# Get VirtualBox

Go to www.virtualbox.org and select Downloads.

Download the current release of VirtualBox for the OS on which you will install VirtualBox. In these notes, that's Windows 7.

Download the VirtualBox Extension Pack.



### Begin the VirtualBox Installation

### VirtualBox/CentOS Setup 2

Run the VirtualBox installer. The first few screens are typical and probably do not require any changes:



stom Setup Select the way you want features to be installed.	
Click on the icons in the tree below to change the wa	ay features will be installed.
VirtuaBox Application     VirtuaBox VSB Support     VirtuaBox VSB Networking     VirtuaBox Hetworking     VirtuaBox Hoto-C     VirtuaBox Python 2.x Su	Orade VM VirtualBox 4.2.6 application.





Ready to Install	
The Setup Wizard is ready to	begin the Custom installation.
Click Install to begin the instal installation settings, click Back	lation. If you want to review or change any of your . Click Cancel to exit the wizard.
	L <sub>2</sub>

Oracle VM VirtualBox 4.2	6
Please wait while the Set take several minutes. Status: Validating insta	up Wizard installs Oracle VM VirtualBox 4.2.6. This may
	6



#### **Computer Organization**

# Starting VirtualBox

When the installation completes, you can run VirtualBox for the first time:



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# Creating a Virtual Machine

### VirtualBox/CentOS Setup 4





**Computer Organization** 

# Configuring Memory for the VM

Specify the amount of memory you'll give the VM.

In this case, I'm installing on a host machine with 8GB of RAM; with less, I'd probably given the VM 1GB.

	<u> ? x</u>
Gereate Virtual Machine	e 🕞
Memory size	
Select the amount of men virtual machine.	nory (RAM) in megabytes to be allocated to the
The recommended memor	y size is 512 MB.
	2048 MB
4 MB	8192 MB
	Next Cancel



# Configuring a Virtual Hard Disk

In the next dialog, select the option to create a new virtual hard drive now.

Take the default hard drive file type in the next dialog unless you're concerned about being compatible with some other virtualization tool like VMWare.

Create Virtual Machine	Create Virtual Hard Drive	Create Virtual Hard Drive
Hard drive If you wish you can add a virtual hard drive to the new machine. You can either create a new hard drive file or select one from the list or from another location using the folder icon. If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created. The recommended size of the hard drive is <b>8.00 GB</b> . Que not add a virtual hard drive Que at a virtual hard drive Que at a virtual hard drive file Ubuntu12-32.vdi (Normal, 32.00 GB)	Hard drive file type Please choose the type of file that you would like to use for the new virtual hard drive. If you do not need to use it with other virtualization software you can leave this setting unchanged.     VDI (VirtualBox Disk Image)   VMDK (Virtual Machine Disk)  VHD (Virtual Hard Disk)  HDD (Parallels Hard Disk)  QED (QEMU enhanced disk)  QCOW (QEMU Copy-On-Write)	Storage on physical hard drive         Please choose whether the new virtual hard drive file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).         A dynamically allocated hard drive file will only use space on your physical hard drive as it fils up (up to a maximum fixed size), although it will not shrink again automatically when space on it is freed.         A fixed size hard drive file may take longer to create on some systems but is often faster to use.         O pynamically allocated         I Fixed size
	Hide Description Next Cancel	Next Cancel

Next, I recommend choosing a fixed-size hard disk.



# Configuring a Virtual Hard Disk

I generally make this 32GB, but make it smaller if you're short on space.







#### **Computer Organization**

# An Empty VM

Now, you have an empty virtual machine (I already had another VM fully set up).

That is, a formatted (virtual) hard disk and no OS.





**Computer Organization** 

# VM Settings

There are a couple of crucial VM settings; right-click on your VM and bring up the Settings dialog:

CentOS 6.4 64-bit - General System Display Storage Audio	Settings General Basic Advanced Description Snapshot Folder: C:\Users\in\VirtualBox VMs\CentOS 6.464-bit\Sn Shared Clipboard: Bidirectional	apshots 🔹	Under Display, enable 3D Acceleration.
Serial Ports	DraginDrop: Host To Guest		
USB	Kellevide Media       Kellevide Kellevide Kellevide Changes         Mini ToolBar:       Image: Show In Fullscreen/Seamless         Image: Show At Top Of Screen       Image: Show At Top Of Screen         Select a settings category from the list on the left-hand side and move the item to get more information.       Image: Select a settings category from the list on the left-hand side and move the item to get more information.	CentOS 6.4 64-bit - 3	Settings       2       X         Display       Video       Remote Display         Video       Remote Display       128         Video       MB       123         Monitor Count:       1       64         Extended Features:       Imable 3D Acceleration       64         Enable 2D Video Acceleration       Imable 2D Video Acceleration       1
Under G make the Bidirectio Drag'n/D	eneral/Advanced, e shared clipboard onal, and enable Orop.		Select a settings category from the list on the left-hand side and move the mouse over a settings item to get more information.         OK       Cancel

## Install the VirtualBox Extensions

Find the file for the VirtualBox Extensions you downloaded earlier.

