



Hands-on Keyboard: Cyber Experiments for Strategists and Policy Makers

VirtualBox Snapshots and Ubuntu Package and Account Management

1. Introduction

This brief activity is an introduction to using VirtualBox snapshots and Ubuntu package and account management. You will make a VirtualBox image snapshot, change the image and revert to the snapshot, install a select set of Ubuntu packages, and create new user accounts.

1.1. Objectives

- Create an Ubuntu image with VirtualBox.
- Take a snapshot and revert to a prior snapshot with VirtualBox.
- Install the Synaptic Package Manager with the apt package manager.
- Install the *nmap* package with the Synaptic Package Manager.
- Update installed packages using the Update Manager.
- Create and delete Ubuntu user accounts through the Graphical User Interface (GUI) and the terminal.

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1.2. Materials

- Windows computer with access to an account with administrative rights
- VirtualBox
- Ubuntu OS .iso file

1.3. Assumptions

- The provided instructions were tested on a Windows 7 physical machine. Instructions may vary for other OS.
- The student has administrative access to their system and possesses the right to install programs.
- The student's computer has internet access.

1.4. Random Notes

- *Ubuntu*, an African word, means *humanity to others*.

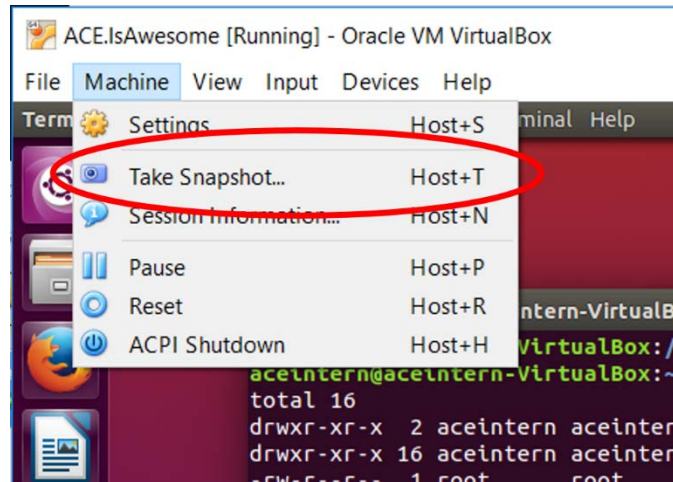
2. VirtualBox Snapshots

2.1. What is a snapshot?

Snapshots capture an image in an instance of time and can serve as a “know good state” for system backup and restore. Imagine you have a website. You install the website on VirtualBox image, take a snapshot, and make the website available to the public. Someone hacks your image and deletes all of your website files. If the compromise is limited to the image (does not include the host), you can revert to the initial snapshot, (hopefully) mitigate the vulnerability the attacker exploited, take an updated snapshot, and put the site back online. (Note: In this case it would be smart to make additional offline copies of the website files and the VirtualBox image.)

2.2. Create a Snapshot

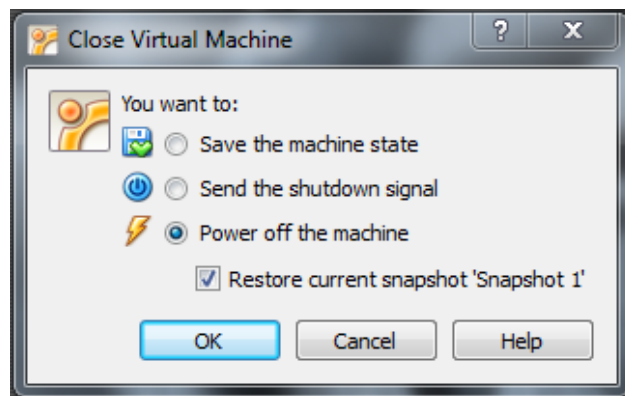
- Power on and log into the Ubuntu image.
- From the VirtualBox Web Access page, select *Machine* → *Take Snapshot*.



- Return to the image, right click on the Desktop, select **Change Desktop Background**, choose a different background image and click on **Close**. Make any other changes (open a terminal or other programs, etc.) you wish.

