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Course/Section: CPE 232 / CPE31S22	Date Submitted: Dec 9, 2022
Instructor: Dr. Jonathan Taylar	Semester and SY: 1st Sem, 2022 - 2023
Activity 15: OpenStack Installation (Neutron, Horizon, Cinder)	
1. Objectives	
Create a workflow to install OpenStack using Ansible as your Infrastructure as Code (IaC).	
2. Intended Learning Outcomes	
<ol style="list-style-type: none"> 1. Analyze the advantages and disadvantages of cloud services 2. Evaluate different Cloud deployment and service models 3. Create a workflow to install and configure OpenStack base services using Ansible as documentation and execution. 	
3. Resources	
Oracle VirtualBox (Hypervisor) 1x Ubuntu VM or Centos VM	
4. Tasks	
<ol style="list-style-type: none"> 1. Create a new repository for this activity. 2. Create a playbook that converts the steps in the following items in https://docs.openstack.org/install-guide/ <ol style="list-style-type: none"> a. Neutron b. Horizon c. Cinder d. Add, commit and push it to your GitHub repo. 	
5. Output (screenshots and explanations)	

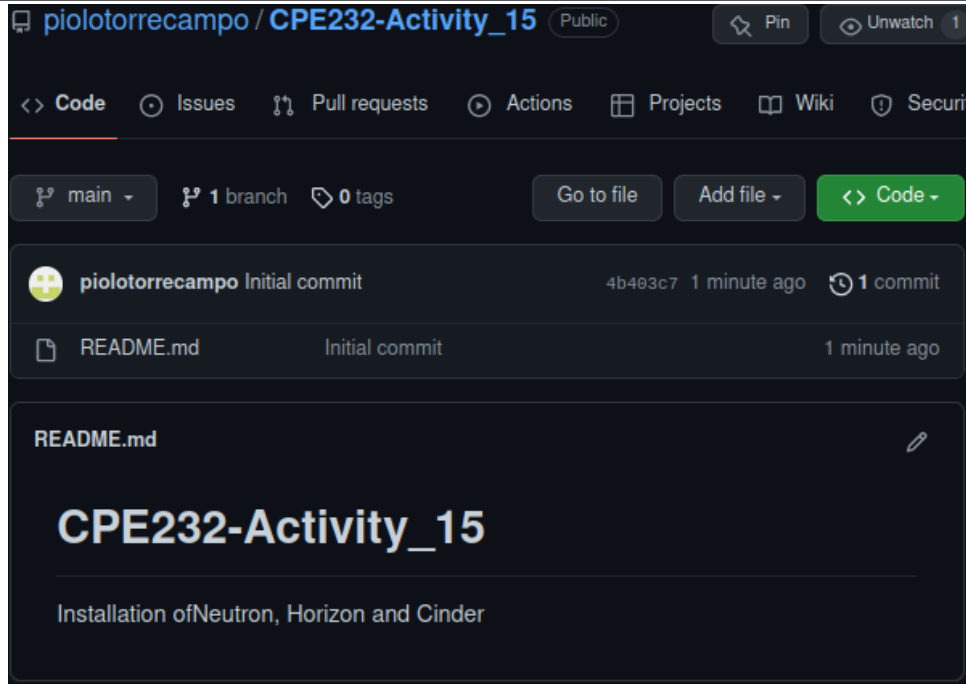


Figure 1. The image above shows the newly created page for this activity.

```
~/Documents/repos +2 > git clone git@github.com:piolotorrecampo/CPE232-Activity_15.git
Cloning into 'CPE232-Activity_15'...
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (4/4), done.
remote: Total 6 (delta 0), reused 0 (delta 0), pack-reused 0
Receiving objects: 100% (6/6), done.
```

Figure 2. Cloning the created repository to the local machine.

```
Documents/repos/CPE232-Activity_15 > tree
.
├── ansible.cfg
├── install_nhc.yml
├── inventory
├── roles
│   ├── cinder
│   │   ├── files
│   │   │   ├── cinder.conf
│   │   │   └── nova.conf
│   │   ├── handlers
│   │   │   └── main.yml
│   │   └── tasks
│   │       ├── configure.yml
│   │       ├── install.yml
│   │       ├── main.yml
│   │       └── prereq.yml
│   └── horizon
│       └── files
```

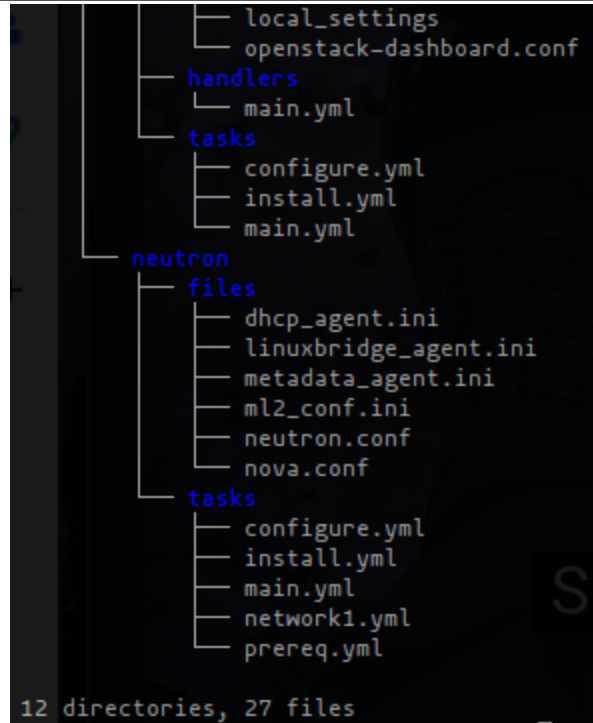


Figure 3. The picture above shows the file structure of the activity.

File Name	Ansible Script
install_nhc.yml	<pre>--- - hosts: all become: true pre_tasks: - name: Updating and upgrading the operating system yum: name: "*" state: latest update_cache: true - hosts: controller_node become: true roles: - neutron - horizon - cinder</pre>

ansible.cfg	<pre>[defaults] inventory = inventory host_key_checking = False deprecation_warnings = False private_key_file = ~/.ssh/id_rsa</pre>
inventory	<pre>[controller_node] 192.168.30.164 ansible_user=cserver</pre>

Table 1. The table above shows the contents of `install_kgn.yml`, `ansible.cfg`, and `inventory`.

