Final Exam Hands-on

Course Code: CPE212	**Program:** Bachelor of Science in Computer Engineering
Course Title: Automating Server Management	**Date Performed:** November 14, 2025
Section: CPE31S4	**Date Submitted:** November 20, 2025
Name: Bonifacio, Redj Guillian	**Instructor:** Engr. Valenzuela, Robin

Tools Needed:

1. VM with Ubuntu, CentOS and Ansible installed
2. Web browser

Procedure:

1. Create a repository and label it as "Final_Exam_Surname"
2. Clone your new repository in your VM
3. Create an Ansible playbook that does the following with an input of a config.yaml file and structure inventory file.
   - 3.1. Install and configure one enterprise service that can be installed in Debian and Centos servers
   - 3.2. Install and configure one monitoring tool that can be installed in Debian and Centos servers (if it is a stack there should be option of different host)
   - 3.3. Change Motd as "Ansible Managed by <username>"
4. Push and commit your files in GitHub
5. Make sure to show evidence of input (codes) process (codes successfully running) and output (evidence of installation)
6. For your final exam to be counted, please paste your repository link as an answer in this exam.

Note: Extra points if you will implement the said services via containerization.

Output:

Input (Codes, Commands, and Others):

```
redjbonifacio@workstation:~$ cd Final_Exam_RBonifacio
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ ls
ansible.cfg  installation.yaml  inventory  README.md  roles
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ cd inventory
redjbonifacio@workstation:~/Final_Exam_RBonifacio/inventory$ ls
hosts.ini
redjbonifacio@workstation:~/Final_Exam_RBonifacio/inventory$ cd
redjbonifacio@workstation:~$ cd Final_Exam_RBonifacio
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ cd roles
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles$ ls
apache  motd  nagios
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles$ cd apache
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/apache$ ls
tasks
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/apache$ cd tasks
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/apache/tasks$ ls
main.yml
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/apache/tasks$ cd
redjbonifacio@workstation:~$ Final_Exam_RBonifacio/roles/motd/tasks
bash: Final_Exam_RBonifacio/roles/motd/tasks: Is a directory
redjbonifacio@workstation:~$ cd Final_Exam_RBonifacio/roles/motd/tasks
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/motd/tasks$ ls
main.yml
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/motd/tasks$ cd
redjbonifacio@workstation:~$ cd Final_Exam_RBonifacio/roles/nagios/tasks
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/nagios/tasks$ ls
main.yml
redjbonifacio@workstation:~/Final_Exam_RBonifacio/roles/nagios/tasks$ cd
redjbonifacio@workstation:~$ cd Final_Exam_RBonifacio/
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ nano config.yaml
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ nano config.yaml
redjbonifacio@workstation:~/Final_Exam_RBonifacio$
```

```
  GNU nano 7.2                         ansible.cfg
[defaults]
inventory = inventory/hosts.ini
remote_user = redjbonifacio
host_key_checking = True
```

```
  GNU nano 7.2                         config.yaml
---
apache_pkg: "apache2"


nagios_tarball: "nagios-4.4.6.tar.gz"
nagios_url: "https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4>
nagios_dir: "/opt/nagios-4.4.6"
nagios_admin_user: "nagiosadmin"
nagios_admin_password: "password"


motd_message: "Ansible Managed by RedjBonifacio"
```

```
  GNU nano 7.2                      installation.yaml
---
- name: Setup Nagios, and MOTD
  hosts: nagios
  become: true
  roles:
    - nagios
    - motd

- name: Setup Apache, and MOTD
  hosts: apache
  become: true
  roles:
    - apache
    - motd
```

```
  GNU nano 7.2                          hosts.ini *
[apache]
mn1 ansible_host=192.168.56.102 ansible_user=redj1bonifacio ansible_become_pass>

[nagios]
mn3 ansible_host=192.168.56.104 ansible_user=rdjbnfc ansible_become_pass="redjb>

[all:vars]
ansible_python_interpreter=/usr/bin/python3
ansible_ssh_common_args='-o StrictHostKeyChecking=no'
```

```
  GNU nano 7.2                   roles/apache/tasks/main.yml
---
- name: Install Apache (apache2) on Ubuntu
  tags: apache, ubuntu
  apt:
    name: apache2
    state: latest
    update_cache: yes

- name: Start and enable Apache service on Ubuntu
  tags: apache, ubuntu, apache2
  service:
    name: apache2
    state: started
    enabled: true
```

```
  GNU nano 7.2                   roles/motd/tasks/main.yml
---
- name: Set the MOTD message
  copy:
    content: "Ansible Managed by RedjBonifacio"
    dest: /etc/motd
    owner: root
    group: root
    mode: '0644'
```

```yaml
  GNU nano 7.2                    roles/nagios/tasks/main.yml
---
- name: Install dependencies for Nagios and Apache
  yum:
    name:
      - httpd
      - php
      - wget
      - gcc
    state: present

- name: Create Nagios group
  group:
    name: nagios
    state: present

- name: Create Nagios user
  user:
    name: nagios
    group: nagios
    shell: /bin/bash
    state: present

- name: Download Nagios tarball
  get_url:
    url: "https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.4.6.tar>
    dest: /tmp/nagios.tar.gz

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

- name: Configure Nagios
  command: ./configure --with-httpd-conf=/etc/httpd/conf.d/
  args:
    chdir: /opt/nagios-4.4.6

- name: Build Nagios
  command: make all
  args:
    chdir: /opt/nagios-4.4.6

- name: Install Nagios
  command: make install
  args:
    chdir: /opt/nagios-4.4.6

- name: Install Nagios init scripts
  command: make install-init
  args:
    chdir: /opt/nagios-4.4.6
```

```
- name: Install Nagios config
  command: make install-config
  args:
    chdir: /opt/nagios-4.4.6

- name: Install Nagios command mode
  command: make install-commandmode
  args:
    chdir: /opt/nagios-4.4.6

- name: Install Nagios web configuration
  command: make install-webconf
  args:
    chdir: /opt/nagios-4.4.6

- name: Configure Nagios Admin User
  command: htpasswd -b -c /usr/local/nagios/etc/htpasswd.users nagiosadmin password

- name: Enable and Start Apache (httpd)
  systemd:
    name: httpd
    enabled: yes
    state: started

- name: Enable and Start nagios
  systemd:
    name: nagios
    enabled: yes
    state: started
```

