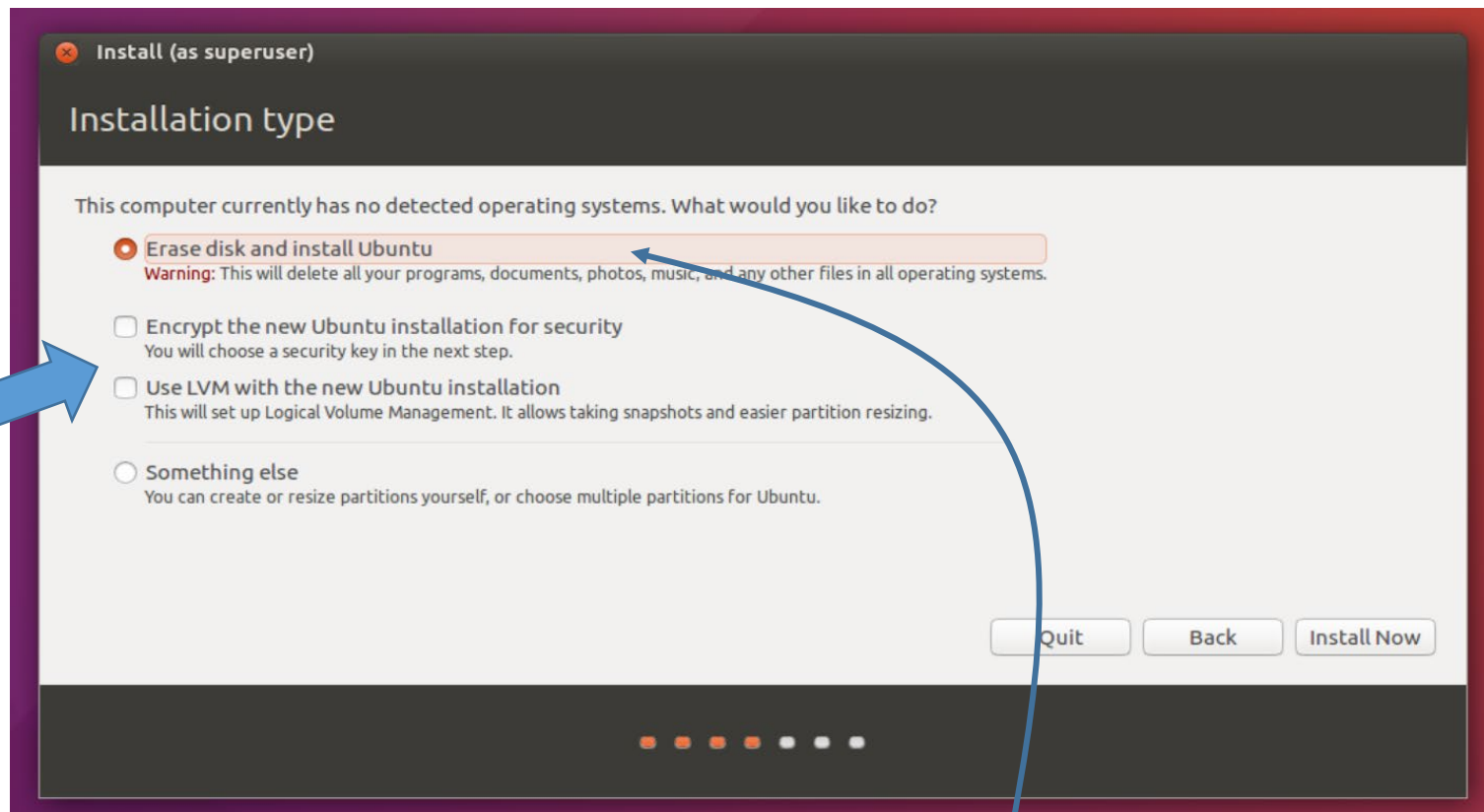


Typical install

Install on “fresh” 8Gb VDI Vbox disk

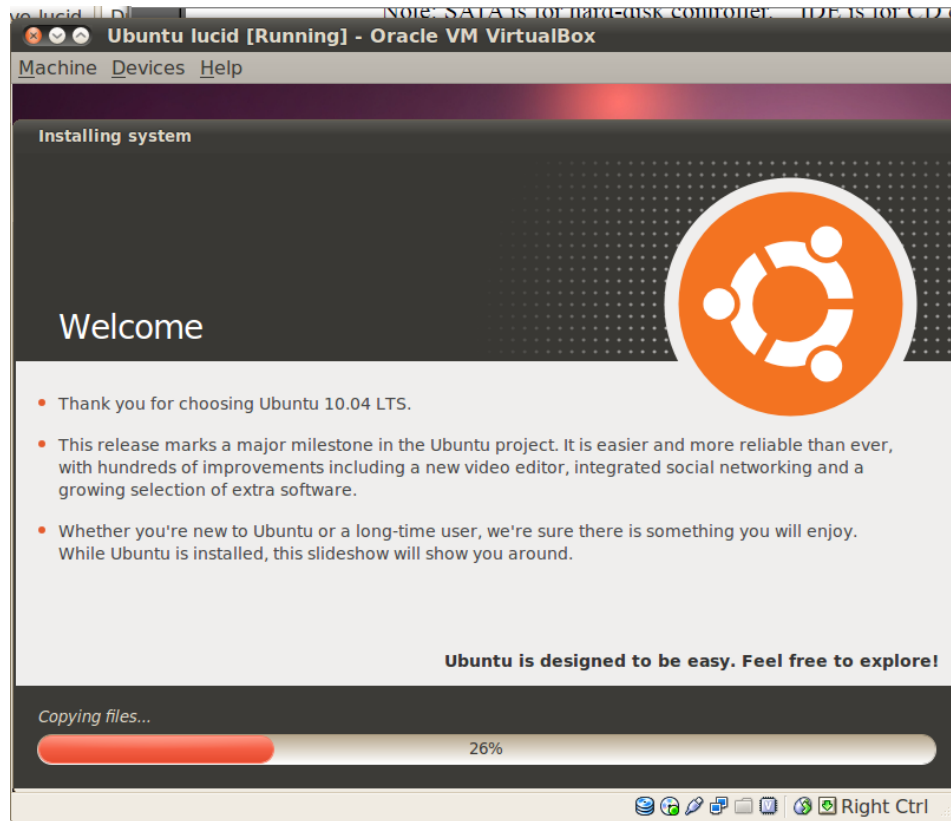