ROLES AND ITS CONTENTS

Neutron		
Directory Name	File Name	Ansible Script
tasks	main.yml	<pre>- import_tasks: prereq.yml - import_tasks: install.yml - import_tasks: network1.yml - import_tasks: configure.yml</pre>
	prereq.yml	<pre>20 - name: Creating neutron database 19 mysql_query: Web Development Linux Essentials Tools Free 18 login_user: root 17 login_password: mysqlpass 16 login_unix_socket: /var/lib/mysql/mysql.sock ent release. The current supported release is Zoo 15 query: 14 - CREATE DATABASE neutron; 13 - GRANT ALL PRIVILEGES ON neutron.* TO 'neutron'@'localhost' IDENTIFIED BY 'neutronpass'; 12 - GRANT ALL PRIVILEGES ON neutron.* TO 'neutron'@'%' IDENTIFIED BY 'neutronpass'; 11 single_transaction: yes 10 failed_when: false 9 no_log: true 8 7 - name: Sourcing the admin credentials nova-api service 6 command: source /home/cserver/admin-openrc Accepts and responds to end user compute API calls 5 failed_when: false supports the OpenStack Compute API. It enforces so 4 no_log: true initiates most orchestration activities, such as running 3 2 - name: Creating neutron user nova-api-metadata service 1 become_user: root 21 expect Accepts metadata requests from instances. The nova 1 command: openstack user create --domain default --password-prompt neutron 2 reponses: service is generally used when you run in multi-host 3 "User Password": neutronpass network installations. For details, see Metadata ser 4 "Repeat User Password": neutronpass Compute Administrator Guide. 5 failed_when: false nova-compute service 6 no_log: true worker daemon that creates and terminates virtual 7 8 - name: Adding admin roles to the neutron user instances through hypervisor APIs. For example: 9 command: openstack role add --project service --user neutron admin 10 failed_when: false 11 no_log: true 12 13 - name: Creating neutron service entity 14 command: openstack service create --name neutron --description "OpenStack Networking" network 15 failed_when: false 16 no_log: true 17 18 - name: Creating the network service API endpoints 19 shell: 20 openstack endpoint create --region RegionOne network public http://controller:9696 state in th 21 openstack endpoint create --region RegionOne network internal http://controller:9696 22 openstack endpoint create --region RegionOne network admin http://controller:9696 23 failed_when: false 24 no_log: true Takes a virtual machine instance request from the q</pre>

	install.yml	<pre> - name: Installing neutron and its dependencies yum: name: - openstack-neutron - openstack-neutron-ml2 - openstack-neutron-linuxbridge - ebtables </pre>
	network1.yml	<pre> - name: Editing neutron config file copy: src: neutron.conf dest: /etc/neutron/neutron.conf owner: root group: neutron mode: 0640 - name: Editing ml2_conf.ini file copy: src: ml2_conf.ini dest: /etc/neutron/plugins/ml2/ml2_conf.ini owner: root group: neutron mode: 0640 - name: Editing neutron config file copy: src: linuxbridge_agent.ini dest: /etc/neutron/plugins/ml2/linuxbridge_agent.ini owner: root group: neutron mode: 0640 - name: Editing neutron config file copy: src: dhcp_agent.ini dest: /etc/neutron/dhcp_agent.ini owner: root group: neutron mode: 0640 </pre>
	configure.yml	<pre> 1 - name: Configuring metadata_agent.ini file 2 copy: 3 src: metadata_agent.ini 4 dest: /etc/neutron/metadata_agent.ini 5 owner: root 6 group: neutron 7 mode: 640 8 - name: Configuring nova.conf file 9 copy: 10 src: nova.conf 11 dest: /etc/nova/nova.conf 12 owner: root 13 group: nova 14 mode: 640 15 16 - name: Creating a link 17 command: ln -s /etc/neutron/plugins/ml2/ml2_conf.ini /etc/neutron/plugin.ini 18 failed_when: false 19 no_log: true 20 21 - name: Populating the database 22 become_user: root 23 command: su -s /bin/sh -c "neutron-db-manage --config-file /etc/neutron/neutron.conf --url mysql://neutron:neutron@localhost:3306/neutron" root 24 failed_when: false 25 no_log: true 26 </pre>