2.3. Revert to the Prior Snapshot

- From the VirtualBox page, select **File** → **Close**. Select “Power off the machine” and click the check box that says “Restore current snapshot ‘NameOfYourSnapshot.’ “ Then click **OK**.



- Return to the VirtualBox Manager window select your VM and click the green start arrow at the top of the page. Notice that the Desktop image and anything else you changed have reverted to the state at the time of the snapshot.

3. Ubuntu Package Managers

3.1. What is a package?

In the past, users downloaded Linux software as source, configured it, compiled it, and installed it. This process was tedious and error prone. Today, most Linux software is available in packages, software pre-built for a specific OS version. Packages combined with package managers such as **Synaptic** and **apt** make install software packages on Linux often easier than install software on Windows.

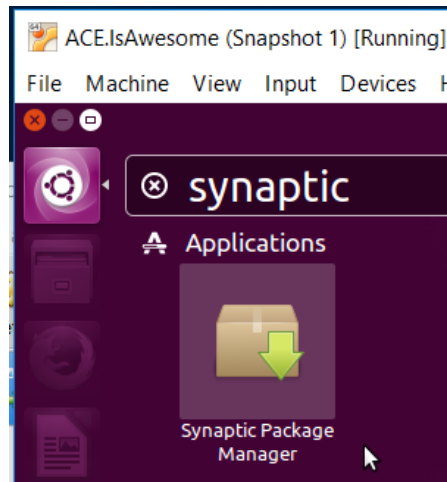
3.2. The APT Package Manager

To optimize system performance, Linux servers often have no GUI installed and require the terminal for user input. The APT package manager handles the installation and removal of software. It automates the retrieval, configuration, and installation of software packages.

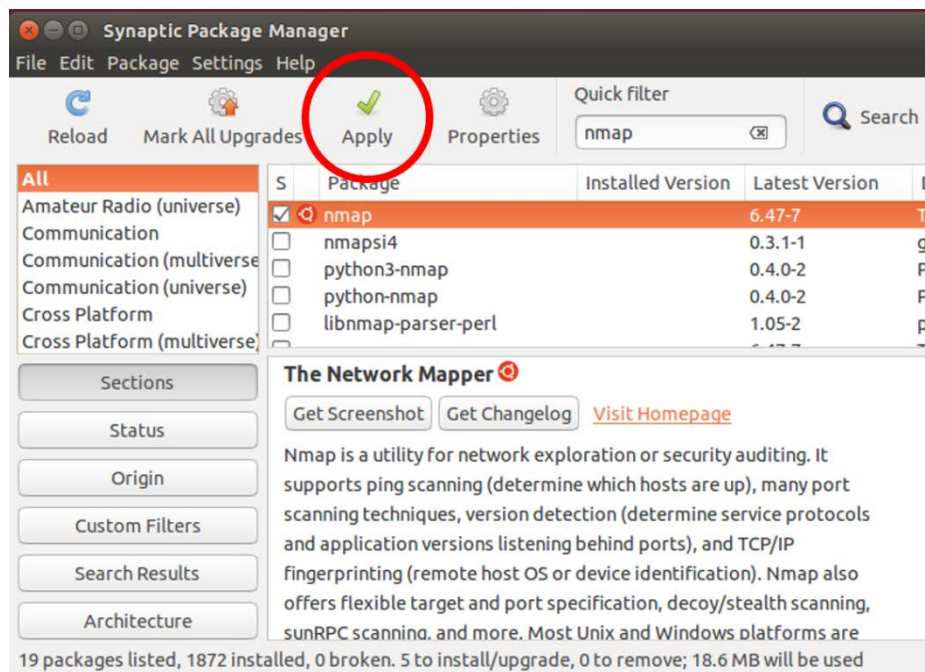
- Open a terminal.
- ***sudo -s*** (to get root privileges)
- ***apt-get update*** (Ensures most up-to-date listing of packages)
- ***apt-get upgrade*** (Upgrades outdated packages to the current version)
- ***apt-get install <package name>*** (Install a new package)
- ***apt-cache search <package name>*** (Search for packages)
- ***apt-cache dump*** (List all packages)

3.3. Synaptic Package Manager

- Synaptic Package Manager is a GUI used to easily install/uninstall/update software.
- Open a terminal.
- Type ***sudo apt-get install synaptic*** in the terminal and hit ***enter***.
- Enter your aceintern password.
- Type ***Y*** and hit enter to confirm the installation of Synaptic Package Manager.
- Open the Synaptic Package Manager by selecting the ***Dash Home*** and performing a search.



