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Midterm Skills Exam: Install, Configure, and Manage Log Monitoring tools

1. Objectives

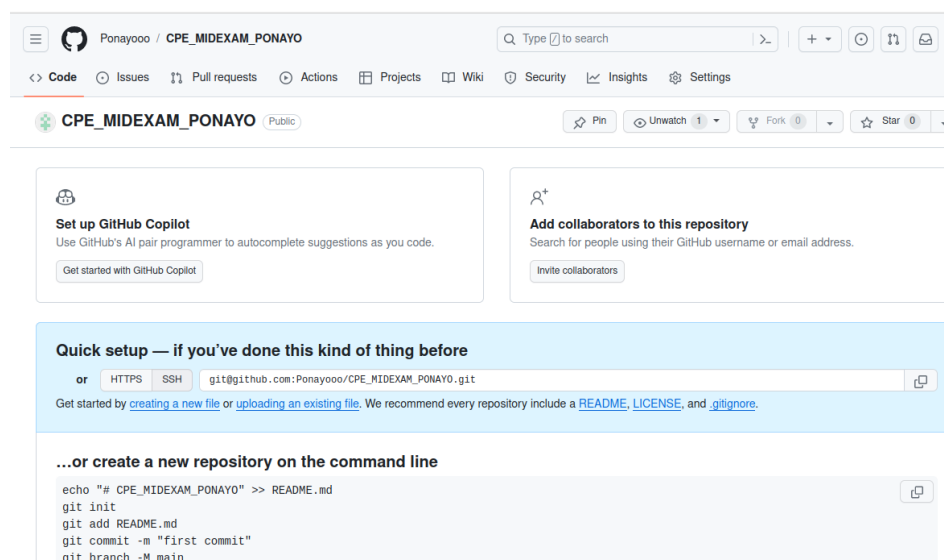
Create and design a workflow that installs, configure and manage enterprise availability, performance and log monitoring tools using Ansible as an Infrastructure as Code (IaC) tool.

2. Instructions

1. Create a repository in your GitHub account and label it CPE_MIDEXAM_SURNAME.
2. Clone the repository and do the following:
 - 2.1. Create an Ansible playbook that does the following with an input of a config.yaml file and arranged Inventory file:
 - 2.2. Install and configure Elastic Stack in separate hosts (Elastic Search, Kibana, Logstash) • Install Nagios in one host
 - 2.3. Install Grafana, Prometheus and Influxdb in seperate hosts (Influxdb, Grafana, Prometheus)
 - 2.4. Install Lamp Stack in separate hosts (Httpd + Php, Mariadb)
3. Document all your tasks using this document. Provide proofs of all the ansible playbooks codes and successful installations.
4. Document the push and commit from the local repository to GitHub.
5. Finally, paste also the link of your GitHub repository in the documentation.

3. Output (screenshots and explanations)

1.



2. Clone the repository and do the following:

```
ponayo@Workstation:~$ git clone git@github.com:Ponayooo/CPE_MIDEXAM_PONAYO.git
Cloning into 'CPE_MIDEXAM_PONAYO'...
warning: You appear to have cloned an empty repository.
ponayo@Workstation:~$ cd CPE_MIDEXAM_PONAYO
ponayo@Workstation:~/CPE_MIDEXAM_PONAYO$
```

2.1

Inventory file

```
ponayo@Workstation: ~/CPE_MIDEXAM_PONAYO
GNU nano 6.2 inventory
[centos]
192.168.56.110

[ubuntu]
192.168.56.112
```

Config.yaml file

```
GNU nano 6.2 config.yaml *
---
- hosts: all
  become: true
  pre_tasks:
    - name: install updates Ubuntu
      apt:
        update_cache: yes
        changed_when: false
        when: ansible_distribution == "Ubuntu"

    - name: install updates CentOS
      dnf:
        update_only: yes
        update_cache: yes
        use_backend: dnf4
        when: ansible_distribution == "CentOS"

- hosts: CentOS
  become: true
  roles:
    - CentOS

- hosts: Ubuntu
  become: true
  roles:
    - Ubuntu
```