		<pre> 27 - name: Restarting the nova-api service 28 service: 29 name: openstack-nova-api.service 30 state: restarted 31 failed_when: false 32 no_log: true 33 34 - name: Starting and enabling the Networking services 35 service: 36 name: 37 - neutron-server.service 38 - neutron-linuxbridge-agent 39 - neutron-dhcp-agent 40 - neutron-metadata-agent 41 state: started 42 enabled: true 43 failed_when: false 44 no_log: true </pre> <p>nova-compute service A worker daemon that creates and instances through hypervisor APIs</p> <ul style="list-style-type: none"> • XenAPI for XenServer/XCP • libvirt for KVM or QEMU • VMwareAPI for VMware <p>Processing is fairly complex. Basic from the queue and performs a se launching a KVM instance and upd</p> <p>nova-scheduler service Takes a virtual machine instance r</p>
files (not all contents are included due to its massive content)	neutron.conf	<pre> 1 [DEFAULT] 2 3 core_plugin = ml2 4 service_plugins = 5 6 transport_url = rabbit://openstack:rabbitpass@controller 7 8 auth_strategy = keystone 9 10 notify_nova_on_port_status_changes = true 11 notify_nova_on_port_data_changes = true 12 13 # From oslo.log 14 15 # If set to true, the logging level will be set to DEBUG instead of the default INFO level. (boolean value) 16 # Note: This option can be changed without restarting. 17 #debug = false 18 19 # The name of a logging configuration file. This file is appended to any 20 # existing logging configuration files. For details about logging configuration 21 # files, see the Python logging module documentation. Note that when logging 22 # configuration files are used then all logging configuration is set in the 23 # configuration file and other logging configuration options are ignored (for 24 # example, log-date-format). (string value) 25 # Note: This option can be changed without restarting. 26 #log_config_append = [DEFAULT]/log_config 27 #log_config_append = <None> 28 29 # Defines the format string for %(asctime)s in log records. Default: 30 # %(default)s . This option is ignored if log_config_append is set. (string 31 # value) 32 #log_date_format = %Y-%m-%d %H:%M:%S 33 34 # (Optional) Name of log file to send logging output to. If no default is set, 35 # logging will go to stderr as defined by use_stderr. This option is ignored if 36 # log_config_append is set. (string value) 37 #log_file = <None> 38 #log_dir = <None> 39 40 # (Optional) The base directory used for relative log file paths. This option 41 # is ignored if log_config_append is set. (string value) 42 #log_dir = <None> 43 44 # Uses logging handler designed to watch file system. When log file is moved or 45 # removed this handler will open a new log file with specified path between the nov 46 # instantaneously. It makes sense only if log_file option is specified and 47 # Linux platform is used. This option is ignored if log_config_append is set. 48 # (boolean value) 49 #watch_log_file = false 50 51 # Use syslog for logging. Existing syslog format is DEPRECATED and will be inform 52 # changed later to honor RFC5424. This option is ignored if log_config_append 53 # is set. (boolean value) 54 #use_syslog = false 55 56 # Enable journald for logging. If running in a systemd environment you may wish 57 # to enable journal support. Doing so will use the journal native protocol. 58 59 </pre> <p>nova-api service Accepts and responds to end user comp</p> <p>nova-api-metadata service Accepts metadata requests from instan</p> <p>nova-compute service A worker daemon that creates and term instances through hypervisor APIs. For e</p> <p>nova-conductor module Takes a virtual machine instance reques determines on which compute server he</p> <p>nova-consoleauth daemon Authorizes tokens for users that consoli</p>

	nova.conf	<pre> [DEFAULT] # Hacking # From nova.conf # # This is in extended maintenance and not the current release. The current supported # # Availability zone for internal services. For more information, refer to the # documentation. (string value) instances, for example). OpenStack Compute #internal_service_availability_zone=internal standard hardware, and download images # # Default availability zone for compute services. For more information, refer to # the documentation. (string value) OpenStack Compute consists of the follow #default_availability_zone=nova nova-api service # Accepts and responds to end user com # # Default availability zone for instances. For more information, refer to the API # documentation. (string value) initiates most orchestration activities, #default_schedule_zone=<None> nova-api-metadata service # Length of generated instance admin passwords. (integer value) requests from insta # Minimum value: 0 service is generally used when you run #password_length=12 network installations. For details, see # # Time period to generate instance usages for. It is possible to define optional # offset to given period by appending @ character followed by a number defining # offset. For more information, refer to the documentation. (string value) A worker daemon that creates and ter #instance_usage_audit_period=month instances through hypervisor APIs. For # # Start and use a daemon that can run the commands that need to be run with # root privileges. This option is usually enabled on nodes that run nova compute # processes. # (boolean value) #use_rootwrap_daemon=false # # Path to the rootwrap configuration file. For more information, refer to the # documentation. (string value) Processing is fairly complex. Basically, #rootwrap_config=/etc/nova/rootwrap.conf launching a KVM instance and updating # # Explicitly specify the temporary working directory. (string value) Takes a virtual machine instance requ #tempdir=<None> determines on which compute server t # # Defines which driver to use for controlling virtualization. For more # information, refer to the documentation. (string value) nova-compute module #compute_driver=libvirt.LibvirtDriver Mediates interactions between the no # # Allow destination machine to match source for resize. Useful when # testing in single-host environments. By default it is not allowed # to resize to the same host. Setting this option to true will add # the same host to the destination options. Also set to true runs. For more infor # if you allow the ServerGroupAffinityFilter and need to resize. # (boolean value) section in the Configuration Options. #allow_resize_to_same_host=false nova-consoleauth daemon </pre>
	ml2_conf.ini	<pre> 1 [DEFAULT] 2 # 3 # From oslo.log 4 # This is in extended maintenance and not the current release. The current support 5 6 # If set to true, the logging level will be set to DEBUG instead of the default 7 # INFO level. (boolean value) instances, for example). OpenStack Com 8 # Note: This option can be changed without restarting. standard hardware, and download imag 9 #debug = false 10 11 # The name of a logging configuration file. This file is appended to any 12 # existing logging configuration files. For details about logging configuration 13 # files, see the Python logging module documentation. Note that when logging 14 # configuration files are used then all logging configuration is set in the 15 # configuration file and other logging configuration options are ignored (for 16 # example, log-date-format). (string value) supports the OpenStack Compute A </pre>

