



## Rich's CCC Confer checklist - setup

- ☐ Slides posted
- ☐ WB converted from PowerPoint
- ☐ Print out agenda slide and annotate page numbers
  
- ☐ Flash cards
- ☐ Page numbers
- ☐ 1st minute quiz
- ☐ Web Calendar summary
- ☐ Web book pages
- ☐ Commands
  
- ☐ Bring Linux ISOs on thumb drive
- ☐ Canvas Practice Test ready and scheduled
- ☐ Practice Test systems ready
- ☐ Schedule midnight turnin directory lock
- ☐ Schedule midnight backup of all myscript files
  
- ☐ Backup slides, CCC info, handouts on flash drive
- ☐ Spare 9v battery for mic
- ☐ Key card for classroom door



### **Student Learner Outcomes**

1. Navigate and manage the UNIX/Linux file system by viewing, copying, moving, renaming, creating, and removing files and directories.
2. Use the UNIX features of file redirection and pipelines to control the flow of data to and from various commands.
3. With the aid of online manual pages, execute UNIX system commands from either a keyboard or a shell script using correct command syntax.

# Introductions and Credits



Jim Griffin

- Created this Linux course
- Created Opus and the CIS VLab
- Jim's site: <http://cabrillo.edu/~jgriffin/>



Rich Simms

- HP Alumnus
- Started teaching this course in 2008 when Jim went on sabbatical
- Rich's site: <http://simms-teach.com>

And thanks to:

- John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system (<http://teacherjohn.com/>)



## Student checklist for attending class

The screenshot shows a web browser window with the address bar displaying [simms-teach.com/cis90calendar.php](http://simms-teach.com/cis90calendar.php). The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". On the left sidebar, there is a link labeled "CIS 90". The main content area has a tab labeled "Calendar". Below the calendar, there is a section titled "Presentation slides (download)" and a link labeled "Enter virtual classroom".

1. Browse to:  
**<http://simms-teach.com>**
2. Click the **CIS 90** link.
3. Click the **Calendar** link.
4. Locate today's lesson.
5. Find the **Presentation slides** for the lesson and **download** for easier viewing.
6. Click the **Enter virtual classroom** link to join CCC Confer.
7. Log into Opus with Putty or ssh command.

Note: Blackboard Collaborate Launcher only needs to be installed once. It has already been downloaded and installed on the classroom PC's.



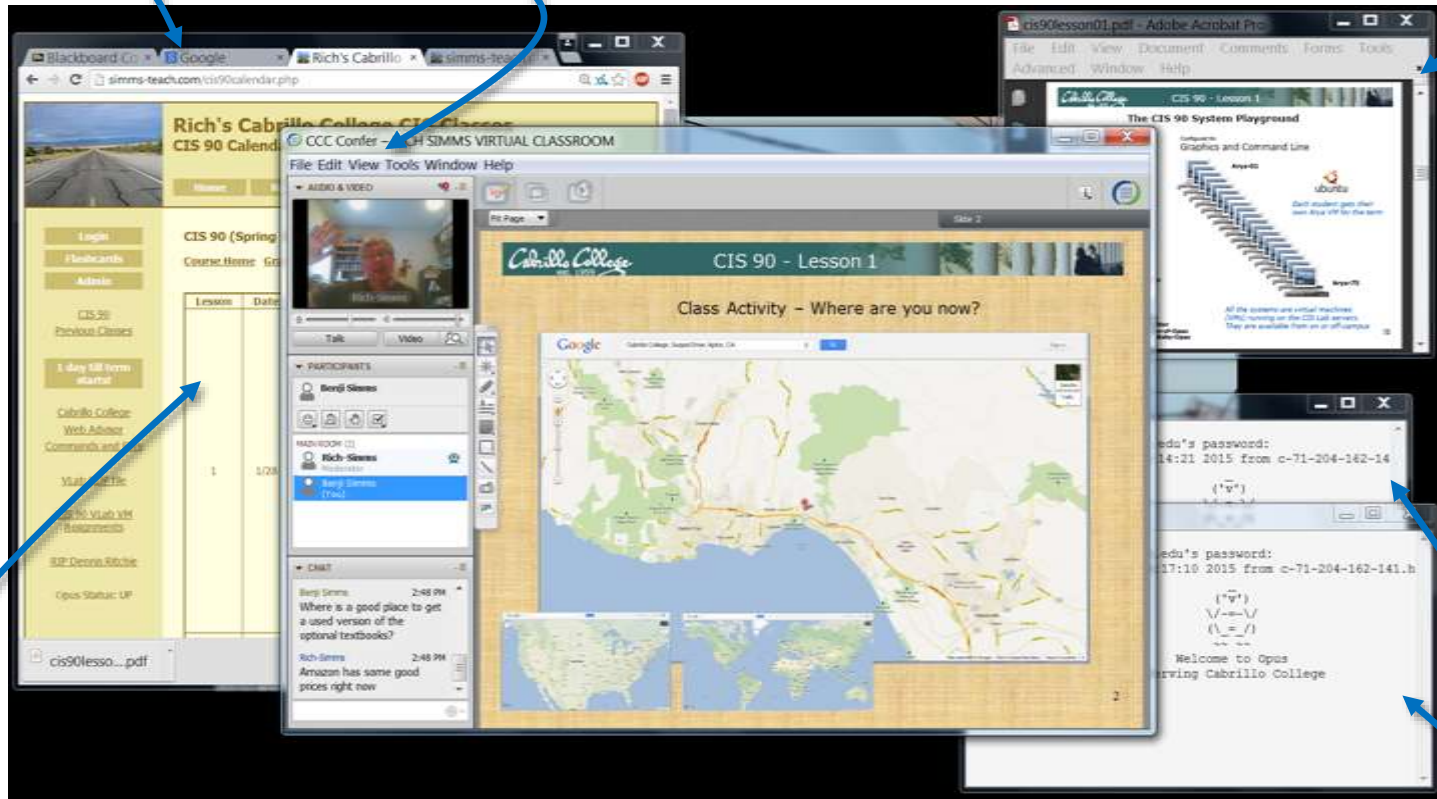


## Student checklist for suggested screen layout

☐ Google

☐ CCC Confer

☐ Downloaded PDF of Lesson Slides



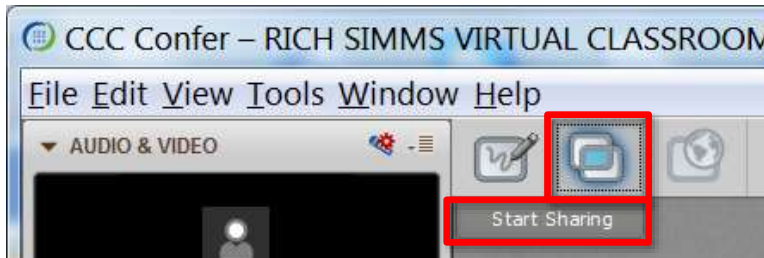
☐ CIS 90 website Calendar page

☐ One or more login sessions to Opus

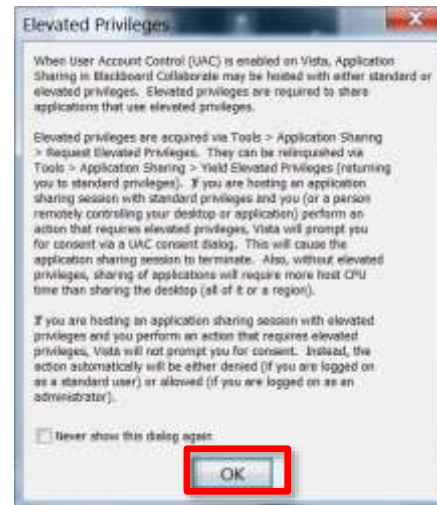


# Student checklist for sharing desktop with classmates

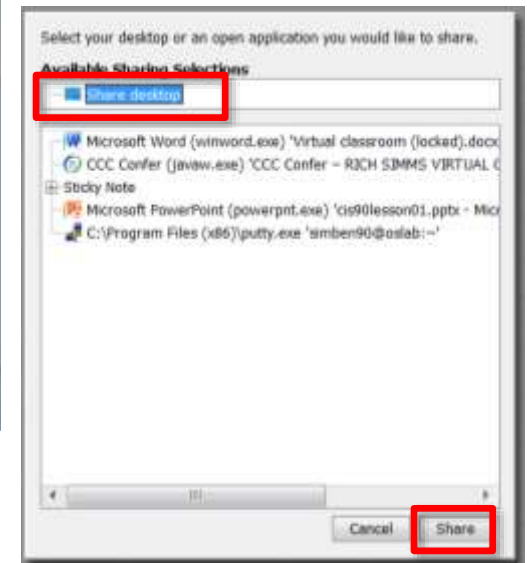
1) Instructor gives you sharing privileges



2) Click overlapping rectangles icon. If white "Start Sharing" text is present then click it as well.



3) Click OK button.



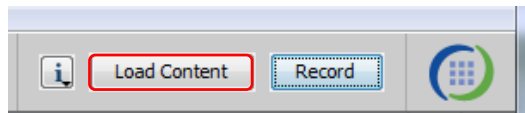
4) Select "Share desktop" and click Share button.



## Rich's CCC Confer checklist - setup

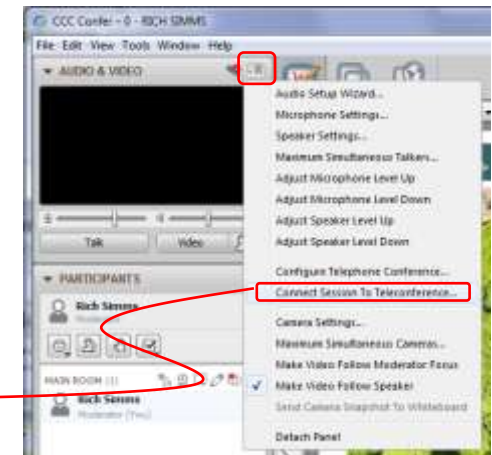
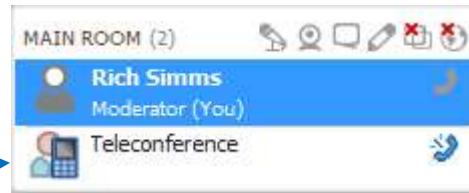


[ ] Preload White Board



[ ] Connect session to Teleconference

*Session now connected to teleconference*



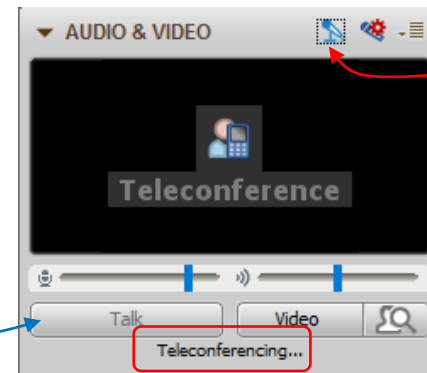
[ ] Is recording on?



*Red dot means recording*

[ ] Use teleconferencing, not mic

*Should be grayed out*



*Should change from phone handset icon to little Microphone icon and the Teleconferencing ... message displayed*



## Rich's CCC Confer checklist - screen layout



The screenshot displays a Windows desktop environment during a CCC Confer session. The desktop includes several open applications:

- CCC Confer - 0 - RIC...:** A window showing the conferencing interface with a video feed of Rich Simms, a list of participants (Rich Simms, Moderator), and a chat window.
- simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf:** A web browser window displaying a quiz titled "Part 1 - Flashc (1 point each)". The quiz questions are:
  - [Q1] What command shows the other users logged in to the computer?
  - [A1] \_\_\_\_\_
  - [Q2] What environment variable is used by the shell to determine which directories to search when locating a command?
  - [A2] \_\_\_\_\_
- Terminal window:** A terminal window showing a login session for simben90@oslab. The output includes:
 

```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Access denied
simben90@oslab.cabrillo.edu's password:
Last login: Mon Oct 8 18:58:43 2011 from 10.10.10.10
d.com
```
- vSphere Client:** A window showing the vSphere Client interface, displaying a list of virtual machines and their status.

Red boxes and arrows highlight specific components:

- foxit for slides:** A red box labeled "foxit for slides" points to the "cis90lesson07.pdf" file in the Foxit Reader window.
- chrome:** A red box labeled "chrome" points to the "simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf" window.
- putty:** A red box labeled "putty" points to the terminal window.
- vSphere Client:** A red box labeled "vSphere Client" points to the vSphere Client window.

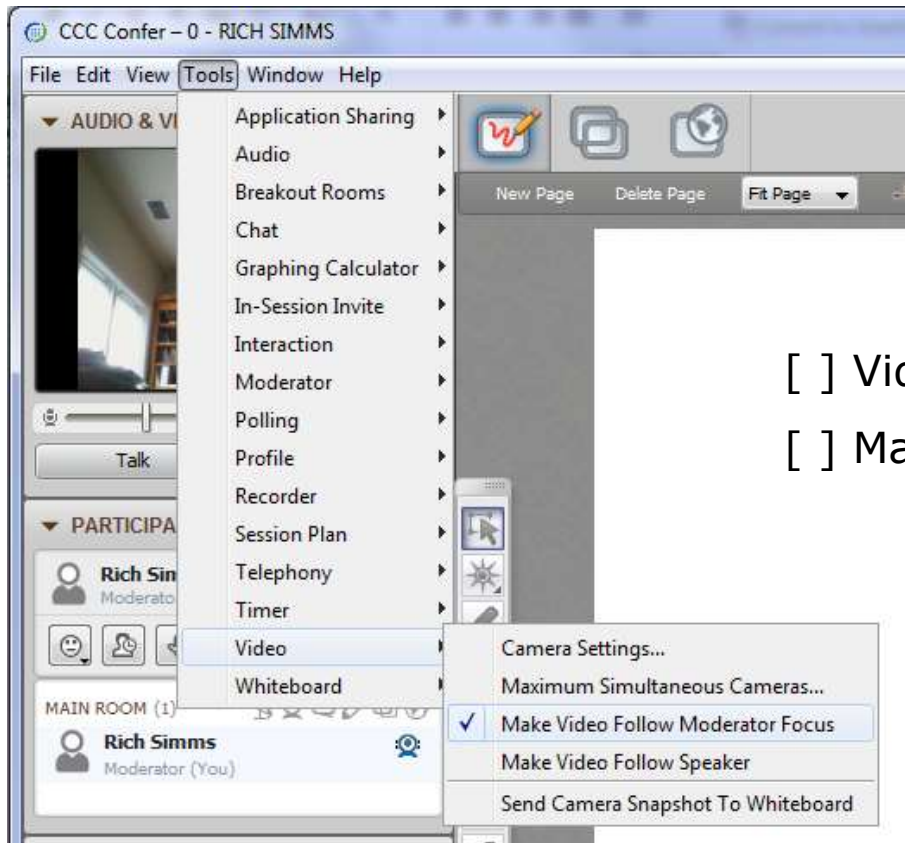
[ ] layout and share apps







## Rich's CCC Confer checklist - webcam setup

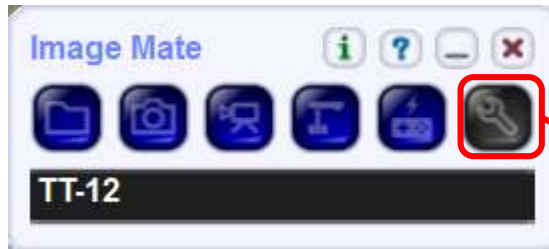


[ ] Video (webcam)

[ ] Make Video Follow Moderator Focus



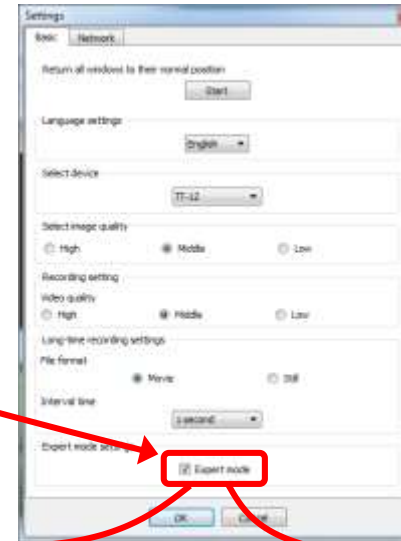
## Rich's CCC Confer checklist - Elmo



Elmo rotated down to view side table



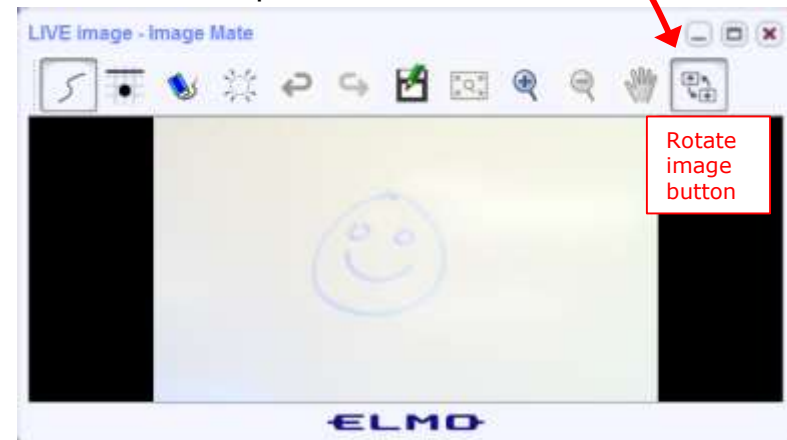
*Run and share the Image Mate program just as you would any other app with CCC Confer*



*The "rotate image" button is necessary if you use both the side table and the white board.*

*Quite interesting that they consider you to be an "expert" in order to use this button!*

Elmo rotated up to view white board



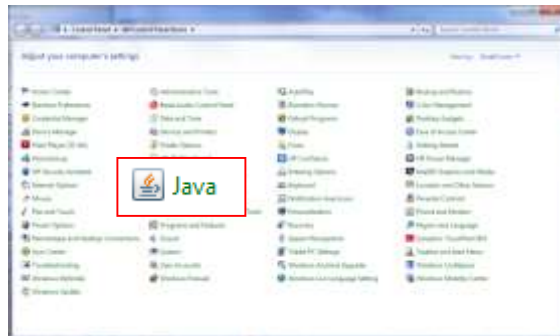


## Rich's CCC Confer checklist - universal fixes

Universal Fix for CCC Confer:

- 1) Shrink (500 MB) and delete Java cache
- 2) Uninstall and reinstall latest Java runtime
- 3) <http://www.cccconfer.org/support/technicalSupport.aspx>

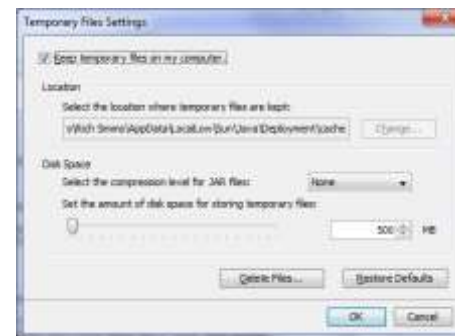
Control Panel (small icons)



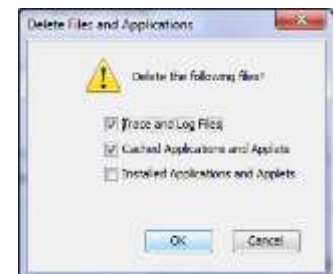
General Tab > Settings...



500MB cache size



Delete these



Google Java download





# Start





# Sound Check

*Students that dial-in should mute their line using \*6 to prevent unintended noises distracting the web conference.*

*Instructor can use \*96 to mute all student lines.*



Instructor: **Rich Simms**  
Dial-in: **888-886-3951**  
Passcode: **136690**



Jacob



Ethan



Amr



Becka



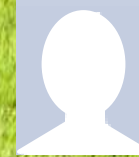
Brenda



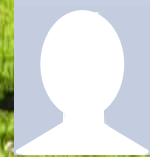
Nikki



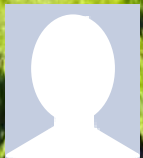
Brad



Tyler



Justin



Nick



Cody



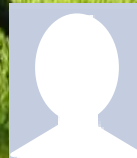
Alan



Carrie



Danny



Steven



Wes



Jade



Brandon



Bryanda



Nicole

## Quiz

**No Quiz  
Today !**



## File Transfer and Review

Objectives	Agenda
<ul style="list-style-type: none"><li>• Transfer project files to Windows and Linux systems</li><li>• Prepare for final exam</li></ul>	<ul style="list-style-type: none"><li>• No Quiz</li><li>• Questions</li><li>• Housekeeping</li><li>• Final Exam (Test 3)</li><li>• Test 3 Tips</li><li>• File transfer continued</li><li>• Compressed archives</li><li>• Make your own Opus</li><li>• Project Presentations</li><li>• Wrap up</li></ul>





# Questions



# Questions?

Lesson material?

Labs? Tests?

How this course works?

- Graded work in home directories
- Answers in /home/cis90/answers

*Who questions much, shall learn much, and retain much.*

- Francis Bacon

*If you don't ask, you don't get.*

- Mahatma Gandhi

Chinese  
Proverb

他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。

*He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.*

# Housekeeping



**Project is  
due tonight!**



**Don't forget  
to submit  
your  
project!**

- Final project **due 11:59 PM** tonight.
- Don't forget to **submit** using the instructions:  

```
cp myscript /home/rsimms/turnin/cis90/myscript.$LOGNAME
```
- Project presentations after lesson material today.
- Final exam is next week **Monday** May 16<sup>th</sup>.
- Extra credit labs and forum posts due 11:59 PM day of the final exam.
- Practice test for final exam is available now.
- Practice test server will shutdown 30 minutes before the final exam.

## Grading rubric (60 points maximum)

Possible Points	Requirements
30	Implementing all five tasks (6 points each): <ul style="list-style-type: none"> <li>Requirements for each task: <ul style="list-style-type: none"> <li>Minimum of 10 "original" script command lines</li> <li>Has one or more non-generic comments to explain what it is doing</li> <li>Has user interaction</li> </ul> </li> </ul>
25	You don't have to do all of these but do at least five: <ul style="list-style-type: none"> <li>Redirecting stdin (5 points)</li> <li>Redirecting stdout (5 points)</li> <li>Redirecting stderr (5 points)</li> <li>Use of permissions (5 points)</li> <li>Use of filename expansion characters (5 points)</li> <li>Use of absolute path (5 points)</li> <li>Use of relative path (5 points)</li> <li>Use of a PID (5 points)</li> <li>Use of inodes (5 points)</li> <li>Use of links (5 points)</li> <li>Use of scheduling (5 points)</li> <li>Use of a GID or group (5 points)</li> <li>Use of a UID or user (5 points)</li> <li>Use of a /dev/tty device (5 points)</li> <li>Use of a signal (5 points)</li> <li>Use of piping (5 points)</li> <li>Use of an environment variable (5 points)</li> <li>Use of /bin/mail (5 points)</li> <li>Use of a conditional (5 points)</li> </ul> <p>The maximum for this section is 25 points.</p>
5	Present your script to the class
<b>Points lost</b>	
-15	Fails to run from <b>allscripts</b>
-15	Other students in the class are unable to read and execute your script.
-15	Error messages are displayed when running one or more tasks
-up to 90	No credit for any task which contains unoriginal script code that: <ul style="list-style-type: none"> <li>Doesn't give full credit to the original author</li> <li>Doesn't indicate where the code was obtained from</li> <li>Doesn't include licensing terms</li> <li>Violates copyright or licensing terms</li> </ul>
<b>Extra credit</b>	
30	Up to three additional tasks (10 points each)

*Make sure you have at least five of these implemented*

*Log in as cis90 and test your script so you don't lose any points*

## Final project status 5/10/2016

```
[rsimms@oslab project]$ ./progress
myscript file: (simben90) 2016-04-19 17:02:45 exists readable executable 245 lines
myscript file: (milhom90) 2016-05-05 21:15:50 exists readable executable 140 lines
myscript file: (bancar90) not found 140 lines
myscript file: (hawjus90) 2016-05-09 17:55:44 exists readable executable 112 lines
myscript file: (hunbra90) 2016-05-07 11:51:24 exists readable executable 207 lines
myscript file: (miljac90) 2016-05-05 23:10:49 exists readable executable 150 lines
myscript file: (pajste90) 2016-05-09 22:50:25 exists readable executable 166 lines
myscript file: (rombry90) 2016-04-27 10:48:02 exists readable executable 42 lines
myscript file: (soramr90) 2016-04-20 10:36:35 exists readable executable 42 lines
myscript file: (specod90) not found 42 lines
myscript file: (stejad90) 2016-04-27 11:30:54 exists readable executable 58 lines
myscript file: (betbra90) 2016-05-09 15:33:19 exists readable executable 110 lines
myscript file: (bomnic90) 2016-05-09 11:19:50 exists readable executable 170 lines
myscript file: (bownic90) 2016-05-04 10:53:03 exists readable executable 44 lines
myscript file: (brinic90) 2016-05-08 17:07:40 exists readable executable 61 lines
myscript file: (ebeeth90) 2016-04-27 10:51:21 exists readable executable 37 lines
myscript file: (jordan90) 2016-05-09 20:50:48 exists readable executable 393 lines
myscript file: (jorwes90) 2016-05-09 11:26:10 exists readable executable 190 lines
myscript file: (loyala90) 2016-05-09 23:39:33 exists readable executable 94 lines
myscript file: (simreb90) 2016-05-08 12:21:15 exists readable executable 110 lines
myscript file: (temtyl90) not found 110 lines
myscript file: (tosbre90) 2016-05-09 21:05:13 exists readable executable 114 lines
[rsimms@oslab project]$
```

*To get started see Lesson 13 "Final Project Getting Started" module*

*If you have started but it doesn't show here make sure you can run your myscript file from allscripts as the cis90 user.*



# Make backup copies of your script

*modify, debug, modify, debug, ... rest*

```
/home/cis90/simben/bin $ cp myscript myscript.v1
```

*modify, debug, modify, debug, ... rest*

```
/home/cis90/simben/bin $ cp myscript myscript.v2
```

*modify, debug, modify, debug, ... rest*

```
/home/cis90/simben/bin $ cp myscript myscript.v3
```

## Fall 2016 Linux Classes and Prerequisites

### CIS 90 Introduction to UNIX/Linux

Provides a technical overview of the UNIX/Linux operating system, including hands-on experience with commands, files, and tools. Recommended Preparation: CIS 1L or CIS 72.

Transfer Credit: Transfers to CSU;UC

Section	Days	Times	Units	Instructor	Room
93337	W	1:00PM-4:05PM	3.00	R.Simms	OL
&	Arr.	Arr.		R.Simms	OL

Section 93337 is an ONLINE course. Meets weekly throughout the semester online during the scheduled times by remote technology with an additional 50 min online lab per week. For details, see instructor's web page at [go.cabrillo.edu/online](http://go.cabrillo.edu/online).

93338	W	1:00PM-4:05PM	3.00	R.Simms	828
&	Arr.	Arr.		R.Simms	OL

Section 93338 is a Hybrid ONLINE course. Meets weekly throughout the semester at the scheduled times with an additional 50 min online lab per week. For details, see instructor's web page at [go.cabrillo.edu/online](http://go.cabrillo.edu/online).

### CIS 191AB UNIX/Linux Installation, Configuration and Administration

Introduces skills required to administer UNIX/Linux systems. Prerequisite: CIS 90 or equivalent skills.

Section	Days	Times	Units	Instructor	Room
93328	Arr.	Arr.	4.00	M.Matera	OL

Section 93328 is an ONLINE course. For details, see instructor's web page at [go.cabrillo.edu/online](http://go.cabrillo.edu/online).

93329	TH	1:00PM-5:05PM	4.00	M.Matera	828
&	Arr.	Arr.		M.Matera	OL

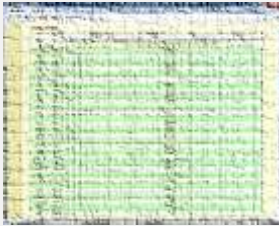
Section 93329 is a Hybrid ONLINE course. Meets weekly throughout the semester at the scheduled times with an additional 50 min online lab per week. For details, see instructor's web page at [go.cabrillo.edu/online](http://go.cabrillo.edu/online).

## Where to find your grades

*Send me your survey to get your LOR code name.*

### The CIS 90 website Grades page

<http://simms-teach.com/cis90grades.php>



### Points that could have been earned:

10 quizzes:	30 points
10 labs:	300 points
2 tests:	60 points
3 forum quarters:	60 points
<b>Total:</b>	<b>450 points</b>

Percentage	Total Points	Letter Grade	Pass/No Pass
90% or higher	504 or higher	A	Pass
80% to 89.9%	448 to 503	B	Pass
70% to 79.9%	392 to 447	C	Pass
60% to 69.9%	336 to 391	D	No pass
0% to 59.9%	0 to 335	F	No pass

**At the end of the term I'll add up all your points and assign you a grade using this table**

### Or check on Opus

**checkgrades** *codename*  
(where codename is your LOR codename)



Written by Jesse Warren a past CIS 90 Alumnus

**grades** *codename*  
(where codename is your LOR codename)



Written by Sam Tindell a past CIS 90 Alumnus.  
Try his tips, schedule and forums scripts as well!

## Last call before finals!



*If you would like some additional help come over to the CIS Lab. There are student lab assistants and instructors there to work with you.*

*Takashi, Melissa, Josh and Andrew are CIS 90 Alumni.*

*Chris is a STEM tutor and can help you Mondays 3-3:30 & 5:30-9 and Wednesdays 4-5 & 7-9.*

*Mike Matera is the other Linux instructor.*

*I'm in there Mondays 10:00-12:30.*







# Final Exam (Test 3)

## Heads up on Final Exam

Test #3 (final exam) is **MONDAY** May 16 **7-9:50AM**

<b>Monday</b>	5/16	Test #3 (the final exam)	5 posts <u>Lab X1</u> <u>Lab X2</u>
		<b>Time</b> <ul style="list-style-type: none"> <li>MONDAY 7:00AM - 9:50AM in Room 828</li> </ul> <b>Materials</b> <ul style="list-style-type: none"> <li>Test (<u>canvas</u>)</li> </ul> <b>CCC Confer</b> <ul style="list-style-type: none"> <li><u>Enter virtual classroom</u></li> <li><u>Class archives</u></li> </ul>	

*Extra credit  
labs and  
final posts  
due by  
11:59PM*

- All students will take the test at the same time. The test must be completed by 9:50AM.
- Working and long distance students can take the test online via CCC Confer and Canvas.
- Working students will need to plan ahead to arrange time off from work for the test.
- Test #3 is mandatory (even if you have all the points you want)

## Final Exam (Test #3)

- **The final exam will be Test #3  
(worth 30 points + 3 points extra credit)**
  - Open book, open notes, open computer.
  - During the test you must work alone and not ask or give assistance to others.
  - Canvas test, so make sure you can log into Canvas before the test starts so you don't waste valuable time on this activity.

# Final Exam (Test #3)

- **Canvas Practice Test 3**

- Advice:

- ❖ Work EVERY question on the practice test and make a personal reference sheet for remembering how to do things
  - ❖ Use your reference sheet on the final exam.
  - ❖ Take the practice test more than once. Use the **restore** command to reset your directory on the testing system
- Use of study groups and the forum are a great way to work on the practice test and prepare for the final exam!





# Test 3

# Tips

Practice Test

**Do the practice test  
multiple times.**

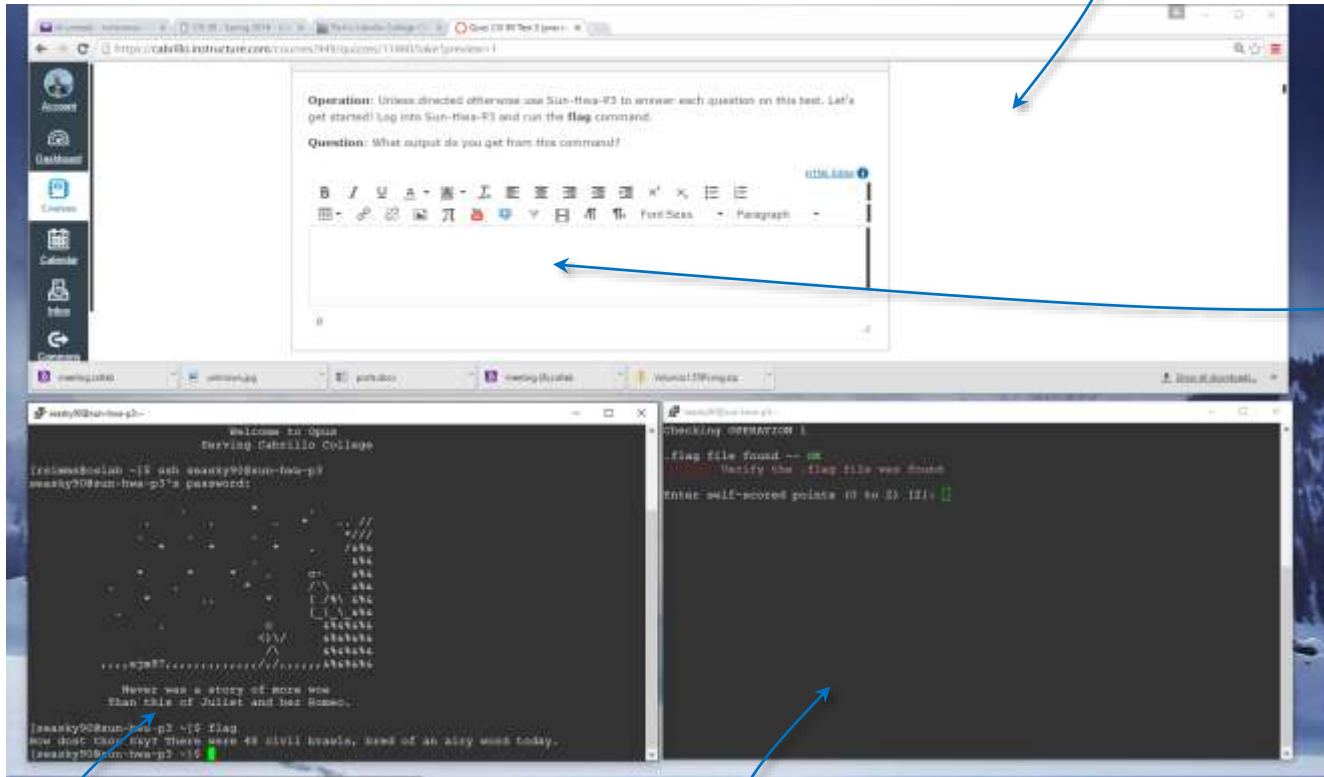
**Use the restore command  
for a fresh start.**

# Test Tips

Practice Test

## Screen Layout

*Resize Canvas to show just one question at a time*



*Note: You can copy and paste text from your session into Blackboard if needed*

*One session to work the questions in*

*Another session to run the check script in, show specs, send signals etc.*

# Test Tips

Use the -v (verbose option) to double check your work



## The -v (verbose) option

```
[rsimms@oslab ~]$ mkdir fun
```

```
[rsimms@oslab ~]$ touch fun/funny
```

```
[rsimms@oslab ~]$ chmod -R 700 fun
```

```
[rsimms@oslab ~]$ chmod -Rv 750 fun
```

```
mode of `fun' changed to 0750 (rwxr-x---)
```

```
mode of `fun/funny' changed to 0750 (rwxr-x---)
```

```
[rsimms@oslab ~]$ touch dog cat
```

```
[rsimms@oslab ~]$ mv dog fun
```

```
[rsimms@oslab ~]$ mv -v cat fun
```

```
`cat' -> `fun/cat'
```

*Notice how using the -v option gives you additional feedback*

# Test Tips

head and tail pipelines  
grep -n

## Sample Task

**Find a block of text in a large file that contains a specific text string. Then write a script that displays that block of text.**



**Examine the *dickens* file in the */home/cis90/depot* directory and find the block of lines containing this quote:**

"Father is so much kinder than he used to be"

*In the dickens file, which line number contains the quote above?*

*Write your answer in the chat window*

## One way: use grep to find the quote in the file

*Use grep to find the quote in the file*

```
/home/cis90/simben $ grep "much kinder" ../depot/dickens  
for ever and ever. Father is so much kinder than he used to be, that
```

*The -n option on grep shows the line number*

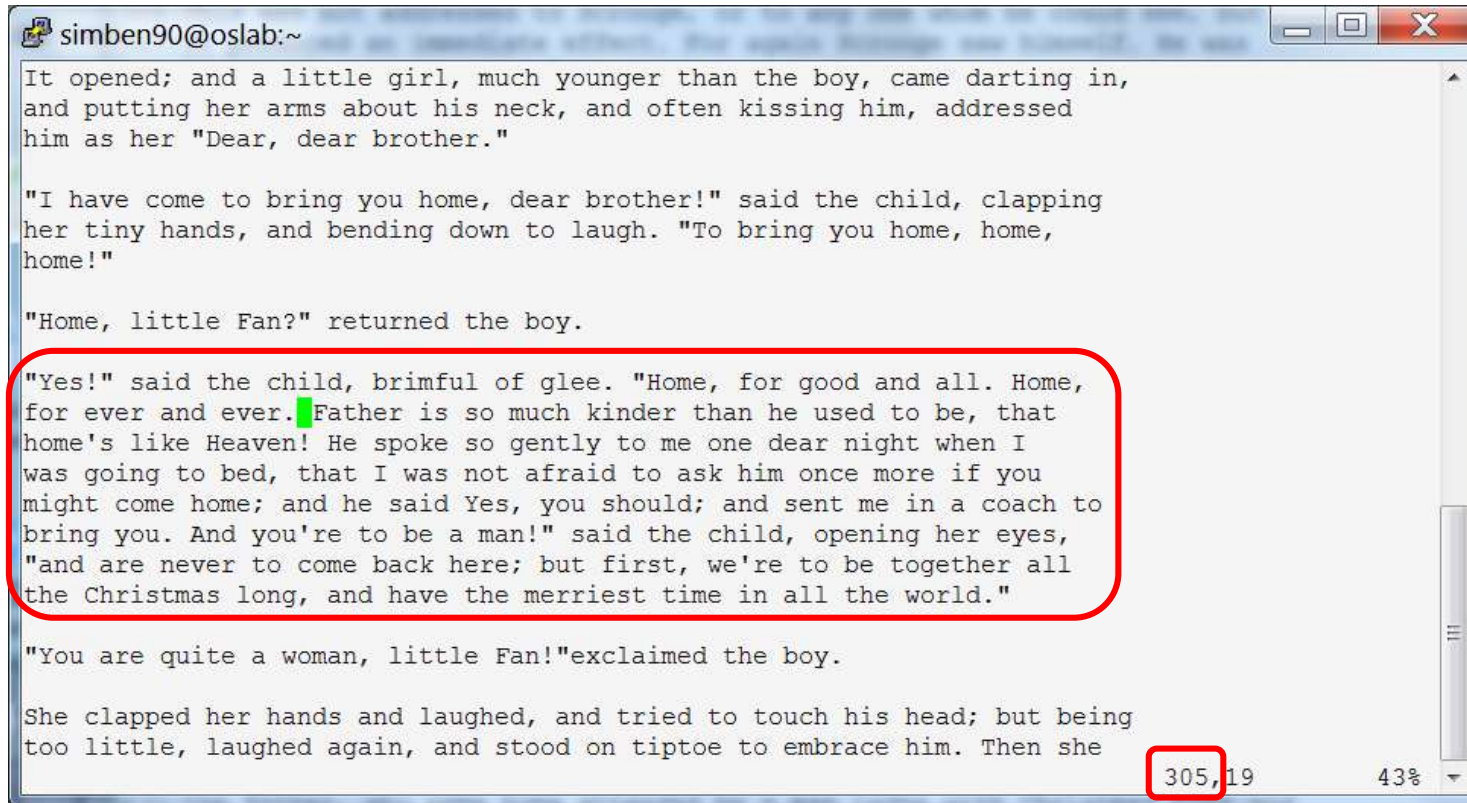
```
/home/cis90/simben $ grep -n "much kinder" ../depot/dickens  
305:for ever and ever. Father is so much kinder than he used to be, that
```

*Using grep we see that the quote is on line 305 of the dickens file*



## Use vi to view the block of lines containing the quote

```
vi ../depot/dickens
```



```
simben90@oslab:~
It opened; and a little girl, much younger than the boy, came darting in,
and putting her arms about his neck, and often kissing him, addressed
him as her "Dear, dear brother."

"I have come to bring you home, dear brother!" said the child, clapping
her tiny hands, and bending down to laugh. "To bring you home, home,
home!"

"Home, little Fan?" returned the boy.

"Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
was going to bed, that I was not afraid to ask him once more if you
might come home; and he said Yes, you should; and sent me in a coach to
bring you. And you're to be a man!" said the child, opening her eyes,
"and are never to come back here; but first, we're to be together all
the Christmas long, and have the merriest time in all the world."

"You are quite a woman, little Fan!" exclaimed the boy.

She clapped her hands and laughed, and tried to touch his head; but being
too little, laughed again, and stood on tiptoe to embrace him. Then she
```

