ORACLE University

Integrated Cloud Applications & Platform Services

UNIX and Linux Essentials

Activity Guide

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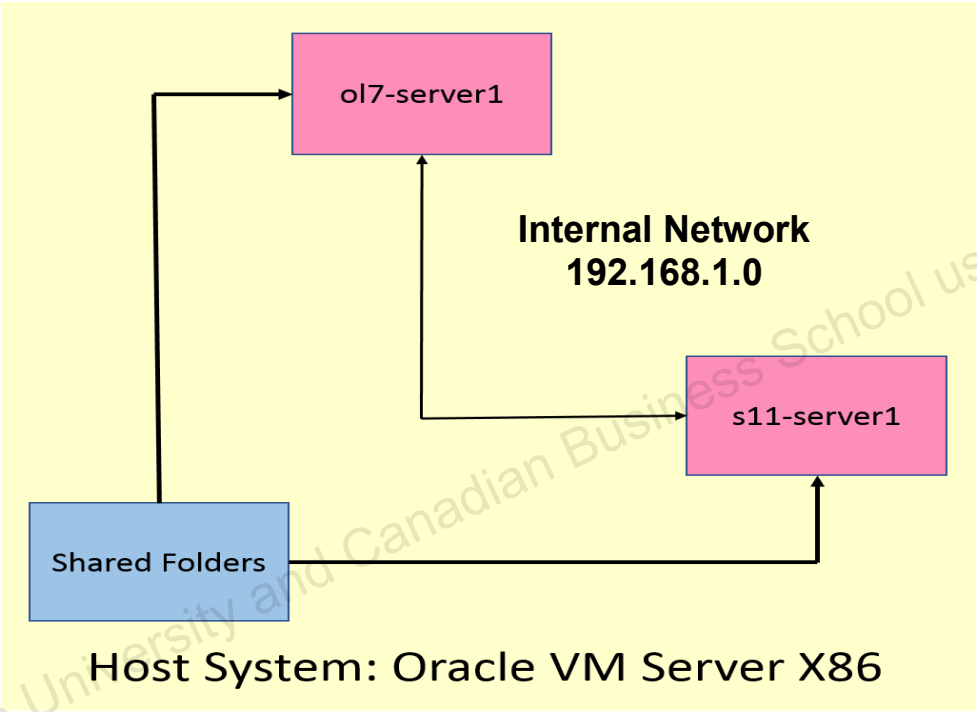
Practices Overview

In these practices:

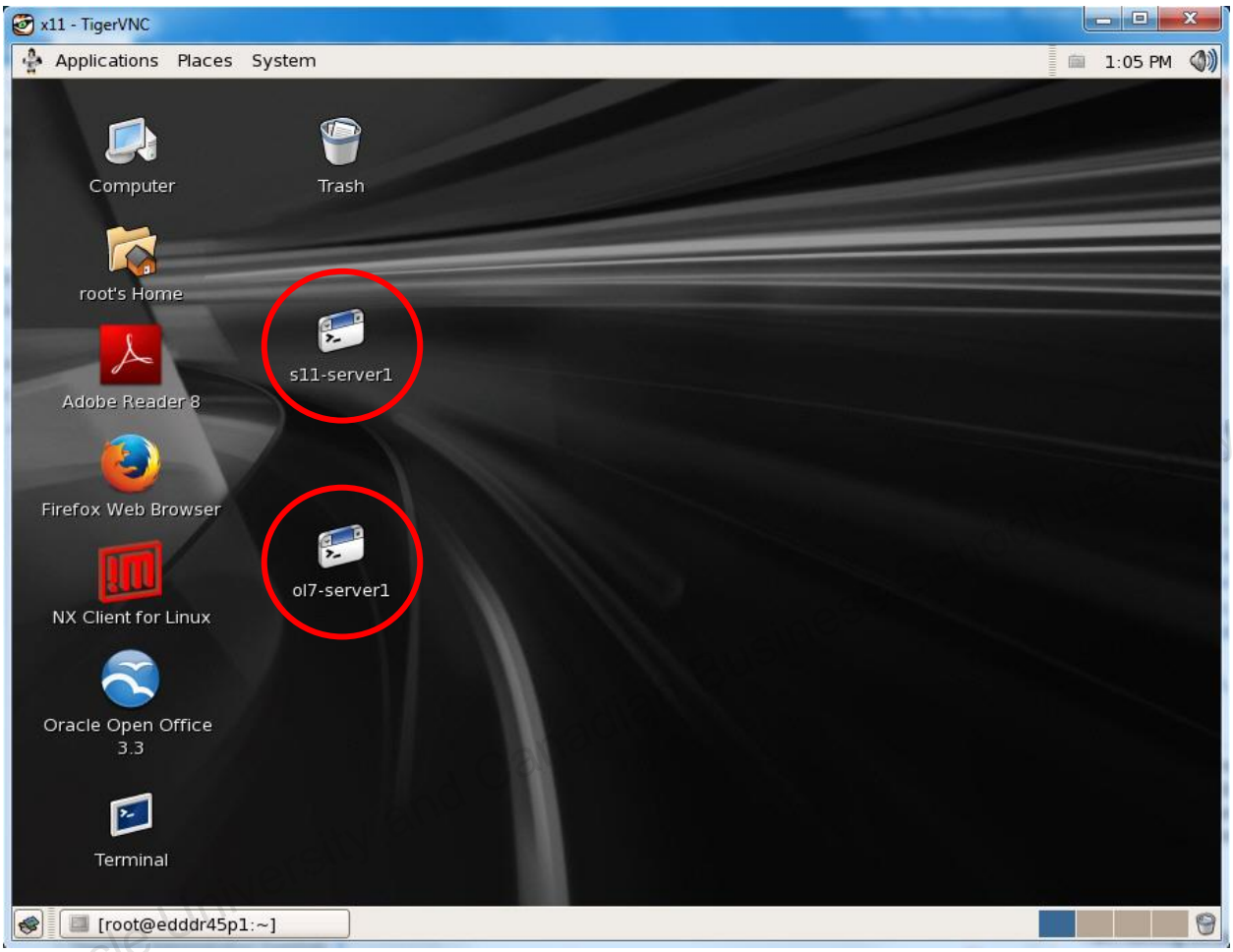
- If you are in an Oracle classroom, the classroom PCs are installed with the Oracle Virtual Machine Server for x86 environment.
- If you are connecting remotely, you will use VNCViewer to connect to the classroom PC.
- You will become familiar with the classroom PC's desktop where there are two virtual machines (VMs) available to use for the hands-on practices in this course

Practices Infrastructure

This section presents the architectural overview of the infrastructure required for the practices. Your practice environment is built using Oracle VM Server for x86 virtualization software. Oracle VM Server for x86 is an x86_64 type 1 hypervisor virtualization application. On each student server PC it provides two guest virtual machines (VMs) that are configured on an internal network (`192.168.1.0`). Each VM can communicate with the other VM and the server PC (host system) on the same internal network. Internet access is not configured for these VMs. The two guest VMs are **ol7-server1** (Oracle Linux 7) and **s11-server1** (Oracle Solaris 11).



Here is an example of your classroom PC desktop viewed using VNCViewer, showing shortcuts to the two configured virtual machines, circled in red. **Note:** some elements of your desktop, such as background, colors, or additional displayed shortcuts may vary.



Name of the VM	Description
ol7-server1	This is a shortcut/launcher that opens a VNC Viewer window to the Oracle Linux 7 guest OS desktop. Each student chooses their preferred VM to use when performing the practice tasks.
s11-server1	This is a shortcut/launcher that opens a VNC Viewer window to the Oracle Solaris 11 guest OS desktop. Each student chooses their preferred VM to use when performing the practice tasks.

The VMs are further configured to communicate with the host machine through a set of shared directories. The shared directories are:

Resource Name	Location	Description
Host share directory	`/opt/ora`	Contains various course files
Student Files	`/opt/ora/lab`	Contains lab bundle contents

The details of the shared directories can be verified in the respective VM settings.

- For usernames and passwords, see the following table:
- If you are attending a classroom-based or live virtual class, ask your instructor or LVC producer for instructions on connecting to and logging into your classroom PC.
- If you are using a self-study format, refer to the communication that you received from Oracle University for this course.
- The first time you access your Oracle Linux or Oracle Solaris VM you may be required to change the provided password to a new password. Oracle Linux has strict password requirements for selecting secure passwords. Ask your instructor about this if you are not sure what type of password to use.

VMs	User Credentials
ol7-server1	• Username: **`oracle`** • Password: **`oracle1`** • System prompt: **`[oracle@ol7-server1 ~]$`** For administrative access, switch to the `root` user using the "`su -`" command as and when instructed by the instructor. • Username: **`root`** • Password: **`oracle1`** • System prompt: **`[root@ol7-server1 ~]#`**

s11-server1	• Username: **oracle** • Password: **oracle1** • System prompt: **[oracle@s11-server1:~]$** For administrative access, use the "`su -`" command to switch to the primary administrator (`root`) role. • Password: **oracle1** • System prompt: **[root@s11-server1:~]#** **Note:** The `root` is configured as a role by default in Oracle Solaris 11. The first username created on the system during the installation is the initial privileged user who can assume the primary administrator role. This can be verified in the `/etc/user_attr` file.

Note: The *system prompt* will identify which VM you are using and which user/role you are logged in as.

Practice 1-1: An Introduction to Your Practice Environment

Overview

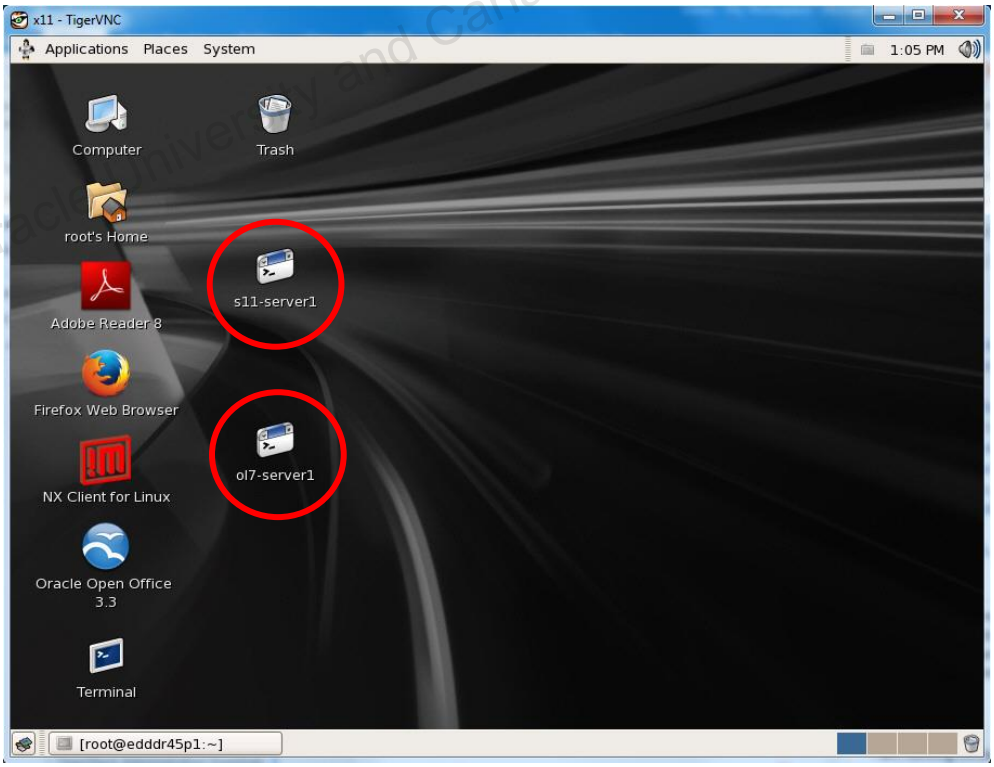
In this practice, you will connect to the classroom PC and then connect the two VMs used for the hands-on practices and become familiar with both of the VM guest configurations

Note

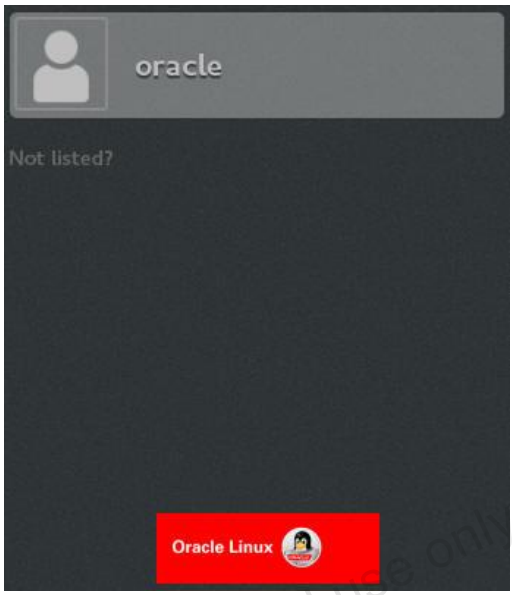
- Your instructor has assigned a classroom PC for you to use.
- The classroom PC is running Oracle VM Server for x86.
- The initial desktop environment for the classroom PC is the GNOME desktop.
- If you are not physically in the classroom, but are connecting remotely, you will initially connect using VNCViewer. Please refer to the **User Credentials** on the previous page titled "*When connecting remotely with VNCViewer to the classroom PC*."
- On the classroom PC desktop, there are two guest virtual machines (VMs): **ol7-server1** (Oracle Linux 7) & **s11-server1** (Oracle Solaris 11).

Tasks

1. Once connected to the classroom PC, check you can log in to your chosen VM from the Desktop window. Double-click either the **ol7-server1** (Oracle Linux) or **s11-server1** (Oracle Solaris) icon on the desktop to open a window to the environment you want to use for your practices.



a. Log in with the username `oracle` and password `oracle1`.



Note: Both VMs use this login combination.

2. After successfully logging in to the VMs, right-click on the desktop and select the **Open Terminal** option to open a terminal window.
   a. If the practice task requires you to become the `root` user/role, in the terminal window, type the `su -` command to assume primary administrator privileges.
   b. Enter `oracle1` when prompted for password.

   Oracle Linux and Oracle Solaris

   ```
   $ su -
   Password: oracle1
   #
   ```

   Note: When entering the password, it will not be displayed, and the prompt will change from a dollar sign (`$`) to a hash (`#`) indicating you are logged in as a privileged user/role.
3. To close a VNCViewer Window, choose one of the VMs, either **ol7-server1** or **s11-server1**, and click the white X in the top-right corner of the VNCViewer Window.
4. If open, repeat on the other open VM VNCViewer Window.
5. If you are connected remotely from your laptop/desktop to the practice environment, at the end of the day you only need to close the VNCViewer window that was used to connect to the classroom desktop. This can be done while leaving the Oracle Linux and Oracle Solaris VM's VNCViewer Window(s) open.

Special Instruction

- The course practices for each lesson are written for UNIX and Linux. Please observe the system prompt in the VM to know which environment you are working in: "**[oracle@s11-server1:~] $** " for Oracle Solaris and "**[oracle@ol7-server1 ~] $** " for Oracle Linux.
- A title with the VM type is identified in all practice tasks to provide clear indication whether commands are specific to Oracle Linux or Oracle Solaris, or work equally for both. For example, above code boxes you will see: **Oracle Linux**, **Oracle Solaris** or **Oracle Linux and Oracle Solaris.**

Practices for Lesson 2: Introduction to the UNIX and Linux Environments

Practices for Lesson 2: Overview

Practices Overview

In these practices, you will perform a set of tasks described in the corresponding lesson. Here is the list of those activities:

- Log in to the system.
- Change your user login password.
- Display system information using the command line.
- Use the man pages.
- Log out of the system.

Practice 2-1: Logging In to the System and Changing Your User Login Password

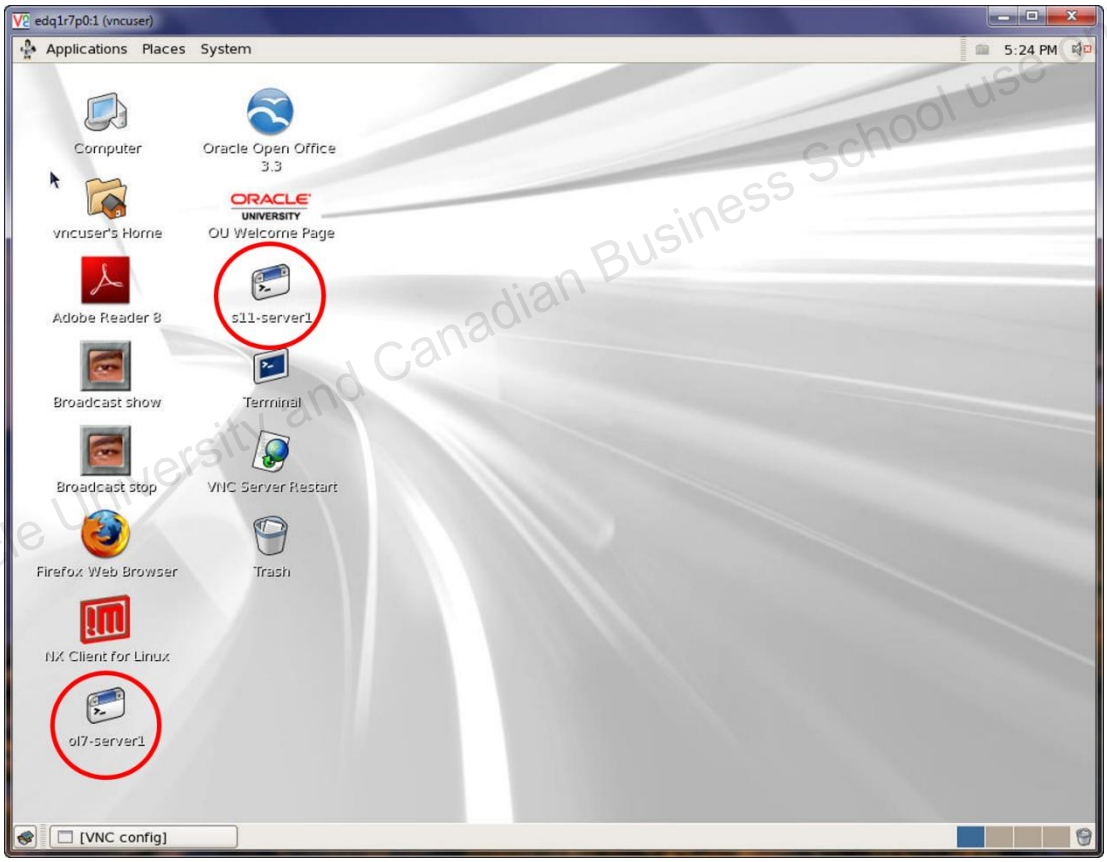
Overview

In this practice, you learn to log in and log out, change the user password, and use a terminal window accessed from the desktop login window to log in in both Oracle Linux and Oracle Solaris VMs.

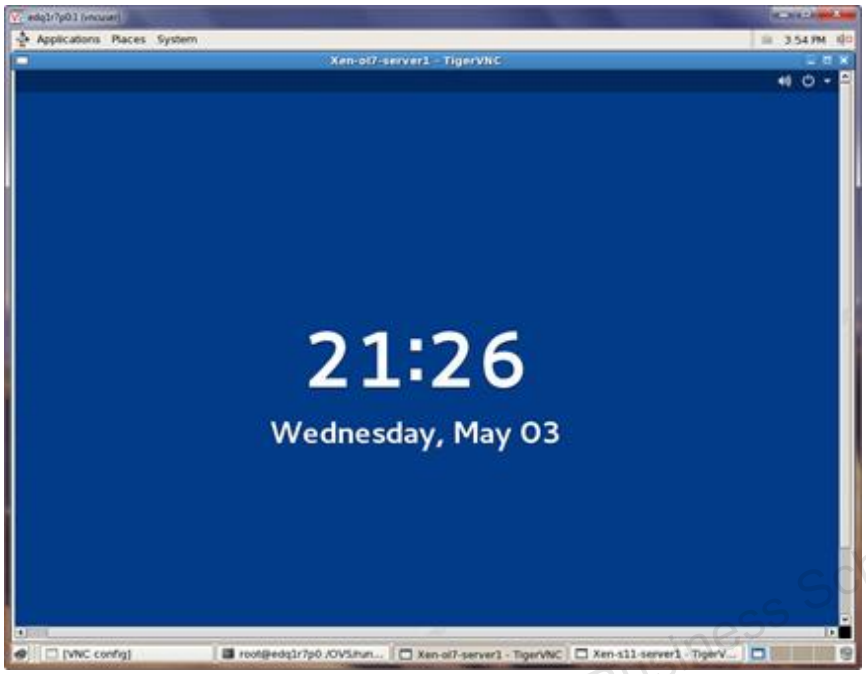
1. Log in to the Oracle Linux and Oracle Solaris systems.

   Note: First perform the following steps in the **ol7-server1** VM (Oracle Linux 7) and then in the **s11-server1** VM (Oracle Solaris 11).

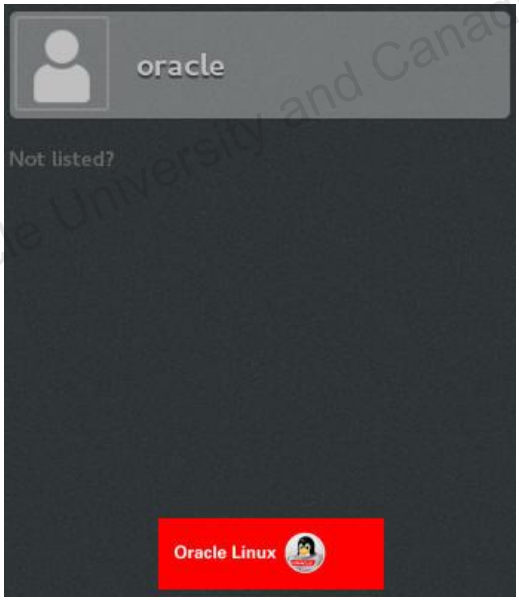
   a. In the Oracle VM Server Desktop window, double-click the **ol7-server1** icon to open a VNCViewer window to the Oracle Linux VM.

