Cabrillo College

Lab 1: Accessing Linux Systems
This lab gets you started on Linux. You learn how to login into several Linux systems and start practicing your first commands.

Resources

- The Opus server
- The Sun-Hwa server
- The Frodo virtual machine in the CIS VLab (Virtual Lab)
- The CIS Student Help Forum

The Opus Server is running a CentOS distribution of Linux. We will use Opus for all lab assignments in the course. Access to Opus is command-line only via SSH.

The Sun-HWA Server is running a Fedora distribution of Linux. We will use Sun-Hwa from time to time to get some experience using a different distribution of Linux. Access to Sun-Hwa is command-line only via SSH.

Frodo is a VM (virtual machine) in the CIS VLab (Virtual Lab). Unlike Opus and Sun-Hwa which are shared, every student gets their own Frodo system. Frodo is running an Ubuntu distribution of Linux and can be accessed via SSH or using graphics mode.

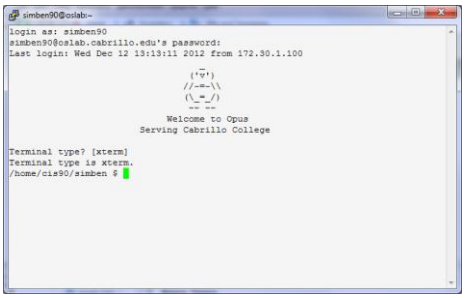
The CIS Student forum has been set up for use by CIS students and instructors to collaborate, share information and help each other. It's an electronic forum that uses phpBB.

Preparation
To do this lab you will need to know your login credentials (usernames and passwords) for each system. You will find this information in an email sent to you by the instructor. Contact the instructor if you need the email resent.

You may prefer to do this first lab in the CIS Lab (http://webhawks.org/~cislab/). The PCs in that room already have everything installed and there are instructors & lab assistants available to help. If you do this lab from home you will need to install Putty (http://goo.gl/XbTF) on your Windows PC or CoRD (http://goo.gl/Lxza) on your Mac.

Task 1 - Log into Opus

This task lets you practice logging into Opus which is the primary Linux system we will be using for this course. Once you log in you will try out some new commands.



Opus

1) Log into Opus at **oslab.cabrillo.edu** over **port 2220** using Putty on Windows or a terminal on the Mac.
2) Hit the Enter key several times. Notice how the system shell prompts you to enter commands. The shell prompt is a string of text that ends with a $ symbol.
3) Type each command below, immediately following the shell prompt, and watch what happens:

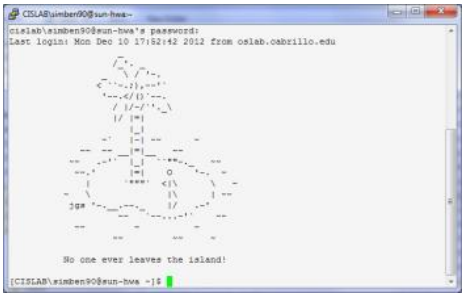
Command	Purpose
date	Show current time and date
cal **cal 2013** **cal 5 2013** **cal** <*birth-month*> <*birth-year*>	Make a calendar
who **who -Hu**	Show all the users currently logged into the system and where they logged in from
who am i **whoami**	Show the username you used to login as
id **id rsimms**	Show the ID and group information for a username
clear	Clear the screen
ps	Show the processes being run by the user. You should see the name of the shell and the **ps** command.
tty	Show which terminal device is being used to connect to the computer

hostname	Show the name of the computer
uname	Show the name of the kernel
cat /etc/issue	Show the name of the Linux distribution
history	Show commands used previously
exit	End the login session

To see Task 1 being done watch this video: http://www.youtube.com/watch?v=c__yWOFQ97M

Task 2 - Log into Sun-Hwa (via Opus)

This task shows how to access a Linux system from another Linux system. You first log into Opus and from there log into Sun-Hwa. After that you run another Opus session to do a side-by-side comparison of the two systems.



Sun-Hwa

1) Login to Opus like you did before.
2) From Opus login to Sun-Hwa with either of the following commands:

   ssh cislab*username***@sun-hwa**
   ssh cislab*username***@172.30.5.21**

   Note that *username* is the same as your username on Opus. The **ssh** command allows you to specify the remote host using either the hostname or the IP address.

   Because Sun-Hwa is a member of a Windows Active Directory Domain it is necessary to prefix the username with the "cislab" domain name followed by two backslashes.