305,19 43%

*For a script to output the circled block of text above we must determine the line numbers of the start and end of the block*

Starts on  
line 304

```
simben90@oslab:~
It opened; and a little girl, much younger than the boy, came darting in,
and putting her arms about his neck, and often kissing him, addressed
him as her "Dear, dear brother."

"I have come to bring you home, dear brother!" said the child, clapping
her tiny hands, and bending down to laugh. "To bring you home, home,
home!"

"Home, little Fan?" returned the boy.

Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
```

304,1

43%

Ends on  
line 311

```
simben90@oslab:~
It opened; and a little girl, much younger than the boy, came darting in,
and putting her arms about his neck, and often kissing him, addressed
him as her "Dear, dear brother."

"I have come to bring you home, dear brother!" said the child, clapping
her tiny hands, and bending down to laugh. "To bring you home, home,
home!"

"Home, little Fan?" returned the boy.

"Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
was going to bed, that I was not afraid to ask him once more if you
might come home; and he said Yes, you should; and sent me in a coach to
bring you. And you're to be a man!" said the child, opening her eyes,
"and are never to come back here; but first, we're to be together all
the Christmas long, and have the merriest time in all the world."

"You are quite a woman, little Fan!" exclaimed the boy.

She clapped her hands and laughed, and tried to touch his head; but being
too little, laughed again, and stood on tiptoe to embrace him. Then she
```

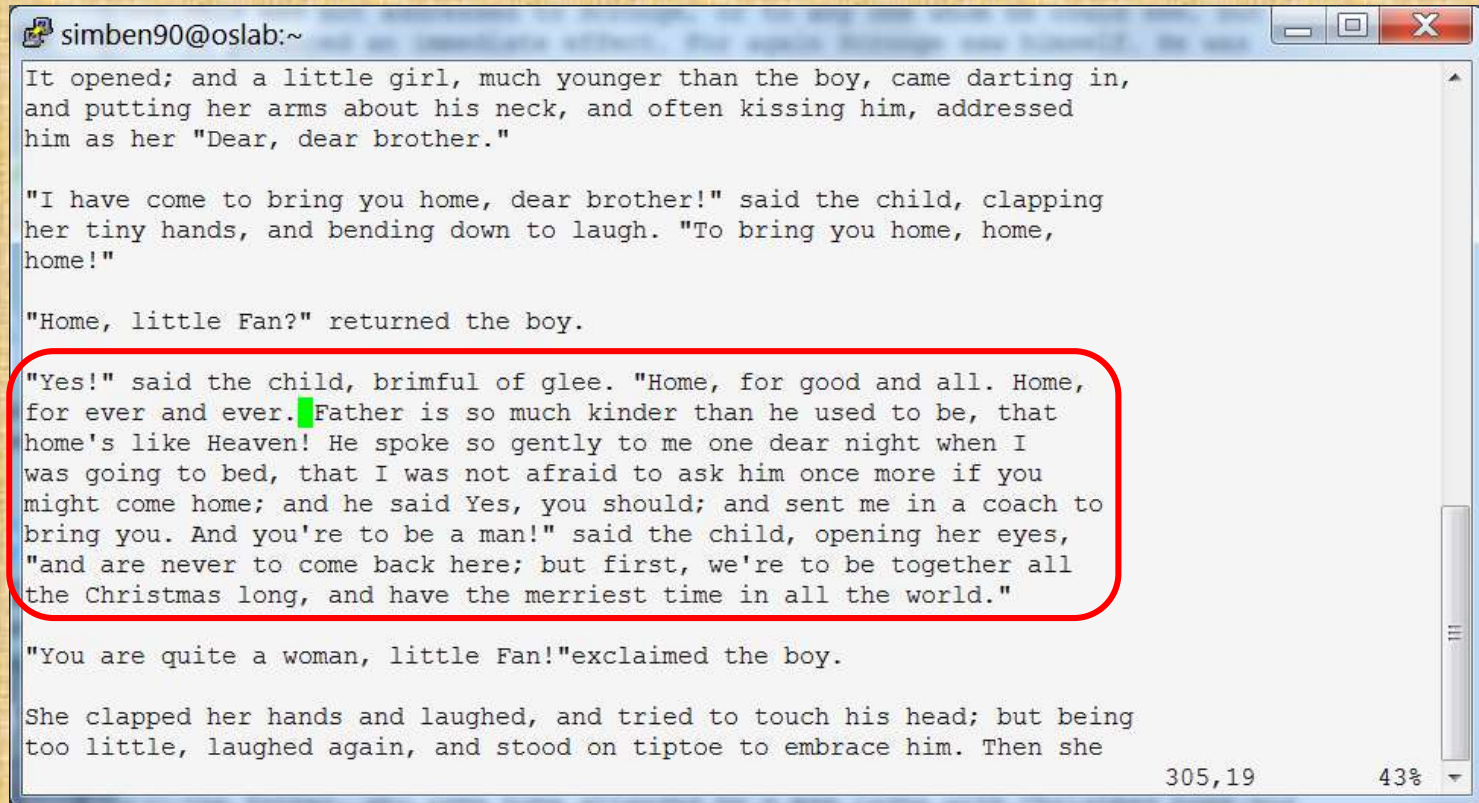
311,1

43%

Just move the cursor in vi and the line number in the lower right changes



**/home/cis90/depot/dickens**



A terminal window titled 'simben90@oslab:~' displays text from Charles Dickens' 'A Christmas Carol'. The text is as follows:

```
It opened; and a little girl, much younger than the boy, came darting in,
and putting her arms about his neck, and often kissing him, addressed
him as her "Dear, dear brother."

"I have come to bring you home, dear brother!" said the child, clapping
her tiny hands, and bending down to laugh. "To bring you home, home,
home!"

"Home, little Fan?" returned the boy.

"Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
was going to bed, that I was not afraid to ask him once more if you
might come home; and he said Yes, you should; and sent me in a coach to
bring you. And you're to be a man!" said the child, opening her eyes,
"and are never to come back here; but first, we're to be together all
the Christmas long, and have the merriest time in all the world."

"You are quite a woman, little Fan!" exclaimed the boy.

She clapped her hands and laughed, and tried to touch his head; but being
too little, laughed again, and stood on tiptoe to embrace him. Then she
```

The terminal window shows a cursor at the end of the last line of text. The bottom right corner of the window displays '305,19' and '43%'.

*Starts on  
line 304*

*Ends on  
line 311*

*What pipeline command using head and tail would print  
just the block of text above?*

*Write your answer in the chat window*

*The last line of  
the block is 311*

*The number of lines in  
the block would be  
 $311 - 304 + 1$   
or 8 lines*

```
/home/cis90/simben $ head -n311 ../depot/dickens | tail -n8
"Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
was going to bed, that I was not afraid to ask him once more if you
might come home; and he said Yes, you should; and sent me in a coach to
bring you. And you're to be a man!" said the child, opening her eyes,
"and are never to come back here; but first, we're to be together all
the Christmas long, and have the merriest time in all the world."
/home/cis90/simben $
```

*This is how you would use a head and tail pipeline to print just  
the block of text in the file containing the quote*

*Let's now make that long command into a script named dickens101*

```
/home/cis90/simben $ vi dickens101
/home/cis90/simben $ cat dickens101
head -n311 ../depot/dickens | tail -n8
```

```
/home/cis90/simben $ chmod +x dickens101
/home/cis90/simben $ dickens101
```

```
"Yes!" said the child, brimful of glee. "Home, for good and all. Home,
for ever and ever. Father is so much kinder than he used to be, that
home's like Heaven! He spoke so gently to me one dear night when I
was going to bed, that I was not afraid to ask him once more if you
might come home; and he said Yes, you should; and sent me in a coach to
bring you. And you're to be a man!" said the child, opening her eyes,
"and are never to come back here; but first, we're to be together all
the Christmas long, and have the merriest time in all the world."
/home/cis90/simben $
```

*Now we have a one-line script to print the block of  
text containing the quote*

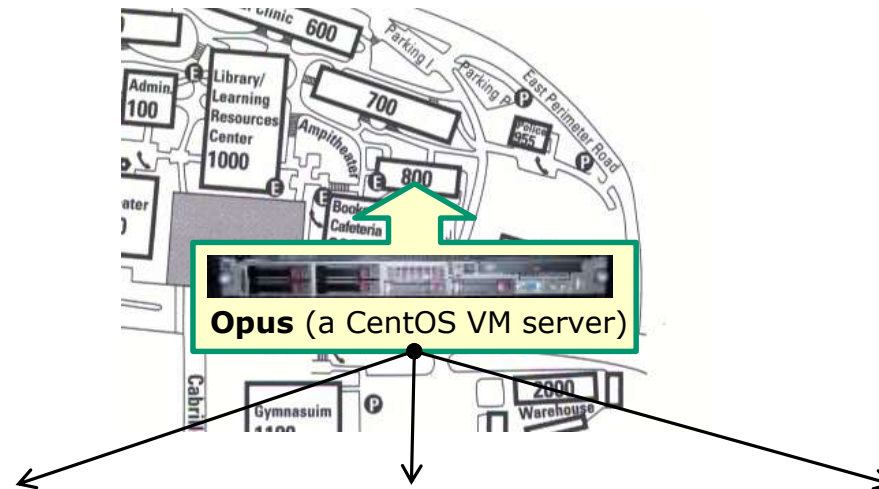




# File transfer continued

# File Transfer

Downloading your Opus files to your home computer



Windows



Mac



Linux

## First, let's backup your home directory on Opus

```
/home/cis90/simben $ tar czf simben90.tgz .  
tar: .: file changed as we read it
```

*The tarball (archive) simben90.tgz is created. The tarball does not include itself. The error message warns the directory changed during backup (new tarball added).*

```
/home/cis90/simben $ ls -lh simben90.tgz  
-rw-rw-r--. 1 simben90 cis90 79K May 10 16:11 simben90.tgz
```

*The -h (human readable) option shows the simben90.tgz tarball is 79K bytes in size*

```
/home/cis90/simben $ tar tzf simben90.tgz | wc -l  
197
```

*197 files were backed up*

Next, let's look at some file transfer tools

- Between Linux and Windows:
  - **Filezilla** or related applications
  - **PSCP** (Putty SCP) command
- Between Linux and Linux/Mac:
  - **Filezilla** or related applications
  - **scp** command

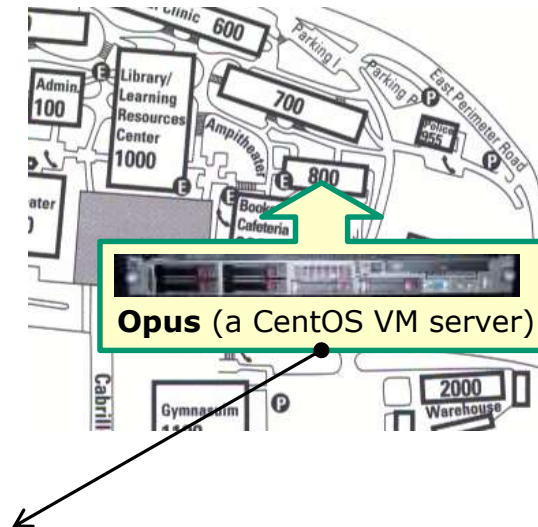
# File Transfer To Windows

## FileZilla



# File Transfer

Downloading your Opus files to your home computer



Windows

Using  FileZilla

# File Transfer

<http://filezilla-project.org>



*Download and install FileZilla on your Windows PC*



**On Windows, connect to your account on Opus**

The screenshot shows the FileZilla client interface. Yellow callout boxes with arrows point to specific fields and buttons:

- Opus username**: Points to the Username field containing "simben90".
- Port: 2220**: Points to the Port field containing "2220".
- Host: sftp://opus.cis.cabrillo.edu**: Points to the Host field containing "sftp://opus.cis.cabrillo.edu".
- Opus Password**: Points to the Password field, which is masked with dots.
- Click to connect**: Points to the "Quickconnect" button.

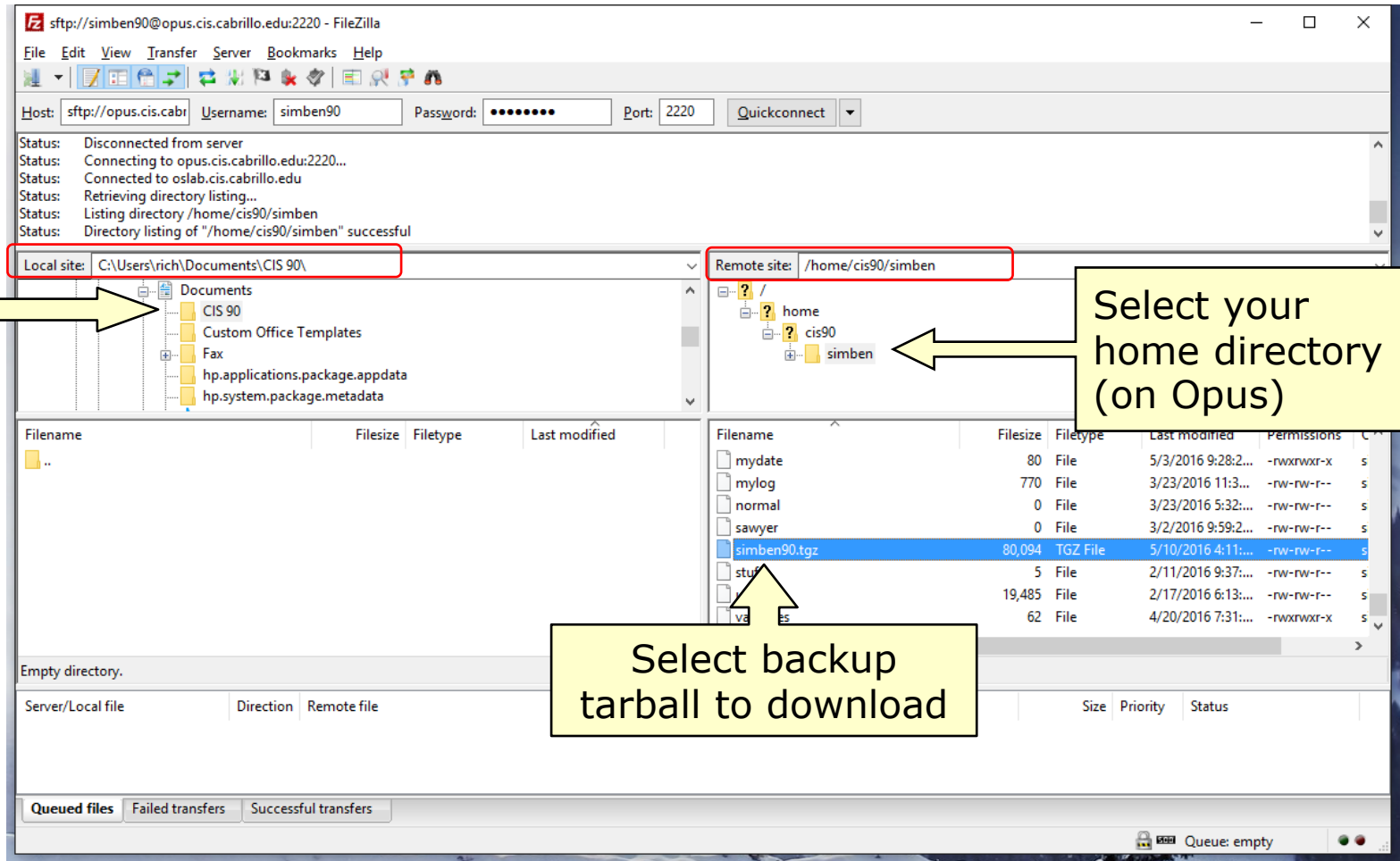
The status bar at the bottom shows "Queue: empty".

Filename	Filesize	Filetype	Last modified
..			
z-zz-staging		File folder	6/28/2013 9:13:23 ...
css		File folder	12/18/2015 4:49:23...
forum		File folder	12/18/2015 5:00:32...
includes		File folder	12/18/2015 6:03:45...
animations		File folder	12/18/2015 6:45:43...
images		File folder	12/18/2015 7:07:00...
z-zz-2015-fall		File folder	12/28/2015 4:10:07...

Filename	Filesize	Filetype	Last modified	Permissions
..				
Hidden		File folder	2/1/2002 10:14:...	drwxr--r-- si
docs		File folder	3/1/2016 5:40:3...	drwxrwxr-x si
etc		File folder	3/1/2016 6:01:1...	drwxrwxr-x si
island		File folder	3/2/2016 9:48:3...	drwxrwxr-x si
slackware		File folder	3/2/2016 9:50:4...	drwxrwxr-x si
africa		File folder	3/2/2016 9:52:4...	drwxrwxr-x si

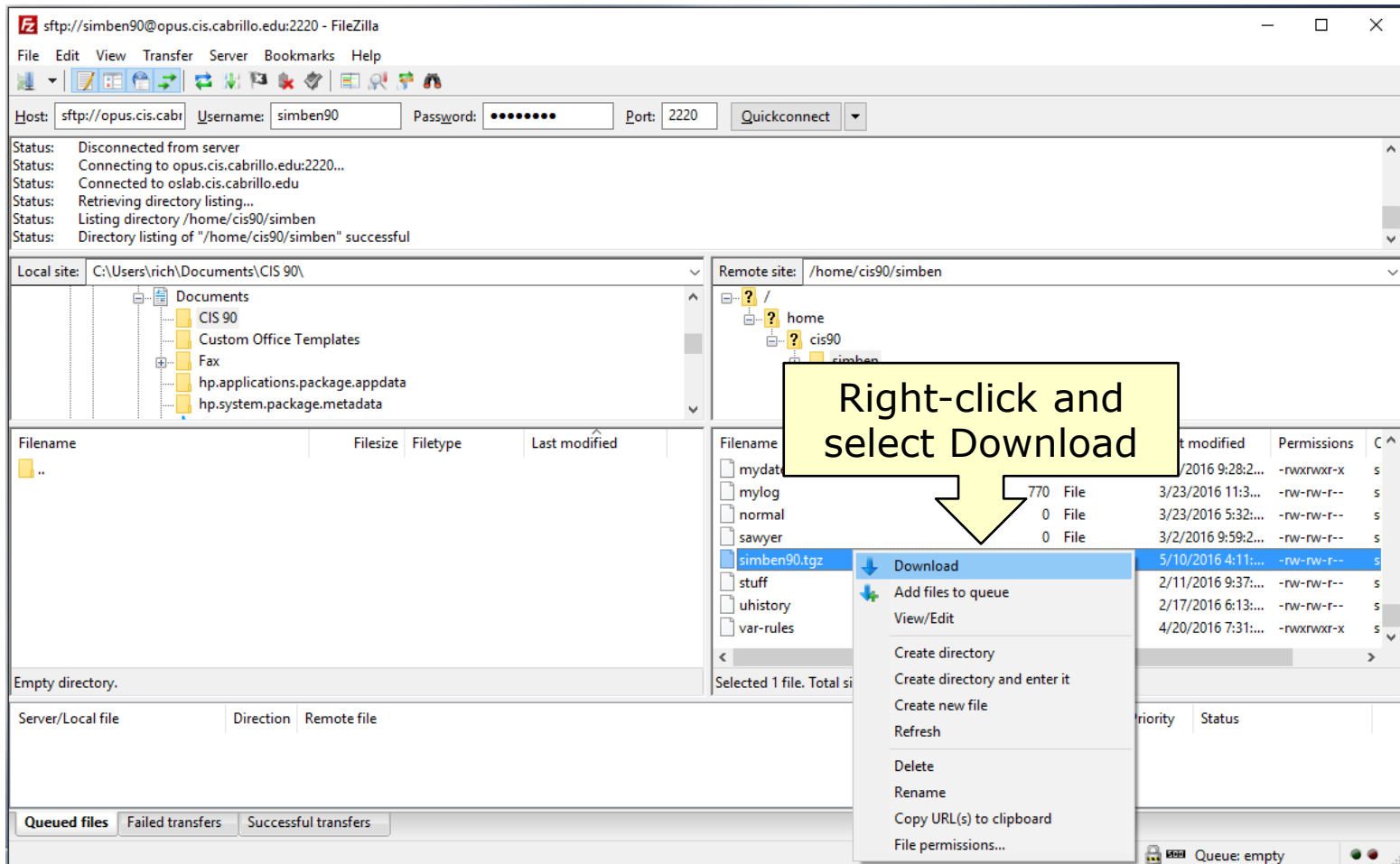


## Select destination and source directories



Select local Windows folder on the left and Opus file to download on the right

## **Initiate Download**







## Monitor transfer progress

FileZilla interface showing a successful file transfer from a remote site to a local site.

**Host:** sftp://opus.cis.cabrillo.edu:2220  
**Username:** simben90  
**Password:** .....  
**Port:** 2220  
**Quickconnect**

**Status Log:**

```

Status: Starting download of /home/cis90/simben/simben90.tgz
Status: remote:/home/cis90/simben/simben90.tgz => local:C:\Users\rich\Documents\CIS 90\simben90.tgz
Status: File transfer successful, transferred 32,768 bytes in 1 second
Status: Starting download of /home/cis90/simben/simben90.tgz
Status: remote:/home/cis90/simben/simben90.tgz => local:C:\Users\rich\Documents\CIS 90\simben90.tgz
Status: File transfer successful, transferred 32,768 bytes in 1 second
  
```

**Local site:** C:\Users\rich\Documents\CIS 90\

**Remote site:** /home/cis90/simben

**Local site files:**

Filename	Filesize	Filetype	Last modified
..			
simben90.tgz	80,094	TGZ File	5/10/2016 4:55:35 ...

**Remote site files:**

Filename	Filesize	Filetype	Last modified	Permissions
mydate	80	File	5/3/2016 9:28:2...	-rwxrwxr-x
mylog	770	File	3/23/2016 11:3...	-rw-rw-r--
normal	0	File	3/23/2016 5:32:...	-rw-rw-r--
sawyer	0	File	3/2/2016 9:59:2...	-rw-rw-r--
simben90.tgz	80,094	TGZ File	5/10/2016 4:11:...	-rw-rw-r--
stuff	5	File	2/11/2016 9:37:...	-rw-rw-r--
uhistory	19,485	File	2/17/2016 6:13:...	-rw-rw-r--
var-rules	62	File	4/20/2016 7:31:...	-rwxrwxr-x

**Downloaded file shows up here**

**Selected 1 file. Total size: 80,094 bytes**

**Server/Local file | Direction | Remote file | Size | Priority | Status**

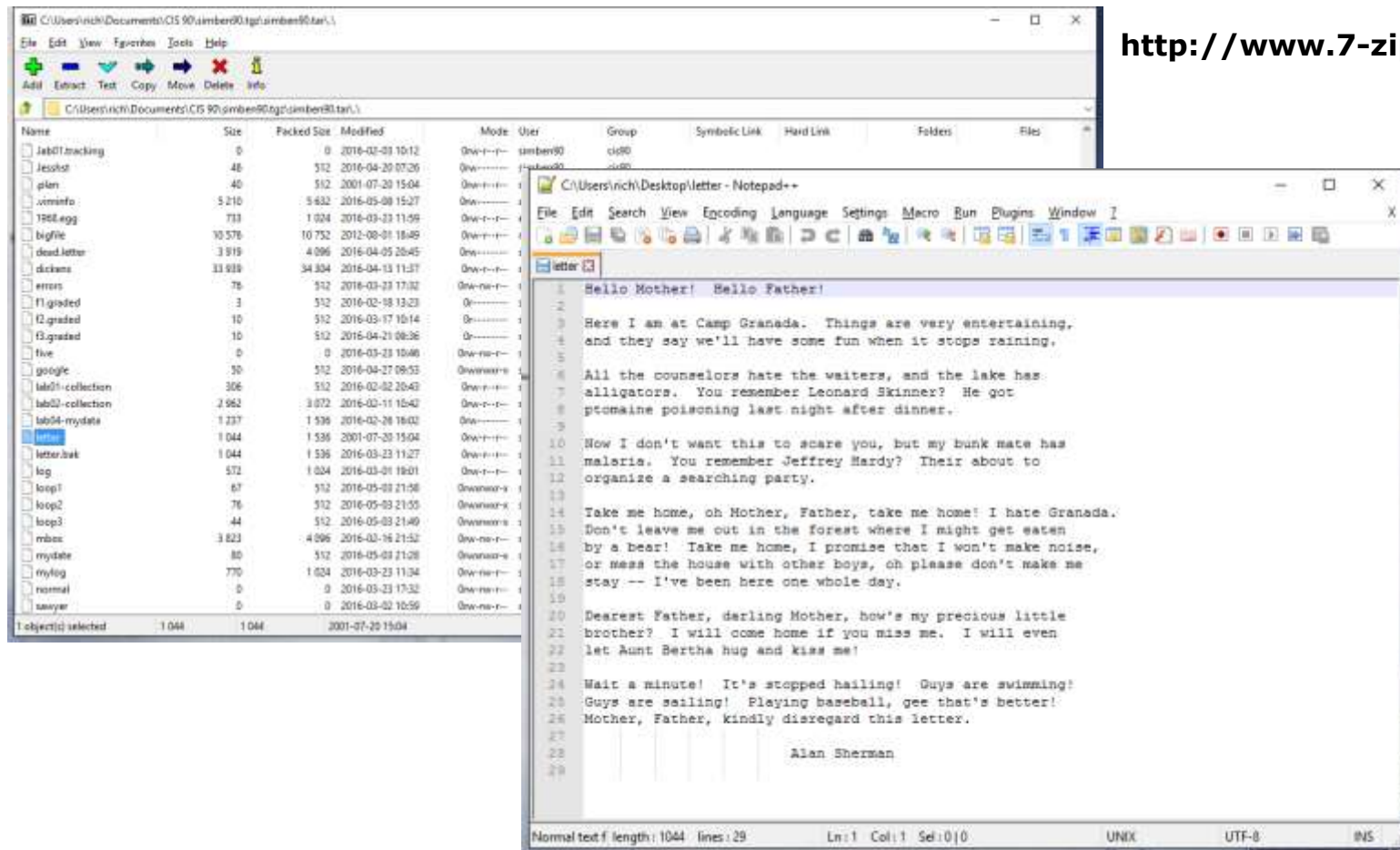
**Queued files | Failed transfers | Successful transfers (4)**

**Queue: empty**

## File transfers

You can use 7-zip to view or extract files from the archive

<http://www.7-zip.org/>

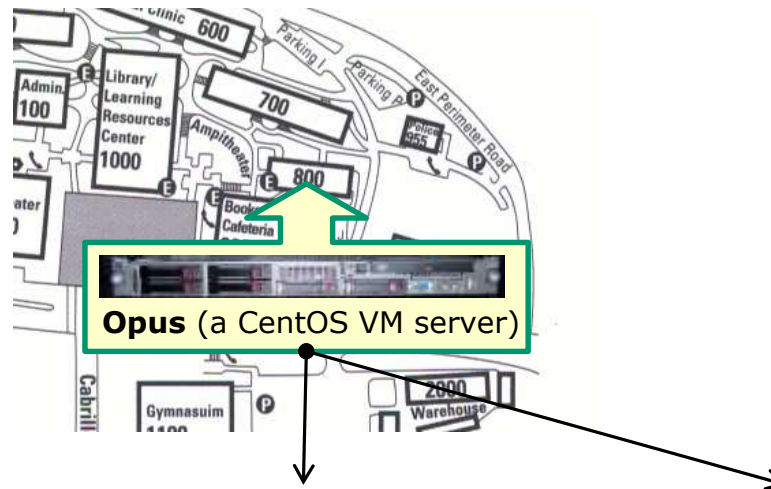


# File Transfer Linux or Mac

scp

# File Transfer

Downloading your Opus files to your home computer



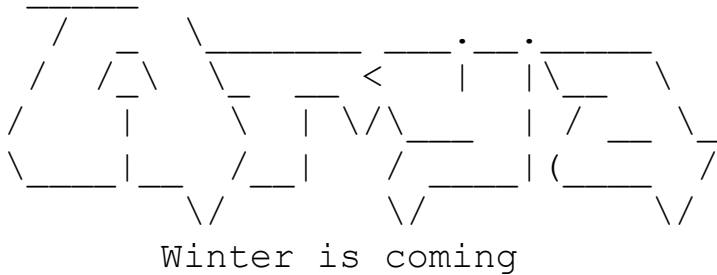
Mac



Linux

# File Transfer

Downloading your Opus files to your Linux system



```
Last login: Tue May 10 16:58:45 2016 from opus.cis.cabrillo.edu
cis90@Arya-03:~$ mkdir cis90
cis90@Arya-03:~$ cd cis90
cis90@Arya-03:~/cis90$ scp -P 2220 simben90@opus.cis.cabrillo.edu:simben90.tgz .
simben90@opus.cis.cabrillo.edu's password:
simben90.tgz                                100%   78KB   78.2KB/s   00:00
cis90@Arya-03:~/cis90$
```

*Use the scp command on Linux or Mac to download the tarball on Opus*

# File Transfer

Extracting files from your backup tarball on your Linux VM

```
cis90@Arya-03:~/cis90$ tar xzf simben90.tgz
cis90@Arya-03:~/cis90$ ls
1968.egg      debian      f2.graded   L7-fun      loop2       sawyer
africa       Dell       f3.graded   lab01-collection  loop3       simben90.tgz
Apple        dickens    five        lab02-collection  mbox        slackware
basket       Directory3 fun         lab04-mydata     misc        stuff
bigfile      docs      google      lesson7        mydate      uhistory
bin          edits     Hidden      letter        mylog       var-rules
cis90_html   errors    HP          letter.bak     normal
class        etc       island      log           poems
dead.letter  f1.graded jobs        loop1         redhat
cis90@Arya-03:~/cis90$
```

*Use the tar command on Linux or Mac to extract the files*

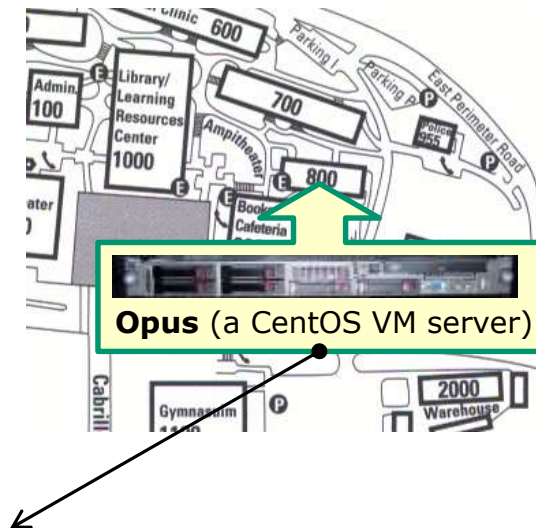


# File Transfer To Windows

## PSCP

# File Transfer

Downloading your Opus files to your home computer



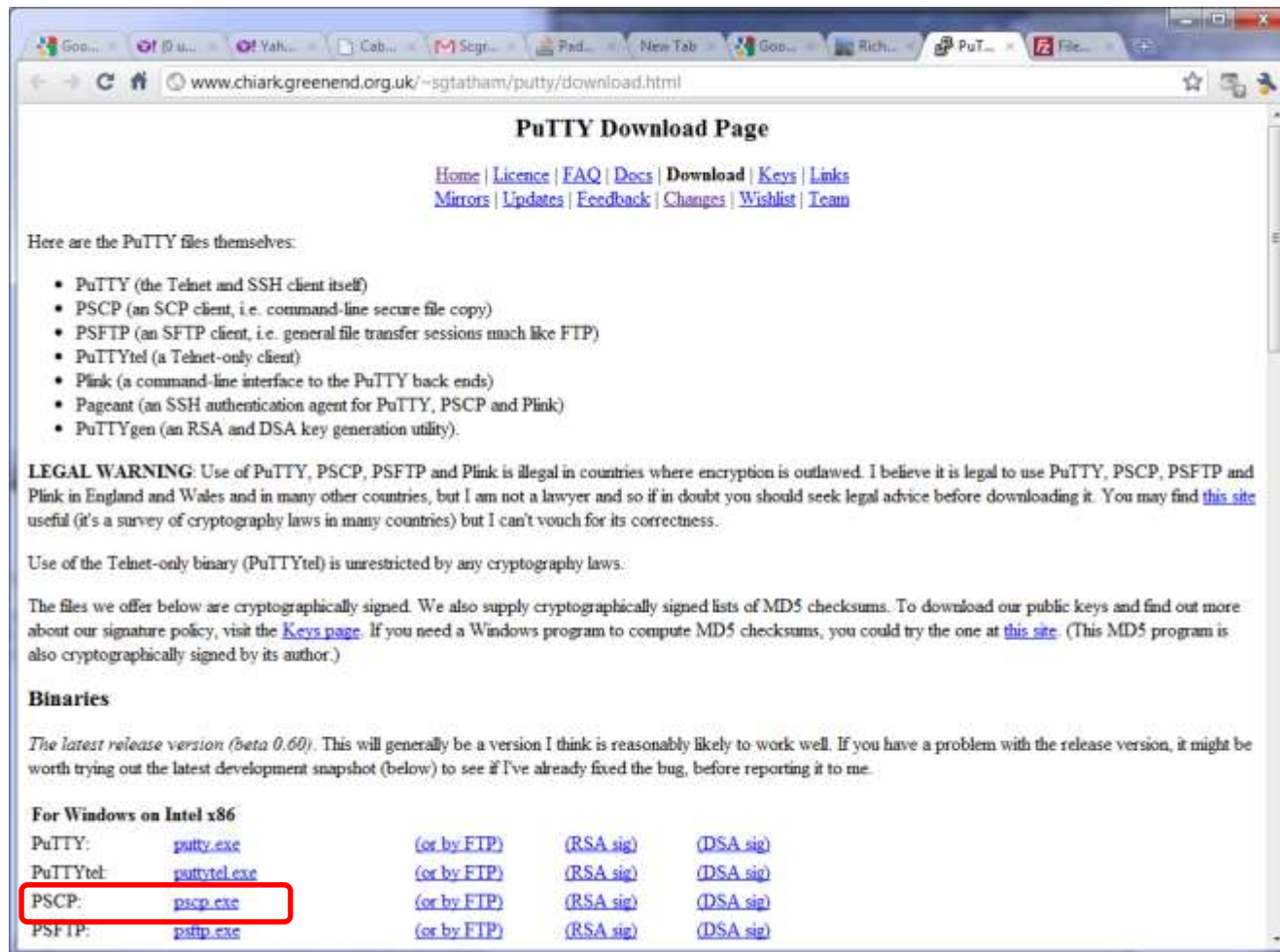
Windows

*Using PSCP*

# PSCP (Putty SCP)

## Downloading

<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>



The screenshot shows a web browser window displaying the 'PuTTY Download Page'. The page title is 'PuTTY Download Page'. Below the title is a navigation menu with links: Home, Licence, FAQ, Docs, Download, Keys, Links, Mirrors, Updates, Feedback, Changes, Wishlist, and Team. The main content area starts with the text 'Here are the PuTTY files themselves:' followed by a bulleted list of software components: PuTTY (the Telnet and SSH client itself), PSCP (an SCP client, i.e. command-line secure file copy), PSFTP (an SFTP client, i.e. general file transfer sessions much like FTP), PuTTYtel (a Telnet-only client), Plink (a command-line interface to the PuTTY back ends), Pageant (an SSH authentication agent for PuTTY, PSCP and Plink), and PuTTYgen (an RSA and DSA key generation utility). Below this list is a 'LEGAL WARNING' section stating that use of PuTTY, PSCP, PSFTP, and Plink is illegal in countries where encryption is outlawed. It also mentions a survey of cryptography laws. Another section states that the use of the Telnet-only binary (PuTTYtel) is unrestricted. A paragraph follows explaining that the files are cryptographically signed and provides links for more information. The 'Binaries' section notes the latest release version is beta 0.60. At the bottom, under 'For Windows on Intel x86', there is a table of download links for various binaries. The 'PSCP' row is highlighted with a red rectangle.

**PuTTY Download Page**

[Home](#) | [Licence](#) | [FAQ](#) | [Docs](#) | [Download](#) | [Keys](#) | [Links](#)  
[Mirrors](#) | [Updates](#) | [Feedback](#) | [Changes](#) | [Wishlist](#) | [Team](#)

Here are the PuTTY files themselves:

- PuTTY (the Telnet and SSH client itself)
- PSCP (an SCP client, i.e. command-line secure file copy)
- PSFTP (an SFTP client, i.e. general file transfer sessions much like FTP)
- PuTTYtel (a Telnet-only client)
- Plink (a command-line interface to the PuTTY back ends)
- Pageant (an SSH authentication agent for PuTTY, PSCP and Plink)
- PuTTYgen (an RSA and DSA key generation utility).

**LEGAL WARNING:** Use of PuTTY, PSCP, PSFTP and Plink is illegal in countries where encryption is outlawed. I believe it is legal to use PuTTY, PSCP, PSFTP and Plink in England and Wales and in many other countries, but I am not a lawyer and so if in doubt you should seek legal advice before downloading it. You may find [this site](#) useful (it's a survey of cryptography laws in many countries) but I can't vouch for its correctness.

Use of the Telnet-only binary (PuTTYtel) is unrestricted by any cryptography laws.

The files we offer below are cryptographically signed. We also supply cryptographically signed lists of MD5 checksums. To download our public keys and find out more about our signature policy, visit the [Keys page](#). If you need a Windows program to compute MD5 checksums, you could try the one at [this site](#). (This MD5 program is also cryptographically signed by its author.)

**Binaries**

The latest release version (beta 0.60). This will generally be a version I think is reasonably likely to work well. If you have a problem with the release version, it might be worth trying out the latest development snapshot (below) to see if I've already fixed the bug, before reporting it to me.