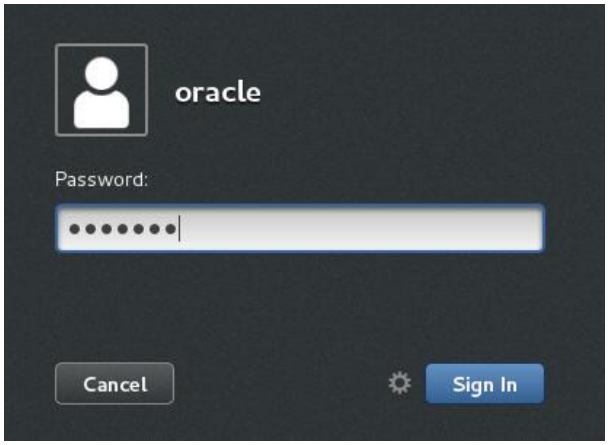


b. You see a mostly blue screen when connecting to the ol7-server1 VNCViewer window. Move the mouse cursor to the lower portion of the screen, then click and hold the left-mouse button. While holding the mouse button move the mouse upward on the screen to reveal the `ol7-server1` sign in screen.



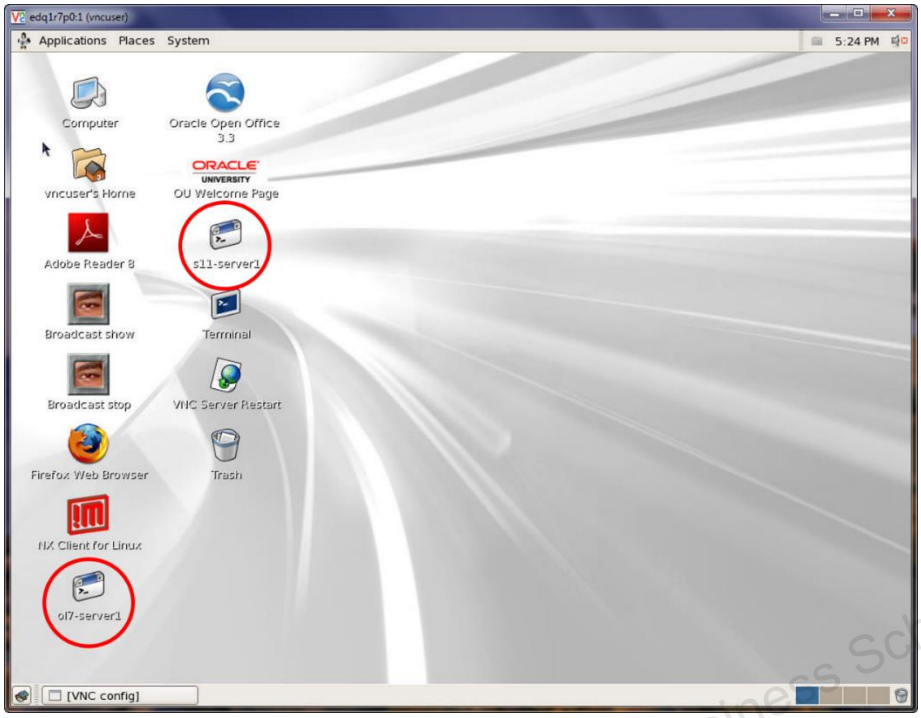
c. In the desktop Login screen, enter the user credentials.





d. The default username `oracle` is already displayed, click the username. Type your password `oracle1`, and press **Enter** or the click the **Sign In** button.

2. Back on the Oracle VM Server Desktop window, double-click the **s11-server1** icon to open a VNCViewer window to the Oracle Solaris VM.



a. In the desktop Login screen, enter the user credentials.

b. Type the username `oracle`, and press **Enter** or click the **Log In** button.

c. Type your password `oracle1`, and press **Enter** or click the **Log In** button.

3. Change your User Password.

For Oracle Solaris (s11-server1):

a. In your Oracle Solaris VM, right-click on the desktop background. The workspace menu opens.

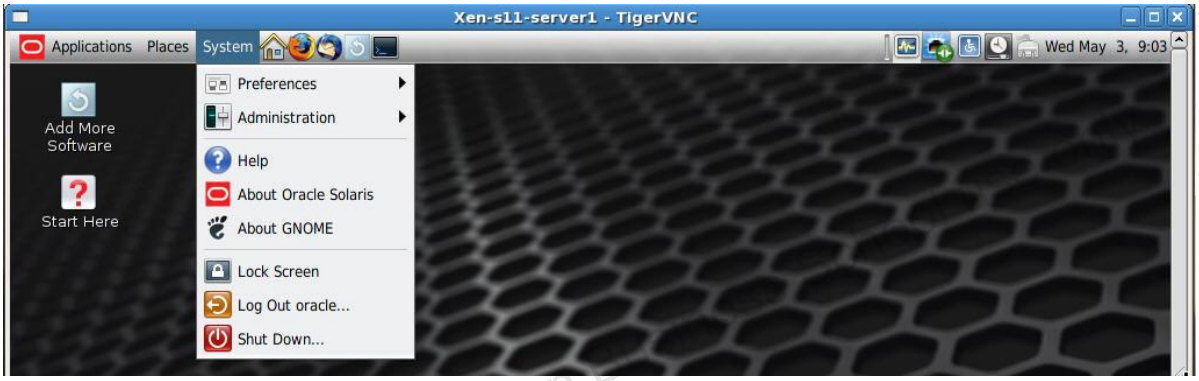
b. Select the **Open Terminal** option. A terminal window appears.

c. Use the `passwd` command to change your password to `mypass1`.

```
[oracle@s11-server1:~]$ passwd
passwd: Changing password for student
New Password:
Re-enter new Password:
passwd: password successfully changed for oracle
[oracle@s11-server1:~]$
```

d. Close the terminal window by entering `exit` and pressing **Enter**.

e. On the desktop window, click **System** in the menu bar.



f. Click **Log Out oracle** to log out of the desktop environment. A logout confirmation window appears. Click **Log Out**.

Note: If you get a warning about “a program is still running”, click **Logout Anyway**.

g. Now, enter the following **incorrect** username and password on the Login screen:

Username: **`oracle2`**

Password: **`wrong`**

The following dialog box appears indicating authentication failure.

h. Click **OK** or press **Enter**. The Login screen reappears.

i. Log in with correct user credentials.

Username: **oracle**

Password: **mypass1**

j. Open a terminal window and use the `passwd` command to reset the `oracle` user password back to its original default setting. The default password is `oracle1`. Log out of the desktop again.

For Oracle Linux (ol7-server1):

Note: Oracle Linux follows a strict default password authentication mechanism for regular users. If you are logged in as a regular user, for example the `oracle` user, you must set a strong password that conforms to strict password requirements. However, if you change to the root user and set a password, the system will accept any password. For the purpose of the following tasks only, you will switch to the root user to set the password for the `oracle` user, and later return it to its original setting.

a. Open a terminal window to your Oracle Linux VM.

b. Change to the root user with the `su -` command and input the root password `oracle1` when prompted.

```
[oracle@ol7-server1 ~]$ su -
Password:
Last Login: Mon Mar 12 14:03:40 IST 2018 on pts/0
[root@ol7-server1 ~]#
```

c. Use the `passwd oracle` command to change your `oracle` user password to `mypass1`. When the password is set, use the `exit` command to return to the `oracle` user.

Note: A `BAD PASSWORD` warning is given that the password fails policy requirements, but as root user the password is accepted after you input it a second time.

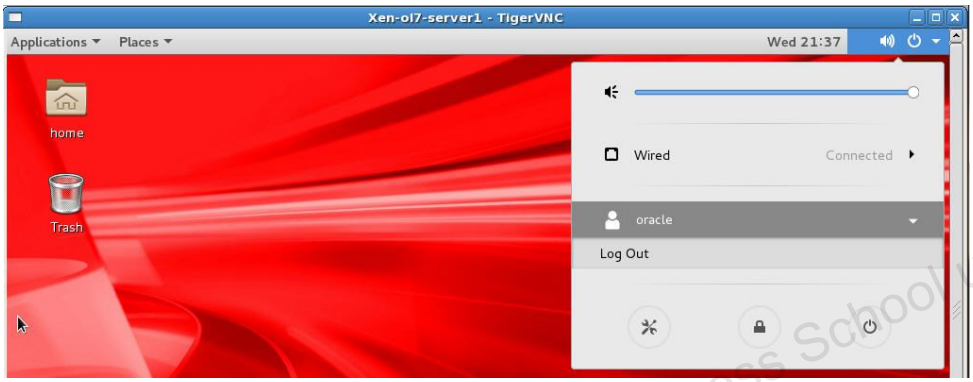
```
[root@ol7-server1 ~]# passwd oracle
Changing password for user oracle.
New password:
BAD PASSWORD: The password fails the dictionary check - it is
based on a dictionary word
Retype new password:
```

```
passwd: all authentication tokens updated successfully.
[root@ol7-server1 ~]#
```

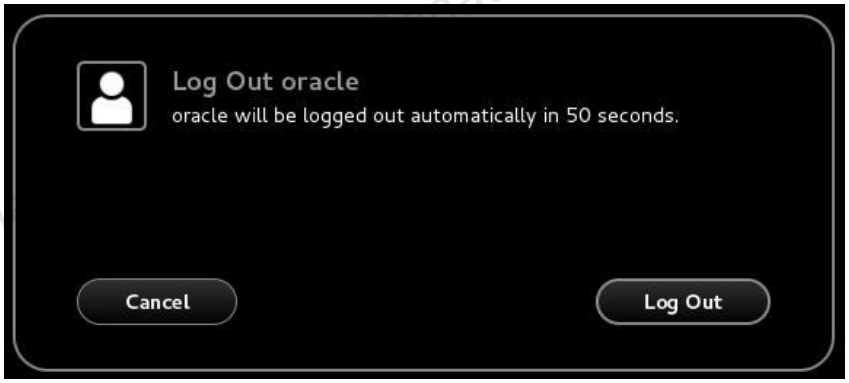
d. Use the `exit` command to switch back to the oracle user. Close the terminal window by entering `exit` again.

```
[root@ol7-server1 ~]# exit
Logout
[oracle@ol7-server1 ~]$ exit
```

e. On the desktop environment, click the **down-arrow** icon in the top right-hand corner.

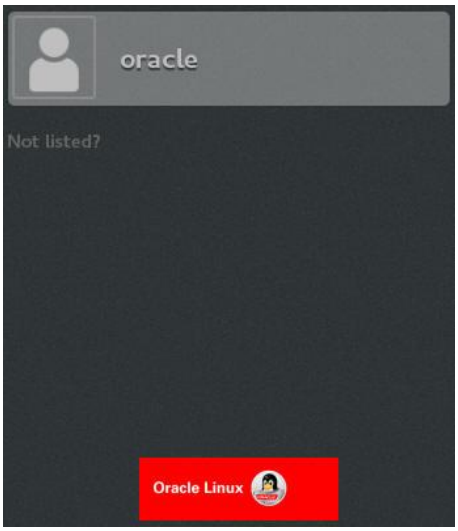


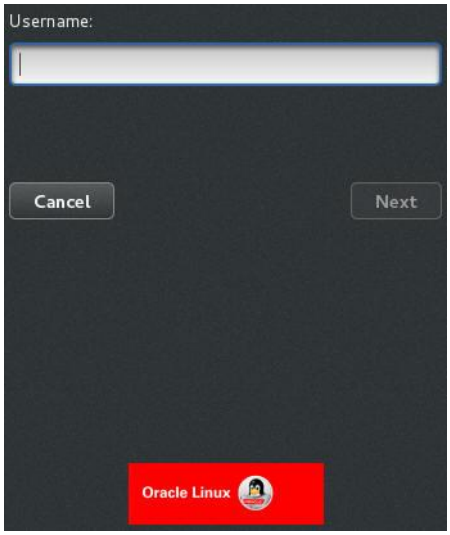
f. Click **oracle** and then click **Log Out** to log out of the desktop environment. A logout confirmation window appears.



g. Click **Log Out** or press Enter to continue with logging out.

h. Click **Not Listed?** to try an incorrect username and password. The Username screen appears.



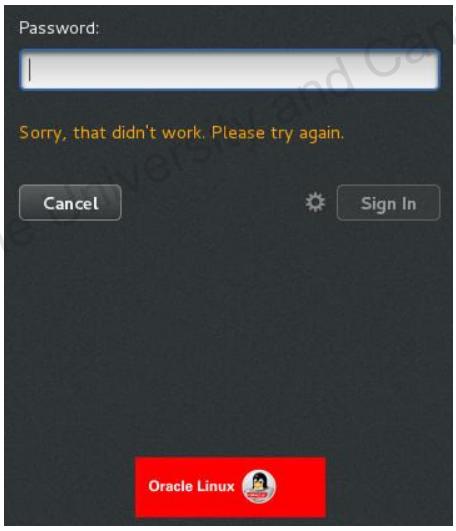


i. Enter the following incorrect username and password on the Username screen:

Username: **`oracle2`**

Password: **`wrong`**

The following dialog box appears indicating authentication failure. Click **Cancel** or press **Enter.** The Login screen reappears.



j. Log in with the correct user credentials.

Username: **`oracle`**

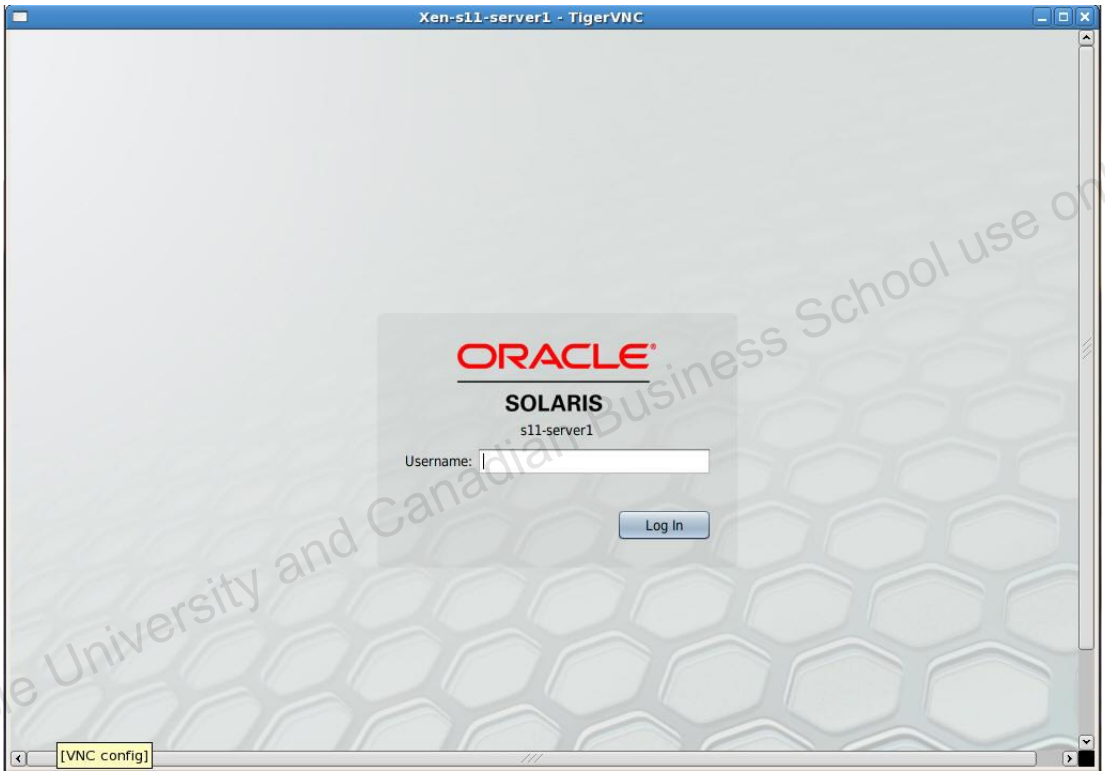
Password: **`mypass1`**

k. Reset the `oracle` user password back to its default setting of `oracle1`. Open a terminal window and switch to the root user with the `su -` command and using the root user password `oracle1`. Use the `passwd oracle` command to set the password back to `oracle1`. Exit out of the terminal window and logout from the desktop. Log back in using the `oracle` user and password `oracle1`. After verifying the reset password is functioning, log out of the desktop again.

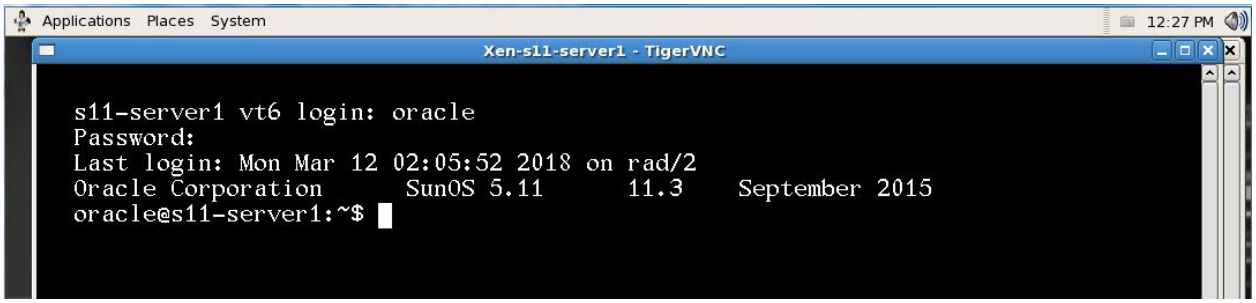
4. Access a console login from the desktop login screen and log in using the command Line.

For Oracle Solaris (s11-server1):

a. Log in to the system using the console login. Return to the graphical login screen.

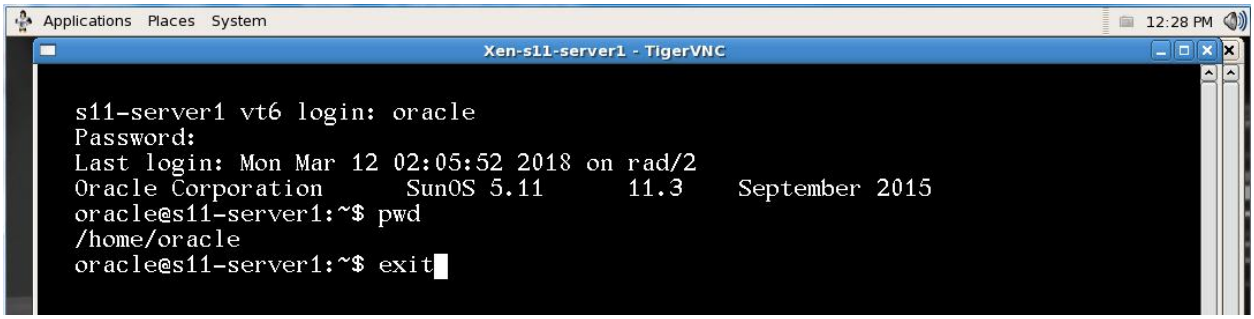


b. Press `Ctrl+Alt+F6` to switch to the command line login. This switches the view to console login. At the console login prompt, log in with the username `oracle` and password `oracle1`.



Note: The password is not displayed while being entered.

c. To confirm the current working directory, use the `pwd` command, then enter `exit` and press **Enter**.



d. To revert to the graphics mode, Press `CTRL + ALT + F7`.

e. In the Login window, enter the user credentials.

Username: **oracle**

Password: **oracle1**

f. Click the **Log In** button or press **Enter**.

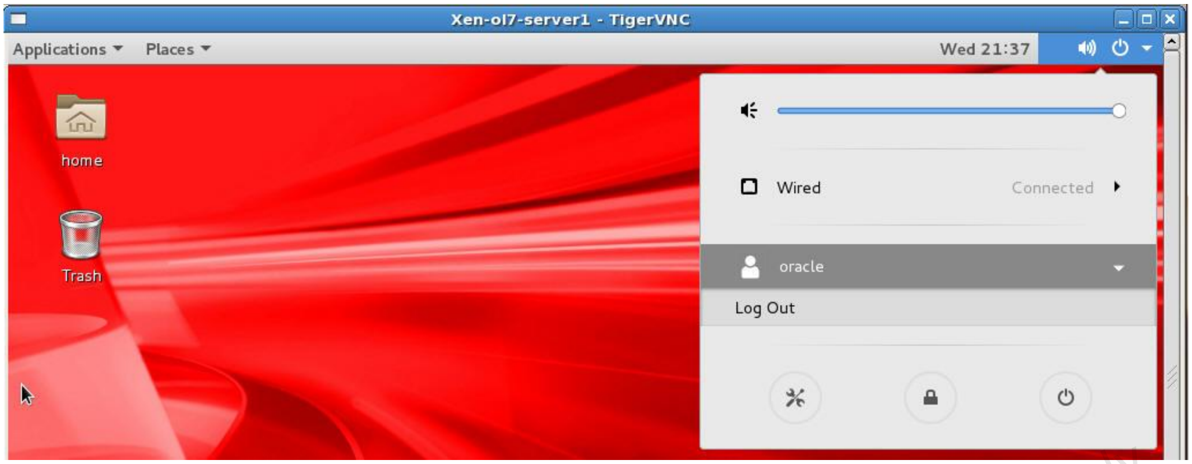
g. Right-click the Desktop and select the **Open Terminal** option.

h. Again, view the current directory using the `pwd` command.

