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Batch: B3 Hons

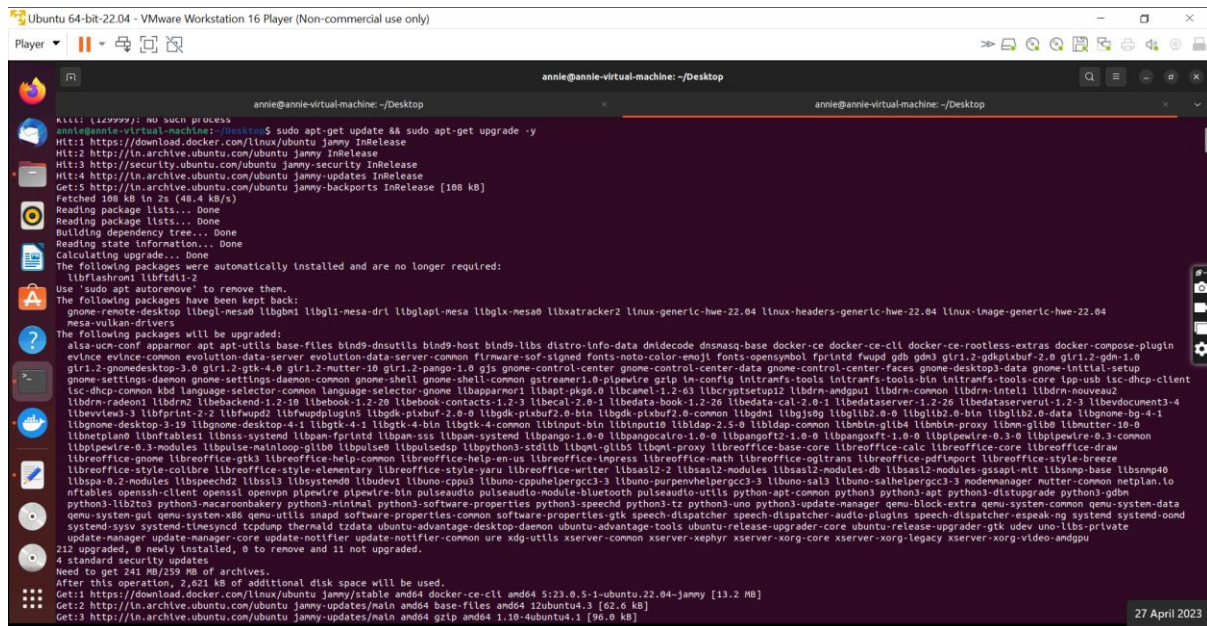
CLOUD APPLICATION DEVELOPMENT

Lab 1

Problem Statement

Installing OpenStack: Install OpenStack on a virtual machine or a physical server. You can use DevStack, which is a tool for installing OpenStack on a single machine. You can also use a tool like Packstack, which is a multi-node installation tool for OpenStack.