**For Windows on Intel x86**

PuTTY:	<a href="#">putty.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PuTTYtel:	<a href="#">puttytel.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PSCP:	<a href="#">pscp.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)
PSFTP:	<a href="#">psftp.exe</a>	(or by FTP)	(RSA sig)	(DSA sig)

*Download the  
pscp.exe file and  
place it in your  
windows folder*

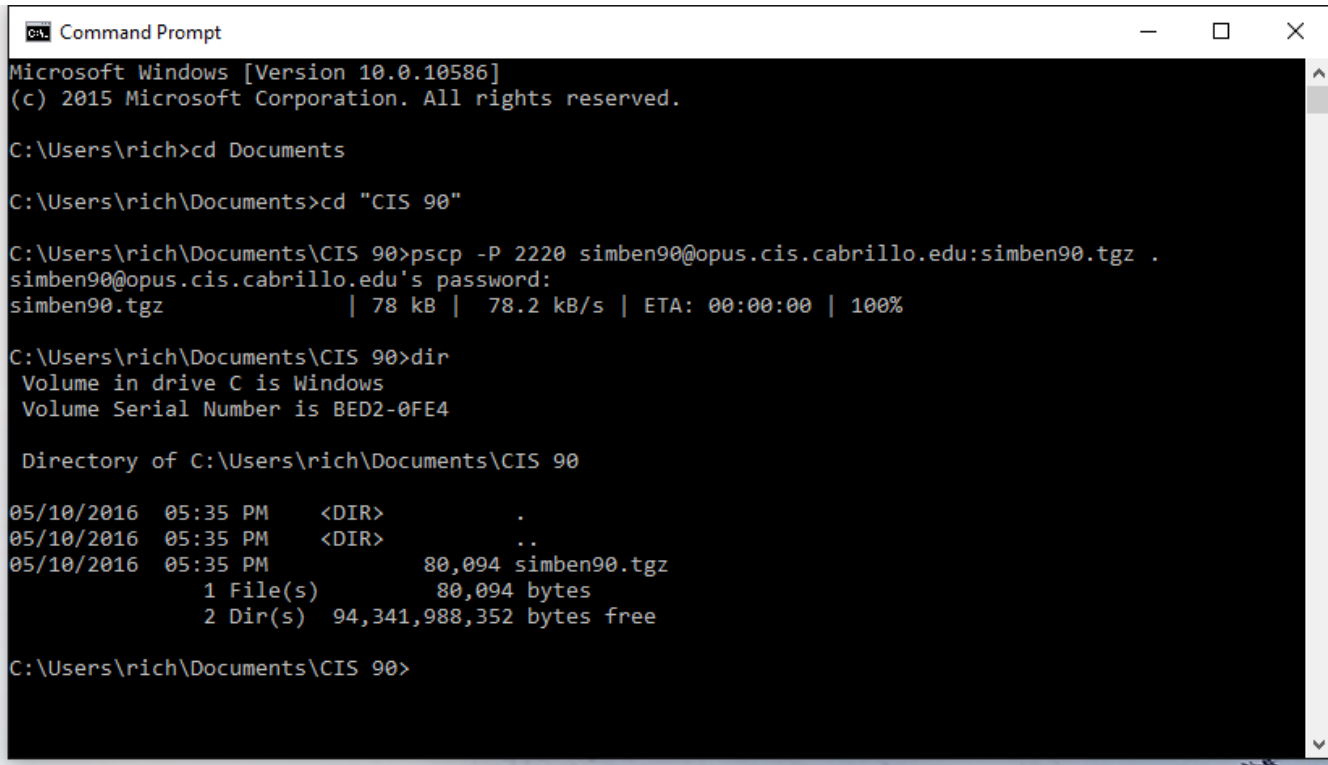
# PSCP

**PSCP** syntax follows **scp** command syntax

`pscp -P 2220 simben90@opus.cis.Cabrillo.edu:simben90.tgz .`

*Backup file  
to copy*

*Destination is  
"here" (the  
current local  
directory)*



```
Command Prompt
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\rich>cd Documents
C:\Users\rich\Documents>cd "CIS 90"
C:\Users\rich\Documents\CIS 90>pscp -P 2220 simben90@opus.cis.cabrillo.edu:simben90.tgz .
simben90@opus.cis.cabrillo.edu's password:
simben90.tgz          | 78 kB | 78.2 kB/s | ETA: 00:00:00 | 100%

C:\Users\rich\Documents\CIS 90>dir
Volume in drive C is Windows
Volume Serial Number is BED2-0FE4

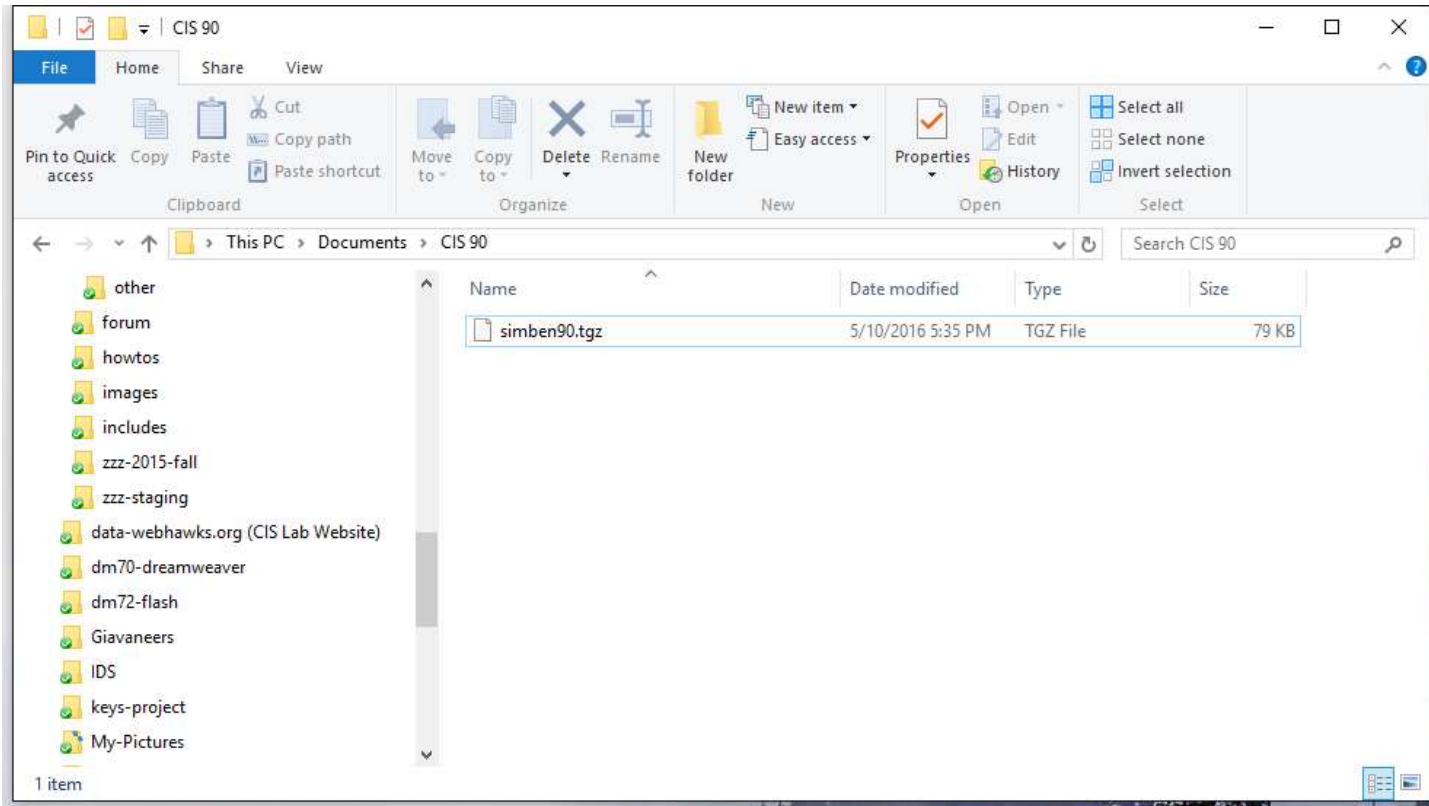
Directory of C:\Users\rich\Documents\CIS 90

05/10/2016  05:35 PM    <DIR>          .
05/10/2016  05:35 PM    <DIR>          ..
05/10/2016  05:35 PM                80,094 simben90.tgz
               1 File(s)                80,094 bytes
               2 Dir(s)  94,341,988,352 bytes free

C:\Users\rich\Documents\CIS 90>
```

# PSCP

Your CIS 90 backup file is now on Windows



*Tarball (archive) copied from Opus to home Windows system*

# Compressed Archives

gzip and gunzip  
tar -z option



## gzip and gunzip commands

```
/home/cis90/simben $ ls -l simben90.tar
```

```
-rw-rw-r--. 1 simben90 cis90 1751040 Dec 10 07:57 simben90.tar
```

*Uncompressed  
archive file*

*Next, compress the archive with **gzip***

```
/home/cis90/simben $ gzip simben90.tar
```

```
/home/cis90/simben $ ls -l simben90.tar.gz
```

```
-rw-rw-r--. 1 simben90 cis90 440895 Dec 10 07:57 simben90.tar.gz
```

*Compressed  
archive file*

*Later, uncompress the archive with **gunzip***

```
/home/cis90/simben $ gunzip simben90.tar.gz
```

```
/home/cis90/simben $ ls -l simben90.tar
```

```
-rw-rw-r--. 1 simben90 cis90 1751040 Dec 10 07:57 simben90.tar
```

*Use gzip and gunzip to compress and un-compress regular tar files.*

*Note: gzip renames the tar file by adding the .gz suffix and gunzip removes the suffix*

## tar -z option

```
/home/cis90/simben $ tar cf simben90.tar .  
tar: ./Hidden: Cannot open: Permission denied  
tar: ./simben90.tar: file is the archive; not dumped  
tar: ./newer: Cannot open: Permission denied  
tar: Exiting with failure status due to previous errors
```

*New tarball is  
NOT compressed.*

```
/home/cis90/simben $ ls -l simben90.tar  
-rw-rw----. 1 simben90 cis90 768000 Dec  9 07:52 simben90.tar  
/home/cis90/simben $
```

```
/home/cis90/simben $ rm simben90.tar  
rm: remove regular file `simben90.tar'? y
```

```
/home/cis90/simben $ tar czf simben90.tar.gz .  
tar: ./Hidden: Cannot open: Permission denied  
tar: ./newer: Cannot open: Permission denied  
tar: Exiting with failure status due to previous errors
```

*New tarball  
IS compressed.*

```
/home/cis90/simben $ ls -l simben90.tar.gz  
-rw-rw----. 1 simben90 cis90 158724 Dec  9 07:51 simben90.tar.gz
```

*Use the z option to compress files when creating the tarball*

## tar -z option

```
/home/cis90/simben $ tar tvzf simben90.tar.gz | head
drwxr-xr-x  simben90/cis90      0 2014-12-09 07:58 ./
-r-----  simben90/staff 1111 2014-10-15 10:09 ./lab05.graded
-rw-r--r--  simben90/cis90   22 2014-10-21 09:25 ./names
-rw-r--r--  simben90/cis90   70 2014-11-02 17:12 ./bigshell
-r-----  simben90/staff 1276 2014-09-17 10:28 ./lab02.graded
-rw-----  simben90/root   410 2014-11-24 07:44 ./bash_profile.fq
-rw-----  simben90/cis90 5146 2014-12-08 19:10 ./viminfo
-rw-----  simben90/cis90  406 2014-11-20 11:49 ./bash_profile.bug
drwx--x---  simben90/cis90    0 2014-10-28 15:48 ./class/
dr-x-wx---  simben90/users    0 2014-10-28 15:48 ./class/labs/
/home/cis90/simben $
```

*Using the z option when extracting or viewing compressed tar files*

## **.tar.gz vs .tgz**

```
/home/cis90/simben $ tar czf simben90.tar.gz .  
tar: ./Hidden: Cannot open: Permission denied  
tar: .: file changed as we read it  
tar: Exiting with failure status due to previous errors  
/home/cis90/simben $ ls -l simben90.tar.gz  
-rw-rw-r--. 1 simben90 cis90 147319 May 12 20:01 simben90.tar.gz  
/home/cis90/simben $ rm simben90.tar.gz
```

```
/home/cis90/simben $ tar czf simben90.tgz .  
tar: ./Hidden: Cannot open: Permission denied  
tar: .: file changed as we read it  
tar: Exiting with failure status due to previous errors  
/home/cis90/simben $ ls -l simben90.tgz  
-rw-rw-r--. 1 simben90 cis90 147319 May 12 20:01 simben90.tgz  
/home/cis90/simben $ rm simben90.tgz
```

*The usage of .tgz and .tar.gz suffixes are equivalent and both indicate the tarball (archive) was compressed*



# Make your own Opus

```
simben90@oslab:~  
login as: simben90  
simben90@oslab.cis.cabrillo.edu's password:  
Last login: Tue Apr 12 10:40:50 2016 from c-71-198-219-50.hsd1.ca.comcast.net  
  
      _  
    ('v')  
  \/--\--\/  
  (\_=_\_/  
   ~ ~ ~  
Welcome to Opus  
Serving Cabrillo College  
  
Terminal type? [xterm]  
Terminal type is xterm.  
/home/cis90/simben $ cat /etc/*-release  
CentOS release 6.7 (Final)  
LSB_VERSION=base-4.0-ia32:base-4.0-noarch:core-4.0-ia32:core-4.0-noarch:graphics-4.0-ia32:graphics-4.0-noarch:printing-4.0-ia32:printing-4.0-noarch  
CentOS release 6.7 (Final)  
CentOS release 6.7 (Final)  
/home/cis90/simben $
```

*Opus is a CentOS 6.7 Linux system*



# Ingredients

**To make your own Opus at home you will need to purchase the following items for your home computer:**

- A CentOS Linux distribution ... price: \$0.00
- Virtualization software
  - For Windows
    - VirtualBox ... price: \$0.00
    - *or* VMware Workstation ... price: \$0.00 (via VMware Academy)
  - For Mac
    - VirtualBox ... price: \$0.00
    - *or* VMware Fusion ... price: \$0.00 (via VMware Academy)
  - For Linux
    - VirtualBox ... price: \$0.00

simms-teach.com/resources.php

Home **Resources** Forums CIS Lab Blackboard

Login  
Flashcards  
Admin

CIS 90  
Previous Classes

11 days till term ends!

Cabrillo College  
Web Advisor  
Commands and Files

VLab RDP file

CIS 90 VLab VM Assignments

RIP Dennis Ritchie

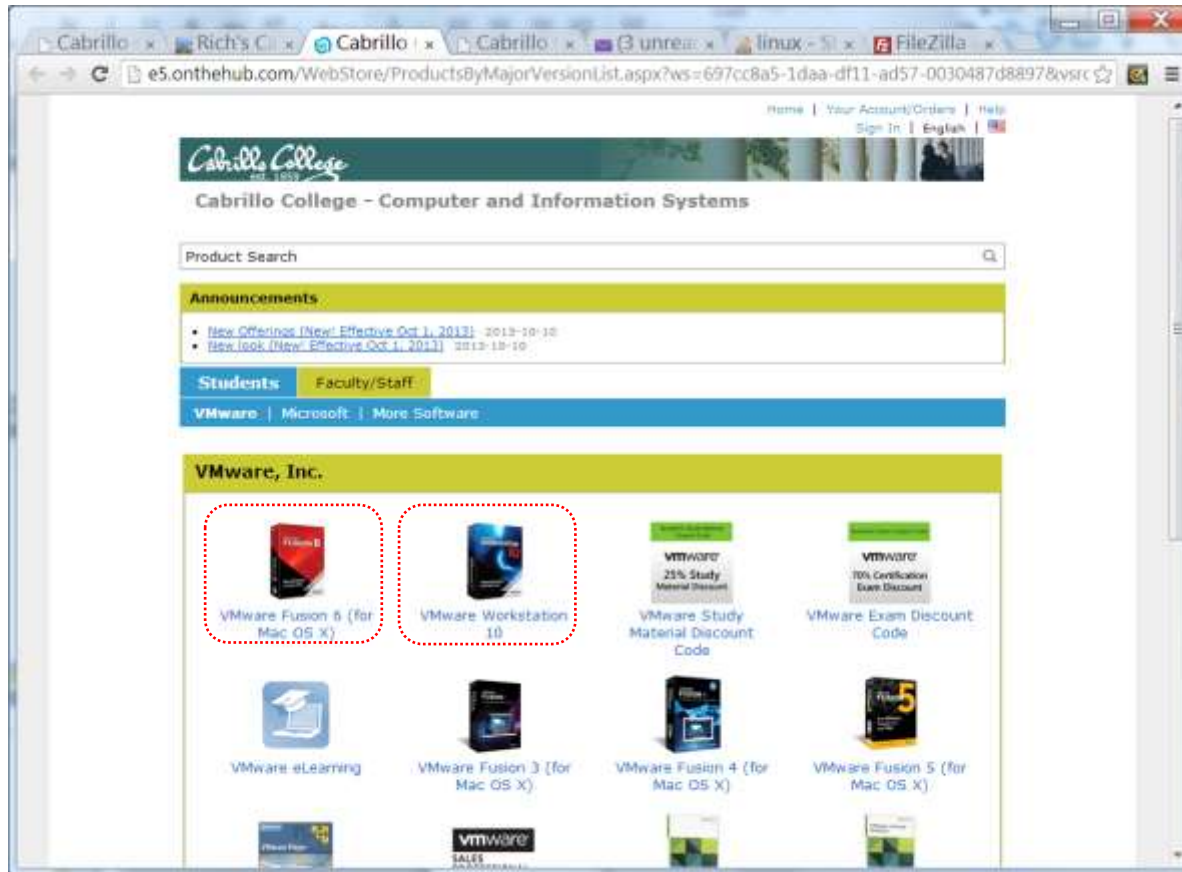
Opus Status: UP

## Links

<b>Instructors</b> <ul style="list-style-type: none"> <li>Programming Master Ed</li> <li>Network Master Gerlinde</li> <li>Programming Master Jeffrey</li> <li>Linux Master Jim</li> <li>Web Master John</li> <li>Systems Master Michael</li> <li>Hardware Master Marcelo</li> <li>Network Master Rick</li> <li>Programming Master Steve</li> </ul> <b>Clubs</b> <ul style="list-style-type: none"> <li>Computer Club</li> <li>Robotics Club</li> </ul> <b>Departments</b> <ul style="list-style-type: none"> <li>CNSA</li> <li>CIS</li> <li>CS</li> </ul>	<b>Getting Linux/UNIX</b> <ul style="list-style-type: none"> <li><b>Linux ISOs</b></li> <li>Kernels</li> <li>RPMs (rpmfind)</li> <li>RPMs (pbone)</li> <li>OpenSolaris</li> </ul> <b>Tools and Software</b> <ul style="list-style-type: none"> <li>Apache</li> <li>Bastille</li> <li>CoRD</li> <li>cygwin</li> <li>DOS boot disks</li> <li>Dynamips/Dynagen</li> <li>John the Ripper</li> <li>Netfilter</li> <li>Putty SSH Tools</li> <li>Quagga routing suite</li> <li>Tripwire</li> <li>Wireshark</li> </ul> <b>Academic Software for CIS Students</b> <ul style="list-style-type: none"> <li>Microsoft Webstore</li> <li><b>VMware Webstore</b></li> </ul> <b>Virtualization</b> <ul style="list-style-type: none"> <li><b>VirtualBox</b></li> <li>VMware ESXi and vSphere client</li> </ul> <b>Standards</b>	<b>Commands</b> <ul style="list-style-type: none"> <li>Practical</li> <li>Command Directory</li> <li>Useful</li> <li>vi summary</li> <li>vi cheat sheet</li> </ul> <b>Howtos</b> <ul style="list-style-type: none"> <li>HowtoForge</li> <li>email</li> <li>DNS</li> <li>Ethernet (NIC drivers)</li> <li>NFS</li> <li>NIS</li> <li>PPP</li> <li>Putty SSH Keys</li> <li>Using sed</li> </ul> <b>Student Howtos</b> <ul style="list-style-type: none"> <li>Logging into Opus from a Mac by Laura Sreckovic and updated by Ann Pike</li> <li>Monitor Script by Sean Callahan</li> <li>WiFi Penetration by Ryan Schell</li> <li>Logging into Opus from a Mac by Laura Sreckovic</li> <li>LDAP Implementation by Tim Childers</li> <li>Install and DualBoot into Microsoft Windows 7 and Linux Ubuntu by Richie Fou</li> </ul>
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*Shopping for the ingredients*

## VMware Workstation (Windows) or Fusion (Mac)





# Vmware Workstaton

Rich's Cabrillo College CIS Classes Resources

Home Resources Forums CIS Lab Calivas

Login  
Flashcards  
Admin

CIS 90  
Previous Terms

11 days OR term ended

Cabrillo College  
Web Advisor  
Blackboard  
Commands and Files

Enter VLab

CIS 90 VLab VM Assignments

RIP Dennis Ritchie

Opus Status: UP

### Links

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<b>Departments</b> <ul style="list-style-type: none"> <li>CNSA</li> <li>CIS</li> <li>CS</li> </ul>	<b>Academic Software for CIS Students</b> <ul style="list-style-type: none"> <li>Microsoft Website</li> <li>VMware Website</li> </ul>	<b>Howtos</b> <ul style="list-style-type: none"> <li>HowtoForge</li> <li>DNS</li> <li>Ethernet (NIC drivers)</li> <li>NFS</li> <li>NIS</li> <li>PPP</li> <li>Putty SSH Keys</li> </ul>
<b>Crib Sheets</b> <ul style="list-style-type: none"> <li>Oliver Wright (CIS 90)</li> </ul>	<b>Virtualization</b> <ul style="list-style-type: none"> <li>VirtualBox</li> <li>VMware ESX and vSphere client</li> </ul>	<b>Student Howtos</b> <ul style="list-style-type: none"> <li>Replacing a MacBook Pro Hard Drive by Amir Sorour</li> <li>Logging into Opus from a Mac by Laura Sreckovic and updated by Ann Pike</li> <li>Monitor Script by Sean Callahan</li> <li>WiFi Penetration by Ryan Schell</li> <li>Logging into Opus from a Mac by Laura Sreckovic</li> <li>LDAP Implementation by Tim Childers</li> <li>Install and Dualboot into Microsoft Windows 7 and Linux Ubuntu by Richie Fou</li> </ul>
<b>Documentation</b> <ul style="list-style-type: none"> <li>TLDP</li> <li>UNIX</li> <li>UNIX Rosetta Stone</li> </ul>	<b>Standards</b> <ul style="list-style-type: none"> <li>IEEE</li> <li>IETF (RFCs)</li> </ul>	
<b>Animations</b> <ul style="list-style-type: none"> <li>Linux network technologies</li> </ul>	<b>Academics</b> <ul style="list-style-type: none"> <li>Chico NetSpace</li> </ul>	



The screenshot shows the LinuxQuestions.org website. The browser's address bar displays 'iso.linuxquestions.org'. The website features a header with the LinuxQuestions.org logo and a banner for 'VM TURBO' (Free Virtual Monitor). The main content area is titled 'Welcome to LQ ISOs' and includes a search bar, a 'Need Help?' section, and a 'Sponsored Links' section. The '15 Latest Linux Distribution Releases' list includes Ubuntu 16.04, Fedora 23, and CentOS 7. The 'Popular Linux Distributions' list includes Ubuntu, Fedora, Linux Mint, openSUSE, PCLinuxOS, Debian, Mageia, Slackware, CentOS, Proxmox, Arch, and MEPIS. The '15 Most Downloaded Distribution Versions (last 30 Days)' and '15 Most Downloaded Distributions (Ever)' sections are also visible. The browser's taskbar at the bottom shows several open windows, including 'CentOS-7-x86\_64-Minimal.iso' and 'CentOS-7-x86\_64-Minimal.iso'.

LinuxQuestions.org

LinuxQuestions.org > ISOs

VM TURBO  
FREE VIRTUAL MONITOR  
ESXi - HYPER-V - XENSERVER - RED HAT  
Free Forever

Welcome to LQ ISOs

\$0.26/Mbps IP Transit  
Global Internet Backbone IPv6+IPv4 and BGP For Your Network

Welcome to LQ ISO

This site is designed to meet all of your Linux distribution [download](#) needs, including searching for fast [mirrors](#), receiving email updates when new versions of your favorite distributions are released and reading reviews. If you do not see the distribution you are looking for below, you can view the complete alphabetical list. Please let us know if you have any suggestions.

If you find the site useful, you can help spread the word by telling 10 friends the URL (<http://www.lqiso.org/>). Thanks.

15 Latest Linux Distribution Releases

1. [gNewSense 4.0](#)
2. [Simplicity Linux 16.04](#)
3. [dMlinux 17.0](#)
4. [Voyager Live 16.04](#)
5. [GParted Live 0.26.0-1](#)
6. [SparkyLinux 4.3](#)
7. [Proxmox 4.2 "Virtual Environment"](#)
8. [Ubuntu GNOME 16.04](#)
9. [Black Lab Linux 7.6](#)
10. [Tails 2.3](#)
11. [Slackel 6.0.5 "Openbox"](#)
12. [Mythbuntu 16.04](#)
13. [KaOS 2016.09](#)
14. [OpenIndiana 2016.09](#)
15. [Ubuntu Kylin 16.04](#)

Popular Linux Distributions

- [Ubuntu](#)
- [Fedora](#)
- [Linux Mint](#)
- [openSUSE](#)
- [PCLinuxOS](#)
- [Debian](#)
- [Mageia](#)
- [Slackware](#)
- [CentOS](#)
- [Proxmox](#)
- [Arch](#)
- [MEPIS](#)

View by Topic: Desktop, Server, Security, Mobile, Live, Firewall, Rescue

15 Most Downloaded Distribution Versions (last 30 Days)

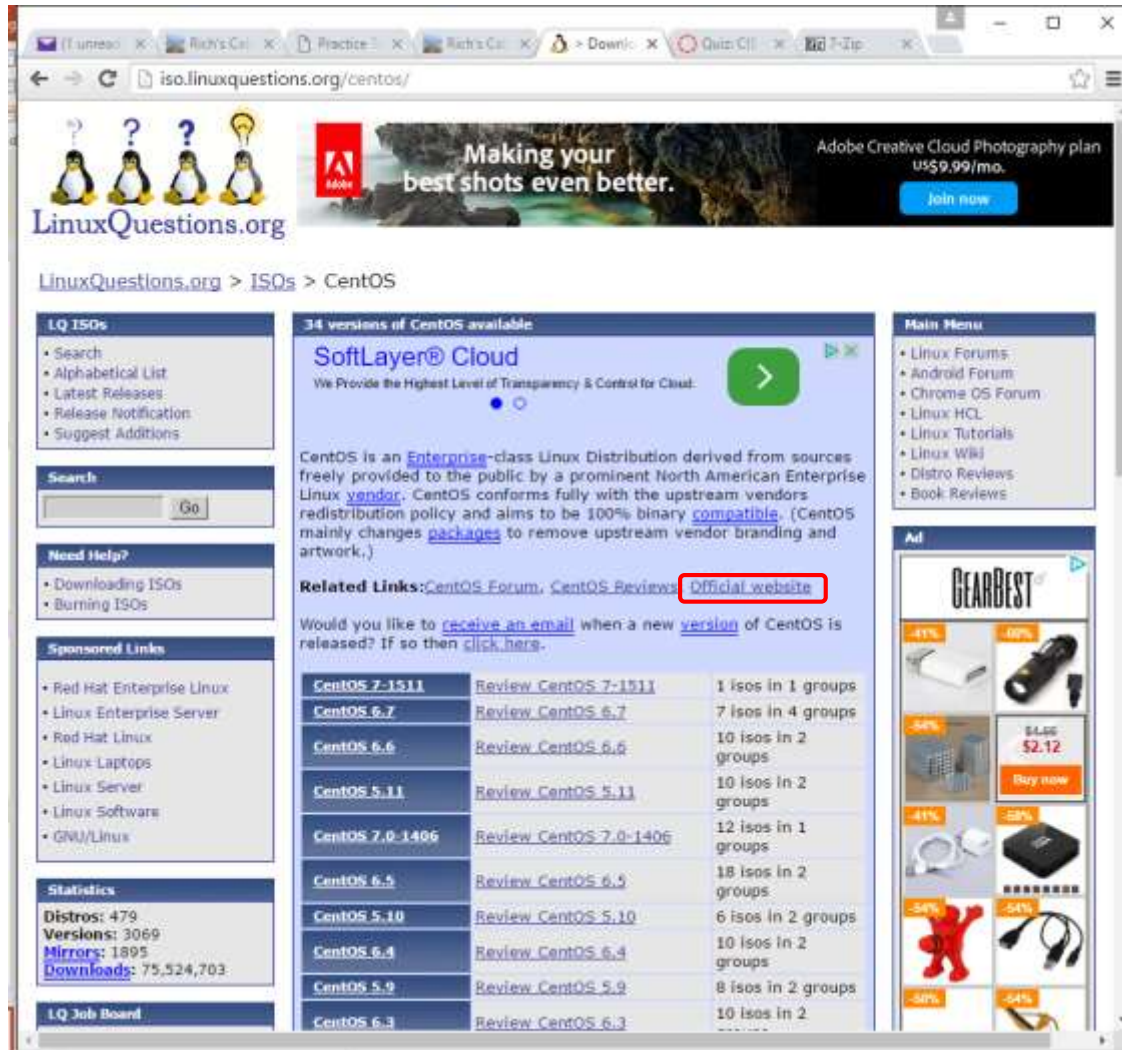
15 Most Downloaded Distributions (Ever)

CentOS-7-x86\_64-Minimal.iso

CentOS-7-x86\_64-Minimal.iso

Show all downloads





The screenshot shows the LinuxQuestions.org website with the following content:

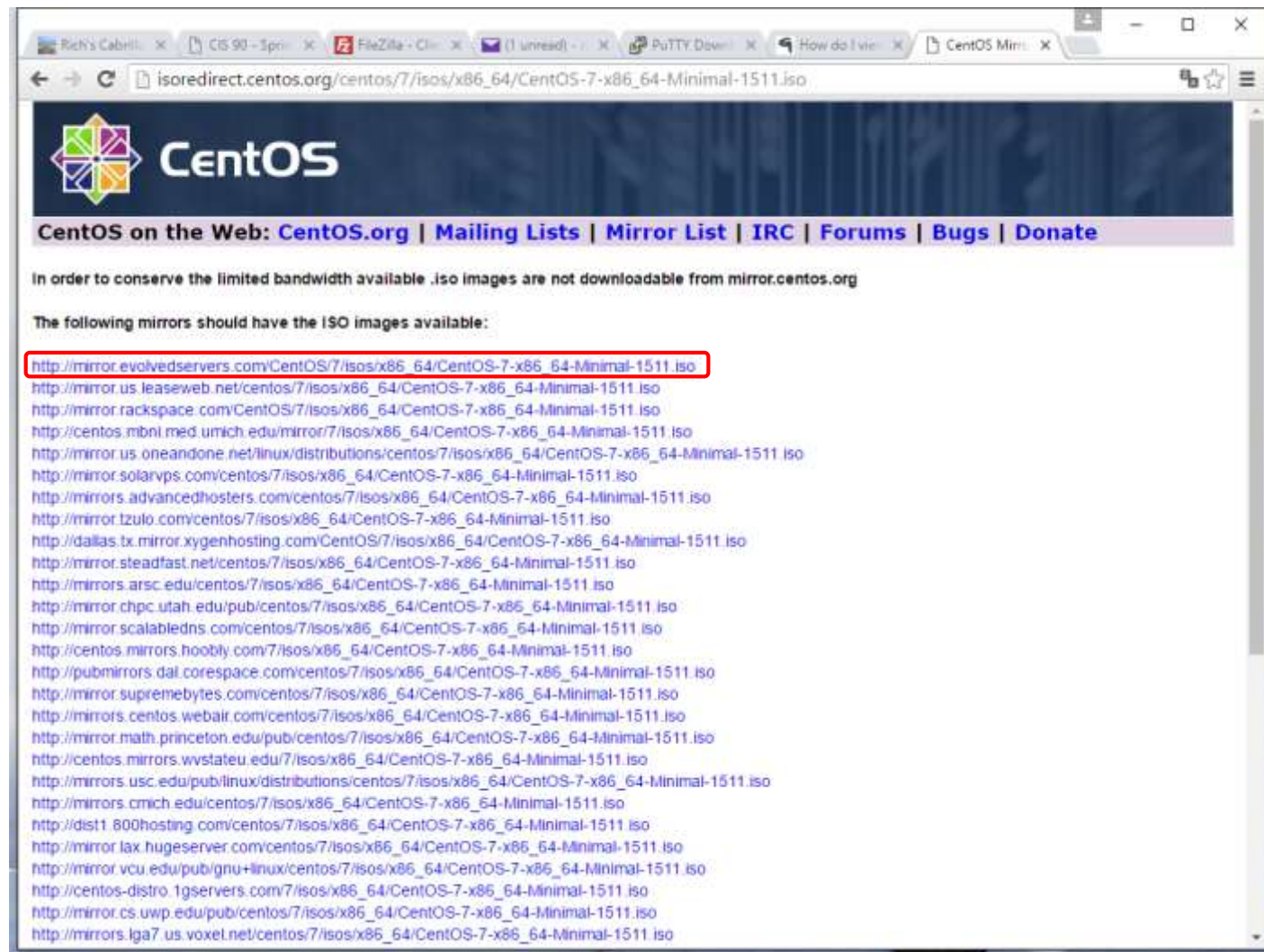
- LinuxQuestions.org** logo and navigation links.
- CentOS** page header with a banner for Adobe Creative Cloud Photography plan.
- LinuxQuestions.org > ISOs > CentOS** breadcrumb trail.
- LQ ISOs** sidebar with links: Search, Alphabetical List, Latest Releases, Release Notification, Suggest Additions.
- Search** bar with a 'Go' button.
- Need Help?** sidebar with links: Downloading ISOs, Burning ISOs.
- Sponsored Links** sidebar with links: Red Hat Enterprise Linux, Linux Enterprise Server, Red Hat Linux, Linux Laptops, Linux Server, Linux Software, GNU/Linux.
- Statistics** sidebar: Distros: 479, Versions: 3069, Mirrors: 1895, Downloads: 75,524,703.
- LQ Job Board** sidebar.
- 34 versions of CentOS available** section with a 'SoftLayer® Cloud' banner.
- CentOS** description: "CentOS is an Enterprise-class Linux Distribution derived from sources freely provided to the public by a prominent North American Enterprise Linux vendor. CentOS conforms fully with the upstream vendors redistribution policy and aims to be 100% binary compatible. (CentOS mainly changes packages to remove upstream vendor branding and artwork.)"
- Related Links:** CentOS Forum, CentOS Reviews, **Official website** (highlighted with a red box).
- Would you like to receive an email when a new version of CentOS is released? If so then click here.**
- Table of CentOS versions:**

CentOS Version	Review Link	Isos in Groups
CentOS 7-1511	<a href="#">Review CentOS 7-1511</a>	1 isos in 1 groups
CentOS 6.7	<a href="#">Review CentOS 6.7</a>	7 isos in 4 groups
CentOS 6.6	<a href="#">Review CentOS 6.6</a>	10 isos in 2 groups
CentOS 5.11	<a href="#">Review CentOS 5.11</a>	10 isos in 2 groups
CentOS 7.0-1406	<a href="#">Review CentOS 7.0-1406</a>	12 isos in 1 groups
CentOS 6.5	<a href="#">Review CentOS 6.5</a>	18 isos in 2 groups
CentOS 5.10	<a href="#">Review CentOS 5.10</a>	6 isos in 2 groups
CentOS 6.4	<a href="#">Review CentOS 6.4</a>	10 isos in 2 groups
CentOS 5.9	<a href="#">Review CentOS 5.9</a>	8 isos in 2 groups
CentOS 6.3	<a href="#">Review CentOS 6.3</a>	10 isos in 2 groups
- Main Menu** sidebar with links: Linux Forums, Android Forum, Chrome OS Forum, Linux HCL, Linux Tutorials, Linux Wiki, Distro Reviews, Book Reviews.
- Ad** sidebar for GearBest with various product listings and discounts.









The screenshot shows a web browser window displaying the CentOS website. The browser's address bar shows the URL: `isoredirect.centos.org/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso`. The page features the CentOS logo and a navigation bar with links: **CentOS on the Web: CentOS.org | Mailing Lists | Mirror List | IRC | Forums | Bugs | Donate**. A message states: "In order to conserve the limited bandwidth available .iso images are not downloadable from mirror.centos.org". Below this, it says: "The following mirrors should have the ISO images available:". A list of mirror URLs follows, with the first one, `http://mirror.evolvedservers.com/CentOS/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso`, highlighted by a red rectangular box.

CentOS

CentOS on the Web: [CentOS.org](#) | [Mailing Lists](#) | [Mirror List](#) | [IRC](#) | [Forums](#) | [Bugs](#) | [Donate](#)

In order to conserve the limited bandwidth available .iso images are not downloadable from mirror.centos.org

The following mirrors should have the ISO images available:

[http://mirror.evolvedservers.com/CentOS/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.evolvedservers.com/CentOS/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.us.leaseweb.net/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.us.leaseweb.net/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.rackspace.com/CentOS/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.rackspace.com/CentOS/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://centos.mbl.med.umich.edu/mirror/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://centos.mbl.med.umich.edu/mirror/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.us.oneandone.net/linux/distributions/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.us.oneandone.net/linux/distributions/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.solarvps.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.solarvps.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.advancedhosters.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.advancedhosters.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.tzulo.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.tzulo.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://dallas.tx.mirror.xygenhosting.com/CentOS/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://dallas.tx.mirror.xygenhosting.com/CentOS/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.steadfast.net/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.steadfast.net/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.arisc.edu/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.arisc.edu/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.chpc.utah.edu/pub/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.chpc.utah.edu/pub/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.scalabledns.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.scalabledns.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://centos.mirrors.hoobly.com/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://centos.mirrors.hoobly.com/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://pubmirrors.dai.corespace.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://pubmirrors.dai.corespace.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.supremebytes.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.supremebytes.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.centos.webair.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.centos.webair.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.math.princeton.edu/pub/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.math.princeton.edu/pub/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://centos.mirrors.wvstateu.edu/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://centos.mirrors.wvstateu.edu/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.usc.edu/pub/linux/distributions/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.usc.edu/pub/linux/distributions/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.cmich.edu/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.cmich.edu/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://dist1.800hosting.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://dist1.800hosting.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirror.lax.hugeserver.com/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.lax.hugeserver.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

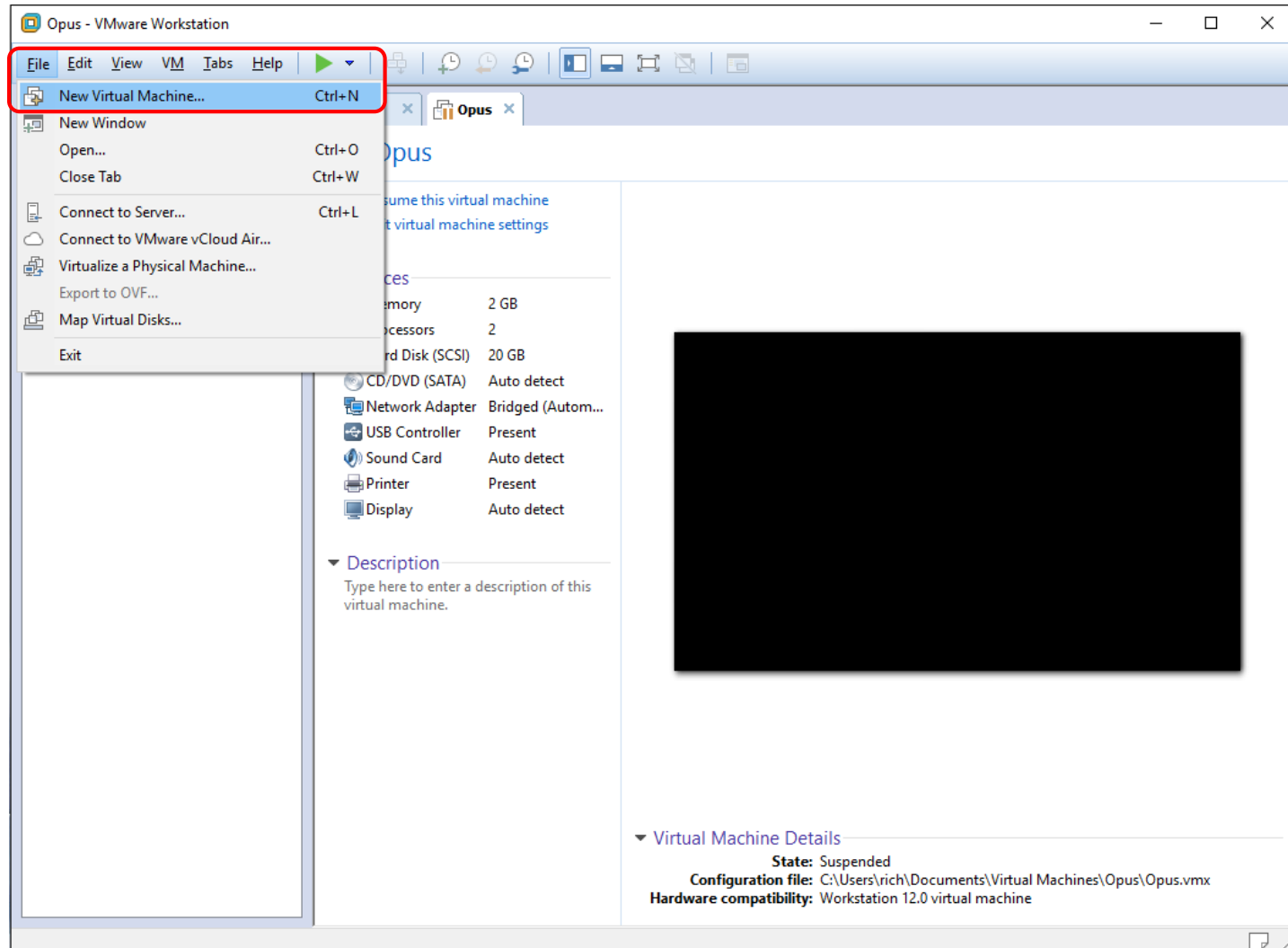
[http://mirror.vcu.edu/pub/gnu+linux/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.vcu.edu/pub/gnu+linux/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://centos-distro.1gservers.com/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://centos-distro.1gservers.com/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

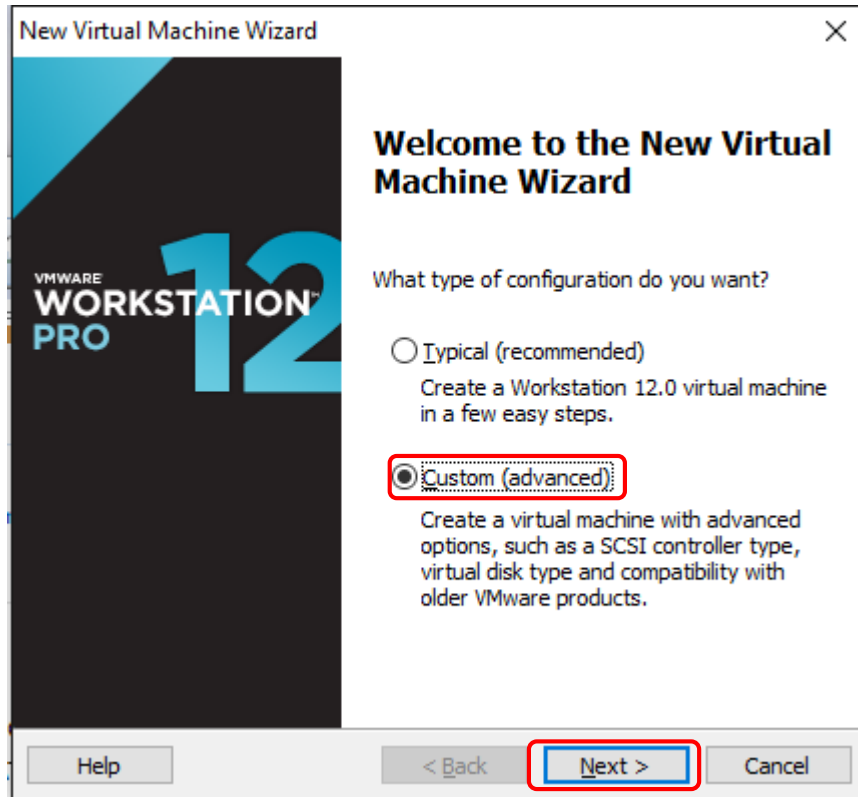
[http://mirror.cs.uwp.edu/pub/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirror.cs.uwp.edu/pub/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

