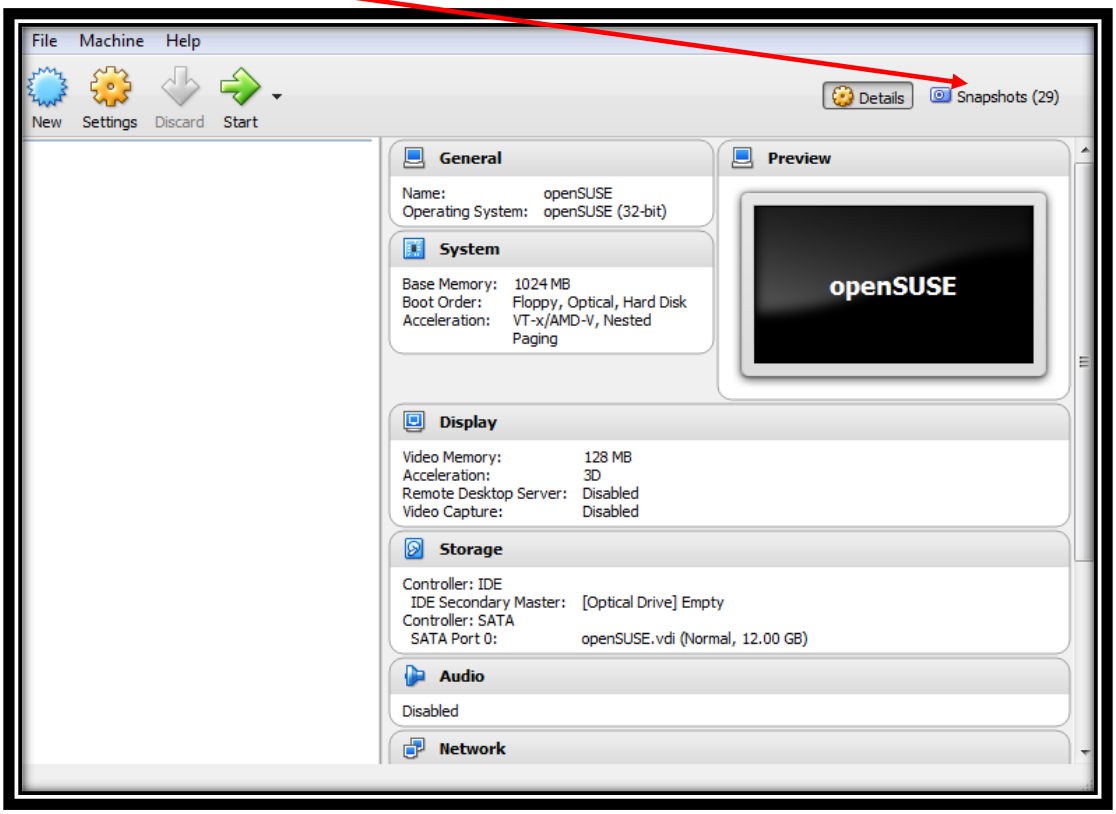
Practical Exercise 8-1: Working with Linux Processes

This Practical Exercise will take students through the steps of managing processes running on a system.

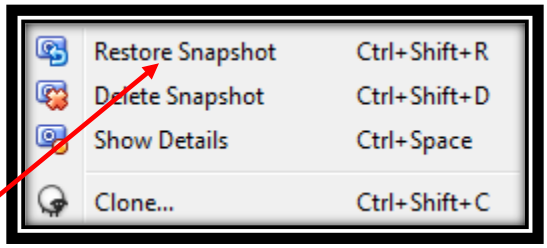
Open VirtualBox and start the openSUSE VM. Run snapshot 13-1 for the correctly configured environment. To run snapshot 13-1:

1. Open the Oracle VM VirtualBox manager by double clicking this icon on your desktop:

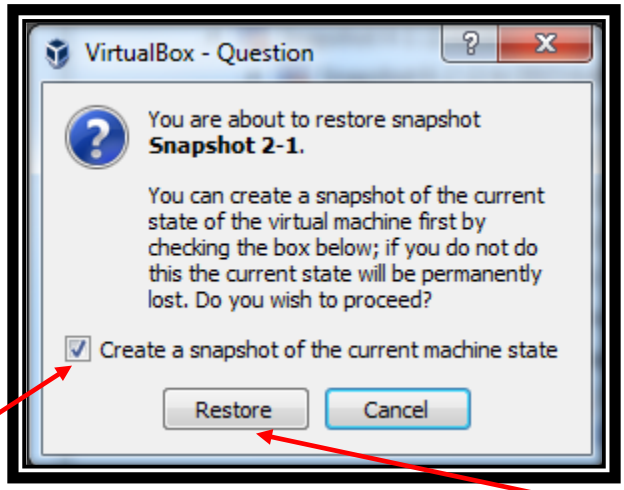
2. Click "Snapshots" in the top right of the Oracle VM Virtualbox Manager.