GNU nano 7.2	README.md

Final_Exam_RBonifacio
Redj Bonifacio CPE 212-CPE31S4 - Automating Server Management

Output (Evidence of Installation)

```
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ ansible-playbook --ask-become
-pass installation.yaml
BECOME password:

PLAY [Setup Nagios, and MOTD] ***********************************************

TASK [Gathering Facts] ******************************************************
ok: [mn3]

TASK [nagios : Install dependencies for Nagios and Apache] ******************
ok: [mn3]

TASK [nagios : Create Nagios group] *****************************************
ok: [mn3]

TASK [nagios : Create Nagios user] ******************************************
ok: [mn3]

TASK [nagios : Download Nagios tarball] *************************************
ok: [mn3]

TASK [nagios : Extract Nagios tarball] *************************************
ok: [mn3]

TASK [nagios : Configure Nagios] ********************************************
changed: [mn3]

TASK [nagios : Build Nagios] ***********************************************
changed: [mn3]

TASK [nagios : Install Nagios] *********************************************
changed: [mn3]

TASK [nagios : Install Nagios init scripts] ********************************
changed: [mn3]

TASK [nagios : Install Nagios config] *************************************
changed: [mn3]

TASK [nagios : Install Nagios command mode] ********************************
changed: [mn3]

TASK [nagios : Install Nagios web configuration] **************************
changed: [mn3]

TASK [nagios : Configure Nagios Admin User] *******************************
changed: [mn3]
```

```
TASK [nagios : Enable and Start Apache (httpd)] ********************************
ok: [mn3]

TASK [nagios : Enable and Start nagios] ***************************************
ok: [mn3]

TASK [motd : Set the MOTD message] *******************************************
ok: [mn3]

PLAY [Setup Apache, and MOTD] ************************************************

TASK [Gathering Facts] ******************************************************
ok: [mn1]

TASK [apache : Install Apache (apache2) on Ubuntu] ****************************
ok: [mn1]

TASK [apache : Start and enable Apache service on Ubuntu] *********************
ok: [mn1]

TASK [motd : Set the MOTD message] *******************************************
ok: [mn1]
```

```
PLAY RECAP *******************************************************************
mn1                        : ok=4    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
mn3                        : ok=17   changed=8    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

redjbonifacio@workstation:~/Final_Exam_RBonifacio$
```

```
redj1bonifacio@server1:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: >
     Active: active (running) since Thu 2025-11-20 15:54:14 PST; 4min 25s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 5953 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SU>
   Main PID: 5956 (apache2)
      Tasks: 6 (limit: 4489)
     Memory: 12.8M (peak: 13.1M)
        CPU: 57ms
     CGroup: /system.slice/apache2.service
             ├─5956 /usr/sbin/apache2 -k start
             ├─5962 /usr/sbin/apache2 -k start
             ├─5963 /usr/sbin/apache2 -k start
             ├─5964 /usr/sbin/apache2 -k start
             ├─5965 /usr/sbin/apache2 -k start
             └─5966 /usr/sbin/apache2 -k start

Nov 20 15:54:14 server1 systemd[1]: Starting apache2.service - The Apache HTTP >
