



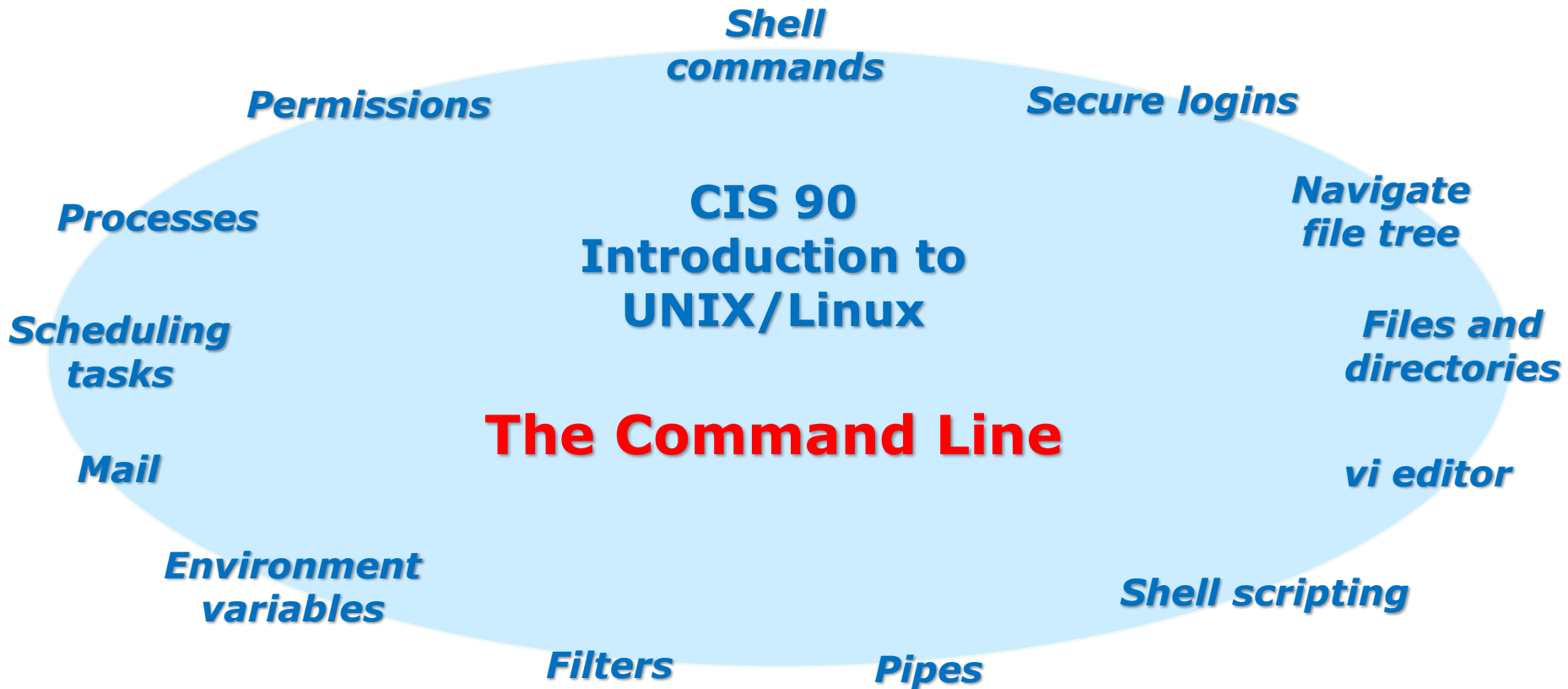
Rich's CCC Confer checklist - setup

Last updated 5/15/2019

- ☐ Zoom recording named and published for previous lesson
- ☐ Slides posted
- ☐ Print out agenda slide and annotate page numbers
- ☐ Flash cards
- ☐ 1st minute quiz
- ☐ Web Calendar updated
- ☐ Bring some Linux ISOs on flash drive
- ☐ Canvas Practice Test 3 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

☐ <https://zoom.us>

- ☐ Putty + Slides + Chrome
- ☐ Enable/Disable attendee sharing
 - ^ > Advanced Sharing Options > Only Host
- ☐ Enable/Disable attended annotations
 - Share > More > Disable Attendee Sharing



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: <https://web.archive.org/web/20140209023942/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. John's site: <http://teacherjohn.com/>
- Jaclyn Kostner for many webinar best practices: e.g. mug shot page.



Student checklist - Before class starts

The screenshot shows the website simms-teach.com/cis90calendar.php. The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". On the left sidebar, the "CIS 90" link is highlighted. The main content area shows the "CIS 90 (Fall 2014) Calendar" with tabs for "Course Details", "Grades", and "Calendar". The "Calendar" tab is selected. A table lists the course topics, with the first row highlighted. Below the table, there are links for "Presentation slides (download)" and "Enter virtual classroom".

Lesson	Date	Topics	Link
1	9/2	Class and Linux Overview - Understand how the course will work - High-level overview of computers, operating systems, and virtual machines - Overview of UNIX/Linux market and architecture - Using SSH for remote network access - Using terminals and the command line	Presentation slides (download) Enter virtual classroom
2	9/9	Supplemental PowerPoint: Logging into Opus (download)	Presentation slides (download) Enter virtual classroom
3	9/16	Assignment - Student Survey - Lab 1	Presentation slides (download) Enter virtual classroom
4	9/23	Lab 2	Presentation slides (download) Enter virtual classroom
5	9/30	Lab 3	Presentation slides (download) Enter virtual classroom
6	10/7	Lab 4	Presentation slides (download) Enter virtual classroom
7	10/14	Lab 5	Presentation slides (download) Enter virtual classroom
8	10/21	Lab 6	Presentation slides (download) Enter virtual classroom
9	10/28	Lab 7	Presentation slides (download) Enter virtual classroom
10	11/4	Lab 8	Presentation slides (download) Enter virtual classroom
11	11/11	Lab 9	Presentation slides (download) Enter virtual classroom
12	11/18	Lab 10	Presentation slides (download) Enter virtual classroom
13	11/25	Lab 11	Presentation slides (download) Enter virtual classroom
14	12/2	Lab 12	Presentation slides (download) Enter virtual classroom
15	12/9	Lab 13	Presentation slides (download) Enter virtual classroom
16	12/16	Lab 14	Presentation slides (download) Enter virtual classroom
17	12/23	Lab 15	Presentation slides (download) Enter virtual classroom
18	12/30	Lab 16	Presentation slides (download) Enter virtual classroom
19	1/6	Lab 17	Presentation slides (download) Enter virtual classroom
20	1/13	Lab 18	Presentation slides (download) Enter virtual classroom
21	1/20	Lab 19	Presentation slides (download) Enter virtual classroom
22	1/27	Lab 20	Presentation slides (download) Enter virtual classroom
23	2/3	Lab 21	Presentation slides (download) Enter virtual classroom
24	2/10	Lab 22	Presentation slides (download) Enter virtual classroom
25	2/17	Lab 23	Presentation slides (download) Enter virtual classroom
26	2/24	Lab 24	Presentation slides (download) Enter virtual classroom
27	3/2	Lab 25	Presentation slides (download) Enter virtual classroom
28	3/9	Lab 26	Presentation slides (download) Enter virtual classroom
29	3/16	Lab 27	Presentation slides (download) Enter virtual classroom
30	3/23	Lab 28	Presentation slides (download) Enter virtual classroom
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38	5/18	Lab 36	Presentation slides (download) Enter virtual classroom
39	5/25	Lab 37	Presentation slides (download) Enter virtual classroom
40	6/1	Lab 38	Presentation slides (download) Enter virtual classroom
41	6/8	Lab 39	Presentation slides (download) Enter virtual classroom
42	6/15	Lab 40	Presentation slides (download) Enter virtual classroom
43	6/22	Lab 41	Presentation slides (download) Enter virtual classroom
44	6/29	Lab 42	Presentation slides (download) Enter virtual classroom
45	7/6	Lab 43	Presentation slides (download) Enter virtual classroom
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58	10/5	Lab 56	Presentation slides (download) Enter virtual classroom
59	10/12	Lab 57	Presentation slides (download) Enter virtual classroom
60	10/19	Lab 58	Presentation slides (download) Enter virtual classroom
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Student checklist - Before class starts

☐ Google

☐ ConferZoom

☐ Downloaded PDF of Lesson Slides. I like Foxit Reader so I can take notes using annotations.

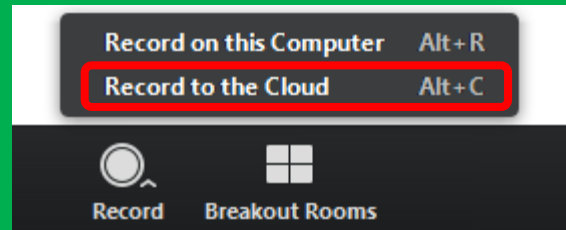
The screenshot shows a Zoom meeting interface with several windows open. The main window displays a video of a white car with the text "Get into the car" overlaid. Other windows include the Google homepage, the Rich's Cabrillo College CIS 90 website, a PDF document titled "CIS 90 - Lesson 1", and a terminal window showing login commands. The Zoom toolbar at the bottom includes buttons for Unmute, Start Video, Invite, Participants, Share Screen, Chat, Record, and Leave Meeting.

☐ CIS 90 website Calendar page

☐ One or more login sessions to Opus-II

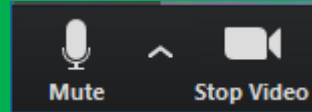


Start



Start Recording

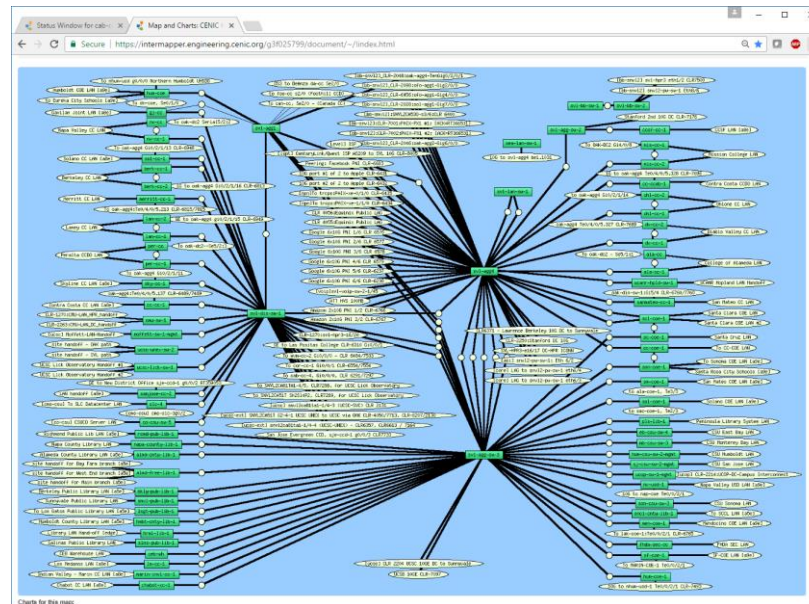
Audio Check



Start Recording

Audio & video Check

Network Check



[https://intermapper.engineering.cenic.org/g3f025799/
document/~!/index.html](https://intermapper.engineering.cenic.org/g3f025799/document/~!/index.html)



Instructor: **Rich Simms**
Dial-in: **669-900-6833 (toll)**
Meeting ID: **426 283 384**



Nick



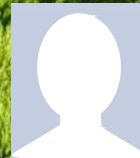
Ryan



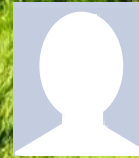
Erik



Matt



David



Jim



Cheryl



Wais



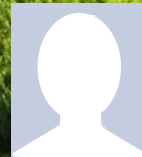
Tanisha



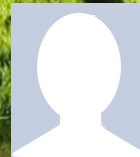
Mark



Ohunayo



Sequoia



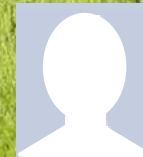
Scott



Lucky



Cole



Shane



Joseph



Evie



Cody

Quiz

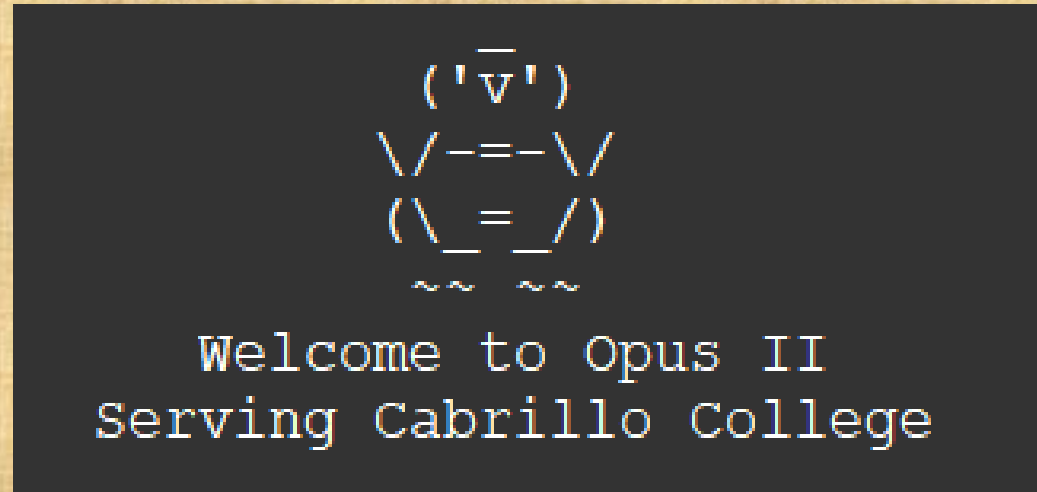
**No Quiz
Today !**



File Transfer and Review

Objectives	Agenda
• Transfer project files to Windows and Linux systems • Prepare for final exam	• No Quiz • Questions • Housekeeping • Final Exam (Test 3) • Test 3 Tips • File transfer continued • Compressed archives • Make your own Opus-II • Project Presentations • Workshop • Wrap up

Class Activity



If you haven't already,
log into Opus-II

Class Activity

3	2/19	Unit 3 Electronic Mail • Guest speaker: Denise Moore on OTC (On-The-Job) training programs • Learn how to use the LMS communication tools write and /bin/mail • Overview on android and email Materials • Presentation slides (download) Supplemental • Howto #318: Accessing vlab (download) Assignment • Read/skim Lesson 3 slides	Lab 3
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<https://simms-teach.com/cis90calendar.php>

If you haven't already,
download the lesson slides

Class Activity

	• <u>Read/skim Lesson 1 slides</u> • <u>Student Survey</u> • <u>Lab 1</u>	
	ConferZoom • <u>Enter virtual classroom</u> • <u>Class archives</u>	
	Quiz 1 Commenda • Understand how the UNIX login operation	

<https://simms-teach.com/cis90calendar.php>

If you haven't already, join
ConferZoom classroom

Before class starts activity

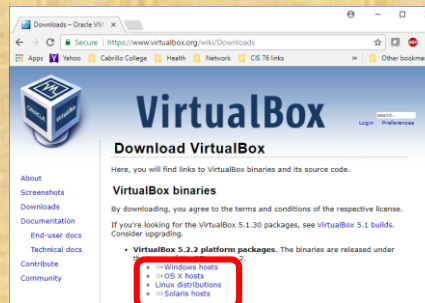
To save time download a CentOS Minimal ISO from:

<https://www.centos.org/download/>



To save even more time download and install VirtualBox from:

<https://www.virtualbox.org/wiki/Downloads>





Questions



Questions?

Lesson material?

Labs? Tests?

How this course works?

- Graded work & tests 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

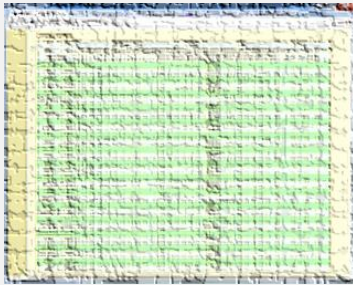
他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。

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

Review your progress in the course

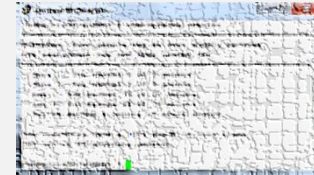
Check the website Grades page

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



Or check on Opus-II

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



Written by Jesse Warren a past CIS 90 Alumnus

- Send me your survey to get your LOR codename.
- Graded labs and tests are in your home directories.

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

Points that could have been earned:

10 quizzes: 30 points
 10 labs: 300 points
 2 tests: 60 points
 3 forum quarters: 60 points
Total: 450 points

Extra Credit

On the forum

Be sure to monitor the forum as I may post extra credit opportunities without any other notice!

On some labs

Extra credit (2 points)

For a small taste of what you would learn in CIS 191 let's add a new user to your Arya VM. Once added we will see how the new account is represented in `/etc/passwd` and `/etc/shadow`.

1. Log into your Arya VM as the cis90 user. Make sure it's your VM and not someone else's.
2. Install the latest updates:
`sudo apt-get update`
`sudo apt-get upgrade`
3. Add a new user account for yourself. You may make whatever username you wish. The example below shows how Benji would make the same username he uses on Opus:
`sudo useradd -G sudo -c "Benji Simms" -m -s /bin/bash simben90`

In lesson slides (search for extra credit)



On the website

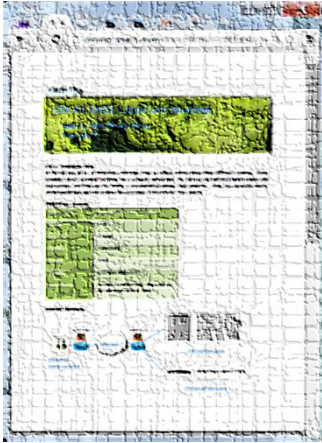
<http://simms-teach.com/cis90grades.php>

For some flexibility, personal preferences or family emergencies there is an additional 90 points available of extra credit activities.

<http://simms-teach.com/cis90extracredit.php>

• **Website content review** - The first person to email the instructor pointing out an error or typo on this website will get one point of extra credit for each unique error. The email must specify the specific document or web page, pinpoint the location of the error, and specify what the correction should be. Duplicate errors count as a single point. This does not apply to pre-published material that has been updated but not yet presented in class. (Up to 20 points total)

Lab Assignments -- Pearls of Wisdom



- Don't wait till the last minute to start.
- Plan for things to go wrong and give yourself time to ask questions and get answers.
- The *slower* you go the *sooner* you will be finished.
- A few minutes reading the forum can save you hour(s).
- Line up materials, references, equipment and software ahead of time.
- It's best if you fully understand each step as you do it. Use Google or refer back to lesson slides to understand the commands you are using.
- Keep a growing cheat sheet of commands and examples.
- Study groups are very productive and beneficial.
- Use the forum to collaborate, ask questions, get clarifications and share tips you learned while doing a lab.
- **Late work is not accepted** so submit what you have for partial credit.



Getting Help When Stuck on an Assignment

- Google the topic/error message.
- Search the Lesson Slides (they are PDFs) for a relevant example on how to do something.
- Check the forum. Someone else may have run into the same issue and found a way past it. If not start a new topic, explain what you are trying to do and what you have tried so far.
- Talk to a tutor/assistant at the CTC (room 1403) or CIS Lab (STEM Center).
- Come see me during my office or lab hours:

<https://www.cabrillo.edu/salsa/listing.php?staffId=1426>

I'm in the CTC (room 1403) every Tuesday from 3:30-6:00 pm.

- Make use of the Open Questions time at the start of every class.
- Make a cheat sheet of commands and examples so you never again get stuck on the same thing!

CIS Labs always involve some troubleshooting!

Help Available!
In the CTC and CIS Lab

Rich's Cabrillo College CIS Classes CIS 90 Calendar

Home

Resources

Forums

Tutors

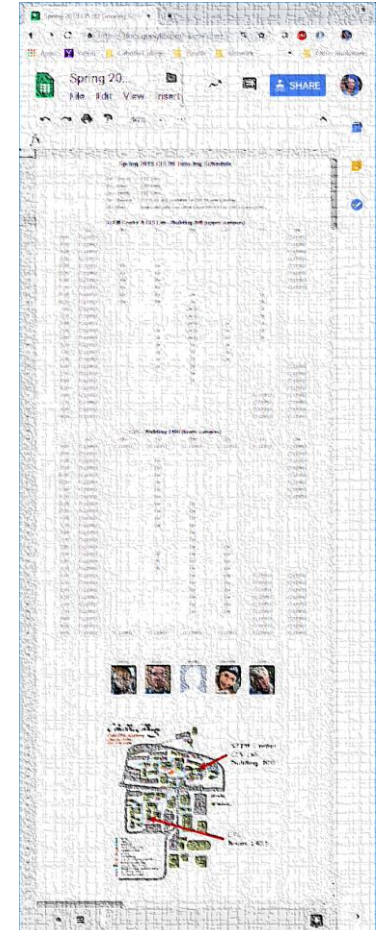
Canvas

Cabrillo College
Cabrillo Gallery
Library #1002
831-479-6308

CIS Lab
in STEM Center
Building 800

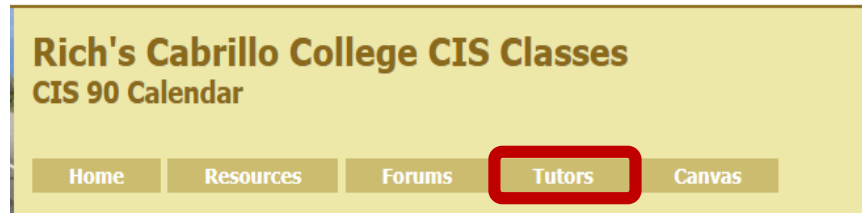
*To see tutor
schedule, click
the Tutors link
on the
website.*

*Instructors, tutors
and equipment are
available for CIS
students to work on
assignments.*



CTC
Room 1403

Help Available! In the CTC and CIS Lab



*To see tutor schedule, click the
Tutors link on the website.*



*The CIS Lab is in the STEM
center (Building 800)*



*Room 1403 is in the
CTC (Building 1400)*



The slippery slope



- 1) If you didn't submit the last lab ...
- 2) If you were in class and didn't submit the last quiz ...
- 3) If you didn't send me the student survey assigned in Lesson 1 ...
- 4) If you haven't made a forum post in the last quarter of the course ...
- 5) If you had trouble doing the last test ...

*Please contact me by email, see me during
my office hours or when I'm in the CTC*

Email: risimms@cabrillo.edu

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 **7-9:50 AM Wed May 22rd**.
- Extra credit labs and forum posts due 11:59 PM day of the final exam.
- Practice test for final exam is available after class.
- Practice test server will shutdown 30 minutes before the final exam.

Possible Points	Requirements
30	Implementing all five tasks (6 points each): - Requirements for each task: - Minimum of 12 "original" lines of bash script - Has one or more non-generic comments to explain what it is doing - Has user interaction
24	At least six bash constructs from this list: - Redirecting stdin (4 points) - Redirecting stdout (4 points) - Redirecting stderr (4 points) - Use of permissions (4 points) - Use of filename expansion characters (4 points) - Use of absolute path (4 points) - Use of relative path (4 points) - Use of a PID (4 points) - Use of inodes (4 points) - Use of links (4 points) - Use of color (4 points) - Use of scheduling (4 points) - Use of a GID or group (4 points) - Use of a UID or user (4 points) - Use of a /dev/tty device (4 points) - Use of a signal (4 points) - Use of piping (4 points) - Use of an environment variable (4 points) - Use of /bin/mail (4 points) - Use of a conditional (4 points) - Use of \$(command) The maximum for this section is 24 points.
6	Present your script to the class
Points lost	
-15	Fails to run from allscripts
-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: - Doesn't give full credit to the original author. - Doesn't indicate where the code was obtained from. - Doesn't include licensing terms. - Violates copyright or licensing terms.
-up to 90	For any "malware" scripts that steal credentials, exfiltrate confidential information, remove or encrypt a user's files or creates a denial of service condition on Opus-II.
Extra credit	
30	Up to three additional tasks (10 points each)

Grading Rubric for Final Project

Make sure a classmate can run your script using allscripts!

Plagiarizing another author's code is a NO-NO! All points lost!

Scripts that result in unauthorized hacking" is a NO-NO! All points lost!

Don't forget to do this!

Make sure everyone can run
your **myscript** from **allscripts**

chmod 750 ~
chmod 750 ~/bin
chmod 750 ~/bin/myscript



Points lost	
-15	Fails to run from allscripts
-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: • Doesn't give full credit to the original author. • Doesn't indicate where the code was obtained from. • Doesn't include licensing terms. • Violates copyright or licensing terms.
-up to 90	For any "malware" scripts that steal credentials, exfiltrate confidential information, remove or encrypt a user's files or creates a denial of service condition on Opus-II.