3. In the right side box populated with snapshots scroll up and find the one titled "Snapshot 13-1" and right click on it. The following box should appear:

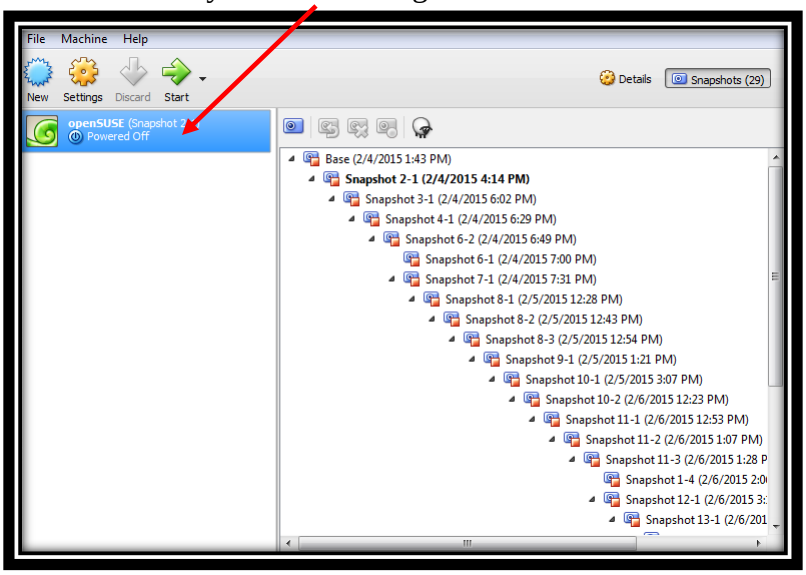


4. Select "Restore Snapshot" and the following pop-up should appear:



5. Uncheck the "Create a Snapshot of the current machine state" box and then click the "Restore" button.

6. You should now see in the left box the openSUSE (Snapshot 13-1) with a status of "Powered Off." Power it on by double clicking it.



7. A separate window should open and you should see the openSUSE Linux OS booting.

8. Press **CTRL+ALT+F1** and login with the username: **root** and password: **student**.

9. Practice starting system processes by doing the following:

a. At the shell prompt, enter **systemctl status atd**. What's the status of your at daemon? (For most distributions, the atd daemon is not configured to run by default.)

b. Start the atd daemon by entering **systemclt start atd** at the shell prompt.

c. Enter **systemctl status atd** again at the shell prompt. The atd service should now be shown as running.

10. Practice using top by doing the following:

a. At the shell prompt, enter **top**.

b. View your running processes.

c. Press **h** to access the top help screen. Which keystroke will sort the display by CPU stats? Press **q** to quit.

d. Press **t** to sort the display by CPU stats. Which processes are using the most CPU time on your system?

e. Press **m** to sort the display by memory usage. Which processes are using the most memory?

f. Add columns by pressing **f**.

g. Add the PPID column to the display by hovering over the PPID field and then pressing the **spacebar**. Hover over the PPID and press the **right arrow key**. Press the **up button** until PPID is under PID, press the **left arrow** and then press **q**. You should now see the PPID of each process added to the display to the right of PID.

h. Exit top by pressing **q**.

11. Practice using the ps utility to view processes by doing the following:

a. At the shell prompt, enter **ps**. What processes are associated with the current shell session?

b. View all running processes on the system by entering **ps –ef | grep atd** at the shell prompt.

c. What username does atd run under? (On most distributions, it should run under the at user.)

d. At the shell prompt, enter **ps –el | grep atd**.

e. Locate the Status (S) column (should be second from left).

f. What is the status of the atd service? (Because it isn't being used at the moment, it's probably sleeping (S).)

12. Practice managing process priorities by completing the following:

a. At the shell prompt, enter **top**.

b. What are the priority (PR) and nice (NI) values associated with the top process? (For most distributions, these values should be 16 and 0.)

c. Press **q** to stop the top process.

d. At the shell prompt, enter **nice –n –20 top**. Now what are the PR and NI values for the top process?

e. Note the PID for the top process.

f. Open a new terminal window by pressing **CTRL-ALT-F2** and login with the username: **root** and the password: **student**.

g. At the shell prompt, adjust the nice value of the top process while it's running by entering **renice 1 top_PID** (top _PID will be random and different for each person doing this PE).

h. Switch back to the first terminal session where top is running by pressing **CTRL-ALT-F1**. What are its PR and NI values now?

i. Press **q** to exit top.

13. Practice switching processes between the foreground and the background by doing the following:

a. Load top again by entering **top** at the shell prompt.

b. In the terminal where top is running, press **CTRL-Z**.

c. Note the background job ID number assigned to the process.

d. At the shell prompt, enter **bg background_job_ID** (The job ID number from top in the last step). The output from top disappears while the process runs in the background.

e. At the shell prompt, enter **fg background_job_ID** (The job ID number from top in the step C). The output from top reappears as the process now runs in the foreground.

14. Practice killing processes by completing the following:

a. The top utility should still be running.

b. Switch to your other terminal session where you're logged in as root, tty2 by pressing **CTRL-ALT-F2**.

c. At the shell prompt, enter **ps –e | grep top**.

d. Note the PID of the top process.

e. At the shell prompt, enter **kill –SIGTERM top_PID** (The PID of top from the last step).

f. Switch back to the terminal session where top was running by pressing **CTRL-ALT-F1**. Verify that top has exited.

g. Load top again at the shell prompt by entering **top**.

h. Switch back to your other terminal session where you're logged in as root, tty2 by pressing **CTRL-ALT-F2**.

i. Kill the top process by entering **killall –15 top**.

j. Switch back to your first terminal window by pressing **CTRL-ALT-F1** and verify that top has exited.

15. Practice using screen by doing the following:

a. Enter **screen** at the command prompt.

b. Press **Enter** to exit the splash screen.

c. At the shell prompt in the screen window, enter **top**.

d. Press **CTRL-A** and then **C** to create a new window.

e. At the shell prompt in the new window, enter **pgrep –l –f top**. Top should still be running and its PID displayed.

f. Press **CTRL-A** and then **N**. You should be toggled back to the window where top is running.

g. Press **CTRL-A** and then **D** to detach the current window.

h. Reattach to the window where top is running by entering **screen –r** at the shell prompt. You should see the top window displayed again.

i. Exit out of top by pressing **q**, and then exit out of the first screen by entering **exit.**

j. Exit the second window of screen by entering **exit** again. You should now be back in the original bash shell.

--End of Practical Exercise--