Nov 20 15:54:14 server1 systemd[1]: Started apache2.service - The Apache HTTP S>
lines 1-19/19 (END)
```

```
Warning: The unit file, source configuration file or drop-ins of nagios.service changed on disk. Run 'systemctl daemon-reload' to reload units.
● nagios.service - Nagios Core 4.4.6
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Thu 2025-11-20 15:35:45 PST; 34min ago
 Invocation: 500cb143f5944bfd981433ffe3d9919d
       Docs: https://www.nagios.org/documentation
    Process: 1188 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 1249 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 1250 (nagios)
      Tasks: 6 (limit: 22402)
     Memory: 20.9M (peak: 23.2M)
        CPU: 417ms
     CGroup: /system.slice/nagios.service
             ├─1250 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─1252 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1253 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1254 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─1255 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─1321 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Nov 20 15:41:46 localhost.localdomain nagios[1250]: HOST ALERT: localhost;DOWN;SOFT;7;(No output on stdout) stderr: execvp(/usr/local/nagios/l>
Nov 20 15:42:46 localhost.localdomain nagios[1250]: HOST ALERT: localhost;DOWN;SOFT;8;(No output on stdout) stderr: execvp(/usr/local/nagios/l>
Nov 20 15:43:46 localhost.localdomain nagios[1250]: HOST ALERT: localhost;DOWN;SOFT;9;(No output on stdout) stderr: execvp(/usr/local/nagios/l>
lines 1-23
```

```
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ ssh redj1bonifacio@192.168.56
.102
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.14.0-35-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

Expanded Security Maintenance for Applications is not enabled.

75 updates can be applied immediately.
35 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

7 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

Ansible Managed by RedjBonifacio
Last login: Thu Nov 20 16:24:42 2025 from 192.168.56.101
redj1bonifacio@server1:~$
```

```
redjbonifacio@workstation:~/Final_Exam_RBonifacio/inventory$ ssh rdjbnfc@192.168
.56.104
Ansible Managed by RedjBonifacio
Web console: https://localhost:9090/ or https://10.0.2.15:9090/

Last login: Thu Nov 20 16:24:34 2025 from 192.168.56.101
rdjbnfc@localhost:~$
```

Git Add, Commit, and Push

```
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ git add -A
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ git commit -m "Final Exam Sub
mission - Redj Bonifacio"
On branch main
Your branch is ahead of 'origin/main' by 1 commit.
  (use "git push" to publish your local commits)

nothing to commit, working tree clean
redjbonifacio@workstation:~/Final_Exam_RBonifacio$ git push
Username for 'https://github.com': RedjBonifacio
Password for 'https://RedjBonifacio@github.com':
Enumerating objects: 18, done.
Counting objects: 100% (18/18), done.
Delta compression using up to 2 threads
Compressing objects: 100% (10/10), done.
Writing objects: 100% (17/17), 2.17 KiB | 740.00 KiB/s, done.
Total 17 (delta 0), reused 0 (delta 0), pack-reused 0
To https://github.com/RedjBonifacio/Final_Exam_RBonifacio.git
   e04a555..d8a0716  main -> main
redjbonifacio@workstation:~/Final_Exam_RBonifacio$
```

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Final_Exam_RBonifacio

Redj Bonifacio CPE 212-CPE31S4 - Automating Server Management

Repository Link

https://github.com/RedjBonifacio/Final_Exam_RBonifacio