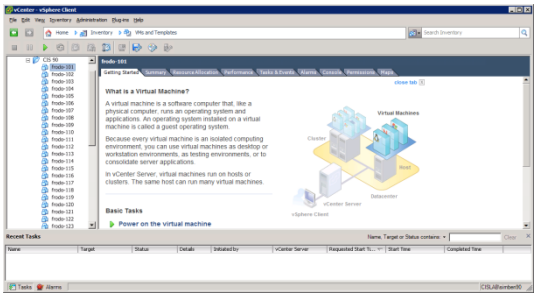
3) Explore Sun-Hwa using the commands you have learned so far. Note both the similarities and differences.
4) Bring up a second login session into Opus and compare the output of the **who**, **id**, **tty**, **uname**, **hostname** and **cat /etc/issue** commands with Sun-Hwa.

5) When finished, use the **exit** command on Sun-Hwa to return back into Opus. Use **exit** on each Opus session to end.

To see Task 2 being done watch this video: http://www.youtube.com/watch?v=jYSGzKFrDak

Task 3 - Log into Frodo (using CIS VLab)

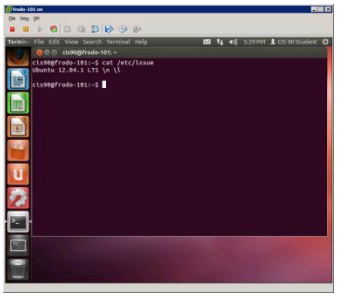
In this task you learn how to use Linux systems in a VMware environment. You will use a product called VMware vSphere Client to power on, use, and shutdown an Ubuntu Linux system. Every student will get their own VM (virtual machine) to use for the term.



CIS VLab (which uses VMware vSphere Client)

Unlike Opus and Sun-Hwa your Frodo VM has a graphical desktop.

1) Download the vcenter.rdp file (http://oslab.cabrillo.edu/) to your desktop and open it. This will do a connection to the CIS VLab using the RDP protocol. Mac users will need to install CoRD first for this to work.
2) Log into the CIS VLab using the credentials in the email sent to you by your instructor.
3) Refer to: http://simms-teach.com/docs/cis90/Pod-Assignments-90-sp13.pdf to identify your specific Frodo VM.
4) After you identify your VM, select it and power it on. Login as "CIS 90 Student" with the password sent to you by your instructor.



Frodo graphical desktop

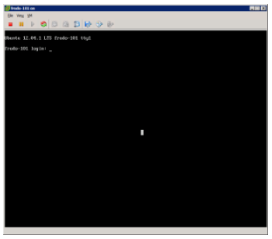
To see Task 3 being done watch this video: http://www.youtube.com/watch?v=rDYTUgZJWxo

Task 4 - Graphical desktops, graphical and virtual terminals

This task lets you practice having multiple login sessions on the same system simultaneously. It demonstrates the multiuser aspects of the UNIX/Linux operating system.

1. The multiuser capabilities of UNIX/Linux are usually exercised by users logging in from different terminals e.g. terminals in various locations around an office building. An added feature of being at the console of a UNIX/Linux system is that you can run multiple login sessions from a single console. Let's do that!
2. From the keyboard, while holding down: **Ctrl -**  **- Alt**, tap **space**, then tap **F1**

Keyboard



Frodo virtual (TTY) terminal

3. This brings up a command-line interface allowing you to login in a non-graphical format. We often call this a terminal interface because it resembles the interface of a standard serial terminal. Sometimes you'll hear the term virtual, TTY, or console terminals used to describe these logon screens because they look and behave as if they were real terminals.
4. Log in using this virtual terminal using the username *cis90* and same password as before. What is the command prompt on Frodo?
5. Use the **who** command to see if any other users are on this system. You should see both of your login sessions.
6. In general, you can log in to a local UNIX machine from as many virtual terminals as the operating system supports. How many does Linux support? (Hint: Holding down the **Ctrl -**  **- Alt** keys, tap space, then tap the other function keys (F2-F9)
7. Log in to virtual terminals tty2 and tty5 and verify using the **who** and **who am i** commands.
8. Using the commands you learned above, answer the following questions:
   - Do you have the same uid (user id) on each of the virtual terminal sessions?
   - Is your command history the same for all login sessions?
   - How can you distinguish between the different login sessions?
   - If you log off one session, do you get logged off all the sessions?
9. Before graphical user interfaces came out on UNIX, this was the way that users were able to simulate multiple windows. UNIX had this concept of *windows* before Microsoft did, the UNIX community called them *screens*. Let's go back to our graphical session. Do you know how? Hint, while holding down:
   Ctrl -  **- Alt**, tap **space**, then tap **F7**
10. A graphical user interface (GUI) is often thought as being easier to use than a command-line interface, because you don't have to memorize commands, and you don't have to type so often. Instead, you use the mouse to look around for meaningful icons and menus, and just point, click and double-click. See if you can accomplish the tasks we did from the command-line by making menu selections from the GUI interface.
11. Using the desktop GUI, can you:

- Find the current date?
- Find a calendar of the current month?
- Find out who else is on the system?
- Log off?