If you are not sure, log into Opus-II as the cis90 user and confirm

Final project status

checkmyscripts

```

#unten0@equi-
/home/cis90/simben $ checkmyscripts
-DWXR-X-X-X. 1 garrya90 cis90 6130 May 15 11:52 /home/cis90/garrya/bin/myscript 270 lines
-DWXR-X-X-X. 1 gillsha90 cis90 3744 May 15 11:27 /home/cis90/gillsha/bin/myscript 160 lines
-DWXR-X-X-X. 1 locjam90 cis90 9364 May 15 16:33 /home/cis90/locjam/bin/myscript 323 lines
-DWXR-X-X-X. 1 macdav90 cis90 2243 May 15 14:05 /home/cis90/macdav/bin/myscript 114 lines
-DWXR-X-X-X. 1 medco90 cis90 2769 May 15 15:33 /home/cis90/medco/bin/myscript 123 lines
-DWXR-X-X-X. 1 patmat90 cis90 6077 May 15 16:47 /home/cis90/patmat/bin/myscript 159 lines
-DWXR-X-X-X. 1 robwal90 cis90 3960 May 14 16:40 /home/cis90/robwal/bin/myscript 147 lines
-DWXR-X-X-X. 1 tomcol90 cis90 2448 May 15 12:13 /home/cis90/tomcol/bin/myscript 113 lines
-DWXR-X-X-X. 1 vannic90 cis90 1508 May 10 12:02 /home/cis90/vannic/bin/myscript 61 lines
-DWXR-X-X-X. 1 winche90 cis90 3097 May 14 20:40 /home/cis90/winche/bin/myscript 146 lines
-DWXR-X-X-X. 1 wyneri90 cis90 562 May 14 19:23 /home/cis90/wyneri/bin/myscript 38 lines
*** -15 point warning: this script cannot be run by classmates! ***
-DWXR-X-X-X. 1 zivjon90 cis90 3861 May 15 00:16 /home/cis90/zivjon/bin/myscript 147 lines
-DWXR-X-X-X. 1 babtan90 cis90 5411 May 15 10:30 /home/cis90/babtan/bin/myscript 177 lines
-DWXR-X-X-X. 1 corseq90 cis90 4305 May 15 11:54 /home/cis90/corseq/bin/myscript 149 lines
-DWXR-X-X-X. 1 corjos90 cis90 6672 May 15 08:34 /home/cis90/corjos/bin/myscript 207 lines
-DWXR-X-X-X. 1 edgcod90 cis90 3804 May 15 12:33 /home/cis90/edgcod/bin/myscript 122 lines
-DWXR-X-X-X. 1 mbaluc90 cis90 7854 May 15 16:45 /home/cis90/mbaluc/bin/myscript 257 lines
-DWXR-X-X-X. 1 vasmar90 cis90 2478 May 11 14:03 /home/cis90/vasmar/bin/myscript 96 lines
-DWXR-X-X-X. 1 tbd0190 cis90 9081 May 15 09:09 /home/cis90/tbd01/bin/myscript 316 lines
-DWXR-X-X-X. 1 tbd0490 cis90 2330 May 11 01:26 /home/cis90/tbd04/bin/myscript 53 lines

Wed May 15 16:53:00 PDT 2019
Students who have started: 20
Students who have not started: 0
Total number of lines in all student myscript files: 3218
/home/cis90/simben $

```

ls -lt /home/cis90/*/bin/myscript

```

#unten0@equi-
/home/cis90/simben $ ls -lt /home/cis90/*/bin/myscript
-DWXR-X-X-X. 1 mbaluc90 cis90 7854 May 15 16:45 /home/cis90/mbaluc/bin/myscript
-DWXR-X-X-X. 1 patmat90 cis90 6077 May 15 16:47 /home/cis90/patmat/bin/myscript
-DWXR-X-X-X. 1 locjam90 cis90 9364 May 15 16:33 /home/cis90/locjam/bin/myscript
-DWXR-X-X-X. 1 medco90 cis90 2769 May 15 15:33 /home/cis90/medco/bin/myscript
-DWXR-X-X-X. 1 macdav90 cis90 2243 May 15 14:05 /home/cis90/macdav/bin/myscript
-DWXR-X-X-X. 1 edgcod90 cis90 3804 May 15 12:33 /home/cis90/edgcod/bin/myscript
-DWXR-X-X-X. 1 tomcol90 cis90 2448 May 15 12:13 /home/cis90/tomcol/bin/myscript
-DWXR-X-X-X. 1 corseq90 cis90 4305 May 15 11:54 /home/cis90/corseq/bin/myscript
-DWXR-X-X-X. 1 garrya90 cis90 6130 May 15 11:52 /home/cis90/garrya/bin/myscript
-DWXR-X-X-X. 1 gillsha90 cis90 3744 May 15 11:27 /home/cis90/gillsha/bin/myscript
-DWXR-X-X-X. 1 babtan90 cis90 5411 May 15 10:30 /home/cis90/babtan/bin/myscript
-DWXR-X-X-X. 1 tbd0190 cis90 9081 May 15 09:09 /home/cis90/tbd01/bin/myscript
-DWXR-X-X-X. 1 zivjon90 cis90 3861 May 15 00:16 /home/cis90/zivjon/bin/myscript
-DWXR-X-X-X. 1 winche90 cis90 3097 May 14 20:40 /home/cis90/winche/bin/myscript
-DWXR-X-X-X. 1 wyneri90 cis90 562 May 14 19:23 /home/cis90/wyneri/bin/myscript
-DWXR-X-X-X. 1 robwal90 cis90 3960 May 14 16:40 /home/cis90/robwal/bin/myscript
-DWXR-X-X-X. 1 vasmar90 cis90 2478 May 11 14:03 /home/cis90/vasmar/bin/myscript
-DWXR-X-X-X. 1 tbd0490 cis90 2330 May 11 01:26 /home/cis90/tbd04/bin/myscript
-DWXR-X-X-X. 1 vannic90 cis90 1508 May 10 12:02 /home/cis90/vannic/bin/myscript
-DWXR-X-X-X. 1 roddu90 cis90 1972 May 8 16:09 /home/cis90/roddu/bin/myscript
-DWXR-X-X-X. 1 simben90 cis90 10517 Apr 27 18:10 /home/cis90/simben/bin/myscript
-DWXR-X-X-X. 1 milhom90 cis90 4543 Apr 21 09:53 /home/cis90/milhom/bin/myscript
/home/cis90/simben $

```

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
```



Final Exam (Test 3)

Heads up on Final Exam

Test #3 (final exam) is **Wednesday May 22, 7-9:50AM**

Wed	5/22	Test #3 (the final exam) Time - WEDNESDAY 7:00AM - 9:50AM in Room 828 or online Materials - Presentation slides (download) - Test (canvas) ConferZoom Enter virtual classroom Class archives		5 posts Lab X1 Lab X2
------------	------	--	--	--

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

- All students will take the test at the same time. The test starts at **7:00AM** must be completed by **9:50AM**.
- Working and long distance students can take the test online via ConferZoom 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)

SPRING 2019 FINAL EXAMINATIONS SCHEDULE MAY 20 TO MAY 25

DAYTIME FINAL SCHEDULE

Daytime Classes: All times in bold refer to the beginning times of classes. **MW/Daily** means Monday alone, Wednesday alone, Monday and Wednesday **or any 3** or more days in any combination. **TTH** means Tuesday alone, Thursday alone, or Tuesday and Thursday. **Classes meeting other combinations of days and/or hours not listed must have a final schedule approved by the Division Dean.**

STARTING CLASS TIME / DAY(S)	EXAM HOUR	EXAM DATE
<i>Classes starting between:</i>		
6:30 am and 8:55 am, MW/Daily	7:00 am-9:50 am	Monday, May 20
9:00 am and 10:15 am, MW/Daily	7:00 am-9:50 am	Wednesday, May 22

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
1	W	9:00AM-12:05PM	3.00	R.Simms	OL
Section 1 is an ONLINE course. Meets weekly throughout the semester online during the scheduled times by remote technology with an additional 50 min arranged online lab per week. For details, see instructor's web page at go.cabrillo.edu/online .					
2	W	9:00AM-12:05PM	3.00	R.Simms	828
&	Arr.	Arr.		R.Simms	OL
Section 2 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 .					

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

Screen layout

Screen Layout

Re-size Canvas to show just one question at a time

The screenshot shows a Blackboard quiz interface. The top window displays a quiz question with an 'Operation' section and a 'Question' section. Below the question is an 'HTML Editor' for the answer. The bottom window shows two terminal sessions. The left terminal is a shell session on 'sun-hwa-p3' where the user has logged in and is prompted for a password. The right terminal shows the output of a script, including a 'Checking OPERATION 1' message and a 'flag file found' message.

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
```

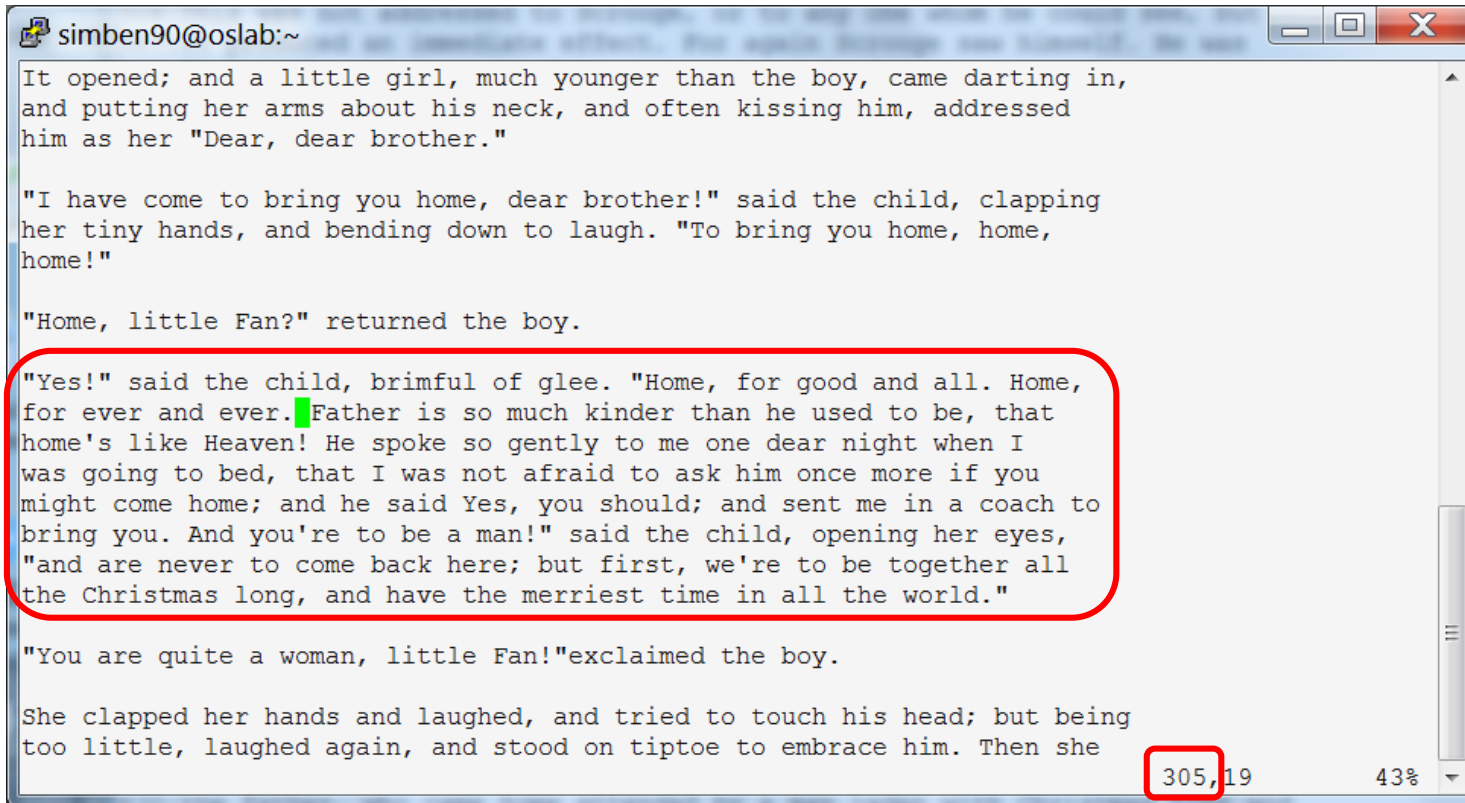
The -n option on grep shows the line number

```
/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.

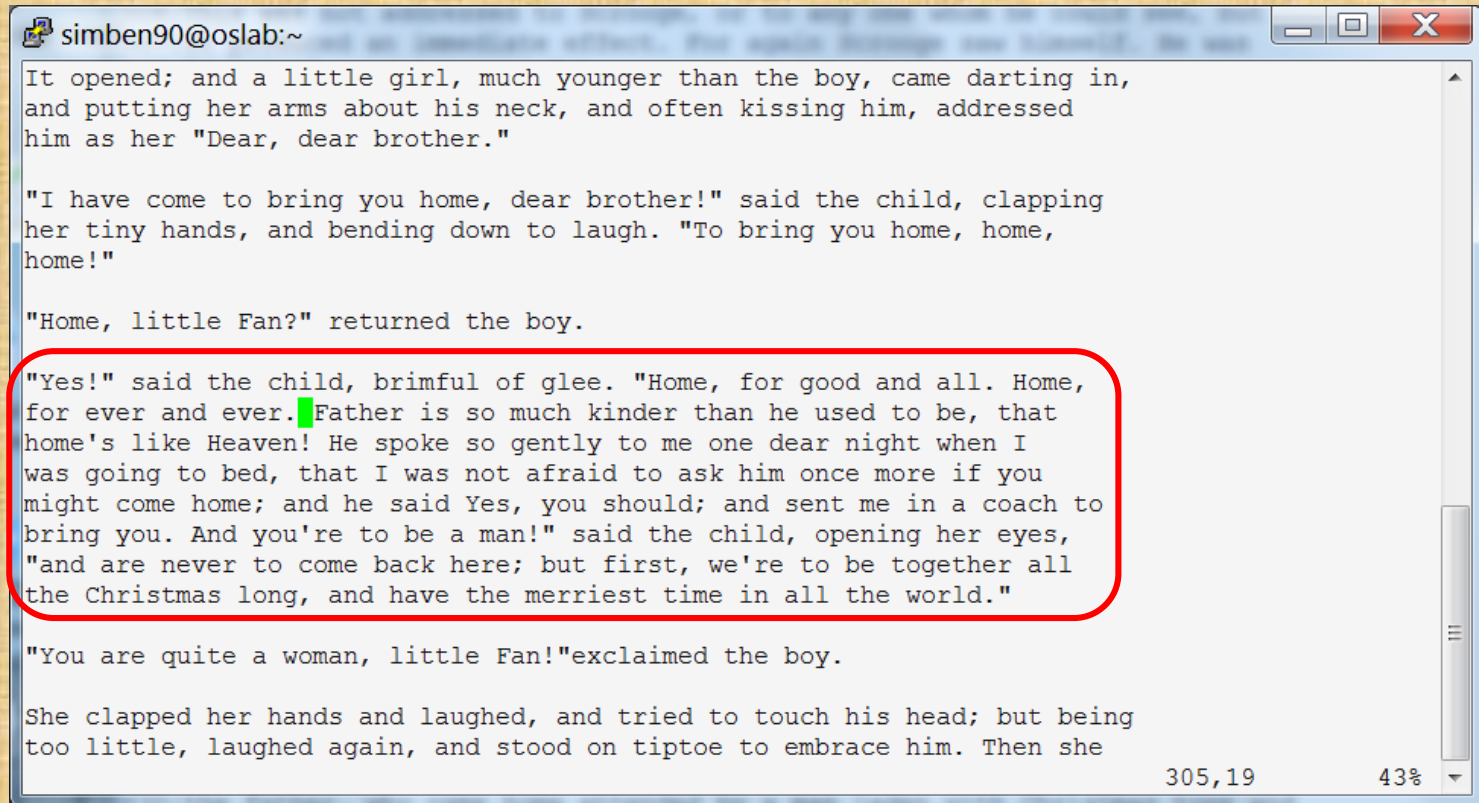
She clapped her hands and laughed, and tried to touch his head; but being
too little, laughed again, and stood on tiptoe to embrace him. Then she
```

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*

*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 $
```

```
/home/cis90/simben $ sed -n '304,311p' ../depot/dickens
```

```
"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 $
```

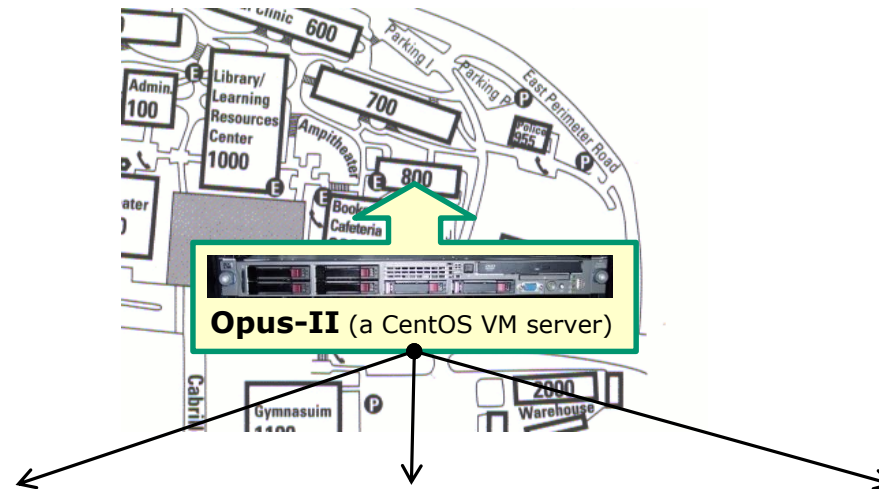
*There is an easier way using the sed (stream editor) command
as shown above*



File transfer continued

File Transfer

Downloading your Opus-II files to your home computer



Windows



Mac



Linux



First, let's backup your home directory on Opus-II

```
/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

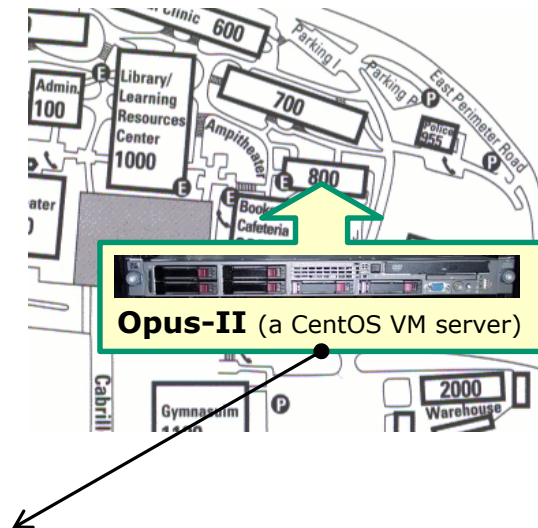
- Between Linux and Windows:
 - **Filezilla** or related applications
- Between Linux and Linux/Mac:
 - **Filezilla** or related applications
 - **scp** command

File Transfer To Windows

FileZilla

File Transfer

Downloading your Opus-II files to your home computer



Using  FileZilla

Windows

File Transfer

<http://filezilla-project.org>



The screenshot shows a web browser window with the FileZilla Client Download page. The browser's address bar displays the URL https://filezilla-project.org/download.php?show_all=1. The page features the FileZilla logo and the tagline "The free FTP solution". A sidebar on the left contains navigation links for Home, FileZilla (Features, Screenshots, Download, Documentation), FileZilla Server (Download), Community (Forum, Project page, Wiki), General (FAQ, Contact, License, Privacy Policy), Development (Source code, Nightly builds, Translations, Version history, Changelog, Issue tracker), and Other projects (libfilezilla, Octochess). The main content area is titled "Client Download" and states: "The latest stable version of FileZilla Client is 3.17.0.1. Please select the file appropriate for your platform below." It lists download links for Windows (64bit), Windows (32bit), Linux, and Mac OS X, each with a recommended .exe or .tar.bz2 file. A small inset image shows the FileZilla Client interface.

Rich's Cabrillo College CIS x CIS 90 - Spring 2016 - Cal x Google Image Result for x FileZilla - Client Download x

https://filezilla-project.org/download.php?show_all=1

FileZilla

The free FTP solution

Home

FileZilla

- Features
- Screenshots
- Download
- Documentation

FileZilla Server

- Download

Community

- Forum
- Project page
- Wiki

General

- FAQ
- Contact
- License
- Privacy Policy

Development

- Source code
- Nightly builds
- Translations
- Version history
- Changelog
- Issue tracker

Other projects

- libfilezilla
- Octochess

PayPal

Client Download

The latest stable version of FileZilla Client is 3.17.0.1

Please select the file appropriate for your platform below.

Windows (64bit)

- [FileZilla_3.17.0.1_win64-setup.exe](#) (recommended)
- [FileZilla_3.17.0.1_win64.zip](#)

The 64bit versions of Windows Vista, 7, 8, 8.1 and 10 are supported.

Windows (32bit)

- [FileZilla_3.17.0.1_win32-setup.exe](#) (recommended)
- [FileZilla_3.17.0.1_win32.zip](#)

The 32bit versions of Windows Vista, 7, 8, 8.1 and 10 are supported.

Linux

- [FileZilla_3.17.0.1_i586-linux-gnu.tar.bz2](#)
- [FileZilla_3.17.0.1_x86_64-linux-gnu.tar.bz2](#)

Built for Debian 8.0 (Jessie). It is highly recommended to use the package management system of your distribution or to manually compile FileZilla if you are running a different flavour of Linux.

Mac OS X

- [FileZilla_3.17.0.1_macosx-x86.app.tar.bz2](#)

Download and install FileZilla on your Windows PC

FileZilla On Windows, connect to your account on Opus-II

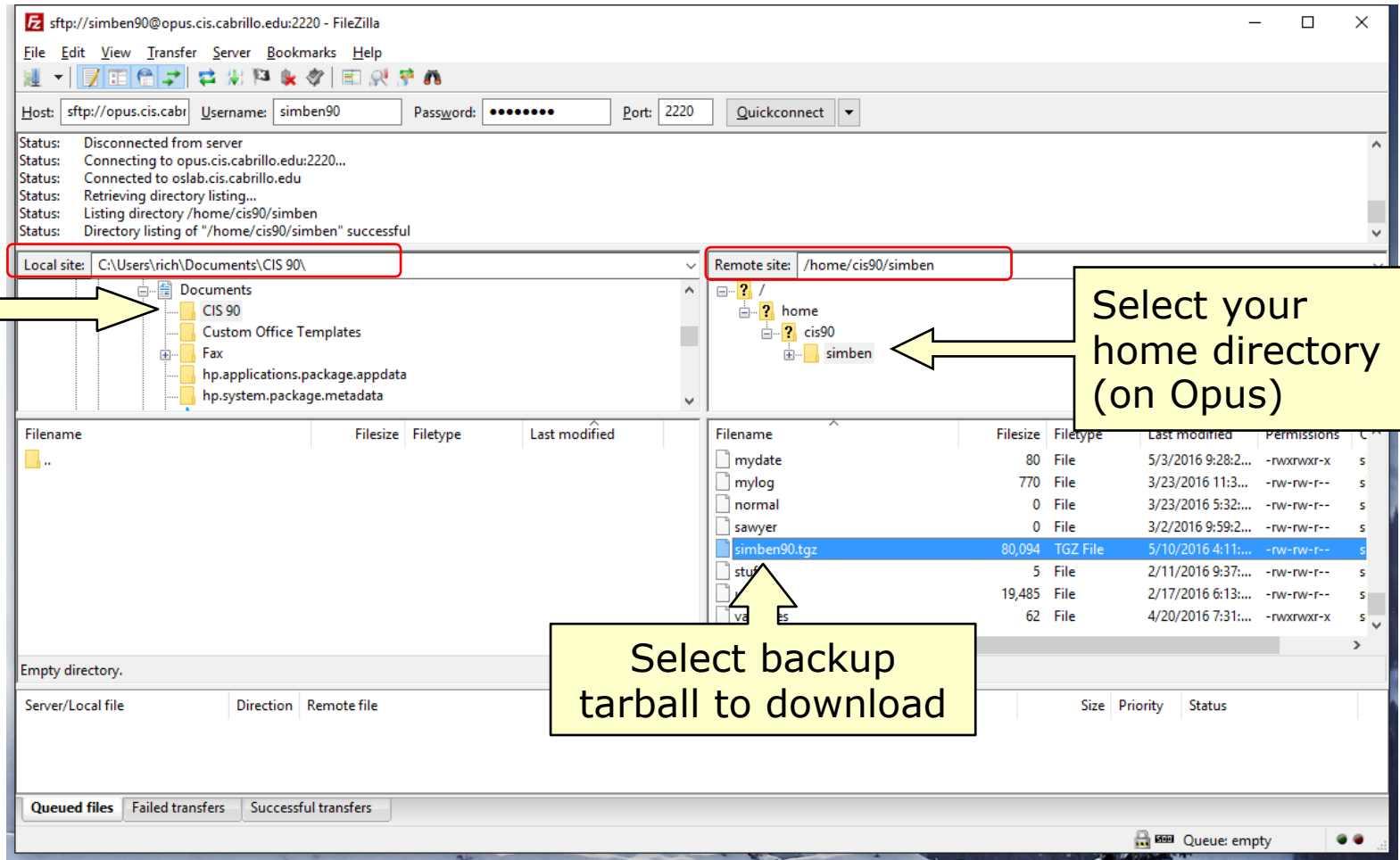
The screenshot shows the FileZilla client interface with several annotations in yellow boxes and arrows pointing to specific fields:

- Opus-II username**: Points to the Username field containing "simben90".
- Port: 2220**: Points to the Port field containing "2220".
- Host: sftp://opus-ii.cis.cabrillo.edu**: Points to the Host field containing "sftp://opus-ii.cis.cabrillo.edu".
- Opus-II 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".

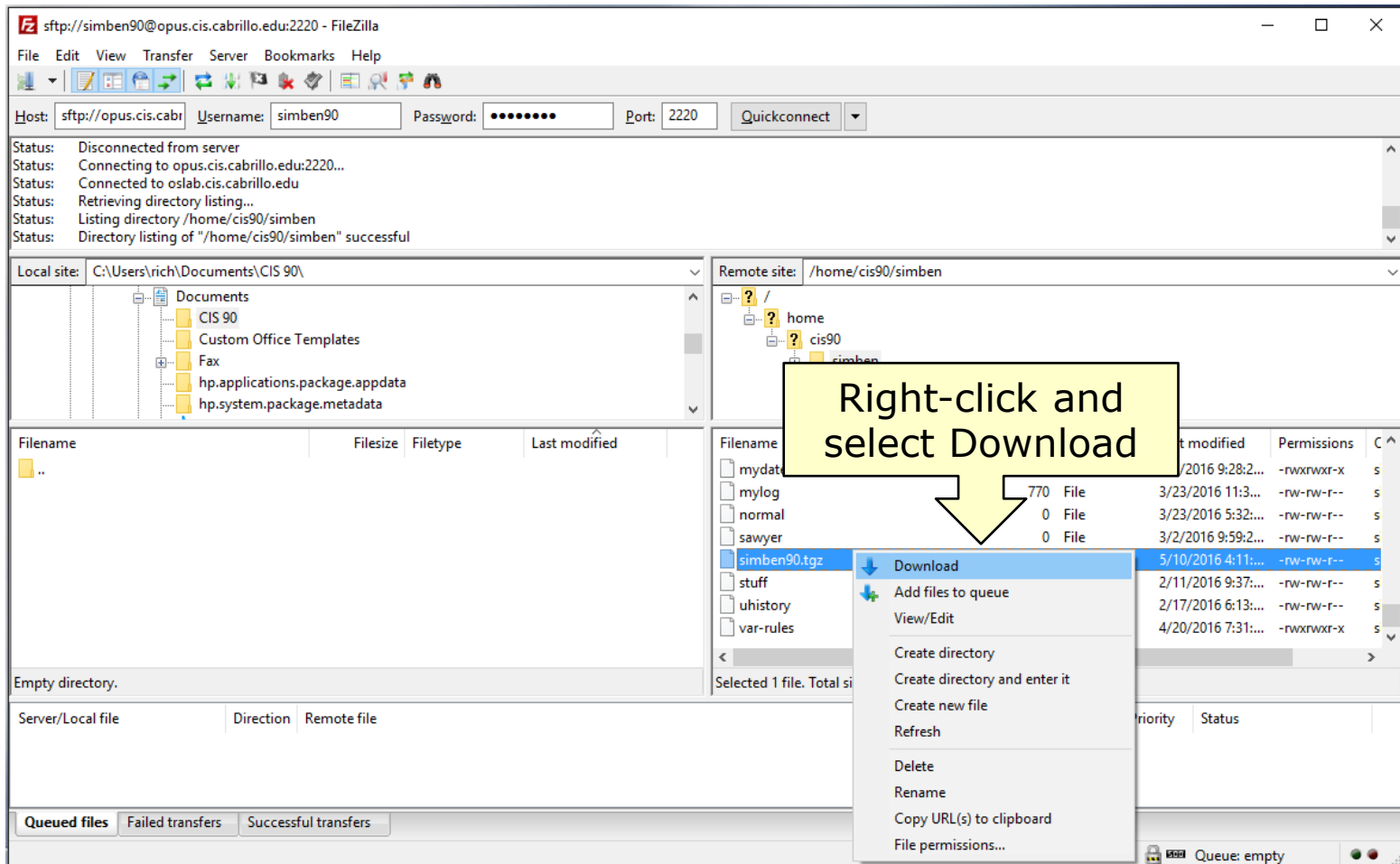


Select destination and source directories



Select local Windows folder on the left and Opus-II 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: [REDACTED]
Port: 2220

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\

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

Remote site: /home/cis90/simben

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

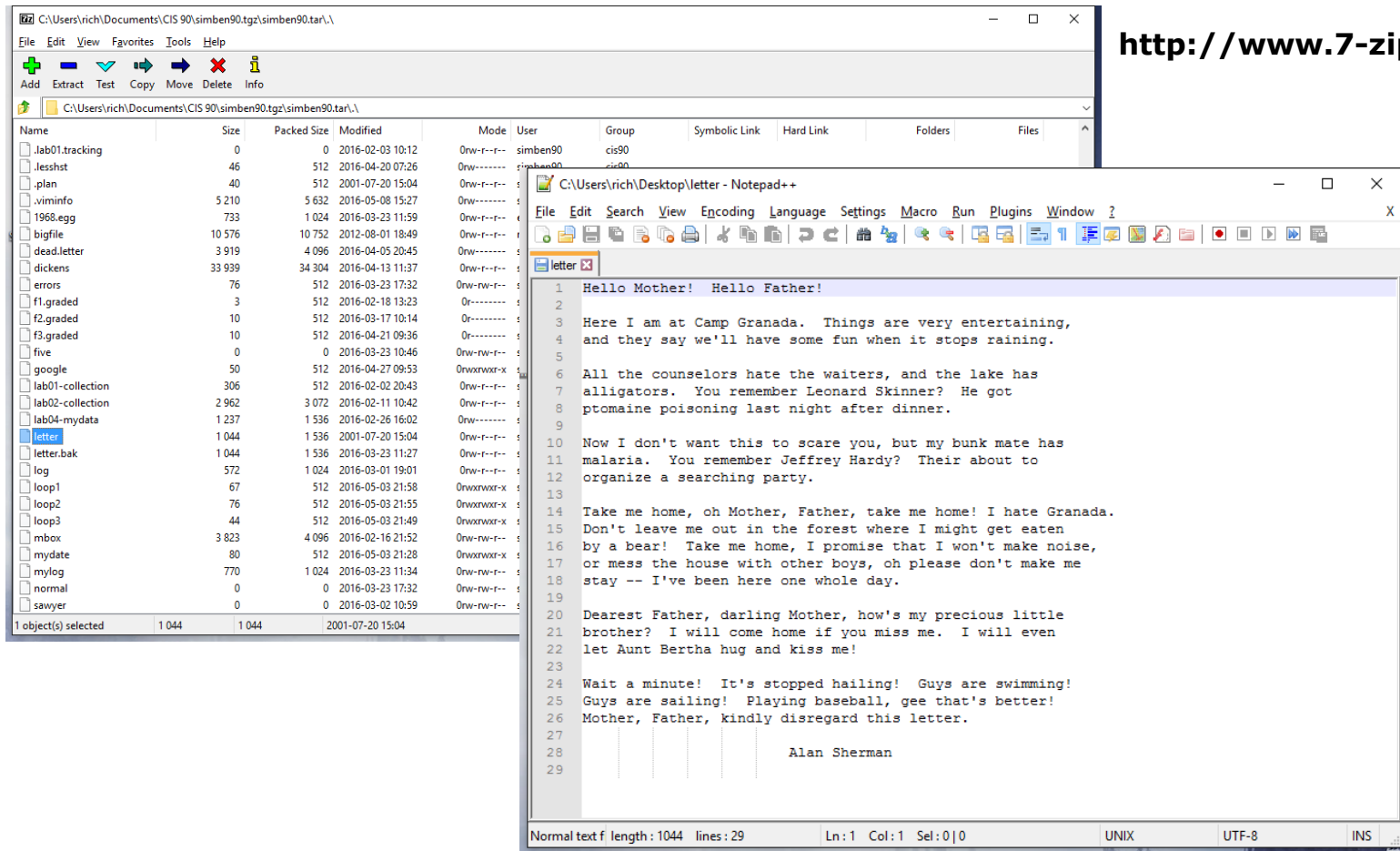
Queued files | Failed transfers | Successful transfers (4)

Queue: empty

File transfers

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

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



The screenshot shows two windows. The top window is FileZilla, displaying a file list for the local path C:\Users\rich\Documents\CIS 90\simben90.tgz\simben90.tar\.