NO

No Encrypt
No LVM
(those are for later)

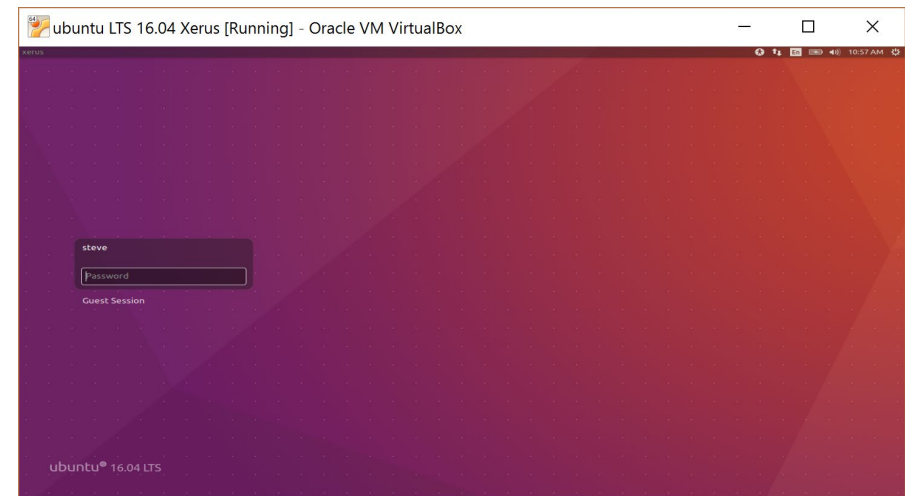
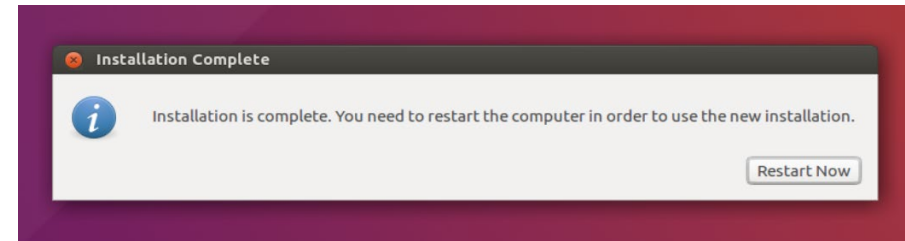