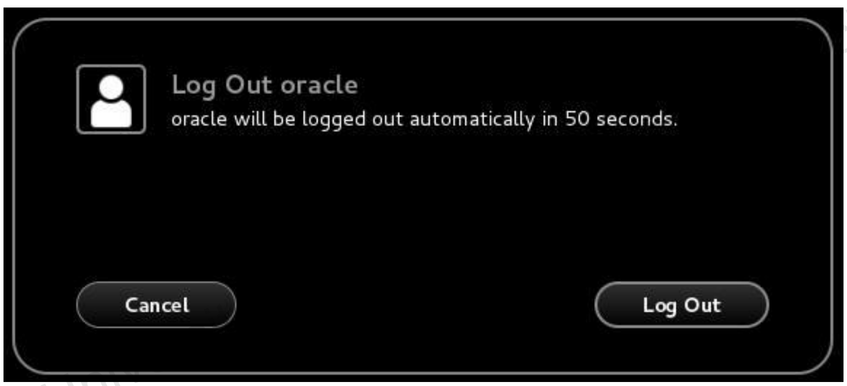
```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$
```

For Oracle Linux (ol7-server1):

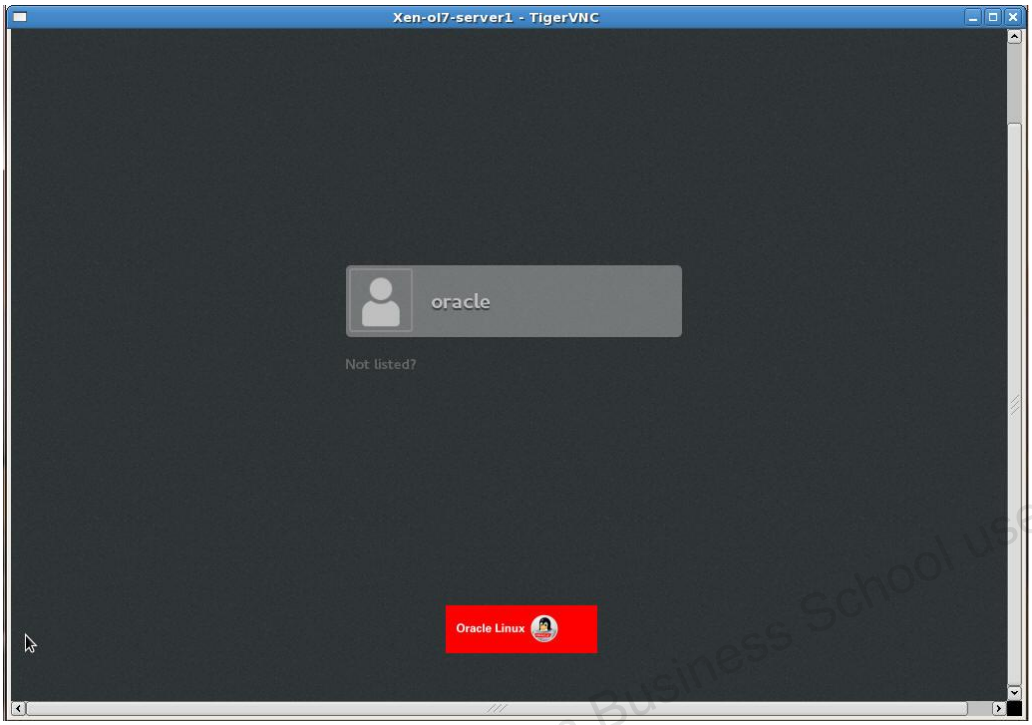
a. If not already logged out, on the desktop environment, click the **down-arrow** icon in the top right-hand corner. Next click **oracle** and then click **Log Out.**



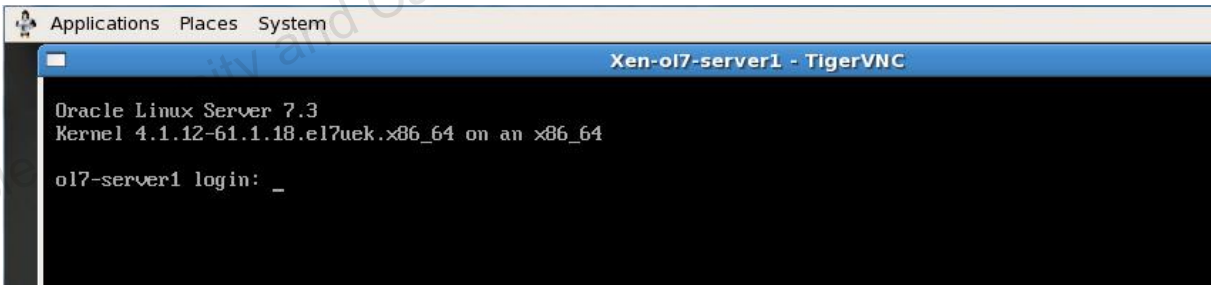
b. A logout confirmation window appears, click **Log Out**.



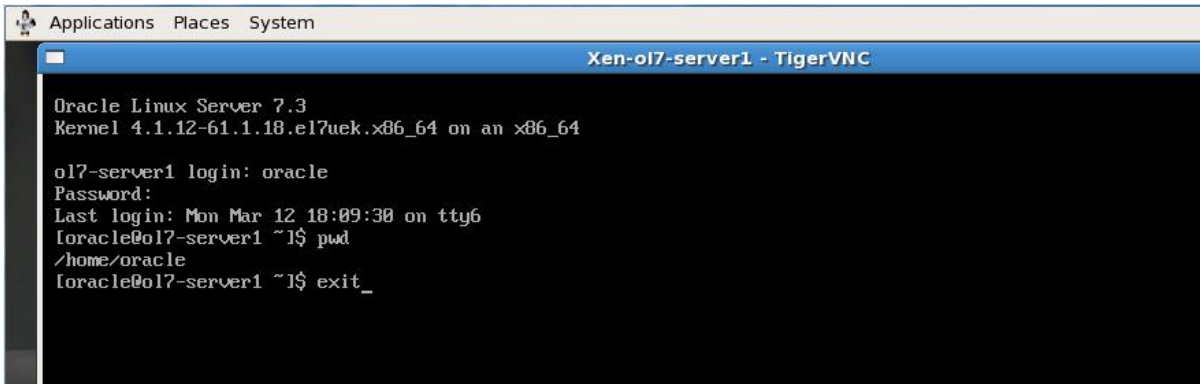
c. Once the graphical login window appears, press `Ctrl + Alt + F6` on the login window to switch to a text console and perform a non-GUI login. This switches the view to console login.



d. At the console prompt, log in with the username `oracle` and password `oracle1`

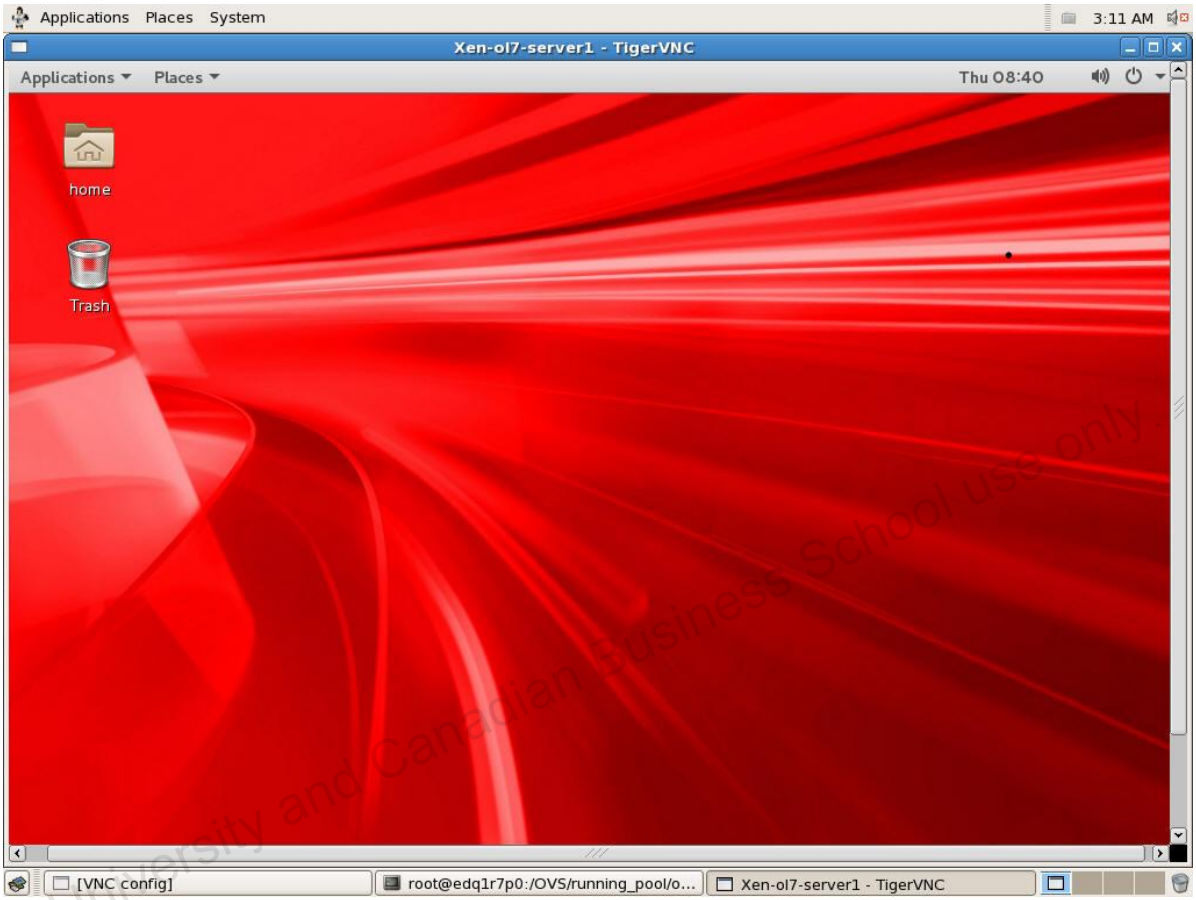


e. After logging in, to confirm the current working directory, enter the `pwd` command, then enter `exit` and press **Enter**.



f. To revert to the graphical mode, press `Ctrl + Alt + F1` or Alt + Right Arrow (cursor key).

g. Click on the `oracle` username and enter the password. When done, the GUI interface is launched.



Practice 2-2: Displaying System Information Using the Command Line

Overview

In this practice, you will display information about the OS and system.

Note

- You can use whichever VM you prefer, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change to the `/home/oracle` directory.
- It should be noted that the time allotted for the practice is only enough to complete the practice on one of the VMs, but not both.

Tasks

1. To open a terminal window, right-click the desktop and select the **Open Terminal** option.
2. Display information about the OS and system.

Oracle Linux

```
[oracle@ol7-server1 ~]$ uname -a
Linux ol7-server1 4.1.12-61.1.18.el7uek.x86_64 #2 SMP Fri Nov 4
15:48:30 PDT 2016 x86_64 x86_64 x86_64 GNU/Linux
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ uname -a
SunOS s11-server1 5.11 11.3 i86pc i386 i86pc
[oracle@s11-server1:~]$
```

3. Display information about the OS name.

Oracle Linux

```
[oracle@ol7-server1 ~]$ uname -s
Linux
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ uname -s
SunOS
[oracle@s11-server1:~]$
```

4. Display information about the OS release level.

Oracle Linux

```
[oracle@ol7-server1 ~]$ uname -r
4.1.12-61.1.18.el7uek.x86_64
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ uname -r
5.11
[oracle@s11-server1:~]$
```

5. Display the current data and time.

Oracle Linux

```
[oracle@ol7-server1 ~]$ date
Fri May 19 06:14:21 IST 2017
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ date
Friday, May 19, 2017 06:14:21 AM IST
[oracle@s11-server1:~]$
```

6. Display the current month's calendar.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cal
      May 2017
 S  M Tu  W Th  F  S
    1  2  3  4  5  6
 7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ cal
   May 2017
 S  M Tu  W Th  F  S
    1  2  3  4  5  6
```

```
 7  8  9 10 11 12 13
14 15 16 17 18 19 20
21 22 23 24 25 26 27
28 29 30 31

[oracle@s11-server1:~]$
```

7. Display the calendar with a specific month and year; for example, June 2017.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cal 06 2017
      June 2017
 S  M Tu  W Th  F  S
             1  2  3
 4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30

[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ cal 06 2017
   June 2017
 S  M Tu  W Th  F  S
             1  2  3
 4  5  6  7  8  9 10
11 12 13 14 15 16 17
18 19 20 21 22 23 24
25 26 27 28 29 30

[oracle@s11-server1:~]$
```

8. Clear the terminal window using the `clear` command.
9. Display the current date and host system name.

Oracle Linux

```
[oracle@ol7-server1 ~]$ date; hostname
Fri May 19 06:14:21 IST 2017
Ol7-server1
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ date; hostname
Friday, May 19, 2017 06:14:21 AM IST
s11-server1
[oracle@s11-server1:~]$
```

10. Display the calendar for March 2012, the current date, and the OS release information.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cal 03 2017; date; cat /etc/system-release
      March 2017
 S  M Tu  W Th  F  S
          1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

Fri May 19 06:14:21 IST 2017
Oracle Linux Server release 7.3
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ cal 03 2017; date; cat /etc/release
   March 2017
 S  M Tu  W Th  F  S
          1  2  3  4
 5  6  7  8  9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30 31

Friday, May 19, 2017 06:14:21 AM IST

                     Oracle Solaris 11.3 X86
  Copyright (c) 1983, 2015, Oracle and/or its affiliates.  All
rights reserved.
                     Assembled 06 October 2015

[oracle@s11-server1:~]$
```

Practice 2-3: Using the Man Pages

Overview

In this practice, you learn to use the `man` command to extract additional information about system commands.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change to the `/home/oracle` directory.
- It should be noted that the time allotted for the practice is only enough to complete the practice on one of the VMs, but not both.

Tasks

1. Display the man[ual] pages and man page sections.
   a. To display the manual pages for the `man` command, run the `man man` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ man man
MAN(1)                  Manual pager utils                  MAN(1)

NAME
       man - an interface to the on-line reference manuals

.. Output truncated ..
```

Oracle Solaris

```
 [oracle@s11-server1:~]$ man man
man(1)                    User Commands                     man(1)

NAME
       man - find and display reference manual pages

.. Output Truncated ..
```

Note: The number within the "( )" is the section number. In this case, it's section 1. Use the letter `q` key command to quit the `man` command.

Keyboard Commands	Functions
h	Provides a description (help) of all scrolling capabilities
Space bar	Displays the next screen of a man page
Return / Enter	Displays the next line of a man page
b	Move back one full screen of the man pages
g	Return to the top on the man pages
G	Go to the bottom of the man pages
/pattern	Searches forward for a *pattern* (regular expression)
?pattern	Searches backwards for a *pattern* (regular expression)
n	Find the next occurrence of the *pattern*
N	Changes the direction of the search
q	Quits the `man` command and returns to the shell prompt

Viewing man pages using the `less` (pager) keyboard commands.

b. To display the man pages section 1 (User Commands), which is the default for the `man` command, run the command as below.

Oracle Linux

```
[oracle@ol7-server1 ~]$ man 1 man

or simply

[oracle@ol7-server1 ~]$ man man
```

Oracle Solaris

```
[oracle@s11-server1:~]$ man -s1 man

or simply

[oracle@s11-server1:~]$ man man
```

Note: `1, -s1` or nothing yields the same *default* section number, for user commands.

c. To display the man pages section 2 (System Calls) for the `exit` command, run the command as below:

Oracle Linux

```
[oracle@ol7-server1 ~]$ man 2 exit
```

Oracle Solaris

```
[oracle@s11-server1:~]$ man -s2 exit
```

d. Use the keyboard commands to scroll through the man pages. You can also search for a pattern by entering `/<pattern>`. For example, choose a pattern and search for it in the man pages for the `uname` command.

e. Using the command `man -k man`, search the man pages for information on the `man` command using the keyword “man”.

f. Search the man pages for information on the `passwd` command.

g. Display section 5 (file formats) in Oracle Linux or section 4 in Oracle Solaris of the man pages for the `passwd` file format and review its contents.

Note: Use the letter `q` key command to quit the `man` command.

Practices for Lesson 3: Working with Files and Directories

Practices for Lesson 3: Overview

Practices Overview

In these practices, you will perform the following set of tasks:

- Display user information
- Display directory contents
- Display file types
- Change directories
- Access files
- Copy files and directories
- Move files and directories
- Create files and directories
- Remove files and directories
- Use symbolic links
- Search files and directories

Practice 3-1: Accessing Files and Directories

Overview

In this practice, you will use file and directory access commands. You will use the files and directories available in the `/home/oracle/lab` directory.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- The time allotted for the practice is enough only to complete it on one of the VMs, not on both.
- Contents of directories may vary between Oracle Linux and Oracle Solaris VMs.

Tasks

1. Open a terminal window by right-clicking on the desktop. Select the **Open Terminal** option.
2. Display user information by using the `id` command.

   Oracle Linux

   ```
   [oracle@ol7-server1 ~]$ id
   uid=1000(oracle) gid=1000(oracle) groups=1000(oracle)
   context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
   [oracle@ol7-server1 ~]$
   ```

   Oracle Solaris

   ```
   [oracle@s11-server1:~]$ id
   uid=60016(oracle) gid=100(oracle)
   [oracle@s11-server1:~]$
   ```

   Note: If there is a difference in command syntax or output between UNIX and Linux, refer to the system prompt for system specifics.
3. Display your current working directory by using the `pwd` command.

   Oracle Linux and Oracle Solaris

   ```
   $ pwd
   /home/oracle
   ```

4. Change to your home directory from any location by using the `cd` command.

Oracle Linux and Oracle Solaris

```
$ cd
$ pwd
/home/oracle
```

5. Display the contents of your current working directory by using the `ls` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ ls
bin  Desktop  Documents  Downloads  lab  Music  Pictures  Public
... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ls
Desktop    Documents  Downloads  lab    Public
[oracle@s11-server1:~]$
```

6. Display all files, including any hidden files, using the `ls -a` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ ls -a
.              .cache     .ICEauthority  Public
..             .config    lab            .ssh
.bash_history  Desktop    .lesshst       Templates
.bash_logout   Documents  .local         Videos
.bash_profile  Downloads  .mozilla       .viminfo
.bashrc        .esd_auth  Music
bin            .gnupg     Pictures
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ls -a
.                   .gtk-bookmarks      .themes
..                  .ICEauthority       .thumbnails
.bash_history       .icons              .updatemanager
.bashrc             .java               .vp
.config             .lesshst            .xsession-errors
.dbus               .local              .xsession-errors.old
.dbus-keyrings      .nautilus           Desktop
.dmrc               .oracle_jre_usage   Documents
```

```
.gconf                  .profile              Downloads
.gconfd                 .pulse                lab
.gnome2                 .pulse-cookie         Public
.gnome2_private         .recently-used.xbel
.gstreamer-0.10         .ssh
[oracle@s11-server1:~]$
```

7. Display a long list of the contents of the current working directory by using the `ls -l` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ ls -l
total 4
drwxrwxr-x. 2 oracle oracle    6 Jul 24  2017 bin
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Desktop
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Documents
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Downloads
drwxr-xr-x. 7 oracle oracle 4096 Mar  5 17:36 lab
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Music
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Pictures
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Public
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Templates
drwxr-xr-x. 2 oracle oracle    6 Mar 13  2017 Videos
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ls -l
total 15
drwxr-xr-x   2 oracle   oracle         5 Mar  9  2017 Desktop
drwxr-xr-x   6 oracle   oracle         6 Mar  9  2017 Documents
drwxr-xr-x   2 oracle   oracle         2 Mar  9  2017 Downloads
drwxr-xr-x   7 oracle   oracle        24 Mar  5 04:55 lab
drwxr-xr-x   2 oracle   oracle         2 Mar  9  2017 Public
[oracle@s11-server1:~]$
```

8. Display the file types in your current working directory by using the `ls -F` command.

Oracle Linux and Oracle Solaris

```
$ ls -F
bin/      Documents/  lab/    Pictures/  Templates/
Desktop/  Downloads/  Music/  Public/    Videos/
$
```

Note: the list will be different for Oracle Linux and Oracle Solaris VMs.

9. Change to the `lab/dir1` directory by using the `cd` command.

Oracle Linux and Oracle Solaris

```
$ cd lab/dir1
$ pwd
/home/oracle/lab/dir1
$
```

10. Display a long list of the contents of the current working directory by using `ls -l` command.

Oracle Linux and Oracle Solaris

```
$ pwd
/home/oracle/lab/dir1
$ ls -l
total 3
drwxr-xr-x   3 oracle   oracle         5 Mar  5 04:55 coffees
$
```

11. Change to the `coffees` directory by using the `cd` command.

Oracle Linux and Oracle Solaris

```
$ cd coffees
$ pwd
/home/oracle/lab/dir1/coffees
$
```

12. Change to the `planets` directory, which is available under the `$HOME/lab/dir3` directory, by using the relative path name, and then return to your home directory.

Oracle Linux and Oracle Solaris

```
$ cd ../../dir3/planets
$ pwd
/home/oracle/lab/dir3/planets
$
```

Now, return to the home directory

```
$ cd
$ pwd
/home/oracle
$
```

13. Change to the `dir1` directory by using the absolute path name, and then return to your home directory.

Oracle Linux and Oracle Solaris

```
$ cd /home/oracle/lab/dir1
$ pwd
/home/oracle/lab/dir1
$ cd
$ pwd
/home/oracle
$
```

Note: The command `cd ~/lab/dir1` will also work in addition to the command shown.

14. Change to the `/etc` directory by using the relative path name. Then change to the `/lab` directory in your home directory, and finally change to the `dir1` directory.

Oracle Linux and Oracle Solaris

```
$ cd ../../etc
$ pwd
/etc
$ cd ~/lab
$ pwd
/home/oracle/lab
$ cd dir1
$ pwd
/home/oracle/lab/dir1
$ cd
$ pwd
/home/oracle
$
```

15. Display the contents of the `fruit` file by using the `cat` command with line numbers.

Oracle Linux and Oracle Solaris

```
$ cd lab
$ cat -n fruit
 1 lemon
 2 orange
```

```
 3 apple
 4 banana
 5 pear
 6 mango
 7 tomato
 8 pomegranate
 9
$
```

16. Display the contents of the `fruit` and `fruit2` files by using a single command.

Oracle Linux and Oracle Solaris

```
$ cat fruit fruit2
lemon
orange
apple
banana
pear
mango
tomato
pomegranate

lemon
orange
apple
banana
tomato
guava
mango
pomegranate
$
```

17. For the Oracle Linux VM, display the first five lines of the `/usr/share/dict/words` file on the screen. For Oracle Solaris, use the `/usr/dict/words` file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ head -5 /usr/share/dict/words
1080
10-point
10th
11-point
12-point
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ head -5 /usr/dict/words
10th
1st
2nd
3rd
4th
[oracle@s11-server1:~/lab]$
```

18. In Oracle Linux, display the last eight lines of the `/usr/share/dict/words` file on the screen. For Oracle Solaris, use the `/usr/dict/words s` file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ tail -8 /usr/share/dict/words
Zyzomys
Zyzzogeton
zyzzyva
zyssyvas
ZZ
Zz
zZt
ZZZ
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ tail -8 /usr/dict/words
Zorn
Zoroaster
Zoroastrian
zounds
z's
zucchini
Zurich
zygote
[oracle@s11-server1:~/lab]$
```

Note: The `head` command displays the first 10 lines of a file, The `tail` command displays the last 10 lines of a file.

19. For Oracle Linux, determine the total number of lines contained in the `/usr/share/dict/words` file by using `wc -l` command. For Oracle Solaris, use the `/usr/dict/words` file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ wc -l /usr/share/dict/words
479828 /usr/share/dict/words
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ wc -l /usr/dict/words
   25146 /usr/dict/words
[oracle@s11-server1:~/lab]$
```

Practice 3-2: Using File and Directory Commands

Overview

In this practice, you will perform some actions on files and directories using file and directory commands.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.