		<pre> 17 # Note: This option can be changed without restarting. 18 # Deprecated group/name - [DEFAULT]/log_config 19 #log_config_append = <None> 20 21 # Defines the format string for %(asctime)s in log records. Default: 22 # %(default)s . This option is ignored if log_config_append is set. (string 23 # value) 24 #log_date_format = %Y-%m-%d %H:%M:%S 25 26 # (Optional) Name of log file to send logging output to. If no default is set, 27 # logging will go to stderr as defined by use_stderr. This option is ignored if 28 # log_config_append is set. (string value) 29 # Deprecated group/name - [DEFAULT]/logfile 30 #log_file = <None> 31 32 # (Optional) The base directory used for relative log_file paths. This option 33 # is ignored if log_config_append is set. (string value) 34 # Deprecated group/name - [DEFAULT]/logdir 35 #log_dir = <None> 36 37 # Uses logging handler designed to watch file system. When log file is moved or 38 # removed this handler will open a new log file with specified path forms a seri 39 # instantaneously. It makes sense only if log_file option is specified and 40 # Linux platform is used. This option is ignored if log_config_append is set. 41 # (boolean value) 42 #watch_log_file = false 43 44 # Use syslog for logging. Existing syslog format is DEPRECATED and will be 45 # changed later to honor RFC5424. This option is ignored if log_config_append 46 # is set. (boolean value) 47 #use_syslog = false 48 49 # Enable journald for logging. If running in a systemd environment you may wish 50 # to enable journal support. Doing so will use the journal native protocol 51 # which includes structured metadata in addition to log messages. This option is 52 # ignored if log_config_append is set. (boolean value) 53 #use_journal = false 54 55 # Syslog facility to receive log lines. This option is ignored if 56 # log_config_append is set. (string value) 57 #syslog_log_facility = LOG_USER </pre>
	<p>metadata_ag ent.ini</p>	<pre> 1 [DEFAULT] 2 nova_metadata_host = controller 3 metadata_proxy_shared_secret = METADATA_SECRET 4 This is in extended maintenance and not the current release. The current supporte 5 # 6 # From oslo.log 7 # 8 9 # If set to true, the logging level will be set to DEBUG instead of the default 10 # INFO level. (boolean value) 11 # Note: This option can be changed without restarting. 12 #debug = false 13 14 # The name of a logging configuration file. This file is appended to anyd user co 15 # existing logging configuration files. For details about logging configuration 16 # files, see the Python logging module documentation. Note that when logging 17 # configuration files are used then all logging configuration is set in the 18 # configuration file and other logging configuration options are ignored (for 19 # example, log-date-format). (string value) 20 # Note: This option can be changed without restarting. 21 # Deprecated group/name - [DEFAULT]/log_config 22 #log_config_append = <None> 23 24 # Defines the format string for %(asctime)s in log records. Default: 25 # %(default)s . This option is ignored if log_config_append is set. (string 26 # value) 27 #log_date_format = %Y-%m-%d %H:%M:%S 28 29 # (Optional) Name of log file to send logging output to. If no default is set, 30 # logging will go to stderr as defined by use_stderr. This option is ignored if 31 # log_config_append is set. (string value) 32 # Deprecated group/name - [DEFAULT]/logfile 33 #log_file = <None> 34 35 # (Optional) The base directory used for relative log_file paths. This option 36 # is ignored if log_config_append is set. (string value) </pre>

		<pre> 37 # Deprecated group/name - [DEFAULT]/logdir 38 #log_dir = <None> 39 40 # Uses logging handler designed to watch file system. When log file is moved or 41 # removed this handler will open a new log file with specified path 42 # instantaneously. It makes sense only if log_file option is specified and 43 # Linux platform is used. This option is ignored if log_config_append is set. 44 # (boolean value) 45 #watch_log_file = false 46 47 # Use syslog for logging. Existing syslog format is DEPRECATED and will be 48 # changed later to honor RFC5424. This option is ignored if log_config_append 49 # is set. (boolean value) 50 #use_syslog = false 51 52 # Enable journald for logging. If running in a systemd environment you may wish 53 # to enable journal support. Doing so will use the journal native protocol 54 # which includes structured metadata in addition to log messages. This option is 55 # ignored if log_config_append is set. (boolean value) 56 #use_journal = false 57 58 # Syslog facility to receive log lines. This option is ignored if 59 # log_config_append is set. (string value) 60 #syslog_log_facility = LOG_USER </pre>
	linuxbridge_agent.ini	<pre> 1 [DEFAULT] 2 # 3 # From oslo.log 4 # This is in extended maintenance and not the current release. The current support 5 # 6 # If set to true, the logging level will be set to DEBUG instead of the default 7 # INFO level. (boolean value) 8 # Note: This option can be changed without restarting 9 #debug = false 10 11 # The name of a logging configuration file. This file is appended to any 12 # existing logging configuration files. For details about logging configuration 13 # files, see the Python logging module documentation. Note that when logging 14 # configuration files are used then all logging configuration is set in the 15 # configuration file and other logging configuration options are ignored (for 16 # example, log_date_format). (string value) 17 # Note: This option can be changed without restarting 18 # Deprecated group/name - [DEFAULT]/log_config 19 #log_config_append = <None> 20 21 # Defines the format string for %(asctime)s in log records. Default: 22 # %(default)s . This option is ignored if log_config_append is set. (string 23 # value) 24 #log_date_format = %Y-%m-%d %H:%M:%S 25 26 # (Optional) Name of log file to send logging output to. If no default is set, 27 # logging will go to stderr as defined by use_stderr. This option is ignored if 28 # log_config_append is set. (string value) 29 # Deprecated group/name - [DEFAULT]/logfile 30 #log_file = <None> 31 32 # (Optional) The base directory used for relative log_file paths. This option 33 # is ignored if log_config_append is set. (string value) 34 # Deprecated group/name - [DEFAULT]/logdir 35 #log_dir = <None> 36 37 # Uses logging handler designed to watch file system. When log file is moved or 38 # removed this handler will open a new log file with specified path forms a serie 39 # instantaneously. It makes sense only if log_file option is specified and 40 # Linux platform is used. This option is ignored if log_config_append is set. 41 # (boolean value) 42 #watch_log_file = false 43 44 # Use syslog for logging. Existing syslog format is DEPRECATED and will be 45 # changed later to honor RFC5424. This option is ignored if log_config_append 46 # is set. (boolean value) 47 #use_syslog = false 48 49 # Enable journald for logging. If running in a systemd environment you may wish 50 # to enable journal support. Doing so will use the journal native protocol 51 # which includes structured metadata in addition to log messages. This option is 52 # ignored if log_config_append is set. (boolean value) 53 #use_journal = false </pre>