2.2

```
TASK [Gathering Facts] *****
ok: [192.168.56.110]
ok: [192.168.56.112]

TASK [install updates Ubuntu] *****
skipping: [192.168.56.110]
ok: [192.168.56.112]

TASK [install updates CentOS] *****
skipping: [192.168.56.112]
ok: [192.168.56.110]

PLAY [CentOS] *****

TASK [Gathering Facts] *****
ok: [192.168.56.110]

TASK [CentOS : Install prerequisites] *****
ok: [192.168.56.110]

TASK [CentOS : Add Elasticsearch RPM repository] *****
changed: [192.168.56.110]

TASK [CentOS : Add Elasticsearch YUM repository] *****
ok: [192.168.56.110]

TASK [CentOS : Install Elasticsearch] *****
ok: [192.168.56.110]

TASK [CentOS : Install Kibana] *****
ok: [192.168.56.110]

TASK [CentOS : Install Logstash for CentOS] *****
ok: [192.168.56.110]

TASK [CentOS : install php and httpd for CentOS] *****
ok: [192.168.56.110]
```

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

TASK [Gathering Facts] *****
ok: [192.168.56.112]

TASK [Ubuntu : install nagios for Ubuntu] *****
ok: [192.168.56.112]

TASK [Ubuntu : Install necessary prerequisites] *****
ok: [192.168.56.112]

TASK [Ubuntu : Add Elasticsearch GPG key] *****
ok: [192.168.56.112]

TASK [Ubuntu : Add Elasticsearch APT repository] *****
ok: [192.168.56.112]

TASK [Ubuntu : Install Elasticsearch] *****
ok: [192.168.56.112]

TASK [Ubuntu : Install Kibana] *****
ok: [192.168.56.112]

TASK [Ubuntu : Install Logstash] *****
ok: [192.168.56.112]

TASK [Ubuntu : install apache2 and php packages for Ubuntu] *****
ok: [192.168.56.112]

TASK [Ubuntu : install mariadb package Ubuntu] *****
ok: [192.168.56.112]

TASK [Ubuntu : Mariadb- Restarting/Enabling] *****
changed: [192.168.56.112]
```

2.4

```
TASK [CentOS : Install Kibana] *****
ok: [192.168.56.110]

TASK [CentOS : Install Logstash for CentOS] *****
ok: [192.168.56.110]

TASK [CentOS : install php and httpd for CentOS] *****
ok: [192.168.56.110]

TASK [CentOS : install mariadb for CentOS] *****
ok: [192.168.56.110]

TASK [CentOS : Mariadb- Restarting/Enabling] *****
changed: [192.168.56.110]

TASK [CentOS : Prometheus PATH directory] *****
ok: [192.168.56.110]

TASK [CentOS : Creating directory for Prometheus files] *****
ok: [192.168.56.110]

TASK [CentOS : Prometheus config file duplicate] *****
ok: [192.168.56.110]

TASK [CentOS : Install Prometheus for CentOS] *****
ok: [192.168.56.110]

TASK [CentOS : Check SELinux status] *****
changed: [192.168.56.110]

TASK [CentOS : Disable SELinux if enabled] *****
skipping: [192.168.56.110]

TASK [CentOS : Modify SELinux configurations] *****
skipping: [192.168.56.110]

TASK [CentOS : Create Grafana YUM repository file] *****
changed: [192.168.56.110]
```

```
TASK [Ubuntu : Install Prometheus for Ubuntu] *****
ok: [192.168.56.112]

TASK [Ubuntu : Prometheus Start service] *****
changed: [192.168.56.112]

TASK [Ubuntu : Install dependencies] *****
ok: [192.168.56.112]

TASK [Ubuntu : Add Grafana APT repository key] *****
changed: [192.168.56.112]

TASK [Ubuntu : Add Grafana APT repository] *****
changed: [192.168.56.112]

TASK [Ubuntu : Install Grafana] *****
changed: [192.168.56.112]

TASK [Ubuntu : Start and enable Grafana service] *****
changed: [192.168.56.112]

TASK [Ubuntu : Installing dependencies] *****
ok: [192.168.56.112]

TASK [Ubuntu : Adding Influxdb in the repository] *****
changed: [192.168.56.112]

TASK [Ubuntu : Installing Influxdb] *****
changed: [192.168.56.112]

TASK [Ubuntu : Making sure that the Influxd is enabled and started] *****
ok: [192.168.56.112]