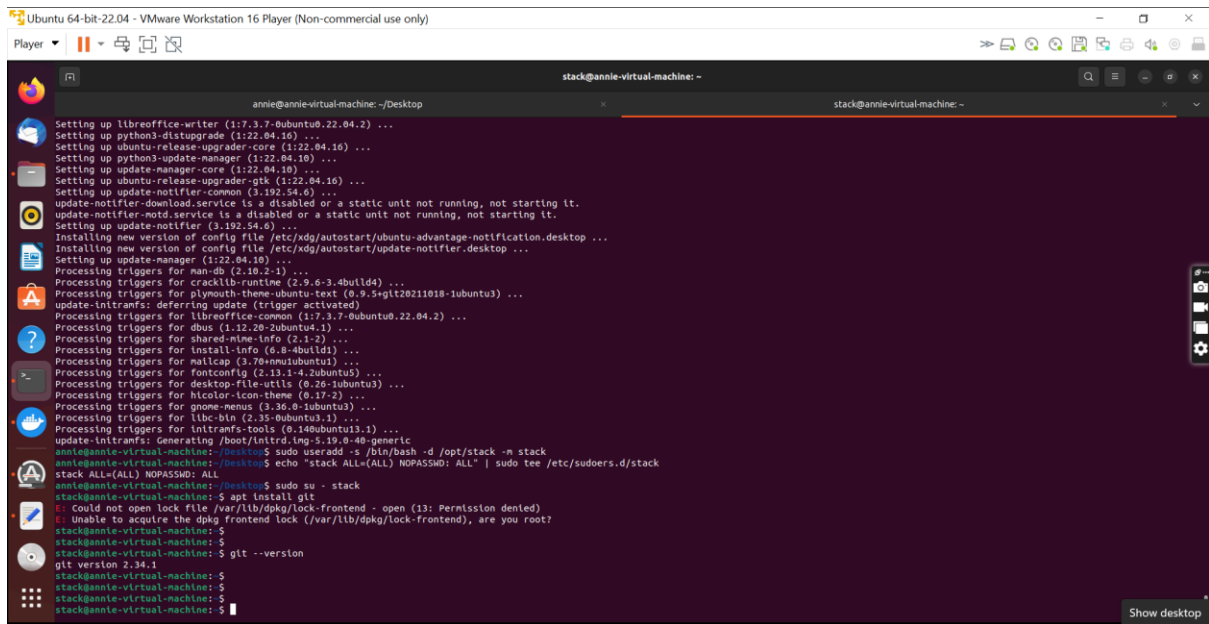
```
sudo apt-get update && sudo apt-get upgrade -y
```



```
annie@annie-virtual-machine: ~/Desktop
annie@annie-virtual-machine:~/Desktop$ sudo apt-get update && sudo apt-get upgrade -y
Hit:1 https://download.docker.com/linux/ubuntu jammy InRelease
Hit:2 http://ln.archive.ubuntu.com/ubuntu jammy InRelease
Hit:3 http://security.ubuntu.com/ubuntu jammy-security InRelease
Hit:4 http://ln.archive.ubuntu.com/ubuntu jammy-updates InRelease
Get:5 http://ln.archive.ubuntu.com/ubuntu jammy-backports InRelease [108 kB]
Fetched 108 kB in 2s (48.4 kB/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libfdt1-2
Use 'sudo apt autoremove' to remove them.
The following packages have been kept back:
  gnome-remote-desktop libegl-mesa0 libgbm1 libgl1-mesa-dri libglapi-mesa libglx-mesa0 libxatracker2 linux-generic-hwe-22.04 linux-headers-generic-hwe-22.04 linux-image-generic-hwe-22.04
  mesa-vulkan-drivers
The following packages will be upgraded:
 alsa-ucm-conf apparmor apt apt-utils base-files bind9-dnswtills bind9-host bind9-libs distro-info-data dnsmasq-base docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin
  evince evince-common evolution-data-server evolution-data-server-common firmware-sof-signed fonts-noto-color-emoji fonts-opensymbol fprintd fwupd gdb gdbn3 glib2.0-gtk-pixbuf-2.0 glib2.0-gtk-1.0
  glib2.0-gnome-desktop-3.0 glib2.0-gtk-4.0 glib2.0-mutter-10 glib2.0-pango-1.0 gjs gnome-control-center gnome-control-center-data gnome-control-center-faces gnome-desktop3-data gnome-initial-setup
  gnome-settings-daemon gnome-settings-daemon-common gnome-shell gnome-shell-common gstreamer1.0-pipewire gzip in-config intransf-tools intransf-tools-bin intransf-tools-core ltp-usb lsc-dhcp-client
  lsc-dhcp-common kbd language-selector-common language-selector-gnome libapparmor1 libapt-pkg0 libcanal-1.2-03 libcryptsetup12 libdrm-andgpus libdrm-common libdrm-intel1 libdrm-nouveau
  libdrm-radeon1 libdrm2 libebackend-1.2-10 libebook-1.2-20 libebook-contacts-1.2-3 libecal-2.0-1 libedata-book-1.2-26 libedata-cal-2.0-1 libedataserver-1.2-26 libedataserverui-1.2-3 libevdocument3-4
  libevview3-3 libfprint-2.2 libfwupd2 libfwupdplugins libgdk-pixbuf-2.0-0 libgdk-pixbuf2.0-bin libgdk-pixbuf2.0-common libgdm1 libgjs0g libglib2.0-0 libglib2.0-bin libglib2.0-data libgnome-bg-4-1
  libgnome-desktop-3-19 libgnome-desktop-4-1 libgtk-4-1 libgtk-4-bin libgtk-4-common libinput-bin libinput10 libldap-2.5-0 libldap-common libmbin-glib4 libmbin-proxy libnn-glib4 libnutter-10-0