		<pre> 55 # Syslog facility to receive log lines. This option is ignored if 56 # log_config_append is set. (string value) 57 #syslog_log_facility = LOG_USER 58 59 # Use JSON formatting for logging. This option is ignored if log_config_append </pre>
	dhcp_agent.ini	<pre> 1 [DEFAULT] 2 interface_driver = linuxbridge 3 dhcp_driver = neutron.agent.linux.dhcp.Dnsmasq 4 enable_isolated_metadata = true 5 6 # 7 # From oslo.log 8 # 9 10 # If set to true, the logging level will be set to DEBUG instead of the default 11 # INFO level. (boolean value) 12 # Note: This option can be changed without restarting. 13 #debug = false 14 15 # The name of a logging configuration file. This file is appended to any 16 # existing logging configuration files. For details about logging configuration 17 # files, see the Python logging module documentation. Note that when logging 18 # configuration files are used then all logging configuration is set in the 19 # configuration file and other logging configuration options are ignored (for 20 # example, log-date-format). (string value) 21 # Note: This option can be changed without restarting. 22 # Deprecated group/name - [DEFAULT]/log_config 23 #log_config_append = <None> 24 25 # Defines the format string for %(asctime)s in log records. Default:Guide. 26 # %(default)s . This option is ignored if log_config_append is set. (string 27 # value) 28 #log_date_format = %Y-%m-%d %H:%M:%S 29 30 # (Optional) Name of log file to send logging output to. If no default is set, 31 # logging will go to stderr as defined by use_stderr. This option is ignored if 32 # log_config_append is set. (string value) 33 # Deprecated group/name - [DEFAULT]/logfile 34 #log_file = <None> 35 36 # (Optional) The base directory used for relative log_file paths. This option 37 # is ignored if log_config_append is set. (string value) 38 # Deprecated group/name - [DEFAULT]/logdir 39 #log_dir = <None> 40 41 # Uses logging handler designed to watch file system. When log file is moved or 42 # removed this handler will open a new log file with specified path 43 # instantaneously. It makes sense only if log_file option is specified and 44 # Linux platform is used. This option is ignored if log_config_append is set. 45 # (boolean value) 46 #watch_log_file = false 47 48 # Use syslog for logging. Existing syslog format is DEPRECATED and will be the r 49 # changed later to honor RFC5424. This option is ignored if log_config_append 50 # is set. (boolean value) 51 #use_syslog = false 52 53 # Enable journald for logging. If running in a systemd environment you may wish 54 # to enable journal support. Doing so will use the journal native protocol re inf 55 # which includes structured metadata in addition to log messages. This option is 56 # ignored if log_config_append is set. (boolean value) 57 #use_journal = false 58 59 # Syslog facility to receive log lines. This option is ignored if 60 # log_config_append is set. (string value) </pre>

Table 2. The table above shows the file and its contents for the Neutron role.

Horizon		
Directory	File Name	Ansible Script

Name		
tasks	main.yml	<pre> 1 - import_tasks: install.yml 2 - import_tasks: configure.yml </pre>
	install.yml	<pre> 1 - name: Installing dashboard yum: 2 name: openstack-dashboard </pre>
	configure.yml	<pre> 1 - name: Configuring dashboard local settings copy: 2 src: local_settings 3 dest: /etc/openstack-dashboard 4 owner: root 5 group: apache 6 mode: 640 7 8 notify: Restarting httpd and memcached 9 10 - name: Configuring openstack dashboard 11 copy: 12 src: openstack-dashboard.conf 13 dest: /etc/httpd/conf.d/ 14 owner: root 15 group: root 16 mode: 0644 17 18 notify: Restarting httpd and memcached 19 </pre>
handlers	main.yml	<pre> 1 - name: Restarting httpd and memcached service: 2 name: 3 - httpd 4 - memcached 5 state: restarted 6 failed_when: false 7 no_log: true </pre>
files (not all contents are included due to its massive content)	local_settings	<pre> 1 -*- coding: utf-8 -*- 2 # 3 # NOTE: The default values of the settings are defined in 4 # openstack_dashboard/defaults.py. Previously most available settings 5 # were listed in this example file, but it is no longer true. 6 # For available settings, see openstack_dashboard/defaults.py and 7 # the horizon setting reference found at instances, for example). OpenStack Compute 8 # https://docs.openstack.org/horizon/latest/configuration/settings.html. 9 # 10 # Django related settings and HORIZON_CONFIG still exist here. 11 # Keep in my mind that they will be revisited in upcoming releases. 12 # 13 # ----- 14 # nova-api service 15 # Accepts and responds to end user comp 16 # lazy as the OpenStack Compute API. 17 # initiates most orchestration activities, s 18 # metadata service 19 # Accepts metadata requests from instan 20 </pre>

		<pre> 21 DEBUG = False 22 23 # This setting controls whether or not compression is enabled. Disabling 24 # compression makes Horizon considerably slower, but makes it much easier 25 # to debug JS and CSS changes 26 #COMPRESS_ENABLED = not DEBUG 27 28 # This setting controls whether compression happens on the fly, or offline and term 29 # with "python manage.py compress" 30 # See https://django-compressor.readthedocs.io/en/latest/usage/#offline-compression 31 # for more information 32 #COMPRESS_OFFLINE = not DEBUG 33 34 # If horizon is running in production (DEBUG is False), set this 35 # with the list of host/domain names that the application can serve. 36 # For more information see: 37 # https://docs.djangoproject.com/en/dev/ref/settings/#allowed-hosts 38 ALLOWED_HOSTS = ['*'] 39 40 # Set SSL proxy settings: 41 # Pass this header from the proxy after terminating the SSL, 42 # and don't forget to strip it from the client's request. 43 # For more information see: 44 # https://docs.djangoproject.com/en/dev/ref/settings/#secure-proxy-ssl-header 45 #SECURE_PROXY_SSL_HEADER = ('HTTP_X_FORWARDED_PROTO', 'https') 46 47 # If Horizon is being served through SSL, then uncomment the following two 48 # settings to better secure the cookies from security exploits. 49 #CSRF_COOKIE_SECURE = True 50 #SESSION_COOKIE_SECURE = True 51 52 # If provided, a "Report Bug" link will be displayed in the site header 53 # which links to the value of this setting (ideally a URL containing 54 # information on how to report issues). 55 #HORIZON_CONFIG["bug_url"] = "http://bug-report.example.com" 56 57 # Show backdrop element outside the modal, do not close the modal mon 58 # after clicking on backdrop. 59 #HORIZON_CONFIG["modal_backdrop"] = "static" </pre>
	openstack-d ashboard.co nf	<pre> 1 #!/usr/bin/python 2 #!/usr/bin/python 3 #!/usr/bin/python 4 #!/usr/bin/python 5 #!/usr/bin/python 6 #!/usr/bin/python 7 #!/usr/bin/python 8 #!/usr/bin/python 9 #!/usr/bin/python 10 #!/usr/bin/python 11 #!/usr/bin/python 12 #!/usr/bin/python 13 #!/usr/bin/python 14 #!/usr/bin/python 15 #!/usr/bin/python 16 #!/usr/bin/python 17 #!/usr/bin/python 18 #!/usr/bin/python 19 #!/usr/bin/python </pre>

Table 3. The table above shows the file and its contents for the Horizon role.