Name	Size	Packed Size	Modified	Mode	User	Group	Symbolic Link	Hard Link	Folders	Files
.lab01.tracking	0	0	2016-02-03 10:12	0rw-r--r--	simben90	cis90				
.lessht	46	512	2016-04-20 07:26	0rw-r--r--	simben90	cis90				
.plan	40	512	2001-07-20 15:04	0rw-r--r--	simben90	cis90				
.viminfo	5 210	5 632	2016-05-08 15:27	0rw-r--r--	simben90	cis90				
1968.egg	733	1 024	2016-03-23 11:59	0rw-r--r--	simben90	cis90				
bigfile	10 576	10 752	2012-08-01 18:49	0rw-r--r--	simben90	cis90				
dead.letter	3 919	4 096	2016-04-05 20:45	0rw-r--r--	simben90	cis90				
dickens	33 939	34 304	2016-04-13 11:37	0rw-r--r--	simben90	cis90				
errors	76	512	2016-03-23 17:32	0rw-rw-r--	simben90	cis90				
f1.graded	3	512	2016-02-18 13:23	0r-----	simben90	cis90				
f2.graded	10	512	2016-03-17 10:14	0r-----	simben90	cis90				
f3.graded	10	512	2016-04-21 09:36	0r-----	simben90	cis90				
five	0	0	2016-03-23 10:46	0rw-rw-r--	simben90	cis90				
google	50	512	2016-04-27 09:53	0rw-rw-r--	simben90	cis90				
lab01-collection	306	512	2016-02-02 20:43	0rw-r--r--	simben90	cis90				
lab02-collection	2 962	3 072	2016-02-11 10:42	0rw-r--r--	simben90	cis90				
lab04-mydata	1 237	1 536	2016-02-26 16:02	0rw-r--r--	simben90	cis90				
letter	1 044	1 536	2001-07-20 15:04	0rw-r--r--	simben90	cis90				
letter.bak	1 044	1 536	2016-03-23 11:27	0rw-r--r--	simben90	cis90				
log	572	1 024	2016-03-01 19:01	0rw-r--r--	simben90	cis90				
loop1	67	512	2016-05-03 21:58	0rw-rw-r--	simben90	cis90				
loop2	76	512	2016-05-03 21:55	0rw-rw-r--	simben90	cis90				
loop3	44	512	2016-05-03 21:49	0rw-rw-r--	simben90	cis90				
mbox	3 823	4 096	2016-02-16 21:52	0rw-rw-r--	simben90	cis90				
mydate	80	512	2016-05-03 21:28	0rw-rw-r--	simben90	cis90				
mylog	770	1 024	2016-03-23 11:34	0rw-rw-r--	simben90	cis90				
normal	0	0	2016-03-23 17:32	0rw-rw-r--	simben90	cis90				
sawyer	0	0	2016-03-02 10:59	0rw-rw-r--	simben90	cis90				

The bottom window is Notepad++, showing the contents of the selected file 'letter'. The text is a letter from Alan Sherman, dated 2001-07-20 15:04.

```

1 Hello Mother! Hello Father!
2
3 Here I am at Camp Granada. Things are very entertaining,
4 and they say we'll have some fun when it stops raining.
5
6 All the counselors hate the waiters, and the lake has
7 alligators. You remember Leonard Skinner? He got
8 ptomaine poisoning last night after dinner.
9
10 Now I don't want this to scare you, but my bunk mate has
11 malaria. You remember Jeffrey Hardy? Their about to
12 organize a searching party.
13
14 Take me home, oh Mother, Father, take me home! I hate Granada.
15 Don't leave me out in the forest where I might get eaten
16 by a bear! Take me home, I promise that I won't make noise,
17 or mess the house with other boys, oh please don't make me
18 stay -- I've been here one whole day.
19
20 Dearest Father, darling Mother, how's my precious little
21 brother? I will come home if you miss me. I will even
22 let Aunt Bertha hug and kiss me!
23
24 Wait a minute! It's stopped hailing! Guys are swimming!
25 Guys are sailing! Playing baseball, gee that's better!
26 Mother, Father, kindly disregard this letter.
27
28
29 Alan Sherman
  
```

Normal text f length: 1044 lines: 29 Ln: 1 Col: 1 Sel: 0 | 0 UNIX UTF-8 INS

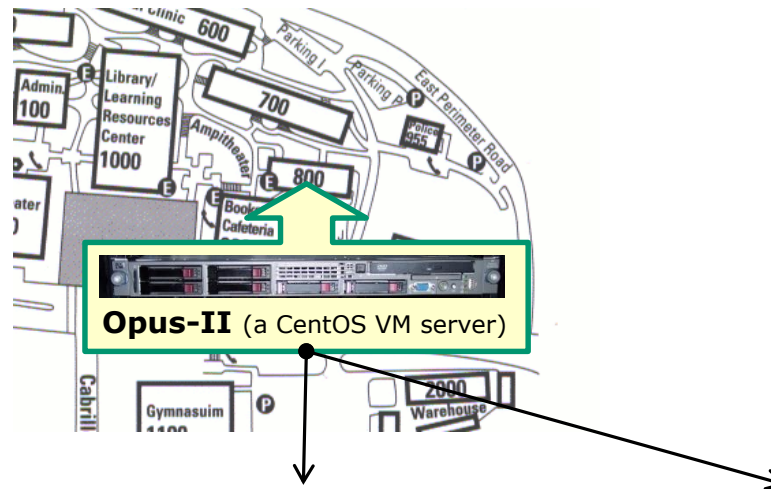
File Transfer

Linux or Mac

scp

File Transfer

Downloading your Opus-II files to your home computer



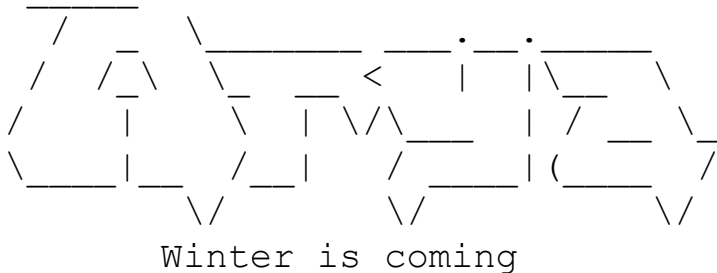
Mac



Linux

File Transfer

Downloading your Opus-II 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-ii.cis.cabrillo.edu:simben90.tgz .
simben90@opus-II.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-II

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



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
```

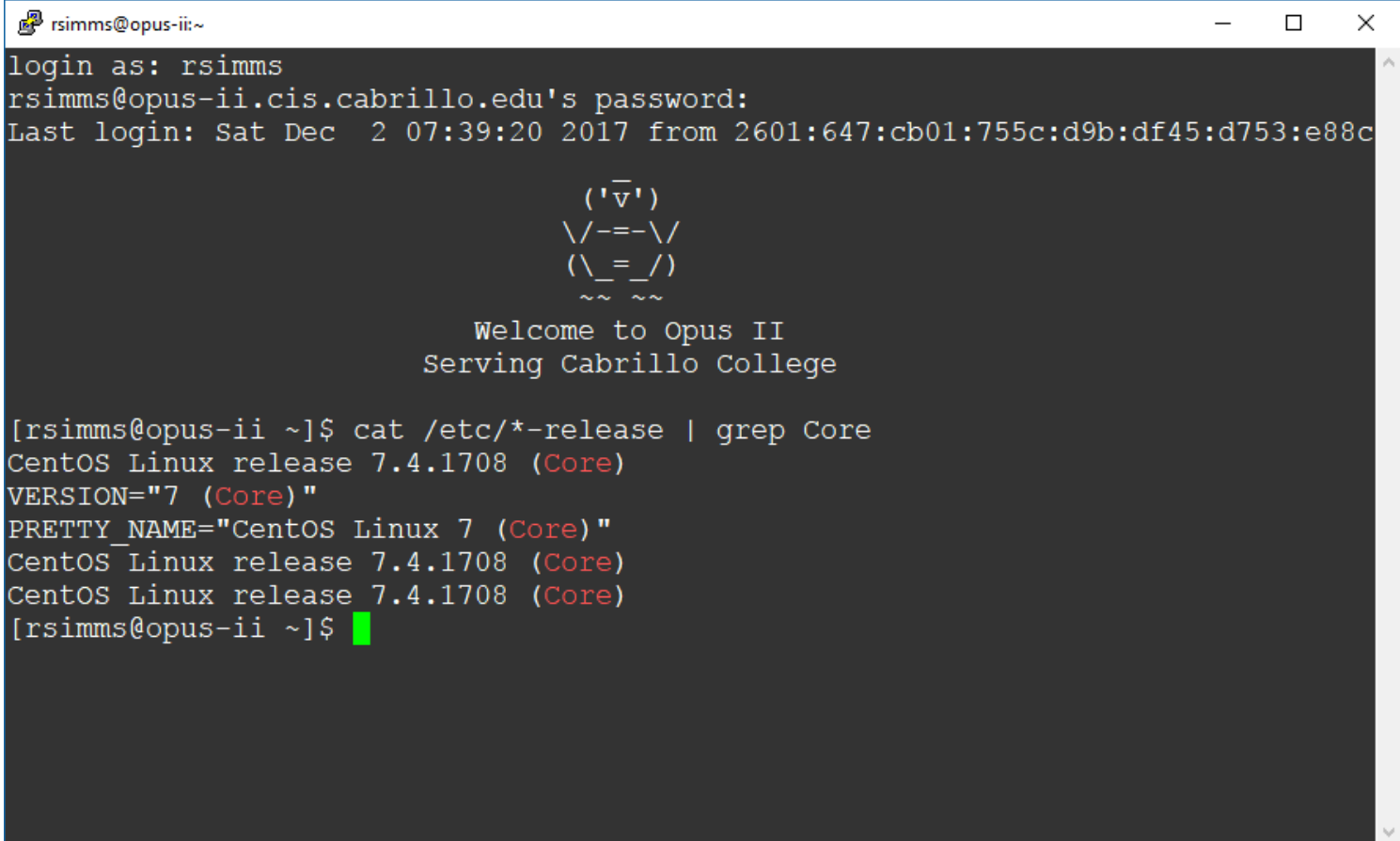
```
/home/cis90/simben $ tar czf simben90.tgz .  
tar: ./Hidden: Cannot open: Permission denied  
tar: .: file changed as we read it  
tar: Exiting with failure status due to previous errors  
/home/cis90/simben $ ls -l simben90.tgz  
-rw-rw-r--. 1 simben90 cis90 147319 May 12 20:01 simben90.tgz  
/home/cis90/simben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

cat /etc/*-release | grep Core

A terminal window titled 'rsimms@opus-ii:~' with standard window controls. It shows a login sequence for 'rsimms' on 'opus-ii.cis.cabrillo.edu', followed by a welcome message. The user then runs the command 'cat /etc/*-release | grep Core', which outputs three lines of CentOS release information, all indicating '(Core)' architecture.

```
rsimms@opus-ii:~  
login as: rsimms  
rsimms@opus-ii.cis.cabrillo.edu's password:  
Last login: Sat Dec  2 07:39:20 2017 from 2601:647:cb01:755c:d9b:df45:d753:e88c  
  
      ( 'v' )  
    \ /--\ /  
   ( \ _ _ / )  
     ~ ~ ~ ~  
  
    Welcome to Opus II  
    Serving Cabrillo College  
  
[rsimms@opus-ii ~]$ cat /etc/*-release | grep Core  
CentOS Linux release 7.4.1708 (Core)  
VERSION="7 (Core)"  
PRETTY_NAME="CentOS Linux 7 (Core)"  
CentOS Linux release 7.4.1708 (Core)  
CentOS Linux release 7.4.1708 (Core)  
[rsimms@opus-ii ~]$
```

Opus-II is a CentOS 7.4 Linux system

Ingredients

To make your own Opus-II 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

<https://simms-teach.com/resources.php>

Rich's Cabrillo College CIS Classes Resources

Home Resources Forums CIS Lab Canvas

Login
Flashcards
Admin

CIS 76
CIS 90
[Previous Terms](#)

14 days till term ends!

[Cabrillo College Web Advisor](#)

[VLab \(classic\)](#)
[VLab \(web\)](#)
[NETLAB+ PE](#)
[NETLAB+ VE](#)
[Annoying Issue List](#)

[CIS 76 VLab Pod](#)

General Links

Instructors - Ed - Gerlinde - Jeffrey - Jim - John - Michael - Marcelo - Rick - Steve - Sam at CCSE Departments - CNSA - CIS - CS	Getting Linux/UNIX Linux ISOs - Kernels - RPMS (rpmfind) - RPMS (pbone) Academic Software for CIS Students - Microsoft Webstore VMware Webstore Virtualization VirtualBox - VMware ESXi and vSphere client Standards - IEEE - IETF (RFCs) Academies - Cisco NetSpace	Palo Alto Networks - PAN commands Making Strong Passwords Password Haystack - Ryan Riley Strong passwords
--	--	---

Shopping for the ingredients

ISO

Get a Linux Distro

Getting Linux Distributions ISOs

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- Michael
- Marcelo
- Rick
- Steve
- Sam at CCSF

Departments

- CNSA
- CIS
- CS

Getting Linux/UNIX

- **Linux ISOs**
- Kernels
- RPMs (rpmfind)
- RPMs (pbone)

Academic Software for CIS Students

- Microsoft Webstore
- VMware Webstore

Virtualization

- VirtualBox
- VMware ESXi and vSphere client

Standards

- IEEE
- IETF (RFCs)

Academies

- Cisco NetSpace

Palo Alto Networks

- PAN commands

Making Strong Passwords

- Password Haystack
- Ryan Riley
- Strong passwords

Linux Distros (Distributions)

The screenshot shows the website iso.linuxquestions.org in a web browser. The page features a navigation menu on the left with links to Search, Alphabetical List, Latest Releases, Release Notification, and Suggest Additions. A central banner advertises VM TURBO, a 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, Linux Mint 17.2, openSUSE 42.1, PCLinuxOS 2016.04, Debian 8.0, Mageia 6.0, Slackware 14.2, Puppy 5.5, Arch 2016.04, and MEPIS 10.0. The "Popular Linux Distributions" section lists Ubuntu, Fedora, Linux Mint, openSUSE, PCLinuxOS, Debian, Mageia, Slackware, CentOS, Puppy, Arch, and MEPIS. The "15 Most Downloaded Distribution Versions (last 30 Days)" list includes Ubuntu 16.04, Fedora 23, Linux Mint 17.2, openSUSE 42.1, PCLinuxOS 2016.04, Debian 8.0, Mageia 6.0, Slackware 14.2, Puppy 5.5, Arch 2016.04, and MEPIS 10.0. The "15 Most Downloaded Distributions (Ever)" list includes Ubuntu, Fedora, Linux Mint, openSUSE, PCLinuxOS, Debian, Mageia, Slackware, CentOS, Puppy, Arch, and MEPIS. The "LQ Job Board" section is also visible. The browser's address bar shows the URL <http://iso.linuxquestions.org/>.

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

CentOS Distro

LinuxQuestions.org

LinuxQuestions.org > ISOs > CentOS

LQ ISOs

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

Search

Go

Need Help?

- Downloading ISOs
- Burning ISOs

Sponsored Links

- Red Hat Enterprise Linux
- Linux Enterprise Server
- Red Hat Linux
- Linux Laptops
- Linux Server
- Linux Software
- GNU/Linux

Statistics

Distros: 479
Versions: 3069
Mirrors: 1895
Downloads: 75,524,703

LQ Job Board

34 versions of CentOS available

SoftLayer® Cloud
We Provide the Highest Level of Transparency & Control for Cloud.

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](#)

Would you like to [receive an email](#) when a new [version](#) of CentOS is released? If so then [click here](#).

CentOS 7-1511	Review CentOS 7-1511	1 isos in 1 groups
CentOS 6.7	Review CentOS 6.7	7 isos in 4 groups
CentOS 6.6	Review CentOS 6.6	10 isos in 2 groups
CentOS 5.11	Review CentOS 5.11	10 isos in 2 groups
CentOS 7.0-1406	Review CentOS 7.0-1406	12 isos in 1 groups
CentOS 6.5	Review CentOS 6.5	18 isos in 2 groups
CentOS 5.10	Review CentOS 5.10	6 isos in 2 groups
CentOS 6.4	Review CentOS 6.4	10 isos in 2 groups
CentOS 5.9	Review CentOS 5.9	8 isos in 2 groups
CentOS 6.3	Review CentOS 6.3	10 isos in 2 groups

Main Menu

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

Ad

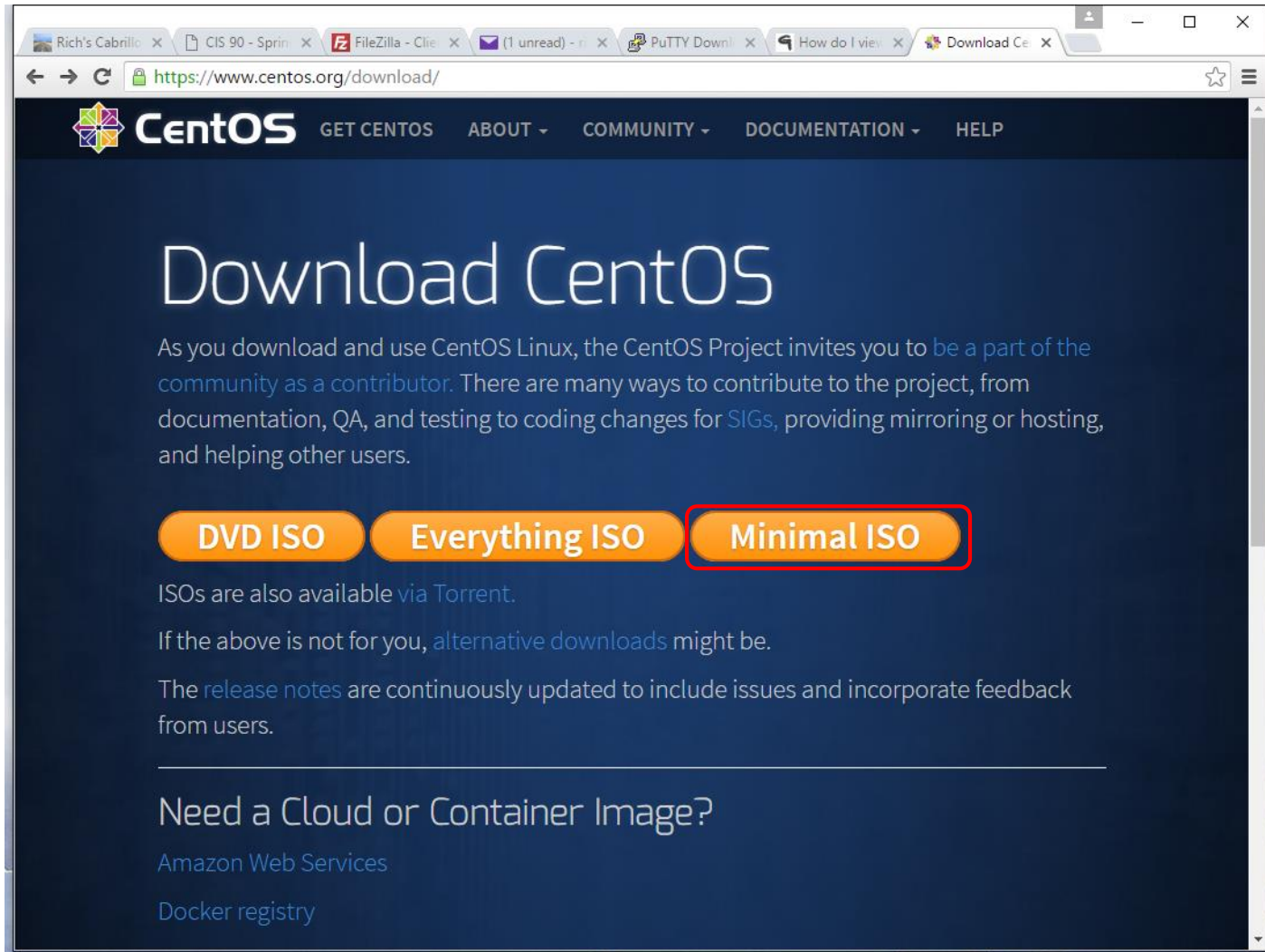
GEARBEST

-41% -60%
-54% \$4.66 \$2.12 Buy now
-41% -58%
-54% -54%
-50% -54%

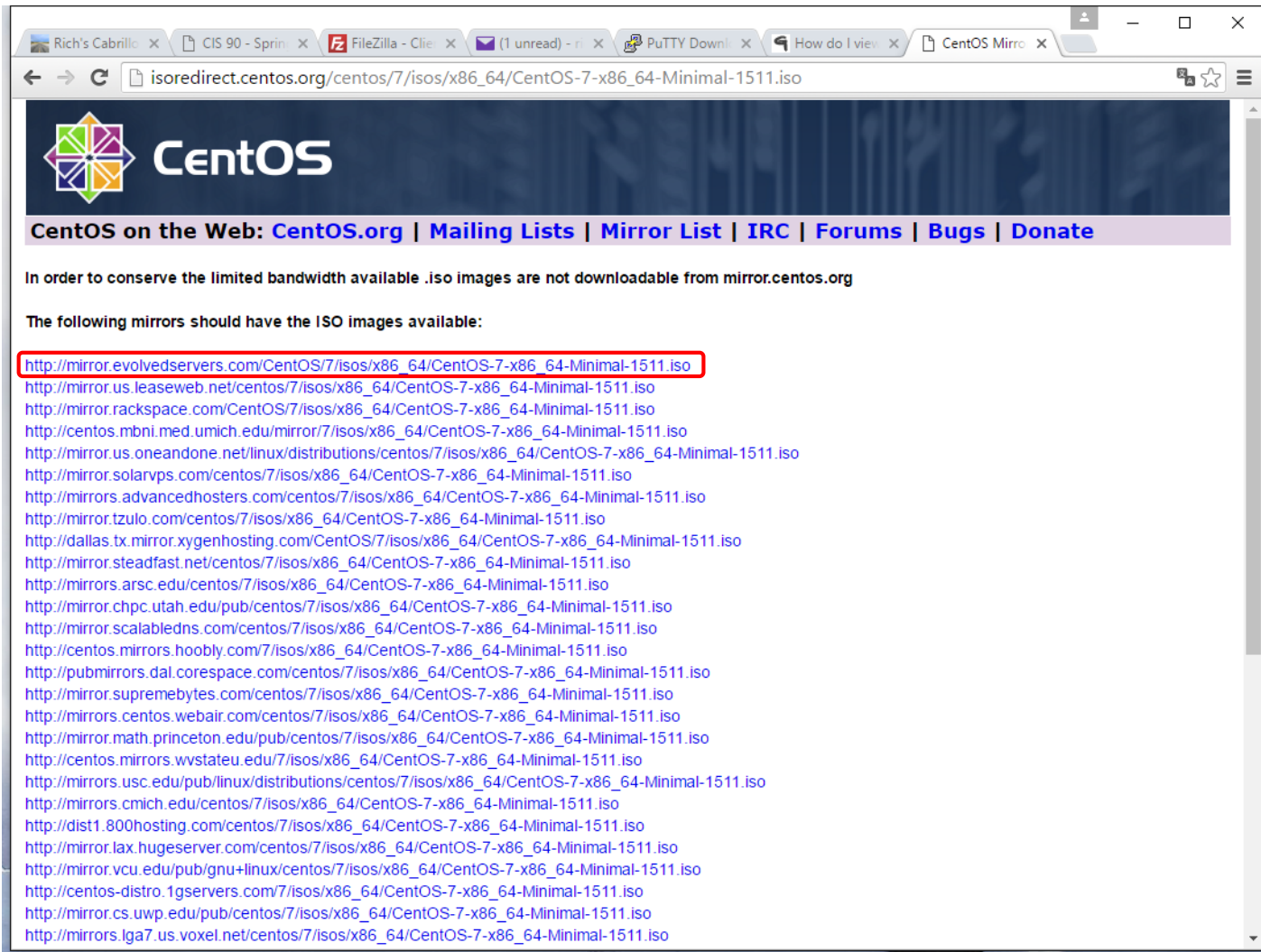
CentOS Official Website



The Minimal ISO



Pick a mirror and download ISO file



Rich's Cabrillo: x CIS 90 - Sprin: x FileZilla - Clie: x (1 unread) - r: x PuTTY Downl: x How do I view: x CentOS Mirro: x

← → ↺ isoredirect.centos.org/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

 **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.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://centos.mbni.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.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://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://mirror.steadfast.net/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

http://mirrors.arsc.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.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://pubmirrors.dal.corespace.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

http://mirror.supremebites.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://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.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://mirror.lax.hugeserver.com/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

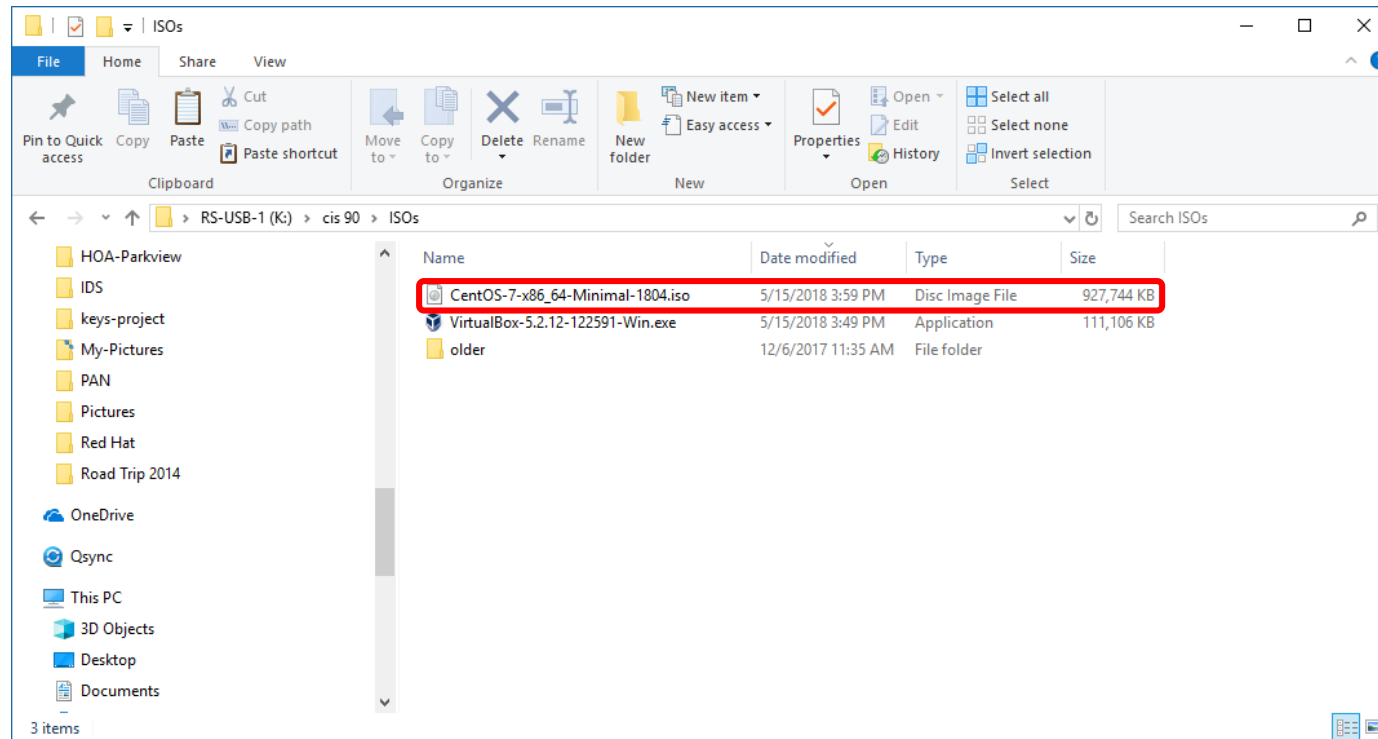
http://mirror.vcu.edu/pub/gnu/linux/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

http://centos-distro.1gserver.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://mirrors.lga7.us.voxel.net/centos/7/isos/x86_64/CentOS-7-x86_64-Minimal-1511.iso

Viewing Downloaded CentOS ISO



Downloaded ISO image of the CentOS Linux distribution

Virtual Box

Getting VirtualBox

Rich's Cabrillo College CIS Classes Resources

Home Resources Forums CIS Lab Canvas

Login
Flashcards
Admin

CIS 76
CIS 90
[Previous Terms](#)

14 days till term ends!