  libonetplace libonetplace1 libos-systemd libos-systemd libos-systemd libpango-1.0-0 libpangocairo-1.0-0 libpangoft2-1.0-0 libpangorft-1.0-0 libpipewire-0.3-0 libpipewire-0.3-common
  libpipewire-0.3-modules libpulse-mainloop-glib0 libpulse0 libpulse0 libpython3-stdlib libqt5-glib5 libqt5-proxy libreeoffice-base-core libreeoffice-calc libreeoffice-core libreeoffice-draw
  libreeoffice-gnome libreeoffice-gtk3 libreeoffice-help-common libreeoffice-help-en-us libreeoffice-impress libreeoffice-math libreeoffice-ogltrans libreeoffice-pdfimport libreeoffice-style-breeze
  libreeoffice-style-collibre libreeoffice-style-elementary libreeoffice-style-yaru libreeoffice-writer libbasil2-2 libbasil2-modules libbasil2-modules-db libbasil2-modules-gsapi-mlt libsnmp-base libsnmp40
  libspa-0.2-modules libspeech2 libssl3 libsystemd0 libudev1 libuno-cppu3 libuno-cppuhelpergcc3-3 libuno-purpenhelpergcc3-3 libuno-sal3 libuno-salhelpergcc3-3 modemmanager mutter-common netplan.io
  nftables openssl-client openssl openvpn pipewire pipewire-bin pulseaudio pulseaudio-module-bluetooth pulseaudio-module-usb python3-apt python3-apt python3-distupgrade python3-gdm
  python3-lib2to3 python3-macaronbakery python3-mintal python3-software-properties python3-speechd python3-tz python3-uno python3-update-manager qemu-block-extra qemu-system-common qemu-system-data
  qemu-system-gui qemu-system-x86 qemu-utils snapd software-properties-common software-properties-gtk speech-dispatcher speech-dispatcher-audio-plugins speech-dispatcher-espeak-ng systemd systemd-oomd
  systemd-sysv systemd-timesyncd tcpdump thermald tzdata ubuntu-advantage-desktop-daemon ubuntu-advantage-tools ubuntu-release-upgrader-core ubuntu-release-upgrader-gtk udev uno-libs-private
  update-manager update-manager-core update-notifier update-notifier-common ure xdg-utils xserver-common xserver-xephyr xserver-xorg-core xserver-xorg-legacy xserver-xorg-video-andgpus
  212 upgraded, 0 newly installed, 0 to remove and 11 not upgraded.
4 standard security updates
Need to get 241 MB/259 MB of archives.
After this operation, 2,621 kB of additional disk space will be used.
Get:1 https://download.docker.com/linux/ubuntu jammy/stable amd64 docker-ce-cli amd64 5:23.0.5-1-ubuntu.22.04-jammy [13.2 MB]
Get:2 http://ln.archive.ubuntu.com/ubuntu jammy-updates/main amd64 base-files amd64 12ubuntu4.3 [62.0 kB]
Get:3 http://ln.archive.ubuntu.com/ubuntu jammy-updates/main amd64 gzip amd64 1.10-4ubuntu4.1 [96.0 kB]
```

```
sudo useradd -s /bin/bash -d /opt/stack -m stack
```