Cinder		
Directory Name	File Name	Ansible Script
tasks	main.yml	<pre> 1 - import_tasks: prereq.yml 2 - import_tasks: install.yml 3 - import_tasks: configure.yml </pre>

	prereq.yml	<pre> 1 - name: Creating cinder database 2 mysql_query: 3 login_user: root 4 login_password: mysqlpass 5 login_unix_socket: /var/lib/mysql/mysql.sock 6 query: 7 - CREATE DATABASE cinder; 8 - GRANT ALL PRIVILEGES ON cinder.* TO 'cinder'@'localhost' IDENTIFIED BY 'cinderpass'; 9 - GRANT ALL PRIVILEGES ON cinder.* TO 'cinder'@'%' IDENTIFIED BY 'cinderpass'; 10 single_transaction: yes 11 failed_when: false 12 no_log: true 13 - name: Sourcing the admin credentials 14 command: source /home/cserver/admin-openrc 15 failed_when: false 16 no_log: true 17 18 - name: Creating cinder user 19 become_user: root 20 expect: 21 command: openstack user create --domain default --password-prompt cinder 22 responses: 23 "User Password": cinderpass 24 "Repeat User Password": cinderpass 25 failed_when: false 26 no_log: true 27 28 29 - name: Creating cinderv2 and cinderv3 service entities 30 shell: 31 openstack service create --name cinderv2 --description "OpenStack Block Storage" volumev2 32 openstack service create --name cinderv3 --description "OpenStack Block Storage" volumev3 33 failed_when: false 34 no_log: true 35 36 - name: Creating a block storage service API endpoints 37 shell: 38 openstack endpoint create --region RegionOne volumev2 public http://controller:8776/v2/%(project_id)s 39 openstack endpoint create --region RegionOne volumev2 internal http://controller:8776/v2/%(project_id)s 40 openstack endpoint create --region RegionOne volumev2 admin http://controller:8776/v2/%(project_id)s 41 openstack endpoint create --region RegionOne volumev3 public http://controller:8776/v3/%(project_id)s 42 openstack endpoint create --region RegionOne volumev3 internal http://controller:8776/v3/%(project_id)s 43 openstack endpoint create --region RegionOne volumev3 admin http://controller:8776/v3/%(project_id)s 44 failed_when: false 45 no_log: true </pre>
	install.yml	<pre> 1 - name: Installing cinder 2 yum: 3 name: openstack-cinder </pre>
	configure.yml	<pre> 1 - name: Configuring cinder config file 2 copy: 3 src: cinder.conf 4 dest: /etc/cinder/cinder.conf 5 owner: root 6 group: cinder 7 mode: 0640 8 9 - name: Configuring nova config file 10 copy: 11 src: nova.conf 12 dest: /etc/nova/nova.conf 13 owner: root 14 group: nova 15 mode: 640 16 notify: Restarting nova 17 18 - name: Populating the Block Storage database 19 become_user: root 20 command: su -s /bin/sh -c "cinder-manage db sync" cinder 21 failed_when: false 22 no_log: true 23 24 - name: Starting and enabling cinder service 25 service: 26 name: 27 - openstack-cinder-api.service 28 - openstack-cinder-scheduler.service 29 state: started </pre>

		<pre> 30 enabled: true 31 failed_when: false 32 no_log: true </pre>
handlers	main.yml	<pre> 1 - name: Restarting nova service: name: openstack-nova-api.service failed_when: false no_log: true </pre>
files (not all contents are included due to its massive content)	cinder.conf	<pre> 1 [DEFAULT] 2 transport_url = rabbit://openstack:rabbitpass@controller 3 4 # From cinder 5 6 7 8 # The maximum number of items that a collection resource returns in a single 9 # response (integer value) 10 #osapi_max_limit = 1000 11 12 # Json file indicating user visible filter parameters for list queries. (string 13 # value) 14 #resource_query_filters_file = /etc/cinder/resource_filters.json 15 16 # Treat X-Forwarded-For as the canonical remote address. Only enable this if 17 # you have a sanitizing proxy. (boolean value) 18 #use_forwarded_for = false 19 20 # Public url to use for versions endpoint. The default is None, which will use 21 # the request's host_url attribute to populate the URL base. If Cinder is 22 # operating behind a proxy, you will want to change this to represent the 23 # proxy's URL. (string value) 24 #public_endpoint = <None> 25 26 # Backup services use same backend. (boolean value) 27 #backup_use_same_host = false 28 29 # Compression algorithm ("none" to disable) (string value) 30 # Possible values: 31 # none - <No description provided> 32 # off - <No description provided> 33 # no - <No description provided> 34 # zlib - <No description provided> 35 # gzip - <No description provided> 36 # bz2 - <No description provided> 37 # bzip2 - <No description provided> 38 #backup_compression_algorithm = zlib 39 40 # Backup metadata version to be used when backing up volume metadata. If this 41 # number is bumped, make sure the service doing the restore supports the new 42 # version. (integer value) 1.03 / 0.15 43 #backup_metadata_version = 2 44 45 # The number of chunks or objects, for which one Ceilometer notification will 46 # be sent (integer value) 47 #backup_object_number_per_notification = 10 48 49 # Interval, in seconds, between two progress notifications reporting the backup 50 # status (integer value) 51 #backup_timer_interval = 120 52 53 # Ceph configuration file to use. (string value) 54 #backup_ceph_conf = /etc/ceph/ceph.conf 55 56 # The Ceph user to connect with. Default here is to use the same user as for 57 # Cinder volumes. If not using cephx this should be set to None. (string value) 58 #backup_ceph_user = cinder 59 60 # The chunk size, in bytes, that a backup is broken into before transfer to the </pre>