Tasks

To use file and directory commands, complete the following steps:

1. If you are not in the `lab` subdirectory in your home directory, change to the `lab` subdirectory.

   Oracle Linux and Oracle Solaris

```
$ pwd
/home/oracle
$ cd ~/lab
$ pwd
/home/oracle/lab
$
```

2. From the `/home/oracle/lab` directory, make a new directory, `dir4`, copy the `dir1/coffees/beans/beans` file into the `dir4` directory, and name it `roses`.

   Oracle Linux and Oracle Solaris

```
$ mkdir dir4
$ cp dir1/coffees/beans/beans dir4/roses
$ ls dir4
roses
$
```

3. Create a directory called `vegetables` in `dir3`.

   Oracle Linux and Oracle Solaris

```
$ mkdir dir3/vegetables
```

4. Move the `dir1/coffees/beans/beans` file into the `dir2` directory.

Oracle Linux and Oracle Solaris

```
$ mv dir1/coffees/beans/beans dir2/
$ ls dir2
beans  notes
```

The command options for `cp`, `mv`, and `rm` commands are described in the following table:

Option	Description
`-f`	Force. Do not prompt before overwrite or removal of existing files or directories.
`-i`	Interactive; prompts before accidental overwrite or removal of existing files or directories
`-r` or `-R`	Recursive; when working with directories, includes the contents of the directory and all subdirectories
`-v`	Verbose; explains what is being done

5. From your `lab` directory, create a directory called `practice1`.

Oracle Linux and Oracle Solaris

```
$ pwd
/home/oracle/lab
$ mkdir practice1
```

6. Using a single command, copy the `file.1` and `file.2` files into the `practice1` directory.

Oracle Linux and Oracle Solaris

```
$ cp file.1 file.2 practice1
$ ls practice1
file.1 file.2
$
```

7. Copy the `dir3/planets/mars` file to the `practice1` directory, and name the file `addresses`.

Oracle Linux and Oracle Solaris

```
$ cp dir3/planets/mars practice1/addresses
$ ls practice1
addresses file.1 file.2
$
```

8. Create a directory called `play` in your `practice1` directory, and move the `practice1/addresses` file to the `play` directory.

Oracle Linux and Oracle Solaris

```
$ mkdir practice1/play
$ ls practice1
addresses file.1 file.2 play
$ mv practice1/addresses practice1/play
$ ls practice1 practice1/play
practice1:
file.1 file.2 play

practice1/play:
addresses
$
```

9. Using a single command, copy the `play` directory in the `practice1` directory to a new directory in the `practice1` directory called `appointments`.

Oracle Linux and Oracle Solaris

```
$ cp -r practice1/play practice1/appointments
$
```

10. Recursively list the contents of the `practice1` directory.

Oracle Linux and Oracle Solaris

```
$ ls -R practice1
practice1:
appointments  file.1        file.2        play

practice1/appointments:
addresses

practice1/play:
addresses
$
```

11. In your home directory, create a directory called `house` with a subdirectory called `furniture` using a single command.

Oracle Linux and Oracle Solaris

```
$ cd; mkdir -p house/furniture
```

12. Create an empty file called `chairs` in the new `furniture` directory.

Oracle Linux and Oracle Solaris

```
$ touch house/furniture/chairs
```

13. Using a single command, create three directories called `records`, `memos`, and `misc` in your `home` directory.

Oracle Linux and Oracle Solaris

```
$ mkdir records memos misc
```

14. Create a new file called `carrot`, and rename it `celery`.

Oracle Linux and Oracle Solaris

```
$ touch carrot
$ mv carrot celery
```

15. Using a single command, remove the directories called `memos` and `misc` from your home directory.

Oracle Linux and Oracle Solaris

```
$ rmdir memos misc
```

Note: A recursive remove can be performed using the `rm -r memos misc` command.

16. Try to remove the directory called `house/furniture` with the `rm` (no options) command. Observe what happens.

Oracle Linux

```
[oracle@ol7-server1 ~]$ rm house/furniture
rm: cannot remove 'house/furniture': Is a directory
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ rm house/furniture
rm: house/furniture/ is a directory
[oracle@s11-server1:~]$
```

17. Use the command `rm -r` to remove a directory that is not empty. Remove the `house/furniture` directory. List the contents of the `house` directory to verify that the `furniture` directory has been removed.

Oracle Linux and Oracle Solaris

```
$ rm -r house/furniture
$ ls house
$
```

18. Create a new directory named `newname`, and rename it `veggies`.

Oracle Linux

```
[oracle@ol7-server1 ~]$ mkdir newname
[oracle@ol7-server1 ~]$ mv newname veggies
[oracle@ol7-server1 ~]$ ls newname veggies
ls: cannot access newname: No such file or directory
veggies:
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ mkdir newname
[oracle@s11-server1:~]$ mv newname veggies
[oracle@s11-server1:~]$ ls newname veggies
newname: No such file or directory
veggies:
[oracle@s11-server1:~]$
```

19. Create a symbolic link called `myprofile` that is a symbolic link to the `/etc/profile` file.

Oracle Linux and Oracle Solaris

```
$ ln -s /etc/profile myprofile
$ ls -l myprofile
lrwxrwxrwx ... myprofile -> /etc/profile
$
```

20. Verify that the symbolic link works.

Oracle Linux

```
[oracle@ol7-server1 ~]$ head -9 myprofile
# /etc/profile

# System wide environment and startup programs, for login setup
# Functions and aliases go in /etc/bashrc
```

```
# It's NOT a good idea to change this file unless you know what you
# are doing.  It's much better to create a custom.sh shell script in
# /etc/profile.d/ to make custom changes to your environment, as this
# will prevent the need for merging in future updates.
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ head -8 myprofile
#
# Copyright (c) 1989, 2012, Oracle and/or its affiliates. All rights
reserved.
#

# The profile that all logins get before using their own .profile
ENV=$home/.bashrc
EDITOR=vi
export ENV EDITOR
[oracle@s11-server1:~]$
```

21. Remove the symbolic link previously created.

Oracle Linux

```
[oracle@ol7-server1 ~]$ rm myprofile
[oracle@ol7-server1 ~]$ ls myprofile
ls: cannot access myprofile: No such file or directory
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ rm myprofile
[oracle@s11-server1:~]$ ls myprofile
myprofile: No such file or directory
[oracle@s11-server1:~]$
```

Practice 3-3: Locating Files and Text

Overview

In this practice, you will use `grep` and related commands to locate files and text in files.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- In these tasks, `/etc/sysctl.conf` is the system configuration file used in Oracle Linux, and `/etc/system` is the equivalent file in Oracle Solaris.

Tasks

As a reminder for these tasks, note the following for reference:

- The `grep` command searches the contents of one or more files for a character pattern using full regular expression metacharacters.
- The `egrep (grep -E)` command searches the contents of one or more files for one or more patterns using **extended** regular expression metacharacters.
- The `fgrep (grep -F)` command searches a file for a literal (**fixed**) string or a group of characters.

1. Search for the text string `root` in the `/etc/group` file and display it on the screen.

Oracle Linux

```
[oracle@ol7-server1 ~]$ grep root /etc/group
root:x:0:
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ grep root /etc/group
root::0:
other::1:root
bin::2:root,daemon
sys::3:root,bin,adm
adm::4:root,daemon
uucp::5:root
mail::6:root
tty::7:root,adm
lp::8:root,adm
nuucp::9:root
daemon::12:root
[oracle@s11-server1:~]$
```

2. In the lab directory under your home directory, display all lines in the `dante`, `file1`, and `dante_1` files that contain the lowercase pattern “who”.

Oracle Linux and Oracle Solaris

```
$ cd ~/lab
$ grep who dante file1 dante_1
dante:Mention “Alighieri” and fee will know whom you are talking
about, say
dante:"Dante," instead, and the whole world knows whom you mean.
For
dante:Who is this Dante, whom T.S. Eliot calls “the most
universal of poets
dante:rather sad young man.  His mother, whose name was Bella
(beautiful) died
dante:while he was still a child.  His father remarried a
certain Lapa who
file1:That other” separates the Achievers from the sustainers,
who don’t get around
file1:With others within their own depts, other depts, and the
whole organization.
dante_1:Santa Croce, and later at Bologna with Brunetto Latini,
who taught him,
$
```

Note: Bolding added for illustration.

3. Use the `grep` command to look for all lines in the file4 file that do not contain the uppercase letter `M`.

Oracle Linux and Oracle Solaris

```
$ cat -n file4
     1 The budget for quarter 2 is:
     2
     3 Marketing.............8M
     4 Sales.................12M
     5 Finance...............4.5M
     6 Manufacturing.........1M
$ grep -v M file4
The budget for quarter 2 is:
$
```

4. Use the `egrep` command to display all lines in the `file4` file that contain either the `”Sales”` or `”Finance”` pattern.

Oracle Linux and Oracle Solaris

```
$ egrep '(Sales|Finance)' file4
Sales.................12M
```

```
Finance.................4.5M
$
```

5. For Oracle Linux, display all the lines that have the pattern "kernel" in the /usr/lib/sysctl.d/50-default.conf file with line numbers.

Oracle Linux

```
[oracle@ol7-server1 ~]$ grep -n kernel /usr/lib/sysctl.d/50-default.conf
14:# System Request functionality of the kernel (SYNC)
16:# Use kernel.sysrq = 1 to allow all keys.
18:kernel.sysrq = 16
21:kernel.core_uses_pid = 1
[oracle@ol7-server1 ~]$
```

Note: Bolding added for illustration.

6. For Oracle Linux, use the grep command to display the number of lines that contain the pattern "net" in the /usr/lib/sysctl.d/50-default.conf file.

Oracle Linux

```
[oracle@ol7-server1 ~]$ grep -c net /usr/lib/sysctl.d/50-default.conf
6
[oracle@ol7-server1 ~]$
```

7. For Oracle Solaris, display all the lines that have the pattern "load" in the /etc/system file with line numbers.

Oracle Solaris

```
[oracle@s11-server1:~]$ grep -n load /etc/system
53:* Modules appearing in the moddir path which are NOT to be loaded,
63:* forceload:
65:* Cause these modules to be loaded at boot time, (just before mounting
67:* forceload expects a filename which includes the directory. Also
68:* note that loading a module does not necessarily imply that it will
72:*       forceload: drv/foo
[oracle@s11-server1:~]$
```

Note: Bolding added for illustration.

8. For Oracle Solaris, use the grep command to display the number of lines that contain at least one instance of the pattern "Module" (uppercase M only) that are in the /etc/system file.

Oracle Solaris

```
[oracle@s11-server1:~]$ grep -c Module /etc/system
1
```

9. For Oracle Solaris, use the `grep` command to display the number of lines that contain at least one instance of the pattern "`Module`", both in uppercase and lowercase (ignore case), in the `/etc/system` file.

Oracle Solaris

```
[oracle@s11-server1:~]$ grep -ic Module /etc/system
10
[oracle@s11-server1:~]$
```

10. Starting with your home directory, find all files of type `f` for file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ cd
$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ find ~ -type f
/home/oracle/.bash_logout
/home/oracle/.bash_profile
/home/oracle/.bashrc
/home/oracle/.cache/gdm/session.log.old
/home/oracle/.cache/gdm/session.log
/home/oracle/.cache/imsetings/log.bak
/home/oracle/.cache/imsetings/log

... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ cd
$ pwd
/home/oracle
[oracle@s11-server1:~]$ find ~ -type f
/home/oracle/.ICEauthority
/home/oracle/.bashrc
/home/oracle/.pulse-cookie
/home/oracle/.xsession-errors
/home/oracle/.dmrc
/home/oracle/.gconfd/saved_state
/home/oracle/.gnome2/saved-state

... Output truncated ...
```

11. Starting in your home directory, find all files of type `d` for directory.

Oracle Linux

```
[oracle@ol7-server1 ~]$ find ~ -type d
/home/oracle
/home/oracle/.mozilla
/home/oracle/.mozilla/extensions
/home/oracle/.mozilla/plugins
/home/oracle/.cache/
/home/oracle/.cache/gdm

... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~]$ find ~ -type d
/home/oracle
/home/oracle/.themes
/home/oracle/.icons
/home/oracle/Downloads
/home/oracle/.java
/home/oracle/.java/fonts

... Output truncated ...
```

12. Starting in your home directory, find all the files that contain the pattern "**dante**".

Oracle Linux and Oracle Solaris

```
$ find . -name *dante*
./lab/dante
./lab/dante_1
$
```

13. Starting in your home directory, find all the files that were modified in the last one day.

Oracle Linux

```
[oracle@ol7-server1 ~]$ find . -mtime -1
.
./.cache/tracker/meta.db-wal
./.cache/tracker/meta.db.shm
./.config/dconf
./.config/dconf/user
```

```
./.local/share/tracker/data/tracker-store.journal

... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~]$ find . -mtime -1
.
./ICEauthority
./xsession-errors
./dmrc
./gconfd
./gconfd/saved-state

... Output truncated ...
```

14. From your home directory, use the `find` command to search for ordinary files of size 0 (zero), beginning in your `lab` directory. Include an option prompting you with `yes` or `no` before long-listing the files.

Oracle Linux and Oracle Solaris

```
$ find lab -type f -size 0 -ok ls -l {} \;
< ls ... lab/dir2/notes > ? yes
-rw-r--r--. 1 oracle oracle 0 Mar  5 17:36 lab/dir2/notes
< ls ... lab/file.3 > ? yes
-rw-r--r--. 1 oracle oracle 0 Mar  5 17:36 lab/file.3
< ls ... lab/file.2 > ? no
< ls ... lab/file.1 > ? ^C
$
```

Note: To break out of the output, press Ctrl + C (^C). The output listing may differ between Oracle Linux and Oracle Solaris.

Practices for Lesson 4: Using the `vim` Editor

Practices for Lesson 4: Overview

Practices Overview

In these practices, you will use the `vimtutor` executable file to start your exploration of the `vim` editor commands. You will then use the `vim` editor to create and modify files.

Practice 4-1: Using the `vim` Editor

Overview

In this practice, you will use the `vimtutor` executable file. The `vimtutor` includes 7 lessons with multiple lesson parts, some of these also cover the improvements between `vim` and `vi`. According to the Welcome page in `vimtutor`, to complete all the lessons should take about 25-30 minutes. Then you will use what you just learned from `vimtutor` to create and modify the contents of a file.

The `vim` editor is the improved version of the `vi` editor. `vim` is the default editor in both Oracle Solaris 11 and Oracle Linux 7.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.

Task

Perform the following task:

1. Before starting `vimtutor`, check to make sure you are in your home directory.

   Oracle Linux and Oracle Solaris

   ```
   $ pwd
   /home/oracle
   $ which vimtutor
   /usr/bin/vimtutor
   $ vimtutor
   ```

   Note: When you start `vimtutor` it makes a copy of the `vim` tutor file so that the original file is protected against modifications. This tutor is set up to teach by use. To quit `vimtutor`, press the **Esc** key to return to command mode, then enter `:q!` to quit the tutor and return to the system prompt.

2. Show that in Oracle Linux, `vi` is an alias to `vim`. In Oracle Solaris, `vi` is a symbolic link to `vim`.

   Oracle Linux

   ```
   [oracle@ol7-server1 ~]$ which vi
   alias vi='vim'
           /usr/bin/vim
   [oracle@ol7-server1 ~]$
   ```

Oracle Solaris

```
[oracle@s11-server1:~]$ ls -l $(which vi)
lrwxrwxrwx   1 root   . . . /usr/bin/vi -> vim
[oracle@s11-server1:~]$
```

3. In your `/home/oracle` directory, create a file called `example`. The terminal window screen is replaced by the `vi` interface. At the top of the terminal window is the blinking cursor. At the bottom of the terminal window, you see “example” [New File].

Oracle Linux and Oracle Solaris

```
$ vi example
~
~
~
... Output truncated ...
"example" [New File]
```

Note: To move to the next line to insert the sentence, press **Enter**.

a. Press the **i** key to change into insert mode and insert the following text:

```
Hello World
What is your
Waht id today’s date?
```

Oracle Linux and Oracle Solaris

```
Hello World
What is your
Waht id today’s date?
~
~
~
-- INSERT --
```

4. To append text to the line `What is your`, press **Esc** to enter command mode. Use the **h**, **j**, **k**, **l** or **arrow** keys to navigate to the last character of the line. Press the **a** key to append and insert a space with the next string "`name?`".

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
Waht id today's date?
~
~
-- INSERT --
```

5. To replace the `d` character with `s` in the line, `Waht id today's date?`, press **Esc** to return to command mode. Then move the cursor to the third line by pressing the **j** or **down arrow** key. This will move the cursor down. To move the cursor to the left, press **h** or the **left arrow** key. Bring the cursor to the `d` character in the string "`id`". Press the **r** key and then insert character `s`. This will replace the character `d` with the character `s`.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
Waht is today's date?
~
~
~
```

Note: Ensure that you are in command mode before you press the **r** command key.

6. To change the word `Waht` to `What`, press **Esc** and move the cursor to the third line. Place your cursor on the character '`a`' of the word `Waht` and execute the **cw** command. Enter the text `hat`. This will change the whole word `Waht` to `what`. Press **ESC** when finished modifying the word.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
~
```

7. To copy and paste the line `Hello World`, press **ESC** to return to command mode. Move the cursor to the beginning of the `Hello World` line. Execute the **yy** command to copy the string. Then move the cursor to the end of the same line and execute the **p** command to paste the string. The whole line is copied and pasted.

   Oracle Linux and Oracle Solaris

```
Hello World
Hello World
What is your name?
What is today's date?
~
~
~
```

   Note: Ensure you are in command mode before executing the **yy** and **p** commands.

8. To delete the additional "`Hello World`" line, press **Esc** to enter command mode. Move the cursor to the beginning of the second line "`Hello World`" and execute the **dd** command. The entire line is deleted.

   Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
~
```

   Note: Ensure you are in command mode before you execute the **dd** command.

9. To search for the string "`What`", press **Esc** to enter command mode and press the forward slash **/** key. Enter the text "`What`" and press **Enter**. The cursor automatically moves to the first string in the file that it encounters. Notice that "`/What`" appears at the bottom of the terminal window screen.

   Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
~
/What
```

   Note: In Oracle Linux matching strings found are also highlighted in yellow.

