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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	
<p>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.</p> <p>Prometheus</p> <p>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</p> <p>Cacti</p> <p>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</p>	
3. Tasks	
<ol style="list-style-type: none"> 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)	
<pre>workstation@workstation:~/Act9\$ mkdir -p roles/{CentOS-Server,Ubuntu-Server}/tasks && touch roles/{CentOS-Server,Ubuntu-Server}/tasks/main.yml</pre>	
<p>This syntax creates roles directory inside the Act9 folder, inside the role directory the directory for CentOS-Server and Ubuntu-Server is also created. Using the touch command, it creates a main.yml file inside this server directories.</p>	

```
workstation@workstation: ~/Act9
GNU nano 7.2 install.yml
- hosts: Ubuntu_Server
  become: true
  roles:
    - Ubuntu-Server

- hosts: CentOS_Server
  become: true
  roles:
    - CentOS-Server
```

This step runs the tasks inside the role directory specified on the OS of the server.

```
workstation@workstation: ~/Act9/roles/CentOS-Server/tasks
GNU nano 7.2 main.yml
---
- name: Install dependencies for Prometheus on CentOS
  yum:
    name: curl
    state: present

- name: Download Prometheus tarball
  get_url:
    url: https://github.com/prometheus/prometheus/releases/download/v2.30.3/prometheus-2.30.3.linux-amd64.tar.gz
    dest: /tmp/prometheus.tar.gz

- name: Extract Prometheus tarball
  unarchive:
    src: /tmp/prometheus.tar.gz
    dest: /opt/
    remote_src: yes

- name: Create symbolic link for Prometheus
  file:
    src: /opt/prometheus-2.30.3.linux-amd64
    dest: /opt/prometheus
    state: link

- name: Copy Prometheus service file
  copy:
    content: |
      [Unit]
      Description=Prometheus
      Documentation=https://prometheus.io/docs/introduction/overview/
      Wants=network-online.target
      After=network-online.target

      [Service]
      User=root
      ExecStart=/opt/prometheus/prometheus --config.file /opt/prometheus/prometheus.yml
      Restart=always

      [Install]
      WantedBy=multi-user.target
    dest: /etc/systemd/system/prometheus.service

- name: Start and enable Prometheus
  systemd:
    name: prometheus
    enabled: yes
    state: started
```

This step installs the Prometheus in CentOS, type this playbook inside the CentOS-Server directory.

```
workstation@workstation: ~/Act9/roles/Ubuntu-Server/tasks
GNU nano 7.2 main.yml
---
- name: Install dependencies for Prometheus on Ubuntu
  apt:
    name: curl
    state: present

- name: Download Prometheus tarball
  get_url:
    url: https://github.com/prometheus/prometheus/releases/download/v2.30.3/prometheus-2.30.3.linux-amd64.tar.gz
    dest: /tmp/prometheus.tar.gz

- name: Extract Prometheus tarball
  unarchive:
    src: /tmp/prometheus.tar.gz
    dest: /opt/
    remote_src: yes

- name: Create symbolic link for Prometheus
  file:
    src: /opt/prometheus-2.30.3.linux-amd64
    dest: /opt/prometheus
    state: link

- name: Copy Prometheus service file
  copy:
    content: |
      [Unit]
      Description=Prometheus
      Documentation=https://prometheus.io/docs/introduction/overview/
      Wants=network-online.target
      After=network-online.target

      [Service]
      User=root
      ExecStart=/opt/prometheus/prometheus --config.file /opt/prometheus/prometheus.yml
      Restart=always

      [Install]
      WantedBy=multi-user.target
    dest: /etc/systemd/system/prometheus.service

- name: Start and enable Prometheus
  systemd:
    name: prometheus
    enabled: yes
    state: started
```