It should be associated with VirtualBox now.

Double-click on it and the Extensions should be installed.





## Install a Guest OS

Choose a Linux distribution to install. CentOS matches the department's servers, including the rlogin cluster, but any distribution should do.

You'll have to select a 32-bit or a 64-bit version.

A 64-bit version gives you a few more options, but either will be sufficient for most of the assignments in CS 2505.

If you install a 32-bit version, you won't be able to run any 64-bit code on it.

If you install a 64-bit version, you won't be able to build any 32-bit executables on it unless you install some additional packages.

Whatever you choose, download an ISO file (CD or DVD). You don't need to burn a physical disk.

**Disclaimer:** the following notes illustrate one session installing a particular distribution of Linux on VirtualBox 4.2.6, running on Windows 7 Enterprise, on a particular underlying hardware system. YMMV. Mine certainly has...



## Beginning the Installation

### VirtualBox/CentOS Setup 12

Select the VM and click Start:



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**Computer Organization** 

# Selecting Installation Media

VirtualBox will recognize the empty system and prompt you to select an installation disk.

Click the folder icon and select your ISO file.





#### **Computer Organization**

# Running the Installation Code

### VirtualBox/CentOS Setup 14

The remaining screen shots will vary considerably depending on which distro you chose to install, but the general procedure will be similar.

Virt	ualBox - Information
i	The virtual machine window is optimized to work in <b>32 bit</b> color mode but the virtual display is currently set to <b>24 bit</b> .
	Please open the display properties dialog of the guest OS and select a <b>32 bit</b> color mode, if it is available, for best possible performance of the virtual video subsystem.
	<b>Note</b> . Some operating systems, like OS/2, may actually work in 32 bit mode but report it as 24 bit (16 million colors). You may try to select a different color mode to see if this message disappears or you can simply disable the message now if you are sure the required color mode (32 bit) is not available in the guest OS.
	Do not show this message again

I got these three dialogs when installing CentOS... eventually I'll sort out the color depth and the mouse pointer integration.

	🧿 VirtualBox - Information	?	×	J
	The Virtual Machine rep guest OS does not supp <b>pointer integration</b> video mode. You need to the mouse (by dicking or display or pressing the order to use the mouse guest OS.	orts the port <b>n</b> to cap over the host k inside	nat the nouse current ture he VM ey) in the again	
irtualBox - In	formation		?	×
You have pressed t the host currently make the machine.	clicked the mouse inside the Virtual I he host key. This will cause the Virtual mouse pointer (only if the mouse pointer supported by the guest OS) and the key m unavailable to other applications runn	Machin Machir integr yboard ing on	e display o ne to <b>capi</b> ation is no , which wi your host	or ture it
You can p and mous currently of the Vir together keyboard	ress the <b>host key</b> at any time to <b>unca</b> e (if it is captured) and return them to n assigned host key is shown on the statu tual Machine window, next to the <b>w</b> ice with the mouse icon placed nearby, indic and mouse capture state.	ormal o s bar a on. This cate th	the keybo operation. at the bott s icon, e current	oard The tom
The host	key is currently defined as <b>Right Ctrl</b> .	2	5	
	Capture Cancel			



#### **Computer Organization**

# Running the Installation Code

#### Here is the CentOS start screen:





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### VirtualBox/CentOS Setup 15

# **Initial Options**

CentOS starts with some basic language and keyboard configuration:

CentOS 6.4 64-bit [Running] - Oracle VM VirtualBox			
Machine View Devices Help	W.		
	CentOS 6.4 64-bit [Running] - Oracle VM VirtualBox		
What language would you like to use during the	Machine View Devices Help		
installation process?	Select the appropriate keyboard for		
	the system.		
(العربية) Arabic			
Assamese (অসমীয়া)	Italian		
Bengali (বাংলা)	Italian (IBM)		
Bengali(India) (বাংলা (ভারত))	Italian (it2)		
Bulgarian (Български)	Japanese		
Catalan (Català)	Korean		
Chinese(Simplified) (中文(简体))	Latin American		
Chinese(Traditional)(中文(正體))	Macedonian		
Croatian (Hrvatski)	Norwegian		
Czech (Čeština)	Polish		
Danish (Dansk)	Portuguese		
Dutch (Nederlands)	Romanian		
English (English)	Russian		
Estonian (eesti keel)	Serbian (latin)		
Finnish (suomi)	Slovak (gwerty)		
French (Français)	Slovenian	<b>N</b>	
German (Deutsch)	Spanish		
Greek (Ελληνικά)	Swedish		
Gujarati (ગુજરાતી)	Swiss French	N	
Hebrew (עברית)	Swiss French (latin1)	L3	
Hindi (हिन्दी)	Swiss German		=
Hungarian (Magyar)	Swiss German (latin1)		
Icelandic (Icelandic)	Turkish		
Iloko (Iloko)	U.S. English		
Indonesian (Indonesia)	U.S. International		
Janling (Janling)	Ukrainian		
	United Kingdom		
			<b>₩</b> Back
			😂 💿 🖉 🖶 🛄 💟 🛛 🖉 Right Ctrl