10. To search for the next occurrence of the same string press **n**. The cursor will move to the second string in the file.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
~
search hit BOTTOM, continuing at TOP
```

11. To customize the session by displaying the line numbers, press **Esc** to enter command mode. Then enter the `:set nu` command and press **Enter**. Notice that `:set nu` appears at the bottom of the terminal window screen.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
:set nu
```

The output changes to:

```
      1 Hello World
      2 What is your name?
      3 What is today's date?
~
~
~
:set nu
```

12. To remove the line numbers, press **Esc** to enter command mode. Next, type the `:set nonu` command and press **Enter**. The line numbers disappear.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
~
:set nonu
```

13. To quit and save the file with the changes, press **Esc** to enter command mode. Then type `:wq` and press **Enter**. Notice that `:wq` appears at the bottom of the terminal window screen. The file is saved and the command prompt returns.

Oracle Linux and Oracle Solaris

```
Hello World
What is your name?
What is today's date?
~
~
:wq
$
```

14. For more information about the various commands in `vim`, refer back to the `vimtutor` executable file you used at the beginning of this practice.

Practices for Lesson 5: Using Features Within the `Bash` Shell

Practices for Lesson 5: Overview

Practices Overview

In these practices, you will perform the following tasks, described in the corresponding lesson.

- Use the shell metacharacters.
- Use command redirection.
- Use variables in the Bash shell.
- Display the command history.
- Customize the user's work environment.

Practice 5-1: Using Shell Metacharacters

Overview

In this practice, you will use shell metacharacters to simplify commands, structure, and output. `bash` is the default shell in both Oracle Solaris and Oracle Linux.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.

Tasks

1. To verify that the default shell, `bash`, is running, use the `echo` command on both Oracle Linux and Oracle Solaris to display the contents of the `SHELL` variable.

Oracle Linux

```
[oracle@ol7-server1 ~]$ echo $SHELL
/bin/bash
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ echo $SHELL
/usr/bin/bash
[oracle@s11-server1:~]$
```

Metacharacter Types	Symbol	Choices or Values
Pathname Expansion	~	Tilde: Represents the home directory of the current user
Expansion	-	Dash: Represents the previous working directory
Parameter Expansion	$	Dollar sign: Parameter/variable expansion
Filename Generation	*	Asterisk: Matches zero or more characters
Filename Generation	?	Question Mark: Matches zero or a single character
Filename Generation	[ ]	Square Brackets: Matches a single character

2. Switch to the user's home directory by using the tilde (~) metacharacter with the `cd` command.

Oracle Linux and Oracle Solaris

```
$ pwd
/home/oracle
$ cd lab/Documents
$ pwd
/home/oracle/lab/Documents
$ cd ~
$ pwd
/home/oracle
$
```

3. Switch between the `/home/oracle` and `/tmp` directories by using the dash (-) metacharacter with the `cd` command.

Oracle Linux and Oracle Solaris

```
$ cd /tmp
$ pwd
/tmp
$ cd -
/home/oracle
$ cd -
/tmp
$ cd
```

Note: There are two shell variables that hold the values for the dash (-) metacharacter, they are `$PWD` and `$OLDPWD`.

4. List all the files and directories in the `~/lab` directory that end with the number `2`.

Oracle Linux and Oracle Solaris

```
$ cd ~/lab
$ ls *2
file.2  file2   fruit2

dir2:
beans    notes
$
```

5. List all the files and directories that start with the string "`file`" and are followed by any other single character.

Oracle Linux and Oracle Solaris

```
$ ls file?
file1  file2  file3  file4
$
```

6. List all the files and directories that start with letters `m` through `z` using square brackets.

Oracle Linux and Oracle Solaris

```
$ ls [m-z]*
myvars  tutor.vi

practice:
mailbox  project  projection  research  results

practice1:
appointments  file.1  file.2  play
$
```

Practice 5-2: Using Command Redirection

Overview

In this practice, you will perform redirection of standard output (`stdout`), and standard error (`stderr`) by using the > (greater-than), and | (pipe) metacharacters.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.

Tasks

1. If not already open, start a terminal session by right-clicking the desktop and selecting the **Open Terminal** option.
2. Use the greater-than (>) metacharacter to redirect the list of files and subdirectories of the user's home directory into the `dir-list` file.

Oracle Linux

```
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ ls > dir-list
[oracle@ol7-server1 ~]$ ls
bin      dir-list   example  Music     records    Videos
celery   Documents  house    Pictures  Templates
Desktop  Downloads  lab      Public    veggies
[oracle@ol7-server1 ~]$ cat -n dir-list
     1  bin
     2  celery
     3  Desktop
     4  dir-list
     5  Documents
     6  Downloads
     7  example
     8  house
     9  lab
    10  Music
    11  Pictures
    12  Public
    13  records
```

```
    14  Templates
    15  veggies
    16  Videos
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$ ls > dir-list
[oracle@s11-server1:~]$ ls
celery     dir-list   Downloads  house      Public     veggies
Desktop    Documents  example    lab        records
[oracle@s11-server1:~]$ cat -n dir-list
     1  celery
     2  Desktop
     3  dir-list
     4  Documents
     5  Downloads
     6  example
     7  house
     8  lab
     9  Public
    10  records
    11  veggies
[oracle@s11-server1:~]$
```

3. Use the `rm` command to remove the directory `dir-list`.

Oracle Linux

```
[oracle@ol7-server1 ~]$ rm dir-list
[oracle@ol7-server1 ~]$ ls
bin      Documents  house  Pictures  Templates
celery   Downloads  lab    Public    veggies
Desktop  example    Music  records   Videos
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ rm dir-list
[oracle@s11-server1:~]$ ls
celery     Documents  example   lab        records
Desktop    Downloads  house     Public     veggies
```

4. From the `/home/oracle` directory, redirect both the standard output (`stdout`) and the standard error (`stderr`) message to a newly created file called `error` in the `lab` directory.

Oracle Linux

```
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ touch lab/error
[oracle@ol7-server1 ~]$ ls /var /test 1> lab/error 2>&1
[oracle@ol7-server1 ~]$ cat lab/error
ls: cannot access /test: No such file or directory
/var:
account
adm
cache

... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$ touch lab/error
[oracle@s11-server1:~]$ ls /var /test 1> lab/error 2>&1
[oracle@s11-server1:~]$ cat lab/error
/test: No such file or directory
/var:
adm
ai
apache2
audit
cache

... Output Truncated ...
```

5. Use the `rm` command to remove the file `lab/error`.

Oracle Linux and Oracle Solaris

```
$ rm lab/error
$ ls lab/error
```

6. View a list of all the subdirectories located in the `/etc` directory by using the redirection symbol `|` (pipe).

Oracle Linux

```
[oracle@ol7-server1 ~]$ ls -F /etc | grep "/"
abrt/
alsa/
alternatives/
at-spi2/
audisp/
audit/

... Output truncated ...
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ls -F /etc | grep "/"
acct/
amd64/
anthy/
apache2/
avahi/
bash/

... Output truncated ...
```

Practice 5-3: Using Variables in the `bash` Shell

Overview

In this practice, you will use variables to store values.

Tasks

1. Use the dollar sign (`$`) parameter expansion metacharacter to display the value stored inside the `SHELL` variable using the `echo` command.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ echo $SHELL
/bin/bash
[oracle@ol7-server1 ~]$
```

   Oracle Solaris

```
[oracle@s11-server1:~]$ echo $SHELL
/usr/bin/bash
[oracle@s11-server1:~]$
```

2. List all shell variables and their values by using the `set` command.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ set
ABRT_DEBUG_LOG=/dev/null
BASH=/bin/bash
BASHOPTS=checkwinsize:cmdhist:expand_aliases:extglob:extquote:fo
rce_fignore:histappend:interactive_comments:login_shell:progcomp
:promptvars:sourcepath
BASH_ALIASES=()
BASH_ARGC=()

... Output truncated ...
```

   Oracle Solaris

```
[oracle@s11-server1:~]$ set
A__z='"*SHLVL'
BASH=/usr/bin/bash
BASHOPTS=cmdhist:expand_aliases:extquote:force_fignore:hostcompl
ete:interactive_comments:progcomp:promptvars:sourcepath:xpg_echo
BASH_ALIASES=()
...(output truncated)
```

3. Use the | (pipe) metacharacter and the `wc -l` word count command to get a count of the number of variables in each environment.

Oracle Linux

```
[oracle@ol7-server1 ~]$ set | wc -l
2225
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
oracle@s11-server1:~]$ set | wc -l
70
oracle@s11-server1:~]$
```

Note: The word count number may vary in each VM.

4. Modify the default prompt using variable PS1.
   a. **For Oracle Linux**, the default value for PS1 in your activity environment is `\u@\h:\w\$`. Verify the current prompt setting using the command `echo $PS1`. Then use `PS1="$LOGNAME@`uname -n` \$PWD $ "` to add the full directory path information to the displayed prompt.

Oracle Linux

```
[oracle@ol7-server1 ~]$ echo $PS1
[\u@\h \W]$
[oracle@ol7-server1 ~]$ PS1="$LOGNAME`uname -n` \$PWD $ "
oracleol7-server1 /home/oracle $
```

Note: Type the command as it is. The backtick (` `) symbols do not represent single quotation marks. The updated prompt then displays the login name of the user, host name, and the current working directory path. Use the `man bash` pages and search for *prompting* to see all the special characters that can be used when creating the prompt.

   b. Return the prompt to its default setting.

Oracle Linux

```
oracleol7-server1 /home/oracle $ PS1="[\u@\h \W]\$ "
[oracle@ol7-server1 ~]$
```

   c. **For Oracle Solaris**, the default prompt value in your activity environment is `PS1=[\u@\h:\w]\$`. Verify the current prompt setting using the command `echo $PS1`. Then use `PS1="$LOGNAME@`uname -n` \$PWD $ "` to add the full directory path information to the displayed prompt.

Oracle Solaris

```
[oracle@s11-server1:~]$ PS1="$LOGNAME@`uname -n` \$PWD $ "
oracle@s11-server1 /home/oracle $
```

Note: Type the command as it is. The backtick (` `) symbols do not represent single quotation marks. The updated prompt then displays the login name of the user, host name, and the current working directory path. Use the `man bash` pages and search for *prompting* to see all the special characters that can be used when creating the prompt.

d. Return the prompt to its default setting.

Oracle Solaris

```
oracle@s11-server1 /home/oracle $ PS1="\u@\h:\w}\$"
[oracle@s11-server1:~]$
```

Note: Setting the prompt this way only applies to the current terminal session. The `exit` command can also be used as it will close the current terminal session and require you to open a new terminal session. This results in the original default PS1 value being used again.

5. If you closed the terminal in the previous task, open a new terminal session by right-clicking the desktop and selecting **Open Terminal**. Then display the current list of colon (`:`)-separated values in the `PATH` variable.

Oracle Linux

```
[oracle@ol7-server1 ~]$ echo $PATH
/usr/local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/home/oracle/.
local/bin:/home/oracle/bin
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ echo $PATH
/usr/bin:/usr/sbin
```

Note: The `PATH` variablle is used to store a colon (`:`)-separated list of directories to be searched when a command is entered.

6. In the user's home directory, add a new directory called `sbin`. Then append the new directory to the end of the contents in the `PATH` variable and display the results by using the `echo $PATH` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ mkdir sbin
[oracle@ol7-server1 ~]$ PATH=$PATH:~/sbin
[oracle@ol7-server1 ~]$ echo $PATH
```

```
/usr/local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:/home/oracle/.
local/bin:/home/oracle/bin:/home/oracle/sbin
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$ mkdir sbin
[oracle@s11-server1:~]$ PATH=$PATH:~/sbin
[oracle@s11-server1:~]$ echo $PATH
/usr/bin:/usr/sbin:/home/oracle/sbin
[oracle@s11-server1:~]$
```

Practice 5-4: Displaying Command History

Overview

In this practice, you will view and set values to manage command-line history.

Tasks

There are two variables that control the amount of command-line history that the `bash` shell maintains. The HISTFILESIZE controls how many lines of command history are recorded in the ~/.bash_history file. HISTSIZE controls how many command lines are buffered in an open terminal window, which will then be appended to the ~/.bash_history file when you exit the terminal window.

1. Check the current number of command lines maintained by the `history` command and set the number of lines being maintained by the `HISTSIZE` variable to `20`. **Note:** a default value of 1000 is used by Oracle Linux, and a default value of 500 is used by Oracle Solaris.

   Oracle Linux

   ```
   [oracle@ol7-server1 ~]$ echo $HISTFILESIZE $HISTSIZE
   1000 1000
   [oracle@ol7-server1 ~]$ HISTSIZE=20
   [oracle@ol7-server1 ~]$
   ```

   Oracle Solaris

   ```
   [oracle@s11-server1:~]$ echo $HISTFILESIZE $HISTSIZE
   500  500
   [oracle@s11-server1:~]$ HISTSIZE=20
   [oracle@s11-server1:~]$
   ```

2. Confirm that the command-line history for an open terminal window size is set to 20.

   Oracle Linux and Oracle Solaris

   ```
   $ echo $HISTSIZE
   20
   $
   ```

3. View the page-wise output of the `history` command. **Note**: The following series of `history` command output lines may not match your output based on the actual commands you have entered and that were stored in the `~/.bash_history` file.

   Oracle Linux and Oracle Solaris

   ```
   $ history | less
     350  touch lab/error
   ```

```
  351  ls /test
  352  ls /var /test 1> lab/error 2>&1
  353  cat lab/error
  354  rm lab/error
  355  ls lab/error
  356  ls -F /etc | grep "/"
  357  echo $SHELL
  358  echo $PS1
  359  echo $PATH
  360  pwd
  361  mkdir sbin
  362  PATH=$PATH:~/sbin
  363  mkdir sbin
  364  echo $PATH
  365  echo $HISTFILESIZE
  366  echo $HISTFILESIZE $HISTSIZE
  367  HISTSIZE=20
  368  echo $HISTFILESIZE $HISTSIZE
  369  history | less
:
```

Note: Press the **q** key to quit the output from the `less` command.

4. To view the preceding 10 commands from the history database:

Oracle Linux and Oracle Solaris

```
$ history 10
  362  PATH=$PATH:~/sbin
  363  mkdir sbin
  364  echo $PATH
  365  echo $HISTFILESIZE
  366  echo $HISTFILESIZE $HISTSIZE
  367  HISTSIZE=20
  368  echo $HISTFILESIZE $HISTSIZE
  369  history | less
  370  history | less
  371  history 10
$
```

5. From the preceding output, to re-execute a specific command from history, enter `!368`, which repeats command # 368. Choose a relevant command number that appears in your output.

Oracle Linux and Oracle Solaris

```
$ !368
echo $HISTFILESIZE $HISTSIZE
500 20
$
```

6. To search the history database, press the Ctrl + R keys at the same time. Then enter the string `SIZE` all in caps. After the command containing the string is found:
   - If this is not the command you were looking, for pressing Ctrl + R continues the search, or if this not the command you choose to execute, then press Ctrl + C to cancel the search.
   - If this is the command you were searching for, then press the Return/Enter key to execute.

Oracle Linux and Oracle Solaris

```
$ <Ctrl+r>
(reverse-i-search)`SIZE': echo $HISTSIZE
```

Note: The search is case-sensitive.

7. Use the `-c` option to clear previous history.

Oracle Linux and Oracle Solaris

```
$ history -c
$ history
  354 history
$
```

8. The following are the various methods for repeating the previous command quickly:
   - Use the up arrow to view the previous command and press Enter to execute it.
   - Enter `!!` and press Enter from the command line.
   - Enter `!-1` and press Enter from the command line.

Practice 5-5: Customizing the User's Work Environment

Overview

In this practice, you will use the `~/.bashrc` file to make customized changes to your shell environment. Both Oracle Linux and Oracle Solaris provide a `~/.bashrc` file as part of the `bash` shell configuration.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.

Tasks

1. Confirm that you are currently in the parent directory by using the `pwd` command and then display the contents of the `.bashrc` file.

Oracle Linux

```
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ cat .bashrc
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

# Uncomment the following line if you don't like systemctl's auto-
paging feature:
# export SYSTEMD_PAGER=

# User specific alias and functions
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$ cat .bashrc
#
# Define default prompt to <username>@<hostname>:<path><"($|#) ">
# and print '#' for user "root" and '$' for normal users.
#
```

```
 typeset +x PS1="[\u@\h:\w]\\$ "
[oracle@s11-server1:~]$
```

2. In the previous practice, the shell variable `HISTSIZE`, which controls how many command lines are buffered in an open terminal window, was set to 20.

   To make this change permanent, for both Oracle Linux and Oracle Solaris, you add the line `HISTSIZE=20` to the end of the `.bashrc` file. **Note**: Any changes that you want to make permanently to the `bash` shell environment can be added to the end of the `~/.bashrc` file.

   a. Use the `vi .bashrc` command to edit the .bashrc file. Use the **G** (capital letter G) key command to go to the bottom of the file, and then press the **o** key to open a new line below the line with the cursor.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ vi .bashrc
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

# Uncomment the following line if you don't like systemctl's auto-
paging feature:
# export SYSTEMD_PAGER=

# User specific alias and functions
```

   Oracle Solaris

```
[oracle@s11-server1:~]$ vi .bashrc
#
# Define default prompt to <username>@<hostname>:<path><"($|#) ">
# and print '#' for user "root" and '$' for normal users.
#


typeset +x PS1="[\u@\h:\w]\\$ "
```

b. Enter `HISTSIZE=20`.

Oracle Linux

```
[oracle@ol7-server1 ~]$ vi .bashrc
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

# Uncomment the following line if you don't like systemctl's auto-
paging feature:
# export SYSTEMD_PAGER=

# User specific alias and functions
HISTSIZE=20
```

Oracle Solaris

```
[oracle@ol7-server1 ~]$ vi .bashrc
#
# Define default prompt to <username>@<hostname>:<path><"($|#) ">
# and print '#' for user "root" and '$' for normal users.
#


typeset +x PS1="[\u@\h:\w]\\$ "
HISTSIZE=20
```

c. Press the **ESC** key, then use the command `:wq` and press Enter to exit and save the change.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cat .bashrc
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi
```

```
# Uncomment the following line if you don’t like systemctl’s auto-
paging feature:
# export SYSTEMD_PAGER=

# User specific alias and functions
HISTSIZE=20

:wq
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ vi .bashrc
#
# Define default prompt to <username>@<hostname>:<path><"($|#) ">
# and print '#' for user "root" and '$' for normal users.
#



typeset +x PS1=”[\u@\h:\w]\\$ ”
 HISTSIZE=20

:wq
[oracle@s11-server1:~]$
```

3. View the `.bashrc` file to verify the command has been added and saved.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cat .bashrc
# .bashrc

# Source global definitions
if [ -f /etc/bashrc ]; then
        . /etc/bashrc
fi

# Uncomment the following line if you don’t like systemctl’s auto-
paging feature:
# export SYSTEMD_PAGER=

# User specific alias and functions
HISTSIZE=20
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ cat .bashrc
#
# Define default prompt to <username>@<hostname>:<path><"($|#) ">
# and print '#' for user "root" and '$' for normal users.
#


typeset +x PS1="[\u@\h:\w]\\$ "
HISTSIZE=20
[oracle@s11-server1:~]$
```

Practices for Lesson 6: Using Basic File Permissions

Practices for Lesson 6: Overview

Practices Overview

In these practices, you will perform the following tasks.

- Changing file ownership
- Changing file permissions
- Using symbolic mode to change permissions
- Using octal mode to change permissions
- Modifying default permissions
- Viewing the default `umask`
- Changing the `umask` setting

Practice 6-1: Changing File Ownership

Overview

In this practice, you will view and change file ownership.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.

Tasks

1. To find the owner of the existing `Documents` directory within the `lab` directory, use the `ls -ld` command. Ensure that you are in the `$HOME` directory.

   Oracle Linux and Oracle Solaris

```
$ cd
$ pwd
/home/oracle
$ ls -ld lab/Documents
drwxr-xr-x. 2 oracle oracle 38 Mar  5 17:36 lab/Documents
$
```

   For additional details about the output from the `ls` command, refer to the following table.

Symbol	Meaning	Comments
`d`	directory	If begins with a dash `-`, it means it is a regular file.
`rwx`	read, write and execute	The user's privilege set
`r-x`	read, write not permitted and execute	The group's privilege set
`r-x`	read, write not permitted and execute	The other's privilege set
`2`	number of links	
`oracle`	user/owner	The user who owns the directory/file
`oracle`	group	The group who owns the directory/file

38	Size	Size of file or directory in bytes
Mar 5 17:36	Day, Month, Year and Hours:Minutes	Last modified date/time information
lab/Documents	directory/file name	

2. Identify the owner of the contents in the Documents directory by using the ls -l command.

Oracle Linux and Oracle Solaris

```
$ ls -l lab/Documents
total 8
-rw-r--r--. 1 oracle oracle 21 Mar  5 17:36 misc.txt
-rw-r--r--. 1 oracle oracle 28 Mar  5 17:36 sample.txt
$
```

Observe that oracle is not only the owner of the Documents directory, but also the owner of the contents of the Documents directory.

3. Change the ownership of the Documents directory to to the root user. Use su - to switch to root user/role and run the change owner chown oracle ~oracle/lab/Documents command.

Oracle Linux and Oracle Solaris

```
$ su -
Password:
# chown oracle ~oracle/lab/Documents
# ls -ld ~oracle/lab/Documents
drwxr-xr-x. 2 root oracle 38 Mar  5 17:36 /home/oracle/lab/Documents
#
```

Note: The password for root is oracle1.

4. Confirm the ownership of the contents of the Documents directory. Change both user and group ownership of its contents to root and root, by running the chown command again with the recursive -R option.

Oracle Linux and Oracle Solaris

```
# ls -l ~oracle/lab/Documents
total 8
-rw-r--r--. 1 oracle oracle 21 Mar  5 17:36 misc.txt
-rw-r--r--. 1 oracle oracle 28 Mar  5 17:36 sample.txt
# chown -R root:root ~oracle/lab/Documents/
# ls -l ~oracle/lab/Documents
total 8
```

```
-rw-r--r--. 1 root root 21 Mar  5 17:36 misc.txt
-rw-r--r--. 1 root root 28 Mar  5 17:36 sample.txt
# exit
logout
```

Note: The command output may vary from UNIX to Linux.

Practice 6-2: Changing File Permissions

Overview

In this practice, you will view and change permissions on files.

Note

- You will perform the practices in your `/home/oracle/lab` directory.

Preparation

Ensure that the `umask` value is set to `0022` on your system. To verify, run the `umask` command.

Oracle Linux

```
[oracle@ol7-server1 ~]$ umask
0002
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ umask
0022
[oracle@s11-server1:~]$
```

If the `umask` is not set to `0022`, then set the `umask` value to `0022` by running the following command:

Oracle Linux and Oracle Solaris

```
$ umask 0022
$
```

Tasks

1. Create a new directory called `perm` in your `/home/oracle/lab` directory:

   Oracle Linux and Oracle Solaris

```
$ cd ~/lab
$ mkdir perm
```

2. Change to the `/etc` directory and list these four files – `group`, `motd`, `shadow`, `fstab` for Oracle Linux and these four files – `group`, `motd`, `shadow`, `vfstab` for Oracle Solaris.

   Note: For Oracle Linux there are no permissions on the shadow file, but for Oracle Solaris the user/owner of this file, in this case, `root`, has read permission.

   Oracle Linux

```
[oracle@ol7-server1 /etc]$ cd /etc
[oracle@ol7-server1 /etc]$ ls -l group motd shadow fstab
-rw-r--r--   1 root     root         438 May  2 11:26 fstab
-rw-r--r--   1 root     root         408 Apr  9 20:12 group
-rw-r--r--   1 root     root           0 Jun  7  2013 motd
----------   1 root     root         661 Apr  9 19:38 shadow
[oracle@ol7-server1 /etc]$
```

   Oracle Solaris

```
[oracle@s11-server1:/etc]$ cd /etc
[oracle@s11-server1:/etc]$ ls -l group motd shadow vfstab
-rw-r--r--   1 root     sys          420 May  8  2017 group
-rw-r--r--   1 root     sys           50 Oct  6  2015 motd
-r--------   1 root     sys          721 Mar 14 06:29 shadow
-rw-r--r--   1 root     sys          430 Sep 27  2016 vfstab
[oracle@s11-server1:/etc]$
```

3. Copy the four files to your `~/lab/perm` directory. The `shadow` file will fail to copy.

   Oracle Linux

```
[oracle@ol7-server1 /etc]$ cp group motd shadow fstab ~/lab/perm
cp: cannot open 'shadow' for reading: Permission denied
[oracle@ol7-server1 /etc]
```

   Oracle Solaris

```
[oracle@s11-server1:/etc]$ cp group motd shadow vfstab ~/lab/perm
cp: cannot open shadow: Permission denied
[oracle@s11-server1:/etc]$
```

4. Go to your `lab` directory and verify the contents of its `~/lab/perm` directory. Copy the contents of the `/etc/skel` directory into the `~/lab/perm` directory.

Oracle Linux

