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Activity 9: Install, Configure, and Manage Performance Monitoring tools

1. Objectives

Create and design a workflow that installs, configure and manage enterprise performance tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Discussion

Performance monitoring is a type of monitoring tool that identifies current resource consumption of the workload, in this page we will discuss multiple performance monitoring tool.

Prometheus

Prometheus fundamentally stores all data as timeseries: streams of timestamped values belonging to the same metric and the same set of labeled dimensions. Besides stored time series, Prometheus may generate temporary derived time series as the result of queries. Source: Prometheus - Monitoring system & time series database

Cacti

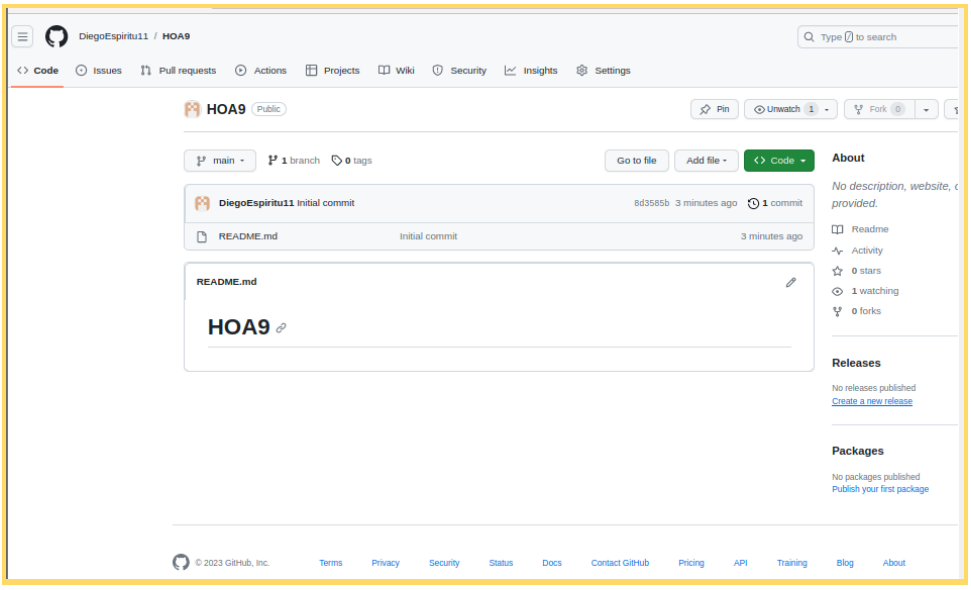
Cacti is a complete network graphing solution designed to harness the power of RRDTool's data storage and graphing functionality. Cacti provides a fast poller, advanced graph templating, multiple data acquisition methods, and user management features out of the box. All of this is wrapped in an intuitive, easy to use interface that makes sense for LAN-sized installations up to complex networks with thousands of devices. Source: Cacti® - The Complete RRDTool-based Graphing Solution

3. Tasks

1. Create a playbook that installs Prometheus in both Ubuntu and CentOS. Apply the concept of creating roles.
2. Describe how you did step 1. (Provide screenshots and explanations in your report. Make your report detailed such that it will look like a manual.)
3. Show an output of the installed Prometheus for both Ubuntu and CentOS.
4. Make sure to create a new repository in GitHub for this activity.

4. Output (screenshots and explanations)

Step 1: Create a repository in github.



Step 2: Clone the created repository.

```
diego@workstation:~$ git clone https://github.com/DiegoEspiritu11/HOA9.git
Cloning into 'HOA9'...
remote: Enumerating objects: 3, done.
remote: Counting objects: 100% (3/3), done.
remote: Total 3 (delta 0), reused 0 (delta 0), pack-reused 0
Unpacking objects: 100% (3/3), done.
diego@workstation:~$ cd HOA9
```

Step 3: Creating a file inside the directory (ansible.cfg, inventory).

```
diego@workstation:~/HOA9$ touch ansible.cfg inventory
diego@workstation:~/HOA9$ ls -l
total 4
-rw-rw-r-- 1 diego diego 0 Oct 19 16:07 ansible.cfg
-rw-rw-r-- 1 diego diego 0 Oct 19 16:07 inventory
-rw-rw-r-- 1 diego diego 6 Oct 19 16:06 README.md
```