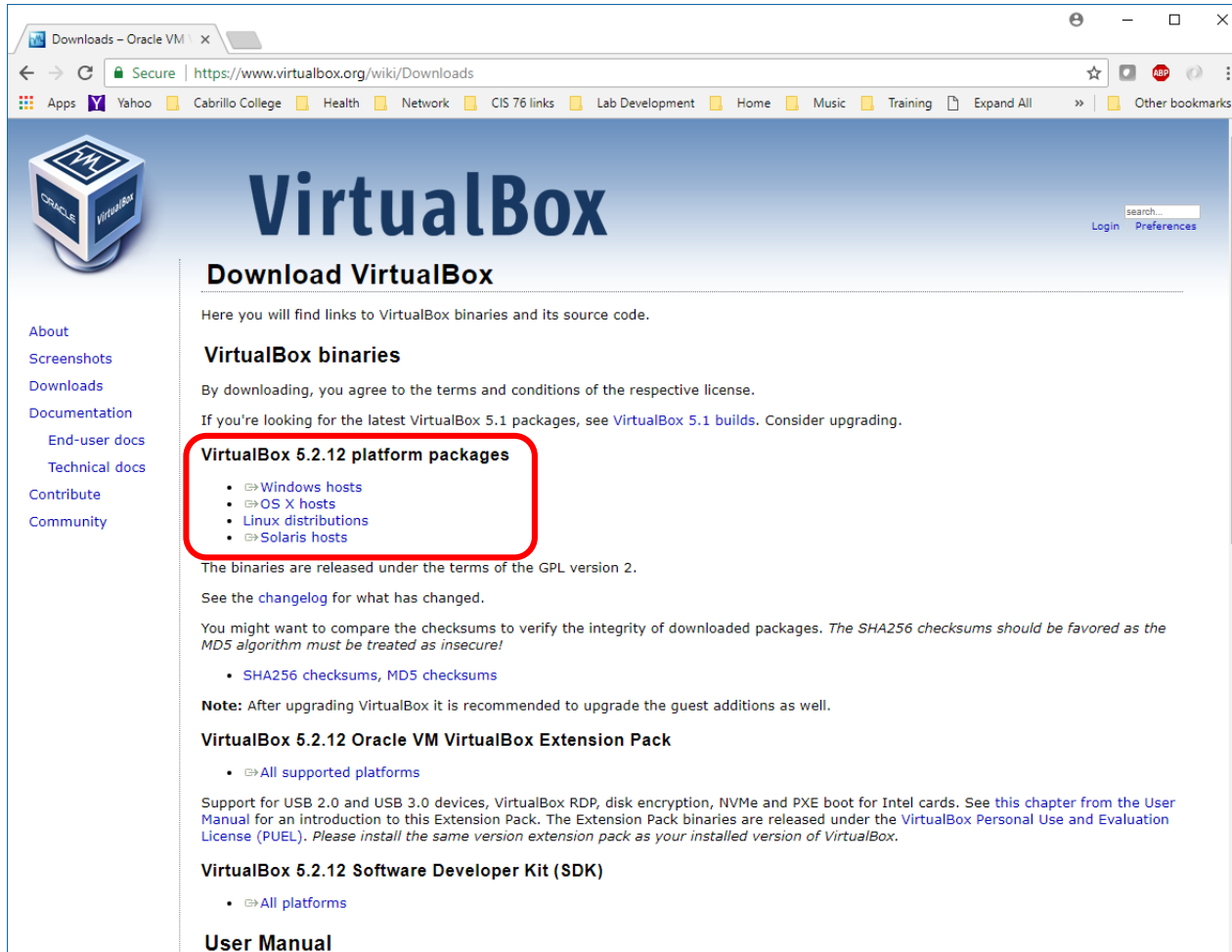
[Cabrillo College Web Advisor](#)

[VLab \(classic\)](#)
[VLab \(web\)](#)
[NETLAB+ PE](#)
[NETLAB+ VE](#)
[Annoying Issue List](#)
[CIS 76 VLab Pod](#)

General Links

Instructors - Ed - Gerlinde - Jeffrey - Jim - John - Michael - Marcelo - Rick - Steve - Sam at CCSE Departments - CNSA - CIS - CS	Getting Linux/UNIX - Linux ISOs - Kernels - RPMs (rpmfind) - RPMs (pbone) Academic Software for CIS Students - Microsoft Webstore - VMware Webstore Virtualization - VirtualBox - VMware ESXi and vSphere client Standards - IEEE - IETF (RFCs) Academies - Cisco NetSpace	Palo Alto Networks - PAN commands Making Strong Passwords - Password Haystack - Ryan Riley - Strong passwords
---	---	---

VirtualBox Download



Downloads - Oracle VM \ X

Secure | <https://www.virtualbox.org/wiki/Downloads>

Apps Yahoo Cabrillo College Health Network CIS 76 links Lab Development Home Music Training Expand All Other bookmarks

VirtualBox

search...
Login Preferences

Download VirtualBox

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

VirtualBox binaries

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

If you're looking for the latest VirtualBox 5.1 packages, see [VirtualBox 5.1 builds](#). Consider upgrading.

VirtualBox 5.2.12 platform packages

- Windows hosts
- OS X hosts
- Linux distributions
- Solaris hosts

The binaries are released under the terms of the GPL version 2.

See the [changelog](#) for what has changed.

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

- [SHA256 checksums](#), [MD5 checksums](#)

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

VirtualBox 5.2.12 Oracle VM VirtualBox Extension Pack

- [All supported platforms](#)

Support for USB 2.0 and USB 3.0 devices, VirtualBox RDP, disk encryption, NVMe and PXE boot for Intel cards. See [this chapter from the User Manual](#) for an introduction to this Extension Pack. The Extension Pack binaries are released under the [VirtualBox Personal Use and Evaluation License \(PUEL\)](#). Please install the same version extension pack as your installed version of VirtualBox.

VirtualBox 5.2.12 Software Developer Kit (SDK)

- [All platforms](#)

User Manual

<https://www.virtualbox.org/wiki/Downloads>

Enable Virtualization in the BIOS

Boot into your BIOS and enable the following:

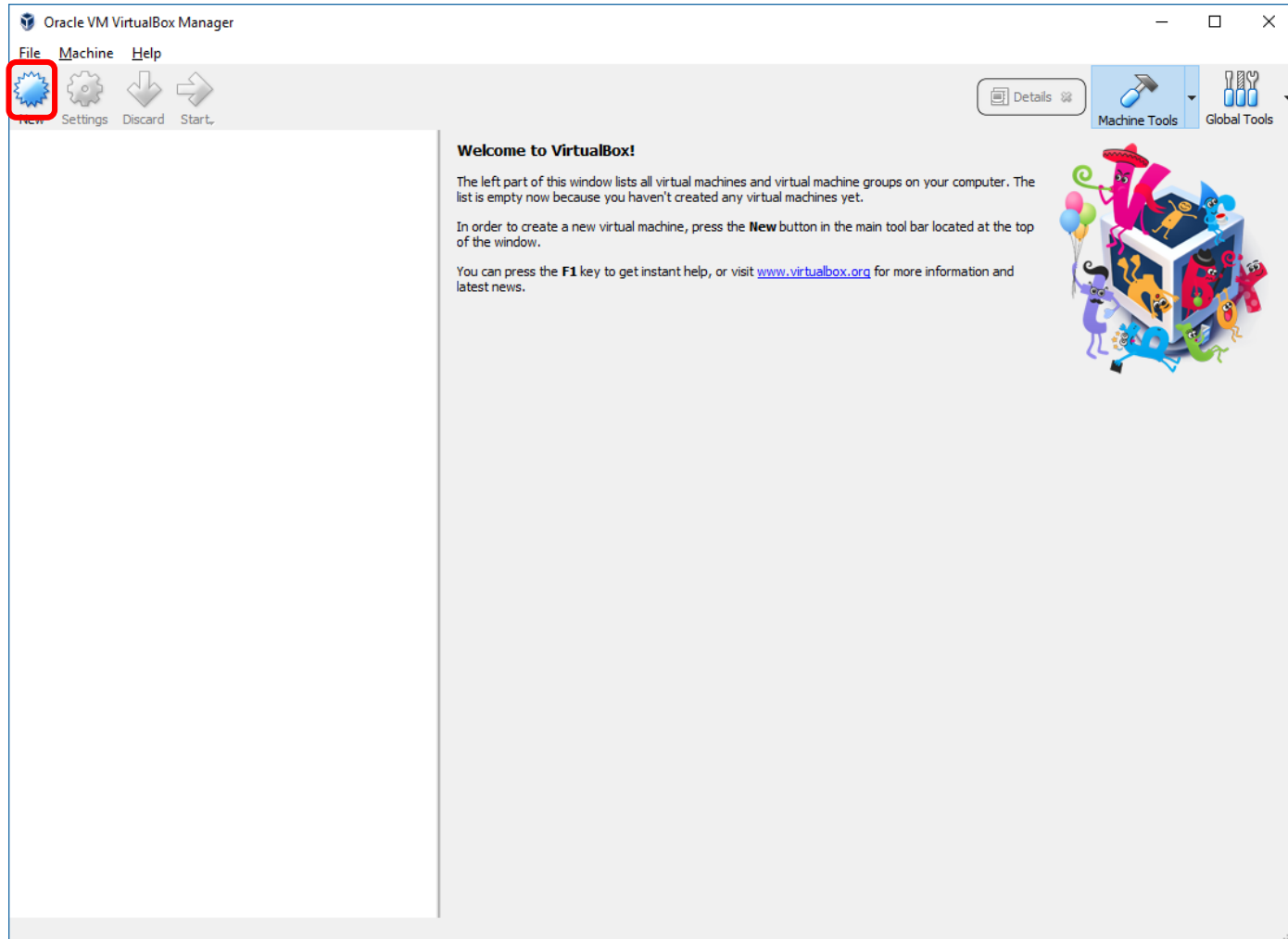
1. Intel Virtualization Technology (also known as Intel VT) or AMD-V.
2. If available, enable Intel VTd or AMD IOMMU.

<http://www.fixedbyvonnice.com/2014/11/virtualbox-showing-32-bit-guest-versions-64-bit-host-os/#.Wvzgw4gvyUI>

https://docs-old.fedoraproject.org/en-US/Fedora/13/html/Virtualization_Guide/sect-Virtualization-Troubleshooting-Enabling_Intel_VT_and_AMD_V_virtualization_in_hardware_extensions_in_BIOS.html

Create a new VM

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



After downloading and installing VirtualBox.

Name, OS, RAM and Hard Drive

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

← Create Virtual Machine

Name and operating system

Name: **My-Opus**

Type: **Linux**

Version: **Red Hat (64-bit)**

Memory size

4 MB 16384 MB 1024 MB

Hard disk

☐ Do not add a virtual hard disk

☒ Create a virtual hard disk now

☐ Use an existing virtual hard disk file

Empty

Guided Mode **Create** Cancel

← Create Virtual Hard Disk

File location

My-Opus

File size

4.00 MB 8.00 GB 2.00 TB

Hard disk file type

☒ **VDI (VirtualBox Disk Image)**

☐ VHD (Virtual Hard Disk)

☐ VMDK (Virtual Machine Disk)

☐ HDD (Parallels Hard Disk)

☐ QCOW (QEMU Copy-On-Write)

☐ QED (QEMU enhanced disk)

Storage on physical hard disk

☒ Dynamically allocated

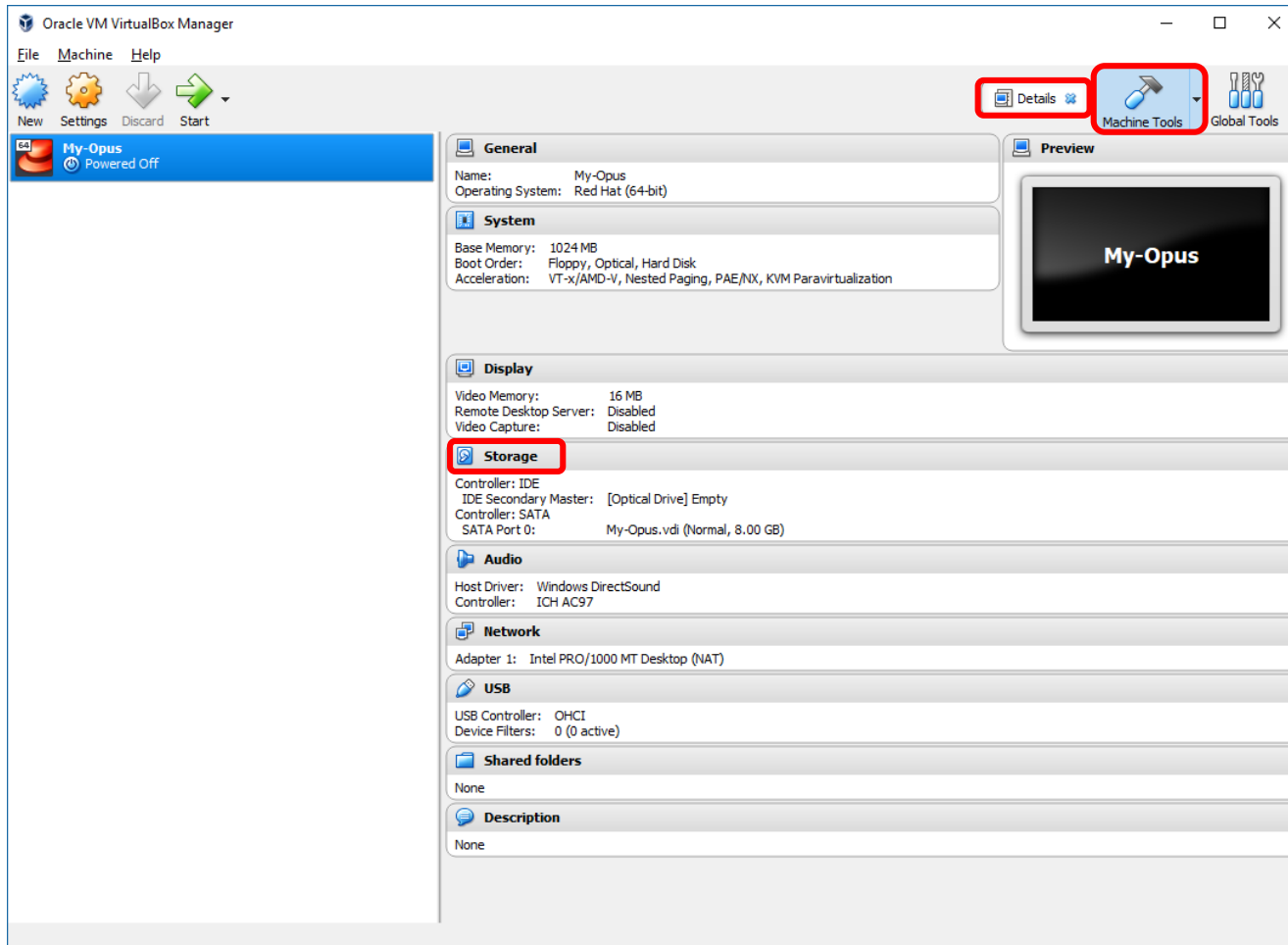
☐ Fixed size

☐ Split into files of less than 2GB

Guided Mode **Create** Cancel

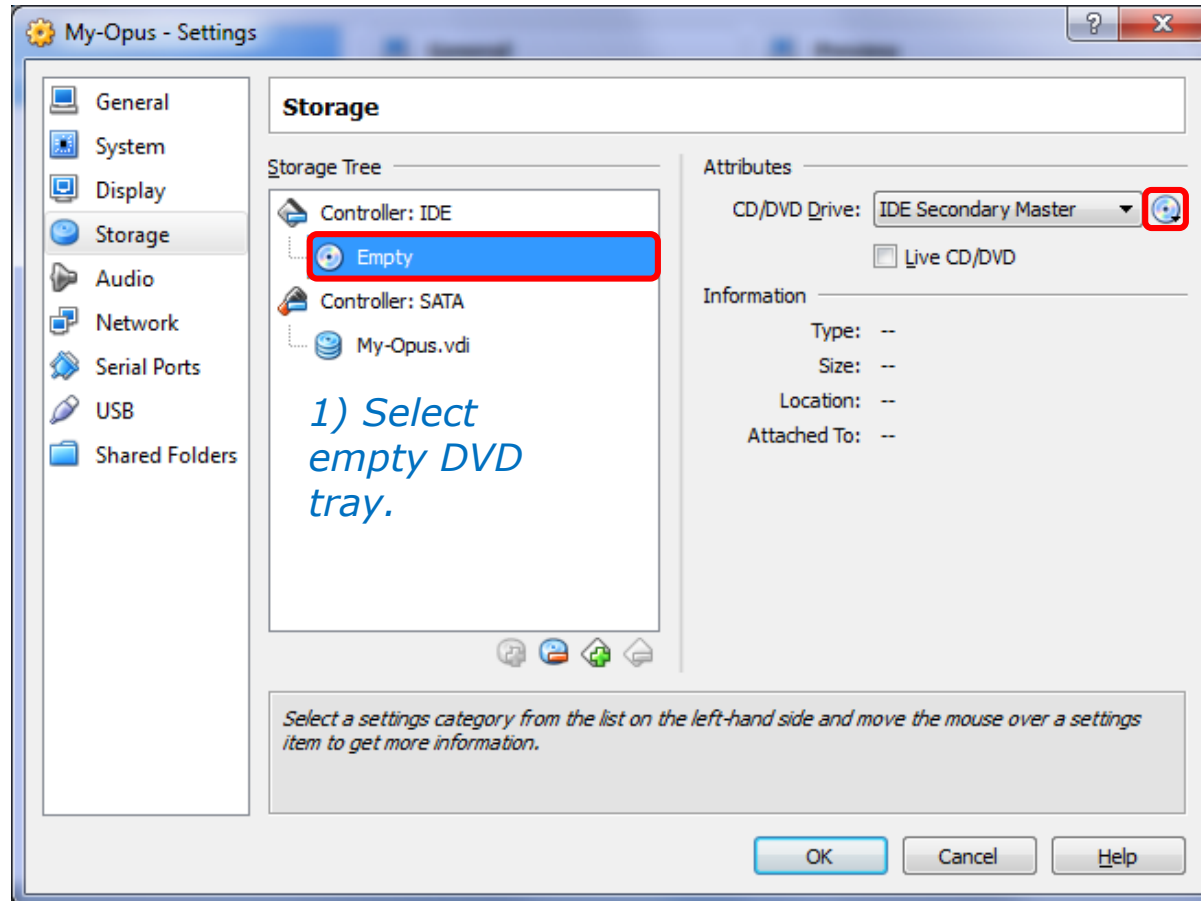
After filling out the Name and operating system, keep pressing Create and take the defaults

Storage: Hard Disk Drive and DVD Drive



The new VM has no operating system. Click on "Storage".

Load the virtual CentOS "DVD" into the virtual DVD tray

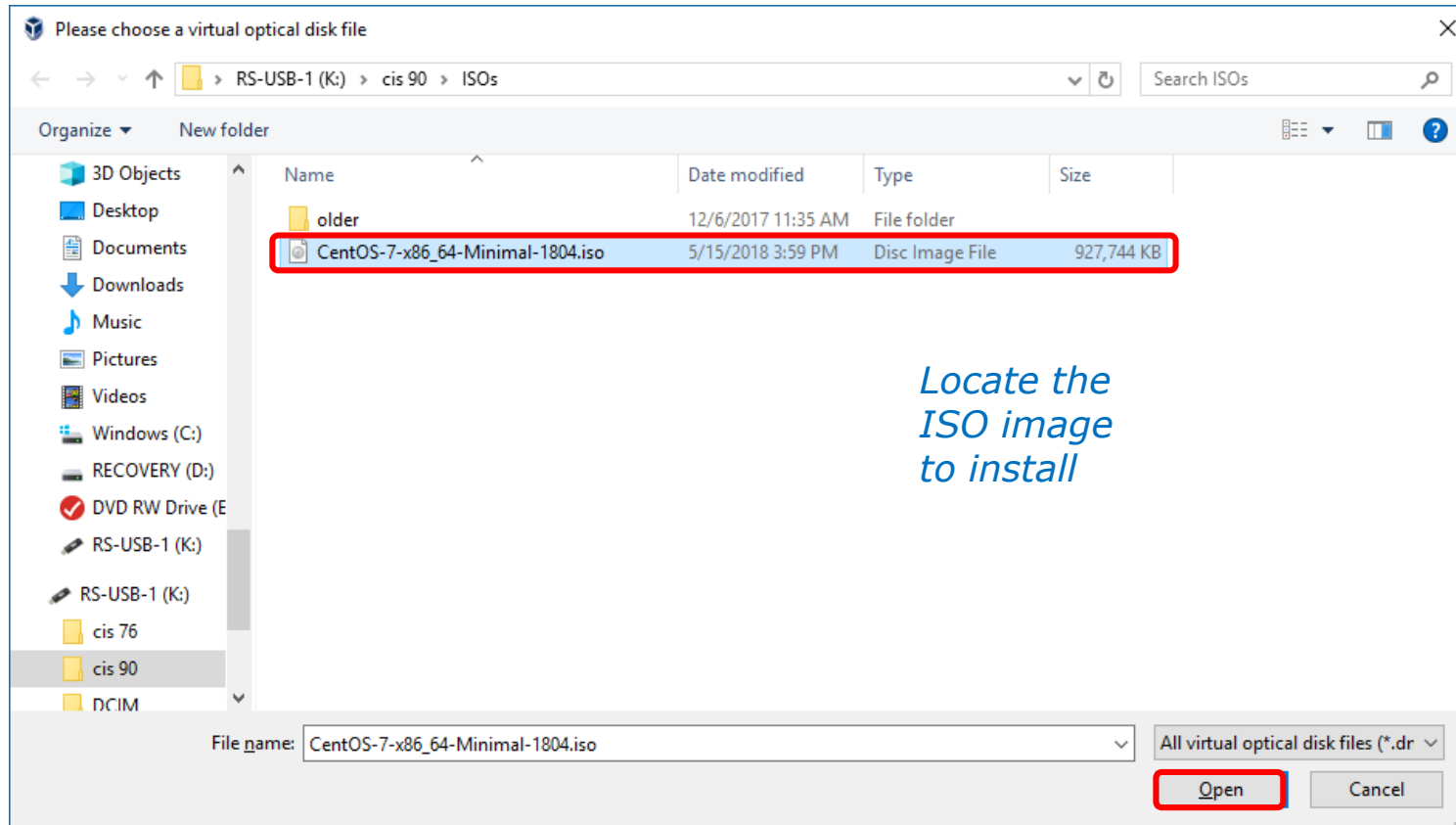


1) Select empty DVD tray.

2) Click the little DVD icon to the left to browse to the CentOS ISO image to install.

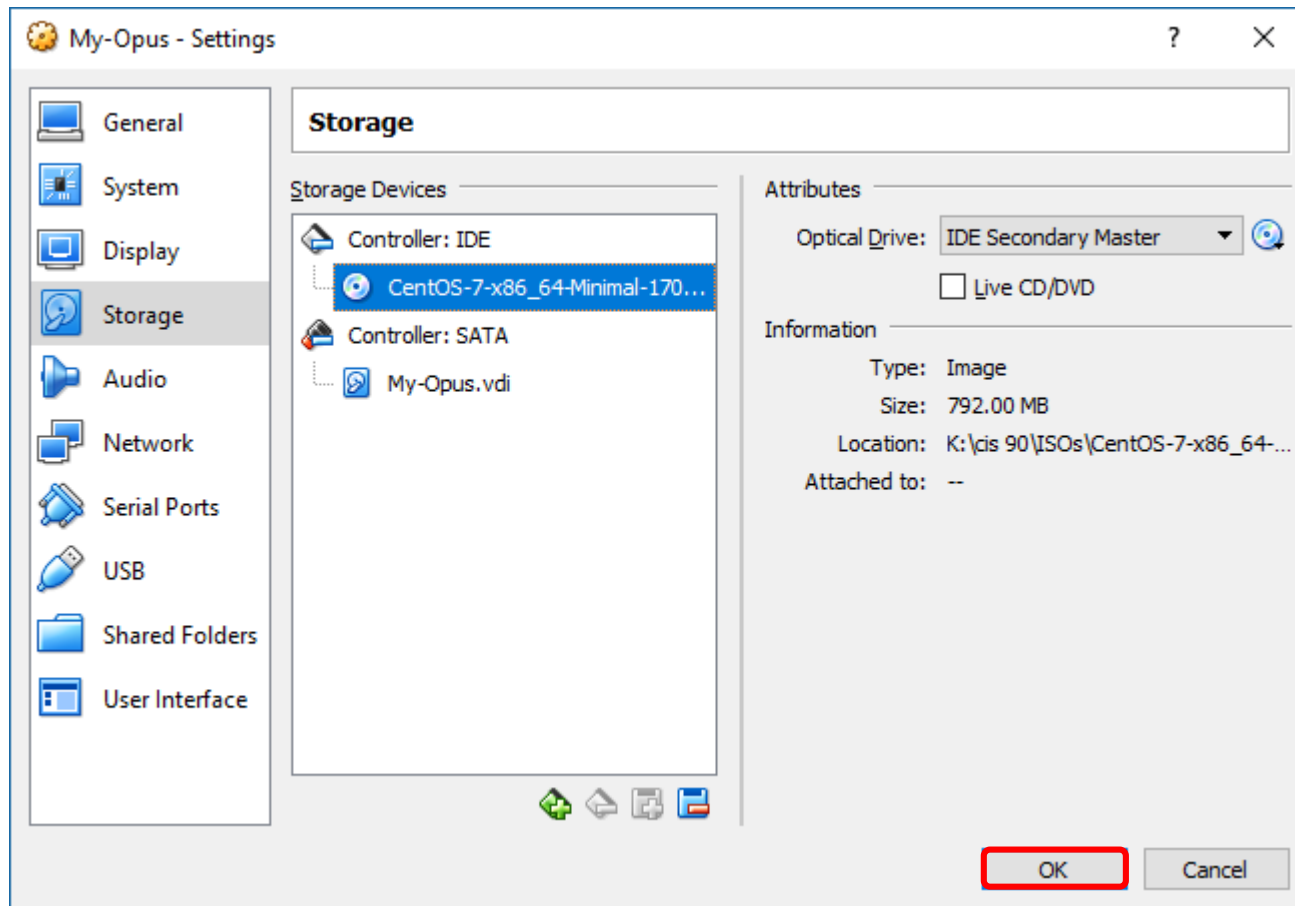
We will be booting from the DVD drive to install the CentOS distro.