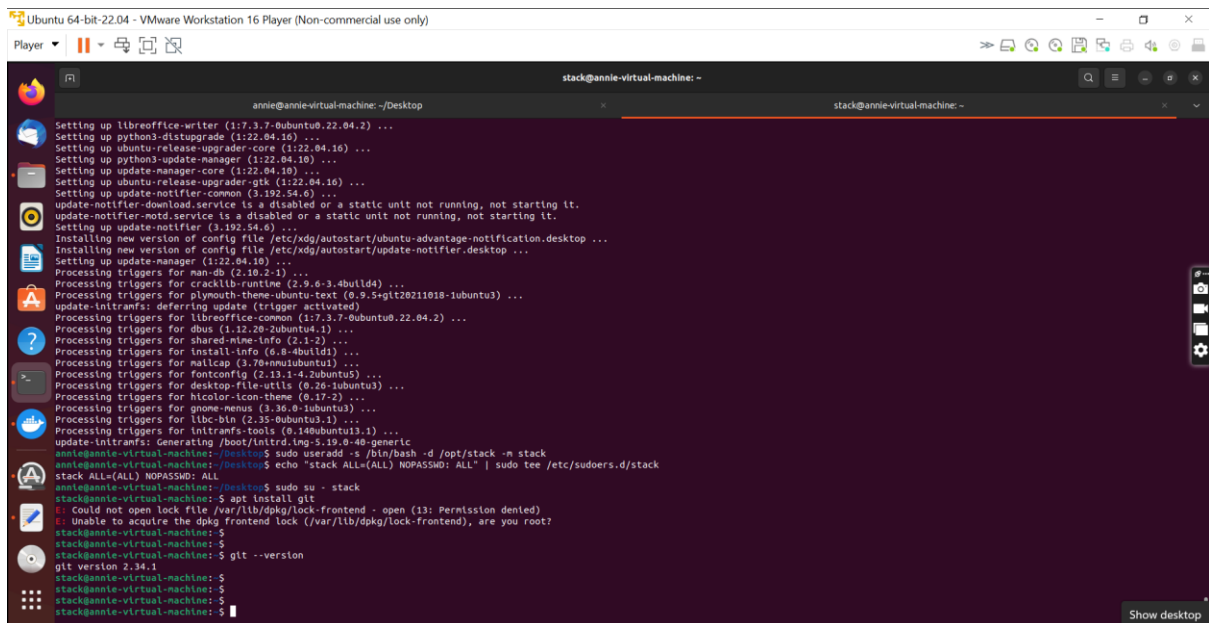
```
echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee /etc/sudoers.d/stack
```



```
Setting up libiofile-writer (1:17.3.7-0ubuntu0.22.04.2) ...
Setting up python3-distupgrade (1:22.04.16) ...
Setting up ubuntu-release-upgrader-core (1:22.04.16) ...
Setting up python3-update-manager (1:22.04.10) ...
Setting up update-manager-core (1:22.04.10) ...
Setting up ubuntu-release-upgrader-gtk (1:22.04.16) ...
Setting up update-notifier-common (3.192.54.0) ...
update-notifier-download.service is a disabled or a static unit not running, not starting it.
update-notifier-notd.service is a disabled or a static unit not running, not starting it.
Setting up update-notifier (3.192.54.0) ...
Installing new version of config file /etc/xdg/autostart/ubuntu-advantage-notification.desktop ...
Installing new version of config file /etc/xdg/autostart/update-notifier.desktop ...
Setting up update-manager (1:22.04.10) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for cracklib-runtime (2.9.6-3.4build4) ...
Processing triggers for plymouth-theme-ubuntu-text (0.9.5+git20211018-1ubuntu3) ...
update-initramfs: deferring update (trigger activated)
Processing triggers for libreoffice-common (1:7.3.7-0ubuntu0.22.04.2) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for shared-mime-info (2.3-2) ...
Processing triggers for install-info (6.8-4build1) ...
Processing triggers for malcap (3.7.0-nmubuntu1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for libcb-bln (2.35-0ubuntu3.1) ...
Processing triggers for initramfs-tools (0.140ubuntu13.1) ...
update-initramfs: Generating /boot/initrd.img-5.19.0-40-generic
annie@annie-virtual-machine:~/Desktop$ sudo useradd -s /bin/bash -d /opt/stack -n stack
annie@annie-virtual-machine:~/Desktop$ echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee /etc/sudoers.d/stack
stack ALL=(ALL) NOPASSWD: ALL
annie@annie-virtual-machine:~/Desktop$ sudo su - stack
stack@annie-virtual-machine:~$ apt install git
E: Could not open lock file /var/lib/dpkg/lock-frontend - open (13: Permission denied)
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-frontend), are you root?
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$ git --version
git version 2.34.1
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
```