PLAY RECAP *****
192.168.56.110      : ok=20   changed=4   unreachable=0    failed=0    skipped=3   rescued=0   ignored=0
192.168.56.112      : ok=24   changed=8   unreachable=0    failed=0    skipped=1   rescued=0   ignored=0
```

As for the output. We can observe that there is 20 OK in the recap. The reason why it was 20 I was installing the objectives while I was debugging every steps.

3. Proof of successfully install

```
[ponayo@localhost ~]$ systemctl status grafana-server.service
● grafana-server.service - Grafana instance
   Loaded: loaded (/usr/lib/systemd/system/grafana-server.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-11-15 21:21:04 PST; 40min ago
     Docs: http://docs.grafana.org
    Main PID: 2261 (grafana-server)
       Tasks: 12
    CGroup: /system.slice/grafana-server.service
            └─2261 /usr/sbin/grafana-server --config=/etc/grafana/grafana.ini --pidfi...

Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=grafanaStorageLog...
Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=report t=2023-11-...
Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=http.server t=202...
Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=ngalert t=2023-11-...
Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=ticker t=2023-11-...
Nov 15 21:21:04 localhost.localdomain grafana-server[2261]: logger=ngalert.multiorg...
Nov 15 21:31:11 localhost.localdomain grafana-server[2261]: logger=cleanup t=2023-11-...
Nov 15 21:41:04 localhost.localdomain grafana-server[2261]: logger=cleanup t=2023-11-...
Nov 15 21:51:04 localhost.localdomain grafana-server[2261]: logger=cleanup t=2023-11-...
Nov 15 22:01:04 localhost.localdomain grafana-server[2261]: logger=cleanup t=2023-11-...
Hint: Some lines were ellipsized, use -l to show in full.
[ponayo@localhost ~]$
```

```
[ponayo@localhost ~]$ systemctl status kibana
● kibana.service - Kibana
   Loaded: loaded (/usr/lib/systemd/system/kibana.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-11-15 21:20:57 PST; 32min ago
     Docs: https://www.elastic.co
    Main PID: 1284 (node)
       Tasks: 11
    CGroup: /system.slice/kibana.service
            └─1284 /usr/share/kibana/bin/./node/bin/node /usr/share/kibana/bin/./sr...

Nov 15 21:23:03 localhost.localdomain kibana[1284]: Root causes:
Nov 15 21:23:03 localhost.localdomain kibana[1284]: security_exception: missing aut...
Nov 15 21:23:04 localhost.localdomain kibana[1284]: [2023-11-15T21:23:04.912+08:00]...l
Nov 15 21:42:59 localhost.localdomain kibana[1284]: [2023-11-15T21:42:59.512+08:00]...s
Nov 15 21:42:59 localhost.localdomain kibana[1284]: at Timeout._onTimeout (/usr/sha...
Nov 15 21:42:59 localhost.localdomain kibana[1284]: at listOnTimeout (node:internal...
Nov 15 21:42:59 localhost.localdomain kibana[1284]: at processTimers (node:internal...
Nov 15 21:42:59 localhost.localdomain kibana[1284]: [2023-11-15T21:42:59.543+08:00]...s
Nov 15 21:42:59 localhost.localdomain kibana[1284]: at installWithTimeout (/usr/sha...
Nov 15 21:42:59 localhost.localdomain kibana[1284]: at ResourceInstaller.installCom...
Hint: Some lines were ellipsized, use -l to show in full.
[ponayo@localhost ~]$
```

```
[ponayo@localhost ~]$ systemctl status prometheus
● prometheus.service - ServicePrometheus
   Loaded: loaded (/etc/systemd/system/prometheus.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-11-15 21:20:56 PST; 42min ago
    Main PID: 1274 (prometheus)
       Tasks: 7
    CGroup: /system.slice/prometheus.service
            └─1274 /usr/local/bin/prometheus/prometheus --config.file=/usr/local/bin/...

Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.018Z..."
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.021Z...l
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.021Z...l
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.021Z...8ms
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.022Z...C
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.022Z..."
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.022Z...l
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.023Z...µs
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.023Z..."
Nov 15 21:21:02 localhost.localdomain prometheus[1274]: ts=2023-11-15T13:21:02.025Z..."
Hint: Some lines were ellipsized, use -l to show in full.
[ponayo@localhost ~]$
```

```

[ponayo@localhost ~]$ systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/usr/lib/systemd/system/logstash.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-11-15 22:04:12 PST; 4s ago
     Main PID: 18547 (java)
        Tasks: 20
       CGroup: /system.slice/logstash.service
               └─18547 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -Djava.awt.headless...