```
[oracle@ol7-server1 etc]$ cd ~/lab
[oracle@ol7-server1 lab]$ ls -l perm
total 8
-rw-r--r--. 1 oracle oracle 513 Mar 14 18:39 fstab
-rw-r--r--. 1 oracle oracle 972 Mar 14 18:39 group
-rw-r--r--. 1 oracle oracle   0 Mar 14 18:39 motd
[oracle@ol7-server1 lab]$ cp -r /etc/skel perm
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:/etc]$ cd ~/lab
[oracle@s11-server1:/lab]$ ls -l perm
total 6
-rw-r--r--   1 oracle   oracle       420 Mar 14 06:41 group
-rw-r--r--   1 oracle   oracle        50 Mar 14 06:41 motd
-rw-r--r--   1 oracle   oracle       430 Mar 14 06:41 vfstab
[oracle@s11-server1:/lab]$ cp -r /etc/skel perm
[oracle@s11-server1:/lab]$
```

5. List the contents of the `perm` directory.

Oracle Linux

```
[oracle@ol7-server1 lab]$ ls -l perm
total 8
-rw-r--r--. 1 oracle oracle 513 Mar 14 18:39 fstab
-rw-r--r--. 1 oracle oracle 972 Mar 14 18:39 group
-rw-r--r--. 1 oracle oracle   0 Mar 14 18:39 motd
drwxr-xr-x. 3 oracle oracle  74 Mar 14 18:44 skel
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ ls -l perm
total 9
-rw-r--r--   1 oracle   oracle       420 Mar 14 06:41 group
-rw-r--r--   1 oracle   oracle        50 Mar 14 06:41 motd
drwxr-xr-x   2 oracle   oracle         7 Mar 14 06:44 skel
-rw-r--r--   1 oracle   oracle       430 Mar 14 06:41 vfstab
[oracle@s11-server1:~/lab]$
```

a. In the following table, fill in the permission sets for each file and write the three-digit octal number that represents the combined set of permissions.

File or Directory	Permission Sets			Octal Value
	User/Owner	Group	Other	
group	rw-	r--	r--	644
motd	rw-	r--	r--	644
skel	rwx	r-x	r-x	755
vfstab/fstab	rw-	r--	r--	644

6. Create a new file `test1` and a new directory `test`.

Oracle Linux and Solaris

```
$ pwd
/home/oracle/lab
$ touch test1
$ mkdir test
```

a. Examine the default permissions of the new file.

Oracle Linux and Solaris

```
$ ls -l test1
-rw-r--r--. 1 oracle oracle 0 Mar 14 18:46 test1
$
```

b. Check the default permissions of the new directory.

Oracle Linux and Solaris

```
$ ls -ld test
drwxr-xr-x. 2 oracle oracle 6 Mar 14 18:47 test
$
```

7. Using the `chmod` command and symbolic mode, add write (`w`) permission for the group permission set to the `motd` file.

Note: Symbolic mode uses a combination of letters and symbols to add or remove permissions for each type of user.

Oracle Linux

```
[oracle@ol7-server1 lab]$ chmod g+w perm/motd
[oracle@ol7-server1 lab]$ ls -l perm
total 8
-rw-r--r--. 1 oracle oracle 513 Mar 14 18:39 fstab
-rw-r--r--. 1 oracle oracle 972 Mar 14 18:39 group
```

```
-rw-rw-r--. 1 oracle oracle   0 Mar 14 18:39 motd
drwxr-xr-x. 3 oracle oracle  74 Mar 14 18:44 skel
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ chmod g+w perm/motd
[oracle@s11-server1:~/lab]$ ls -l perm
-rw-r--r--   1 oracle   oracle       420 Mar 14 06:41 group
-rw-rw-r--   1 oracle   oracle        50 Mar 14 06:41 motd
drwxr-xr-x   2 oracle   oracle         7 Mar 14 06:44 skel
-rw-r--r--   1 oracle   oracle       430 Mar 14 06:41 vfstab
[oracle@s11-server1:~/lab]$
```

8. Using octal mode, change the permissions on the `motd` file to `-rwxrw----`.

   Note: Octal mode uses octal numbers to represent permissions. Octal mode is also referred to as absolute mode.

   Oracle Linux

```
[oracle@ol7-server1 lab]$ chmod 760 perm/motd
[oracle@ol7-server1 lab]$ ls -l perm
total 8
-rw-r--r--. 1 oracle oracle 513 Mar 14 18:39 fstab
-rw-r--r--. 1 oracle oracle 972 Mar 14 18:39 group
-rwxrw----. 1 oracle oracle   0 Mar 14 18:39 motd
drwxr-xr-x. 3 oracle oracle  74 Mar 14 18:44 skel
[oracle@ol7-server1 lab]$
```

   Oracle Solaris

```
[oracle@s11-server1:~/lab]$ chmod 760 perm/motd
[oracle@s11-server1:~/lab]$ ls -l perm
total 9
-rw-r--r--   1 oracle   oracle       420 Mar 14 06:41 group
-rwxrw----   1 oracle   oracle        50 Mar 14 06:41 motd
drwxr-xr-x   2 oracle   oracle         7 Mar 14 06:44 skel
-rw-r--r--   1 oracle   oracle       430 Mar 14 06:41 vfstab
[oracle@s11-server1:~/lab]$
```

9. Using octal mode, add write (`w`) permission for other on the file named `group`.

   Oracle Linux

```
[oracle@ol7-server1 lab]$ chmod 646 perm/group
[oracle@ol7-server1 lab]$ ls -l perm
```

```
total 8
-rw-r--r--. 1 oracle oracle 513 Mar 14 18:39 fstab
-rw-r--rw-. 1 oracle oracle 972 Mar 14 18:39 group
-rwxrw----. 1 oracle oracle   0 Mar 14 18:39 motd
drwxr-xr-x. 3 oracle oracle  74 Mar 14 18:44 skel
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ chmod 646 perm/group
[oracle@s11-server1:~/lab]$ ls -l perm
total 9
-rw-r--rw-   1 oracle   oracle       420 Mar 14 06:41 group
-rwxrw----   1 oracle   oracle        50 Mar 14 06:41 motd
drwxr-xr-x   2 oracle   oracle         7 Mar 14 06:44 skel
-rw-r--r--   1 oracle   oracle       430 Mar 14 06:41 vfstab
[oracle@s11-server1:~/lab]$
```

10. Identify the GID and UID for the `motd` file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ ls -n perm/motd
-rwxrw----. 1 1000 1000 0 Mar 14 18:39 perm/motd
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ ls -n perm/motd
-rwxrw----   1 60016    100           50 Mar 14 06:41 perm/motd
[oracle@s11-server1:~/lab]$
```

11. Create a new file called `memo` in your `dir4` directory.

Oracle Linux and Oracle Solaris

```
$ touch ~/lab/dir4/memo
$ ls -l ~/lab/dir4/memo
-rw-r--r--. 1 oracle oracle 0 Mar 14 18:54 /home/oracle/lab/dir4/memo
$
```

12. Remove the read (`r`) permission for the owner from the `memo` file in the `dir4` directory. You can use symbolic mode to do this.

Oracle Linux and Oracle Solaris

```
$ chmod u-r ~/lab/dir4/memo
$ ls -l ~/lab/dir4/memo
--w-r--r--. 1 oracle oracle 0 Mar 14 18:54 /home/oracle/lab/dir4/memo
$
```

Or you can use octal mode.

Oracle Linux and Oracle Solaris

```
$ chmod 244 ~/lab/dir4/memo
$ ls -l ~/lab/dir4/memo
--w-r--r--. 1 oracle oracle 0 Mar 14 18:54 /home/oracle/lab/dir4/memo
$
```

13. Use the `cat` command to view the `memo` file.

Oracle Linux

```
[oracle@ol7-server1 lab]$ cat ~/lab/dir4/memo
cat: /home/oracle/lab/dir4/memo: Permission denied
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ cat ~/lab/dir4/memo
cat: cannot open /home/oracle/lab/dir4/memo: Permission denied
[oracle@s11-server1:~/lab]$
```

Note: This fails because read permission has been removed from the user. Even though you are part of the group, the permissions are viewed in the order in which they appear.

14. Copy the `memo` file to the `~/lab` directory.

Oracle Linux

```
[oracle@ol7-server1 lab]$ cp ~/lab/dir4/memo ~/lab
cp: cannot open ‘/home/oracle/lab/dir4/memo’ for reading:
Permission denied
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ cp ~/lab/dir4/memo ~/lab
cp: cannot open /home/oracle/lab/dir4/memo: Permission denied
[oracle@s11-server1:~/lab]$
```

Note: You cannot copy the file, because the user has no read permission.

Practice 6-3: Modifying Default Permissions

Overview

In this practice, you modify the default permissions of files and directories.

Note

- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.

Tasks

1. Check the current umask value on your system with the `umask` command.

   Note: The `umask` utility modifies the default permissions set for files and directories at the time of creation.

   Oracle Linux and Oracle Solaris

```
$ umask
0022
$
```

2. Change `umask` to 027.

   Oracle Linux and Oracle Solaris

```
$ umask 027
$
```

3. Create a new file and a new directory in the `lab` directory. Record the access permissions.

   Oracle Linux and Oracle Solaris

```
$ cd
$ touch lab/testfile
$ mkdir lab/testdir
$ ls -l lab/testfile
-rw-r-----. 1 oracle oracle 0 Mar 14 19:27 lab/testfile
$ ls -ld lab/testdir
drwxr-x---. 2 oracle oracle 6 Mar 14 19:28 lab/testdir
$
```

4. Change `umask` back to 0022.

   Oracle Linux and Oracle Solaris

```
$ umask 0022
```

5. Create a new file and a new directory.

Oracle Linux and Oracle Solaris

```
$ touch lab/test2file
$ mkdir lab/test2dir
```

6. Record the access permissions.

Oracle Linux and Oracle Solaris

```
$ ls -l lab/test2file
-rw-r--r--. 1 oracle oracle 0 Mar 14 19:29 lab/test2file
$ ls -ld lab/test2dir
drwxr-xr-x. 2 oracle oracle 6 Mar 14 19:29 lab/test2dir
$
```

Note: The permission set for other's using 0027 has no privileges, whereas with 0022, the permission set for other's has read access on files, and read and execute access on directories.

Practices for Lesson 7: Performing Basic Process Control

Practices for Lesson 7: Overview

Practices Overview

In this practice, you will perform the following tasks, described in the lesson.

- List system processes.
- Control system processes.
- Terminate a process.

This practice introduces the `tty` command, which displays the name of the current terminal window. The name displayed by the `tty` command includes a unique identification number assigned by the UNIX and Linux operating systems to each open terminal window (for example, `/dev/pts/2`). In the tasks illustrating the `tty` command, the unique identification number is displayed as `/dev/pts/`***n***, where *n* is a numeral.

Practice 7-1: Controlling System Processes

Overview

In this practice, you will determine the process identifier (PID), view a process tree, and kill processes.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.

Tasks

1. Use the following `ps` commands to list the processes currently running on your system.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ ps
  PID TTY          TIME CMD
21786 pts/0    00:00:00 bash
 6443 pts/0    00:00:00 ps
[oracle@ol7-server1 ~]$
```

   Oracle Solaris

```
[oracle@s11-server1:~]$ ps
  PID TTY          TIME CMD
3827 pts/1        0:00 ps
2755 pts/1        0:00 bash
[oracle@s11-server1:~]$
```

   Note: This command prints information for the current user and terminal.

2. Use the `-f` option to print a full listing for the command.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ ps -f
UID        PID  PPID  C STIME TTY          TIME CMD
oracle   21786 21781  0 Mar12 pts/0    00:00:00 bash
oracle    6461 21786  0 17:35 pts/0    00:00:00 ps -f
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ps -f
UID      PID PPID   C     STIME TTY      TIME CMD
oracle  3828 2755   0  05:24:43 pts/1   0:00 ps -f
oracle  2755 2752   0    Mar 12 pts/1   0:00 /usr/bin/bash
[oracle@s11-server1:~]$
```

3. Use the `-e` option to print information about every process running. The use the `ps -e | wc -l` command to show the total number of processes.

Oracle Linux

```
[oracle@ol7-server1 ~]$ ps -e
  PID TTY          TIME CMD
    1 ?        00:00:57 systemd
    2 ?        00:00:00 kthreadd
    3 ?        00:00:00 ksoftirqd/0
    6 ?        00:00:04 kworker/30:0
    7 ?        00:00:16 rcu_sched
    8 ?        00:00:00 rcu_bh
    9 ?        00:00:15 rcuos/0
   10 ?        00:00:00 rcuob/0
   11 ?        00:00:00 migration/0

... Output truncated ...

[oracle@ol7-server1 ~]$ ps -e | wc -l
179
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ps -e
PID TTY          TIME CMD
  0 ?            0:00 sched
  5 ?            0:07 zpool-rp
  6 ?            0:24 kmem_tas
  1 ?            0:05 init
  2 ?            0:00 pageout
  3 ?           30:55 fsflush
  7 ?            0:44 intrd
  8 ?            0:00 vmtasks
  9 ?            0:00 postwait
```

```
... Output truncated ...

[oracle@s11-server1:~]$ ps -e | wc -l
     105
[oracle@s11-server1:~]$
```

4. Run the `ps -f` command again.

   Note: Observe the TTY column on the Oracle Linux VM where the controlling terminal is `pts/0`, and on the Oracle Solaris VM where the controlling terminal is `pts/1`.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ ps -f
UID        PID  PPID  C STIME TTY          TIME CMD
oracle   21786 21781  0 Mar12 pts/0    00:00:00 bash
oracle    6461 21786  0 17:37 pts/0    00:00:00 ps -f
 [oracle@ol7-server1 ~]$
```

   Oracle Solaris

```
[oracle@s11-server1:~]$ ps -f
UID      PID PPID   C     STIME TTY      TIME CMD
oracle  3828 2755   0  05:28:03 pts/1   0:00 ps -f
oracle  2755 2752   0    Mar 12 pts/1   0:00 /usr/bin/bash
[oracle@s11-server1:~]$
```

5. Open a second terminal window, and execute the `ps -f` command in the new terminal window.

   Note: Observe the TTY column in the Oracle Linux VM, where the controlling terminal is `pts/1`, and in the Oracle Solaris VM where the controlling terminal is `pts/1`. This is because you now have two separate and concurrent terminal window sessions open at the same time.

   Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ ps -f
UID        PID  PPID  C STIME TTY          TIME CMD
oracle   6514 21781  0 17:38 pts/1    00:00:00 bash
oracle   6553  6514  0 04:05 pts/1    00:00:00 ps -f
[oracle@ol7-server1 ~]$
```

   Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ ps -f
UID      PID PPID   C     STIME TTY      TIME CMD
oracle  3837 3836   0  05:28:40 pts/2   0:00 ps -f
```

```
oracle  3836 2752   0  05:28:28 pts/2   0:00 bash
 [oracle@s11-server1:~]$
```

6. In your first terminal window, enter the `gnome-calculator` command:

Oracle Linux (1st terminal window)

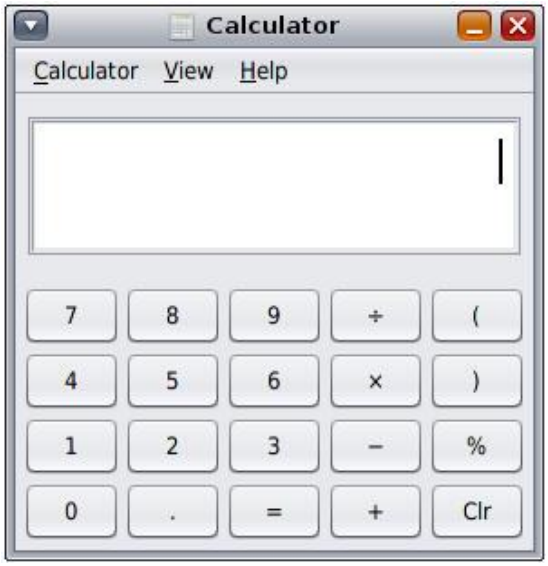
```
[oracle@ol7-server1 ~]$ gnome-calculator
```

The Gnome calculator tool opens.

Oracle Solaris (1st terminal window)

```
[oracle@s11-server1:~]$ gnome-calculator
```

The Gnome calculator tool opens.



7. In the second terminal window, use the `ps -ef | grep gnome-calculator` or `pgrep -f gnome-calculator` command to identify the PID of the `gnome-calculator` process.

   Note: As you launched Gnome Calculator form the first terminal window, command line input is not available in this terminal while the utility is open.

   Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ ps -ef | grep gnome-calculator
oracle  6590   21786 0  17:40 pts/0    00:00:00 gnome-calculator
oracle  6598    6514 0  17:40 pts/0    00:00:00 grep –color=auto
gnome-calculator
[oracle@ol7-server1 ~]$ pgrep -f gnome-calculator
6590
[oracle@ol7-server1 ~]$
```

   Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ ps -ef | grep gnome-calculator
oracle  3840   2755 1 05:30:15 pts/1       0:00 gnome-calculator
[oracle@s11-server1:~]$ pgrep -f gnome-calculator
3840
[oracle@s11-server1:~]$
```

   Note: On Oracle Linux, `6590` is the PID value for the `gnome-calculator`. On Oracle Solaris, `3840` is the PID value for the `gnome-calculator`. Your PID value will be different.

8. From the second terminal window, use the `kill <PID>` command, or the `pkill -f gnome-calculator` command, to terminate the `gnome-calculator` process. The `-f` option used with `pkill` ensures the process name must fully match the name used in the command.

   Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ kill 6590
```

   Or use:

```
[oracle@ol7-server1 ~]$ pkill -f gnome-calculator
```

   Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ kill 3840
```

   Or use:

```
[oracle@s11-server1:~]$ pkill -f gnome-calculator
```

9. In the second terminal window, enter the `tty` command to identify the name of this terminal window. The name appears as `/dev/pts/<n>`, where *n* is a number (for example, `/dev/pts/4`).

Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ tty
/dev/pts/1
[oracle@ol7-server1 ~]$
```

Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ tty
/dev/pts/2
[oracle@s11-server1:~]$
```

10. Return to your first terminal window. Use the `pgrep -t` (terminal option) command to find the PID associated with the second terminal window.

Oracle Linux (1st terminal window)

```
[oracle@ol7-server1 ~]$ pgrep -t pts/1
6514
[oracle@ol7-server1 ~]$
```

Oracle Solaris (1st terminal window)

```
[oracle@s11-server1:~]$ pgrep -t pts/2
3852
[oracle@s11-server1:~]$
```

Note: Your PID value will be different.

11. In your first terminal window, use the `kill` command or the `pkill -t` command attempt to terminate your second terminal window.

Oracle Linux (1st terminal window)

```
[oracle@ol7-server1 ~]$ kill 6514
[oracle@ol7-server1 ~]$
```

Or use:

```
[oracle@ol7-server1 ~]$ pkill -t pts/1
[oracle@ol7-server1 ~]$
```

Oracle Solaris (1st terminal window)

```
[oracle@s11-server1:~]$ kill 3852
[oracle@s11-server1:~]$
```

Or use:

```
[oracle@s11-server1:~]$ pkill -t pts/2
[oracle@s11-server1:~]$
```

Note: This does not work. The terminal process is one that ignores the regular termination signal from the `kill` command.

12. Use the `kill` command or the `pkill` command with the `-9` option to terminate your second terminal window.

Oracle Linux (1st terminal window)

```
[oracle@ol7-server1 ~]$ kill -9 6514
[oracle@ol7-server1 ~]$
```

Or use:

```
[oracle@ol7-server1 ~]$ pkill -9 -t pts/1
[oracle@ol7-server1 ~]$
```

Oracle Solaris (1st terminal window)

```
[oracle@s11-server1:~]$ kill -9 3852
[oracle@s11-server1:~]$
```

Or use:

```
[oracle@s11-server1:~]$ pkill -9 -t pts/2
[oracle@s11-server1:~]$
```

Note: The `-9` option forces the terminal process to terminate.

13. Run the following `kill -l` (list option) commands to identify the signal names and signal values.

Oracle Linux and Oracle Solaris

```
$ kill -l 9
KILL
$ kill -l kill
9
$ kill -l 15
TERM
$ kill -l term
15
$
```

Note: For signal value 9, the signal name is `KILL`, and for the signal name `kill`, the signal value is 9. For signal value 15, the signal name is `TERM`, and for the signal name `term`, the signal value is 15.

14. In the terminal window, enter the `sleep 600 &` command and place it in the background.

Oracle Linux

```
[oracle@ol7-server1 ~]$ sleep 600 &
[1] 6877
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ sleep 600 &
[1] 3857
[oracle@s11-server1:~]$
```

15. Use the `ps` command to identify the bash shell process running in that window.

Oracle Linux

```
[oracle@ol7-server1 ~]$ ps
  PID TTY          TIME CMD
21786 pts/0    00:00:00 bash
 6877 pts/0    00:00:00 sleep
 6881 pts/0    00:00:00 ps
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ ps
 PID TTY          TIME CMD
3858 pts/1       0:00 ps
2755 pts/1       0:00 bash
3857 pts/1       0:00 sleep
[oracle@s11-server1:~]$
```

Note: Your PID value will be different.

16. Open a second terminal window. To display the process tree use the bash shell PID, for Oracle Linux, use the `pstree -p <PID>` (show PIDs option) command, and for Oracle Solaris, use the `ptree <PID>` command.

Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ pstree -p 1252
bash(21786)---sleep(6877)
[oracle@ol7-server1 ~]$
```

Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ ptree 2755
2752 /usr/bin/gnome-terminal -x /bin/sh -c cd '/home/oracle' && exec $SHELL
  2755 bash
    3857 sleep 600
[oracle@s11-server1:~]$
```

17. In the second terminal window, terminate the first terminal window using the `kill -9` command with the bash shell PID.

Oracle Linux (2nd terminal window)

```
[oracle@ol7-server1 ~]$ kill -9 21786
```

Oracle Solaris (2nd terminal window)