[http://mirrors.lga7.us.voxel.net/centos/7/isos/x86\\_64/CentOS-7-x86\\_64-Minimal-1511.iso](http://mirrors.lga7.us.voxel.net/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso)

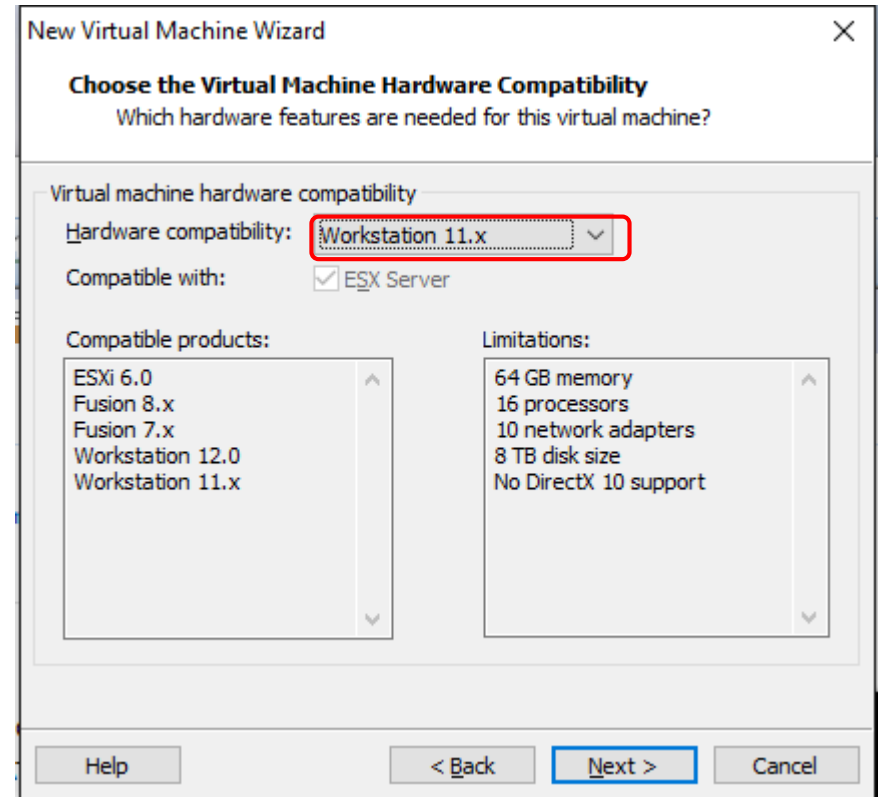
*Pick a mirror and download ISO file*



Create new VM

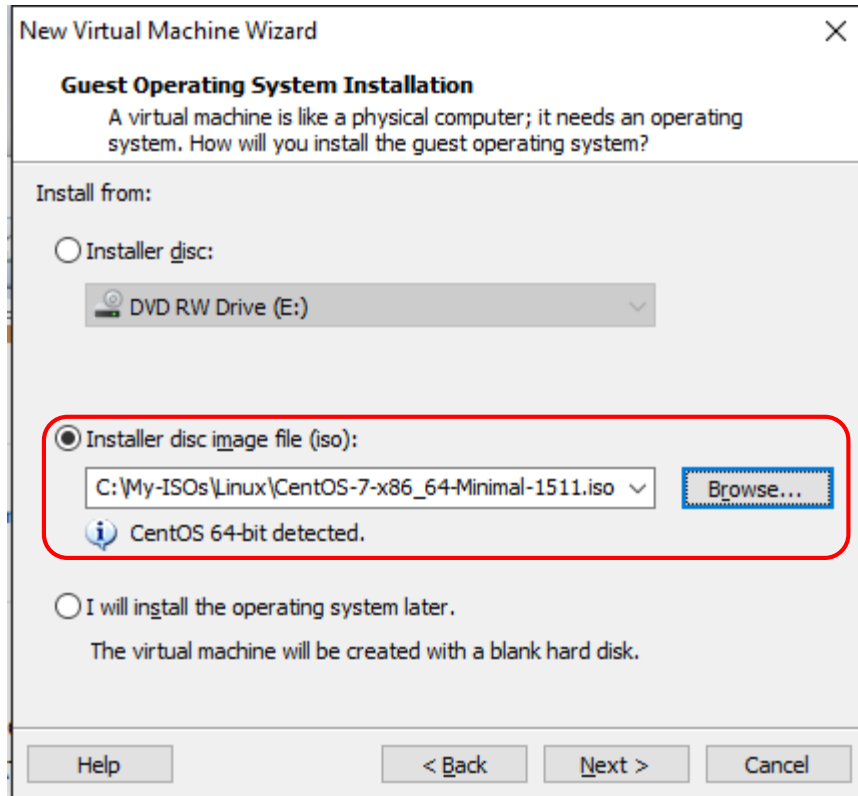


*Custom configuration*

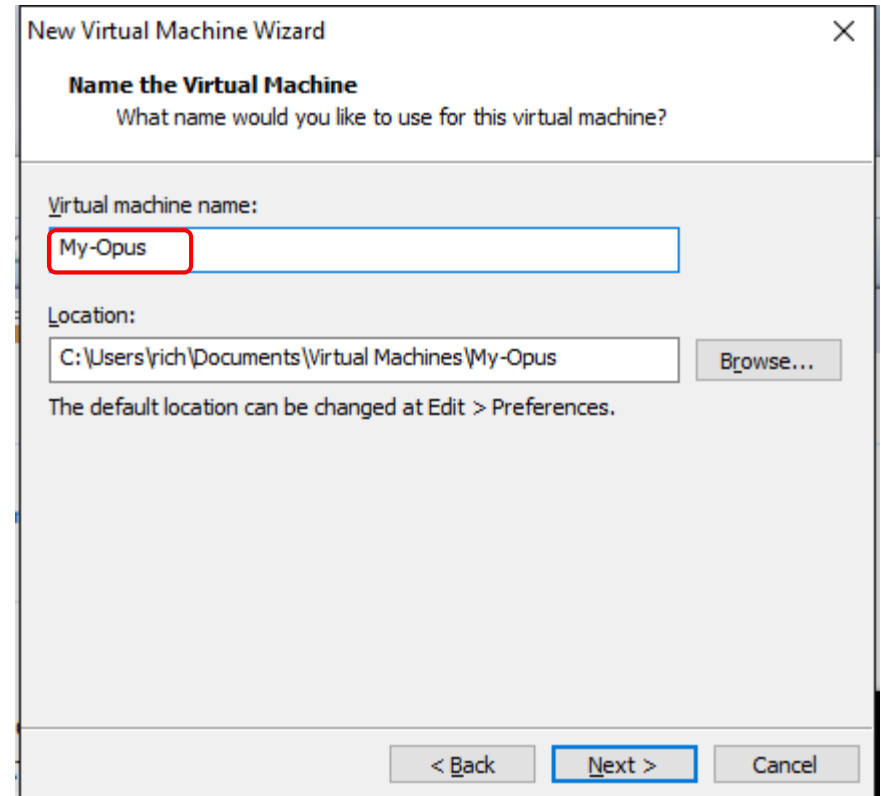


*Want to be able to use it on ESXi 6.0 server too*





*Browse to downloaded ISO file*



*Name the new VM*

**New Virtual Machine Wizard** [X]

**Processor Configuration**  
Specify the number of processors for this virtual machine.

Processors

Number of processors: 1

Number of cores per processor: 1

Total processor cores: 1

Help < Back Next > Cancel

**New Virtual Machine Wizard** [X]

**Memory for the Virtual Machine**  
How much memory would you like to use for this virtual machine?

Specify the amount of memory allocated to this virtual machine. The memory size must be a multiple of 4 MB.

Memory for this virtual machine: 1024 MB

64 GB -  
32 GB -  
16 GB -  
8 GB -  
4 GB -  
2 GB -  
1 GB -  
512 MB -  
256 MB -  
128 MB -  
64 MB -  
32 MB -  
16 MB -  
8 MB -  
4 MB -

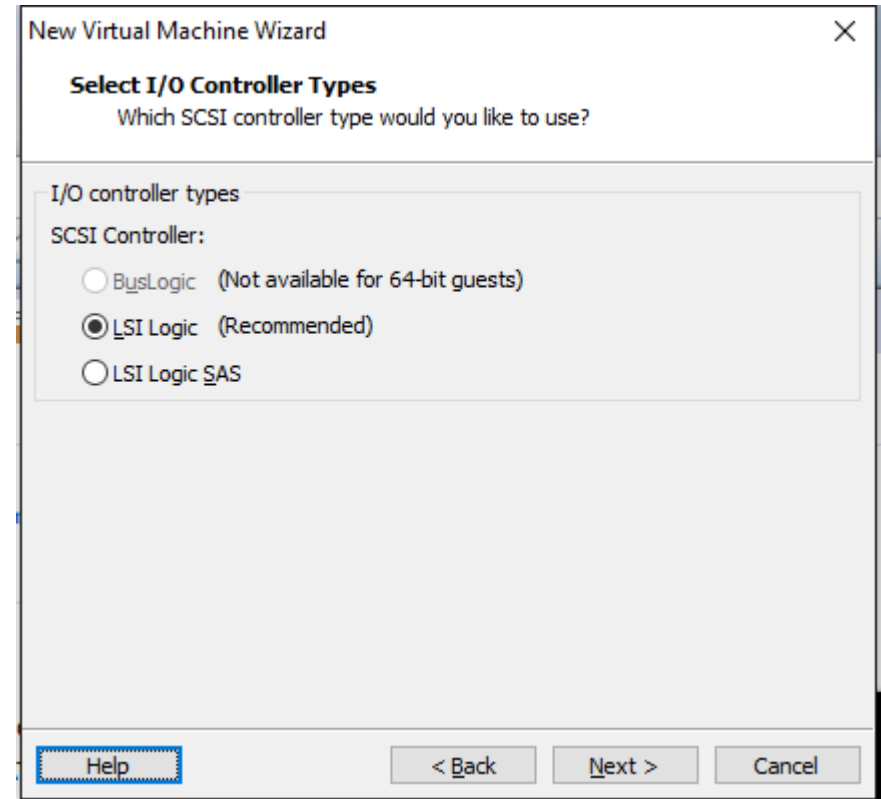
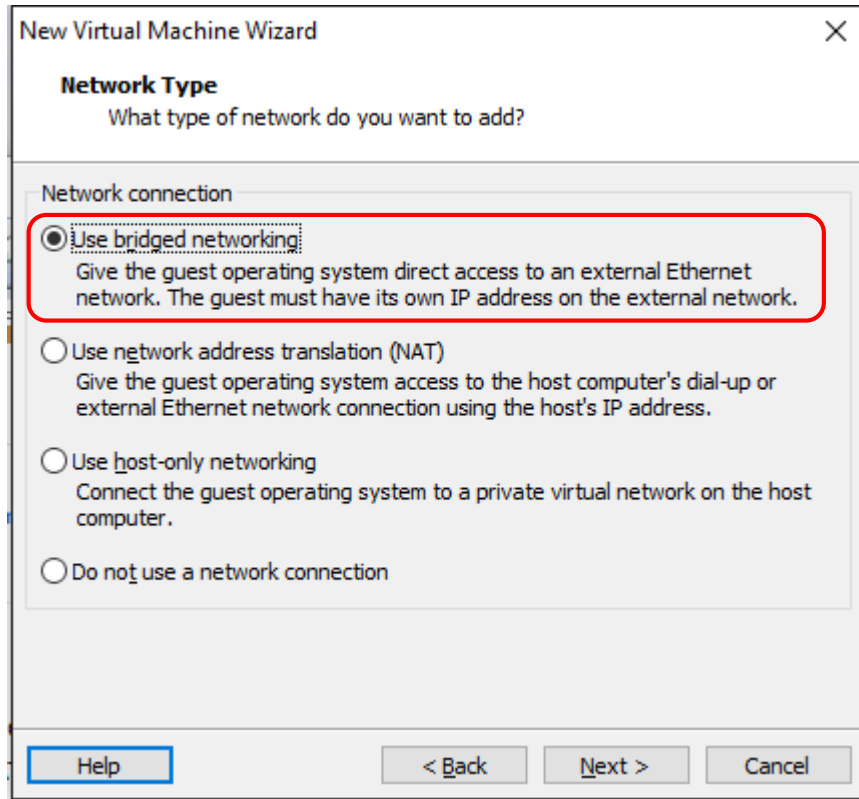
Maximum recommended memory: 13684 MB

Recommended memory: 1024 MB

Guest OS recommended minimum: 512 MB

Help < Back Next > Cancel

*Take defaults: 1 CPU and 1GB RAM*



*Let's use bridged so we can ssh into our new VM from the host computer*

*Take default*

New Virtual Machine Wizard

**Select a Disk Type**  
What kind of disk do you want to create?

Virtual disk type

☐ IDE

☒ SCSI (Recommended)

☐ SATA

Help < Back Next > Cancel

New Virtual Machine Wizard

**Select a Disk**  
Which disk do you want to use?

Disk

☒ Create a new virtual disk  
A virtual disk is composed of one or more files on the host file system, which will appear as a single hard disk to the guest operating system. Virtual disks can easily be copied or moved on the same host or between hosts.

☐ Use an existing virtual disk  
Choose this option to reuse a previously configured disk.

☐ Use a physical disk (for advanced users)  
Choose this option to give the virtual machine direct access to a local hard disk.

Help < Back Next > Cancel

*Take defaults*

New Virtual Machine Wizard

**Specify Disk Capacity**  
How large do you want this disk to be?

Maximum disk size (GB):

Recommended size for CentOS 64-bit: 20 GB

☐ Allocate all disk space now.  
Allocating the full capacity can enhance performance but requires all of the physical disk space to be available right now. If you do not allocate all the space now, the virtual disk starts small and grows as you add data to it.

☒ **Store virtual disk as a single file:**

☐ Split virtual disk into multiple files  
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.

Help < Back Next > Cancel

*Select hard drive size and store a single file*

New Virtual Machine Wizard

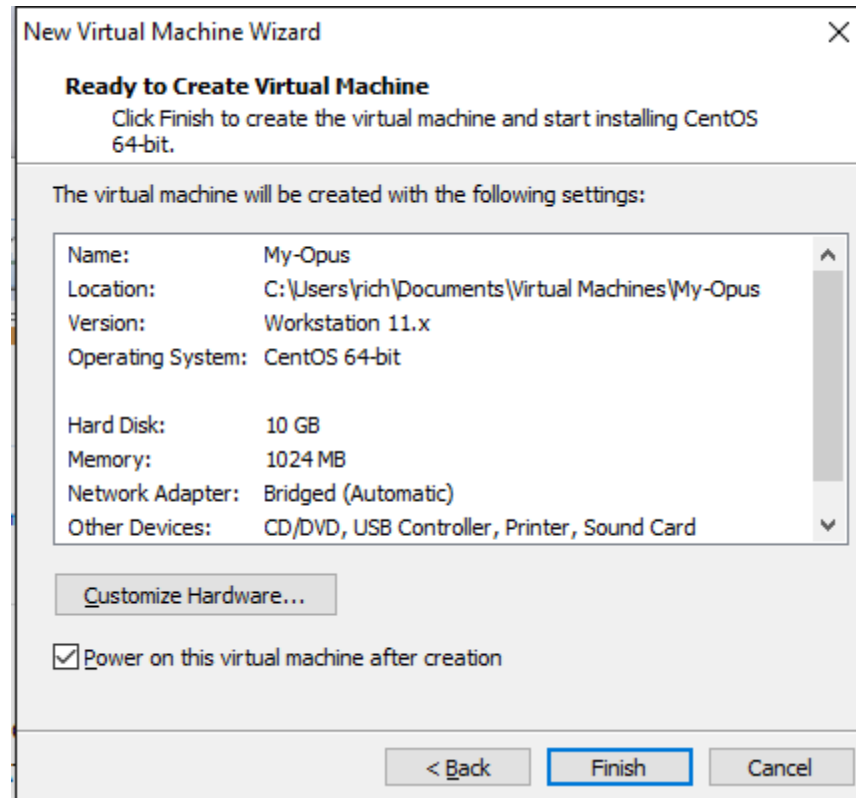
**Specify Disk File**  
Where would you like to store the disk file?

Disk File  
One 10 GB disk file will be created using the file name provided here.

Browse...

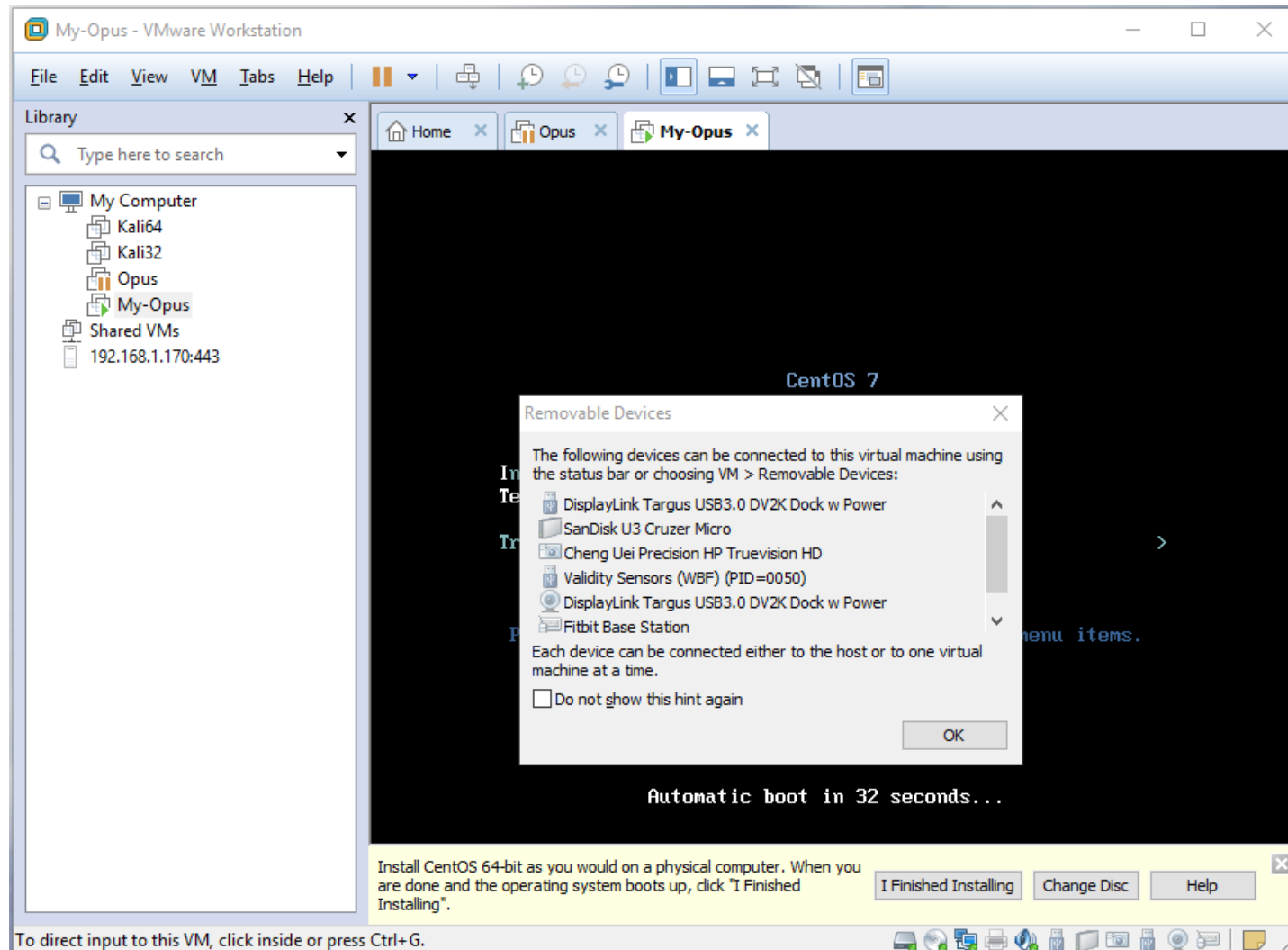
Help < Back Next > Cancel

*Take default*

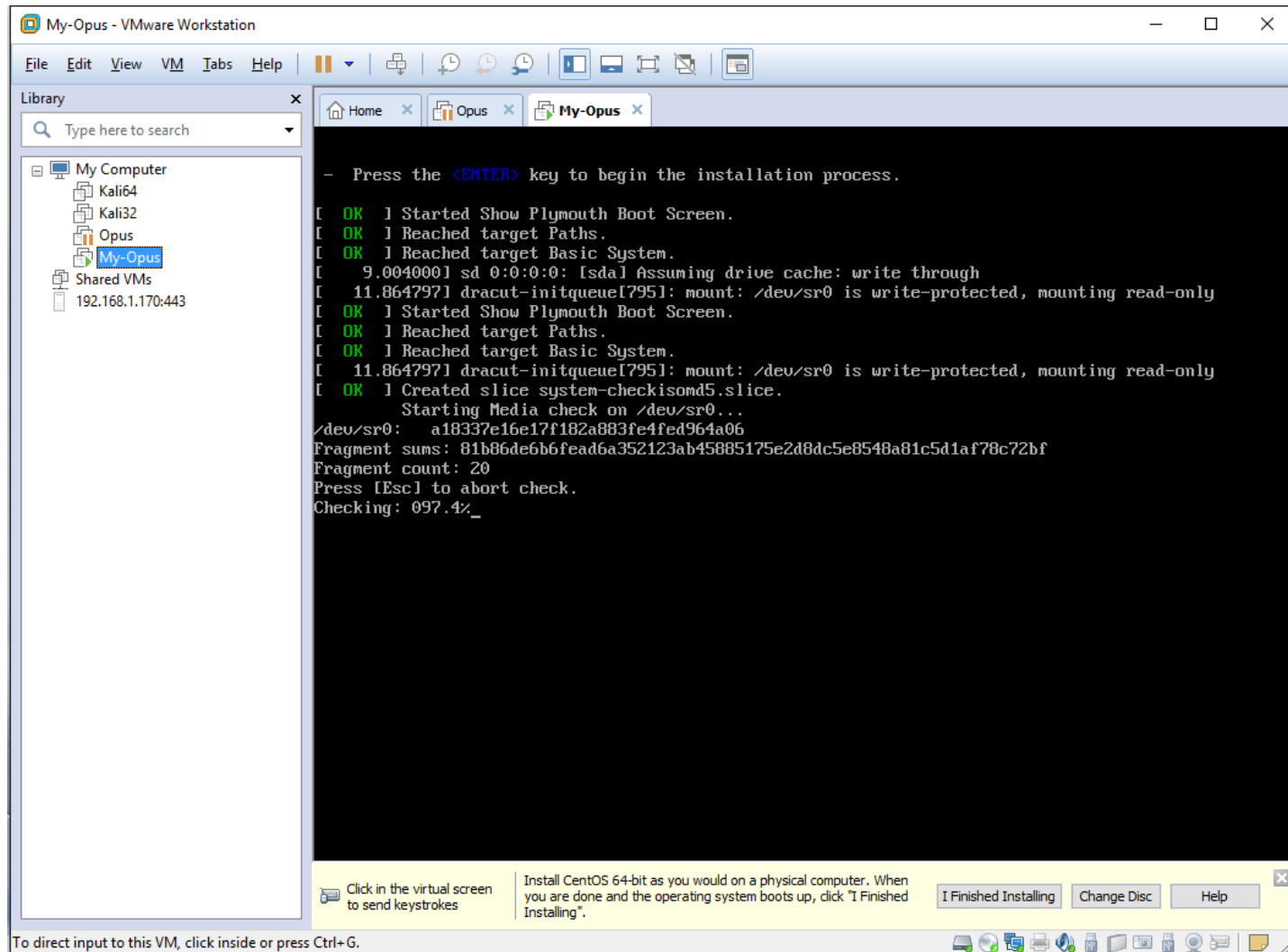


*Go for it!*

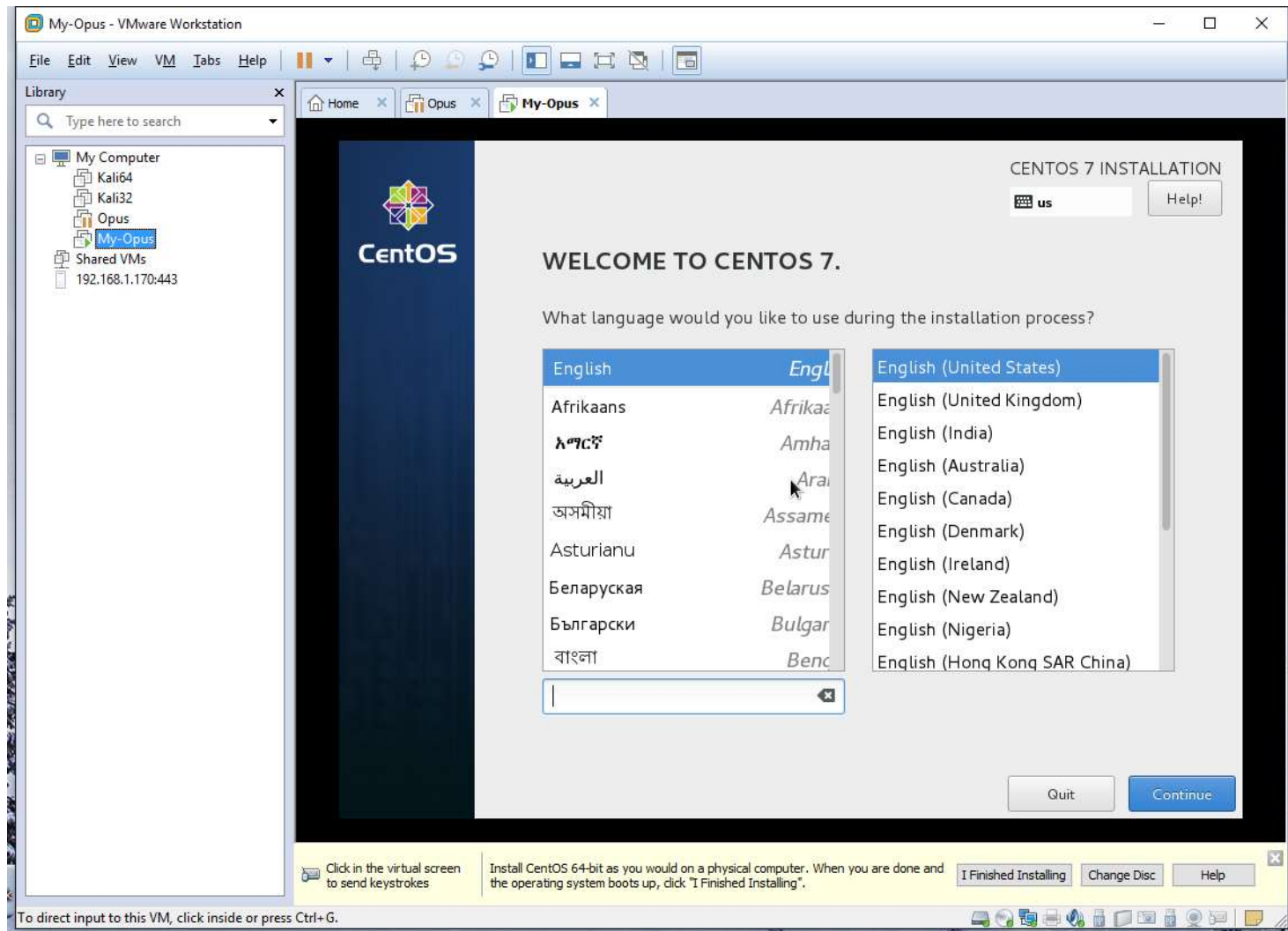




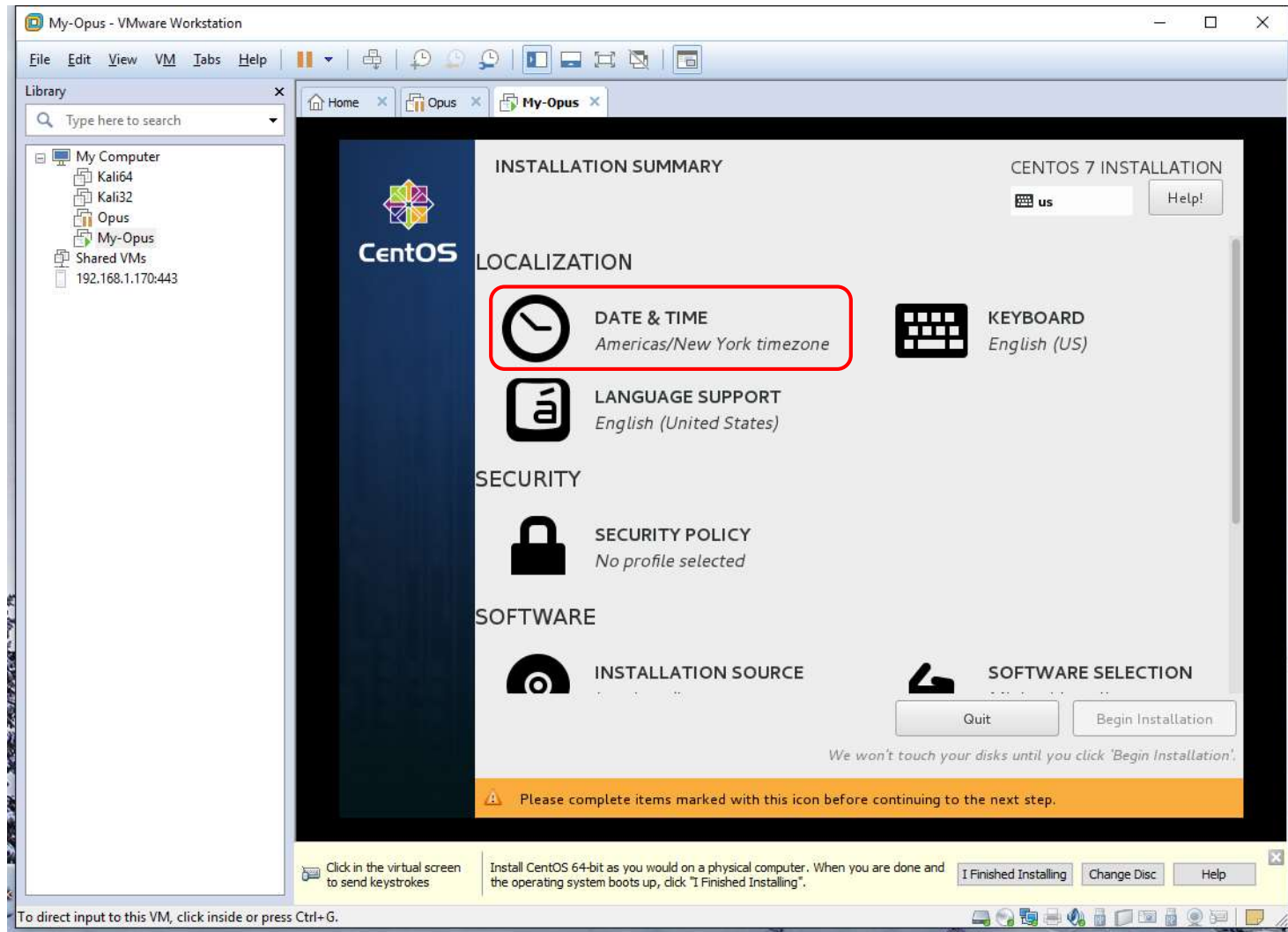
*Read and click OK. Click inside VM, arrow up to "Install CentOS 7" and press Enter*



