Aim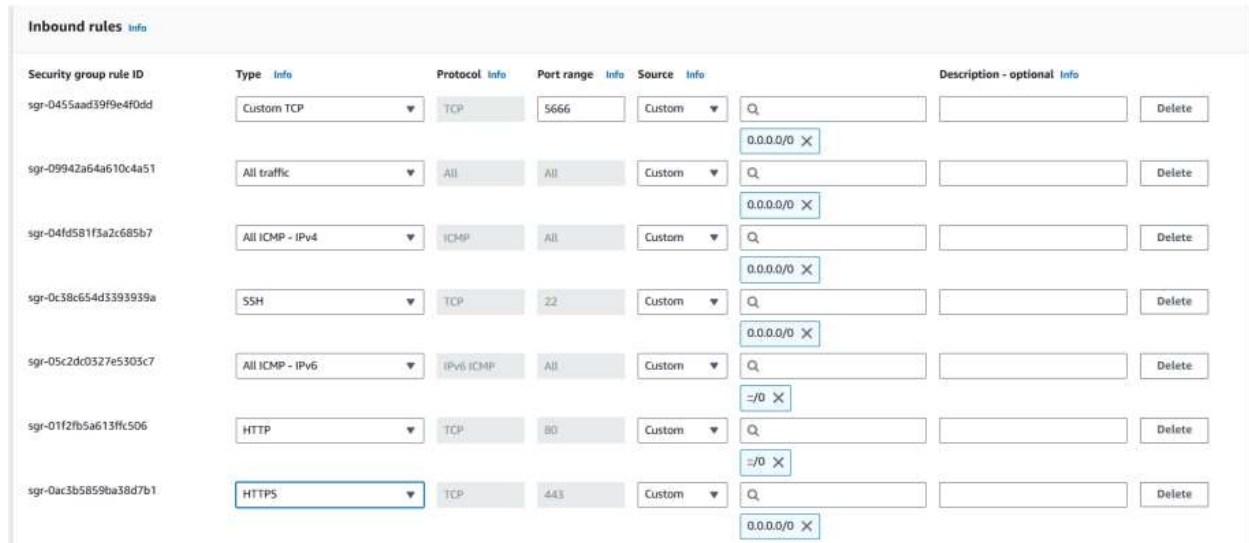: To Understand Continuous monitoring and Installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.
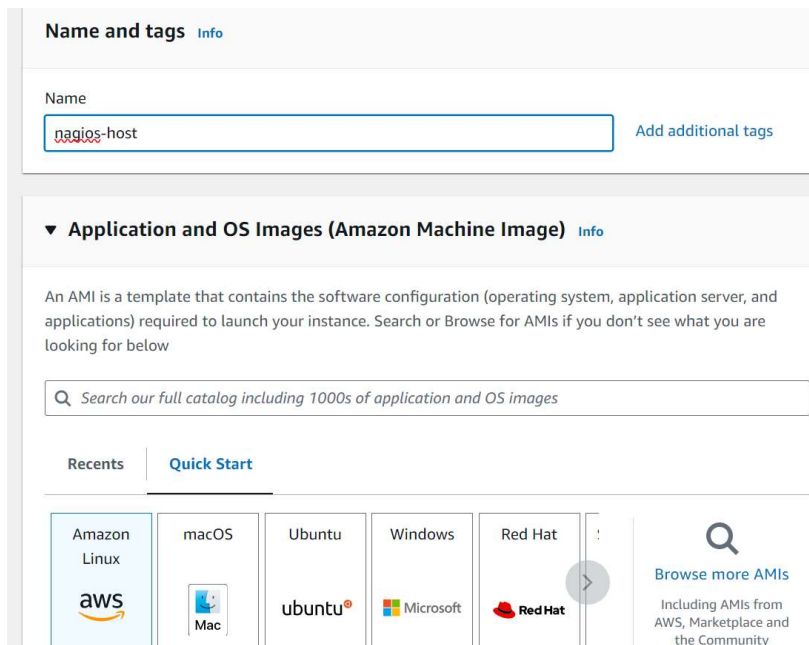
1. Firstly, go to the EC2 section in the Aws academy lab. Go to the security group and click on create a new security group. Add the following inbound rules in your security group and give it an appropriate name.