Selecting the DVD ISO image



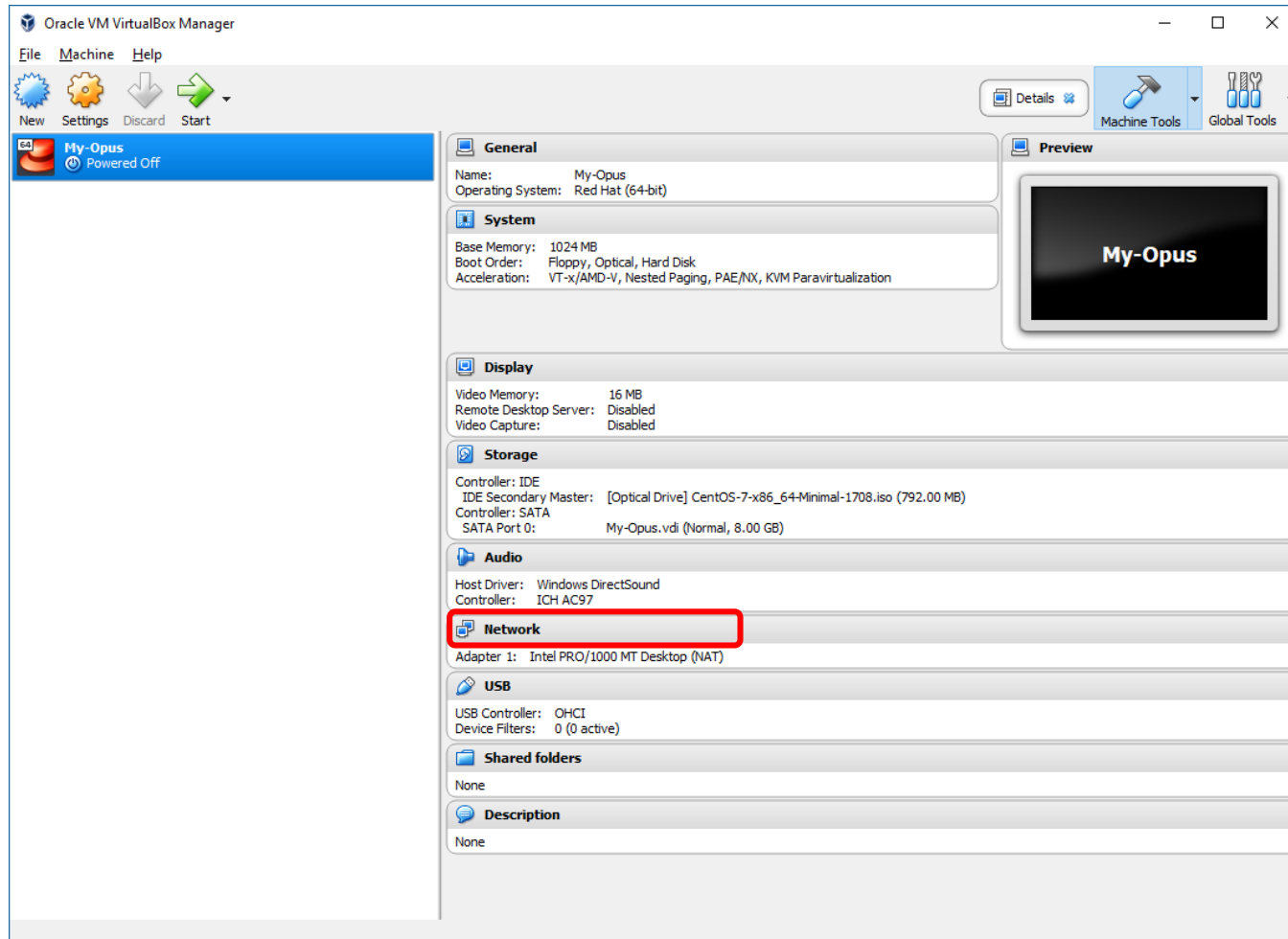
Select the ISO image previously downloaded

The "DVD" is loaded



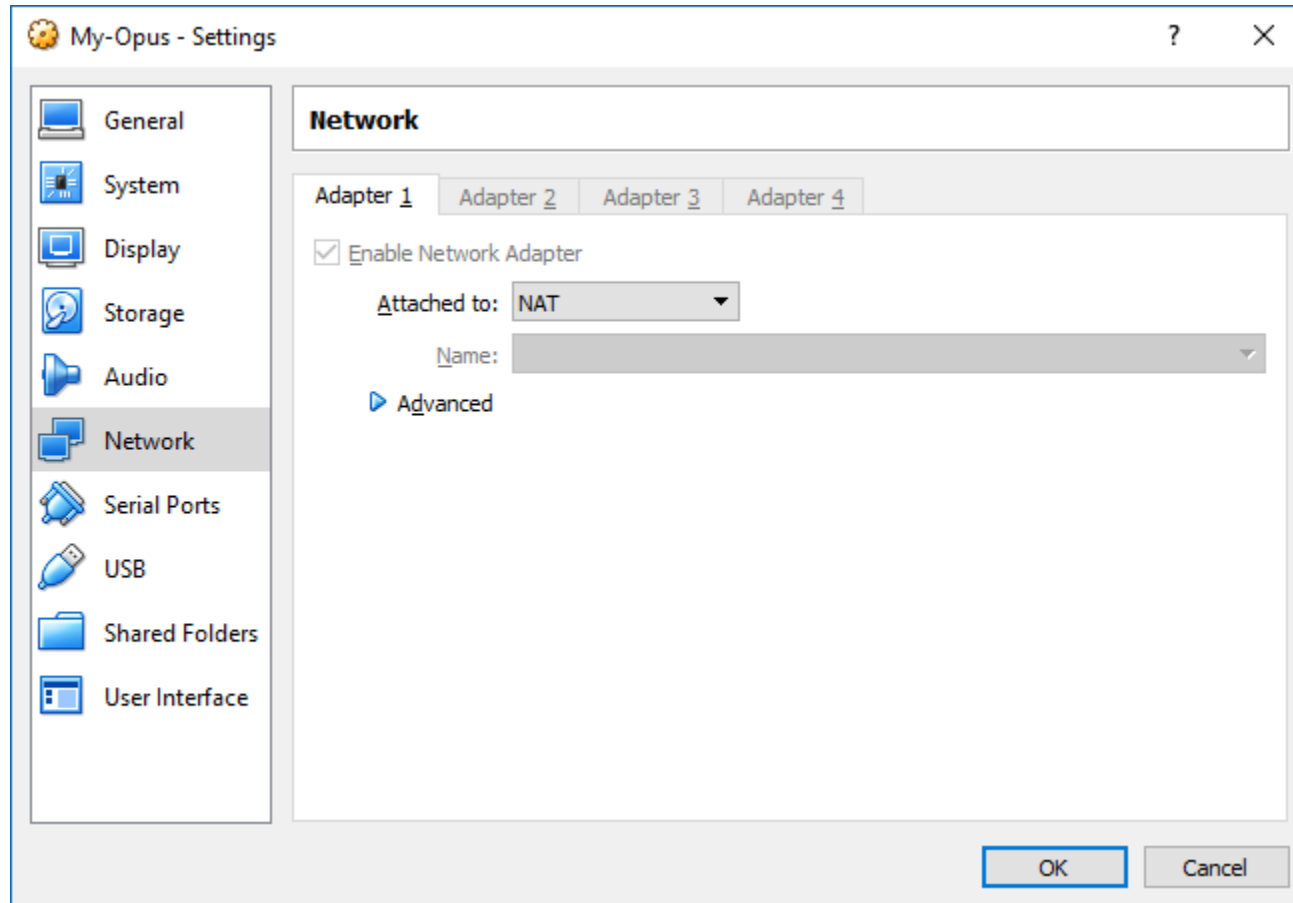
The CD (and ISO image) is now in the virtual CD tray

Network Settings



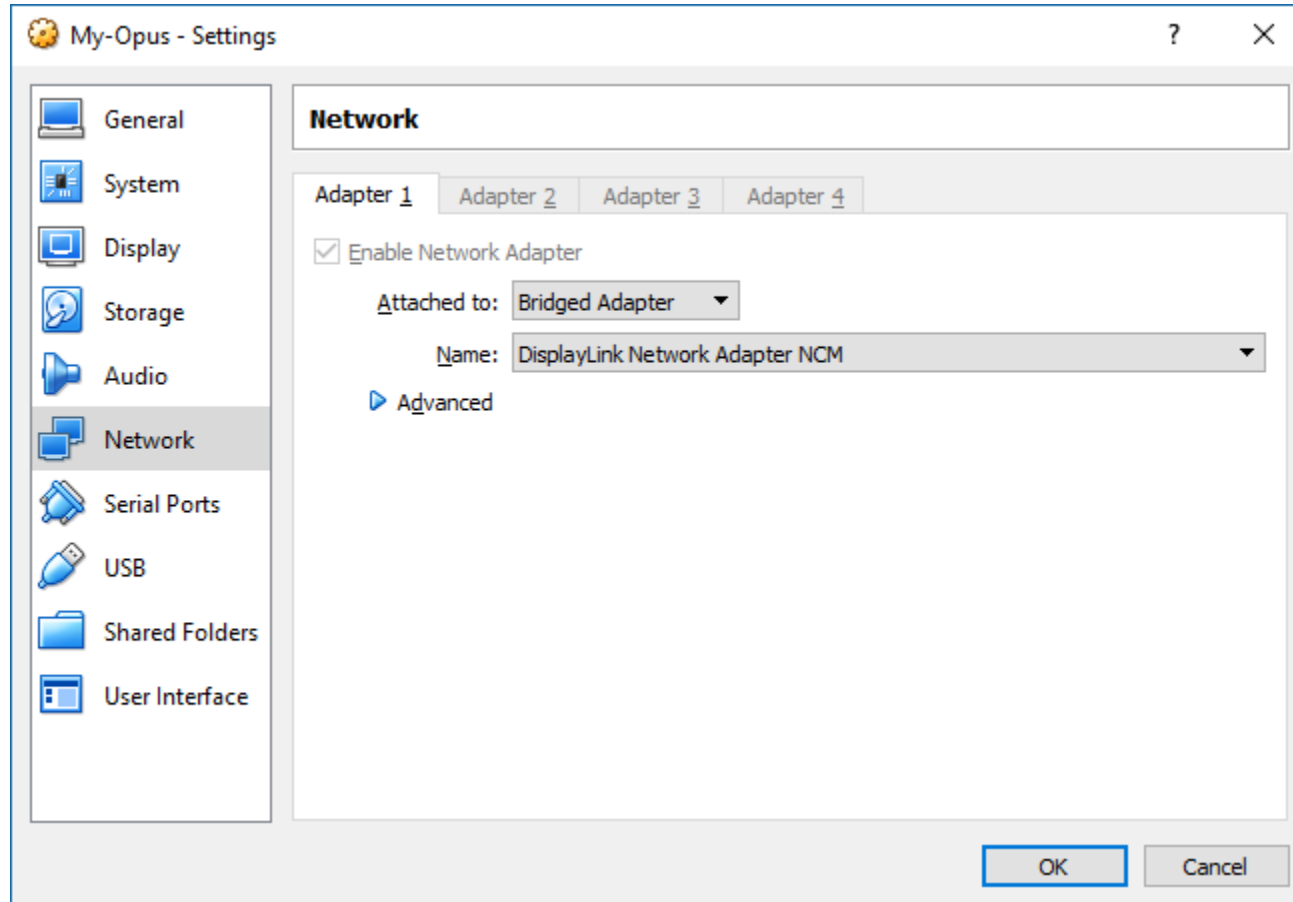
*Click on
Network*

Network Adapter Settings - NAT



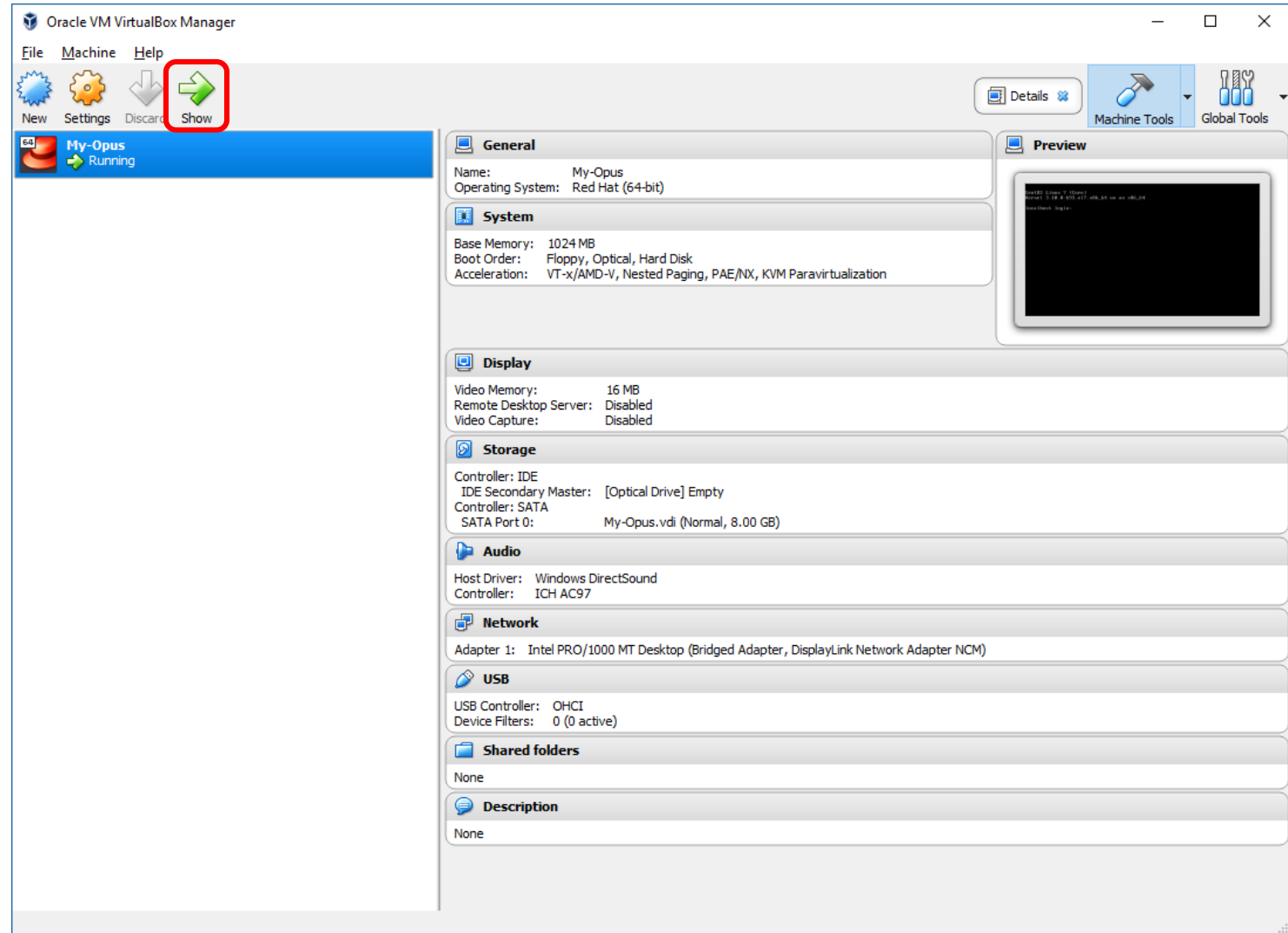
Select NAT (Network Address Translation) so you can connect to network services from a private IP address.

Network Adapter Settings - Bridged

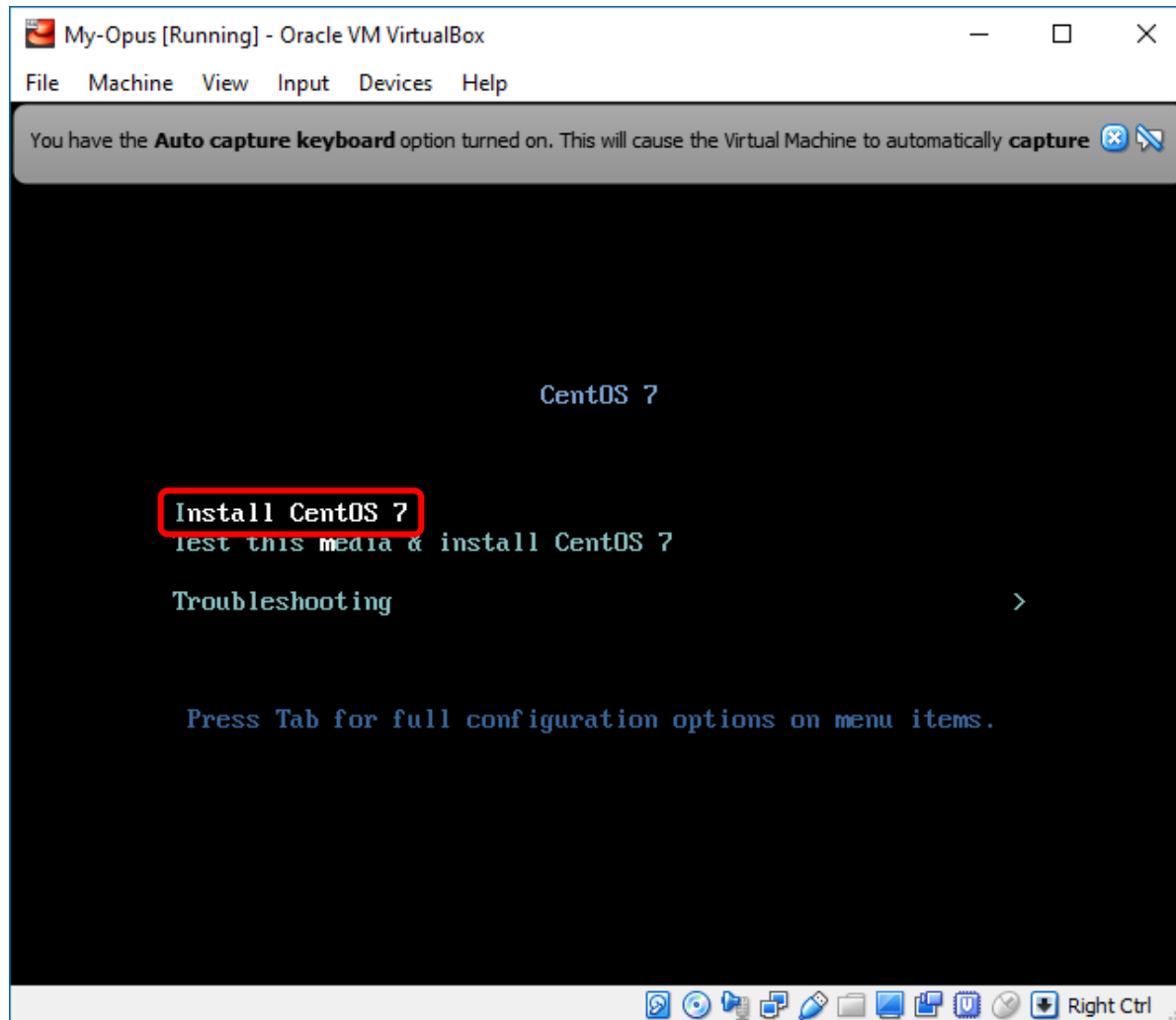


Select Bridged if you want your new VM to be accessible to other systems on the network.

Power on your new VM



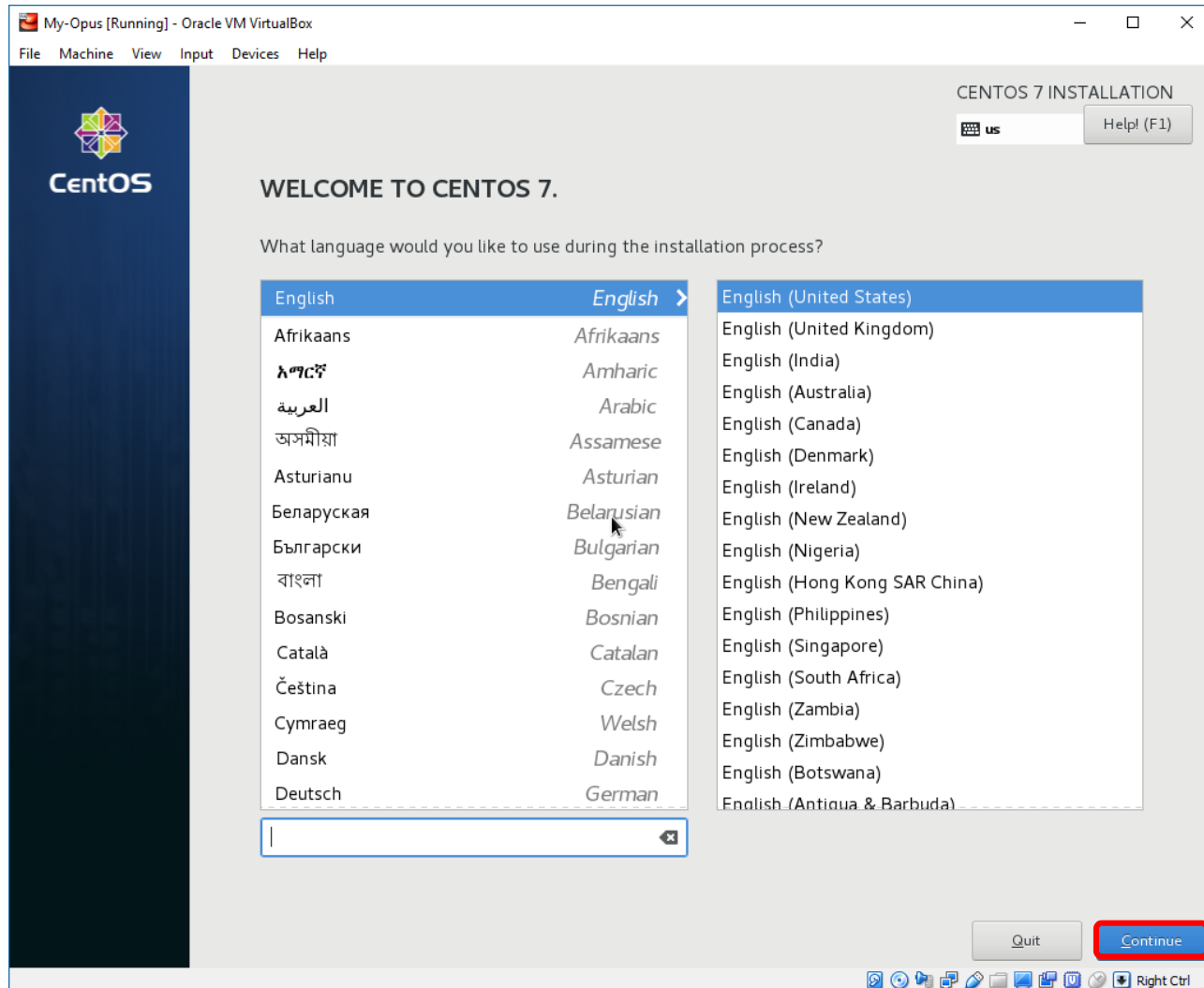
Booting from the installation "DVD"



Allow "Capture" of the mouse by the VM. Use right Ctrl to release if needed.

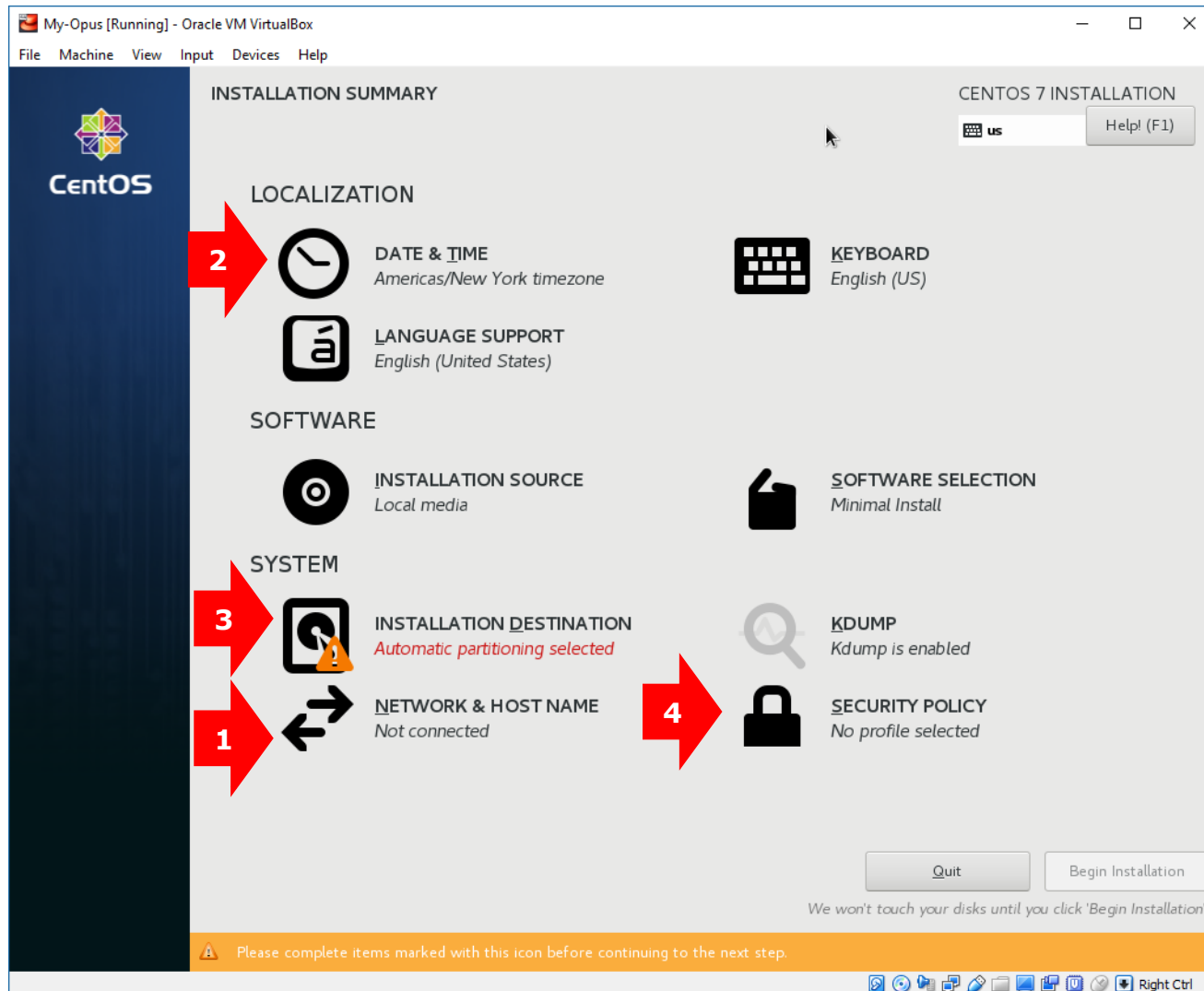
Using arrow keys, select and enter "Install CentOS 7"