**Computer Organization** 

# **Initial Options**

You're installing on the virtual drive, not your actual hard drive, so don't be alarmed by the second dialog.

CentOS 6.4 64-bit [Running] - Oracle VM VirtualBox		
Machine View Devices Help		
<ul> <li>CentOS 64 64-bit [Running] - Oracle VM VirtualBox</li> <li>Machine View Devices Help</li> <li>What type of devices will your installation involve?</li> <li>Basic Storage Devices</li> <li>Installs or upgrades to typical types of storage devices. If you're ne this is probably it.</li> <li>Specialized Storage Devices</li> <li>Installs or upgrades to enterprise devices such as Storage Area Net you to add FCoE / ISCSI / zFCP disks and to filter out devices the ins</li> </ul>	CentOS 6.4 64-bit [Running] - Oracle VM VirtualBox      Machine View Devices Help	
		<u>N</u> ext



**Computer Organization** 

## **Basic Settings**

Name your install, select your time zone and set the password for root:



## **Storage Configuration**

#### VirtualBox/CentOS Setup 19



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#### **Computer Organization**

## Installation Type

Select the general type of system you want... probably Software Development.

You can add additional packages later.

ichine View Devices Help	
The default installation of CentOS is a minimum install. You can optional different set of software now	ly select a
O Desktop	
O Minimal Desktop	
O Minimal	
O Basic Server	
<ul> <li>Database Server</li> </ul>	k
<ul> <li>Web Server</li> </ul>	
<ul> <li>Virtual Host</li> </ul>	
Software Development Workstation	
Please select any additional repositories that you want to use for softwa	re installation.
Please select any additional repositories that you want to use for softwa	re installation.
Please select any additional repositories that you want to use for softwa C CentOS	re installation.
Please select any additional repositories that you want to use for softwa C CentOS	re installation.
Please select any additional repositories that you want to use for softwar C CentOS	re installation.
Please select any additional repositories that you want to use for software centors	re installation.
Please select any additional repositories that you want to use for softwa	re installation.
Please select any additional repositories that you want to use for softwa	re installation.
Please select any additional repositories that you want to use for softwa  C CentOS  A Add additional software repositories  Modify reposit fou can further customize the software selection now, or after install via management application.	re installation.
Please select any additional repositories that you want to use for softwar C CentOS CentOS CentOS Modify reposit You can further customize the software selection now, or after install via management application. O Customize now	re installation.
Please select any additional repositories that you want to use for software CentOS	re installation.
Please select any additional repositories that you want to use for software	re installation.
Please select any additional repositories that you want to use for softwa	re installation.



#### **Computer Organization**

# First Completion...

Things should proceed automatically until a restart is needed:



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#### **Computer Organization**

## **Initial Setup**

### VirtualBox/CentOS Setup 22



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## **Initial Setup**

#### VirtualBox/CentOS Setup 23



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# **Continuing Setup**

### VirtualBox/CentOS Setup 24

#### Set data/time information; I'd take the default Kdump settings:

<ul> <li>CentOS 6.4 64-bit [Running] - Oracle</li> <li>Machine View Devices Help</li> <li>Welcome</li> <li>License</li> <li>Information</li> <li>Create User</li> <li>Date and Time</li> <li>Kdump</li> </ul>	VM VirtualBox           Date and Time           Please set the date and time for the system.           Date and Time           Current date and time: Mon 22 Jul 2013 02:20:55 PM EDT			
	□ synchronize date and time over the network Manually set the date and time of your system:	CentOS 6.4 64-bit [Running] - Oracle VM VirtualBo Machine View Devices Help	x	
	Date       Time         \$\$\$\$ 100       1       2       3       4       5       6       7       8       9       10       11       12       13       14       15       16       17       18       19       10       11       12       13       14       15       16       17       18       19       10       11       12       13       14       15       16       17       18       19       10       12       13       14       15       16       17       18       19       10       12       23       24       25       26       27       28       28       29       30       31       1       2       3       4       5       6       7       8       9       10 <th>Welcome License Information Create User Date and Time → Kdump Usable Advanu # Cor # Thi # the # Cor # Thi # the # Cor # Thi # the # con # the # con</th> <th>by the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the kdump kernel has been loaded. If the series of the kdump initramfs, and have no effect of the system is mounted and the normal init scripts are proceed to series the series of the series of the series and path may be configured at once the configured dump target and path may be configured at once the configured dump target fails, the default directive below after the strend may be configured at once the configured dump target fails, the default action will be preform (in grader) when the series of the series of</th> <th>Back Finish</th>	Welcome License Information Create User Date and Time → Kdump Usable Advanu # Cor # Thi # the # Cor # Thi # the # Cor # Thi # the # con # the # con	by the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the crash. Note that kdump does the series of the kdump kernel has been loaded. If the series of the kdump initramfs, and have no effect of the system is mounted and the normal init scripts are proceed to series the series of the series of the series and path may be configured at once the configured dump target and path may be configured at once the configured dump target fails, the default directive below after the strend may be configured at once the configured dump target fails, the default action will be preform (in grader) when the series of	Back Finish