i.e. This “**Erase**” message is talking about the *new*, blank VDI

Typical install



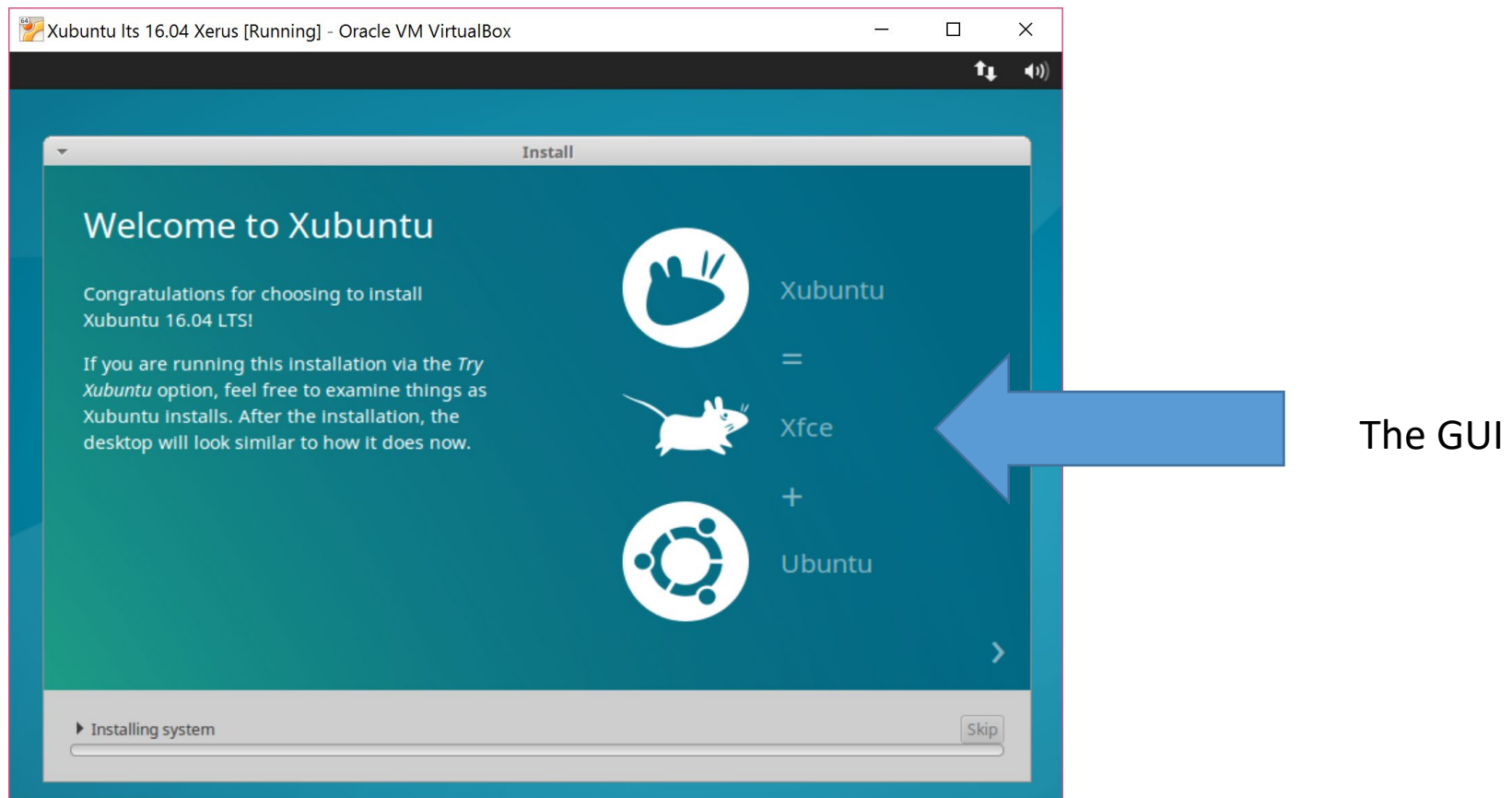
It will take 5-10 min, depending on CPU and internet connection