Installation of git is done

git --version



```
Setting up libiofile-writer (1:17.3.7-0ubuntu0.22.04.2) ...
Setting up python3-distupgrade (1:22.04.16) ...
Setting up ubuntu-release-upgrader-core (1:22.04.16) ...
Setting up python3-update-manager (1:22.04.10) ...
Setting up update-manager-core (1:22.04.10) ...
Setting up ubuntu-release-upgrader-gtk (1:22.04.16) ...
Setting up update-notifier-common (3.192.54.0) ...
update-notifier-download.service is a disabled or a static unit not running, not starting it.
update-notifier-notd.service is a disabled or a static unit not running, not starting it.
Setting up update-notifier (3.192.54.0) ...
Installing new version of config file /etc/xdg/autostart/ubuntu-advantage-notification.desktop ...
Installing new version of config file /etc/xdg/autostart/update-notifier.desktop ...
Setting up update-manager (1:22.04.10) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for cracklib-runtime (2.9.6-3.4build4) ...
Processing triggers for plymouth-theme-ubuntu-text (0.9.5+git20211018-1ubuntu3) ...
update-initramfs: deferring update (trigger activated)
Processing triggers for libreoffice-common (1:7.3.7-0ubuntu0.22.04.2) ...
Processing triggers for dbus (1.12.20-2ubuntu4.1) ...
Processing triggers for shared-mime-info (2.3-2) ...
Processing triggers for install-info (6.8-4build1) ...
Processing triggers for malcap (3.7.0-nmubuntu1) ...
Processing triggers for fontconfig (2.13.1-4.2ubuntu5) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for libcb-bln (2.35-0ubuntu3.1) ...
Processing triggers for initramfs-tools (0.140ubuntu13.1) ...
update-initramfs: Generating /boot/initrd.img-5.19.0-40-generic
annie@annie-virtual-machine:~/Desktop$ sudo useradd -s /bin/bash -d /opt/stack -n stack
annie@annie-virtual-machine:~/Desktop$ echo "stack ALL=(ALL) NOPASSWD: ALL" | sudo tee /etc/sudoers.d/stack
stack ALL=(ALL) NOPASSWD: ALL
annie@annie-virtual-machine:~/Desktop$ sudo su - stack
stack@annie-virtual-machine:~$ apt install git
E: Could not open lock file /var/lib/dpkg/lock-frontend - open (13: Permission denied)
E: Unable to acquire the dpkg frontend lock (/var/lib/dpkg/lock-frontend), are you root?
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$ git --version
git version 2.34.1
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
stack@annie-virtual-machine:~$
```

sudo su - stack

git clone <https://opendev.org/openstack/devstack>

```

stack@annie-virtual-machine:~$ sudo su - stack
su: user - does not exist or the user entry does not contain all the required fields
stack@annie-virtual-machine:~$ sudo su - stack
stack@annie-virtual-machine:~$ git clone https://opendev.org/openstack/devstack
Cloning into 'devstack'...
remote: Enumerating objects: 30303, done.
remote: Counting objects: 100% (30303/30303), done.
remote: Compressing objects: 100% (10044/10044), done.
remote: Total 49921 (delta 29576), reused 20259 (delta 20259), pack-reused 19618
Receiving objects: 100% (49921/49921), 9.20 MiB | 84.00 KiB/s, done.
Resolving deltas: 100% (35455/35455), done.
stack@annie-virtual-machine:~$