Language selection



The English (US) language was selected above

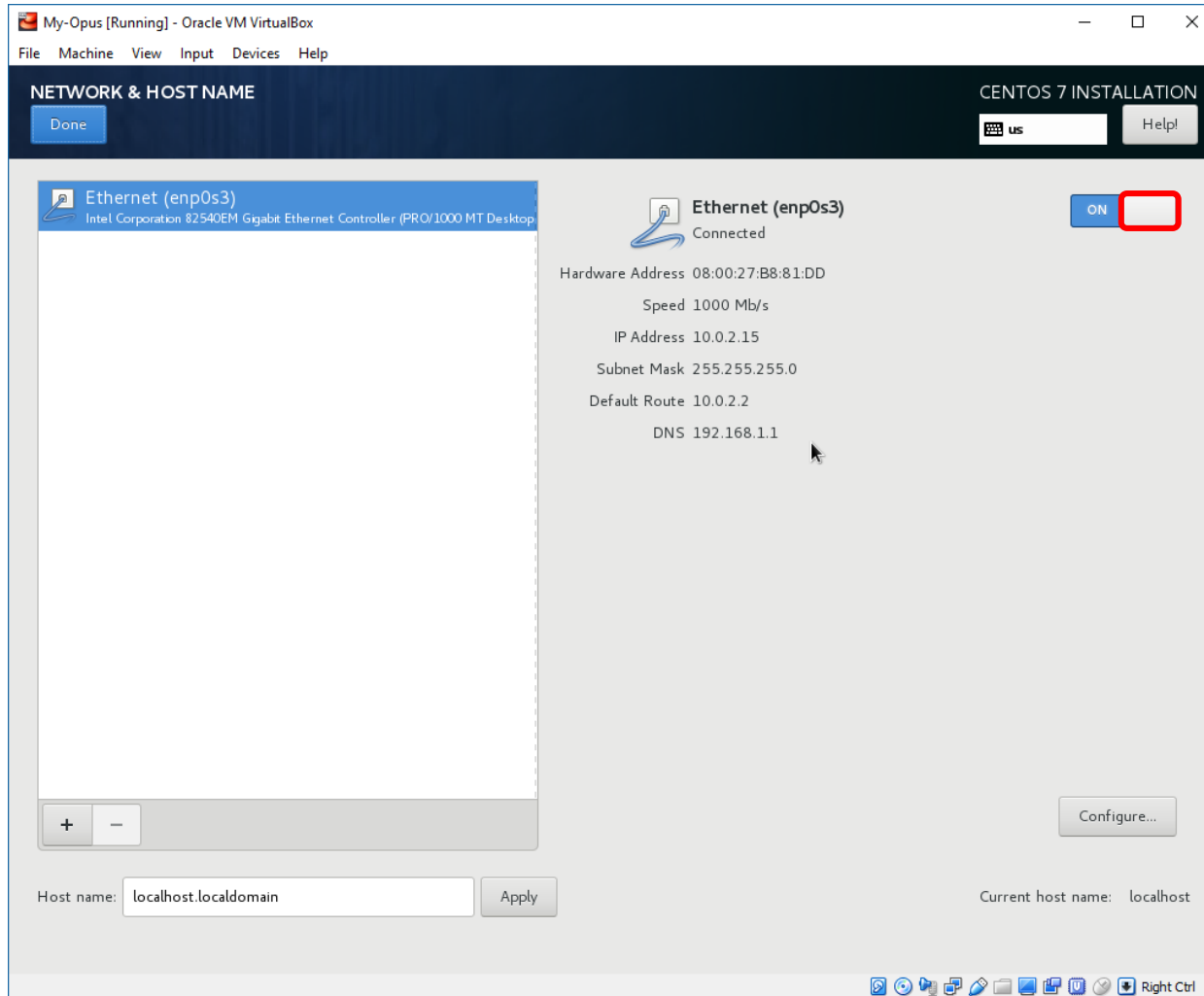
Installation Settings





NETWORK & HOST NAME
Not connected

Configuring the Network Settings



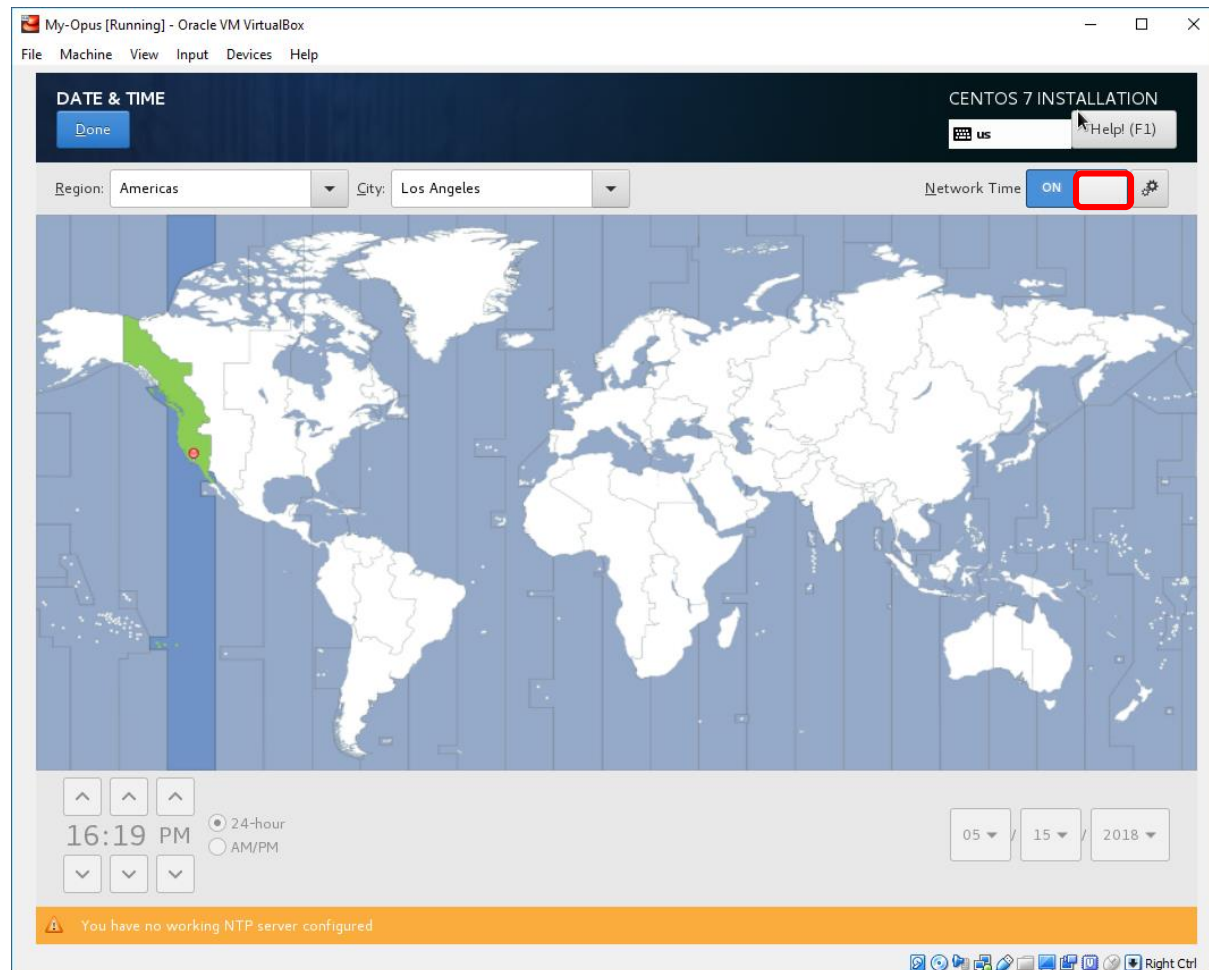
Turn on Network Interface using default settings

LOCALIZATION



DATE & TIME
Americas/New York timezone

Configuring Data & Time



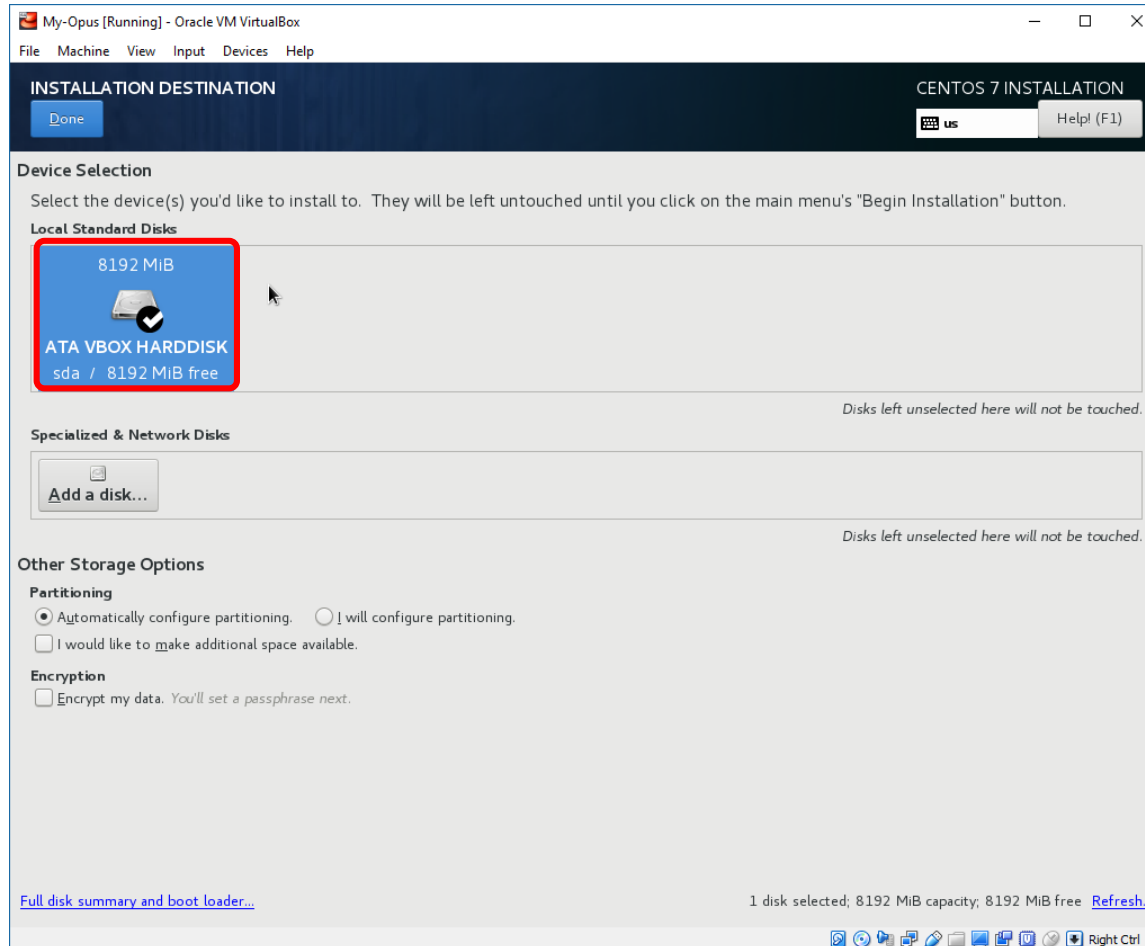
Select your location enable Network Time

SYSTEM



INSTALLATION DESTINATION
Automatic partitioning selected

Configuring the Installation Drive

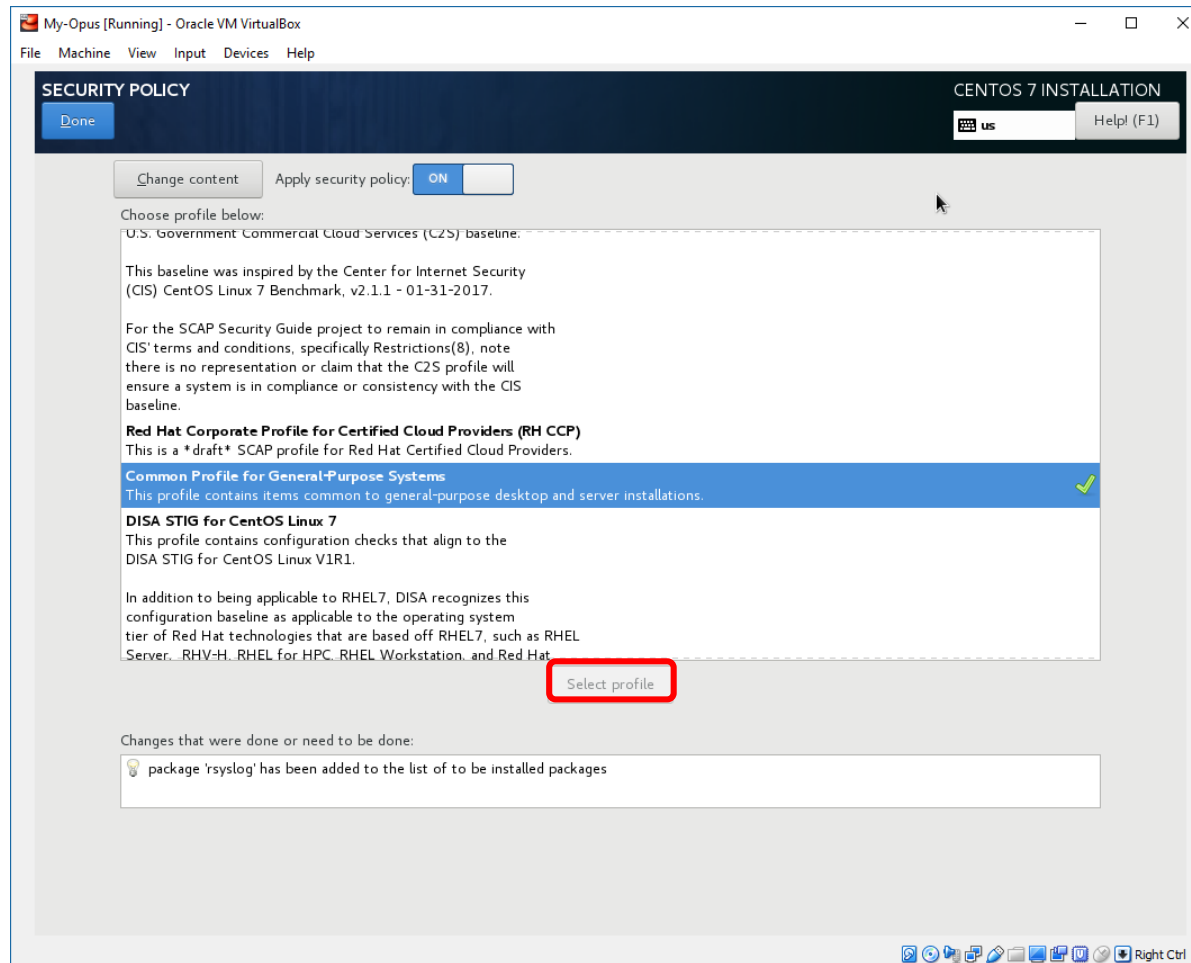


Select the hard drive



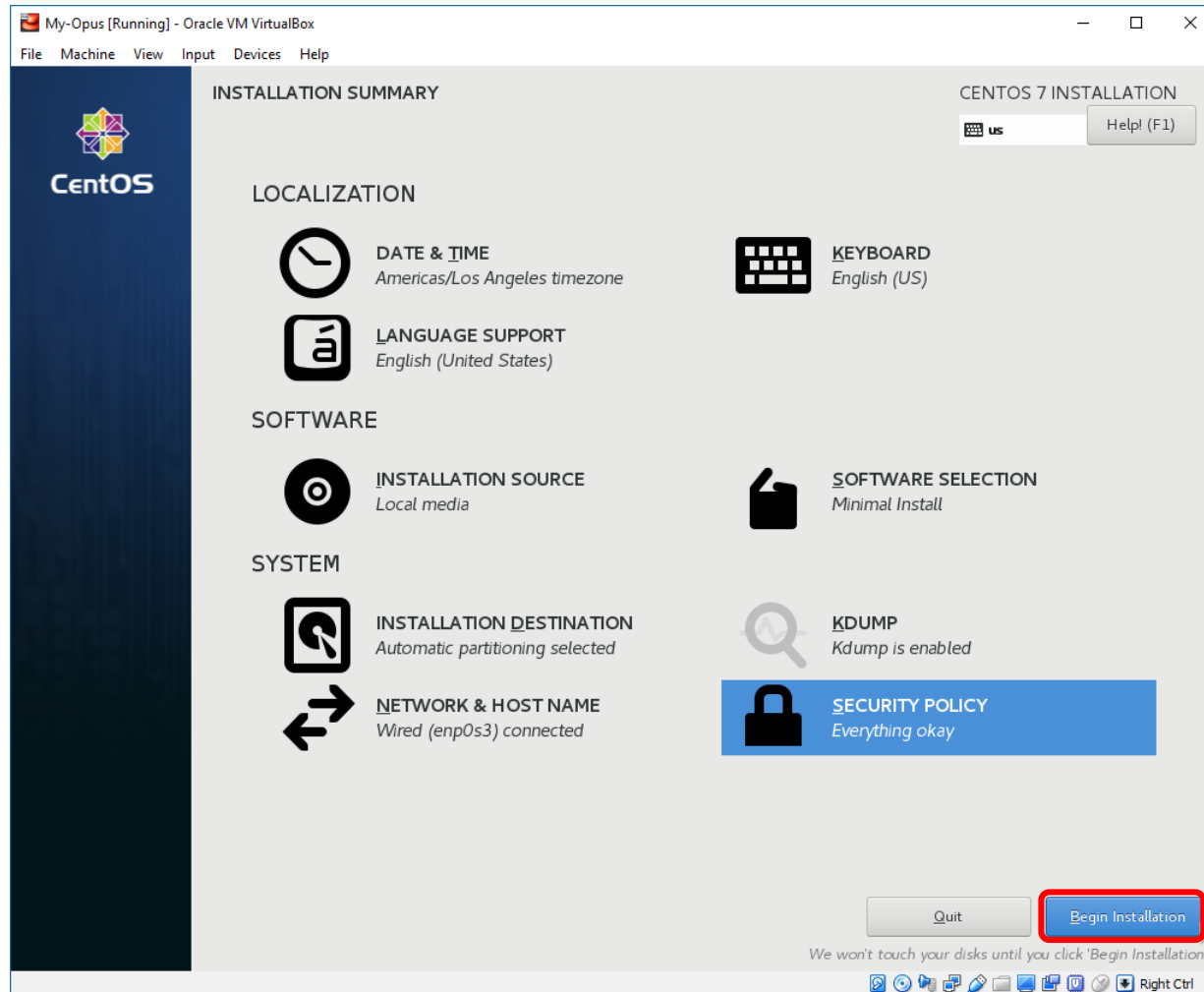
SECURITY POLICY
No profile selected

Configuring the Security Profile



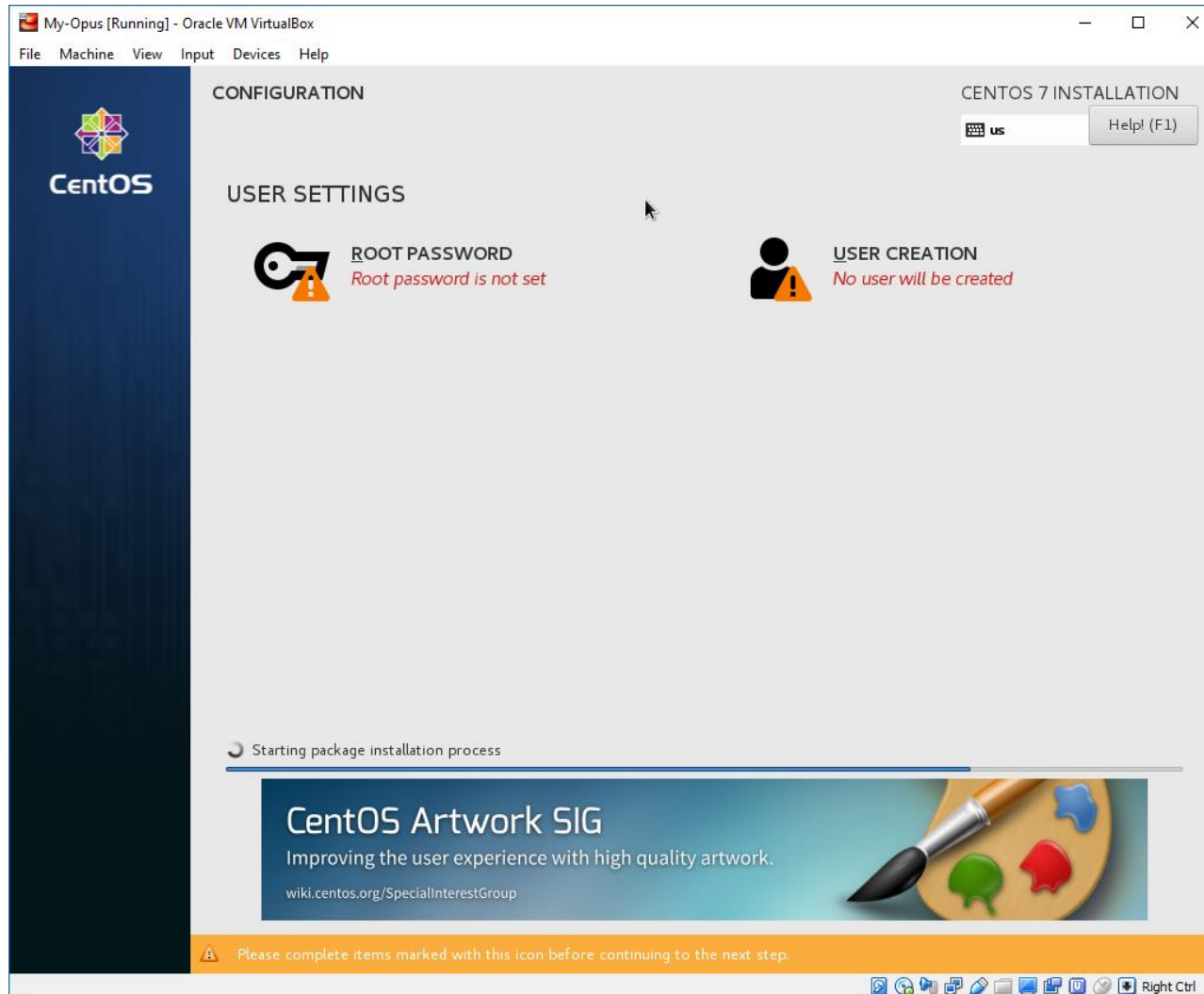
Select Common Profile for General Purpose Systems

Start the Installation



Click the Begin Installation button

Installation Starts



We can set up initial users while installation is proceeding



Set root password

My-Opus [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

ROOT PASSWORD CENTOS 7 INSTALLATION

[Done](#) US Help! (F1)

The root account is used for administering the system. Enter a password for the root user.

Root Password:

Strong

Confirm:

Right Ctrl



USER CREATION
No user will be created

Create first user

My-Opus [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

CREATE USER CENTOS 7 INSTALLATION

Done US Help!

Full name: Rich Simms

User name: rsimms

Tip: Keep your user name shorter than 32 characters and do not use spaces.

☒ Make this user administrator

☒ Require a password to use this account

Password:|

Strong

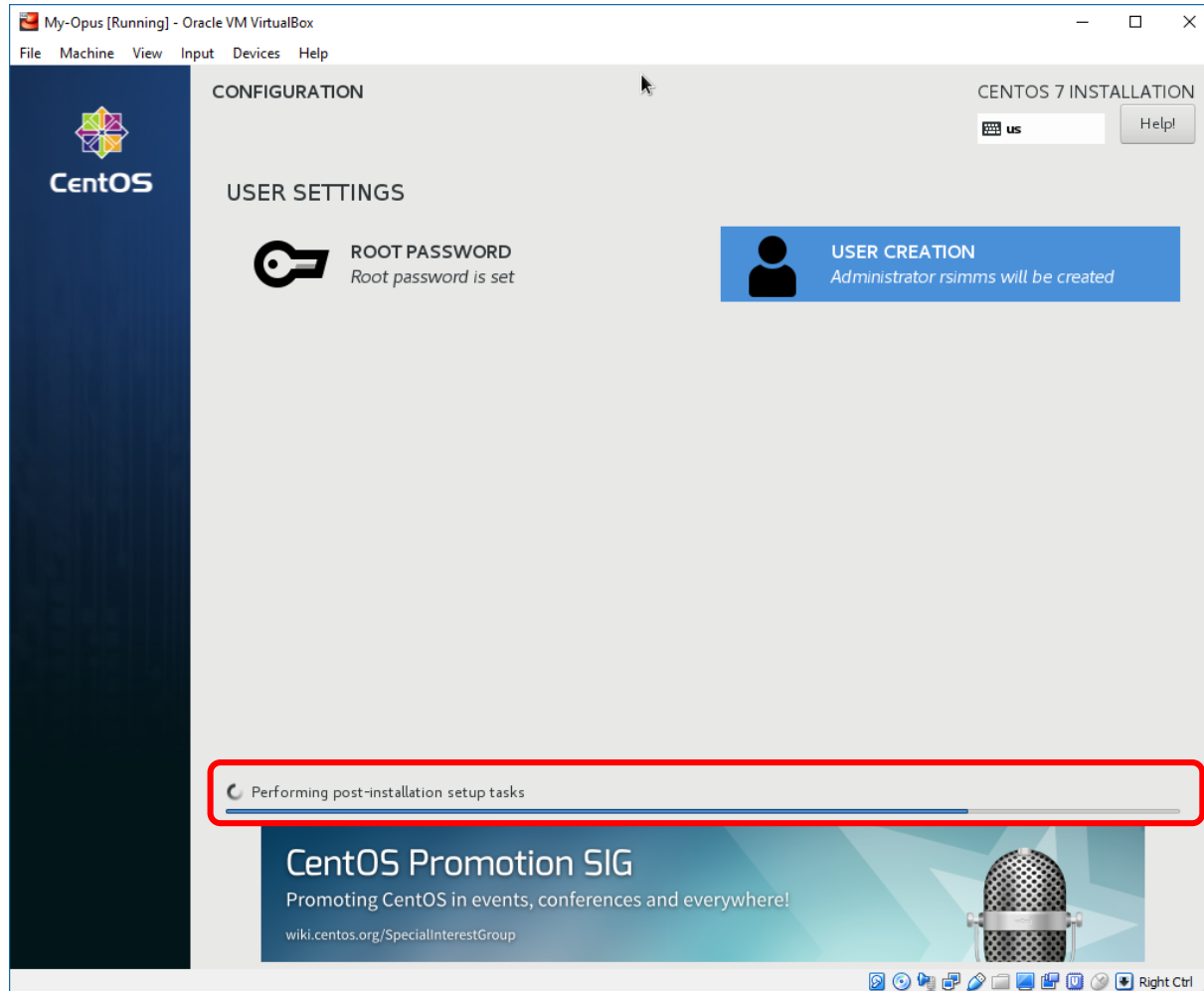
Confirm password:

Advanced...