Nov 15 22:04:12 localhost.localdomain systemd[1]: Stopped logstash.
Nov 15 22:04:12 localhost.localdomain systemd[1]: Started logstash.
Nov 15 22:04:12 localhost.localdomain logstash[18547]: Using bundled JDK: /usr/share/...k
Hint: Some lines were ellipsized, use -l to show in full.
[ponayo@localhost ~]$

```

```

[ponayo@localhost ~]$ systemctl status elasticsearch
● elasticsearch.service - Elasticsearch
   Loaded: loaded (/usr/lib/systemd/system/elasticsearch.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-11-15 21:22:08 PST; 42min ago
     Docs: https://www.elastic.co
     Main PID: 1279 (java)
        Tasks: 88
       CGroup: /system.slice/elasticsearch.service
               └─1279 /usr/share/elasticsearch/jdk/bin/java -Xms4m -Xmx64m -XX:+UseSerial...
                 └─2478 /usr/share/elasticsearch/jdk/bin/java -Des.networkaddress.cache.tt...
                 └─2525 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/b...

Nov 15 21:20:56 localhost.localdomain systemd[1]: Starting Elasticsearch...
Nov 15 21:21:08 localhost.localdomain systemd-entrypoint[1279]: Nov 15, 2023 9:21:08...
Nov 15 21:21:08 localhost.localdomain systemd-entrypoint[1279]: WARNING: COMPAT loca...
Nov 15 21:22:08 localhost.localdomain systemd[1]: Started Elasticsearch.
Hint: Some lines were ellipsized, use -l to show in full.
[ponayo@localhost ~]$

```

```

ponayo@Workstation: ~$ systemctl status grafana-server.service
● grafana-server.service - Grafana instance
   Loaded: loaded (/lib/systemd/system/grafana-server.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 21:34:26 PST; 30min ago
     Docs: http://docs.grafana.org
     Main PID: 23693 (grafana)
        Tasks: 17 (limit: 2261)
       Memory: 88.4M
          CPU: 8.976s
       CGroup: /system.slice/grafana-server.service
               └─23693 /usr/share/grafana/bin/grafana server --config=/etc/grafana/grafana.ini --pidfile=/run/grafana/grafana.pid

Nov 15 21:44:53 Workstation grafana[23693]: logger=cleanup t=2023-11-15T21:44:53.997145448+08:00 level=info msg="Completing cleanup"
Nov 15 21:44:54 Workstation grafana[23693]: logger=grafana.update.checker t=2023-11-15T21:44:54.762456518+08:00 level=info msg="Checking for updates"
Nov 15 21:44:55 Workstation grafana[23693]: logger=plugins.update.checker t=2023-11-15T21:44:55.187884887+08:00 level=info msg="Checking for plugin updates"
Nov 15 21:49:49 Workstation grafana[23693]: logger=sqlstore.transactions t=2023-11-15T21:49:49.375109604+08:00 level=info msg="Executing transactions"
Nov 15 21:54:53 Workstation grafana[23693]: logger=cleanup t=2023-11-15T21:54:53.991937291+08:00 level=info msg="Completing cleanup"
Nov 15 21:54:54 Workstation grafana[23693]: logger=grafana.update.checker t=2023-11-15T21:54:54.839004389+08:00 level=info msg="Checking for updates"
Nov 15 21:54:55 Workstation grafana[23693]: logger=plugins.update.checker t=2023-11-15T21:54:55.230671952+08:00 level=info msg="Checking for plugin updates"
Nov 15 22:04:54 Workstation grafana[23693]: logger=cleanup t=2023-11-15T22:04:54.008333937+08:00 level=info msg="Completing cleanup"
Nov 15 22:04:54 Workstation grafana[23693]: logger=grafana.update.checker t=2023-11-15T22:04:54.76948352+08:00 level=info msg="Checking for updates"
Nov 15 22:04:55 Workstation grafana[23693]: logger=plugins.update.checker t=2023-11-15T22:04:55.196550061+08:00 level=info msg="Checking for plugin updates"
lines 1-21/21 (END)

```