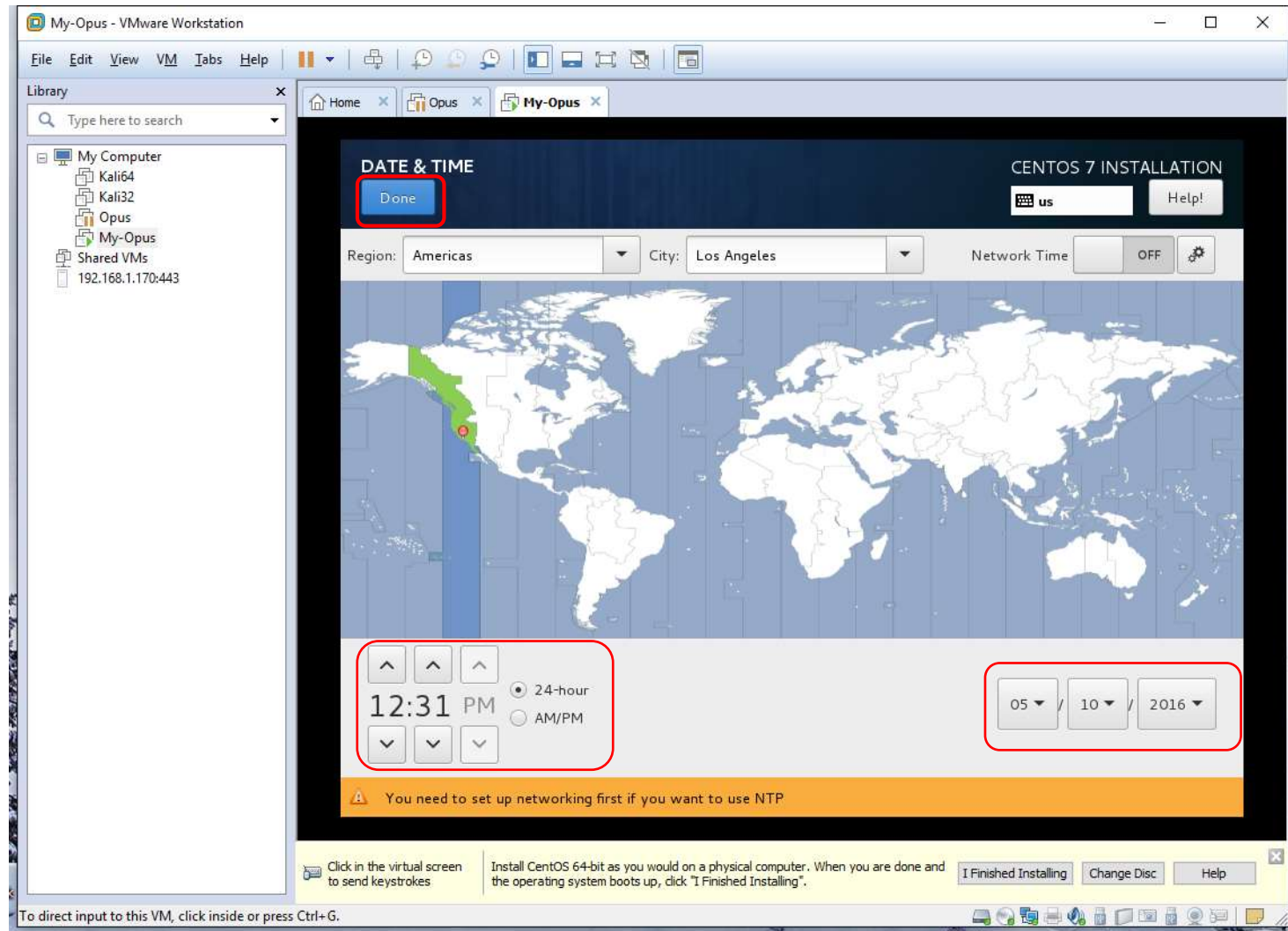
*Away it goes ...*



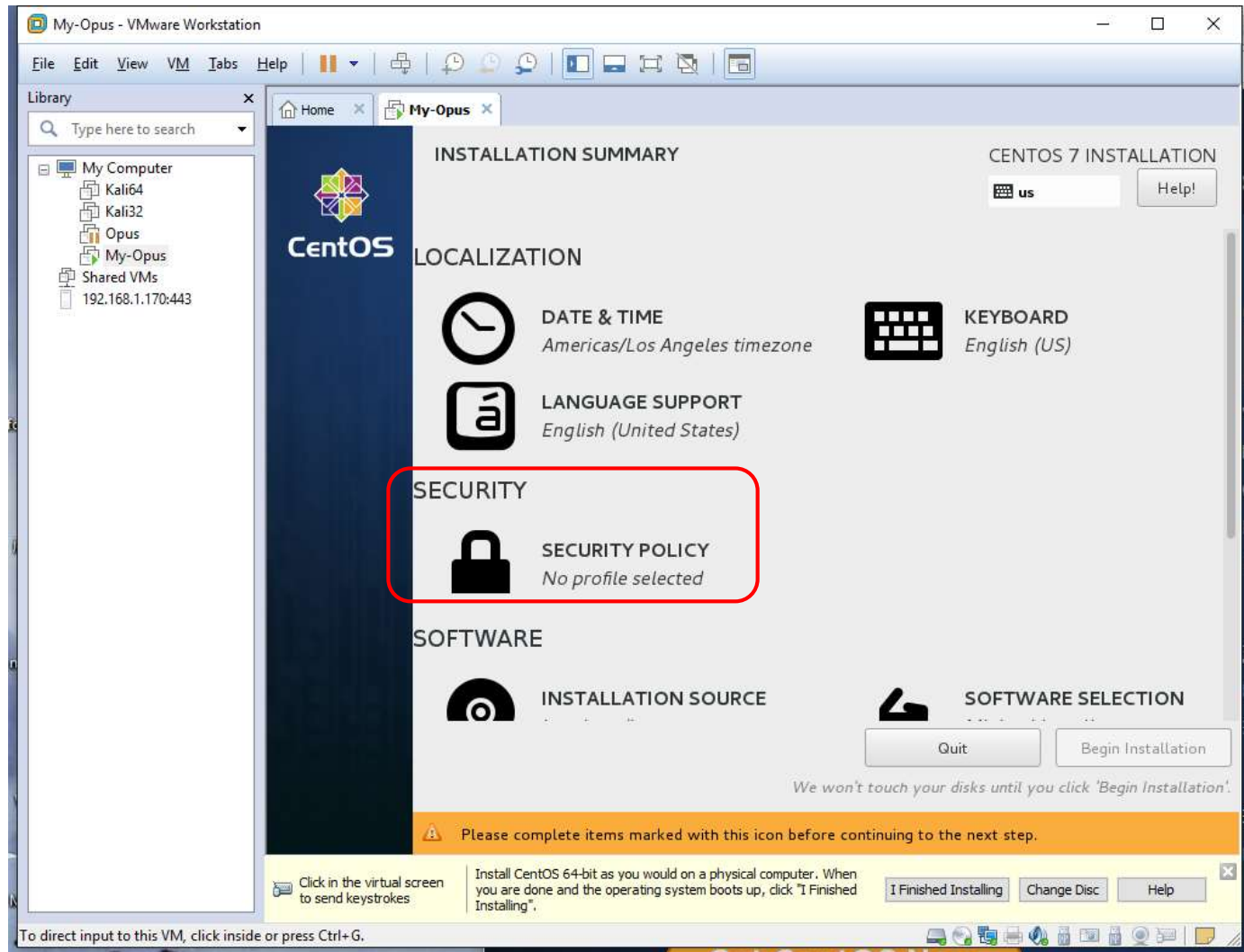
*Take defaults*



Update time zone

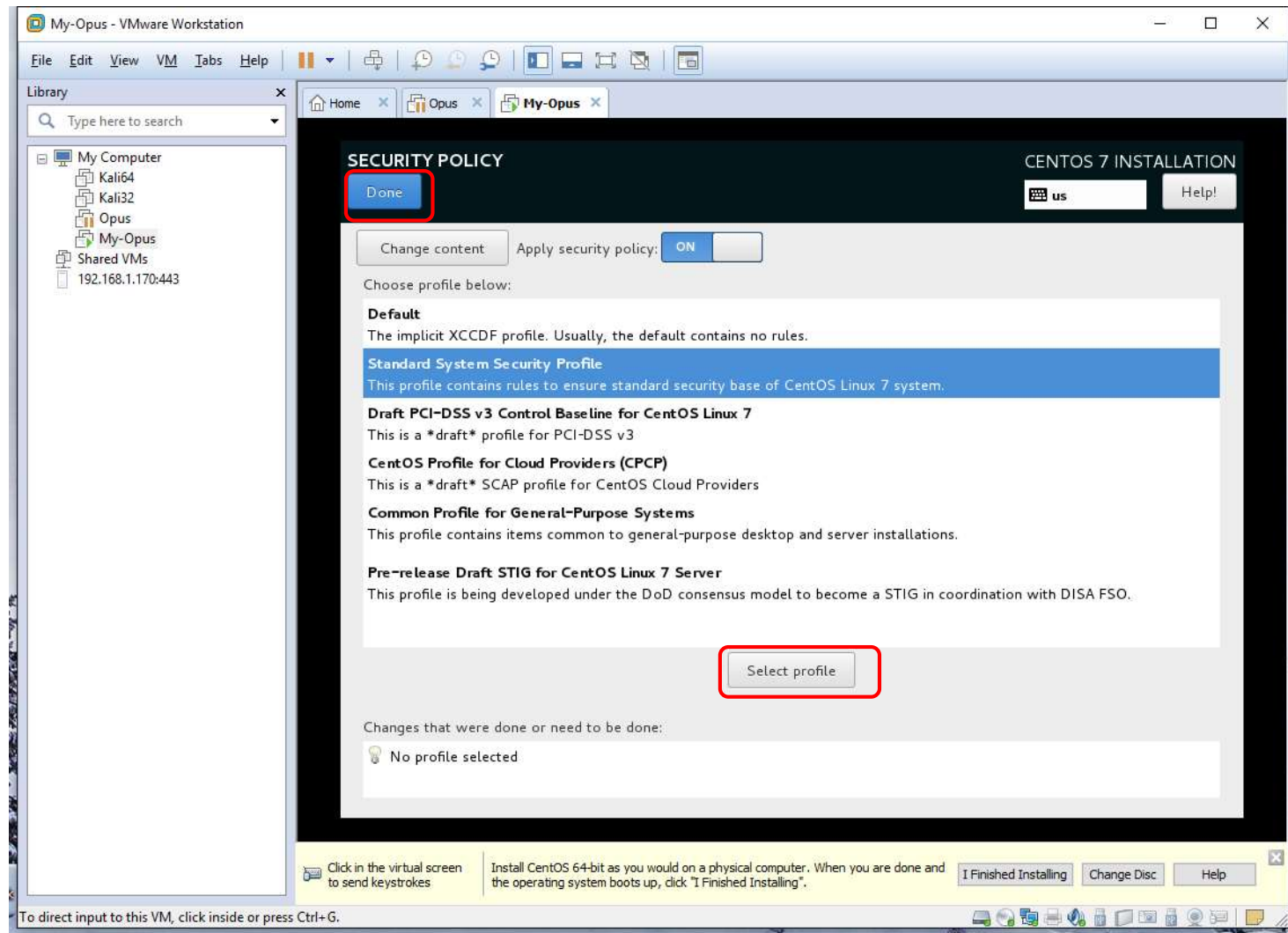


*Click your zone, set the correct time and date then click done*

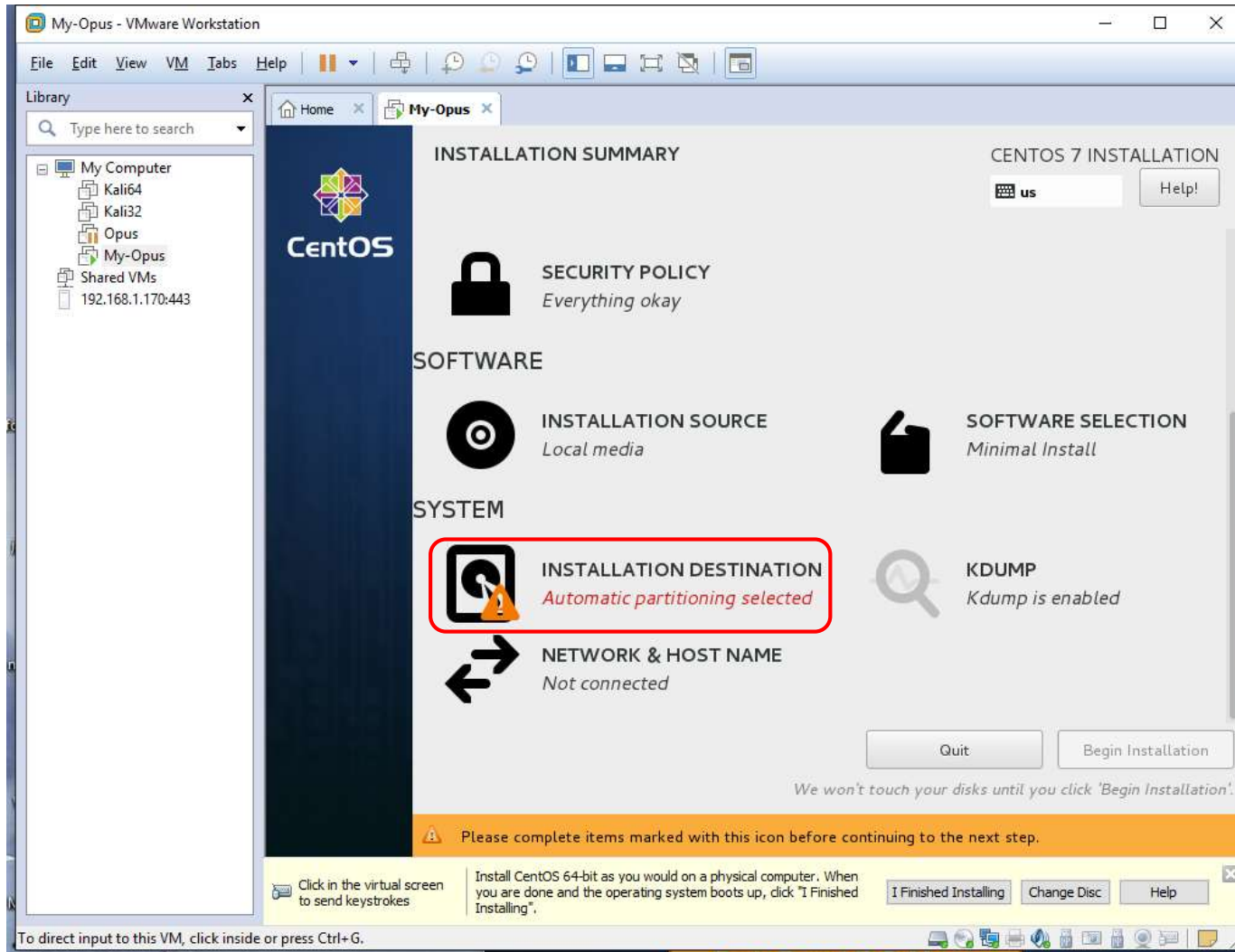


Update security policy

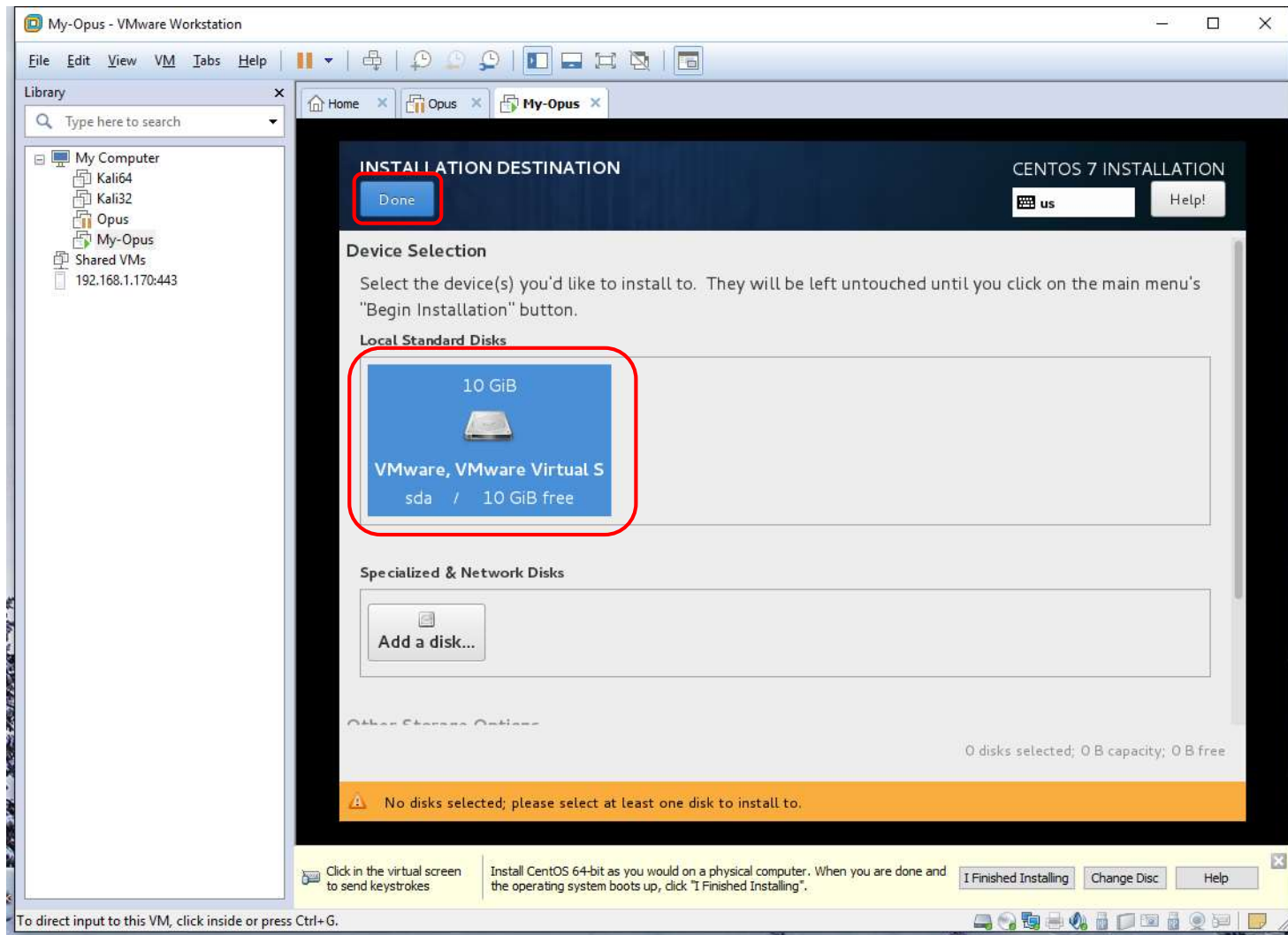




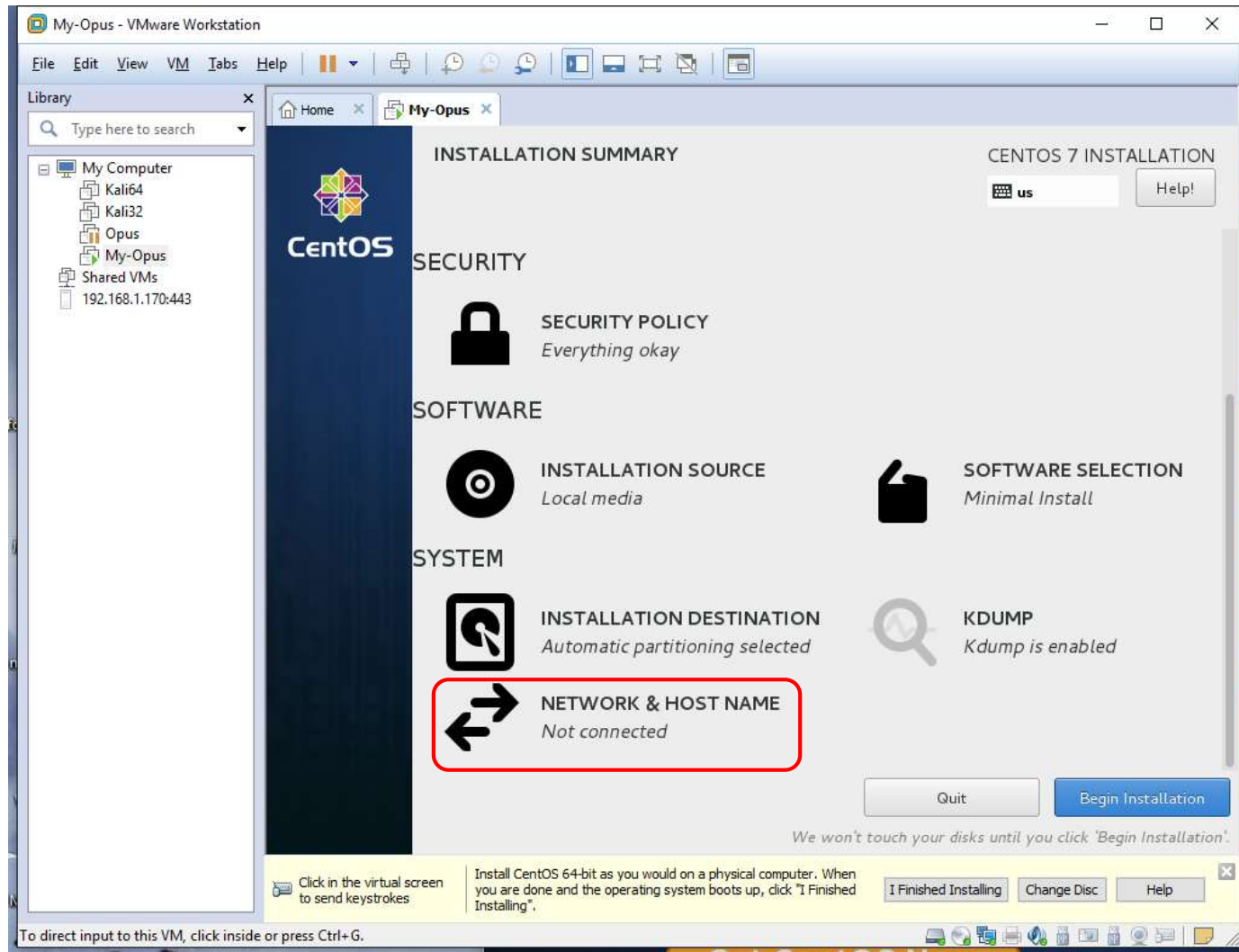
*Select standard, click Select profile and click Done*



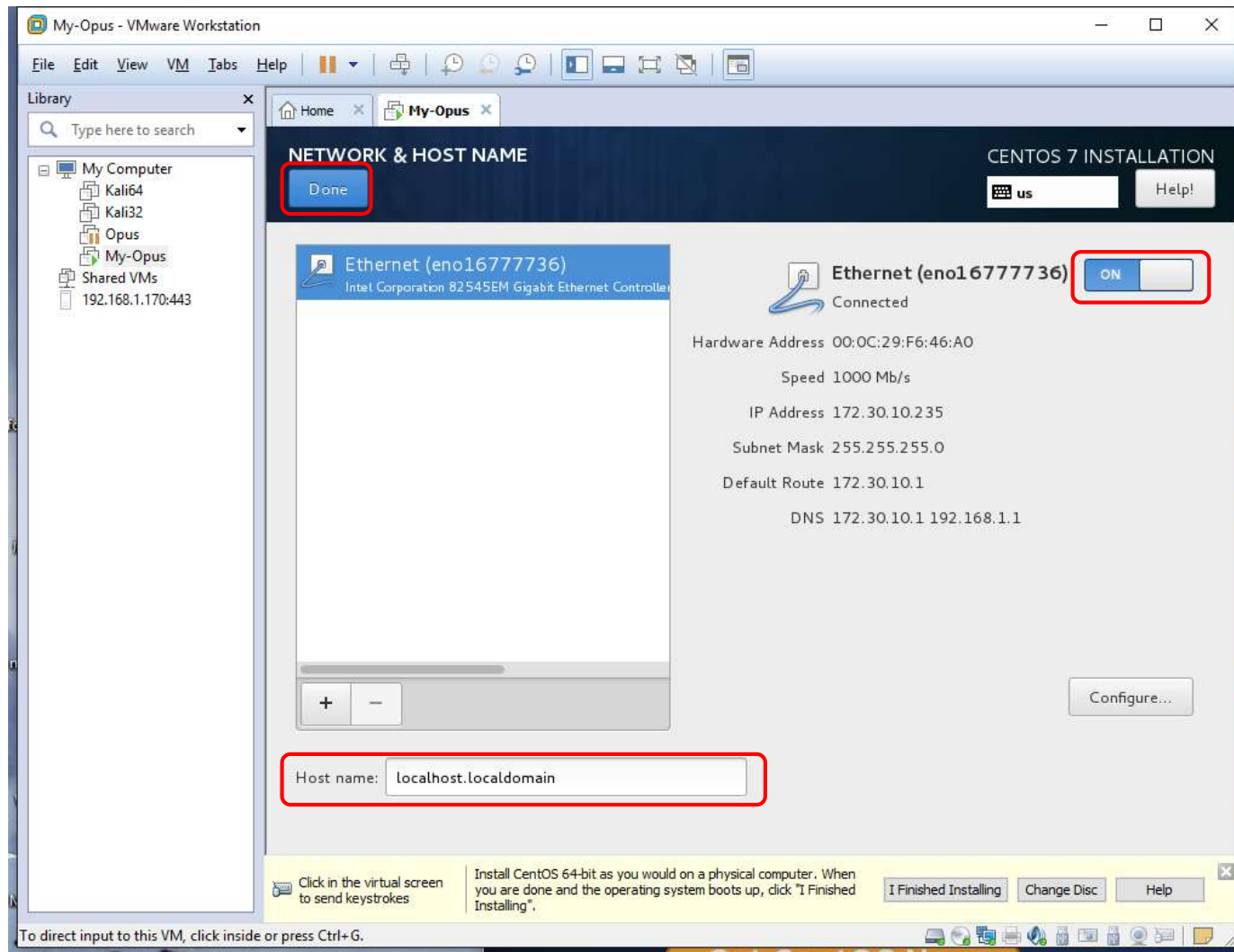
Select where to install



*Select new drive and click Done*

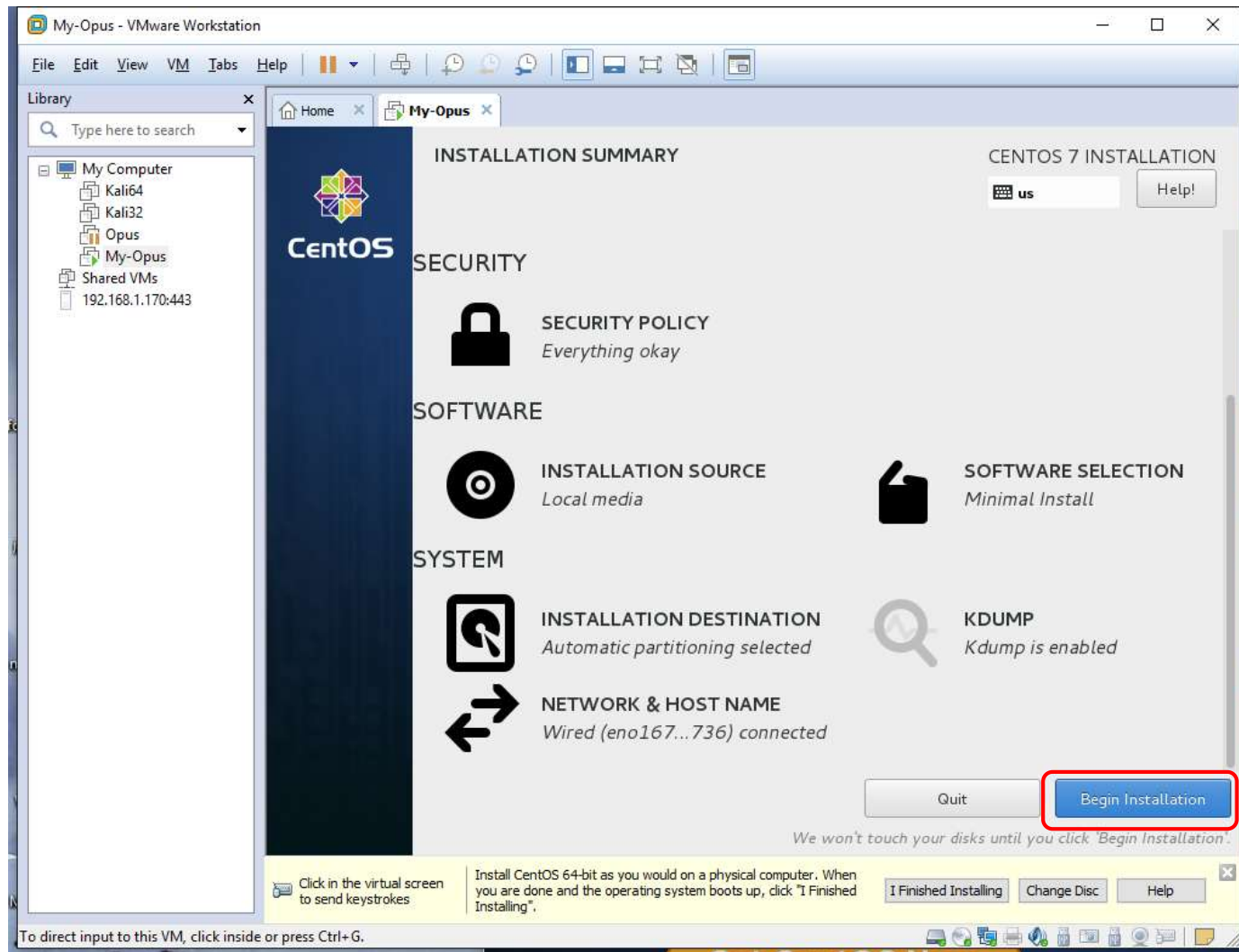


Configure network



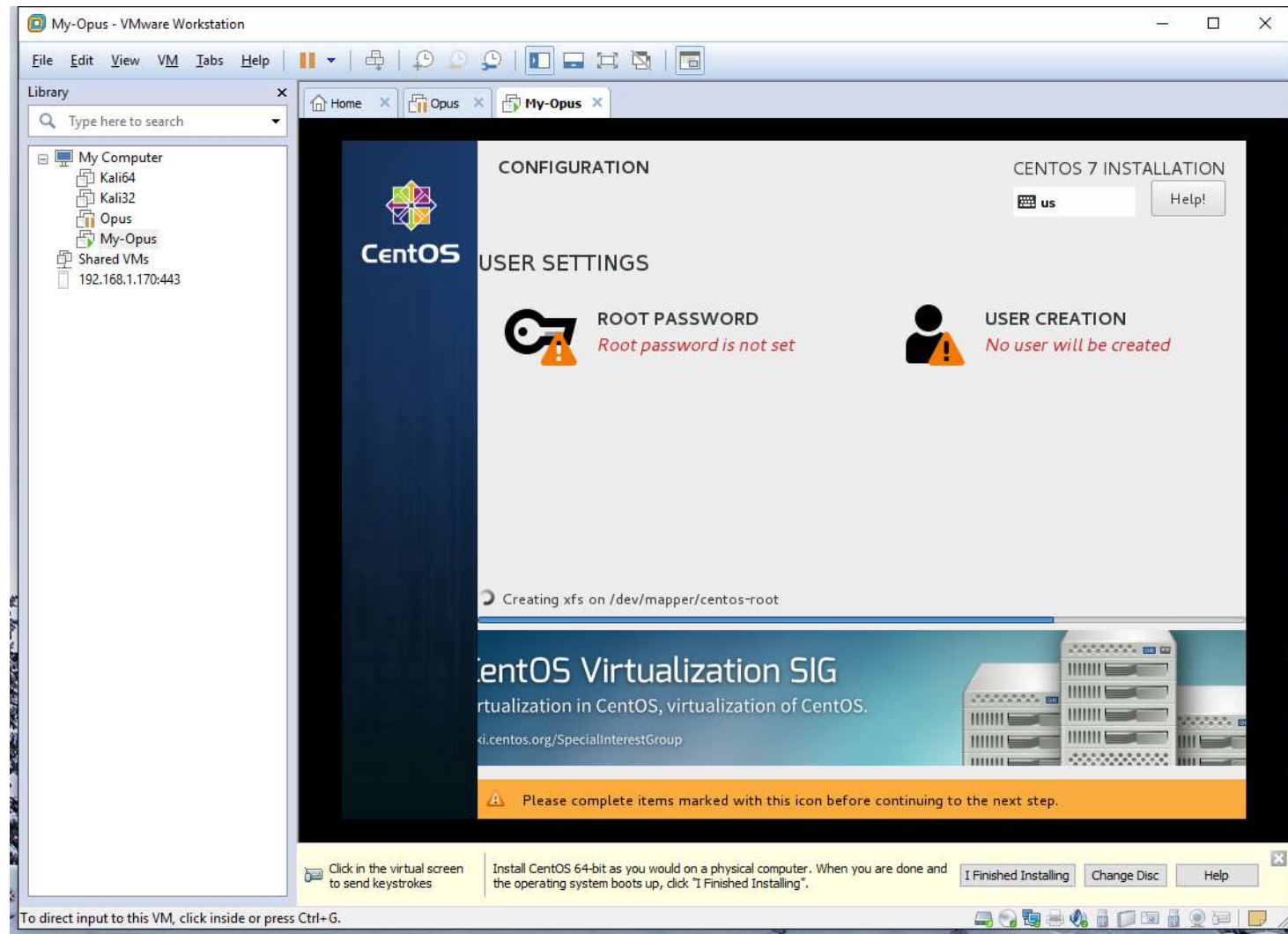
*Configure interface to "ON", optionally name system then click Done*



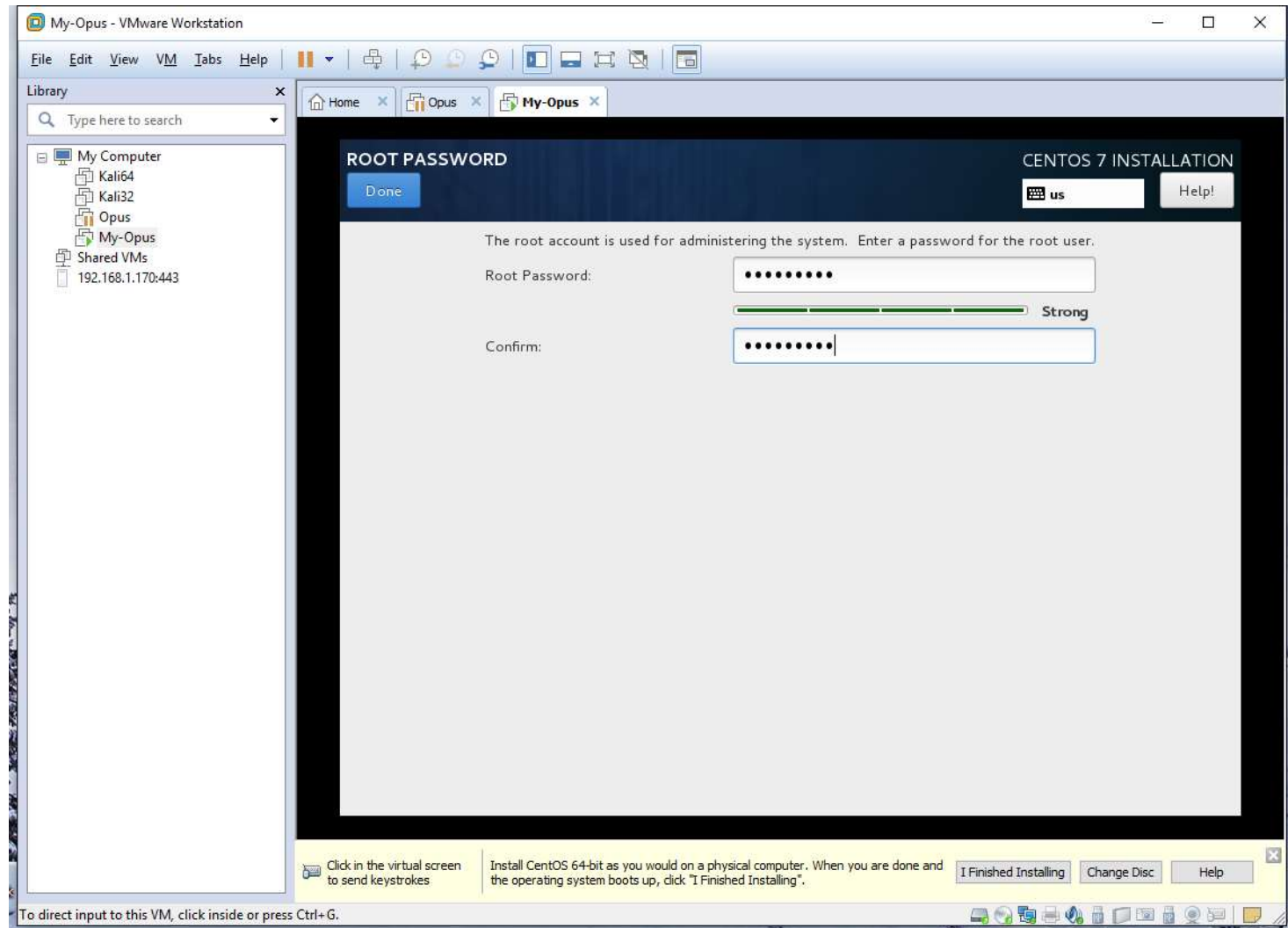


Go for it!

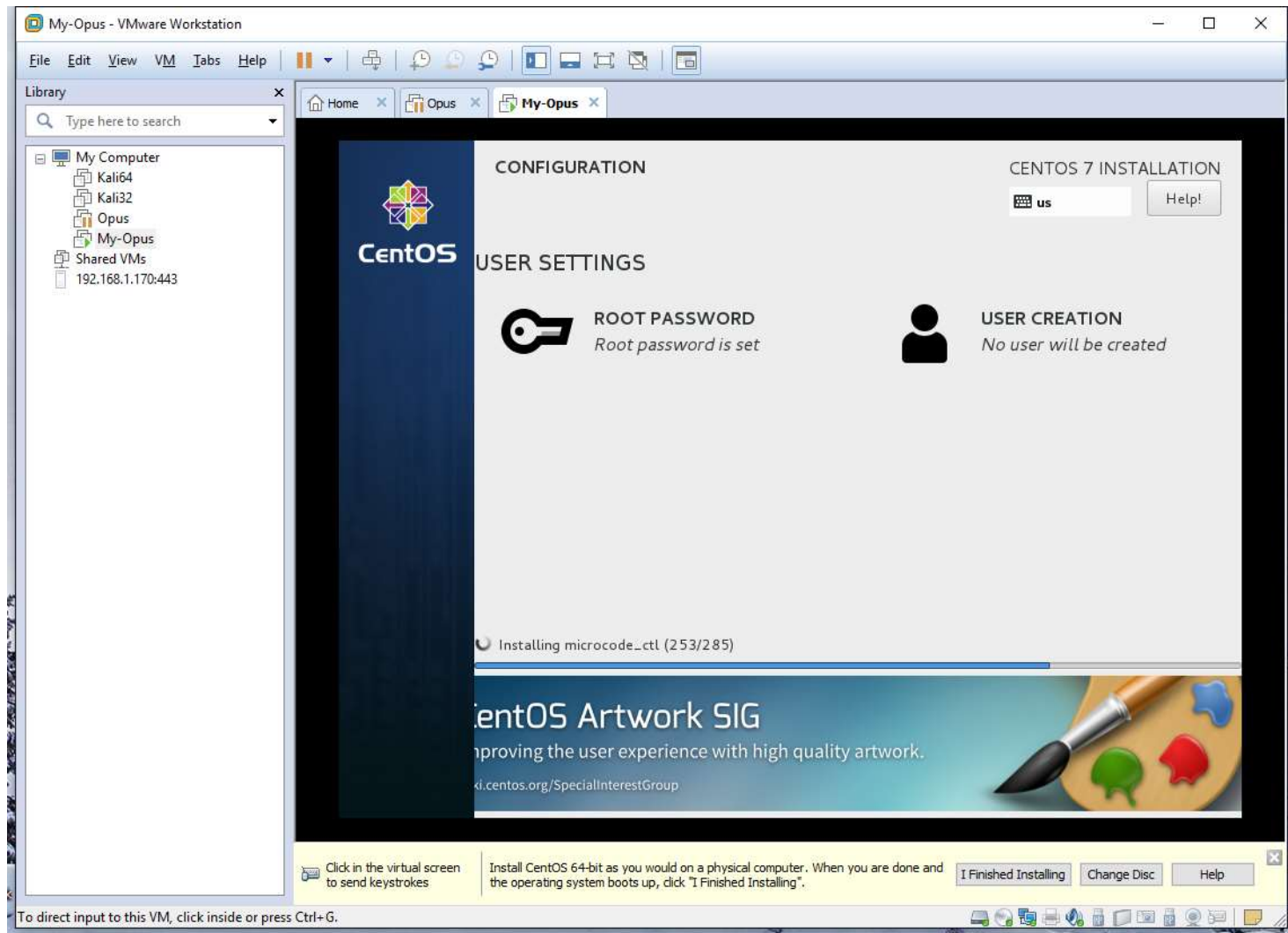




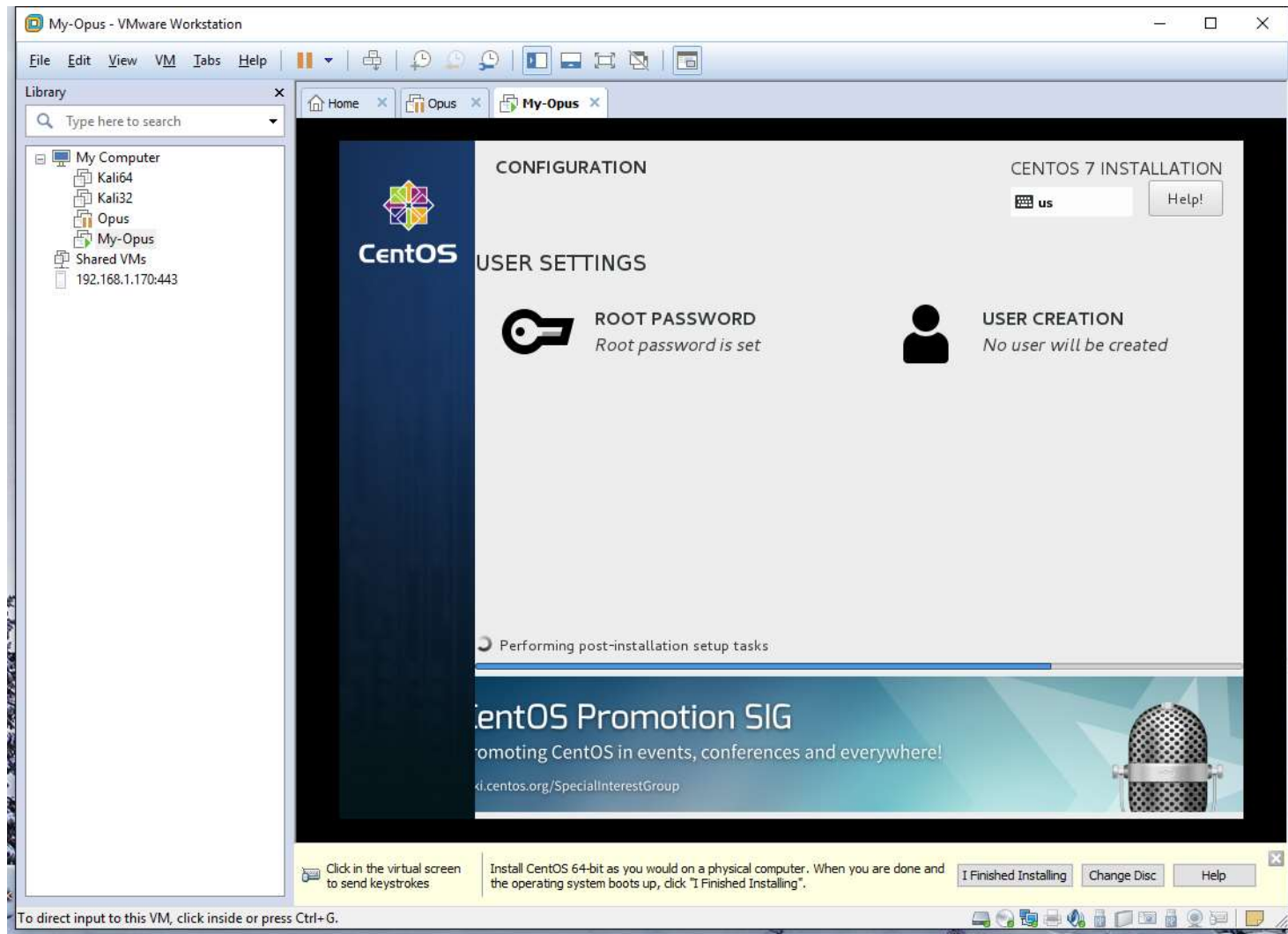
*While we are waiting set password for root user*



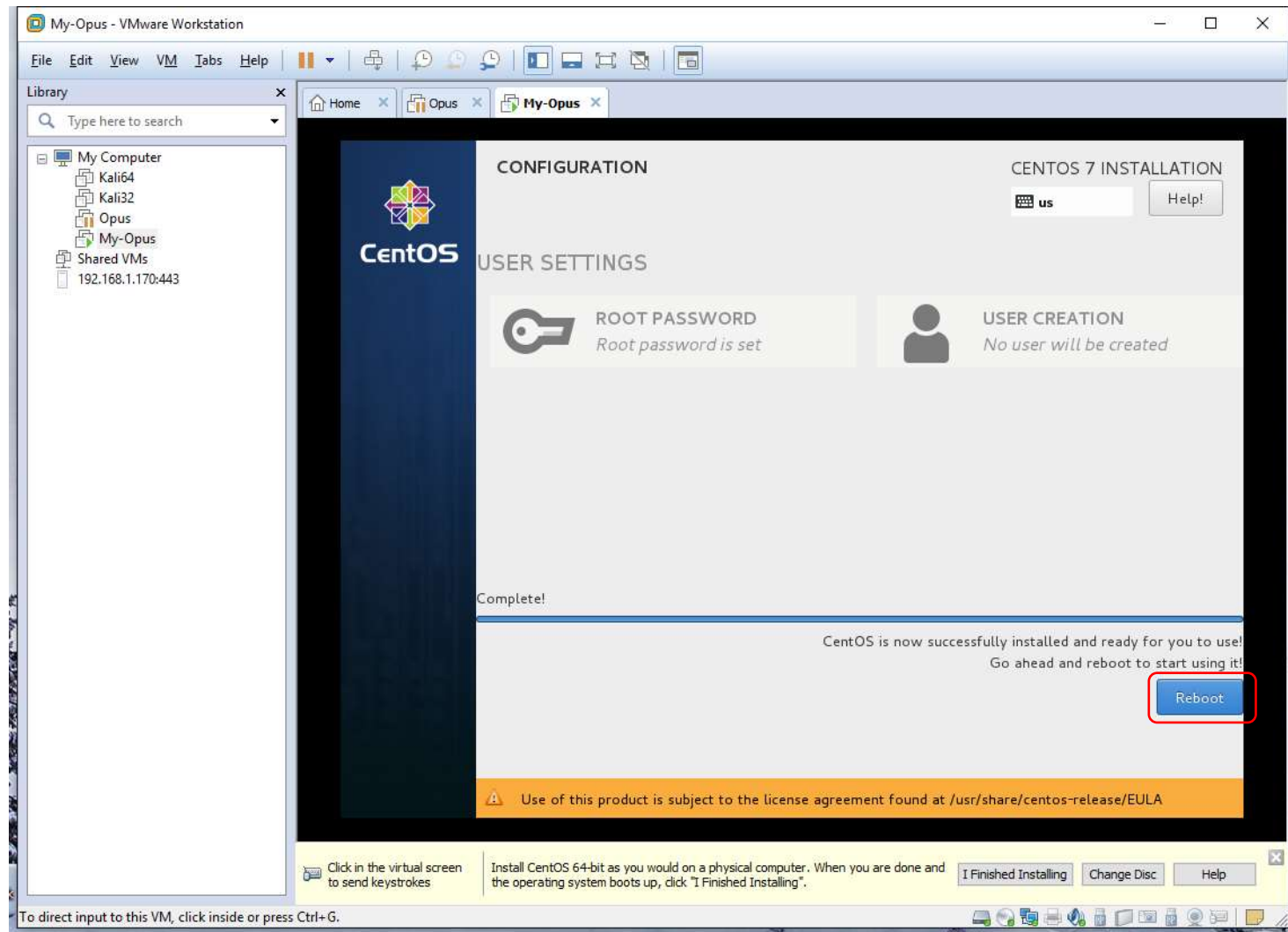
*Make it a strong one*



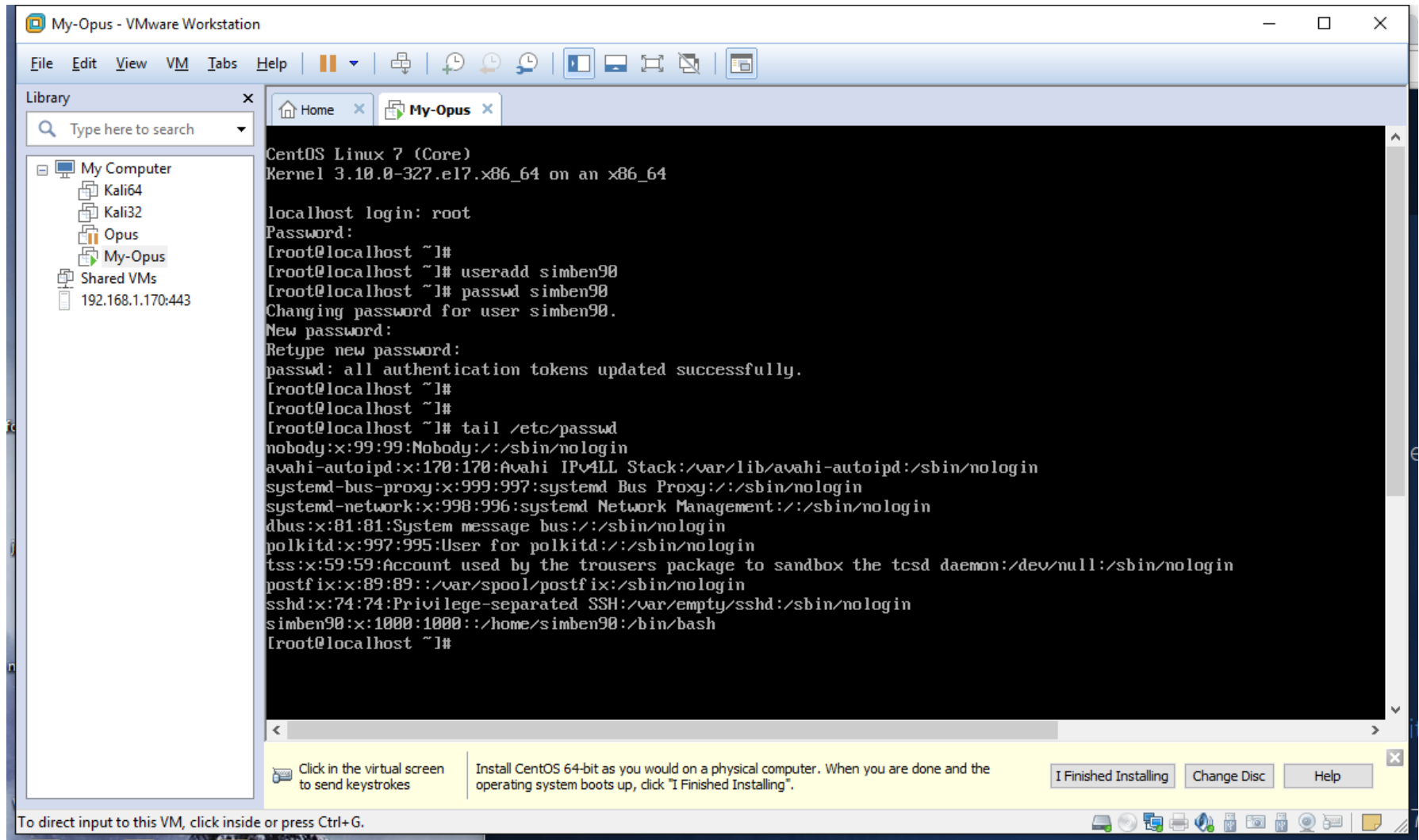
Wait ...