- Select the Synaptic Package Manager and enter your password when prompted then click **Authenticate**.
- Synaptic will list packages available for download from remote repositories (you must have an Internet connection to install from remote repositories).
- Synaptic enables browsing for packages by category, searching for packages by name or keyword, and updating currently installed packages to the latest version.
- To install a package, select the box preceding the package name, click **Mark**, and click **Apply**.
- Use Synaptic to install the **nmap** package. When prompted, allow Ubuntu to make the required changes.

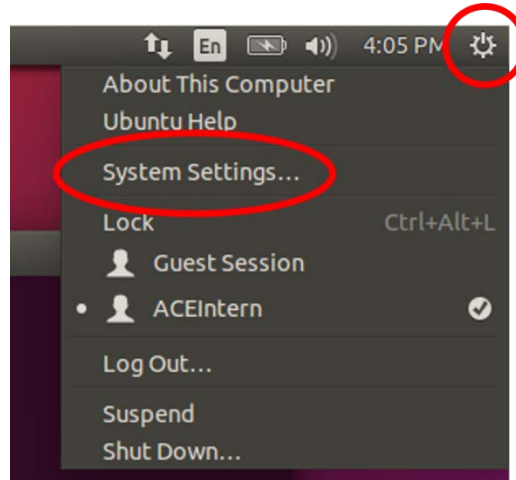


4. Create Ubuntu User Accounts

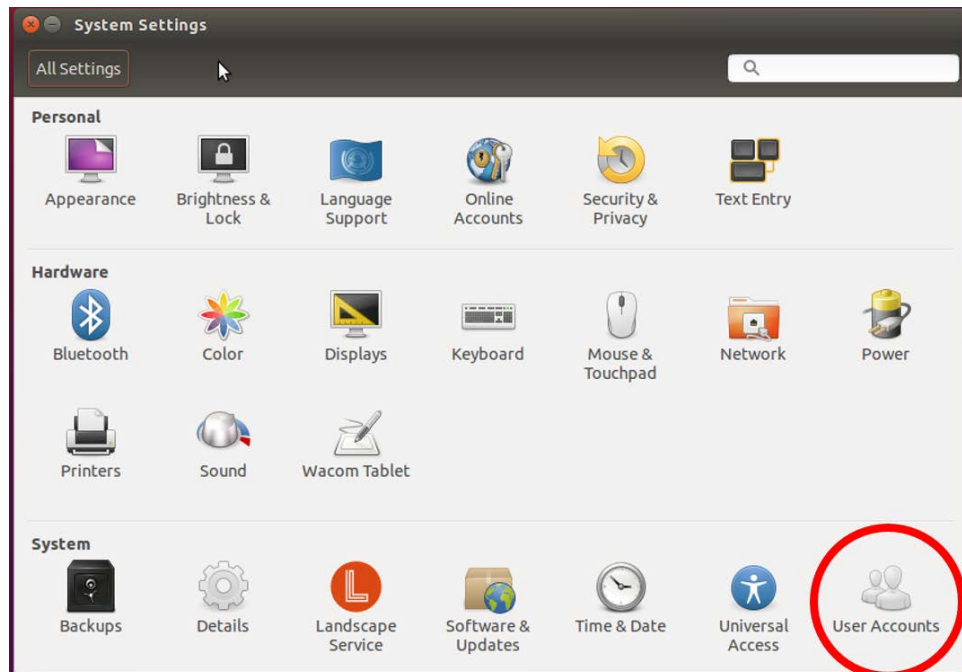
As with most things in Ubuntu, there are multiple ways to create accounts. Two of the ways are through the User Settings GUI and the *adduser* command.

4.1. The Users and Groups GUI

- Click the icon at the far right of the menu bar and select *System Settings*.



- Open *User Accounts*.