Step 4: Put the ip address of server1 and CentOS in the inventory.

```
                                                    diego@workstation: ~/HOA9
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                                                  inventory

[Ubuntu]
192.168.56.102 ansible_user=diego

[CentOS]
192.168.56.107 ansible_user=diego
```

Step 5: Necessary file for ansible.cfg

```
diego@workstation: ~/HOA9
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                    ansible.cfg

[defaults]

inventory = inventory
host_key_checking = Falase

deprecation_warnings = False

remote_user = diego
private_key_file = ~/.ssh/
```

Step 6: Ping the servers in ansible to make sure it is working and connected.

```
diego@workstation:~/HOA9$ ansible all -m ping
192.168.56.102 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
192.168.56.107 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
```

Step 7: Apply the concept of creating roles under the same directory, create a new directory and name it roles.

```
diego@workstation:~/HOA9$ mkdir roles
diego@workstation:~/HOA9$ cd roles
diego@workstation:~/HOA9/roles$
```

Step 8: Create new directories: Ubuntu, CentOS. For each directory, create a directory and name it tasks.

```
diego@workstation:~/HOA9$ mkdir roles
diego@workstation:~/HOA9$ cd roles
diego@workstation:~/HOA9/roles$ mkdir Ubuntu
diego@workstation:~/HOA9/roles$ mkdir CentOS
diego@workstation:~/HOA9/roles$ cd Ubuntu
diego@workstation:~/HOA9/roles/Ubuntu$ mkdir tasks
diego@workstation:~/HOA9/roles/Ubuntu$ cd -
/home/diego/HOA9/roles
diego@workstation:~/HOA9/roles$ cd CentOS
diego@workstation:~/HOA9/roles/CentOS$ mkdir tasks
diego@workstation:~/HOA9/roles/CentOS$ cd -
/home/diego/HOA9/roles
diego@workstation:~/HOA9/roles$ tree
.
├── CentOS
│   └── tasks
└── Ubuntu
    └── tasks

4 directories, 0 files
```

Step 9: Create a directory inside the main directory and name it files and in create a file name prometheus.service.

```
diego@workstation:~$ cd HOA9
diego@workstation:~/HOA9$ mkdir files
diego@workstation:~/HOA9$ cd files
diego@workstation:~/HOA9/files$ sudo nano prometheus.service
diego@workstation:~/HOA9/files$
```

```
                                    diego@workstation: ~/HOA9/files
File  Edit  View  Search  Terminal  Help
  GNU nano 2.9.3                                  prometheus.service

[Unit]
Description=Prometheus Service
After=network.target

[Service]
Type=simple
ExecStart=/usr/local/bin/prometheus/prometheus --config.file=/usr/local/bin/prometheus/prometheus.yml

[Install]
WantedBy=multi-user.target
```

Step 10: Go to tasks for all directory and create a file. Name it for each of the tasks for all directories.

```
diego@workstation:~/HOA9/roles$ cd Ubuntu
diego@workstation:~/HOA9/roles/Ubuntu$ cd tasks
diego@workstation:~/HOA9/roles/Ubuntu/tasks$ sudo nano main.yml
```

```
diego@workstation:~/HOA9/roles$ cd CentOS
diego@workstation:~/HOA9/roles/CentOS$ cd tasks
diego@workstation:~/HOA9/roles/CentOS/tasks$ sudo nano main.yml
```

```
diego@workstation:~/HOA9$ tree
.
├── ansible.cfg
├── inventory
├── README.md
└── roles
    ├── CentOS
    │   └── tasks
    │       └── main.yml
    └── Ubuntu
        └── tasks
            └── main.yml

5 directories, 5 files
```