Right Ctrl

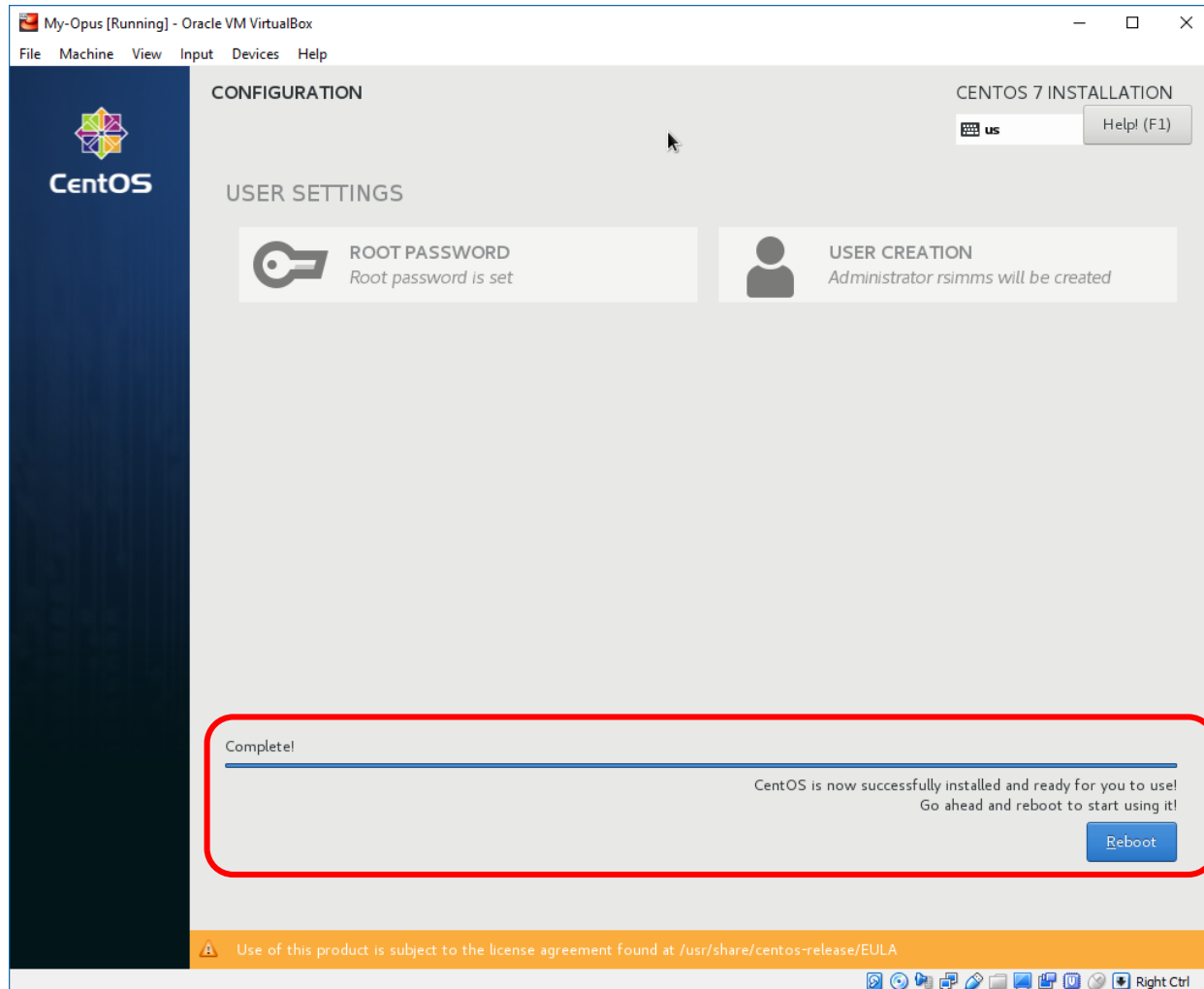
Add yourself as an administrator

Installation Continues



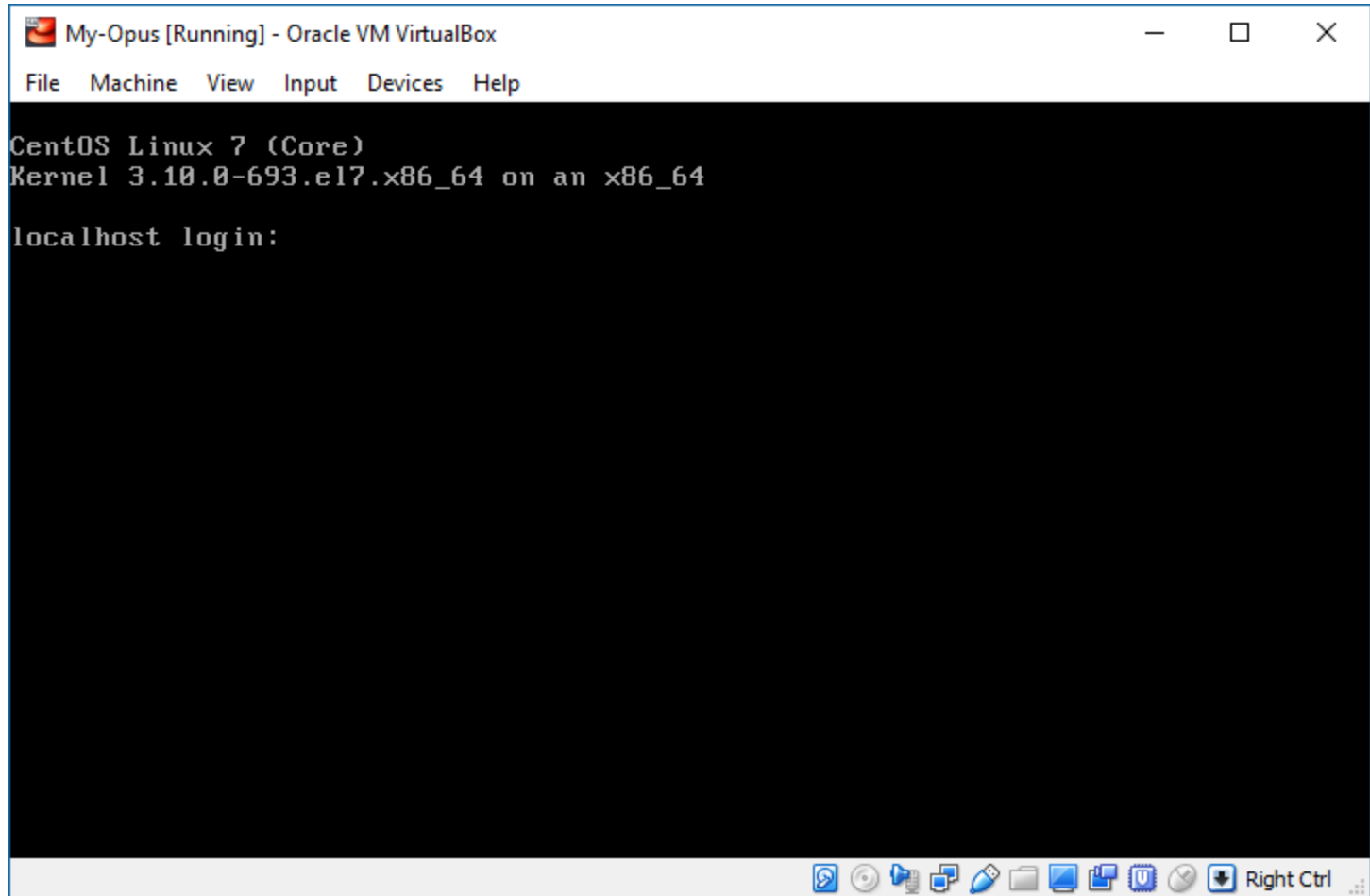
Watch the progress bar moving ...

Installation Completed



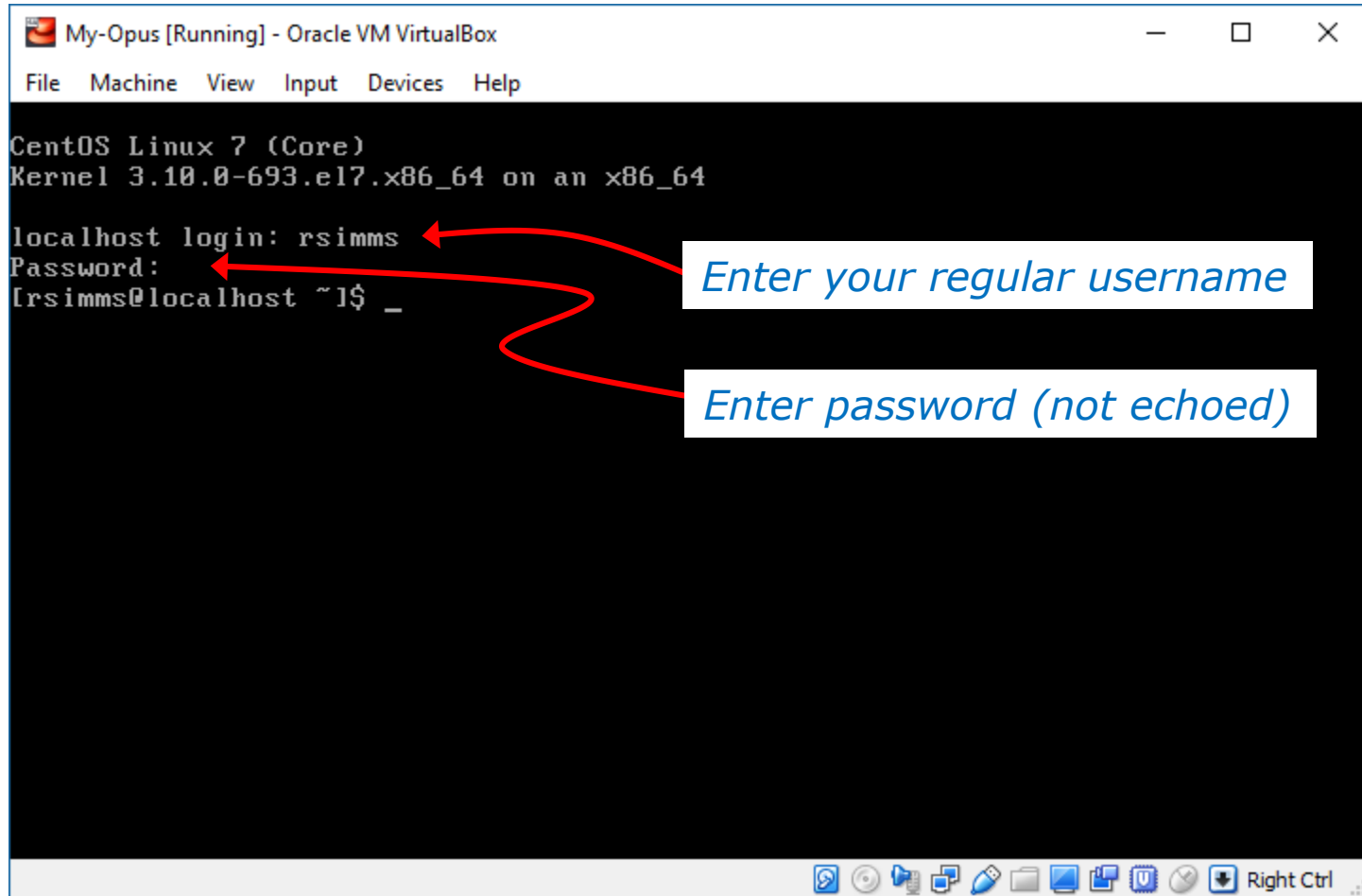
Click Reboot button

Login as regular user



*Login to your new Linux server using
the regular user name you configured*

Login as regular user



```
My-Opus [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

CentOS Linux 7 (Core)
Kernel 3.10.0-693.el7.x86_64 on an x86_64

localhost login: rsimms
Password:
[rsimms@localhost ~]$_
```

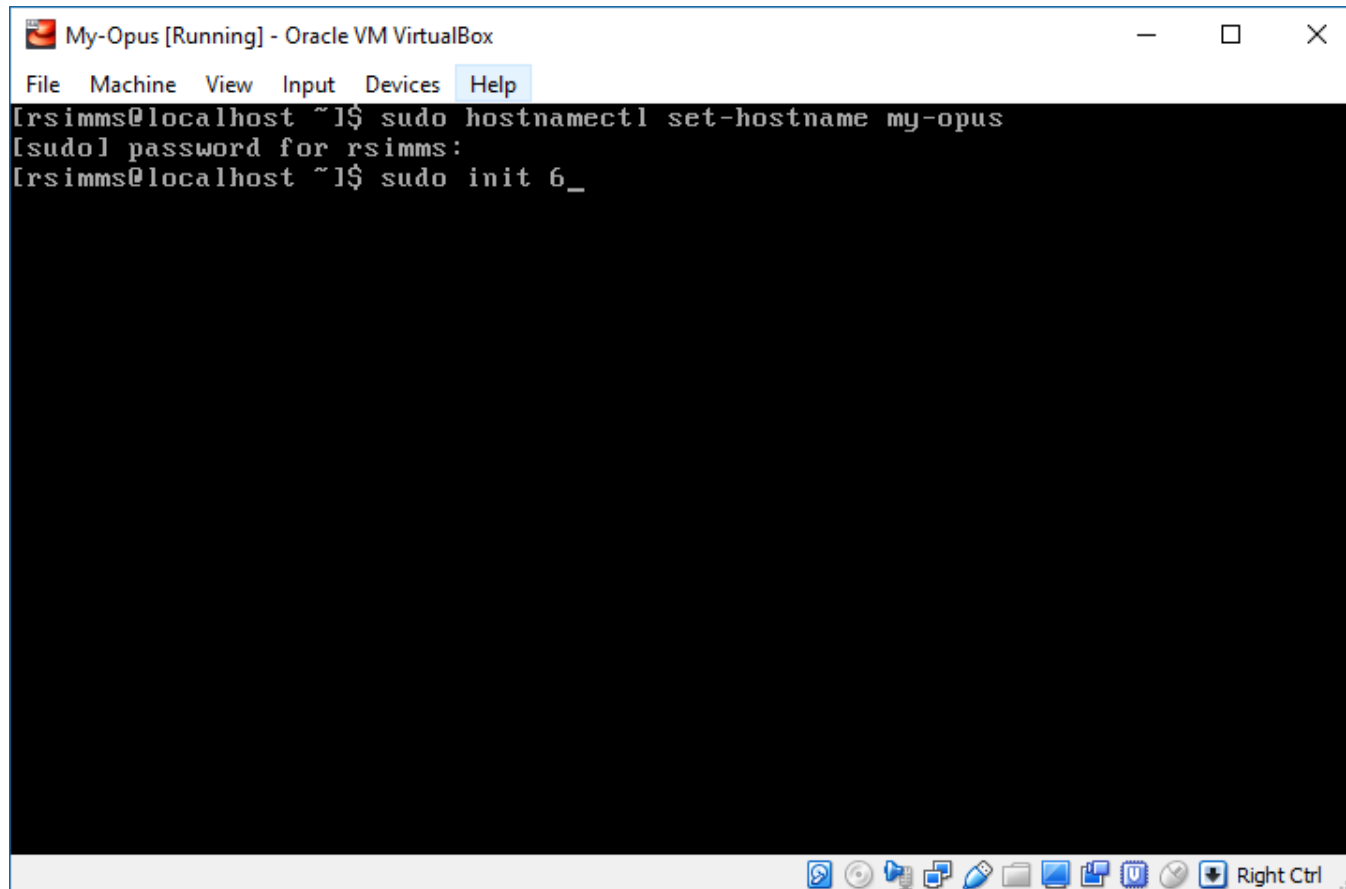
Enter your regular username

Enter password (not echoed)

*Login to your new Linux server using
the regular username you configured*

Configure Hostname

sudo hostnamectl set-hostname my-opus
sudo init 6



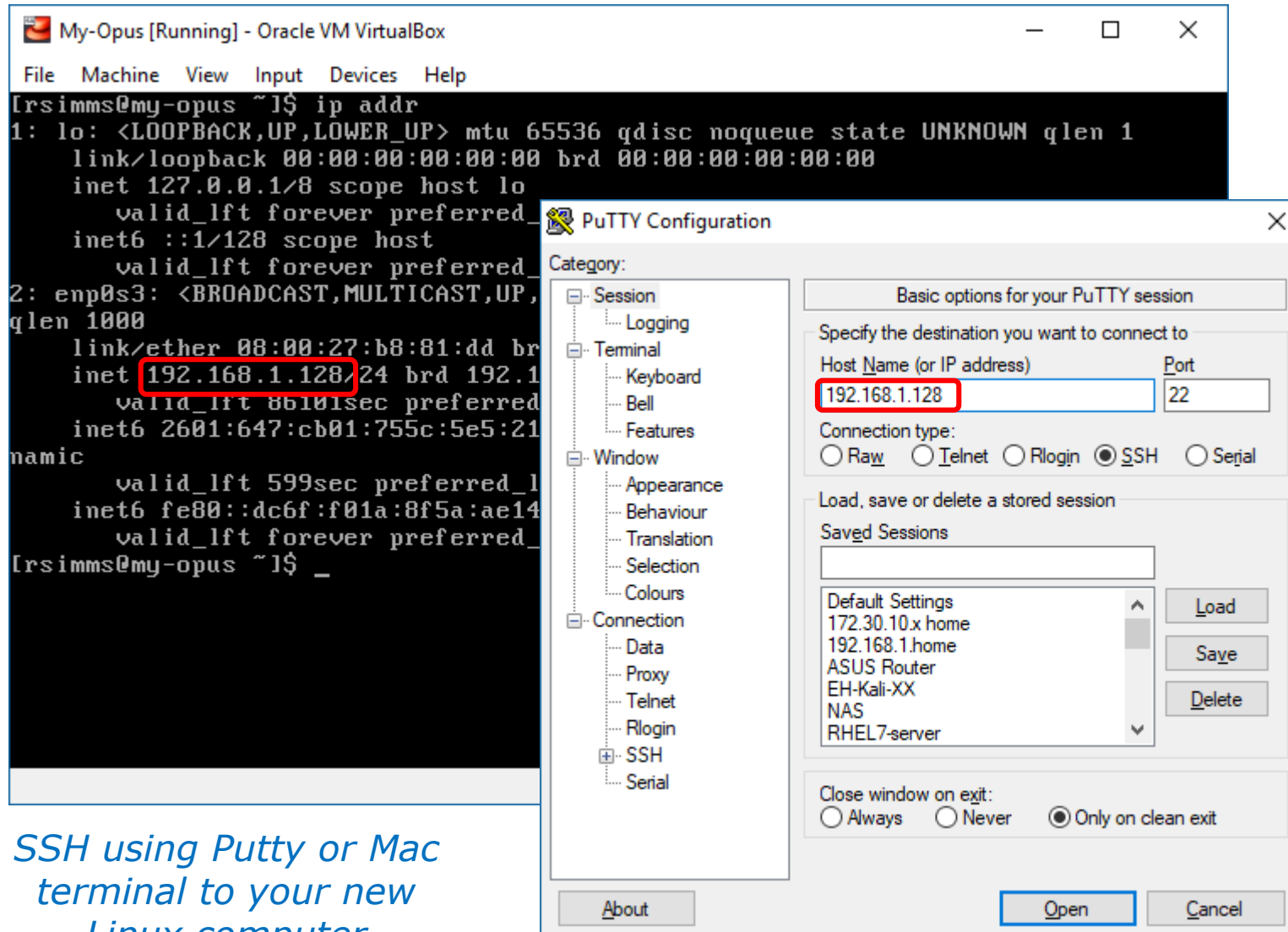
The screenshot shows a terminal window titled "My-Opus [Running] - Oracle VM VirtualBox". The terminal has a menu bar with "File", "Machine", "View", "Input", "Devices", and "Help". The command prompt shows the user "rsimms" at "localhost" in the "~" directory. The user enters the command "sudo hostnamectl set-hostname my-opus", followed by the password prompt "[sudo] password for rsimms:". After entering the password, the user enters "sudo init 6_". The terminal output is not visible, only the commands and prompts are shown. The window has standard Linux-style window controls (minimize, maximize, close) in the top right corner. At the bottom of the window, there is a taskbar with various icons including a clock, network, volume, and a "Right Ctrl" button.

```
My-Opus [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
[rsimms@localhost ~]$ sudo hostnamectl set-hostname my-opus
[sudo] password for rsimms:
[rsimms@localhost ~]$ sudo init 6_
```

Configure the hostname and reboot

SSH into your new VM (if using bridged adapter)

ip addr



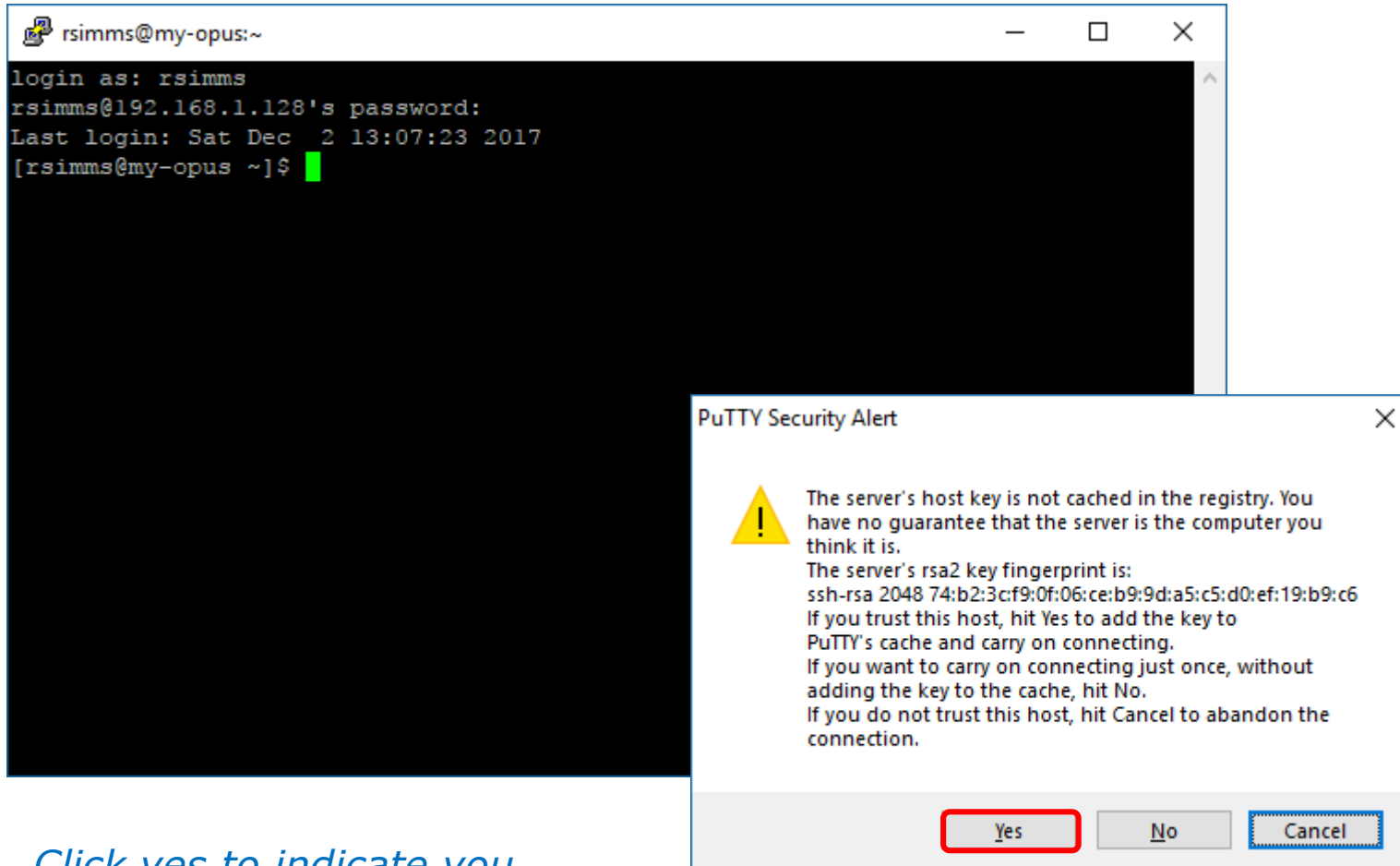
The image shows a screenshot of a virtual machine window titled "My-Opus [Running] - Oracle VM VirtualBox". The terminal window displays the output of the command `ip addr`. The output shows the loopback interface `lo` and the ethernet interface `enp0s3`. The IP address for `enp0s3` is `192.168.1.128`, which is highlighted with a red box. The PuTTY Configuration window is also open, showing the "Basic options for your PuTTY session" category. The "Host Name (or IP address)" field is set to `192.168.1.128`, and the "Port" is set to `22`. The "Connection type" is set to `SSH`. The "Saved Sessions" list includes "Default Settings", "172.30.10.x home", "192.168.1.home", "ASUS Router", "EH-Kali-XX", "NAS", and "RHEL7-server". The "Close window on exit" option is set to "Only on clean exit".

```

[rsimms@my-opus ~]$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP> qlen 1000
    link/ether 08:00:27:b8:81:dd brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.128/24 brd 192.168.1.255 scope global dynamic
        valid_lft 86101sec preferred_lft 599sec
    inet6 fe80::dc6f:f01a:8f5a:ae14%enp0s3 scope link
        valid_lft forever preferred_lft forever
[rsimms@my-opus ~]$ _
  
```

SSH using Putty or Mac terminal to your new Linux computer

SSH first time connection warning

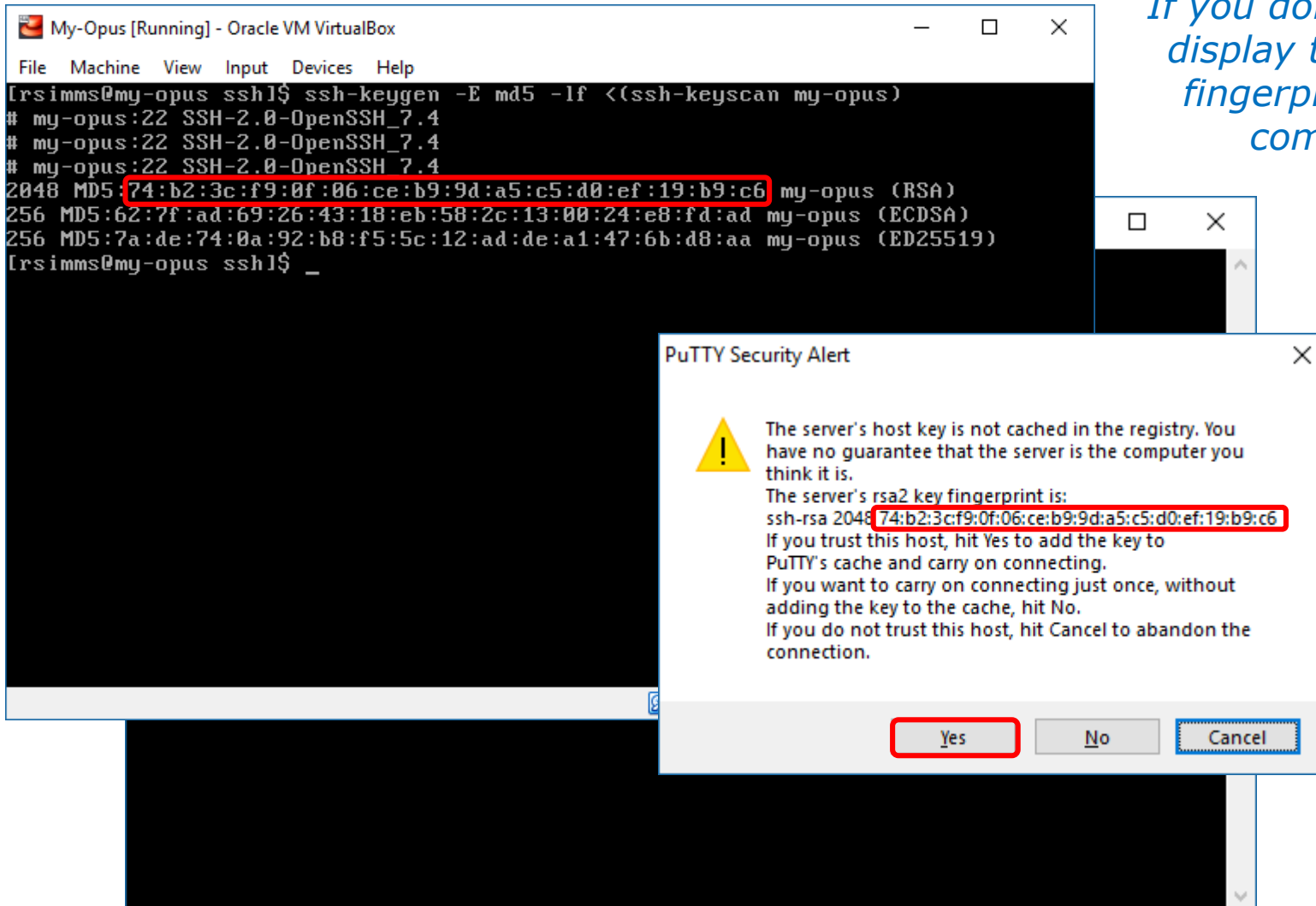


Click yes to indicate you trust the computer you are about to connect to

SSH fingerprint check

ssh-keygen -E md5 -lf <(ssh-keyscan my-opus)

*If you don't trust it,
display the actual
fingerprints and
compare*



The image shows a terminal window titled "My-Opus [Running] - Oracle VM VirtualBox" with a menu bar (File, Machine, View, Input, Devices, Help). The terminal output shows the command `ssh-keygen -E md5 -lf <(ssh-keyscan my-opus)` being executed. The output lists three fingerprints for "my-opus":

- 2048 MD5:74:b2:3c:f9:0f:06:ce:b9:9d:a5:c5:d0:ef:19:b9:c6 my-opus (RSA)
- 256 MD5:62:7f:ad:69:26:43:18:eb:58:2c:13:00:24:e8:fd:ad my-opus (ECDSA)
- 256 MD5:7a:de:74:0a:92:b8:f5:5c:12:ad:de:a1:47:6b:d8:aa my-opus (ED25519)

The first line (RSA fingerprint) is highlighted with a red box. Below the terminal window, a "PuTTY Security Alert" dialog box is displayed. It contains a warning icon and the following text:

The server's host key is not cached in the registry. You have no guarantee that the server is the computer you think it is.
The server's rsa2 key fingerprint is:
ssh-rsa 2048 74:b2:3c:f9:0f:06:ce:b9:9d:a5:c5:d0:ef:19:b9:c6
If you trust this host, hit Yes to add the key to PuTTY's cache and carry on connecting.
If you want to carry on connecting just once, without adding the key to the cache, hit No.
If you do not trust this host, hit Cancel to abandon the connection.

The "Yes" button is highlighted with a red box.