```
[oracle@s11-server1:~]$ kill -9 2755
```

Practices for Lesson 8: Using Advanced Shell Features in Shell Scripts

Practices for Lesson 8: Overview

Practices Overview

In this practice, you will perform the following range of tasks and activities:

- Manage jobs in the Bash shell
- Create an alias
- Use Bash shell functions
- Set Bash shell options
- Create and run shell scripts
- Pass values to a shell script
- Use the test command
- Execute conditional commands

Practice 8-1: Using Advanced Bash Shell Functionality

Overview

In this practice, you will perform some tasks using the job control commands described in this lesson.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.
- Bash is the default shell in both Oracle Linux and Oracle Solaris.

Tasks

1. Run the `sleep 500 &` command to create a running job.

   Oracle Linux and Oracle Solaris

```
$ sleep 500 &
[1] 13462
$
```

2. Job control commands enable you to place jobs in the foreground or background, and to start or stop jobs. Use the `jobs` command to confirm the `sleep` command executed is currently running.

   Oracle Linux and Oracle Solaris

```
$ jobs
[1]+  Running                 sleep 500 &
$
```

3. Bring the job to the foreground, and then put it back in the background. To stop a command and get back to the prompt, use `CTRL+Z`.

   Oracle Linux and Oracle Solaris

```
$ fg %1
sleep 500
^Z
[1]+  Stopped                 sleep 500
$ bg %1
[1]+ sleep 500 &
$
```

Note: The `jobs` command lists all jobs that are currently running or are stopped in the background. The `bg %n` command runs the current or specified job in the background (`n` is the job ID).

4. Terminate a job with the `kill` command. To confirm, run the `jobs` command again.

Oracle Linux

```
[oracle@ol7-server1 ~]$ kill %1
[oracle@ol7-server1 ~]$ jobs
[1]+  Terminated              sleep 500
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ kill %1
[1]+  Terminated              sleep 500
[oracle@s11-server1:~]$ jobs
[oracle@ol7-server1 ~]$
```

5. Enable the `noclobber` option, and use the `set` command to verify it is enabled.

Oracle Linux and Oracle Solaris

```
$ set -o noclobber
$ set -o | more
allexport       off
braceexpand     on
emacs           on
errexit         off
errtrace        off
functrace       off
hashall         on
histexpand      on
history         on
ignoreeof       off
interactive-comments on
keyword         off
monitor         on
noclobber            on
noexec          off
noglob          off
nolog           off
notify          off
nounset         off
```

```
onecmd          off
physical        off
pipefail        off
posix                 off
privileged            off
verbose               off
vi                    off
xtrace                off
$
```

Note: To stop the command output, use `ctrl` + `z` or `q`.

6. Display all predefined aliases.

Oracle Linux

```
[oracle@ol7-server1 ~]$ alias
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l.='ls -d .* --color=auto'
alias ll='ls -l --color=auto'
alias ls='ls --color=auto'
alias vi=vim
alias which='alias | /usr/bin/which --tty-only -read-alias --
show-dot --show-tilde'
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ alias
[oracle@s11-server1:~]$
```

Note: If you do not see an alias list, there are no predefined aliases on the system.

7. Create an alias named `cls` that clears the terminal screen.

Oracle Linux and Oracle Solaris

```
$ alias cls=clear
```

8. Create an alias named `dir` that displays a long listing of all the files and directories in the current directory.

Oracle Linux and Oracle Solaris

```
$ alias dir='ls -l'
```

9. Create an alias named `h` that lists your command `history`.

Oracle Linux and Oracle Solaris

```
[oracle@s11-server1:~]$ alias h=history
```

10. Run the `alias` command again.

Oracle Linux

```
[oracle@ol7-server1 ~]$ alias
alias cls=clear
alias dir='ls -l'
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias h=history
alias l.='ls -d .* --color=auto'
alias ll='ls -l --color=auto'
alias ls='ls --color=auto'
alias vi=vim
alias which='alias | /usr/bin/which --tty-only -read-alias --
show-dot --show-tilde'
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ alias
alias cls='clear'
alias dir='ls -l'
alias h='history'
[oracle@s11-server1:~]$
```

11. Unalias the `history` command and the `cls` command.

Oracle Linux and Oracle Solaris

```
$ unalias h
$ unalias cls
```

12. Display all defined functions.

Oracle Linux

```
[oracle@ol7-server1 ~]$ typeset -f
__expand_tilde_by_ref ()
{
    if [[ ${!1} == \~* ]]; then
        if [[ ${!1} == */* ]]; then
```

```
            eval $1="${!1/%\/*}"/'${!1#*/}';
        else
            eval $1="${!1}";
        fi;
    fi
}
__get_cword_at_cursor_by_ref ()
{

... Output truncated ...

quote_readline ()
{
    local quoted;
    _quote_readline_by_ref "$1" ret;
    printf %s "$ret"
}
[oracle@ol7-server1 ~]$
```

Note: There is a lot of information returned for this command in Oracle Linux, only the beginning and end of the output is shown above.

Oracle Solaris

```
[oracle@s11-server1:~]$ typeset -f
[oracle@s11-server1:~]$
```

13. Create and test a function called `data` that performs the following activities:
    - Clears the terminal screen
    - Displays date and time
    - Displays users logged in to the system
    - Displays the path of the current working directory
    - Lists current working directory in a long format

Oracle Linux and Oracle Solaris

```
$ function data { clear; date; who; pwd; ls -l; }
$
```

14. To confirm that the function is created, run `typeset –f data`.

Oracle Linux

```
[oracle@ol7-server1 ~]$ typeset -f data
data ()
{
    clear;
    date;
    who;
    pwd;
    ls --color=auto -l
}
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ typeset –f data
data ()
{
    clear;
    date;
    who;
    pwd;
    ls -l
}
[oracle@s11-server1:~]$
```

15. Use vi to edit the profile file in your home directory. For Oracle Linux this is the `.bash_profile`, and for Oracle Solaris this is `.profile`.

Oracle Linux

```
[oracle@ol7-server1 ~]$ vi ~/.bash_profile
```

Oracle Solaris

```
[oracle@s11-server1:~]$ vi ~/.profile
```

a. Add the following line entries to the profile file:

```
set -o vi
alias h='history'
alias cls='clear'
alias lf='pwd; ls -lF'
```

Oracle Linux

```
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
        . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH:$HOME/.local/bin:$HOME/bin

export PATH
set -o vi
alias h='history'
alias cls='clear'
alias lf='pwd; ls -lF'
~
~
```

Oracle Solaris

```
#Simple profile places /usr/bin at front, followed by /usr/sbin.
#
# Use less(1) or more(1) as the default pager for the man(1)
command.
#
export PATH=/usr/bin:/usr/sbin

if [ -f /usr/bin/less ]; then
    export PAGER="/usr/bin/less -ins"
elif [ -f /usr/bin/more ]; then
    export PAGER="/usr/bin/more -s"
fi
#
# Define default prompt to <username>@<hostname>:<path><"($|#)
">
# and print '#' for user "root" and '$' for normal users.
#
# Currently this is only done for bash/pfbash(1).
#
ENV=$HOME/.bash
export ENV
case ${SHELL} in
```

```
*bash)
    typeset +x PS1="\u@\h:\w\\ $ "
    ;;
esac
set -o vi
alias h='history'
alias cls='clear'
alias lf='pwd; ls -lF'
```

16. Log your user out and back in again, then test your new aliases and functions with the commands `h`, `lf` and `clr`. Verify the output is as expected. When finished testing close the terminal with the `exit` command.

    Note: For Oracle Solaris you can use the `source ~/.profile` command to enable the aliases and functions in the current active terminal.

Practice 8-2: Using Shell Scripts

Overview

In this practice, you will edit, and run shell scripts using some of the test and conditional statements.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.

Tasks

1. In this task, you will modify and run a simple shell script called `info.sh`, which displays date, time, username, and current directory.
   a. Switch to the `lab` directory in your home directory. Open the `vi` editor and edit the shell script file, `info.sh` so it is as shown below. Ensure that you are in the `lab` directory of your home directory.

      Note: For your benefit, the file `info.sh` is already available in the `lab` directory.

      Oracle Linux and Oracle Solaris

```
$ cd lab
$ vi info.sh
#!/usr/bin/bash
#info.sh
# This script displays the date, time, username and the current
directory.
   echo "Date and time is:"
   date
   echo
   echo "Your username is: `whoami`"
   echo "Your current directory is: `pwd`"
~
~
```

      Note: Exit the file by pressing the ESC key followed by executing the command `:q` to quit vi. The first entry `#!/usr/bin/bash` indicates that the script should be run in the bash shell.

b. Grant execute permission to the script by running the `chmod +x` command. Confirm this change by running the `ls -l` command.

Oracle Linux

```
[oracle@ol7-server1 lab]$ chmod +x info.sh
[oracle@ol7-server1 lab]$ ls -l info.sh
-rwxr-xr-x. 1 oracle oracle 232 May 13  2017 info.sh
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ chmod +x info.sh
[oracle@s11-server1:~/lab]$ ls -l info.sh
-rwxr-xr-x   1 oracle   oracle       225 Mar  5 04:55 info.sh
[oracle@s11-server1:~/lab]$
```

c. To execute the script, run the command as shown below:

Oracle Linux

```
[oracle@ol7-server1 lab]$ ./info.sh
Date and time is:
Tue Feb 27 14:59:44 IST 2018

Your username is: oracle
Your current directory is: /home/oracle/lab
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ ./info.sh
Date and time is:
Monday, March 19, 2018 05:01:00 AM PDT

Your username is: oracle
Your current directory is: /home/oracle/lab
[oracle@s11-server1:~/lab]$
```

2. In this task, you pass values to the `greetings` shell script, which is also available in the `lab` directory.

a. View greetings by running the `cat` command.

Oracle Linux and Oracle Solaris

```
$ cat greetings
#!/bin/sh
echo $1 $2 #echo the first two parameters passed
$
```

b. Add user execute permissions to `greetings`.

Oracle Linux and Oracle Solaris

```
$ chmod u+x greetings
$
```

c. Run greetings with the `hello` and `world` values.

Oracle Linux and Oracle Solaris

```
$ ./greetings hello world
hello world
$
```

3. In this task, you will practice using the `test` command.

a. Test whether the value of the `LOGNAME` variable is student.

Oracle Linux and Oracle Solaris

```
$ echo $LOGNAME
oracle
$ test "$LOGNAME" = "oracle"
$ echo $?
0
$
```

Note: The test command does not return any output. For a true condition, the exit status of the test command is set to `0`.

b. Now test, whether the value of the `LOGNAME` variable is `user`.

Oracle Linux and Oracle Solaris

```
$ test "$LOGNAME" = "user"
$ echo $?
1
$
```

4. In this task, you will practice using the conditional statements. Using the conditional 'if' statement, la

   a. Use `cat` to view the shell script called `leaptest.sh` which is provided in your /lab directory.

      Note: For your benefit, the file `leaptest.sh` is already available in the `lab` directory.

      Oracle Linux and Oracle Solaris

```
$ cat leaptest.sh
#!/usr/bin/bash
# This script will test if the year is a leap year.

year=`date +%Y`

if [ $[$year % 400] -eq "0" ]; then
  echo "This is a leap year.  February has 29 days."
elif [ $[$year % 4] -eq 0 ]; then
        if [ $[$year % 100] -ne 0 ]; then
          echo "This is a leap year, February has 29 days."
        else
          echo "This is not a leap year.  February has 28 days."
        fi
else
  echo "This is not a leap year.  February has 28 days."
fi

$
```

   b. Add execute permission to the script.

      Oracle Linux and Oracle Solaris

```
$ chmod u+x leaptest.sh
```

   c. Find the current year using the `date` command and then subsequently run the `leaptest` script to find whether the current year is a leap year.

      Oracle Linux

```
[oracle@ol7-server1 lab]$ date
Tue Feb 27 17:43:00 IST 2018
[oracle@ol7-server1 lab]$ ./leaptest.sh
This is not a leap year.  February has 28 days.
[oracle@ol7-server1 lab]$
```

Oracle Solaris

```
[oracle@s11-server1:~/lab]$ date
Monday, March 19, 2018 05:04:12 AM PDT
[oracle@s11-server1:~/lab]$./leaptest.sh
This is not a leap year.  February has 28 days.
[oracle@s11-server1:~/lab]$
```

Practices for Lesson 9: Archiving Files and Remote Transfer

Practices for Lesson 9: Overview

Practices Overview

In these practices, you will perform the following range of tasks:

- Create an archive file on a disk
- View an archive file on a disk
- Retrieve archive data from a disk
- Compress files
- View compressed files
- Uncompress files
- Establish a remote login session
- Copy files or directories to and from another system
- Transfer files between systems

Practice 9-1: Archiving and Retrieving Files

Overview

In this practice, you will perform tasks to create, view, and retrieve archived files.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.
- Bash is the default shell in both Oracle Solaris and Oracle Linux.

Tasks

1. Run `chmod 775` on the `lab` directory, before starting this practice.

   Oracle Linux and Oracle Solaris

```
$ cd
$ pwd
$ /home/oracle
$ chmod -R 775 lab
```

2. Archive the `lab` directory in your home directory to a file called `lab.tar` using the `tar` command.

   Oracle Linux

```
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$ ls -l
total 8
-rw-rw-r--.  1 oracle oracle   51 Mar 13 18:28 £1
-rw-rw-r--.  1 oracle oracle    0 Mar 13 14:31 celery
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Desktop
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Documents
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Downloads
-rw-rw-r--.  1 oracle oracle   53 Mar 13 17:18 example
drwxrwxr-x.  2 oracle oracle    6 Mar 13 14:33 house
drwxrwxr-x. 13 oracle oracle 4096 Mar 19 17:15 lab
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Music
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Pictures
```

```
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Public
drwxrwxr-x.  2 oracle oracle    6 Mar 13 14:31 records
drwxrwxr-x.  2 oracle oracle    6 Mar 14 14:46 sbin
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Templates
drwxrwxr-x.  2 oracle oracle    6 Mar 13 14:34 veggies
drwxr-xr-x.  2 oracle oracle    6 Mar 13  2017 Videos
[oracle@ol7-server1 ~]$ tar cvf lab.tar lab
lab/
lab/fruit2
lab/file.1
lab/leaptest.sh
lab/Documents/
lab/Documents/misc.txt
lab/Documents/sample.txt

... Output truncated ...

lab/testfile
lab/testdir/
lab/test2file
lab/test2dir/
lab/feathers
lab/info.sh
[oracle@ol7-server1 ~]$ ls -l
total 128
-rw-rw-r--.  1 oracle oracle     51 Mar 13 18:28 £1
-rw-rw-r--.  1 oracle oracle      0 Mar 13 14:31 celery
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Desktop
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Documents
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Downloads
-rw-rw-r--.  1 oracle oracle     53 Mar 13 17:18 example
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:33 house
drwxrwxr-x. 13 oracle oracle   4096 Mar 19 17:15 lab
-rw-rw-r--.  1 oracle oracle 112640 Mar 19 17:46 lab.tar
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Music
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Pictures
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Public
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:31 records
drwxrwxr-x.  2 oracle oracle      6 Mar 14 14:46 sbin
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Templates
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:34 veggies
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Videos
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ pwd
/home/oracle
[oracle@s11-server1:~]$ ls -l
total 33
-rw-------   1 oracle   oracle      624 Mar 19 02:14 20
-rw-r--r--   1 oracle   oracle        0 Mar 13 03:48 celery
drwxr-xr-x   2 oracle   oracle        5 Mar  9  2017 Desktop
drwxr-xr-x   6 oracle   oracle        6 Mar  9  2017 Documents
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Downloads
-rw-r--r--   1 oracle   oracle       54 Mar 13 05:00 example
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 house
drwxrwxr-x  11 oracle   oracle       29 Mar 14 06:45 lab
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Public
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:47 records
drwxr-xr-x   2 oracle   oracle        2 Mar 14 02:20 sbin
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 veggies
[oracle@s11-server1:~]$ tar cvf lab.tar lab
a lab/ 0K
a lab/dir4/ 0K
a lab/.recently-used 0K
a lab/dante_1 1K
a lab/.gnome/ 0K
a lab/Documents/ 0K
a lab/Documents/misc.txt 1K
a lab/Documents/sample.txt 1K

... Output truncated ...

a lab/dir1/ 0K
a lab/dir1/coffees/ 0K
a lab/dir1/coffees/nuts 0K
a lab/dir1/coffees/beans/ 0K
a lab/dir1/coffees/beans/beans 12K
a lab/dir1/coffees/brands 0K
a lab/dir1/fruit/ 0K
a lab/dir1/trees/ 0K
a lab/file.1 0K
a lab/.gnome2_private/ 0K
a lab/fruit 1K
a lab/fruit2 1K
```

```
a lab/.gtkrc-1.2-gnome2 1K
[oracle@s11-server1:~]$ ls -l
total 235
-rw-------   1 oracle   oracle      624 Mar 19 02:14 20
-rw-r--r--   1 oracle   oracle        0 Mar 13 03:48 celery
drwxr-xr-x   2 oracle   oracle        5 Mar  9  2017 Desktop
drwxr-xr-x   6 oracle   oracle        6 Mar  9  2017 Documents
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Downloads
-rw-r--r--   1 oracle   oracle       54 Mar 13 05:00 example
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 house
drwxrwxr-x  11 oracle   oracle       29 Mar 14 06:45 lab
-rw-r--r--   1 oracle   oracle   102912 Mar 19 05:23 lab.tar
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Public
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:47 records
drwxr-xr-x   2 oracle   oracle        2 Mar 14 02:20 sbin
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 veggies
[oracle@s11-server1:~]$
```

Note: You can follow similar steps to create and archive the file to another directory or an external drive.

3. Create a new directory called `retrieve` under the `lab` directory in your home directory. Use the `cd` command to move to this new directory. Use this new directory to practice retrieving files from archives. Retrieve the contents of the `lab.tar` file that you just created into this new directory.

Oracle Linux

```
[oracle@ol7-server1 ~]$ cd lab
[oracle@ol7-server1 lab]$ mkdir retrieve
[oracle@ol7-server1 lab]$ cd retrieve
[oracle@ol7-server1 retrieve]$ tar xvf /home/oracle/lab.tar
lab/
lab/fruit2
lab/file.1
lab/leaptest.sh
lab/Documents/
lab/Documents/misc.txt
lab/Documents/sample.txt

... Output truncated ...

lab/testfile
lab/testdir/
lab/test2file
```

```
lab/test2dir/
lab/feathers
lab/info.sh
[oracle@ol7-server1 retrieve]$ ls -l
total 4
drwxrwxr-x. 13 oracle oracle 4096 Mar 19 17:15 lab [oracle@ol7-
server1 retrieve]$ cd
[oracle@ol7-server1 ~]$
```

Oracle Solaris

```
[oracle@s11-server1:~]$ cd lab
[oracle@s11-server1:~]/lab$ mkdir retrieve
[oracle@s11-server1:~]/lab$ cd retrieve
[oracle@s11-server1:~]/lab/retrieve$ tar xvf
/home/oracle/lab.tar
x lab, 0 bytes, 0 tape blocks
x lab/dir4, 0 bytes, 0 tape blocks
x lab/.recently-used, 0 bytes, 0 tape blocks
x lab/dante_1, 368 bytes, 1 tape blocks
x lab/.gnome, 0 bytes, 0 tape blocks
x lab/Documents, 0 bytes, 0 tape blocks
x lab/Documents/misc.txt, 21 bytes, 1 tape blocks
x lab/Documents/sample.txt, 28 bytes, 1 tape blocks

.. Output truncated ..

x lab/dir1, 0 bytes, 0 tape blocks
x lab/dir1/coffees, 0 bytes, 0 tape blocks
x lab/dir1/coffees/nuts, 0 bytes, 0 tape blocks
x lab/dir1/coffees/beans, 0 bytes, 0 tape blocks
x lab/dir1/coffees/beans/beans, 12288 bytes, 24 tape blocks
x lab/dir1/coffees/brands, 0 bytes, 0 tape blocks
x lab/dir1/fruit, 0 bytes, 0 tape blocks
x lab/dir1/trees, 0 bytes, 0 tape blocks
x lab/file.1, 0 bytes, 0 tape blocks
x lab/.gnome2_private, 0 bytes, 0 tape blocks
x lab/fruit, 57 bytes, 1 tape blocks
x lab/fruit2, 57 bytes, 1 tape blocks
x lab/.gtkrc-1.2-gnome2, 96 bytes, 1 tape blocks
[oracle@s11-server1:~]/lab/retrieve$
[oracle@s11-server1:~]/lab/retrieve$ ls -l
total 3
```

```
drwxr-xr-x  11 oracle   oracle        29 Mar 14 06:45 lab
[oracle@s11-server1:~]/lab/retrieve$ cd
[oracle@s11-server1:~]$
```

Practice 9-2: Compressing and Restoring Files

Overview

In this practice you compress, view, and uncompress files.

Note

- You can use whichever VM you want, either `ol7-server1` or `s11-server1`.
- You will perform the exercises in your `/home/oracle` directory. If you are in a different directory when starting, use the `cd` command to change the directory to the `/home/oracle` directory.
- Note that the time allotted for the practice is only enough time to complete the practice on one of the VMs, but not both.
- Bash is the default shell in both Oracle Solaris and Oracle Linux.

Tasks

1. In the `lab` directory of your home directory, compress the `dante` and `file1` files using the `gzip` command.

   Oracle Linux and Oracle Solaris

```
$ cd
$ pwd
/home/oracle
$ cd lab
$ gzip dante
$ gzip file1
$ ls -l dante* file1*
-rw-r--r--. 1 oracle oracle 368 Mar  5 17:36 dante_1
-rw-r--r--. 1 oracle oracle 768 Mar  5 17:36 dante.gz
-rw-r--r--. 1 oracle oracle 863 Mar  5 17:36 file1.gz
$
```

   Note: When using the `gzip` command, the output file extension will be `.gz`. The new names for compressed versions are `dante.gz` and `file1.gz`.

2. Use the following commands to view the contents of the file that was compressed with the `gzip` command.

   For Oracle Linux:

   - `zcat <filename>`

   For Oracle Solaris:

   - `gzcat <filename>`

Oracle Linux

```
[oracle@ol7-server1 lab]$ zcat dante.gz
                         The Life and Times of Dante

                                  by Dante Pocai



Mention "Alighieri" and few may know about whom you are talking.
Say "Dante," instead, and the whole world knows whom you mean.
For Dante Alighieri, like Raphael, Michelangelo, Galileo, etc.
is usually referred to by his first name.  There is only one
Dante, as we recognize one Raphael, one Michelangelo, and one
Galileo.