This step installs the Prometheus in Ubuntu OS, type this playbook inside the Ubuntu-Server directory.

```
workstation@workstation:~/Act9$ ansible-playbook --ask-become-pass install.yml
BECOME password:
```

```
PLAY [Ubuntu_Server] *****
*

TASK [Gathering Facts] *****
*
ok: [server1]

TASK [Ubuntu-Server : Install dependencies for Prometheus on Ubuntu] *****
*
changed: [server1]

TASK [Ubuntu-Server : Download Prometheus tarball] *****
*
changed: [server1]

TASK [Ubuntu-Server : Extract Prometheus tarball] *****
*
changed: [server1]

TASK [Ubuntu-Server : Create symbolic link for Prometheus] *****
*
changed: [server1]

TASK [Ubuntu-Server : Copy Prometheus service file] *****
*
changed: [server1]
```

```
TASK [Ubuntu-Server : Start and enable Prometheus] *****
*
changed: [server1]

PLAY [CentOS_Server] *****
*

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

TASK [CentOS-Server : Install dependencies for Prometheus on CentOS] *****
*
ok: [centos]

TASK [CentOS-Server : Download Prometheus tarball] *****
*
changed: [centos]

TASK [CentOS-Server : Extract Prometheus tarball] *****
*
changed: [centos]

TASK [CentOS-Server : Create symbolic link for Prometheus] *****
*
changed: [centos]
```

```

TASK [CentOS-Server : Copy Prometheus service file] *****
*
changed: [centos]

TASK [CentOS-Server : Start and enable Prometheus] *****
*
changed: [centos]

PLAY RECAP *****
*
centos                : ok=7    changed=5    unreachable=0    failed=0
skipped=0      rescued=0    ignored=0
server1          : ok=7    changed=6    unreachable=0    failed=0
skipped=0      rescued=0    ignored=0

```

This step runs the ansible playbook main.yml. After running the playbook, the same output should be the same as the screenshots above. The text highlighted in green shows that tasks that's been successfully performed from your playbook.

```

root@server1: /home/workstation
root@server1:/home/workstation# systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: e>
   Active: active (running) since Sun 2024-10-20 19:21:05 PST; 26min ago
     Docs: https://prometheus.io/docs/introduction/overview/
   Main PID: 3627 (prometheus)
     Tasks: 9 (limit: 5626)
    Memory: 25.7M
       CPU: 1.192s
    CGroup: /system.slice/prometheus.service
           └─3627 /opt/prometheus/prometheus --config.file /opt/prometheus/pr>

Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.109>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.109>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.109>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.109>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.109>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.114>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.114>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.114>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.114>
Oct 20 19:21:06 server1 prometheus[3627]: level=info ts=2024-10-20T11:21:06.115>

root@server1:/home/workstation# which prometheus

```

This step checks if the Prometheus is running on the Ubuntu server, the green highlighted text that says active(running) means that prometheus has been successfully installed and is now running in the server.

```
[root@centos centos]# systemctl status prometheus
● prometheus.service - Prometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; preset: d>
   Active: active (running) since Sun 2024-10-20 19:22:16 PST; 27min ago
     Docs: https://prometheus.io/docs/introduction/overview/
    Main PID: 4454 (prometheus)
      Tasks: 11 (limit: 35757)
     Memory: 39.9M
        CPU: 4.492s
    CGroup: /system.slice/prometheus.service
            └─4454 /opt/prometheus/prometheus --config.file /opt/prometheus/pr>

Oct 20 19:22:17 centos prometheus[4454]: level=info ts=2024-10-20T11:22:17.214Z>
Oct 20 19:22:17 centos prometheus[4454]: level=info ts=2024-10-20T11:22:17.214Z>
Oct 20 19:22:17 centos prometheus[4454]: level=info ts=2024-10-20T11:22:17.214Z>
Oct 20 19:22:17 centos prometheus[4454]: level=info ts=2024-10-20T11:22:17.214Z>
Oct 20 19:22:17 centos prometheus[4454]: level=info ts=2024-10-20T11:22:17.214Z>
```

This step checks if the Prometheus is running on the CentOS server, the green highlighted text that says active(running) means that Prometheus has been successfully installed and is now running in the server.

Reflections:

Answer the following:

1. What are the benefits of having a performance monitoring tool?

A performance monitoring tool like Prometheus helps track system health by collecting data on resource usage, allowing administrators to detect problems early. It provides real-time alerts when something goes wrong, so issues can be fixed faster. This helps keep systems running smoothly and reduces downtime.

Conclusions:

In this activity, we were tasked with installing Prometheus on both Ubuntu and CentOS servers using an Ansible playbook that contained the tasks for the correct and proper installation of Prometheus. I was able to install it on the servers and get it running. By using the command `systemctl status prometheus` on both Ubuntu and CentOS servers, I confirmed that the tasks performed by the playbook were successful. Installing a performance monitoring tool on control nodes allows a system administrator to monitor computers in real time, enabling them to detect potential issues ahead of time. It tracks the computer's CPU usage and performance in real time, giving the admin information if the device is experiencing problems.