Install Apache Web Server

sudo yum -y install httpd

```
rsimms@my-opus:~$ sudo yum -y install httpd
[sudo] password for rsimms:
Loaded plugins: fastestmirror
Determining fastest mirrors
 * base: linux.mirrors.es.net
 * extras: linux.mirrors.es.net
 * updates: linux.mirrors.es.net
base                               | 3.6 kB    00:00
extras                             | 3.4 kB    00:00
updates                             | 3.4 kB    00:00
(1/4): extras/7/x86_64/primary_db   | 125 kB    00:00
(2/4): base/7/x86_64/group_gz       | 166 kB    00:00
(3/4): base/7/x86_64/primary_db     | 5.9 MB    00:00
(4/4): updates/7/x86_64/primary_db  | 1.0 MB    00:00
Resolving Dependencies
--> Running transaction check
--> Package httpd.x86_64 0:2.4.6-80.el7.centos will be installed
--> Processing Dependency: httpd-tools = 2.4.6-80.el7.centos for package: httpd-2.4.6-80.el7.centos.x86_64
--> Processing Dependency: /etc/mime.types for package: httpd-2.4.6-80.el7.centos.x86_64
--> Processing Dependency: libaprutil-1.so.0()(64bit) for package: httpd-2.4.6-80.el7.centos.x86_64
--> Processing Dependency: libapr-1.so.0()(64bit) for package: httpd-2.4.6-80.el7.centos.x86_64
--> Running transaction check
--> Package apr.x86_64 0:1.4.8-3.el7_4.1 will be installed
--> Package apr-util.x86_64 0:1.5.2-6.el7 will be installed
--> Package httpd-tools.x86_64 0:2.4.6-80.el7.centos will be installed
--> Package mailcap.noarch 0:2.1.41-2.el7 will be installed
--> Finished Dependency Resolution

Dependencies Resolved

=====
Package             Arch           Version           Repository        Size
=====
Installing:
httpd               x86_64         2.4.6-80.el7.centos    base              2.7 M
Installing for dependencies:
apr                 x86_64         1.4.8-3.el7_4.1       base              103 k
apr-util            x86_64         1.5.2-6.el7           base              92 k
httpd-tools         x86_64         2.4.6-80.el7.centos    base              89 k
mailcap             noarch         2.1.41-2.el7          base              31 k
=====

Transaction Summary
=====
Install      1 Package (+4 Dependent packages)
Total download size: 3.0 M
Installed size: 10 M
Downloading packages:
warning: /var/cache/yum/x86_64/7/base/packages/apr-util-1.5.2-6.el7.x86_64.rpm:
Header V3 RSA/SHA256 Signature, key ID f4a80eb5: NOKEY
Public key for apr-util-1.5.2-6.el7.x86_64.rpm is not installed
(1/5): apr-util-1.5.2-6.el7.x86_64.rpm | 92 kB    00:00
(2/5): apr-1.4.8-3.el7_4.1.x86_64.rpm | 103 kB   00:00
(3/5): httpd-tools-2.4.6-80.el7.centos.x86_64.rpm | 89 kB    00:00
(4/5): mailcap-2.1.41-2.el7.noarch.rpm | 31 kB    00:00
(5/5): httpd-2.4.6-80.el7.centos.x86_64.rpm | 2.7 MB   00:00
-----
Total                               5.5 MB/s | 3.0 MB   00:00
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Importing GPG key 0xF4A80EB5:
  Userid      : "CentOS-7 Key (CentOS 7 Official Signing Key) <security@centos.org>"
  Fingerprint: 6341 ab27 53d7 8a78 a7c2 7bb1 24c6 a8a7 f4a8 0eb5
  Package     : centos-release-7-5.1804.el7.centos.x86_64 (@anaconda)
  From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : apr-1.4.8-3.el7_4.1.x86_64                                1/5
  Installing : apr-util-1.5.2-6.el7.x86_64                             2/5
  Installing : httpd-tools-2.4.6-80.el7.centos.x86_64                  3/5
  Installing : mailcap-2.1.41-2.el7.noarch                             4/5
  Installing : httpd-2.4.6-80.el7.centos.x86_64                        5/5
  Verifying   : httpd-tools-2.4.6-80.el7.centos.x86_64                  1/5
  Verifying   : apr-1.4.8-3.el7_4.1.x86_64                             2/5
  Verifying   : mailcap-2.1.41-2.el7.noarch                             3/5
  Verifying   : httpd-2.4.6-80.el7.centos.x86_64                       4/5
  Verifying   : apr-util-1.5.2-6.el7.x86_64                             5/5

Installed:
  httpd.x86_64 0:2.4.6-80.el7.centos

Dependency Installed:
  apr.x86_64 0:1.4.8-3.el7_4.1          apr-util.x86_64 0:1.5.2-6.el7
  httpd-tools.x86_64 0:2.4.6-80.el7.centos mailcap.noarch 0:2.1.41-2.el7

Complete!
rsimms@my-opus:~$
```

```
rsimms@my-opus:~$ sudo yum -y install httpd
Install 1 Package (+4 Dependent packages)

Total download size: 3.0 M
Installed size: 10 M
Downloading packages:
warning: /var/cache/yum/x86_64/7/base/packages/apr-util-1.5.2-6.el7.x86_64.rpm:
Header V3 RSA/SHA256 Signature, key ID f4a80eb5: NOKEY
Public key for apr-util-1.5.2-6.el7.x86_64.rpm is not installed
(1/5): apr-util-1.5.2-6.el7.x86_64.rpm | 92 kB    00:00
(2/5): apr-1.4.8-3.el7_4.1.x86_64.rpm | 103 kB   00:00
(3/5): httpd-tools-2.4.6-80.el7.centos.x86_64.rpm | 89 kB    00:00
(4/5): mailcap-2.1.41-2.el7.noarch.rpm | 31 kB    00:00
(5/5): httpd-2.4.6-80.el7.centos.x86_64.rpm | 2.7 MB   00:00
-----
Total                               5.5 MB/s | 3.0 MB   00:00
Retrieving key from file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Importing GPG key 0xF4A80EB5:
  Userid      : "CentOS-7 Key (CentOS 7 Official Signing Key) <security@centos.org>"
  Fingerprint: 6341 ab27 53d7 8a78 a7c2 7bb1 24c6 a8a7 f4a8 0eb5
  Package     : centos-release-7-5.1804.el7.centos.x86_64 (@anaconda)
  From        : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : apr-1.4.8-3.el7_4.1.x86_64                                1/5
  Installing : apr-util-1.5.2-6.el7.x86_64                             2/5
  Installing : httpd-tools-2.4.6-80.el7.centos.x86_64                  3/5
  Installing : mailcap-2.1.41-2.el7.noarch                             4/5
  Installing : httpd-2.4.6-80.el7.centos.x86_64                        5/5
  Verifying   : httpd-tools-2.4.6-80.el7.centos.x86_64                  1/5
  Verifying   : apr-1.4.8-3.el7_4.1.x86_64                             2/5
  Verifying   : mailcap-2.1.41-2.el7.noarch                             3/5
  Verifying   : httpd-2.4.6-80.el7.centos.x86_64                       4/5
  Verifying   : apr-util-1.5.2-6.el7.x86_64                             5/5

Installed:
  httpd.x86_64 0:2.4.6-80.el7.centos

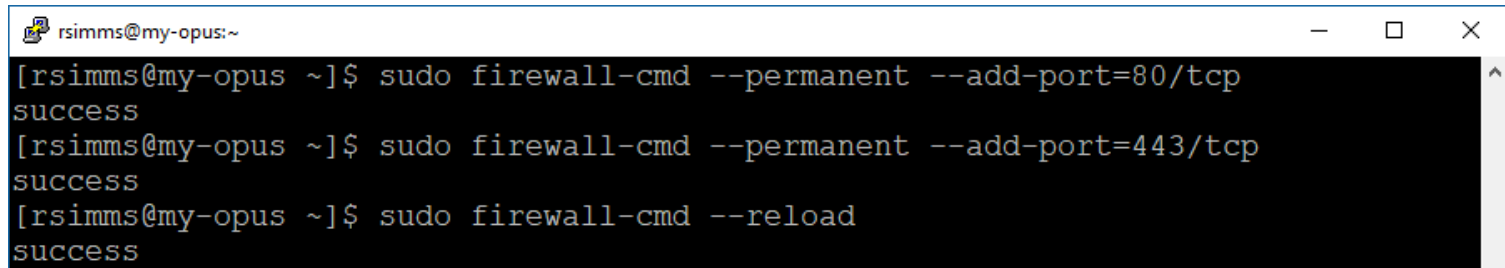
Dependency Installed:
  apr.x86_64 0:1.4.8-3.el7_4.1          apr-util.x86_64 0:1.5.2-6.el7
  httpd-tools.x86_64 0:2.4.6-80.el7.centos mailcap.noarch 0:2.1.41-2.el7

Complete!
rsimms@my-opus:~$
```

The httpd package is the Apache web server

Configure Firewall to allow incoming HTTP requests

```
sudo firewall-cmd --permanent --add-port=80/tcp  
sudo firewall-cmd --permanent --add-port=443/tcp  
sudo firewall-cmd --reload
```



```
rsimms@my-opus:~  
[rsimms@my-opus ~]$ sudo firewall-cmd --permanent --add-port=80/tcp  
success  
[rsimms@my-opus ~]$ sudo firewall-cmd --permanent --add-port=443/tcp  
success  
[rsimms@my-opus ~]$ sudo firewall-cmd --reload  
success
```

*Poke holes in the firewall for ports 80 (HTTP) and 443 (HTTPS).
This allows remote users access to your Apache web server*

Start and verify Apache Web Service

```
sudo systemctl start httpd  
sudo systemctl enable httpd  
sudo systemctl status httpd
```

```
[rsimms@my-opus ~]$ sudo systemctl start httpd  
[rsimms@my-opus ~]$ sudo systemctl enable httpd  
Created symlink from /etc/systemd/system/multi-user.target.wants/httpd.service to /usr/lib/systemd/system/httpd.service.  
[rsimms@my-opus ~]$ sudo systemctl status httpd  
● httpd.service - The Apache HTTP Server  
   Loaded: loaded (/usr/lib/systemd/system/httpd.service; enabled; vendor preset: disabled)  
   Active: active (running) since Sat 2017-12-02 13:24:19 PST; 16s ago  
     Docs: man:httpd(8)  
           man:apachectl(8)  
  Main PID: 1265 (httpd)  
    Status: "Total requests: 0; Current requests/sec: 0; Current traffic: 0 B/sec"  
    CGroup: /system.slice/httpd.service  
            └─1265 /usr/sbin/httpd -DFOREGROUND  
            └─1266 /usr/sbin/httpd -DFOREGROUND  
            └─1267 /usr/sbin/httpd -DFOREGROUND  
            └─1268 /usr/sbin/httpd -DFOREGROUND  
            └─1269 /usr/sbin/httpd -DFOREGROUND  
            └─1270 /usr/sbin/httpd -DFOREGROUND  
  
Dec 02 13:24:19 my-opus systemd[1]: Starting The Apache HTTP Server...  
Dec 02 13:24:19 my-opus httpd[1265]: AH00558: httpd: Could not reliably det...ge  
Dec 02 13:24:19 my-opus systemd[1]: Started The Apache HTTP Server.  
Hint: Some lines were ellipsized, use -l to show in full.  
[rsimms@my-opus ~]$
```

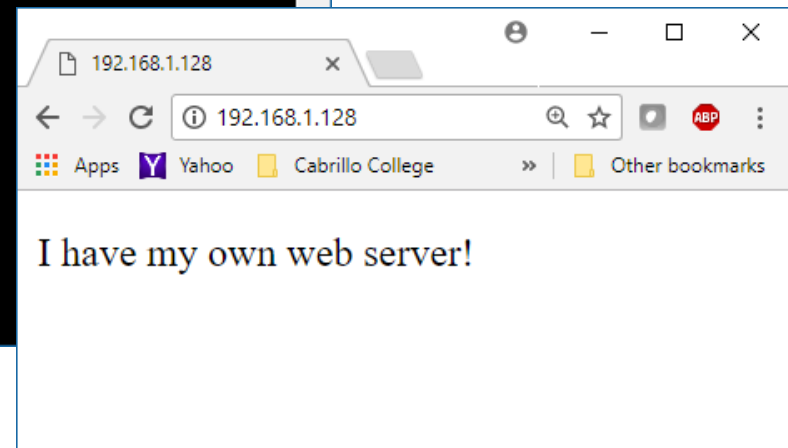
Start Apache and enable it to start automatically at boot

```
sudo vi /var/www/html/index.html  
cat /var/www/html/index.html
```

Make a sample webpage

```
rsimms@my-opus:~  
[rsimms@my-opus ~]$ sudo vi /var/www/html/index.html  
[rsimms@my-opus ~]$ cat /var/www/html/index.html  
<!DOCTYPE html>  
<html>  
<body>  
  
<p>I have my own web server!</p>  
  
</body>  
</html>  
[rsimms@my-opus ~]$
```

Browse to your VM



```
<!DOCTYPE html>  
<html>  
<body>
```

```
<p>I have my own web server!</p>
```

```
</body>  
</html>
```

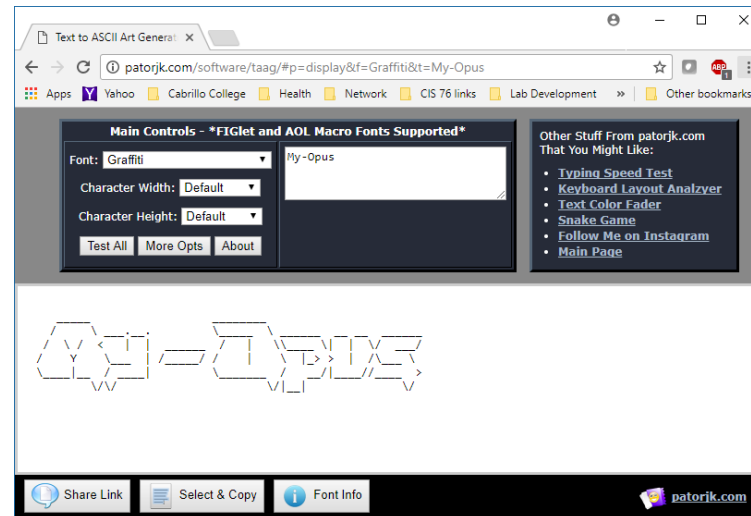
*Make a little web page
named index.html*

Make a MOTD (Message of the Day)

sudo vi /etc/motd

```
rsimms@my-opus:~  
[rsimms@my-opus ~]$ sudo vi /etc/motd  
[sudo] password for rsimms:  
[rsimms@my-opus ~]$ cat /etc/motd  
  
  Y<= > > >  
  |   |   |   |  
  V   V   V   V  
  
[rsimms@my-opus ~]$
```

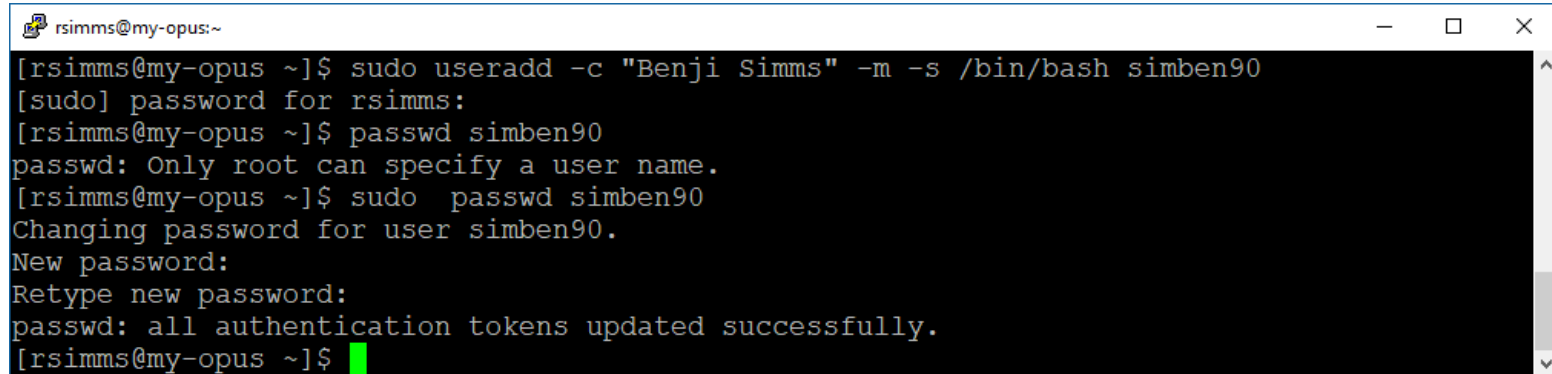
*Make your MOTD
(Message of the Day) file*



<http://patorjk.com/software/taag>

Add your CIS 90 account

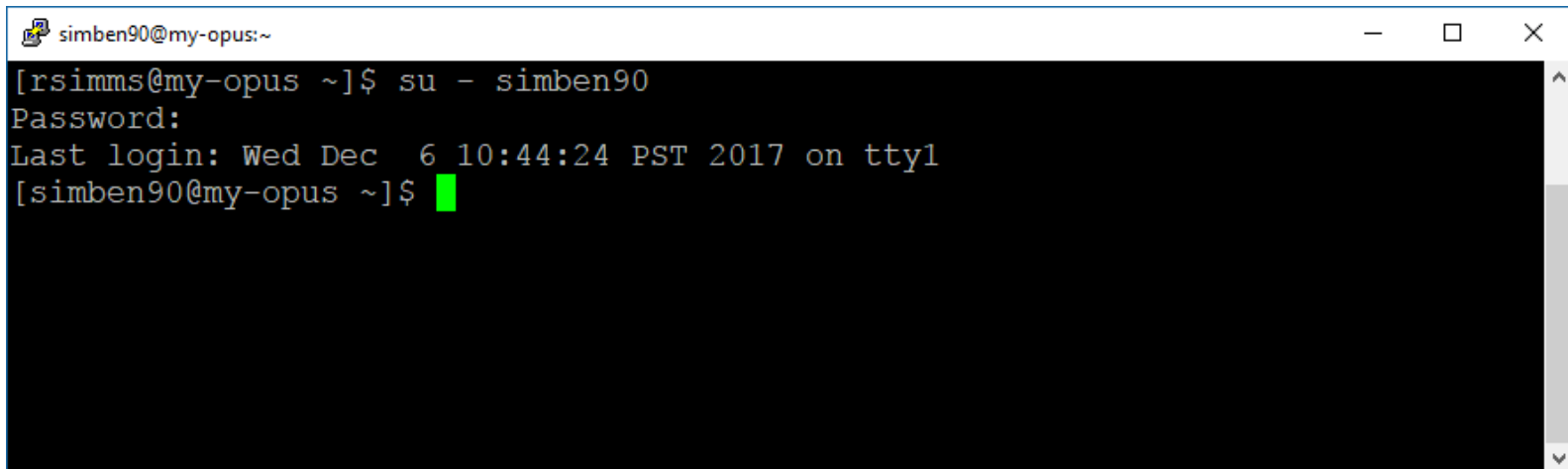
```
sudo useradd -c "Benji Simms" -m -s /bin/bash simben90  
sudo passwd simben90
```

A terminal window titled 'rsimms@my-opus:~' with standard window controls. The terminal shows the execution of two commands: 'sudo useradd -c "Benji Simms" -m -s /bin/bash simben90' and 'sudo passwd simben90'. The first command succeeds. The second command prompts for a password, but the user enters nothing. The system then prompts for a new password, which is entered, followed by a confirmation. The process ends with a success message and a new shell prompt.

```
rsimms@my-opus:~  
[rsimms@my-opus ~]$ sudo useradd -c "Benji Simms" -m -s /bin/bash simben90  
[sudo] password for rsimms:  
[rsimms@my-opus ~]$ passwd simben90  
passwd: Only root can specify a user name.  
[rsimms@my-opus ~]$ sudo passwd simben90  
Changing password for user simben90.  
New password:  
Retype new password:  
passwd: all authentication tokens updated successfully.  
[rsimms@my-opus ~]$
```

Switch to your CIS 90 account

su - simben90

A terminal window titled 'simben90@my-opus:~' with standard window controls. The terminal shows a user 'rsimms' at 'my-opus' in the home directory. They enter 'su - simben90'. The prompt changes to 'Password:'. After an invisible password entry, the prompt changes to 'Last login: Wed Dec 6 10:44:24 PST 2017 on tty1'. Finally, the prompt changes to '[simben90@my-opus ~]\$' with a green cursor.

```
simben90@my-opus:~  
[rsimms@my-opus ~]$ su - simben90  
Password:  
Last login: Wed Dec 6 10:44:24 PST 2017 on tty1  
[simben90@my-opus ~]$
```

Switch to your CIS 90 account

Copy your files on Opus to your new VM

scp -r -P 2220 opus-ii.cis.cabrillo.edu:* .
yes

```
simben90@my-opus:~
[simben90@my-opus ~]$ scp -r -P 2220 opus-ii.cis.cabrillo.edu:* .
The authenticity of host '[opus-ii.cis.cabrillo.edu]:2220 ([2607:f380:80f:f425::244]):2220'
' can't be established.
ECDSA key fingerprint is SHA256:xKmlxeB/u8y3dW61lLYniQzigUQmlpdcPS2mPdd8SV0.
ECDSA key fingerprint is MD5:b3:bc:ad:b3:a9:38:ab:9e:5a:bb:7b:d0:3c:e5:57:e6.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '[opus-ii.cis.cabrillo.edu]:2220,[2607:f380:80f:f425::244]:2220'
' (ECDSA) to the list of known hosts.
simben90@opus-ii.cis.cabrillo.edu's password:
address                100%   22    1.4KB/s   00:00
badevents              100% 1010   32.8KB/s   00:00
treat5                 100%  795   42.3KB/s   00:00
bigfile                100%  10KB  612.5KB/s   00:00
bigfile.bak            100%  10KB  615.7KB/s   00:00
bigshell               100%   70    3.8KB/s   00:00
enlightenment         100% 3442  150.0KB/s   00:00
treed                  100%  190   11.1KB/s   00:00
zoom                   100%   74    3.4KB/s   00:00
app                    100%  220   14.5KB/s   00:00
hi                     100%  107    7.4KB/s   00:00
I                      100%  375   16.2KB/s   00:00
tryme                  100%  174    7.2KB/s   00:00
banner                 100%  15KB  800.2KB/s   00:00
simple.c                100%  598   27.6KB/s   00:00
simple                  100% 8768  490.9KB/s   00:00
simpleplus.cpp          100%  630   42.3KB/s   00:00
```

Copy your CIS 90 files recursively from Opus-II

Make sure you got them all

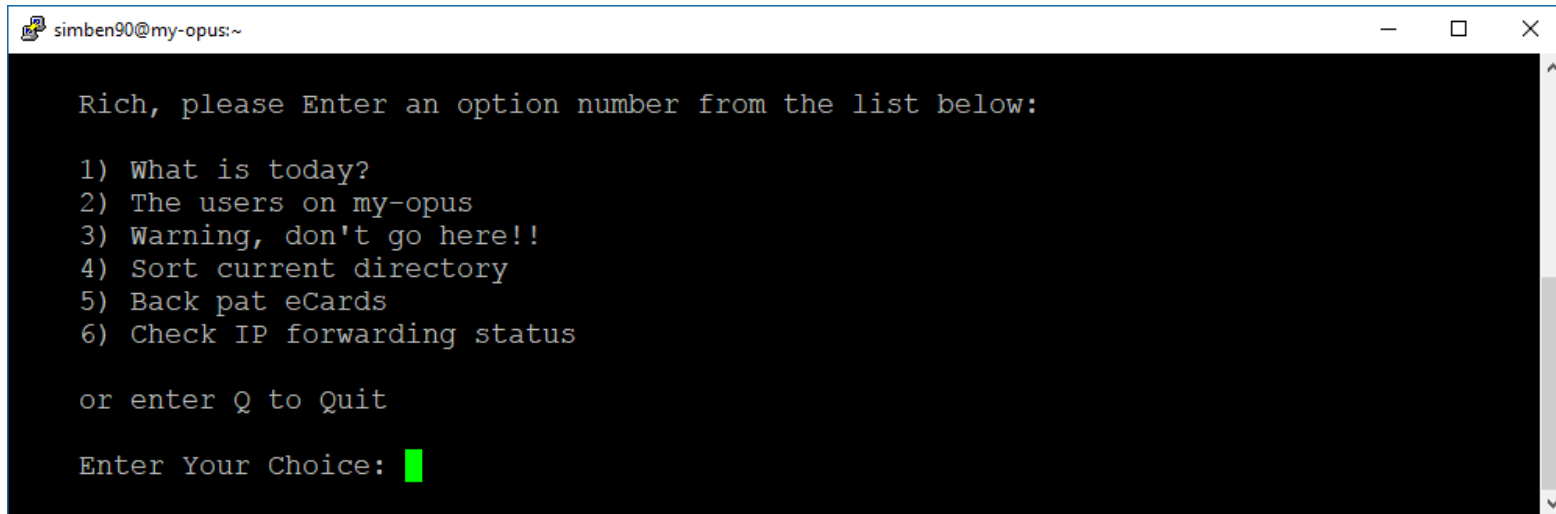
ls

```
simben90@my-opus:~  
[simben90@my-opus ~]$ ls  
address      dead.letter  f1.graded    lab07         mission      text.fxd  
badevents    Directory3   f2.graded    lab08         mylog        timecal  
bag           dogs         f3.graded    lab09         poems        trash  
bigfile       dogs.tar     files.out     lab09.graded  proposal1    treat1  
bigfile.bak   dulces       Hidden        Lab2.0        proposal2    uhistory  
bigshell      dups         jobs          Lab2.1        proposal3    uhistory.bak  
bin           edits        lab01.graded  labx2         scratch      uhistory.rsims  
bin.tar       empty        lab02-collection letter        sweets       what_am_i  
candy         example777   lab04.graded  log           text.err     words  
cis90_html    example808   lab04-mydata  Miscellaneous  text.fixed  
[simben90@my-opus ~]$
```

Listing of home directory on new VM

Run your final project

bin/myscript

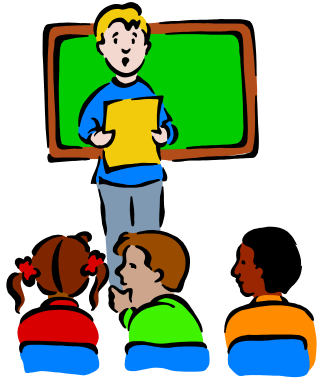


```
simben90@my-opus:~  
  
Rich, please Enter an option number from the list below:  
  
1) What is today?  
2) The users on my-opus  
3) Warning, don't go here!!  
4) Sort current directory  
5) Back pat eCards  
6) Check IP forwarding status  
  
or enter Q to Quit  
  
Enter Your Choice: █
```

Check you can still run your final project



Project Presentations



To demo your project and earn six points:

Remote students - Share desktop when it is your turn.

Classroom students - use the instructor station at the front of the room.

Project Workshop (If time permits)

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)



Notes to instructor

Practice Test System

[] Start: `echo "/root/unlock-cis90; rm -f /etc/nologin" | at [end of L15]`

[] End: `echo "/root/lock-cis90; cp /etc/nologin.bak /etc/nologin" | at [T-30]`

Canvas Practice Test:

[] availability from = [end of L15], due & available until = [T-30]

[] remove password on practice test on Canvas [start of L15]

[] moderate any accommodations 1.5x = +85m 2x=+170m (

Real Test system

[] Start: `echo "/root/unlock-cis90; rm -f /etc/nologin" | at [T-0] 7:00 am 1:00 pm`

[] End: `echo "./lock-cis90-1.0" | at [T+171] 9:51 am 3:51 pm`

[] End: `echo "./lock-cis90-1.5" | at [T+256] 11:16 am 5:16 pm`

[] End: `echo "./lock-cis90-2.0" | at [T+341] 12:41 pm 6:41 pm`

[] End: `echo "cp /etc/nologin.bak /etc/nologin " | at [splashdown + 170 minutes]`

`date -d "07:00 today + xxx minutes" +%H:%M'`

Canvas Real Test:

[] availability from = [T-0], due & available until = [splashdown]

[] remove password on real test on Canvas [T-0]

[] moderate time limit any accommodations 1.5x = +85m 2x=+170m and customize due times

A full-page background image showing a sunset over a beach. The sky is filled with vibrant orange, pink, and purple clouds. 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 reflecting the colors of the sky, with some dark rocks scattered about.

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

End Meeting

End Meeting