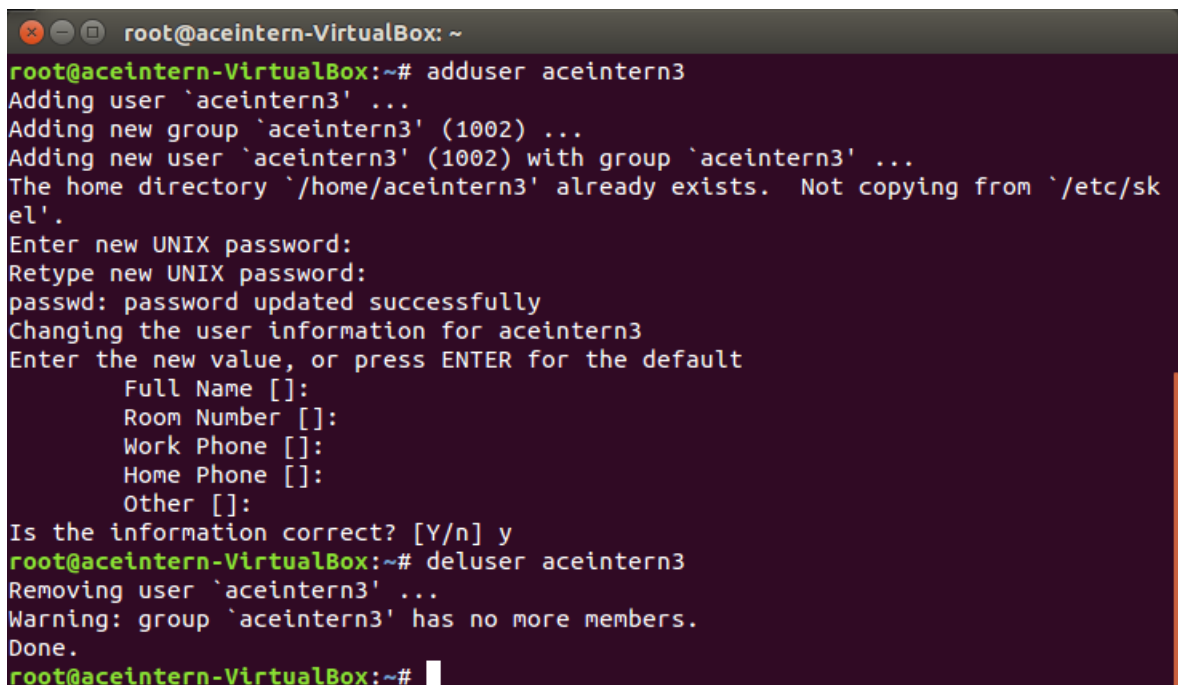


- You will need administrative access to create users. Click *Unlock* in the upper right hand corner, and type in your password then click *Authenticate*.

- To create a new user, click the + in the bottom left hand corner of the User Accounts window.
- Create a standard account *aceintern2*.

4.2. The Command Line (adduser)

- Open a terminal.
- Type *sudo -s* and enter your password to gain root privileges.
- Type *adduser aceintern3*.
- Set the password to *password*.
- Select *enter* for Full Name, Room Number, Work Phone, Home Phone, and Other.
- Type *Y* to verify the information is correct.
- Type *deluser iaintern3* to delete the user iaintern3.
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```
root@aceintern-VirtualBox: ~
root@aceintern-VirtualBox:~# adduser aceintern3
Adding user `aceintern3' ...
Adding new group `aceintern3' (1002) ...
Adding new user `aceintern3' (1002) with group `aceintern3' ...
The home directory `/home/aceintern3' already exists. Not copying from `/etc/skel'.
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
Changing the user information for aceintern3
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? [Y/n] y
root@aceintern-VirtualBox:~# deluser aceintern3
Removing user `aceintern3' ...
Warning: group `aceintern3' has no more members.
Done.
root@aceintern-VirtualBox:~#
```

5. Review Exercises

5.1. Write an Ubuntu Linux command to determine the group ID for a user named Clark.

5.2. Write a single Ubuntu Linux terminal command to search for a package named wallyworld.

5.3. Write an Ubuntu Linux command to add a new user named ellen.

5.4. Write an Ubuntu Linux command to add user ellen to a group named rusty.