Step 11: Create a file inside of the main directory (HOA9) and name it, create a playbook for running the installation of Prometheus in both Ubuntu and CentOS.

```
diego@workstation:~/HOA9$ sudo nano install.yml
```

diego@workstation: ~/HOA9

File Edit View Search Terminal Help

GNU nano 2.9.3 install.yml

```
---

- hosts: all
  become: true
  pre_tasks:

  - name: epel-release download
    yum:
      name:
        - epel-release
    when: ansible_distribution == "CentOS"

  - name: Remote CentOS server Update and Upgrade
    yum:
      update_cache: yes
      update_only: yes
    when: ansible_distribution == "CentOS"

  - name: Ubuntu server Update and Upgrade
    apt:
      update_cache: yes
      upgrade: dist
    when: ansible_distribution == "Ubuntu"

- hosts: Ubuntu
  become: true
  roles:
    - role: Ubuntu
      source: https://github.com/prometheus/prometheus/releases/download/v2.39.1/prometheus-2.39.1.linux-amd64.tar.gz

- hosts: CentOS
  become: true
  roles:
    - role: CentOS
      source: https://github.com/prometheus/prometheus/releases/download/v2.39.1/prometheus-2.39.1.linux-amd64.tar.gz
```

Step 12: Create a playbook in main.yml for both Ubuntu and CentOS for the installation of Prometheus in Ubuntu and CentOS.

Ubuntu:

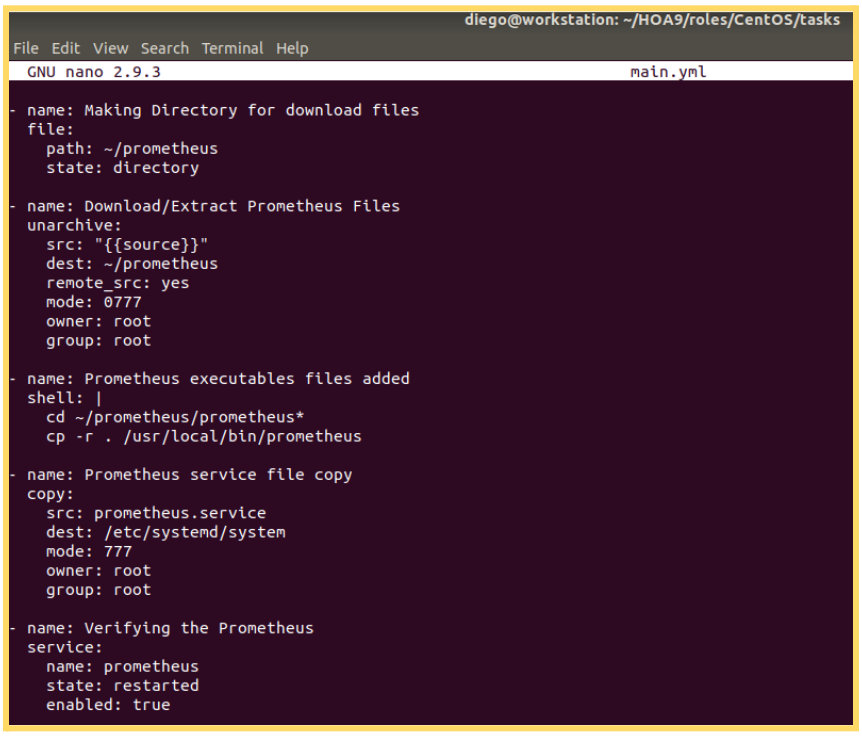
diego@workstation: ~/HOA9/roles/Ubuntu/tasks

File Edit View Search Terminal Help

GNU nano 2.9.3 main.yml

```
- name: Making Directory for download files
  file:
    path: ~/prometheus
    state: directory

- name: Download/Extract Prometheus Files
  unarchive:
    src: "{{source}}"
    dest: ~/prometheus
    remote_src: yes
    mode: 0777
    owner: root
    group: root

- name: Prometheus executables files added
  shell: |
    cd ~/prometheus/prometheus*
    cp -r . /usr/local/bin/prometheus

- name: Prometheus service file copy
  copy:
    src: prometheus.service
    dest: /etc/systemd/system
    mode: 777
    owner: root
    group: root

- name: Verifying the Prometheus
  service:
    name: prometheus
    state: restarted
    enabled: true
```

CentOS:

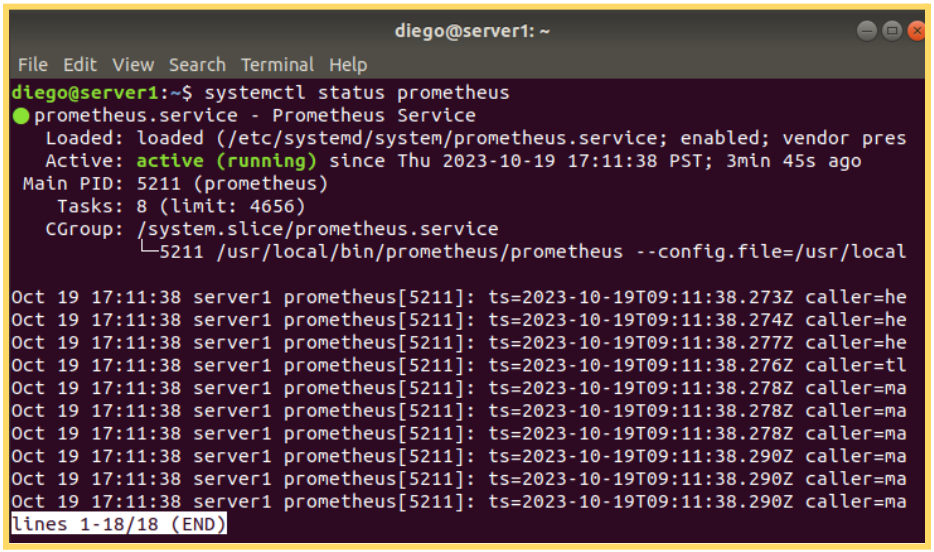

diego@workstation: ~/HOA9/roles/CentOS/tasks
File Edit View Search Terminal Help
GNU nano 2.9.3 main.yml
- name: Making Directory for download files
file:
path: ~/prometheus
state: directory
- name: Download/Extract Prometheus Files
unarchive:
src: "{{source}}"
dest: ~/prometheus
remote_src: yes
mode: 0777
owner: root
group: root
- name: Prometheus executables files added
shell: |
cd ~/prometheus/prometheus*
cp -r . /usr/local/bin/prometheus
- name: Prometheus service file copy
copy:
src: prometheus.service
dest: /etc/systemd/system
mode: 777
owner: root
group: root
- name: Verifying the Prometheus
service:
name: prometheus
state: restarted
enabled: true