#### **Computer Organization**

# Booting up the VM

### VirtualBox/CentOS Setup 25





**Computer Organization** 

# CentOS VM Desktop

VirtualBox/CentOS Setup 26





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## Enable CentOS Network

If you install CentOS from a DVD or ISO (as we did), networking is not enabled by default.

Right-click on the networking icon and select Edit Connections:

Wed Aug 28, 2:30 PM   Enable Networking   Enable Notifications   Connection Information   Edit Connections   About     Network Connections   Name   Last Used   Vired   System eth0   3 minutes ago	Select eth0 and Edit           Image: Add image: A	Editing System eth0 Connection name: System eth0 ✓ Connect automatically ✓ Available to all users Wired 802.1x Security IPv4 Settings IPv6 Settings Device MAC address: 08:00:27:B9:C3:01 Cloned MAC address: MTU: automatic → bytes
	Close	<u>Cancel</u> Apply



# **OS** Updates

I recommend running any OS updates next.

You can select the update tool from the CentOS menu bar:

It is likely that a lot of updates will be offered. It's probably OK to just accept all of them.

<b>0</b> <sup>1</sup>	Soltware opuate		~		
Software updates correct errors, eliminate security vulnerabilities and provide new features.					
Install	Software 🗸	Status Size			
🔶 🗸	Libraries used by the BIND DNS packages bind-libs-32:9.8.2-0.17.rc1.el6_4.6 (x86_64)	878.5 KB	=		
🌞 🗹	Utilities for querying DNS name servers bind-utils-32:9.8.2-0.17.rc1.el6_4.6 (x86_64)	182.2 KB			
🌞 🗹	Statically linked binary providing simplified versions busybox-1:1.15.1-16.el6_4 (x86_64)	610.6 KB			
🌞 🗹	CPU frequency adjusting daemon cpuspeed-1:1.5-20.el6_4 (x86_64)	36.7 KB			
🔺 🗹	Gcore extension module for the crash utility	37.0 KB	~		
The development 2013-08 • Fix gssa 2013-07 • fix CVE- 2013-03 • fix CVE- ship dn 2013-02	The developer logs will be shown as no description is available for this update: <b>2013-08-14</b> Tomas Hozza <thozza@redhat.com> 32:9.8.2-0.17.rc1.6 • Fix gssapictx memory leak (#996955) <b>2013-07-28</b> Tomas Hozza <thozza@redhat.com> 32:9.8.2-0.17.rc1.5 • fix CVE-2013-4854 <b>2013-03-27</b> Adam Tkac <atkac com="" redhat=""> 32:9.8.2-0.17.rc1.4 • fix CVE-2013-2266 • ship dns/rrl.h in -devel subpkg <b>2013-02-08</b> Adam Tkac <atkac com="" redhat=""> 32:9.8.2-0.17.rc1.3 • computer one house file form (usc /charse /desc_intraduced hu BBL patch</atkac></atkac></thozza@redhat.com></thozza@redhat.com>				
	35 updates selected (56.9 MB)				
Hel	Quit	Install Update	es		



## VirtualBox Guest Additions

The VirtualBox Guest Additions provide additional functionality for your VM.



One note: until you install the VirtualBox Extension Pack (slide 10) and the Guest Additions, some things like mouse capture and scaled displays may not work.

Another note: if you run the system updater or install other software on your VM, you may have to reinstall the Guest Additions.



## VirtualBox Guest Additions

Pay attention to the console window during the installation.

If there are error messages, the Guest Addition may not have been installed.



Verifying archive integrity... All good. Uncompressing VirtualBox 4.2.6 Guest Additions for Linux...... VirtualBox Guest Additions installer Removing existing VirtualBox non-DKMS kernel modules ...done. Building the VirtualBox Guest Additions kernel modules The headers for the current running kernel were not found. If the following module compilation fails then this could be the reason.

Building the main Guest Additions module