... Output truncated ...

[oracle@ol7-server1 lab]$
```

Note: Including the file extension `.gz` is optional for the `zcat` command.

Oracle Solaris

```
[oracle@s11-server1:~]/lab$ gzcat dante.gz
               The Life and Times of Dante

                        by Dante Pocai



Mention "Alighieri" and few may know about whom you are talking.
Say "Dante," instead, and the whole world knows whom you mean.
For Dante Alighieri, like Raphael, Michelangelo, Galileo, etc.
is usually referred to by his first name.  There is only one
Dante, as we recognize one Raphael, one Michelangelo, and one
Galileo.

... Output truncated ...

[oracle@s11-server1:~]/lab$
```

Note: Including the file extension `.gz` is optional for the `gzcat` command.

3. Use the `gunzip` command to uncompress the `dante.gz` and and `file1.gz` files.

Oracle Linux and Oracle Solaris

```
$ gunzip dante file1
$ ls -l dante* file1*
-rw-r--r--. 1 oracle oracle 1319 Mar  5 17:36 dante
```

```
-rw-r--r--. 1 oracle oracle  368 Mar  5 17:36 dante_1
-rw-r--r--. 1 oracle oracle 1610 Mar  5 17:36 file1
$
```

Note: Including the file extension `.gz` is optional for the `gunzip` command.

4. Use the zip command to archive and compress the `file3`, `fruit2`, and `tutor.vi` files to a single file called `myfiles.zip`.

   Note: The original versions of the `file3`, `fruit2`, and `tutor.vi` files still exist after archiving and compression.

   Oracle Linux and Oracle Solaris

```
$ zip myfiles.zip file3 fruit2 tutor.vi
  adding: file3 (deflated 26%)
  adding: fruit2 (deflated 14%)
  adding: tutor.vi (deflated 74%)
[oracle@ol7-server1 lab]$ ls -l myfiles.zip
-rw-rw-r--. 1 oracle oracle 7983 Mar 19 18:00 myfiles.zip
$
```

5. Use the `unzip -l` command to view the new compressed archive file.

   Oracle Linux and Oracle Solaris

```
$ unzip -l myfiles.zip
Archive:  myfiles.zip
  Length      Date    Time    Name
---------  ---------- -----   ----
      218  05-13-2017 22:59   file3
       57  05-13-2017 22:59   fruit2
    28709  05-13-2017 22:59   tutor.vi
---------                     -------
    28984                     3 files
$
```

6. Use the `unzip` command to extract and uncompress the files in the `myfiles.zip` archive.

   Oracle Linux and Oracle Solaris

```
$ unzip myfiles.zip
Archive: myfiles.zip
replace file3? [y]es, [n]o, [A]ll, [N]one, [r]ename: A
inflating: file3
inflating: fruit2
inflating: tutor.vi
$
```

Note: The options `[y]`, `[n]`, `[A]` and `[N]` allow you to control how the archived files are extracted.

Practice 9-3: Performing Remote Connections and File Transfers

Overview

In this practice, you will use remote connection and file transfer commands.

Note

In this practice, remote connections and transfers of files will occur between the Oracle Solaris VM (`s11-server1`) and the Oracle Linux VM (`ol7-server1`). Take care to note on which VM you are being asked to carry out a command, as different tasks require specific commands run on a specific VM. Both VMs have the `ssh` service pre-installed and enabled to be able to perform remote connections and secure file transfers.

Ensure both VMs, `s11-server1` and `ol7-server1`, are up and running before beginning this practice.

Tasks

1. Launch the gnome calculator on the remote Oracle Linux system (`ol7-server1`) using the `gnome-calculator` command**.** This is required for a later task in this practice where you will attempt to perform a command on a remote system to kill the process related to this calculator tool.
   a. In your Oracle Linux VM (`ol7-server1`), open a terminal and run the `gnome-calculator` command. Leave the calculator tool open.

Oracle Linux

```
[oracle@ol7-server1 ~]$ gnome-calculator
```

2. Open a terminal in your Oracle Solaris VM (`s11-server1`) and use the `ssh` command to log in to Oracle Linux VM (`ol7-server1`) in your virtual network.

Oracle Solaris

```
[oracle@s11-server1:~]$ ssh oracle@ol7-server1
oracle@ol7-server1's password:
Last login: Sat May 12 19:58:12 2012 from s11-server1
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$
```

Or

Oracle Solaris

```
[oracle@s11-server1:~]$ ssh –l oracle ol7-server1
oracle@ol7-server1's password:
Last login: Sat May 12 19:58:12 2012 from s11-server1
[oracle@ol7-server1 ~]$ pwd
/home/oracle
[oracle@ol7-server1 ~]$
```

Note: Password for the user `oracle` is `oracle1`. The default directory on the remote machine will be the user's home directory `/home/oracle`.

3. Use the `uname` command to display the host name of the current system.

Oracle Solaris

```
[oracle@ol7-server1 ~]$ uname -n
ol7-server1
[oracle@ol7-server1 ~]$
```

4. Use the `ps` command to identify the PID of the `gnome-calculator` command on the remote system.

Oracle Solaris

```
[oracle@ol7-server1 ~]$ ps -ef | grep gnome-calculator
oracle   3616  3438  0 17:24 pts/1  00:00:00 gnome-calculator
oracle   3645  3378  0 17:30 pts/0  00:00:00 grep --color=auto
gnome-calculator
[oracle@ol7-server1 ~]$
```

Note: the first entry shown with a PID of `3616` is the process ID of the tool on the remote system. The second entry represents the `ps` command using `grep` to list the process with the name `gnome-calculator`.

5. Terminate the `gnome-calculator` process using the `kill` command and the process PID.

Oracle Solaris

```
[oracle@ol7-server1 ~]$ kill 3616
```

Note: If you log in to the remote system as root, you can terminate the process. If you log in to the remote system as the same user (same UID) as the user who started the process on the remote system, then also you can terminate the process. However, if you log in to the remote system as some other user, you cannot terminate the process because you do not own the process and do not have the appropriate permission.

6. Log out of the remote system.

Oracle Solaris

```
[oracle@ol7-server1 ~]$ exit
logout
Connection to ol7-server1 closed.
[oracle@s11-server1:~]$
```

7. Display the host name of your current system to determine whether you have returned to your host system.

Oracle Solaris

```
[oracle@s11-server1:~]$ uname -n
s11-server1
[oracle@s11-server1:~]$
```

8. Use the `scp` command to copy the `dante` file from the `lab` directory of your home directory on your Oracle Linux VM (`ol7-server1`) to the `/home/oracle/lab/dir1` directory on your Oracle Solaris VM (`s11-server1`).

Oracle Linux

```
[oracle@ol7-server1 ~]$ cd lab
[oracle@ol7-server1 lab]$ ls -l dante*
-rwxrwxr-x. 1 oracle oracle 1319 Aug 23  2017 dante
-rwxrwxr-x. 1 oracle oracle  368 May 13  2017 dante_1
[oracle@ol7-server1 lab]$
[oracle@ol7-server1 lab]$ scp dante s11-
server1:/home/oracle/lab/dir1
Password:
dante                              100% 1319     1.3KB/s   00:00
[oracle@ol7-server1 lab]$
```

a. Verify the file has been copied to the `lab/dir1` directory on your Oracle Solaris (`s11-server1`) VM.

Oracle Solaris

```
[oracle@s11-server1:~]$ cd lab/dir1
[oracle@s11-server1:~/lab/dir1]$ ls -l dante*
-rwxr-xr-x   1 oracle  oracle    1319 Mar  1 04:50 dante
[oracle@s11-server1:~/lab/dir1]$
```

9. Now copy the `dante` file from your Oracle Solaris VM (`s11-server1`) remote system back to the `lab/dir2` directory on your local Oracle Linux VM (`ol7-server1`) system.

a. Check the file is not already in the remote system directory.

Oracle Linux

```
[oracle@ol7-server1 lab]$ cd dir2
[oracle@ol7-server1 dir2]$ ls -l dante*
ls: cannot access dante*: No such file or directory
[oracle@ol7-server1 dir2]$
```

b. Copy the file using the `scp` command.

Oracle Solaris

```
[oracle@s11-server1:~/lab/dir1]$ scp dante ol7-
server1:/home/oracle/lab/dir2
oracle@ol7-server1's password:
dante                 100% |***************|  1319       00:00
[oracle@s11-server1:~/lab/dir1]$
```

c. Verify the file has been copied.

Oracle Linux

```
[oracle@ol7-server1 dir2]$ ls -l dante*
-rwxr-xr-x. 1 oracle oracle 1319 Mar  1 18:36 dante
[oracle@ol7-server1 dir2]$
```

10. Copy the `lab/practice` directory from your Oracle Linux VM (`ol7-server1`) to your home directory on your Oracle Solaris VM (`s11-server1`).

a. On your Oracle Linux VM (`ol7-server1`), return to the lab directory, and use the `scp -r` command to copy the `practice` directory and its contents to your Oracle Solaris VM (`s11-server1`).

Oracle Linux

```
[oracle@ol7-server1 dir2]$ cd ..
[oracle@ol7-server1 lab]$ scp -r practice s11-
server1:/home/oracle
Password:
research                                  100%    0     0.0KB/s   00:00
projection                                100%    0     0.0KB/s   00:00
mailbox                                   100%    0     0.0KB/s   00:00
project                                   100%    0     0.0KB/s   00:00
results                                   100%    0     0.0KB/s   00:00
[oracle@ol7-server1 lab]$
```

b. Check the directory and its contents or now in your home directory on your remote system.

Oracle Solaris

```
[oracle@s11-server1:~/lab/dir1]$ cd
[oracle@s11-server1:~]$ ls -l
total 238
-rw-------   1 oracle   oracle      624 Mar 19 02:14 20
-rw-r--r--   1 oracle   oracle        0 Mar 13 03:48 celery
drwxr-xr-x   2 oracle   oracle        5 Mar  9  2017 Desktop
drwxr-xr-x   6 oracle   oracle        6 Mar  9  2017 Documents
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Downloads
-rw-r--r--   1 oracle   oracle       54 Mar 13 05:00 example
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 house
drwxrwxr-x  12 oracle   oracle       31 Mar 19 05:35 lab
-rw-r--r--   1 oracle   oracle   102912 Mar 19 05:23 lab.tar
drwxr-xr-x   2 oracle   oracle        7 Mar 19 05:59 practice
drwxr-xr-x   2 oracle   oracle        2 Mar  9  2017 Public
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:47 records
drwxr-xr-x   2 oracle   oracle        2 Mar 14 02:20 sbin
drwxr-xr-x   2 oracle   oracle        2 Mar 13 03:50 veggies
[oracle@s11-server1:~]$ ls -l practice
total 5
-rw-r--r--   1 oracle   oracle       0 Mar 19 05:59 mailbox
-rw-r--r--   1 oracle   oracle       0 Mar 19 05:59 project
-rw-r--r--   1 oracle   oracle       0 Mar 19 05:59 projection
-rw-r--r--   1 oracle   oracle       0 Mar 19 05:59 research
-rw-r--r--   1 oracle   oracle       0 Mar 19 05:59 results
[oracle@s11-server1:~]$
```

11. Use the `sftp` command to securely retrieve the file `myvars` from the `lab` directory on your Oracle Solaris VM (`s11-server1`), to the `/home/oracle` directory on your Oracle Linux VM (`ol7-server1`).

Oracle Linux

```
[oracle@ol7-server1 lab]$ cd
[oracle@ol7-server1 ~]$
[oracle@ol7-server1 ~]$ sftp s11-server1
Password:
Connected to s11-server1.
sftp> pwd
Remote working directory: /home/oracle
sftp> get lab/myvars
Fetching /home/oracle/lab/myvars to myvars
/home/oracle/lab/myvars          100%   67     0.1KB/s   00:00
sftp> exit
[oracle@ol7-server1 ~]$ ls -l myvars
-rwxrwxr-x. 1 oracle oracle 67 Mar  19 19:07 myvars
[oracle@ol7-server1 ~]$
```

Note: You can also exit the sftp session with the `quit` or `bye` command at the `sftp>` prompt.

12. Using the string "file", transfer multiple files from the `lab` directory on your Oracle Solaris VM (`s11-server1`), to the `/home/oracle` directory on your Oracle Linux VM (`ol7-server1`).
    a. Check the files are not already in your home directory on your Oracle Linux VM (`ol7-server1`).

Oracle Linux

```
[oracle@ol7-server1 ~]$ ls -l
total 128
-rw-rw-r--.  1 oracle oracle     51 Mar 13 18:28 £1
-rw-rw-r--.  1 oracle oracle      0 Mar 13 14:31 celery
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Desktop
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Documents
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Downloads
-rw-rw-r--.  1 oracle oracle     53 Mar 13 17:18 example
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:33 house
drwxrwxr-x. 14 oracle oracle   4096 Mar 19 18:01 lab
-rw-rw-r--.  1 oracle oracle 112640 Mar 19 17:46 lab.tar
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Music
-rw-r--r--.  1 oracle oracle     67 Mar 19 18:33 myvars
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Pictures
```

```
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Public
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:31 records
drwxrwxr-x.  2 oracle oracle      6 Mar 14 14:46 sbin
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Templates
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:34 veggies
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Videos
[oracle@ol7-server1 ~]$
```

b. Establish an sftp session to your Oracle Solaris VM (`s11-server1`) and retrieve all files with the string "file" in their name.

Oracle Linux

```
[oracle@ol7-server1 ~]$ sftp s11-server1
Password:
Connected to s11-server1.
sftp> pwd
Remote working directory: /home/oracle
sftp> cd lab
sftp> pwd
Remote working directory: /home/oracle/lab
sftp> mget file*
Fetching /home/oracle/lab/file.1 to file.1
Fetching /home/oracle/lab/file.2 to file.2
Fetching /home/oracle/lab/file.3 to file.3
Fetching /home/oracle/lab/file1 to file1
/home/oracle/lab/file1           100% 1610     1.6KB/s   00:00
Fetching /home/oracle/lab/file2 to file2
/home/oracle/lab/file2           100%  105     0.1KB/s   00:00
Fetching /home/oracle/lab/file3 to file3
/home/oracle/lab/file3           100%  218     0.2KB/s   00:00
Fetching /home/oracle/lab/file4 to file4
/home/oracle/lab/file4           100%  137     0.1KB/s   00:00
sftp> exit
[oracle@ol7-server1 ~]$ ls -l
total 144
-rw-rw-r--.  1 oracle oracle     51 Mar 13 18:28 £1
-rw-rw-r--.  1 oracle oracle      0 Mar 13 14:31 celery
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Desktop
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Documents
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Downloads
-rw-rw-r--.  1 oracle oracle     53 Mar 13 17:18 example
-rw-r--r--.  1 oracle oracle   1610 Mar 19 18:35 file1
-rw-r--r--.  1 oracle oracle      0 Mar 19 18:35 file.1
```

```
-rw-r--r--.  1 oracle oracle    105 Mar 19 18:35 file2
-rw-r--r--.  1 oracle oracle      0 Mar 19 18:35 file.2
-rw-r--r--.  1 oracle oracle    218 Mar 19 18:35 file3
-rw-r--r--.  1 oracle oracle      0 Mar 19 18:35 file.3
-rw-r--r--.  1 oracle oracle    137 Mar 19 18:35 file4
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:33 house
drwxrwxr-x. 14 oracle oracle   4096 Mar 19 18:01 lab
-rw-rw-r--.  1 oracle oracle 112640 Mar 19 17:46 lab.tar
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Music
-rw-r--r--.  1 oracle oracle     67 Mar 19 18:33 myvars
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Pictures
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Public
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:31 records
drwxrwxr-x.  2 oracle oracle      6 Mar 14 14:46 sbin
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Templates
drwxrwxr-x.  2 oracle oracle      6 Mar 13 14:34 veggies
drwxr-xr-x.  2 oracle oracle      6 Mar 13  2017 Videos
[oracle@ol7-server1 ~]$
```

13. Transfer the file `myvars` from `/home/oracle` directory on your Oracle Linux VM (`ol7-server1`) to the `/home/oracle` directory on your Oracle Solaris VM (`s11-server1`).
    a. Establish the session with sftp and check the file is not already in the remote system directory.

Oracle Linux

```
[oracle@ol7-server1 ~]$ sftp s11-server1
Password:
Connected to s11-server1.
sftp> ls -l
-rw-------    1 oracle   oracle     624 Mar 19 02:14 20
drwxr-xr-x    2 oracle   oracle       5 Mar  9  2017 Desktop
drwxr-xr-x    6 oracle   oracle       6 Mar  9  2017 Documents
drwxr-xr-x    2 oracle   oracle       2 Mar  9  2017 Downloads
drwxr-xr-x    2 oracle   oracle       2 Mar  9  2017 Public
-rw-r--r--    1 oracle   oracle       0 Mar 13 03:48 celery
-rw-r--r--    1 oracle   oracle      54 Mar 13 05:00 example
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:50 house
drwxrwxr-x   12 oracle   oracle      31 Mar 19 05:35 lab
-rw-r--r--    1 oracle   oracle  102912 Mar 19 05:23 lab.tar
drwxr-xr-x    2 oracle   oracle       7 Mar 19 05:59 practice
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:47 records
drwxr-xr-x    2 oracle   oracle       2 Mar 14 02:20 sbin
```

```
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:50
veggiessftp>
```

b. Use the `put` command to transfer the `myvars` file to the remote Oracle Solaris VM (s11-server1).

Oracle Linux

```
sftp> put myvars
Uploading myvars to /home/oracle/myvars
myvars                              100%   67     0.1KB/s   00:00
sftp> ls -l
-rw-------    1 oracle   oracle      624 Mar 19 02:14 20
drwxr-xr-x    2 oracle   oracle       5 Mar  9  2017 Desktop
drwxr-xr-x    6 oracle   oracle       6 Mar  9  2017 Documents
drwxr-xr-x    2 oracle   oracle       2 Mar  9  2017 Downloads
drwxr-xr-x    2 oracle   oracle       2 Mar  9  2017 Public
-rw-r--r--    1 oracle   oracle       0 Mar 13 03:48 celery
-rw-r--r--    1 oracle   oracle      54 Mar 13 05:00 example
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:50 house
drwxrwxr-x   12 oracle   oracle      31 Mar 19 05:35 lab
-rw-r--r--    1 oracle   oracle  102912 Mar 19 05:23 lab.tar
-rw-r--r--    1 oracle   oracle      67 Mar 19 06:07 myvars
drwxr-xr-x    2 oracle   oracle       7 Mar 19 05:59 practice
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:47 records
drwxr-xr-x    2 oracle   oracle       2 Mar 14 02:20 sbin
drwxr-xr-x    2 oracle   oracle       2 Mar 13 03:50
veggiessftp> exit
[oracle@ol7-server1 ~]$
```

14. Using the `mput` command, transfer multiple files starting with the string “file” from `/home/oracle` directory on your Oracle Linux VM (`ol7-server1`) to the `/home/oracle` directory on your remote Oracle Solaris VM (`s11-server1`).

Oracle Linux

```
[oracle@ol7-server1 ~]$ sftp s11-server1
Password:
Connected to s11-server1.
sftp> pwd
Remote working directory: /home/oracle
sftp> mput file*
Uploading file.1 to /home/oracle/file.1
file.1                              100%    0     0.0KB/s   00:00
Uploading file.2 to /home/oracle/file.2
```

```
file.2                                100%    0     0.0KB/s   00:00
Uploading file.3 to /home/oracle/file.3
file.3                                100%    0     0.0KB/s   00:00
Uploading file1 to /home/oracle/file1
file1                                 100% 1610     1.6KB/s   00:00
Uploading file2 to /home/oracle/file2
file2                                 100%  105     0.1KB/s   00:00
Uploading file3 to /home/oracle/file3
file3                                 100%  218     0.2KB/s   00:00
Uploading file4 to /home/oracle/file4
file4                                 100%  137     0.1KB/s   00:00
sftp> ls -l
-rw-------    1 oracle   oracle        624 Mar 19 02:14 20
drwxr-xr-x    2 oracle   oracle          5 Mar  9  2017 Desktop
drwxr-xr-x    6 oracle   oracle          6 Mar  9  2017 Documents
drwxr-xr-x    2 oracle   oracle          2 Mar  9  2017 Downloads
drwxr-xr-x    2 oracle   oracle          2 Mar  9  2017 Public
-rw-r--r--    1 oracle   oracle          0 Mar 13 03:48 celery
-rw-r--r--    1 oracle   oracle         54 Mar 13 05:00 example
-rw-r--r--    1 oracle   oracle          0 Mar 19 06:10 file.1
-rw-r--r--    1 oracle   oracle          0 Mar 19 06:10 file.2
-rw-r--r--    1 oracle   oracle          0 Mar 19 06:10 file.3
-rw-r--r--    1 oracle   oracle       1610 Mar 19 06:10 file1
-rw-r--r--    1 oracle   oracle        105 Mar 19 06:10 file2
-rw-r--r--    1 oracle   oracle        218 Mar 19 06:10 file3
-rw-r--r--    1 oracle   oracle        137 Mar 19 06:10 file4
drwxr-xr-x    2 oracle   oracle          2 Mar 13 03:50 house
drwxrwxr-x   12 oracle   oracle         31 Mar 19 05:35 lab
-rw-r--r--    1 oracle   oracle     102912 Mar 19 05:23 lab.tar
-rw-r--r--    1 oracle   oracle         67 Mar 19 06:07 myvars
drwxr-xr-x    2 oracle   oracle          7 Mar 19 05:59 practice
drwxr-xr-x    2 oracle   oracle          2 Mar 13 03:47 records
drwxr-xr-x    2 oracle   oracle          2 Mar 14 02:20 sbin
drwxr-xr-x    2 oracle   oracle          2 Mar 13 03:50
veggiessftp> exit
[oracle@ol7-server1 ~]$
```

15. Close the terminal windows.

16. Power off the Oracle Linux and Oracle Solaris virtual machines.