```

Installation of vim

sudo apt install vim

```

Player | Ubuntu 64-bit-22.04 - VMware Workstation 16 Player (Non-commercial use only)
stack@annie-virtual-machine: ~
stack@annie-virtual-machine:~$ sudo apt install vim
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libflashrom1 libftdi1-2 liblvm13 linux-headers-5.19.0-40-generic linux-hwe-5.19-headers-5.19.0-40 linux-image-5.19.0-40-generic linux-modules-5.19.0-40-generic linux-modules-extra-5.19.0-40-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  vim-runtime
Suggested packages:
  ctags vim-doc vim-scripts
The following NEW packages will be installed:
  vim-runtime
0 upgraded, 2 newly installed, 0 to remove and 1 not upgraded.
Need to get 8,553 kb of archives.
After this operation, 37.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim-runtime all 2:8.2.3995-1ubuntu2.7 [6,825 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 vim amd64 2:8.2.3995-1ubuntu2.7 [1,728 kB]
Fetched 8,553 kB in 24s (359 kB/s)
Selecting previously unselected package vim-runtime.
(Reading database ... 236159 files and directories currently installed.)
Preparing to unpack .../vim-runtime_2:8.2.3995-1ubuntu2.7_all.deb ...
Adding 'diversion of /usr/share/vim/vim82/doc/help.txt to /usr/share/vim/vim82/doc/help.txt.vim-tiny by vim-runtime'
Adding 'diversion of /usr/share/vim/vim82/doc/tags to /usr/share/vim/vim82/doc/tags.vim-tiny by vim-runtime'
Unpacking vim-runtime (2:8.2.3995-1ubuntu2.7) ...
Selecting previously unselected package vim.
Preparing to unpack .../vim_2:8.2.3995-1ubuntu2.7_amd64.deb ...
Unpacking vim (2:8.2.3995-1ubuntu2.7) ...
Setting up vim-runtime (2:8.2.3995-1ubuntu2.7) ...
Setting up vim (2:8.2.3995-1ubuntu2.7) ...
update-alternatives: using /usr/bin/vim.basic to provide /usr/bin/vim (vim) in auto mode
update-alternatives: using /usr/bin/vimdiff to provide /usr/bin/vimdiff (vimdiff) in auto mode
update-alternatives: using /usr/bin/rvim to provide /usr/bin/rvim (rvim) in auto mode
update-alternatives: using /usr/bin/rview to provide /usr/bin/rview (rview) in auto mode
update-alternatives: using /usr/bin/vi to provide /usr/bin/vi (vi) in auto mode
update-alternatives: using /usr/bin/view to provide /usr/bin/view (view) in auto mode
update-alternatives: using /usr/bin/vim.basic to provide /usr/bin/ex (ex) in auto mode
Processing triggers for man-db (2:8.2.1) ...
stack@annie-virtual-machine:~$

```

vim local.conf

```
[[local|localr]]
```

```

ADMIN_PASSWORD=StrongAdminSecret
DATABASE_PASSWORD=$ADMIN_PASSWORDCinder
RABBIT_PASSWORD=$ADMIN_PASSWORD
SERVICE_PASSWORD=$ADMIN_PASSWORD

```


Ubuntu 64-bit-22.04 - VMware Workstation 16 Player (Non-commercial use only)

```
stack@annie-virtual-machine: ~/devstack
stack@annie-virtual-machine: $
stack@annie-virtual-machine: $ sudo su - stack
stack@annie-virtual-machine: $ cd devstack
stack@annie-virtual-machine: ~/devstack $
stack@annie-virtual-machine: ~/devstack $ vln local.conf
stack@annie-virtual-machine: ~/devstack $
stack@annie-virtual-machine: ~/devstack $ ./stack.sh
+ unset GREP_OPTIONS
+ unset LANG
+ unset LANGUAGE
+ LC_ALL=en_US.UTF8
+ export LC_ALL
++ env
++ grep -E '^OS='
++ cut -d = -f 1
+ unset
+ unset 022
+ PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin:/usr/local/bin:/usr/local/sbin:/usr/sbin:/sbin
+++ dirname ./stack.sh
++ cd .
++ pwd
+ TOP_DIR=/opt/stack/devstack
+ NOUNSET=
+ [[ -n '' ]]
++ date +%s
+ DEVSTACK_START_TIME=1682607994
+ [[ -r /opt/stack/devstack/.stackenv ]]
+ FILES=/opt/stack/devstack/files
+ '[' '' -d /opt/stack/devstack/files ']'
+ '[' '' -d /opt/stack/devstack/inc ']'
+ '[' '' -d /opt/stack/devstack/lib ']'
+ '[' '' = v ']'
+ [[ 1001 -eq 0 ]]
+ [[ -n '' ]]
+ [[ -r /opt/stack/no-devstack ]]
+ LAST_SPINNER_PID=
+ source /opt/stack/devstack/functions
++ [[ -z '' ]]
++ declare -r g_DEVSTACK_FUNCTIONS=1
++++ dirname /opt/stack/devstack/functions
+++ cd /opt/stack/devstack
```