12. Sometimes it's just easier to use a terminal when you know what you want to do. A graphical session allows you to run a graphical terminal session in a separate window. On the left dash panel, select the Terminal application (immediately below the gear/wrench icon).
13. A graphical terminal window should now appear so that you can run any UNIX command.
14. Using **who** and **who am i** commands, what terminal device are you using now?

To see some of Task 4 being done watch this video: http://www.youtube.com/watch?v=xI2_MHntf04

Task 5 - Login to Frodo (via Opus)
This task shows that you can also access your Frodo VM the same way you accessed Sun-Hwa earlier. The method uses SSH rather than the VMware vSphere Client.

1) On your Frodo VM, show the IP address using **ifconfig eth0** and look for the IP address immediately following "inet addr:"
2) On Opus, log into that IP address using **ssh cis90@***<ip-address>*
3) In your new session on Frodo type the **who** command and spot which login was initiated from Opus.
4) Use **exit** to end your Frodo login session, then **exit** again to end your Opus session.
5) When you are finished with the lab you should shutdown Frodo.

To see Task 5 being done watch this video: http://www.youtube.com/watch?v=t40vkl2nxvs

Task 6 - Make a forum post
If you haven't already, register and make your first post on the class forum at http://oslab.cabrillo.edu/forum/. Post something that you have learned or observed while doing Lab 1. Please include any problems you ran and how you got around them that will help another classmate do the lab. Feel free to post any questions you have as well.

Submit your work
To get credit for Lab one you must download this PDF document (including the content above) to your computer, fill out the form below, then email the entire filled in PDF to risimms@cabrillo.edu before the deadline. Be sure and cc: yourself to verify you are not sending a blank document.

Lab 1 Submittal

Name: _____

Part 1 - Command practice across all systems

Log into each system below and use your new commands to complete the table entries. Some have already been filled in by Benji. For the "Command" column, specify the command you used to determine the answer for the row.

	Opus	Sun-Hwa	Frodo	Command
Host name	oslab.cabrillo.edu	(a1)_____	(a2)_____	(a3)_____
Kernel name	(a4)_____	Linux	(a5)_____	uname
Distribution name	CentOS	(a6)_____	(a7)_____	(a8)_____
Distribution version	(a9)_____	(a10)_____	12.04.1	(a11)_____
Shell prompt string	(a12)_____	(a13)_____	cis90@frodo-108:~$	(a14)_____
Shell program used	(a15)_____	bash	(a16)_____	ps
(UID) User ID	(a17)_____	(a18)_____	1001	(a19)_____
Where logged in from	(a20)_____	oslab.cabrillo.edu	(a21)_____	(a22)_____
Terminal device used	/dev/tty1	(a23)_____	(a24)_____	tty

Part 3 - Multiuser aspects of UNIX/Linux

Power on Frodo and log into three different virtual terminals as *cis90* and answer the following questions:

1) Does logging off one session log you off all the others? (a25)_____

2) After typing some commands, is your command history the same on each session? (a26)_____

3) Is your terminal device the same for each session? (a27)_____

4) Is your UID (user ID) the same for each session? (a28)_____

5) Looking at **who** output, how can you distinguish one cis90 login session from another?
(a29)_____

6) How does the output of the **ps** command differ between the different login sessions?
(a30)_____

Part 4 - Some sleuthing (3 points extra credit)

There is a user named Juliet who is currently logged into one of the three Linux systems you used in this lab. Find the system where Juliet is logged in. Now comes the fun part. See if you can find out the name or IP address of a fourth system that Juliet used to log in <u>from</u>. Note this mystery system is <u>not</u> one of the three you used previously. With the name or IP address log into this mystery session as *cis90* and the same password that is used on Frodo. After logging into the mystery system use your new command skills to answer the following questions:

1) What is the host name of the mystery system? (a31)_____

2) What distribution of Linux is the mystery system running? (a32)_____

3) What is the UID of the Juliet user on the mystery system? (a33)_____

Grading Rubric

30 points total. One point for each correct answer. The three extra credit questions are optional and worth one point each. Points for forum posts are tallied separately but each post is worth four points up to a maximum of 20 points per quarter of the term.

Remember, late work is not accepted. If you can't finish the lab before the deadline then submit what you have completed before the deadline for partial credit.