*Wait some more ...*



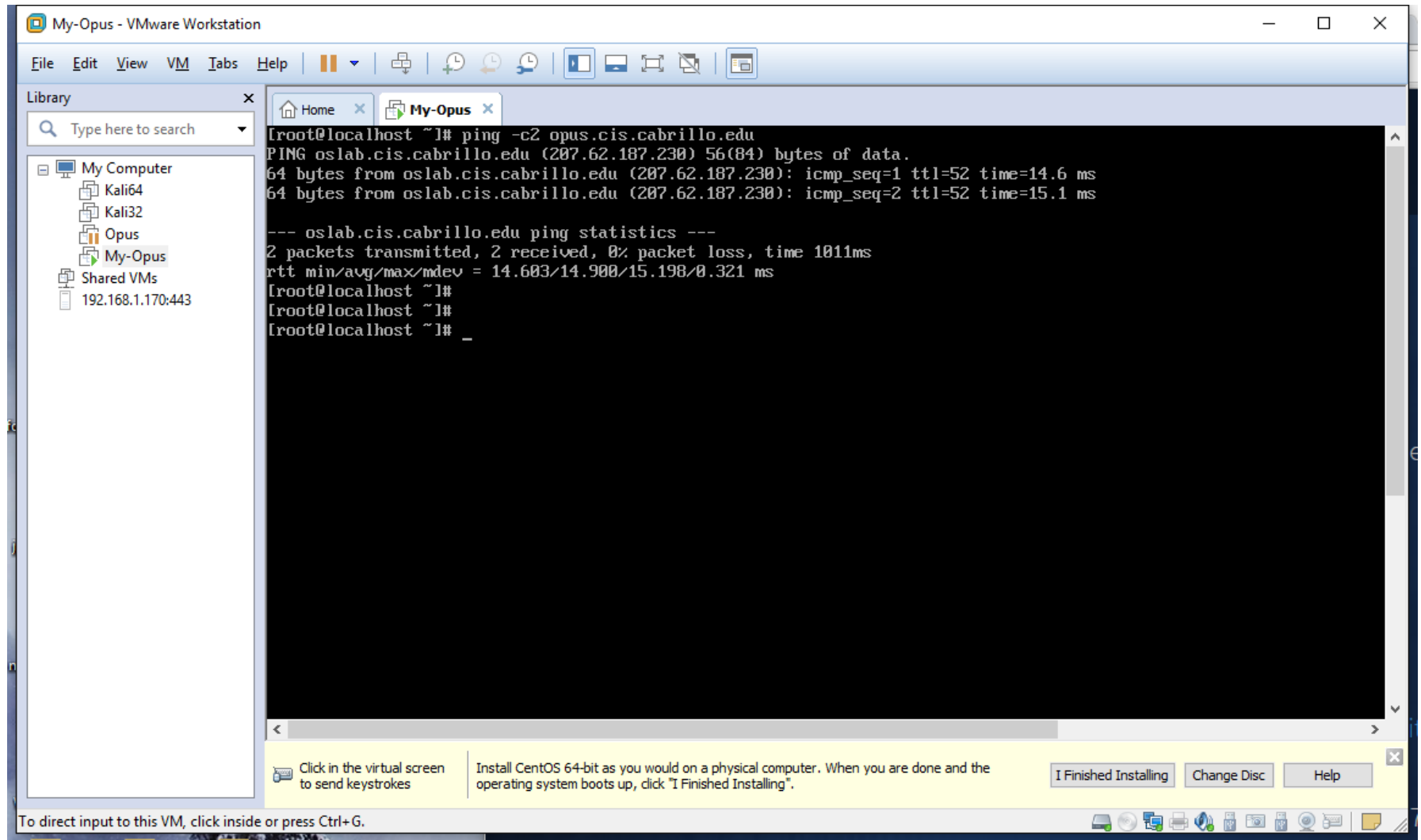
*Click Reboot to start new VM*

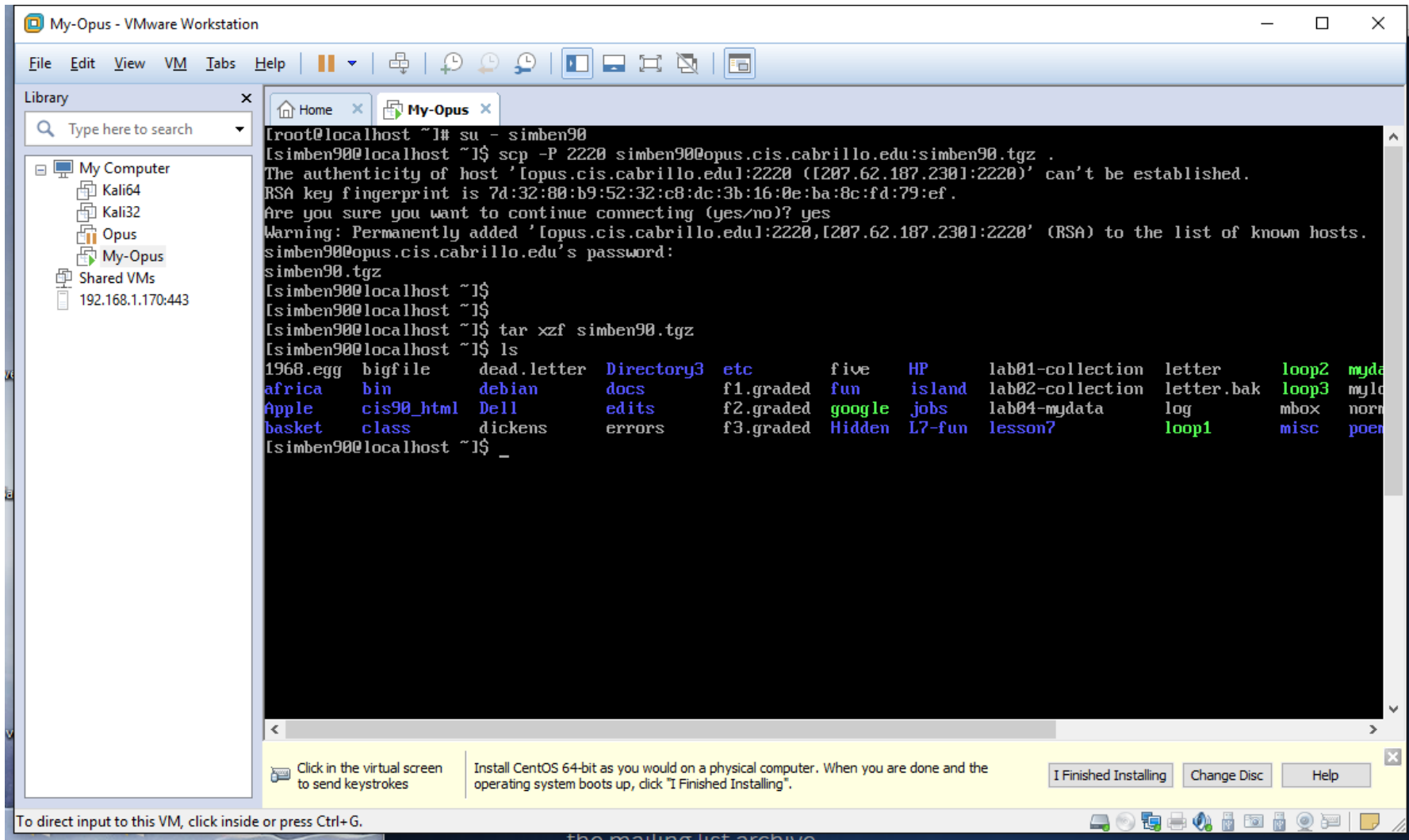


*Login as root*

```
adduser simben90
passwd simben90
tail /etc/passwd
```







```
su - simben90
```

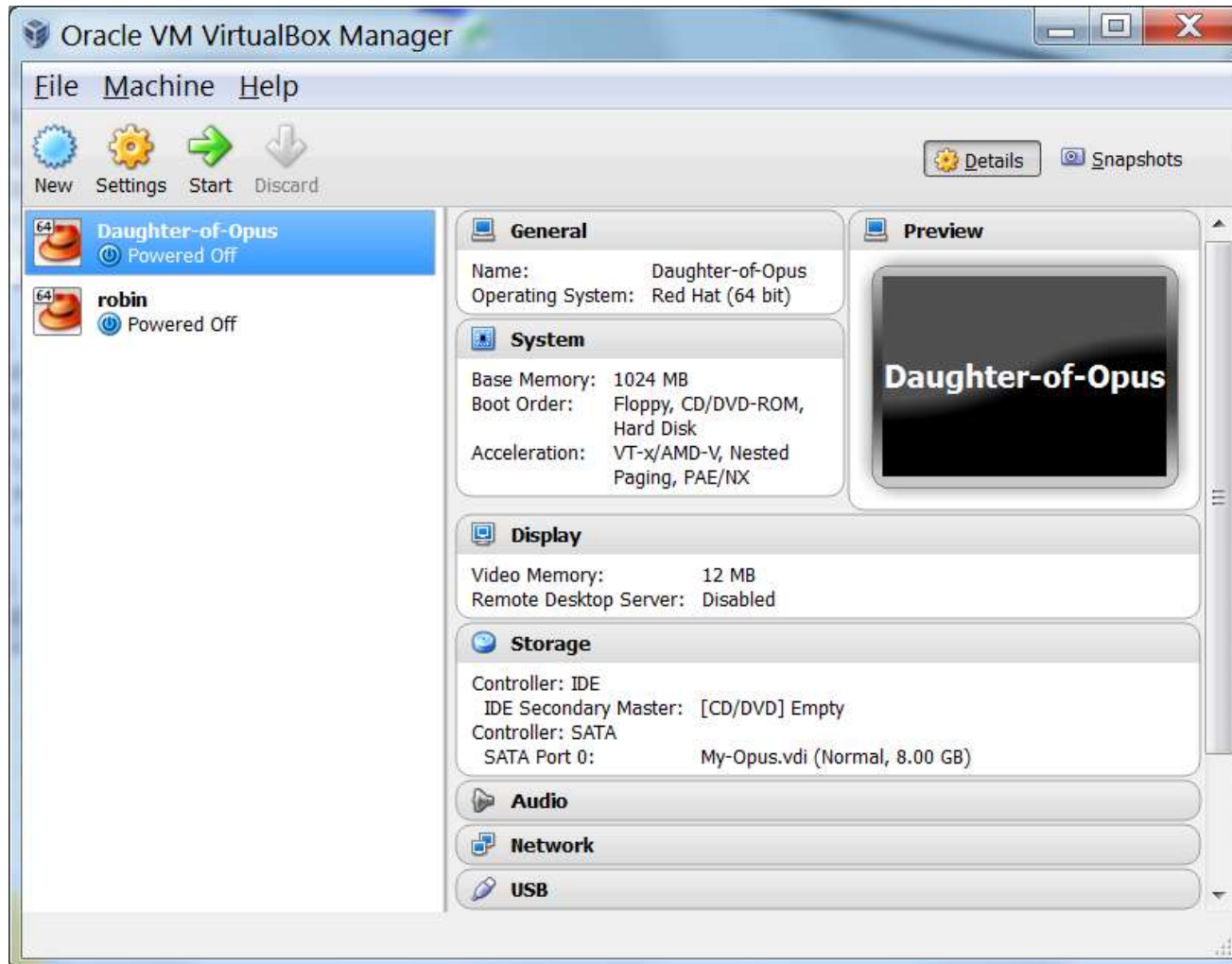
```
scp -P 2220 simben90@opus.cis.cabrillo.edu:simben90.tgz .
```

```
tar xzf simben90.tgz
```



# Virtual Box

## Oracle VirtualBox



*Provides you with an empty (No OS) virtual computer*

## virtualbox.org





<http://iso.linuxquestions.org/>

The screenshot shows the LinuxQuestions.org website. The header includes the site logo, a Rackspace Managed Cloud banner, and navigation links. The main content area is titled 'Linux Download' and 'Welcome to LQ ISO'. It provides a search bar, a 'Need Help?' section, and a 'Sponsored Links' section. The central part of the page features a list of '15 Latest Linux Distribution Releases' and a 'Popular Linux Distributions' section. The footer includes a 'Statistics' section and an 'LQ Job Board'.

**LinuxQuestions.org**

**THE RACKSPACE MANAGED CLOUD**  
Now accepting IT headaches. Troubleshooting SEE HOW

**LinuxQuestions.org > ISOs**

**LQ ISOs**

- Search
- Alphabetical List
- Latest Releases
- Release Notification
- Suggest Additions

**Search**

**Need Help?**

- Downloading ISOs
- Burning ISOs

**Sponsored Links**

- Linux Os
- Ubuntu Server
- Download Linux
- Laptop Deals
- Programming
- Linux Certification
- Linux Operating System

**Statistics**

Distros: 465  
Versions: 2760  
Mirrors: 1849  
Downloads: 55,668,721

**LQ Job Board**

Jobs

**Welcome to LQ ISOs**

**Linux Download**  
Answer Your Linux Questions. Expert Articles & Tips. Free Guide!

Welcome to LQ ISO

This site is designed to meet all of your Linux distribution [download](#) needs, including searching for fast [mirrors](#), receiving email updates when new versions of your favorite distributions are released and reading reviews. If you do not see the distribution [you are looking for](#) below, you can view the complete alphabetical list. Please let us know if you have any suggestions.

If you find the site useful, you can help spread the word by telling 10 friends the URL (<http://www.lqiso.org/>). Thanks:

**15 Latest Linux Distribution Releases**

1. Porteus 3.1
2. FreeNAS 9.3
3. SparkyLinux 3.6 "LXDE", "MATE", "Xfce", "KDE", "KDE"
4. Maktulinux 2.0 "Xfce"
5. antiX 14.2 "Mx"
6. Linux Lite 2.2
7. Manjaro Linux 0.8.11
8. Linux Mint 17.1
9. dMLinux 10.1
10. DragonFly BSD 4.0.1
11. siduction 14.1.0
12. NetBSD 5.2.3, 5.1.5
13. Guadalinex 9
14. Univention Corporate Server 4.0
15. Grml 2014.11

**Popular Linux Distributions**

- Ubuntu
- Fedora
- Linux Mint
- openSUSE
- PCLinuxOS
- Debian
- Mageia
- Slackware
- CentOS
- Puppy
- Arch
- MEPIS

View by Topic: Desktop, Server, Security, Mobile, Live, Firewall, Rescue

**Main Menu**

- Linux Forums
- Android Forum
- Chrome OS Forum
- Linux HCL
- Linux Tutorials
- Linux Wiki
- Distro Reviews
- Book Reviews

**Ad**

Google Cloud Platform

Build apps faster on Google App Engine

Try it now

*You will need a Linux Distro to install on your virtual Computer*



## centos.org



**CentOS Overview**

CentOS is an Enterprise-class Linux Distribution derived from sources freely provided to the public by a prominent North American Enterprise Linux vendor. CentOS conforms fully with the upstream vendor's redistribution policy and aims to be 100% binary compatible. (CentOS mainly changes packages to remove upstream vendor branding and artwork.) CentOS is free.

CentOS is developed by a small but growing team of core developers. In turn the core developers are supported by an active user community including system administrators, network administrators, enterprise users, managers, core Linux contributors and Linux enthusiasts from around the world.

CentOS has numerous advantages over some of the other done projects including: an active and growing user community, quickly rebuilt, tested, and QA'ed errata packages, an extensive **mirror network**, developers who are contactable and responsive, multiple free support avenues including **IRC Chat**, **Mailing Lists**, **Forums**, a dynamic **FAQ**.

This site makes use of Javascript. If your browser doesn't work with Javascript we recommend you use **Firefox**.

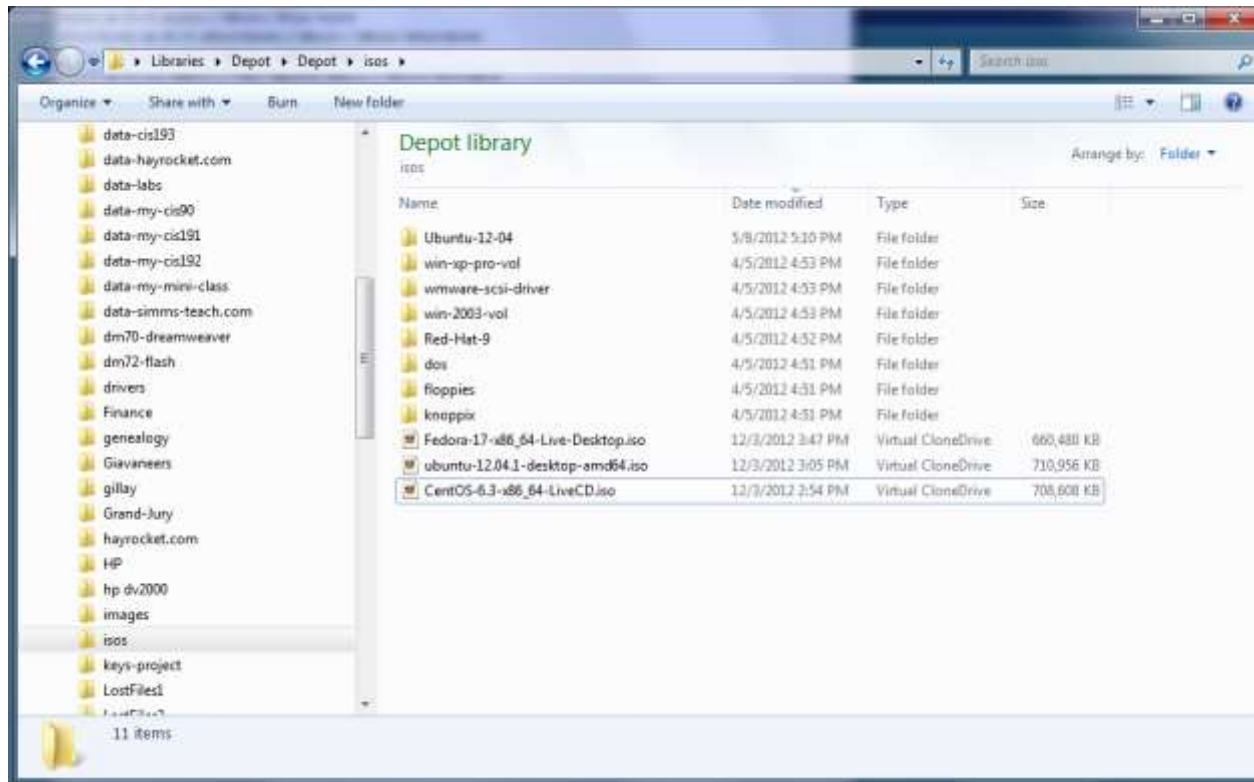
**CentOS 6 Releases**

July 9th 2012

The CentOS team is pleased to **announce** the immediate availability of CentOS-6.3 for i386 and x86\_64 Architectures.

**CentOS 6 Releases Table:**

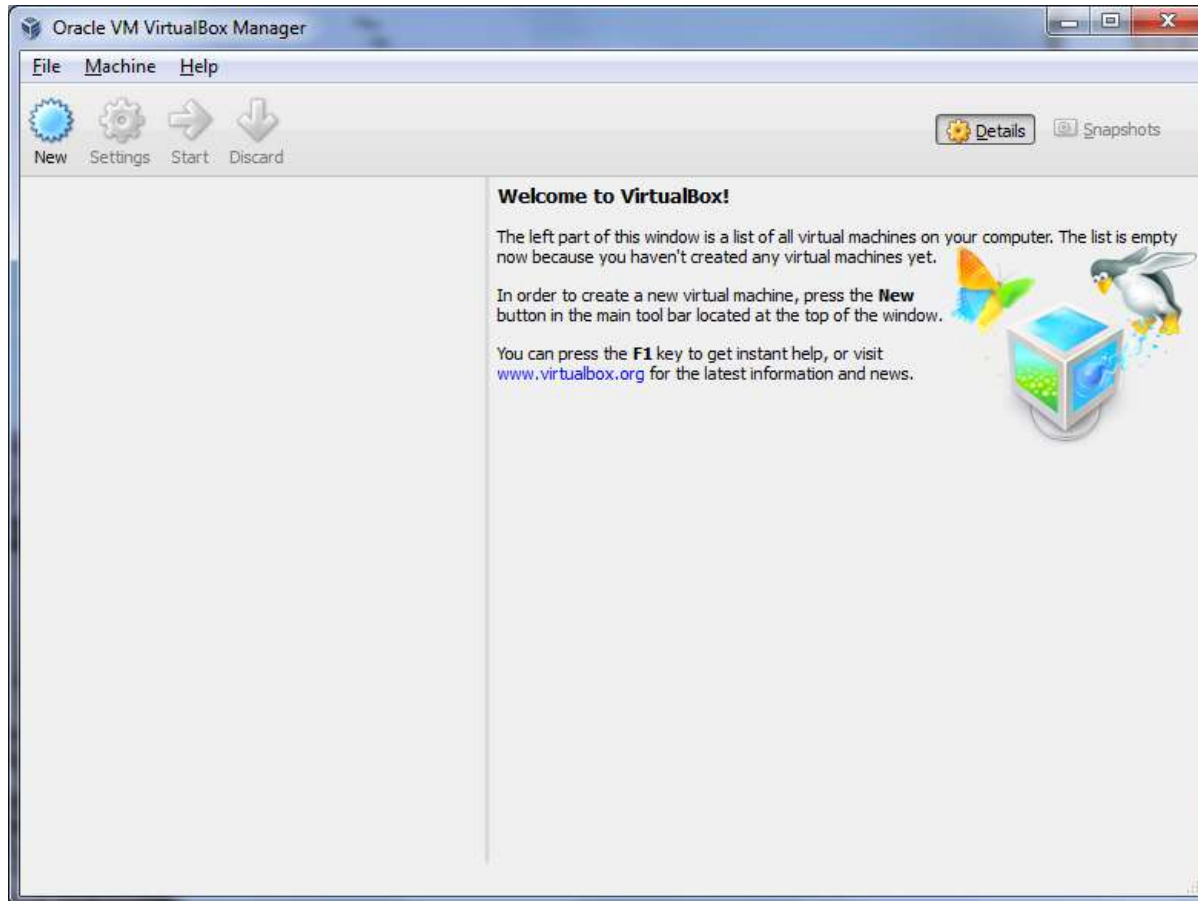
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29.5	02-Mar-2011 15:44	-	
29.6	02-Mar-2011 15:44	-	
29.7	02-Mar-2011 15:44	-	
29.8	02-Mar-2011 15:44	-	
29.9	02-Mar-2011 15:44	-	
30.0	02-Mar-2011 15:44	-	
30.1	02-Mar-2011 15:44	-	
30.2	02-Mar-2011 15:44	-	
30.3	02-Mar-2011 15:44	-	
30.4	02-Mar-2011 15:44	-	
30.5	02-Mar-2011 15:44	-	
30.6	02-Mar-2011 15:44	-	
30.7	02-Mar-2011 15:44	-	
30.8	02-Mar-2011 15:44	-	
30.9	02-Mar-2011 15:44	-	
31.0			



*Download an iso image of the Linux distribution*

## VirtualBox

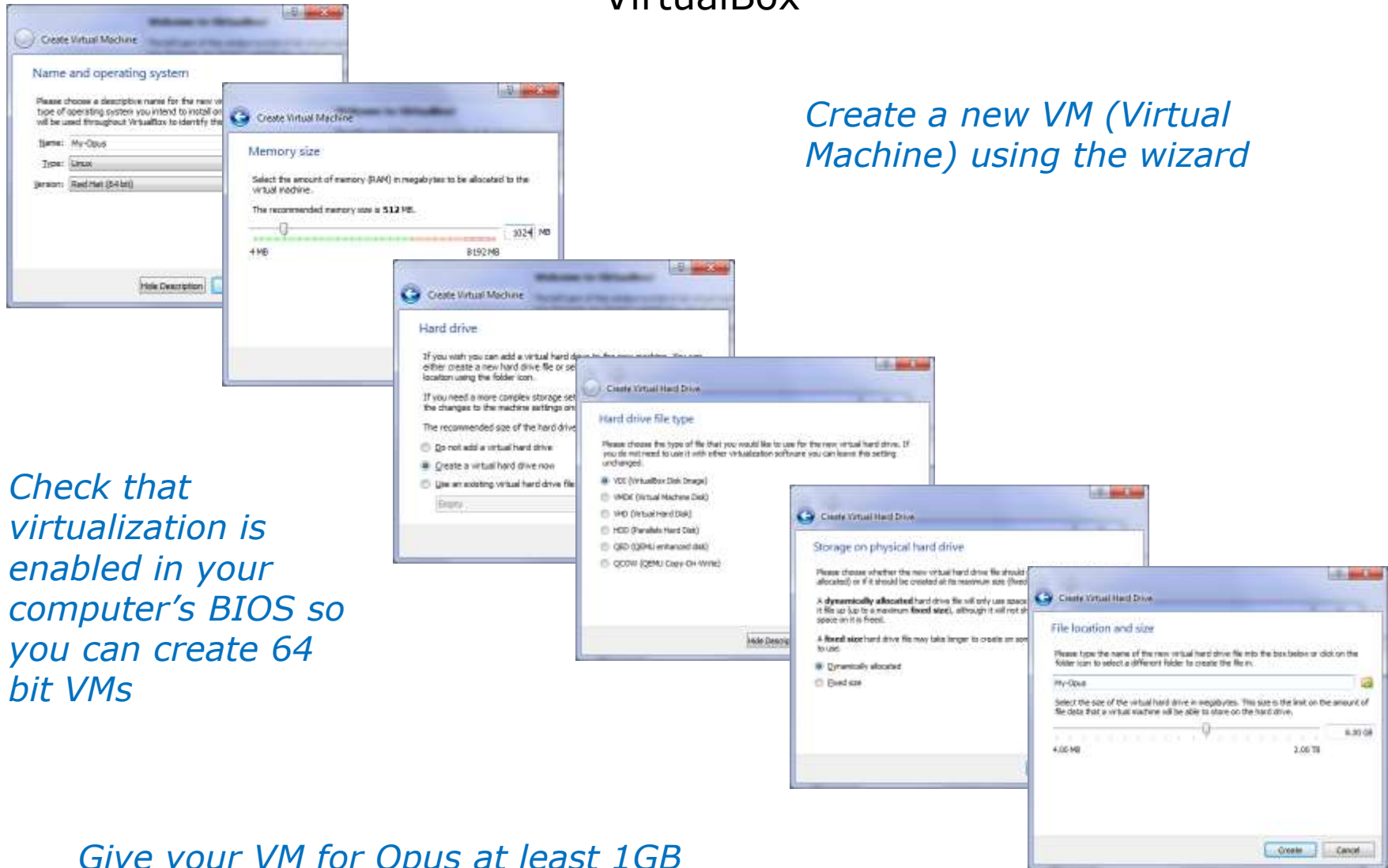
*Click the  
New button  
to create a  
new VM.*



*Download and install one of the virtualization products.  
This example will use VirtualBox.*

## VirtualBox

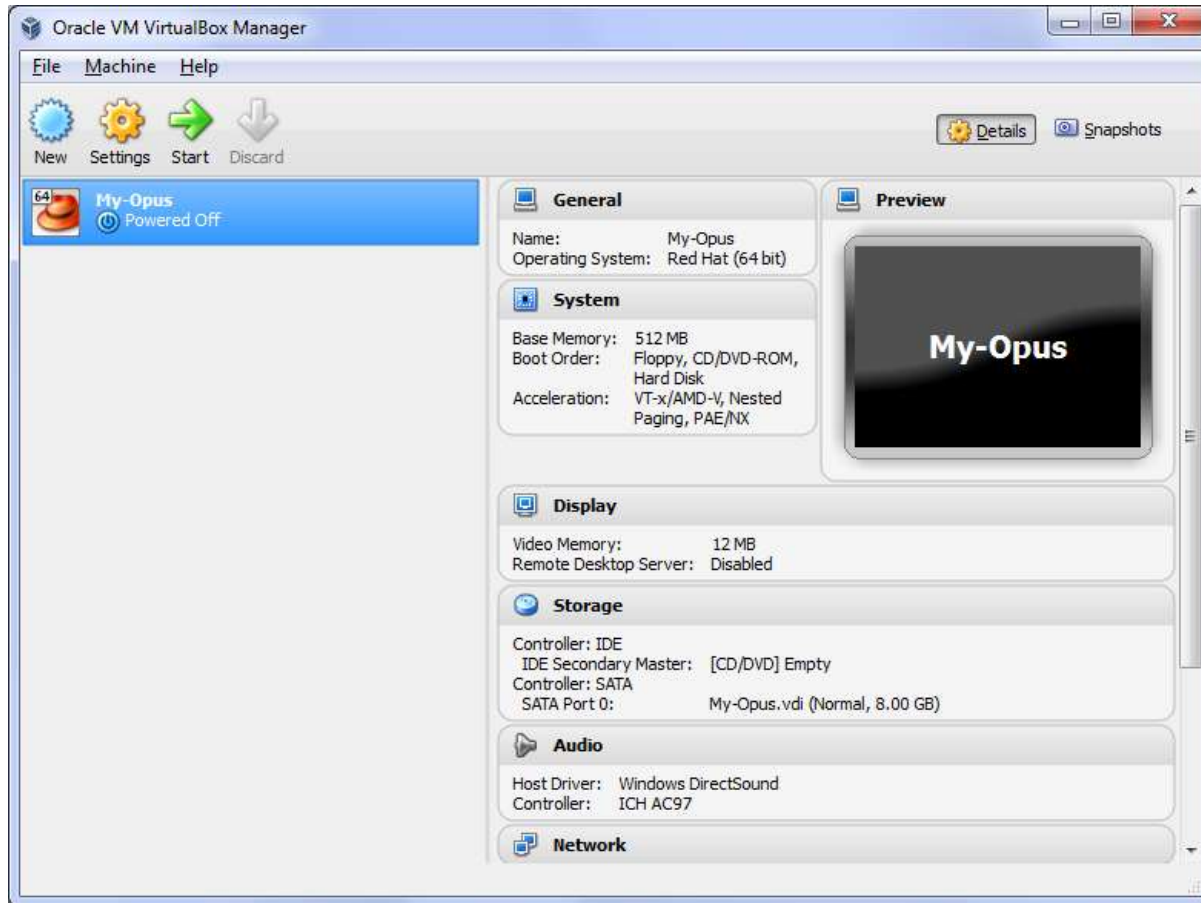
*Create a new VM (Virtual Machine) using the wizard*



*Check that virtualization is enabled in your computer's BIOS so you can create 64 bit VMs*

*Give your VM for Opus at least 1GB of memory and an 8GB hard drive*

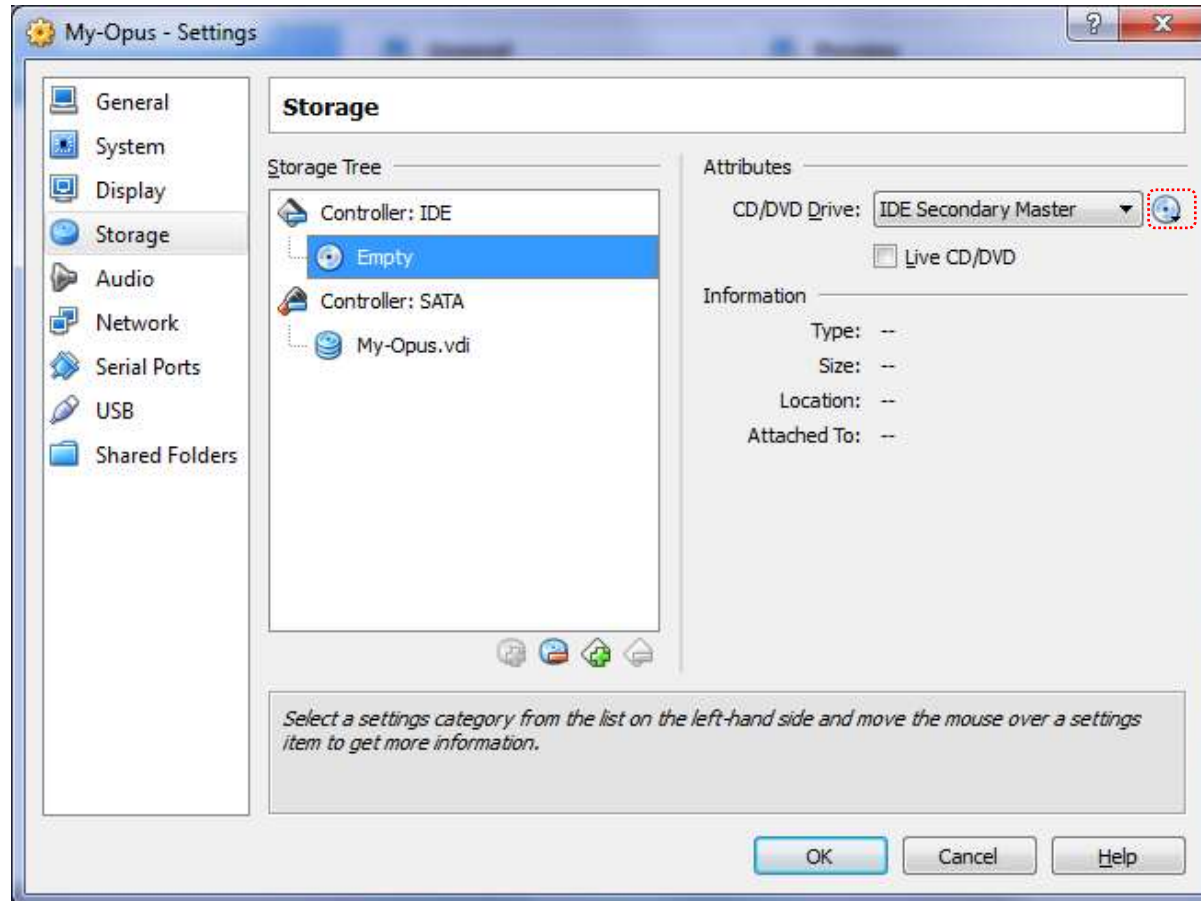
## VirtualBox



*The new VM has no operating system*



## VirtualBox

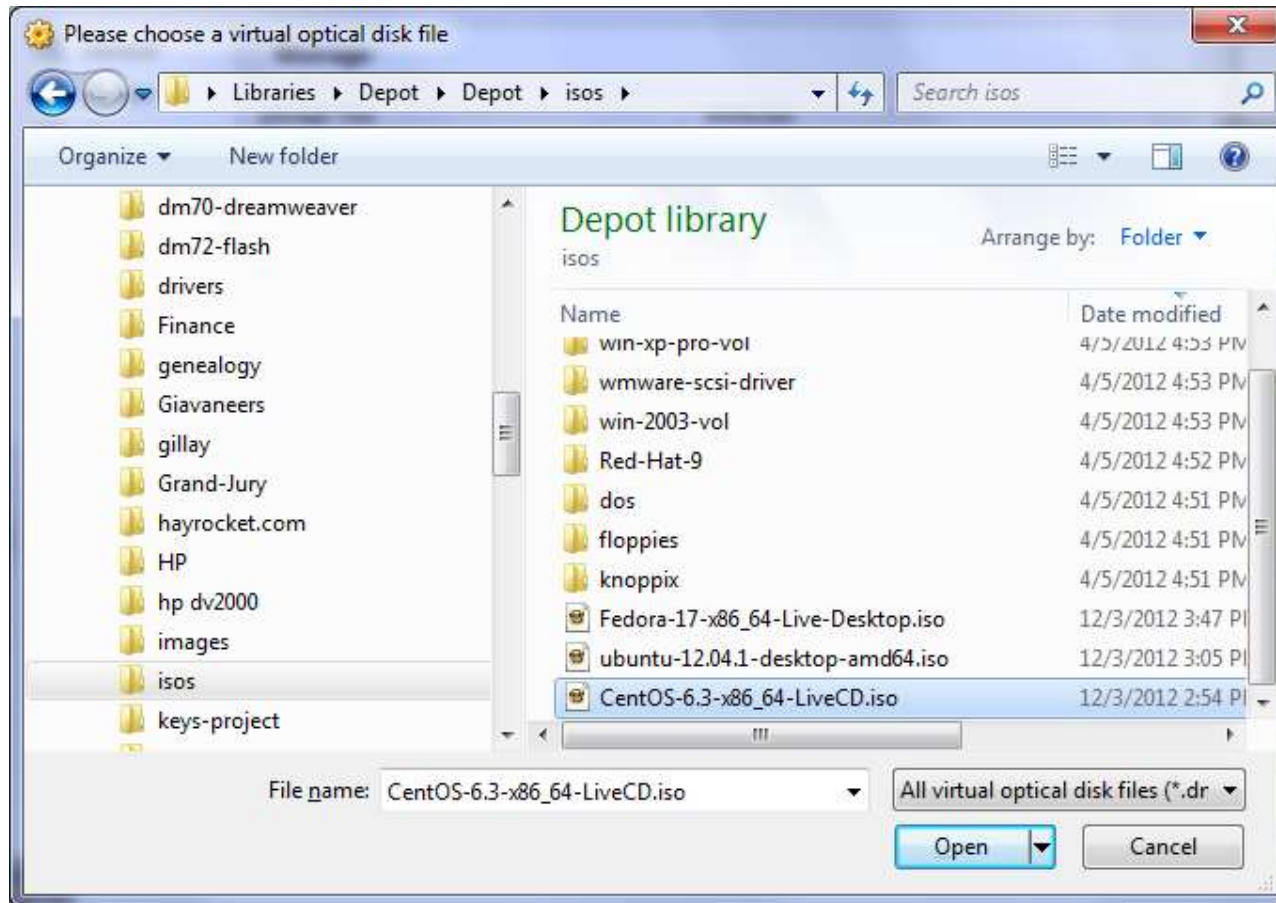


*Click the little CD icon to the left to browse to the CentOS ISO image to install*