```

ponayo@Workstation: ~$ systemctl status kibana
● kibana.service - Kibana
   Loaded: loaded (/etc/systemd/system/kibana.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 22:06:04 PST; 2s ago
     Docs: https://www.elastic.co
     Main PID: 29675 (node)
        Tasks: 7 (limit: 2261)
       Memory: 100.2M
          CPU: 1.065s
       CGroup: /system.slice/kibana.service
               └─29675 /usr/share/kibana/bin/../node/bin/node /usr/share/kibana/bin/../src/cli/dist --logging.dest=/var/log/kibana.log

Nov 15 22:06:04 Workstation systemd[1]: Started Kibana.
lines 1-12/12 (END)

```



```
ponayo@Workstation:~$ systemctl status prometheus
● prometheus.service - Monitoring system and time series database
   Loaded: loaded (/lib/systemd/system/prometheus.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 21:32:43 PST; 33min ago
     Docs: https://prometheus.io/docs/introduction/overview/
           man:prometheus(1)
   Main PID: 22220 (prometheus)
      Tasks: 9 (limit: 2261)
     Memory: 35.5M
        CPU: 3.443s
    CGroup: /system.slice/prometheus.service
            └─22220 /usr/bin/prometheus

Nov 15 21:32:43 Workstation prometheus[22220]: ts=2023-11-15T13:32:43.884Z caller=head.go:592 level=info component=tsdb
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.025Z caller=head.go:592 level=info component=tsdb
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.085Z caller=head.go:592 level=info component=tsdb
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.094Z caller=head.go:598 level=info component=tsdb
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.098Z caller=main.go:850 level=info fs_type=EXT4_S
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.099Z caller=main.go:853 level=info msg="TSDB start
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.099Z caller=main.go:980 level=info msg="Loading co
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.113Z caller=main.go:1017 level=info msg="Completed
Nov 15 21:32:44 Workstation prometheus[22220]: ts=2023-11-15T13:32:44.113Z caller=main.go:795 level=info msg="Server is
lines 1-22/22 (END)
```

```
ponayo@Workstation:~$ systemctl status logstash
● logstash.service - logstash
   Loaded: loaded (/lib/systemd/system/logstash.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 22:06:40 PST; 20s ago
     Main PID: 29785 (java)
        Tasks: 21 (limit: 2261)
       Memory: 501.4M
          CPU: 38.527s
     CGroup: /system.slice/logstash.service
             └─29785 /usr/share/logstash/jdk/bin/java -Xms1g -Xmx1g -Djava.awt.headless=true -Dfile.encoding=UTF-8 -Djru

Nov 15 22:06:40 Workstation systemd[1]: Started logstash.
Nov 15 22:06:40 Workstation logstash[29785]: Using bundled JDK: /usr/share/logstash/jdk
lines 1-12/12 (END)
```

```
ponayo@Workstation:~$ systemctl status elasticsearch
● elasticsearch.service - Elasticsearch
   Loaded: loaded (/lib/systemd/system/elasticsearch.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2023-11-15 20:29:41 PST; 1h 37min ago
     Docs: https://www.elastic.co
     Main PID: 1131 (java)
        Tasks: 81 (limit: 2261)
       Memory: 326.6M
          CPU: 1min 25.827s
     CGroup: /system.slice/elasticsearch.service
             └─1131 /usr/share/elasticsearch/jdk/bin/java -Xms4m -Xmx64m -XX:+UseSerialGC -Dcli.name=server -Dcli.scrip
               2263 /usr/share/elasticsearch/jdk/bin/java -Des.networkaddress.cache.ttl=60 -Des.networkaddress.cache.neg
               2569 /usr/share/elasticsearch/modules/x-pack-ml/platform/linux-x86_64/bin/controller

Nov 15 20:24:28 Workstation systemd[1]: Starting Elasticsearch...
Nov 15 20:29:41 Workstation systemd[1]: Started Elasticsearch.
lines 1-15/15 (END)
```

GitHub link:

[Ponayooo/CPE_MIDEXAM_PONAYO \(github.com\)](https://github.com/Ponayooo/CPE_MIDEXAM_PONAYO)

Conclusions: (link your conclusion from the objective)

In this exam, creating a workflow for installing, configuring, and managing enterprises can provide several benefits, including increased efficiency, reduced costs, and improved security. By automating repetitive tasks, a workflow can help us students to focus on more strategic initiatives. By performing the elasticsearch, kibana, lgostash, and prometheus on our previous activities is a huge help since i was able to familiarize on how to install the grafana influxdb. Additionally, a workflow can help to ensure that all systems are configured consistently and securely.