5 new notifications

Ubuntu 64-bit-22.04 - VMware Workstation 16 Player (Non-commercial use only)

```
stack@annie-virtual-machine: ~/devstack
+lib/neutron:install_neutron:517
+inc/python:use_library_from_glt:244
+inc/python:use_library_from_glt:245
+inc/python:use_library_from_glt:246
+inc/python:use_library_from_glt:246
+inc/python:use_library_from_glt:247
+lib/neutron:install_neutron:522
+functions-common:git_clone:571
+functions-common:git_clone:572
+functions-common:git_clone:573
+functions-common:git_clone:574
++functions-common:git_clone:575
+functions-common:git_clone:576
++functions-common:git_clone:578
++functions-common:truoefalse:219
+++functions-common:truoefalse:220
+++functions-common:truoefalse:220
++functions-common:truoefalse:220
++functions-common:truoefalse:221
+functions-common:git_clone:578
+functions-common:git_clone:579
+functions-common:git_clone:583
+functions-common:git_clone:592
+functions-common:git_clone:592
+functions-common:git_clone:686
+functions-common:git_clone:687
+functions-common:git_clone:688
+functions-common:git_clone:688
+functions-common:time_start:2372
+functions-common:time_start:2373
+functions-common:time_start:2374
++functions-common:time_start:2377
+functions-common:time_start:2377
+functions-common:git_clone:688
+cloning into '/opt/stack/neutron'...
remote: Enumerating objects: 201989, done.
remote: Counting objects: 100% (201989/201989), done.
remote: Compressing objects: 100% (29866/29866), done.
use_library_from_glt neutron-lib
local name=neutron-lib
local enabled=1
[[ '' = \A\L\ ]]
[[ ,,, = ,neutron-lib, ]]
return 1
git clone https://opendev.org/openstack/neutron.git /opt/stack/neutron master
local git_remote=https://opendev.org/openstack/neutron.git
local git_dest=/opt/stack/neutron
local git_ref=master
local orig_dir
pwd
orig_dir=/opt/stack/devstack
local git_clone_flags=
trueorfalse False RECLONE
local xtrace
set -o
grep xtrace
xtrace='set -o xtrace'
set -o xtrace
RECLONE=False
[[ 0 -gt 0 ]]
[[ False = \T\r\h\l\ ]]
egrep -q '^refs'
echo master
[[ ! -d /opt/stack/neutron ]]
[[ False = \T\r\h\l\ ]]
git timed clone https://opendev.org/openstack/neutron.git /opt/stack/neutron --branch master
local count=0
local timeout=0
[[ -n 0 ]]
timeout=0
time_start git timed
local name=git_timed
local start_time=
[[ -n '' ]]
date +%s%N
TIME_START[$name]=1682609488192
timeout -s SIGINT 0 git clone https://opendev.org/openstack/neutron.git /opt/stack/neutron --branch master
```

<https://server-ip/dashboard>


openstack.

Log in

User Name

Password

Sign In

Openstack Login

API Access

Compute

Overview

Instances

Images

Key Pairs

Server Groups

Volumes

Network

Admin

Identity

Project / Compute / Overview

Overview

Limit Summary

Compute

Instances

Used 0 of 10

VCPUs

Used 0 of 20

RAM

Used 0Bytes of 50GB

Volume

Volumes

Used 0 of 10

Volume Snapshots

Used 0 of 10

Volume Storage

Used 0Bytes of 1000GB

Network

OpenStack Dashboard