*In Settings locate Storage so we can "put the CentOS CD into the DVD drive" by configuring the virtual IDE DVD drive with the ISO image downloaded earlier.*



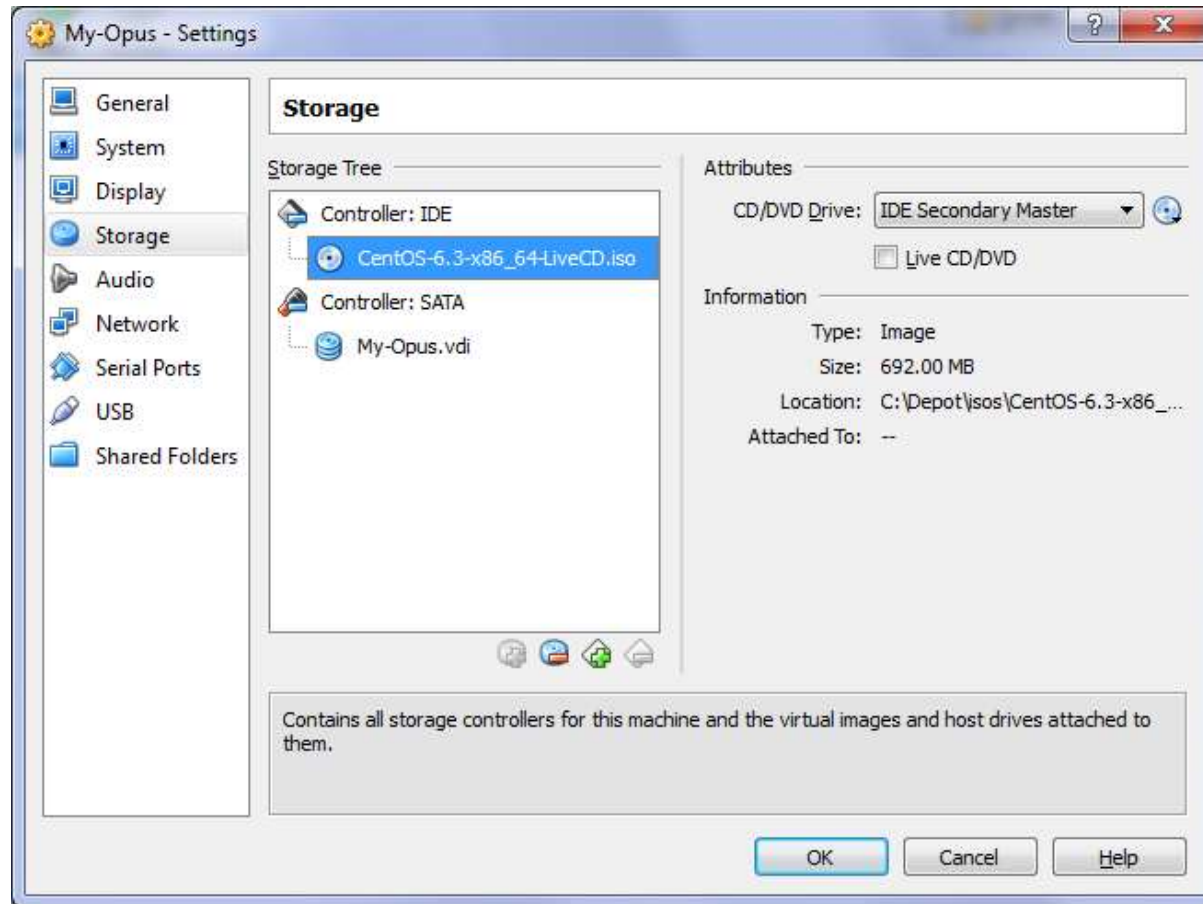
## VirtualBox



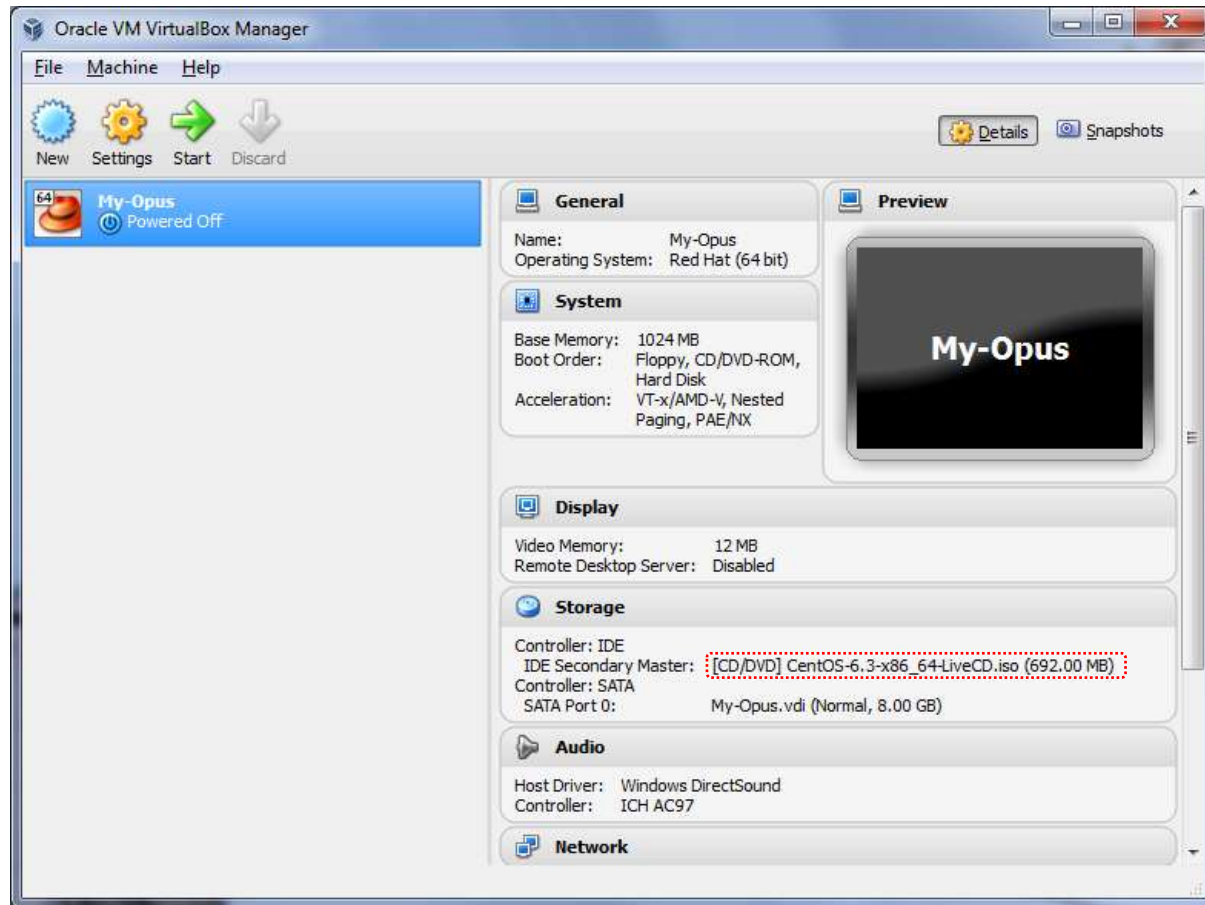
*Locate the  
ISO image  
to install*

CentOS-6.3-x86\_64-LiveCD.iso

## VirtualBox

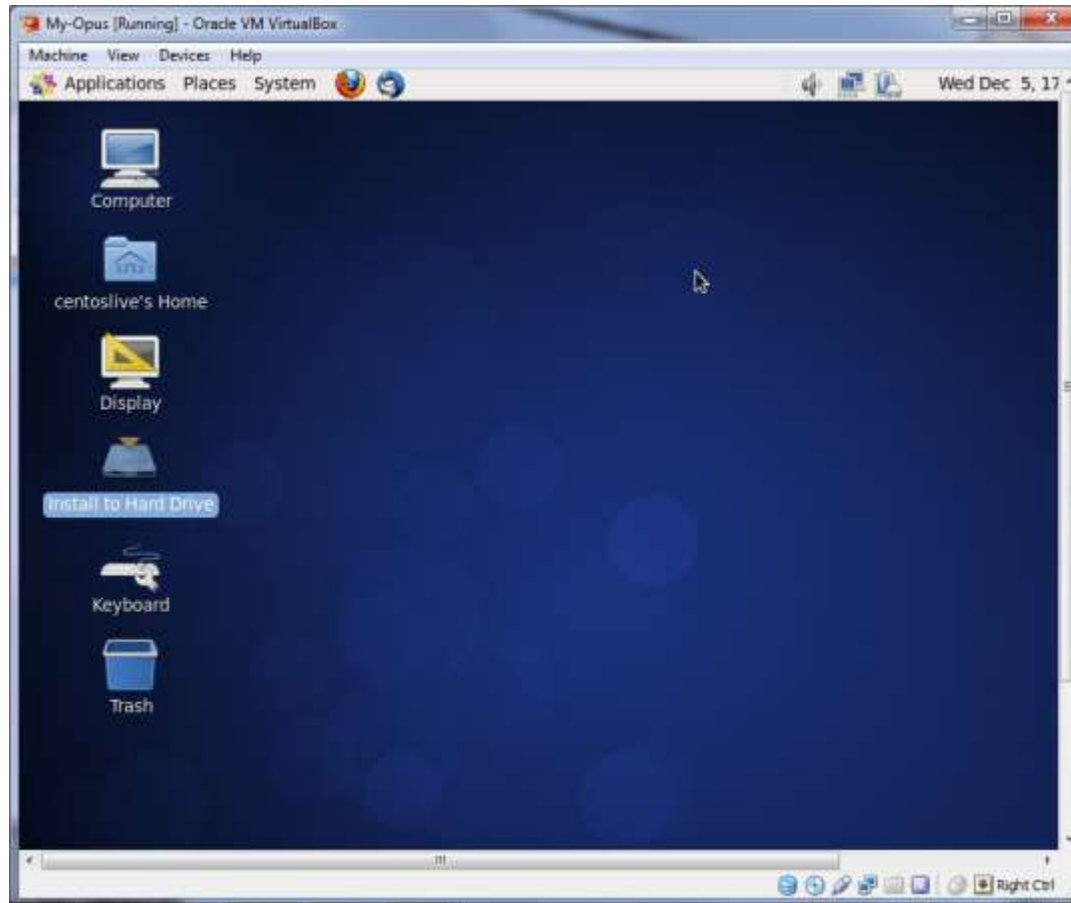


## VirtualBox



*If you see the correct ISO image in the drive you can power on the VM*

## VirtualBox



*If it complains you don't have a 64-bit CPU (and you do have a 64-bit CPU) then enable Virtualization Technology in your BIOS.*

*Otherwise just let it boot up using the live image which runs in memory and is not installed to the hard drive.*

*To install permanently to the VM hard drive open the "Install to Hard Drive" icon on the desktop*

## VirtualBox



*Keep hitting the Next button to let the wizard install the CentOS Linux distribution*

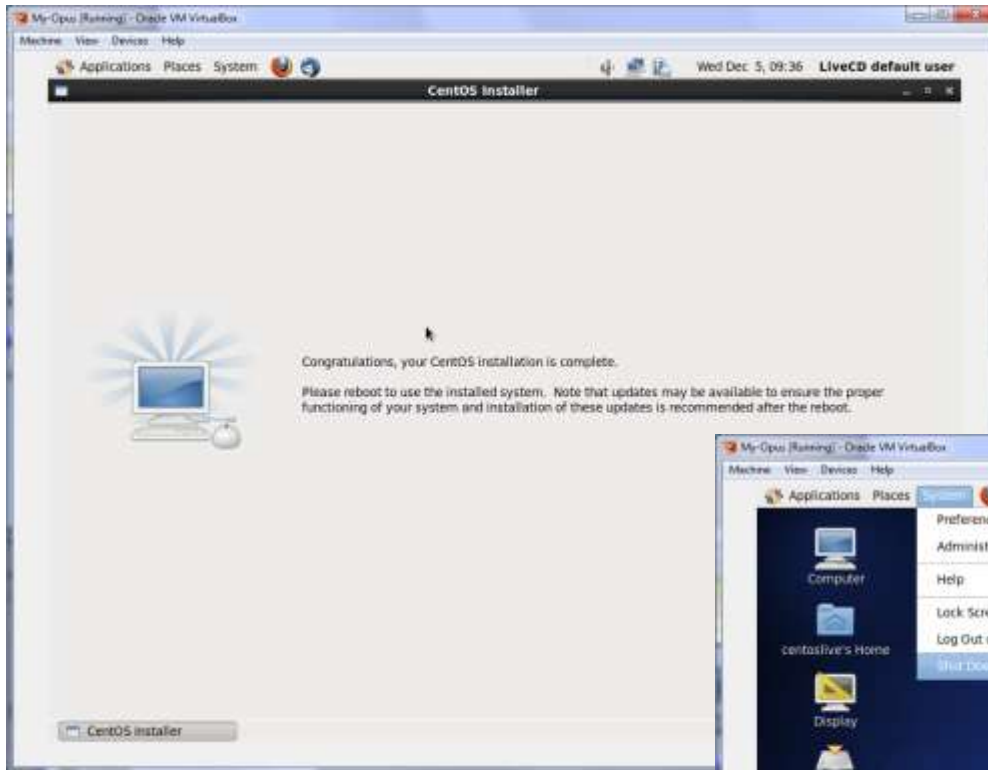
*Yes, discard any data*

*America/Los Angeles*

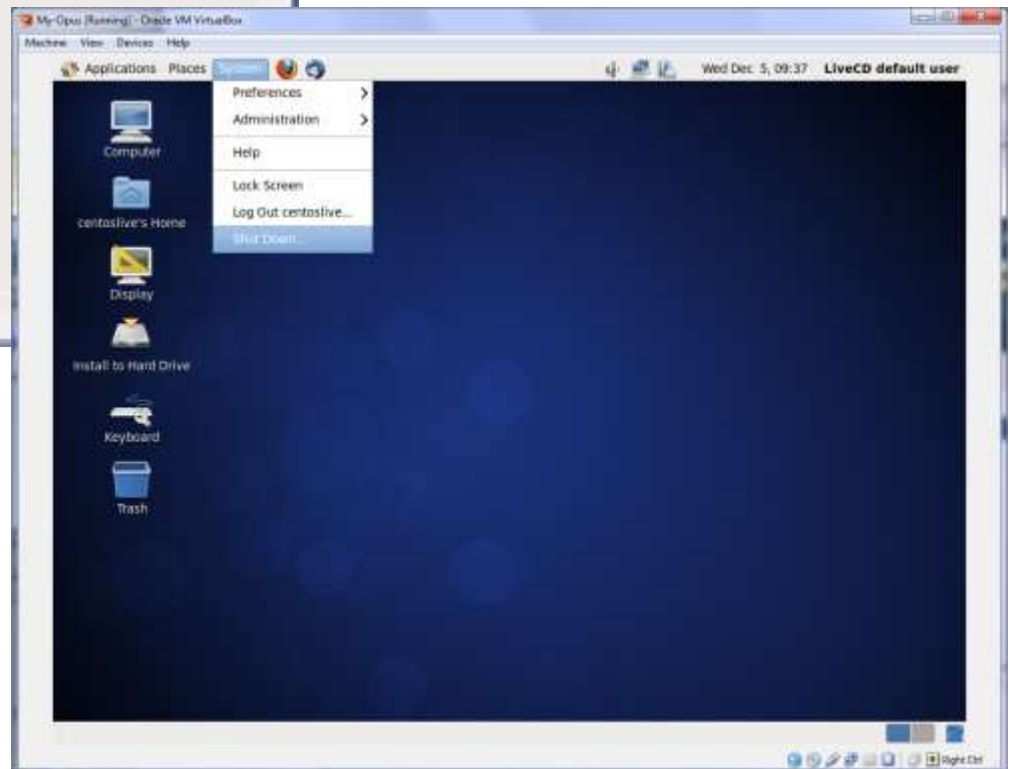
*Write changes to disk*



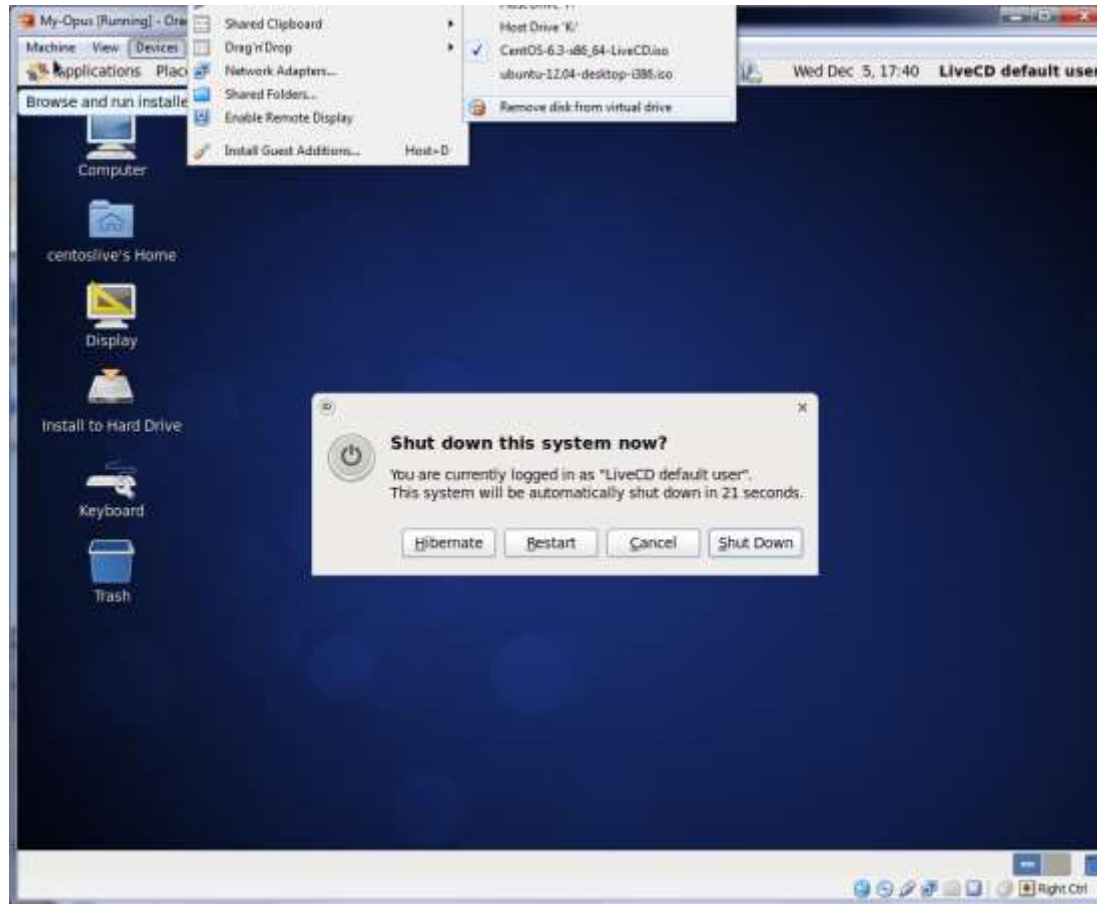
## VirtualBox



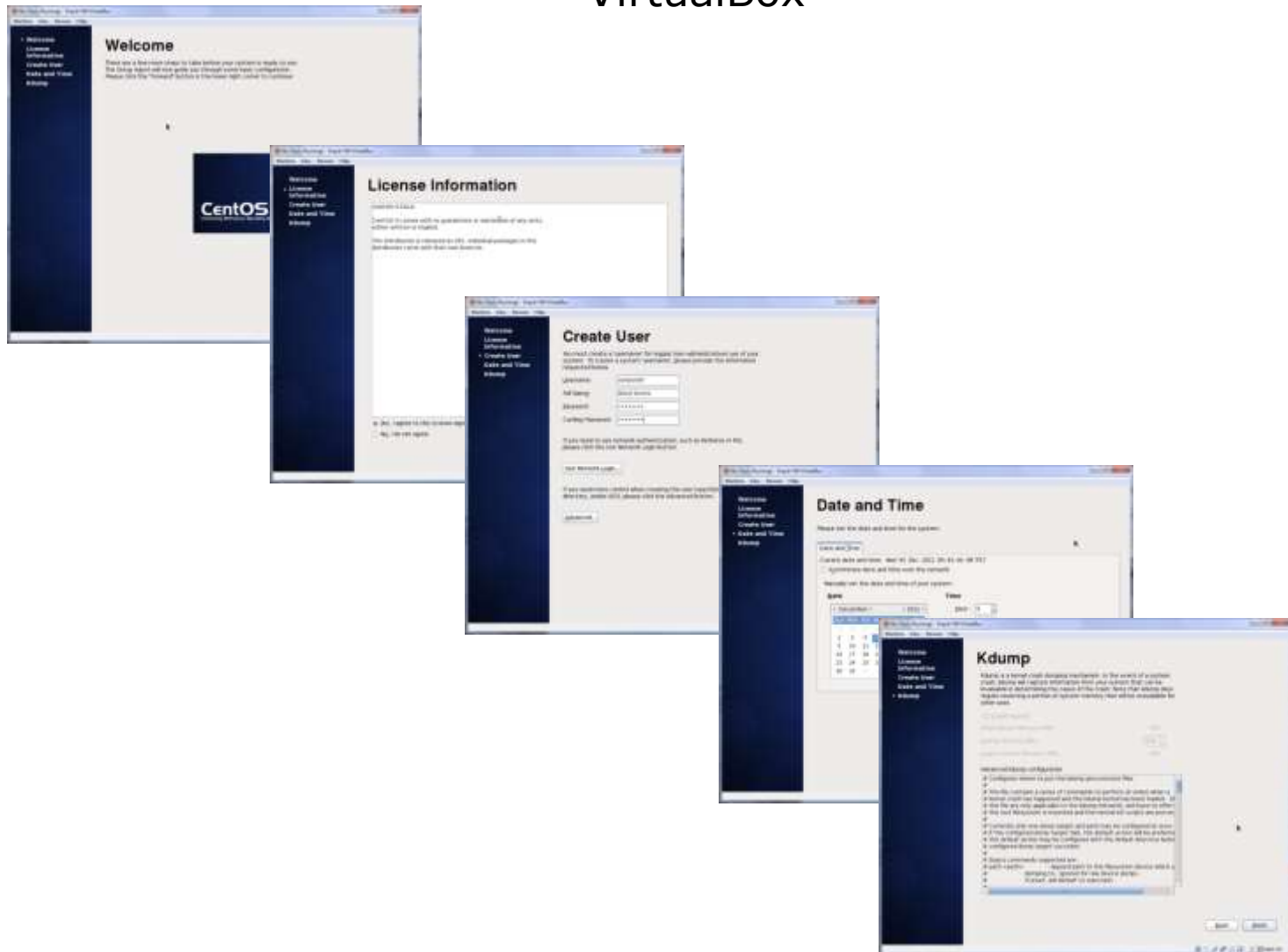
*Shutdown the system and  
before starting again  
remove the CD from the  
drive (Settings > Storage)*



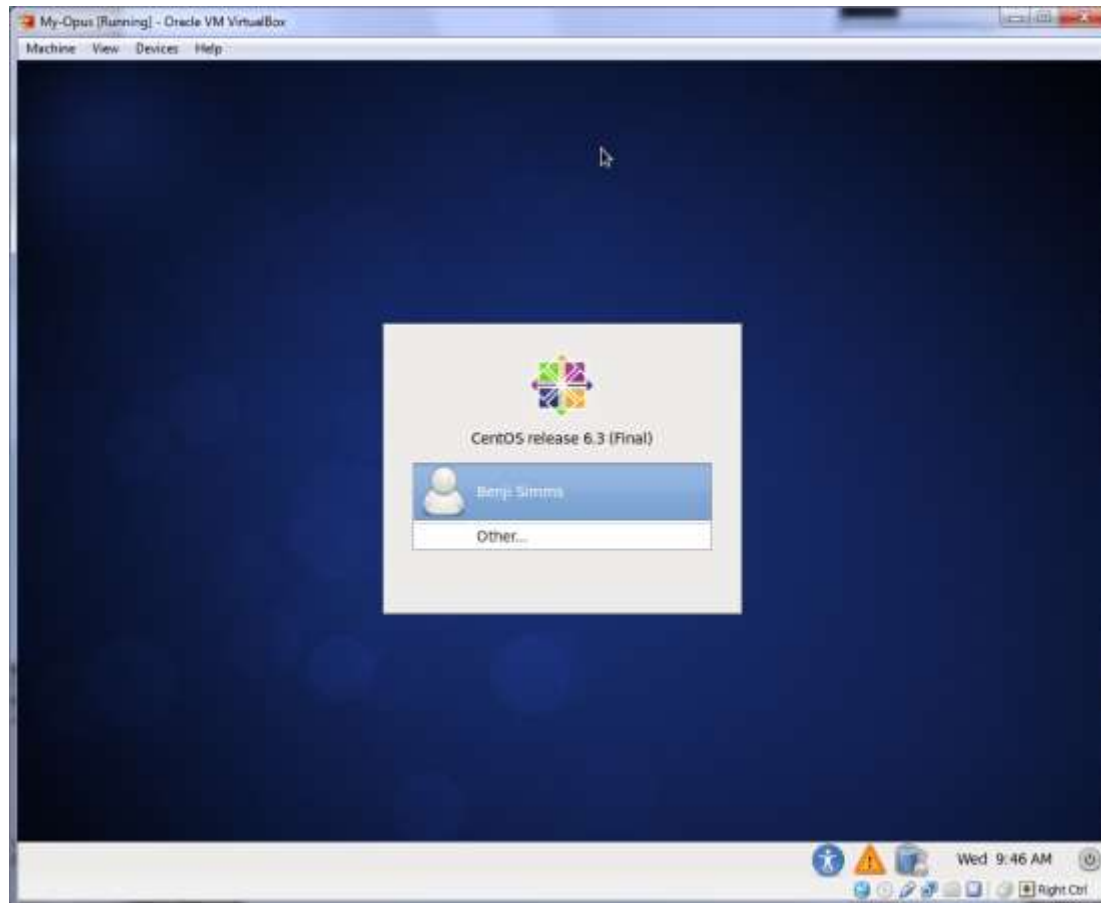
## VirtualBox



## VirtualBox



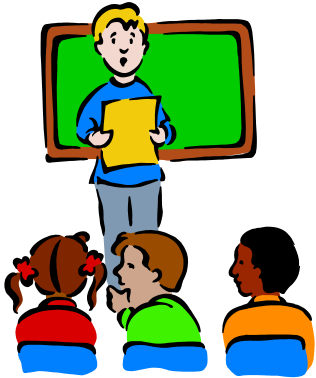
Voilà



*If you like doing this you will love CIS 191!*



# Project Presentations



## **To demo your project and earn five points:**

Join CCC Confer and share desktop when it is your turn

- Remote users should dial or Skype to 888-886-3951 and use passcode: 136690
- Classroom students can use the station next to the Polycom teleconference phone.

*Five minutes max please!*



## CCC Confer - Attending class online

The screenshot displays the CCC Confer application window titled "CCC Confer - 0 - RICH SIMMS". The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for drawing, erasing, and navigating. The main content area shows a virtual classroom with a grid of participant avatars. A callout box points to the interaction controls on the left, and another points to the chat area at the bottom.

**AUDIO & VIDEO**

Rich Simms

Talk Video

**PARTICIPANTS**

Benji

MAIN ROOM (2)

Rich Simms  
Moderator

Benji  
(You)

**CHAT**

- You joined the Main Room: ( 2:23 PM ) -  
- Rich Simms joined the Main Room: ( 2:24 PM ) -

**CIS Linux Classes**

Instructor: Rich Simms  
Dial-in: 888-450-4821

*Raise your hand, make gestures, use emoticons and indicate responses using these controls*

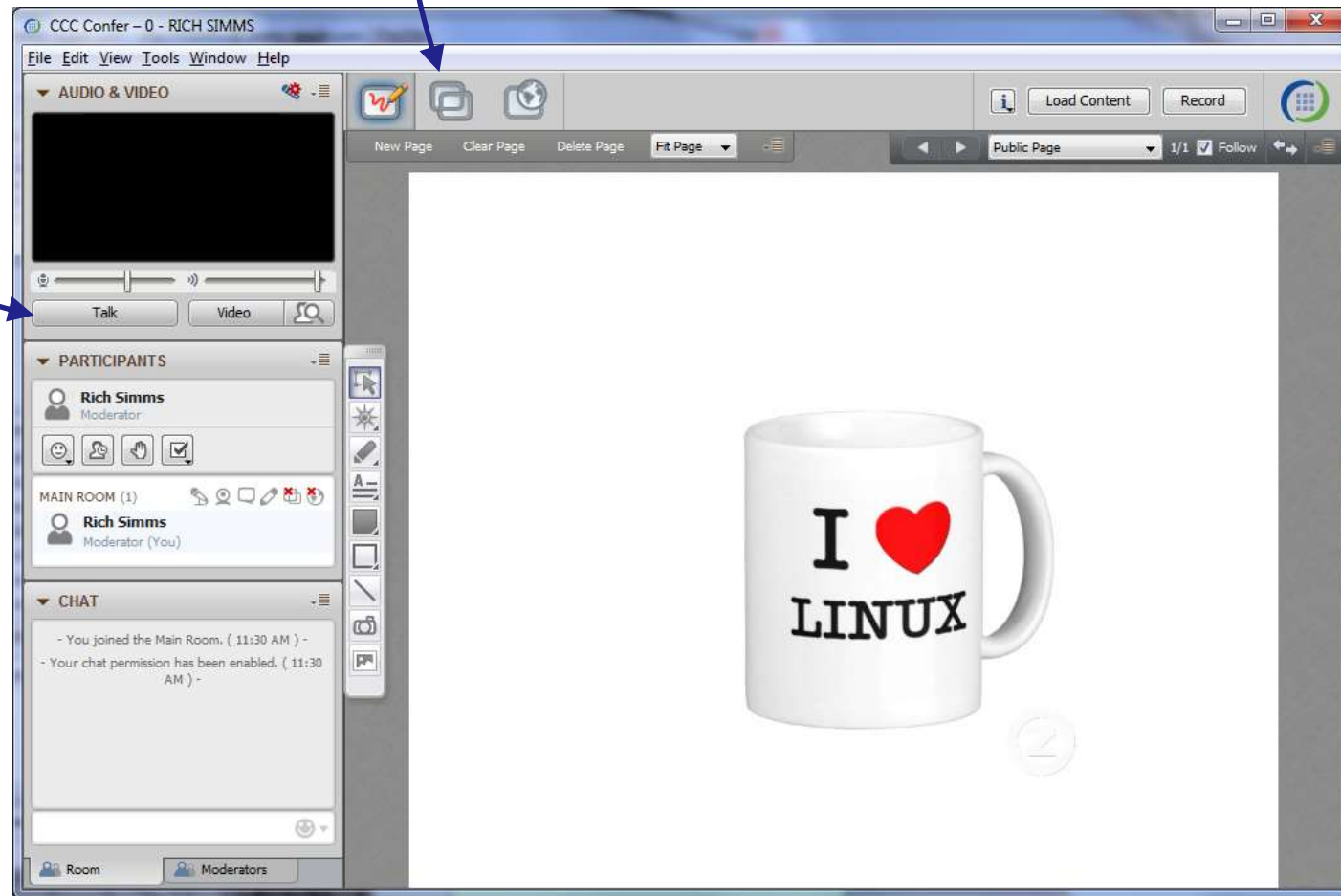
*Ask public or private questions using the chat area*

137

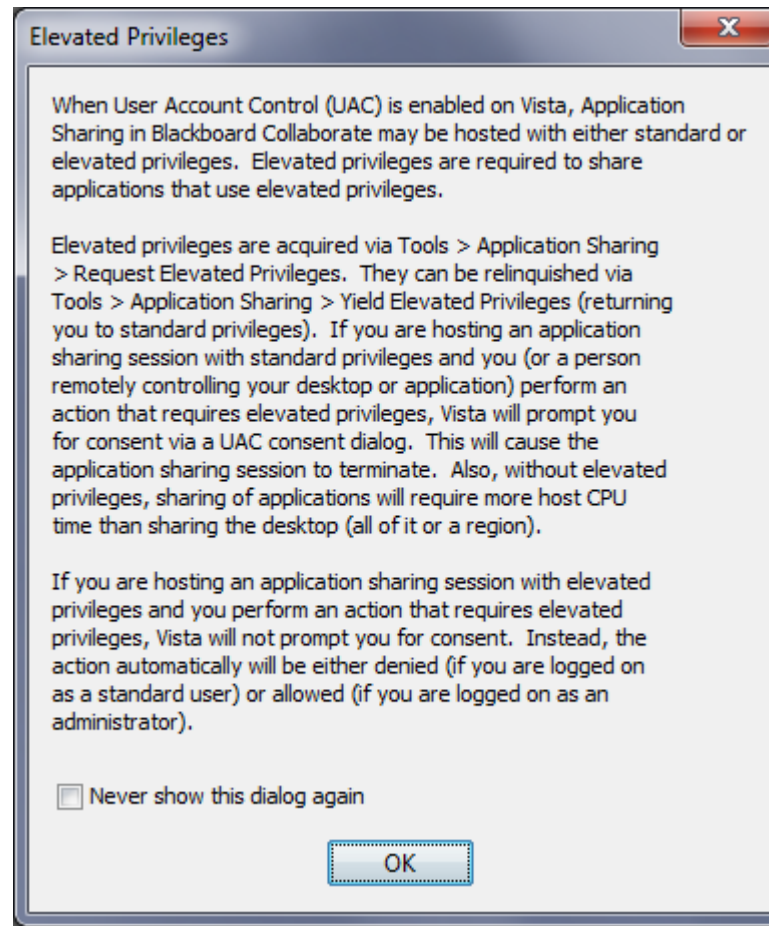
## Sharing from CCC Confer

Click **Talk** so we can hear you from your computer's microphone

Click **overlapping rectangles** to share

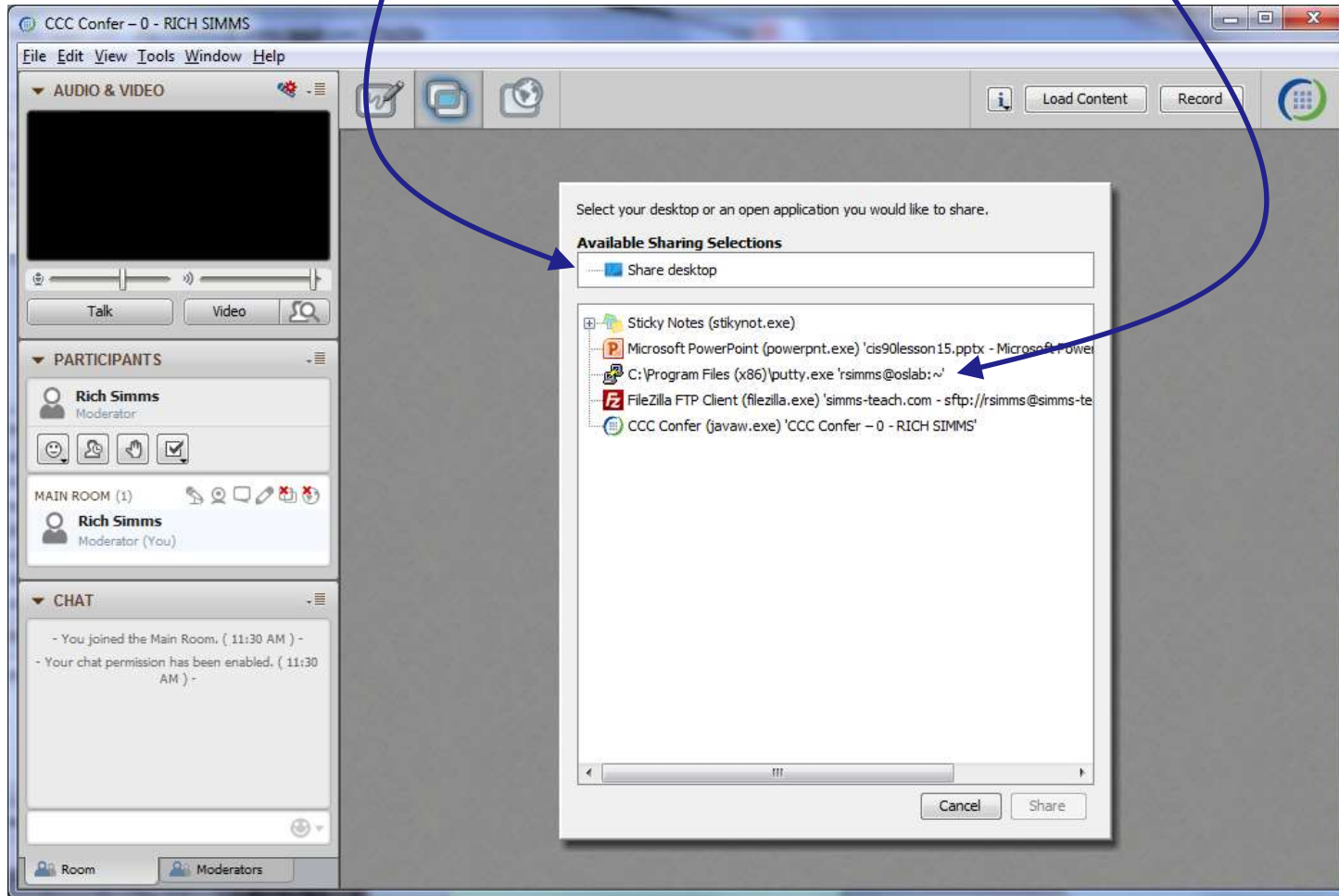


## Sharing from CCC Confer



## Sharing from CCC Confer

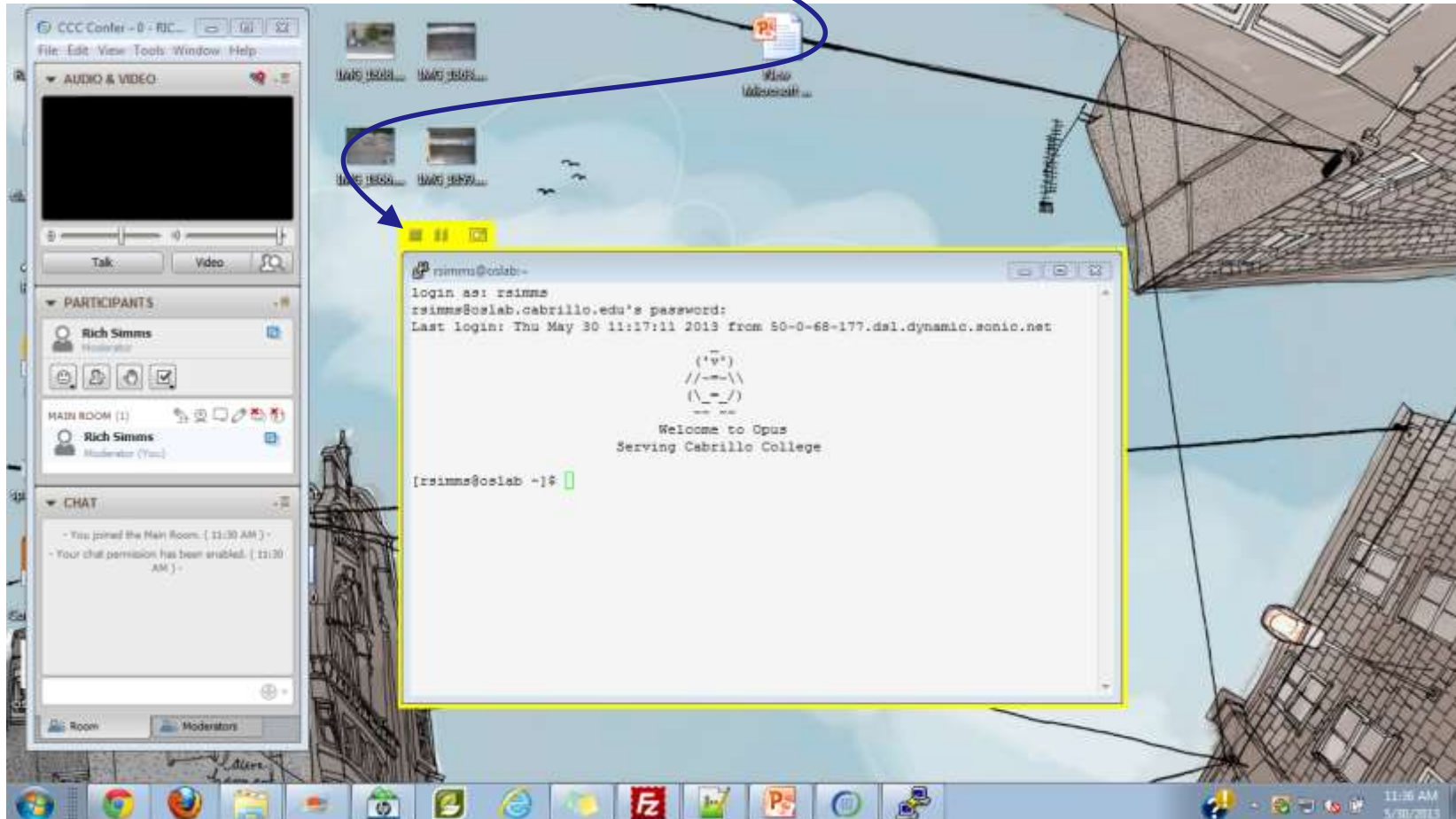
*Either share putty/terminal or entire desktop*





# Sharing from CCC Confer

*Click stop symbol to end sharing*





# Assignment





**Do Practice Test #3**

**Do Practice Test #3**

**Do Practice Test #3**

**Do Practice Test #3**

**Do Practice Test #3**

**Five Posts**

**Lab X1 (extra credit)**

**Lab X2 (extra credit)**

A scenic sunset over a beach. The sky is filled with vibrant colors of orange, pink, and purple. The sun is low on the horizon, casting a warm glow. To the right, a dark, silhouetted cliff rises from the beach. The foreground shows the wet sand of the beach and some rocks.