	nova.conf	<pre> 1 [DEFAULT] 2 transport_url = rabbit://openstack:rabbitpass@controller 3 4 # 5 # From cinder 6 # 7 8 # The maximum number of items that a collection resource returns in a single 9 # response (integer value) 10 #osapi_max_limit = 1000 11 12 # Json file indicating user visible filter parameters for list queries. (string 13 # value) 14 #resource_query_filters_file = /etc/cinder/resource_filters.json 15 16 # Treat X-Forwarded-For as the canonical remote address. Only enable this if 17 # you have a sanitizing proxy. (boolean value) 18 #use_forwarded_for = false 19 20 # Public url to use for versions endpoint. The default is None, which will use 21 # the request's host_url attribute to populate the URL base. If Cinder is 22 # operating behind a proxy, you will want to change this to represent the 23 # proxy's URL. (string value) 24 #public_endpoint = <None> 25 26 # Backup services use same backend. (boolean value) 27 #backup_use_same_host = false 28 29 # Compression algorithm ("none" to disable) (string value) 30 # Possible values: 31 # none - <No description provided> 32 # off - <No description provided> 33 # no - <No description provided> 34 # zlib - <No description provided> 35 # gzip - <No description provided> 36 # bz2 - <No description provided> 37 # bzip2 - <No description provided> 38 #backup_compression_algorithm = zlib 39 40 # Backup metadata version to be used when backing up volume metadata. If this 41 # number is bumped, make sure the service doing the restore supports the new 42 # version. (integer value) 43 #backup_metadata_version = 2 44 45 # The number of chunks or objects, for which one Ceilometer notification will 46 # be sent (integer value) 47 #backup_object_number_per_notification = 10 48 49 # Interval, in seconds, between two progress notifications reporting the backup 50 # status (integer value) 51 #backup_timer_interval = 120 52 53 # Ceph configuration file to use. (string value) 54 #backup_ceph_conf = /etc/ceph/ceph.conf 55 56 # The Ceph user to connect with. Default here is to use the same user as for 57 # Cinder volumes. If not using cephx this should be set to None. (string value) 58 #backup_ceph_user = cinder 59 60 # The chunk size, in bytes, that a backup is broken into before transfer to the </pre>
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Table 4. The table above shows the file and its contents for the Cinder role.

<pre> Documents/repos/CPE232-Activity_15 +2 BECOME password: PLAY [all] *** TASK [Gathering Facts] *** ok: [192.168.30.164] TASK [Updating and upgrading the operating system] *** ok: [192.168.30.164] </pre>	
--	--


```
PLAY [controller_node] *****
***

TASK [Gathering Facts] *****
***
ok: [192.168.30.164]

TASK [neutron : Creating neutron database] *****
***
ok: [192.168.30.164]

TASK [neutron : Sourcing the admin credentials] *****
***
ok: [192.168.30.164]

TASK [neutron : Creating neutron user] *****
***
ok: [192.168.30.164]

TASK [neutron : Adding admin roles to the neutron user] *****
***
changed: [192.168.30.164]

TASK [neutron : Creating neutron service entity] *****
***
changed: [192.168.30.164]

TASK [neutron : Creating the network service API endpoints] *****
***
changed: [192.168.30.164]

TASK [neutron : Installing neutron and its dependencies] *****
***
ok: [192.168.30.164]

TASK [neutron : Editing neutron config file] *****
***
ok: [192.168.30.164]

TASK [neutron : Editing ml2_conf.ini file] *****
***
ok: [192.168.30.164]

TASK [neutron : Editing neutron config file] *****
***
ok: [192.168.30.164]
```

```
TASK [neutron : Editing neutron config file] *****
***
ok: [192.168.30.164] Web Devolpment  Software Development  Linux Essentials  Tools  Freelance  Networks  >

TASK [neutron : Configuring metadata_agent.ini file] *****
***
ok: [192.168.30.164]

TASK [neutron : Configuring nova.conf file] *****
***
changed: [192.168.30.164]

TASK [neutron : Creating a link] *****
***
changed: [192.168.30.164]

TASK [neutron : Populating the database] *****
***
changed: [192.168.30.164]

TASK [neutron : Restarting the nova-api service] *****
***
ok: [192.168.30.164]

TASK [neutron : Starting and enabling the Networking services] *****
***
ok: [192.168.30.164]

TASK [horizon : Installing dashboard] *****
***
ok: [192.168.30.164]

TASK [horizon : Configuring dashboard local settings] *****
***
ok: [192.168.30.164]

TASK [horizon : Configuring openstack dashboard] *****
***
ok: [192.168.30.164]
```

```

TASK [cinder : Creating cinder database] *****
***
ok: [192.168.30.164]

TASK [cinder : Sourcing the admin credentials] *****
***
ok: [192.168.30.164]

TASK [cinder : Creating cinder user] *****
***
ok: [192.168.30.164]

TASK [cinder : Creating cinderv2 and cinderv3 service entities] *****
***
changed: [192.168.30.164]

TASK [cinder : Creating a block storage service API endpoints] *****
***
changed: [192.168.30.164]

TASK [cinder : Installing cinder] *****
***
ok: [192.168.30.164]

TASK [cinder : Configuring cinder config file] *****
***
changed: [192.168.30.164]

TASK [cinder : Configuring nova config file] *****
***
changed: [192.168.30.164]

TASK [cinder : Populating the Block Storage database] *****
***
changed: [192.168.30.164]

TASK [cinder : Starting and enabling cinder service] *****
***
ok: [192.168.30.164]

RUNNING HANDLER [cinder : Restarting nova] *****
***
ok: [192.168.30.164]

PLAY RECAP *****
***
192.168.30.164      : ok=34   changed=11   unreachable=0   failed=0   skipped=0   rescued=0   ignored=0