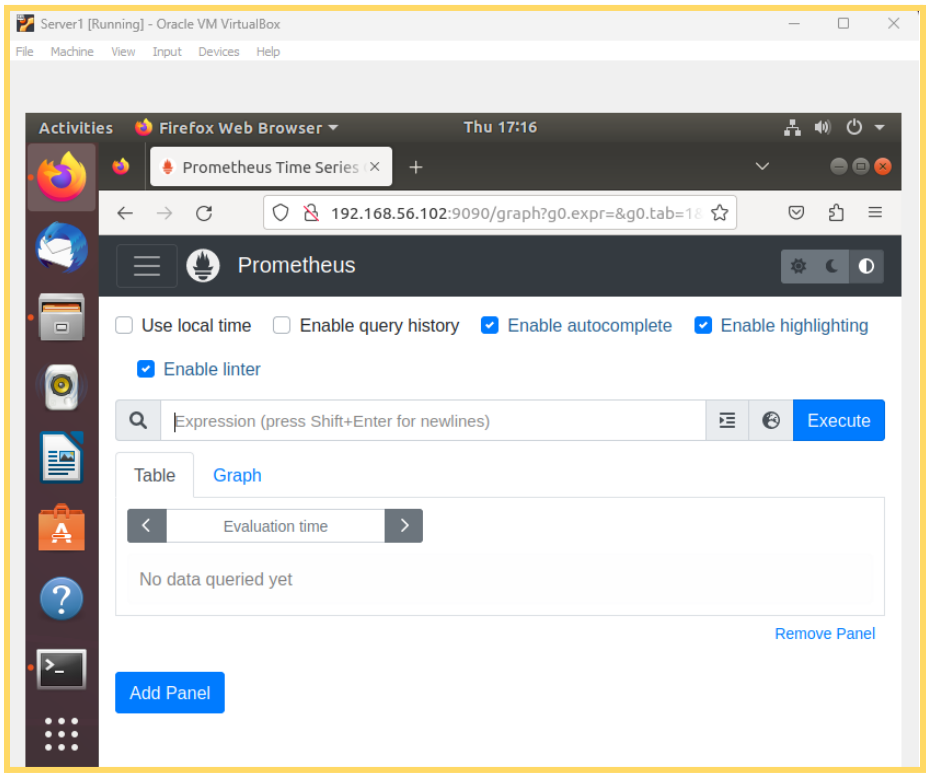
Step 13: Run the created playbook in the main directory.

```
diego@workstation:~/HOA9$ ansible-playbook --ask-become-pass install.yml
BECOME password:

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [192.168.56.102]
ok: [192.168.56.107]

TASK [epel-release download] ***************************************************************************************
skipping: [192.168.56.102]
ok: [192.168.56.107]

TASK [Remote CentOS server Update and Upgrade] *********************************************************************
skipping: [192.168.56.102]
ok: [192.168.56.107]

TASK [Ubuntu server Update and Upgrade] ****************************************************************************
skipping: [192.168.56.107]
ok: [192.168.56.102]

PLAY [Ubuntu] ******************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [192.168.56.102]

TASK [Ubuntu : Making Directory for download files] ****************************************************************
ok: [192.168.56.102]

TASK [Ubuntu : Download/Extract Prometheus Files] ******************************************************************
ok: [192.168.56.102]

TASK [Ubuntu : Prometheus executables files added] *****************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Prometheus service file copy] ***********************************************************************
changed: [192.168.56.102]

TASK [Ubuntu : Verifying the Prometheus] ***************************************************************************
changed: [192.168.56.102]

PLAY [CentOS] ******************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [192.168.56.107]

TASK [CentOS : Making Directory for download files] ****************************************************************
changed: [192.168.56.107]

TASK [CentOS : Download/Extract Prometheus Files] ******************************************************************
changed: [192.168.56.107]

TASK [CentOS : Prometheus executables files added] *****************************************************************
changed: [192.168.56.107]

TASK [CentOS : Prometheus service file copy] ***********************************************************************
changed: [192.168.56.107]

TASK [CentOS : Verifying the Prometheus] ***************************************************************************
changed: [192.168.56.107]

PLAY RECAP *********************************************************************************************************
192.168.56.102             : ok=8    changed=3    unreachable=0    failed=0    skipped=2    rescued=0    ignored=0
192.168.56.107             : ok=9    changed=5    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0

diego@workstation:~/HOA9$ cd HOA9
```

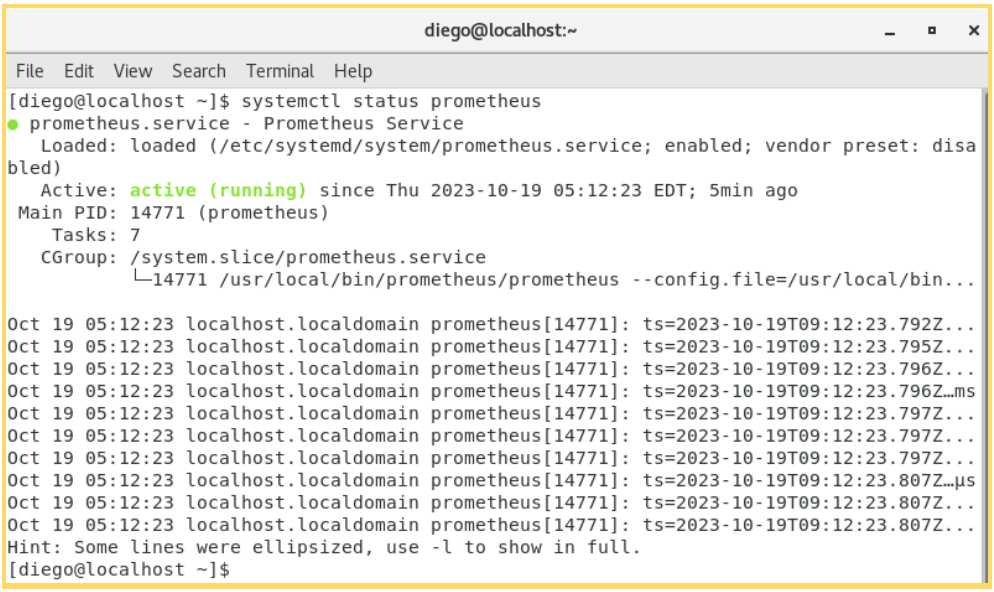
OUTPUT:

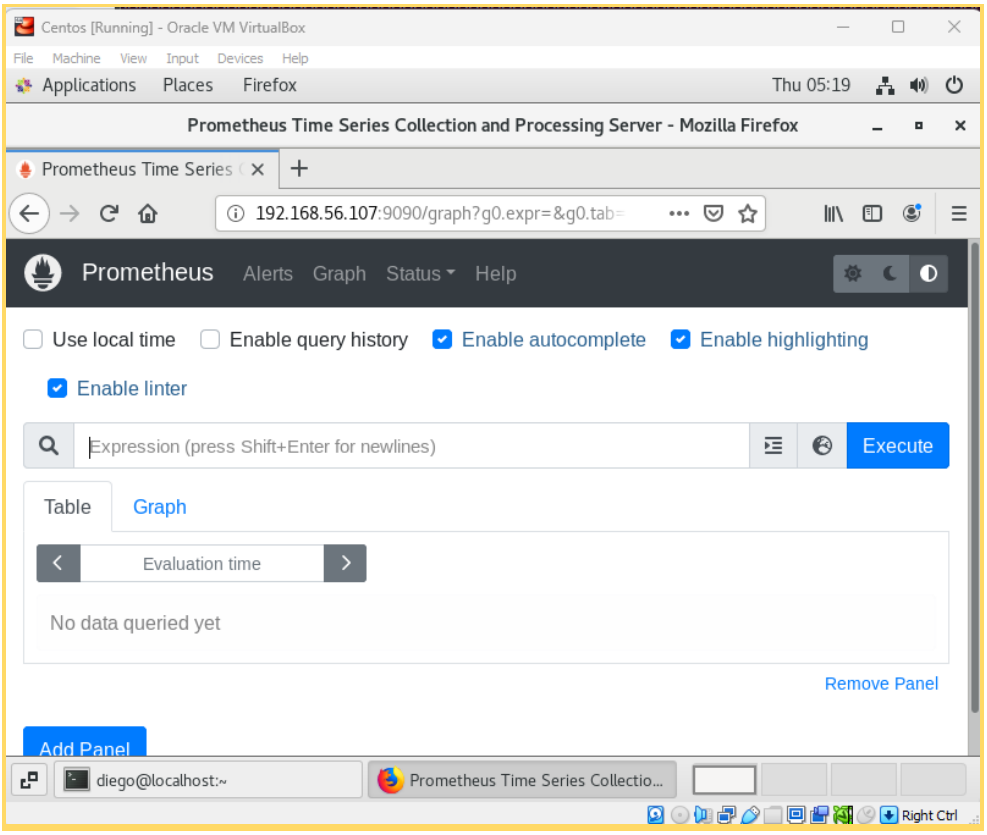
Ubuntu:





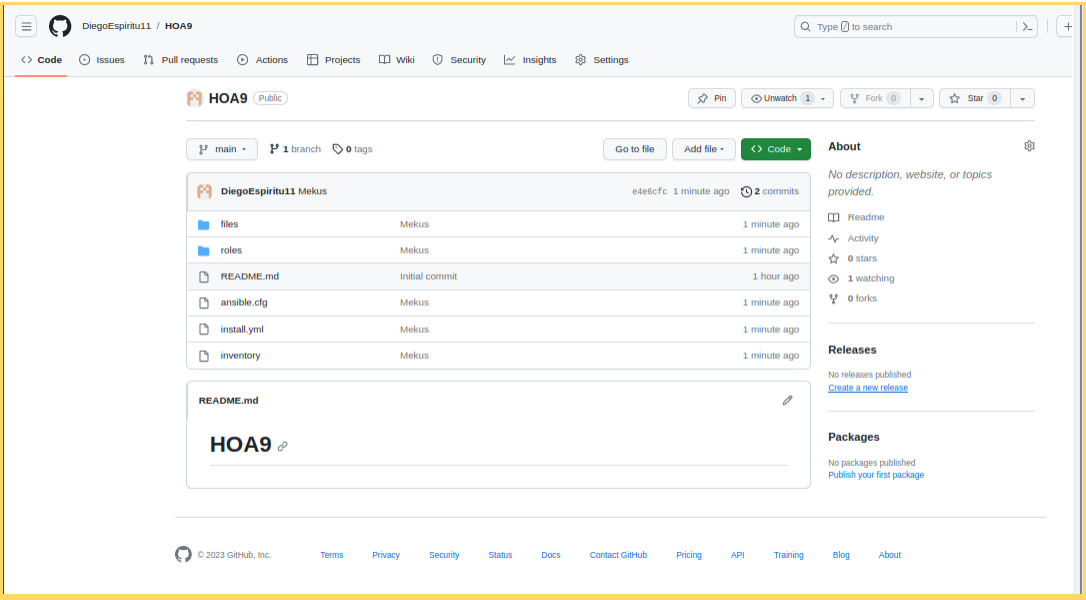
CentOS:


diego@localhost:~
File Edit View Search Terminal Help
[diego@localhost ~]$ systemctl status prometheus
● prometheus.service - Prometheus Service
Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disabled)
Active: active (running) since Thu 2023-10-19 05:12:23 EDT; 5min ago
Main PID: 14771 (prometheus)
Tasks: 7
CGroup: /system.slice/prometheus.service
└─14771 /usr/local/bin/prometheus/prometheus --config.file=/usr/local/bin...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.792Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.795Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.796Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.796Z…ms
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.797Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.797Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.797Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.807Z…µs
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.807Z...
Oct 19 05:12:23 localhost.localdomain prometheus[14771]: ts=2023-10-19T09:12:23.807Z...
Hint: Some lines were ellipsized, use -l to show in full.
[diego@localhost ~]$


Centos [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Applications Places Firefox
Thu 05:19
Prometheus Time Series Collection and Processing Server - Mozilla Firefox
Prometheus Time Series
192.168.56.107:9090/graph?g0.expr=&g0.tab=
Prometheus
Alerts
Graph
Status
Help
Use local time
Enable query history
Enable autocomplete
Enable highlighting
Enable linter
Expression (press Shift+Enter for newlines)
Execute
Table
Graph
Evaluation time
No data queried yet
Remove Panel
Add Panel
diego@localhost:~
Prometheus Time Series Collectio...
Right Ctrl

Step14: Git commit the created files.

```
diego@workstation:~/HOA9$ git commit -m "Mekus"
[main e4e6cfc] Mekus
 6 files changed, 125 insertions(+)
 create mode 100644 ansible.cfg
 create mode 100644 files/prometheus.service
 create mode 100644 install.yml
 create mode 100644 inventory
 create mode 100644 roles/CentOS/tasks/main.yml
 create mode 100644 roles/Ubuntu/tasks/main.yml
diego@workstation:~/HOA9$ git push origin
Username for 'https://github.com': DiegoEspiritu11
Password for 'https://DiegoEspiritu11@github.com':
Counting objects: 11, done.
Delta compression using up to 2 threads.
Compressing objects: 100% (8/8), done.
Writing objects: 100% (11/11), 1.50 KiB | 1.50 MiB/s, done.
Total 11 (delta 0), reused 0 (delta 0)
To https://github.com/DiegoEspiritu11/HOA9.git
   8d3585b..e4e6cfc  main -> main
diego@workstation:~/HOA9$ git status
On branch main
Your branch is up to date with 'origin/main'.

nothing to commit, working tree clean
diego@workstation:~/HOA9$
```



github.com/DiegoEspiritu11/HOA9

Reflections:

Answer the following:

1. What are the benefits of having a performance monitoring tool?
   -The advantage of using an availability monitoring tool is that it can identify errors and their root causes, making it easier to track and resolve them promptly. Prometheus is a simple monitoring tool that is easy to use when tracking servers. It is an open-source tool that can monitor metrics and send alerts for monitoring purposes.

Conclusions:

In this activity, Prometheus is a crucial tool for storing data as time series, which allows for the streaming of time stamped values to the same metric and labeled dimensions. On the other hand, Cacti is a network graphing solution that enables users to harness the power of RRDTool's data storage and graphing functionality. Cacti offers a fast poller, advanced graph templating, user management, and many other features. Prometheus is a simple monitoring tool that is easy to use when tracking servers.