# Wrap up

New commands:

tar

gzip

gunzip

Backup and restore files

Zip and compress files

Unzip files

New Files and Directories:



Next Class is the Final Exam (Test #3)

Test #3

Five Posts

Lab X1 (extra credit)

Lab X2 (extra credit)



# Backup

# Linux and Telephones





## Way back in Lesson 1

### Apple iOS



*The Apple iOS, internally known as Darwin, like Mac OS X, runs on a Unix-like kernel (Mach kernel + BSD components)*

### Android



*Android smartphones use the Linux kernel*



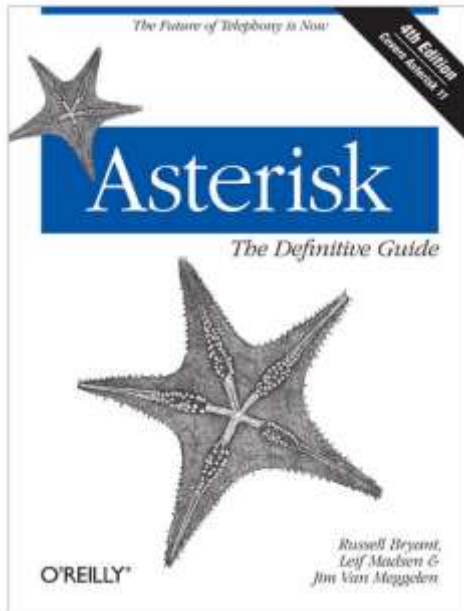
## Telephone System Terminology

**PSTN (Public Switched Telephone Network)** - The global telecommunication infrastructure.

**PBX (Private Branch Exchange)** - a telephone system used by a business or organization. Each user has their own extension. Trunk lines connect the PBX to the PSTN for incoming and outgoing calls.

**SIP (Session Initiation Protocol)** - a protocol used for voice/video sessions.

**VoIP (Voice over IP)** - umbrella group of technologies for delivering voice communications and multimedia sessions.



- Open source PBX (Private Branch Exchange) software.
- Implements a complete VOIP phone system.
- Created in 1999 by Mark Spencer of Digium.
- <http://www.asterisk.org/>

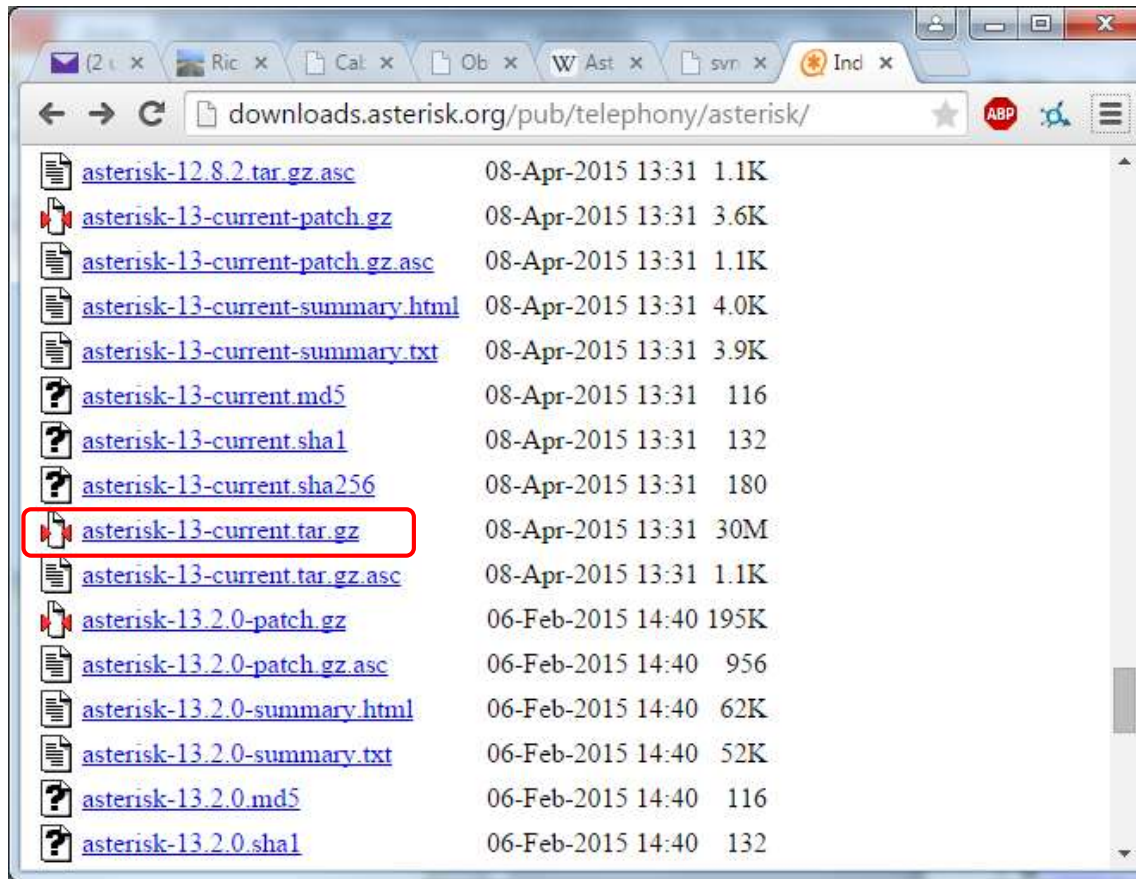


- Open-source web-based GUI (Graphical User Interface) to manage Asterisk.
- <http://www.freepbx.org/>

## Asterisk Source Code



<http://downloads.asterisk.org/pub/telephony/asterisk/>



*Asterisk is licensed under the GNU GPL which means you have the freedom to download, view and modify the source code.*

*All the files for each version have been tarred and compressed into a single tarball.*

*Obtaining the current version Asterisk source code to examine*

# Asterisk app\_voicemail.c source code file

FYI  
only

```

1  /*
2  * Asterisk -- An open source telephony toolkit.
3  *
4  * Copyright (C) 1999 - 2004, Digium, Inc.
5  *
6  * Mark Spencer <markster@digium.com>
7  *
8  * See http://www.asterisk.org for more information about
9  * the Asterisk project. Please do not directly contact
10 * any of the maintainers of this project for assistance;
11 * the project provides a web site, mailing lists and IRC
12 * channels for your use.
13 *
14 * This program is free software, distributed under the terms of
15 * the GNU General Public License Version 2. See the LICENSE file
16 * at the top of the source tree.
17 */
18
19 /*
20 * \file
21 * \author Mark Spencer <markster@digium.com>
22 * \brief Comedian Mail - Voicemail System
23 *
24 * \mainpage (http://www.unimelb.org/)
25 * A source distribution of University of Washington's INAP v-client
26 * (http://www.washington.edu/inap/)
27 *
28 * \par See also
29 * \arg User Config_vo
30 * \note For information about voicemail INAP storage, http://wiki.asterisk.
31 * \ingroup applications
32 * \todo This module requires res_sdp to load. This needs to be optional
33 * during compilation.
34 *
35 * \todo This file is now almost impossible to work with, due to all \ifdef

```

You can see it was authored by Mark Spencer and licensed under the GNU GPL (General Public License).

```

2776
2777 /*
2778 * \brief The handler for the change password option.
2779 * \param vnu The voicemail user to work with.
2800 * \param newpassword The new password (that has been gathered from the appropriate prompting).
2801 * This is called when a new user logs in for the first time and the option to force them to change their password is set.
2802 * It is also called when the user wants to change their password from menu option '5' on the mailbox options menu.
2803 */
2804 static void vm_change_password(struct ast_vm_user *vnu, const char *newpassword)
2805 {
2806     struct ast_config *cfg = NULL;
2807     struct ast_variable *var = NULL;
2808     struct ast_category *cat = NULL;
2809     char *category = NULL, *value = NULL, *new = NULL;
2810     const char *exp = NULL;
2811     struct ast_flags config_flags = { CONFIG_FLAG_WITHCOMMENTS };
2812     char secretfn[PATH_MAX] = "";
2813     int found = 0;
2814
2815     if (!change_password_realtime(vnu, newpassword))
2816         return;
2817
2818     /* check if we should store the secret in the spool directory next to the messages */
2819     switch (vnu->passwordlocation) {
2820     case OPT_WLOC_SPOOLDIR:
2821         snprintf(secretfn, sizeof(secretfn), "%s/%s/secret.%04d", VM_SPOOL_DIR, vnu->context, vnu->mailbox);
2822         if (write_password_to_file(secretfn, newpassword) == 0) {
2823             ast_test_suite_event_notify("PASSWORDCHANGED", "Message: secret.%04d updated with new password.\r\nPasswordSource: secret.%04d");
2824             ast_verb(4, "Writing voicemail password to file %s succeeded.\r\n", secretfn);
2825             reset_user_pw(vnu->context, vnu->mailbox, newpassword);
2826             ast_copy_string(vnu->password, newpassword, sizeof(vnu->password));
2827             break;
2828         } else {
2829             ast_verb(4, "Writing voicemail password to file %s failed, falling back to %s file.\r\n", secretfn);

```

It is written in the C language.  
The C function shown on the right implements voicemail user password changes.



# Making your own telephone system on a budget



## PC Soft Phone

X-Lite

Free

<http://www.counterpath.com/x-lite-download/>



## raspbx download

(Asterisk + FreePBX)

Free download, SD card ~\$12

<http://www.raspberry-asterisk.org/downloads/beta-image/>



## raspbx documentation

Free

<http://www.raspberry-asterisk.org/>



## Linux Computer

Raspberry Pi 2

\$39.99

<http://tinyonestore.com/>



## Android/iOS Soft Phone

Zoiper

Free

<http://www.zoiper.com/>



## Network Switch

RouterBoard (Mikrotik) RB260GS

\$38.95

<http://www.streakwave.com/>



## SIP phones

Polycom SoundPoint IP 331

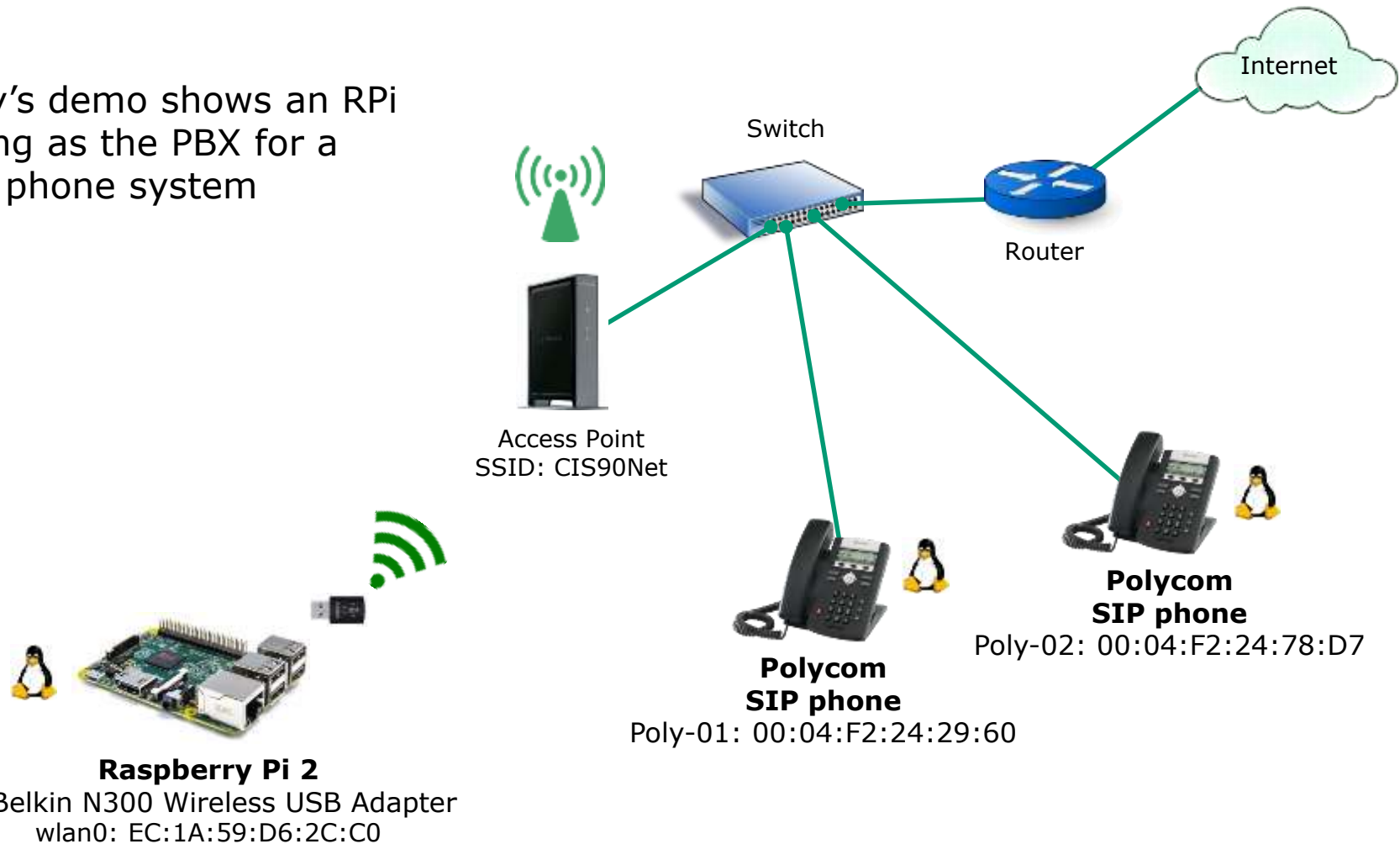
\$15.00 each

<http://ebay.com/>



# VOIP Demo on RPi and Polycom SIP phones

Today's demo shows an RPi serving as the PBX for a VOIP phone system





# Polycom SoundPoint IP Phones



**SIP phone**  
Polycom SoundPoint IP 331

*Is it a phone?  
Is it a computer?*



SEPTEMBER 2013 | 3725-47083-002/A

## Polycom® Voice OFFER of Source for GPL and LGPL Software

You may have received from Polycom®, certain products that contain—in part—some free software (software licensed in a way that allows you the freedom to run, copy, distribute, change, and improve the software).

As a part of this product, Polycom may have distributed to you hardware and/or software, or made electronic downloads, that contain a version of alsa-lib, alsasink, alsa-utils, BlueZ, busybox-1.11.1, DirectFB, fbset, ffmpeg, ffmpegdec, glibc, glib2, gst-openmax, gstreamer, libomxil-bellagio, libstdc++ 4.3.2, libusb, Libxml, **Linux Kernel**, module-init-tools-3.2.2, mtd-utils-1.2.0-1.fc10, omxvideodec, procps-3.2.7-20.fc9, SDL, tsattach-1.0, tslib, u-boot, udev-092, WebKit, wireless-tools, wrsv-1.1, and x-loader, which are **free software programs developed by the Free Software Foundation**. With your purchase of the products listed in Table A, Polycom has granted you a license to the above-mentioned software under the terms of the GNU General Public License (GPL), GNU Library General Public License (LGPLv2), or GNU Lesser General Public License (LGPL). The text of these Licenses can be found in Licenses on page 19.

For at least three years from the date of distribution of the applicable product or software, we will give to anyone who contacts us at the contact information provided below, for a charge of no more than our cost of physically distributing, the following items:

- A copy of the complete corresponding machine-readable source code for programs listed below that are distributed under the GNU GPL
- A copy of the corresponding machine-readable source code for the libraries listed below that are distributed under the GNU LGPL, as well as the executable object code of the Polycom work that the library links with

The software included or distributed for the product, including any software that may be downloaded electronically via the internet or otherwise (the "Software") is licensed, not sold. The customer may modify any of the Libraries listed below licensed under the GNU LGPL, and then re-link to produce a modified executable containing the modified Library. Customers who choose to modify the original software delivered by Polycom for the product void all WARRANTY, SERVICE and SOFTWARE SUPPORT agreements.

**Table A: Polycom® Products Incorporating GPL and LGPL Software**

Business Media Phones: Polycom VVX® 300, Polycom VVX® 310, Polycom VVX® 400, Polycom VVX® 410, Polycom VVX® 500, Polycom VVX® 600, Polycom VVX® 1500, Polycom VVX® 1500 D

SoundStructure: Polycom SoundStructure® VoIP Interface Plug-in Card

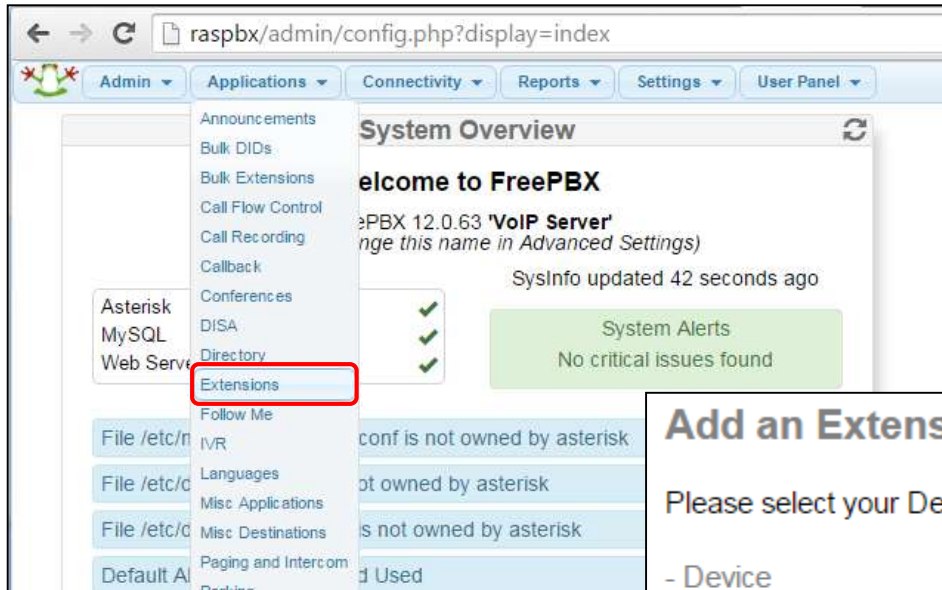
# Add User (extension) to PBX



## Adding New Extension (user) on PBX



**http://<ip-of-pbx-server>**



**raspbx server**  
(Asterisk + FreePBX on Linux)

### Add an Extension

Please select your Device below then click Submit

- Device

---

Device

Generic CHAN SIP Device ▼

Submit

*Add new SIP phone extension using FreePBX web page*

## Adding New Extension (user) on PBX



CIS 90 VLab Assignments

Student	Hostname
Abraham C.	Arya-12
Abraham N.	Arya-66
Ahmad	Arya-75
Al	Arya-03
Benji C.	Arya-54
Benji S.	Arya-02
Cameron	Arya-68
Chris	Arya-35
Clara	Arya-17
Diego	Arya-73
Django	Arya-08
Duke	Arya-46
Eddie	Arya-72
Efrain	Arya-38
Emilio	Arya-74
Ethan	Arya-21
Geoffrey	
Gerlinde	
Homer	
Ian	
Ivers	
John	
Mario	
Mateo	
Matt	
Melissa	
Mike	
Monte	
Nick	
Rick	
Roberto	
Ryan	
Sean	
Sherpa	
Sky	
Tanner	
Tess	
Tim	Arya-23
TBD	Arya-57
TBD	Arya-31
TBD	Arya-47
TBD	Arya-19
TBD	Arya-13
TBD	Arya-60



**raspbx server**  
(Asterisk + FreePBX on Linux)

- Add Extension

User Extension?

470

Display Name?

Sherpa

CID Num Alias?

SIP Alias?

Portion of FreePBX "Add Extension" web page

*Enter User Extension and Display Name  
(4xx is "4" + student CIS 90 VM pod number)*

## Adding New Extension (user) on PBX



**raspbx server**  
(Asterisk + FreePBX on Linux)

- Device Options

---

This device uses **CHAN\_SIP** technology listening on :5060

Secret <sup>?</sup>

DTMF Signaling <sup>?</sup>

NAT Mode <sup>?</sup>

Portion of FreePBX "Add Extension" web page

*Set Secret password to use when adding handset later*



## Adding New Extension (user) on PBX



**raspbx server**  
(Asterisk + FreePBX on Linux)

- Voicemail

Status	<input type="text" value="Enabled"/>
Voicemail Password ?	<input type="text" value="12345"/>
Require From Same Extension ?	<input type="button" value="yes"/> <input type="button" value="no"/>
Email Address ?	<input type="text" value="watshe90@opus.cis.cabrillo.edu"/>
Pager Email Address ?	<input type="text" value="watshe90@opus.cis.cabrillo.edu"/>
Email Attachment ?	<input type="button" value="yes"/> <input type="button" value="no"/>
Play CID ?	<input type="button" value="yes"/> <input type="button" value="no"/>
Play Envelope ?	<input type="button" value="yes"/> <input type="button" value="no"/>
Delete Voicemail ?	<input type="button" value="yes"/> <input type="button" value="no"/>

Portion of FreePBX "Add Extension" web page

*Configure voicemail and use Opus email address*

# Add SIP Hard Phone to Network



## Configure SIP "Hard" Phone as extension

**FYI**  
only

**http://<ip-of-sip-phone>**



**SIP phone**

is connected using standard LAN cable

Simple Setup	
<b>Language</b>	
Phone Language	English (Internal) ▼
Web Utility Language	Add
<b>Time Synchronization</b>	
SNTP Server	north-america.pool.ntp.org ▼
	(GMT -8:00) Pacific Time (US & Canada) ▼
<b>SIP Server</b>	
Address	raspbx.cis.cabrillo.edu
Port	5060
<b>SIP Outbound Proxy</b>	
<b>SIP Line Identification</b>	
Display Name	Rich
Address	400
Authentication User ID	400
Authentication Password	****
Label	

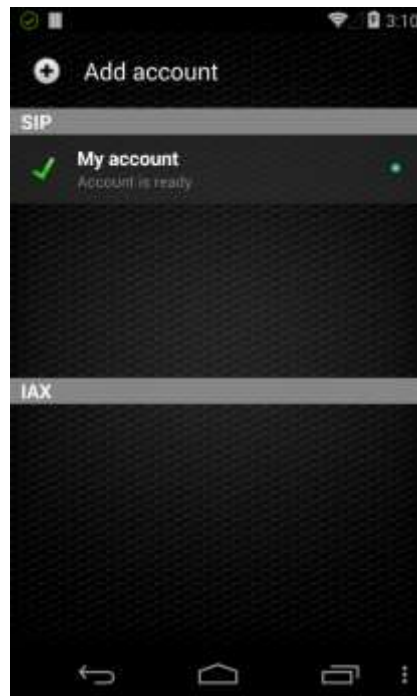
*Configure SIP phone with extension number and address of PBX server*

# Install SIP Soft Phone on Android



## Zoiper

<http://www.zoiper.com/>



*Lets you use your Android device as an phone extension*

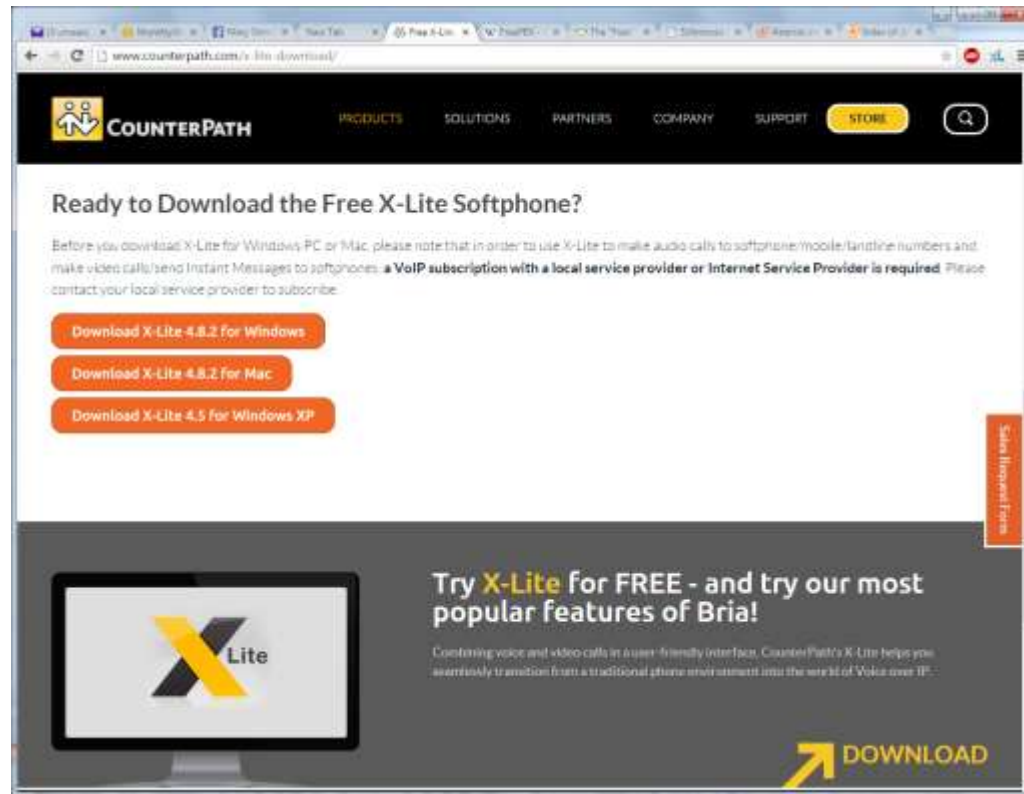
# Install SIP Soft Phone on PC





## X-Lite soft phone

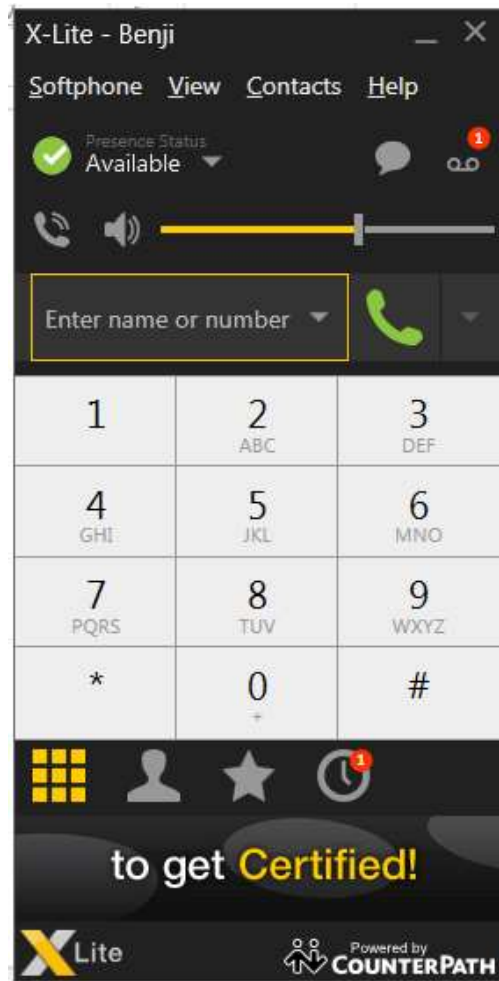
<http://www.counterpath.com/x-lite-download/>



*Lets you use your PC as an phone extension*

## Configure soft phone as extension

**FYI**  
only



### Softphone > Account Settings

Account Voicemail Topology Presence Transport Advanced

Account name:

Protocol:

Allow this account for

☒ Call

☒ IM / Presence

User Details

\* User ID:

\* Domain:

Password:

Display name:

Authorization name:

Domain Proxy

☒ Register with domain and receive calls

Send outbound via:

☒ Domain

☐ Proxy Address:

Dial plan:

## Configure soft phone as extension

**FYI**  
only

Softphone > Preferences > Devices > [Test Devices]

The image shows two overlapping windows from a softphone application. The background window is the 'Preferences' dialog, with the 'Devices' tab selected. Under 'Devices', the 'Test Devices' button is highlighted. The 'Headset Mode' checkbox is also checked. The foreground window is the 'Troubleshooting' dialog, with the 'Devices' tab selected. It shows the current mode as 'Headset mode'. The first step is to select a microphone, with 'Microphone (High Definition Audio Device)' selected. The second step is to speak into the microphone, with a green bar indicating success. The third step is to select speakers, with 'Speakers (High Definition Audio Device) 2' selected. The fourth step is to test the speakers, with a green bar indicating success. The 'Done' button is at the bottom right.

**Preferences**

- Application
- Alerts & Sounds
- Devices**
- Audio Codecs
- Video Codecs
- Calls

**Devices**

- ☒ Automatic gain control
- ☒ Reduce background noise
- Test Devices** Test Camera
- ☒ Headset Mode Speakerphone
- Speaker: Speakers and Headset
- Microphone: Internal Mic (IDT HiFi)

**Troubleshooting**

- ☒ **Devices** ☐ Audio ☐ Diagnostics

**You are currently in: Headset mode**

- Select the microphone you want to use:
  - Microphone (High Definition Audio Device)
- Speak into the microphone:
  - ☒ Your microphone works
- Select the speakers you want to use:
  - Speakers (High Definition Audio Device) 2
- Test the speakers:
  - ☒ Your speakers work

**Done**

*Configure soft phone audio to use computer headset*

# Troubleshooting



## How to reset used Polycom phone to factory defaults

**FYI**  
only

richsimms - Y x Rich's Cabrill x CIS 90 - Sprin x CIS Lab x FreePBX Adm x Polycom - So x Polycom VoIP x

voipt2.polycom.com

**Polycom** | Support

Click the ICON to go to Polycom Support pages

### Welcome to the Polycom VoIP Phone Provisioning Server

#### Getting Started

This is a publicly accessible server intended only for use of provisioning, upgrading, or downgrading the software of Polycom IP phones with stock Polycom software and configuration files.

Multiple 'stock' directories exist with different versions of SIP, UC, and BootROM software, and are named according to the SIP or UC software version contained within. These directories are completely ♦Stock♦; no changes should be made to any configuration files within.

Each directory contains an [ABOUT.TXT](#) to indicate which SIP and BootROM software versions exist within that directory.

**To Provision Your Polycom VoIP Phone:**

- From the phone's local menu interface, press **Menu > Settings > Advanced** (default password: 456) > **Administration Settings > Network Configuration > Server Menu**.
- Configure your DHCP menu:  
**On 3.x Phones:** Main Menu > Settings > Advanced > Admin Settings > Network Configuration > DHCP Menu  
**On 4.x/5.x phones:** Main Menu > Settings > Advanced > Admin Settings > Network Configuration > Provisioning Server > DHCP Menu set the following:  
 Boot Server: **Static**  
 BootSrv Type: **IP Address** ♦♦♦♦♦ (Once phone is upgraded, please remove the IP address from the phone!!!)
- From the Provisioning Server menu set: ♦♦♦♦♦ Server Type: **HTTP**
- Next input Server Address as **voipt2.polycom.com** or **IP** ♦♦♦♦♦ Example to load the latest SIP 4.06 = voipt2.polycom.com/406  
 a. Note voipt2.polycom.com can be entered in IP form, enter ♦♦♦♦♦ Example **140.242.64.35/406** for convenience.
- Unless otherwise instructed by VoIP Support, do not change Server User or Password.  
 (Optional): Specify a directory for the SIP or UC software version you wish the phone to provision, as listed below.

**IMPORTANT NOTE:** Using this server to provision your phone will erase all preferences and will restore all settings to their Factory Default Values!  
**ALL SETTINGS WILL BE LOST!!**

*Used phones may have previous configuration on them*

## How to reset used Polycom phone to factory defaults



downloads.polycom.com/voice/voip/sip\_sw\_releases\_matrix.html

### Polycom® UC Software Release Matrix For SoundPoint IP and SoundStation IP Phones

The Polycom UC Software Release Matrix For VX Phones and SoundStructure VoIP Interface Card can be found [here](#).

Release	Release Notes	IP301	IP320/330	IP321/331	IP335	IP430	IP450	IP501	IP550	IP560	IP600	IP601	IP602
<a href="#">4.1.1 (MS Lync Only) Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.1.1 (MS Lync Only) Split</a>		No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.1.0 Rev S (MS Lync Only) Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.1.0 Rev S (MS Lync Only) Split</a>		No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.1.0 Rev B (MS Lync Only) Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.1.0 Rev B (MS Lync Only) Split</a>		No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.0.8 Rev C Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.0.8 Rev C Split</a>		No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.0.7 Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.0.7 Split</a>		No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes
<a href="#">4.0.6 Combined</a>	<a href="#">View</a>	No	No	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Yes

*Installing latest firmware on a Polycom phone*





## Freepbx “tampered” error fix

```
amportal chown  
amportal a ma refreshsignatures  
amportal a reload
```

*Updates digital signatures after upgrading modules*

# Miscellaneous



# Student Volunteer Checklist



1. Google "x-lite download" and install X-Lite for Windows on workstation (including C++ libraries)

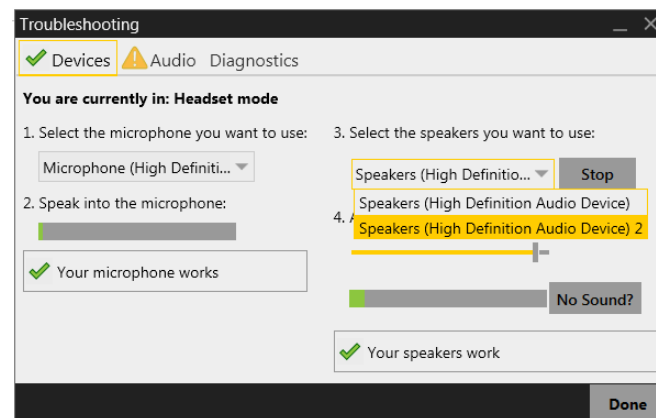
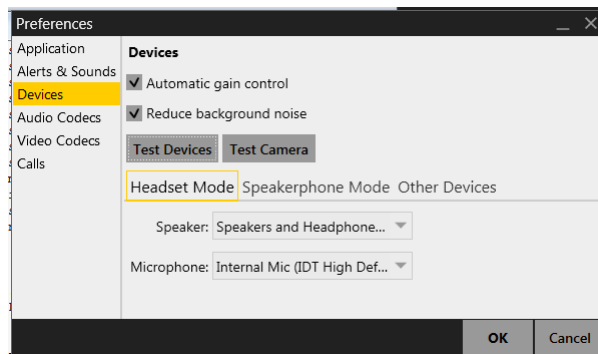


<http://www.counterpath.com/x-lite-download/>

Download X-Lite 4.8.2 for Windows

2. Plugin in Plantronics headset and configure X-Lite audio speakers

**Softphone > Preferences > Devices > [Test Devices]**



## Classroom Testing Checklist



1. Install X-Lite on instructor station
2. Connect Poly-01 and Poly-02 to classroom LAN
3. Find IP address of raspbx, poly-01 and poly-02
  - a) raspbx = 172.30.1.34
  - b) poly-01 = 172.30.1.36
  - c) poly-02 = 172.30.1.37
4. Delete all current extensions on PBX
5. Add Rich as x400 for Poly-01 hard phone
6. Add Benji as x412 for Poly-02 hard phone
7. Add Smartphone as x402 for Zoiper soft phone
8. Test x400 <-> x412 <-> 402
  - a) Voice session
  - b) Voicemail
9. Test voice mail. From phone dial own extension and hit \* to enter voice mail. Check for email on each recorded message.

```
NoPar#show ip dhcp binding

ip dhcp pool raspbx-828-wifi
 host 172.30.1.34 255.255.255.0
 client-identifier 01ec.1a59.d62c.c0
!
ip dhcp pool poly-01
 host 172.30.1.36 255.255.255.0
 hardware-address 0004.f224.2960
!
ip dhcp pool poly-02
 host 172.30.1.37 255.255.255.0
 hardware-address 0004.f224.78d7
!
ip dhcp pool volumio
 host 172.30.1.38 255.255.255.0
 hardware-address 40a5.ef09.ae53
 hardware-address b827.ebcf.c47e (eth0)
```

Poly-01: 00:04:F2:24:29:60

Poly-02: 00:04:F2:24:78:D7

Raspbx-828 eth0: B8:27:EB:78:79:7D

Raspbx-828-wifi wlan0: EC:1A:59:D6:2C:C0

Volumio eth0: b8:27:eb:cf:c4:7e

Volumio wlan0: 40:a5:ef:09:ae:53



# MACs and IPs

Poly-01: 00:04:F2:24:29:60  
 Poly-02: 00:04:F2:24:78:D7  
 Raspbx-828 eth0: B8:27:EB:78:79:7D  
 Raspbx-828-wifi wlan0: EC:1A:59:D6:2C:C0

Volumio eth0: b8:27:eb:cf:c4:7e  
 Volumio wlan0: 40:a5:ef:09:ae:53

```
NoPar#sh ip dhcp binding
```

Bindings from all pools not associated with VRF:

IP address	Client-ID/ Hardware address/ User name	Lease expiration	Type
172.20.4.150	0100.5056.65c0.b3	May 10 2015 07:30 PM	Automatic
172.20.9.247	01f0.4da2.4091.81	May 10 2015 07:52 PM	Automatic
172.30.1.31	b827.ebb7.b399	Infinite	Manual
<i>raspbx</i> 172.30.1.32	01b8.27eb.7879.7d	Infinite	Manual
172.30.1.164	01b8.ca3a.83e2.e0	May 10 2015 07:15 PM	Automatic
<i>poly-01</i> 172.30.1.166	0004.f224.2960	May 10 2015 07:22 PM	Automatic
172.30.1.167	0110.1f74.6b62.cc	May 10 2015 08:44 PM	Automatic
172.30.1.168	01f0.4da2.4091.7d	May 10 2015 07:52 PM	Automatic
<i>poly-02</i> 172.30.1.169	0004.f224.78d7	May 10 2015 08:56 PM	Automatic
172.30.1.170	01b8.ca3a.83df.2d	May 10 2015 08:56 PM	Automatic
172.30.1.190	b8ca.3a92.e0fd	May 10 2015 08:18 PM	Automatic
172.30.1.193	01b8.ca3a.7cc8.8a	May 10 2015 07:46 PM	Automatic
172.30.2.212	01f0.4da2.4091.7f	May 10 2015 07:52 PM	Automatic

NoPar#

To clear an IP address if reservation fails:  
**clear ip dhcp binding 172.30.1.165**



## PBX command line

```

root@raspbx:~# asterisk -r
Asterisk 11.17.0, Copyright (C) 1999 - 2013 Digium, Inc. and others.
Created by Mark Spencer <markster@digium.com>
Asterisk comes with ABSOLUTELY NO WARRANTY; type 'core show warranty' for details.
This is free software, with components licensed under the GNU General Public
License version 2 and other licenses; you are welcome to redistribute it under
certain conditions. Type 'core show license' for details.
=====
Connected to Asterisk 11.17.0 currently running on raspbx (pid = 4063)
raspbx*CLI> sip show users
Username                               Secret          Accountcode      Def.Context      ACL
Forcerport
400                                     Cabrillo        from-internal    Yes No
402                                     Cabrillo        from-internal    Yes No
407                                     Cabrillo        from-internal    Yes No
446                                     Cabrillo        from-internal    Yes No
raspbx*CLI>
raspbx*CLI> exit
Asterisk cleanly ending (0).
Executing last minute cleanups

```

*Show configured user extensions*





## PBX command line

```
root@raspbx:~# amportal stop
```

```
Please wait...
```

```
STOPPING ASTERISK
```

```
Waiting for Asterisk to Stop Gracefully...
```

```
Asterisk Stopped
```

```
root@raspbx:~#
```

*Gracefully shutting down asterisk*