```

Figure 4. The screenshots above shows the output after running the ansible playbook file.

```

CPE232-Activity_15 on ♢ main [?] +2 > git add *
CPE232-Activity_15 on ♢ main [+] +2 > git commit -m "first commit"
[main 555aba1] first commit
27 files changed, 20740 insertions(+)
create mode 100644 ansible.cfg
create mode 100644 install_nhc.yml
create mode 100644 inventory
create mode 100644 roles/cinder/files/cinder.conf
create mode 100644 roles/cinder/files/nova.conf
create mode 100644 roles/cinder/handlers/main.yml
create mode 100644 roles/cinder/tasks/configure.yml
create mode 100644 roles/cinder/tasks/install.yml
create mode 100644 roles/cinder/tasks/main.yml
create mode 100644 roles/cinder/tasks/prereq.yml
create mode 100644 roles/horizon/files/local_settings
create mode 100644 roles/horizon/files/openstack-dashboard.conf
create mode 100644 roles/horizon/handlers/main.yml
create mode 100644 roles/horizon/tasks/configure.yml
create mode 100644 roles/horizon/tasks/install.yml
create mode 100644 roles/horizon/tasks/main.yml
create mode 100644 roles/neutron/files/dhcp_agent.ini
create mode 100644 roles/neutron/files/linuxbridge_agent.ini
create mode 100644 roles/neutron/files/metadata_agent.ini
create mode 100644 roles/neutron/files/ml2_conf.ini
create mode 100644 roles/neutron/files/neutron.conf
create mode 100644 roles/neutron/files/nova.conf
create mode 100644 roles/neutron/tasks/configure.yml
create mode 100644 roles/neutron/tasks/install.yml

```

```

create mode 100644 roles/neutron/tasks/main.yml
create mode 100644 roles/neutron/tasks/network1.yml
create mode 100644 roles/neutron/tasks/prereq.yml
CPE232-Activity_15 on main [↑] +2 > git push git@github.com:school:piolotorrecampo/CPE232-Activity_15.git
Enumerating objects: 42, done.
Counting objects: 100% (42/42), done.
Delta compression using up to 4 threads
Compressing objects: 100% (39/39), done.
Writing objects: 100% (41/41), 107.47 KiB | 495.00 KiB/s, done.
Total 41 (delta 7), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (7/7), done.
To github.com:school:piolotorrecampo/CPE232-Activity_15.git
dbb3585..555aba1 main -> main

```

Figure 5. Pushing the repository contents in Github.

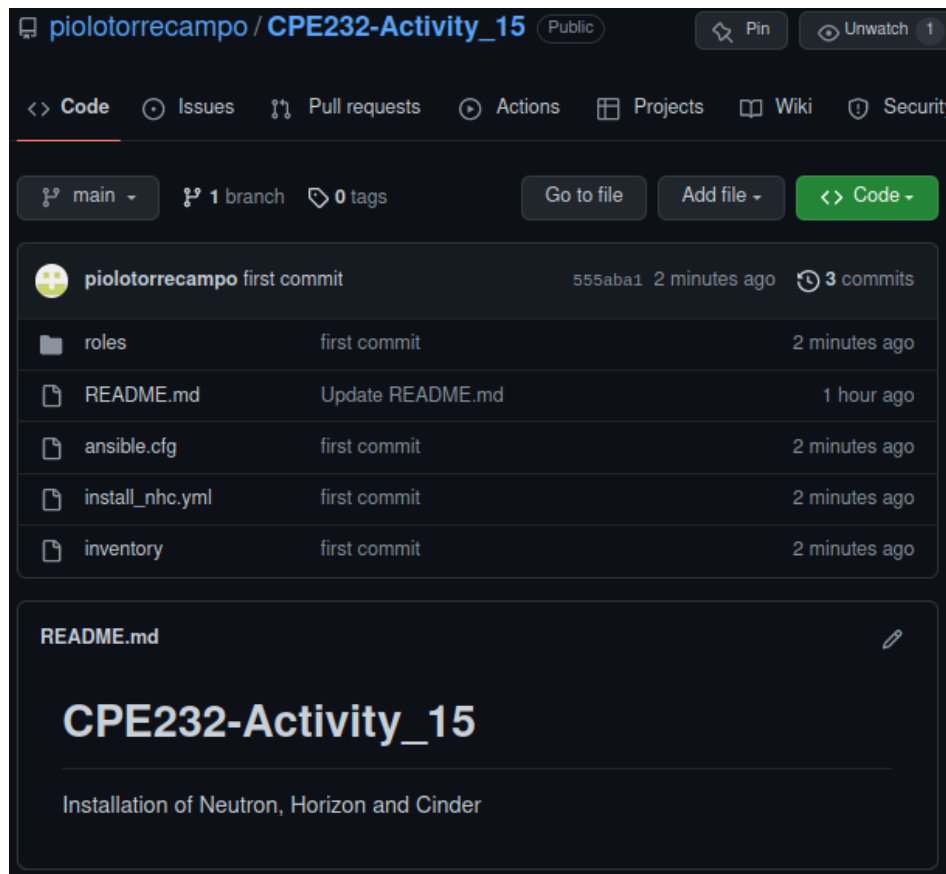


Figure 6. The image above shows the updated Github page.

Reflections:

Answer the following:

1. Describe Neutron, Horizon and Cinder services

- Neutron is an OpenStack service that provides network connectivity as a service for other OpenStack services. It allows users to create and manage networks, subnets, and routers, as well as to attach interfaces to these networks. Horizon is the web-based dashboard for OpenStack. It provides a graphical user interface for users to manage and interact with the

various OpenStack services, including Neutron. Cinder is an OpenStack block storage service that provides persistent storage for use by other OpenStack services. It allows users to create, attach, and manage block storage volumes and snapshots. Cinder volumes can be used as primary storage for instances or as additional storage attached to instances.

Conclusions:

In conclusion, using Ansible as the Infrastructure as Code (IaC) tool in an OpenStack environment can provide several benefits. Ansible's simple, declarative language and agentless architecture make it easy to manage and deploy complex infrastructure. It also integrates well with other OpenStack components, allowing for a seamless and automated end-to-end workflow. Neutron, Horizon, and Cinder are all important components of the OpenStack cloud computing platform. Neutron provides network connectivity as a service for other OpenStack services, allowing users to create and manage networks, subnets, and routers. Horizon is the web-based dashboard for OpenStack, providing a graphical user interface for users to manage and interact with the various OpenStack services. Cinder provides block storage services, allowing users to create, attach, and manage persistent storage volumes and snapshots. Together, these components form a powerful and flexible platform for managing cloud infrastructure in a consistent and automated manner.

Honor Pledge:

"I affirm that I will not give or receive unauthorized help on this activity and that all will be my own."