Reboot & Done

Xubuntu install

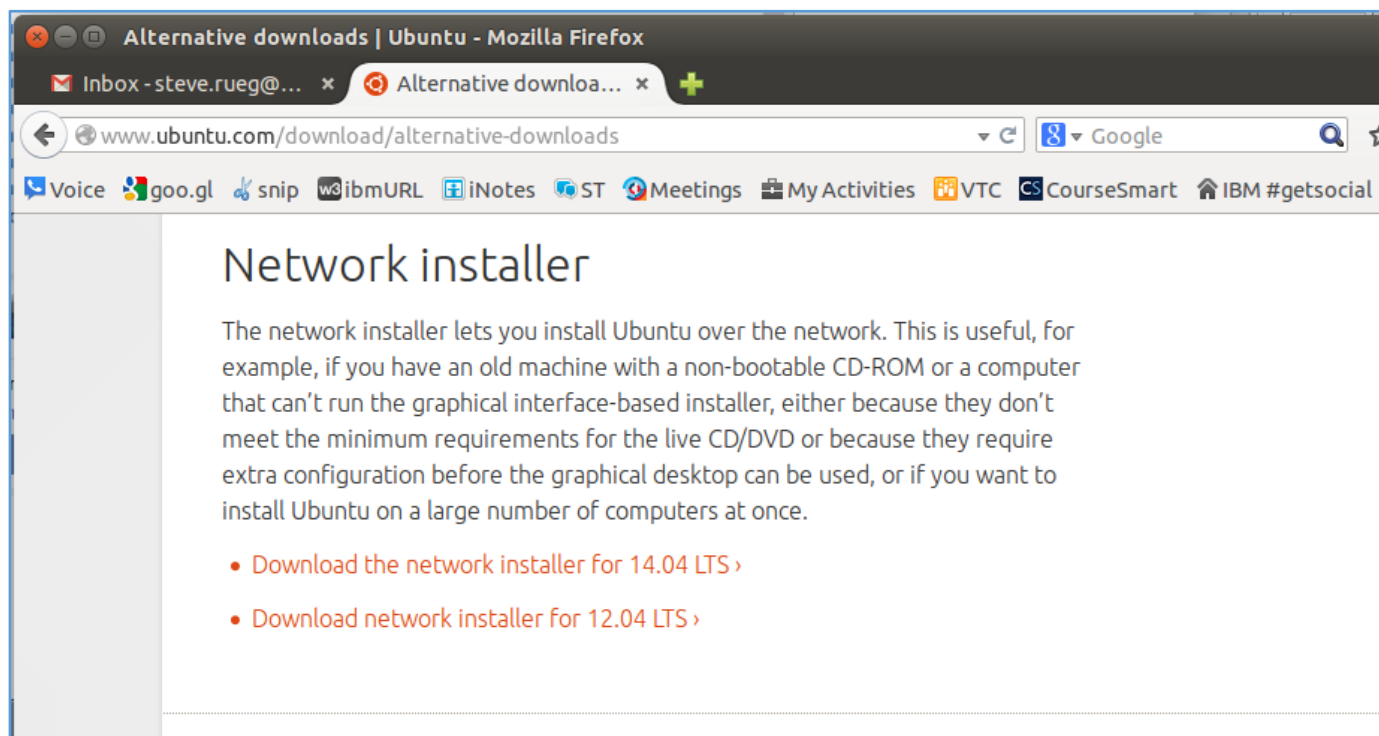
Again, Xubuntu “is” Ubuntu, but with a simpler GUI interface, called Xfce. The installation is identical.



Note: In Mac, you can't choose the GUI. In Windows, you can't choose the GUI. In Linux, you choose the GUI.

FYI – another method: Network Installer

- *a.k.a.* “minimal” linux install
- Select “only” required packages from repo for download
- N.B. the repo could be 'local'



Mini install / network install

archive.ubuntu.com/ubuntu/dists/trusty/main/installer-amd64/current/images/netboot

Index of /ubuntu/dists/trusty/main/installer-amd64/current/images/netboot

Name	Last modified	Size
Parent Directory	-	-
boot.img.gz	15-Apr-2014 21:53	20M
mini.iso	15-Apr-2014 21:53	37M
netboot.tar.gz	15-Apr-2014 21:53	26M
pxelinux.0	15-Apr-2014 21:53	26K
pxelinux.cfg/	15-Apr-2014 21:53	-
ubuntu-installer/	15-Apr-2014 21:53	-
xen/	15-Apr-2014 21:53	-

Apache/2.2.22 (Ubuntu) Server at archive.ubuntu.com Port 80

← mini.iso

Put in “CD” of mini.iso



Update the OS

- Your newly installed OS is the version when it was '*frozen*' when the install CD was created.
 - It is now *months* old.
- Linux has 'easy' ways to upgrade (most all OS's do now-a-days)
- The two different flavors of Linux have 2 different ways
 - Red Hat: `yum`
 - Debian (Ubuntu): `apt-get`
- Both have GUIs as well
- We'll focus on Ubuntu (APT) for this lecture, but you are welcome to use Red Hat or SUSE and yum.

APT

- Advanced Package Tool
- A GUI app for APT is called “synaptic”
- Command line:

```
$ sudo apt-get update
```

```
$ sudo apt-get upgrade
```

Know what these do.

```
$ sudo apt-get dist-upgrade
```

- Install new packages (must know package name)

```
$ sudo apt-get install <package>
```