2. Now go to the EC2 instance dashboard and click on Launch Instance. Name your instance as nagios-host, select Amazon Linux as the instance type. Create a new key pair and download the corresponding .pem file in your pc. Also choose the existing security group which we created in the previous step.

3. Now click on the instance id in the dashboard and click on connect. Go to the ssh client tab and copy the example command. Locate the folder in which your .pem file was downloaded and open it in terminal. Run the copied command in the terminal to connect to your ec2 instance.
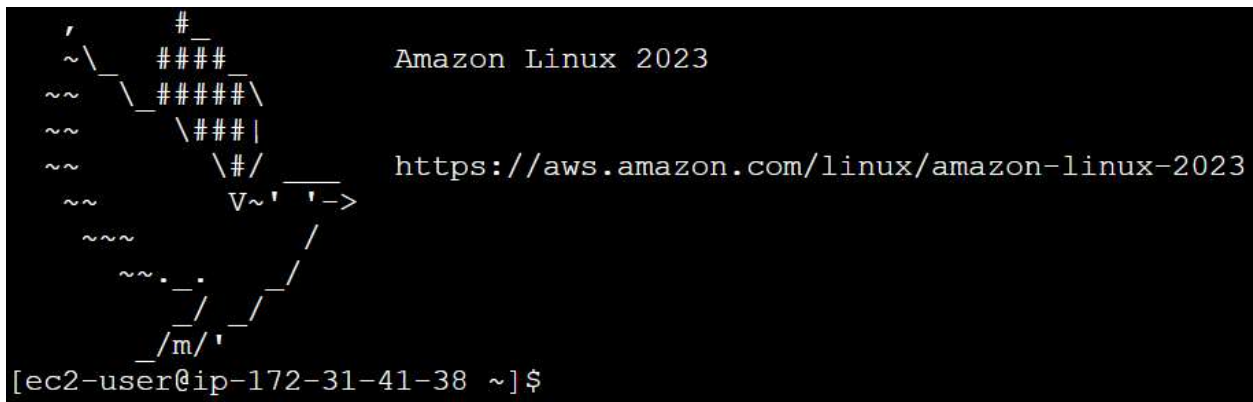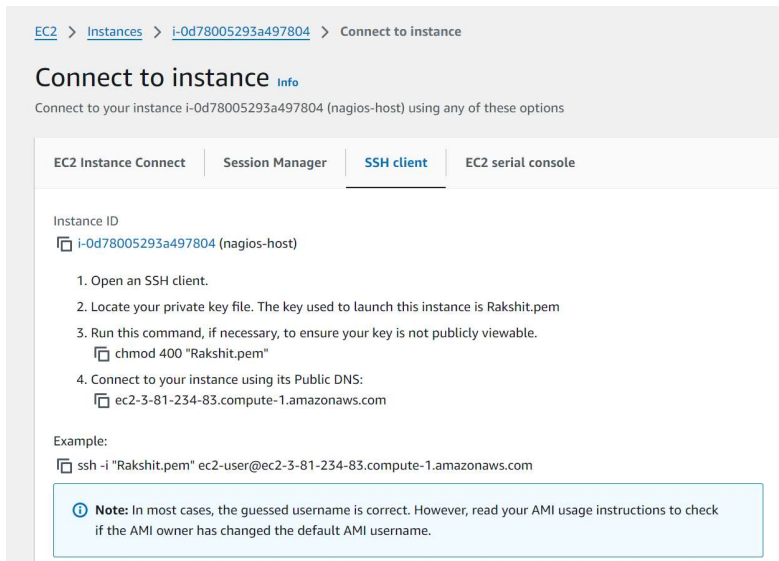
4. Run the commands:
   sudo adduser -m nagios
   sudo passwd nagios
   This creates a user named 'nagios', ensures it has a home directory and sets up a password for it.
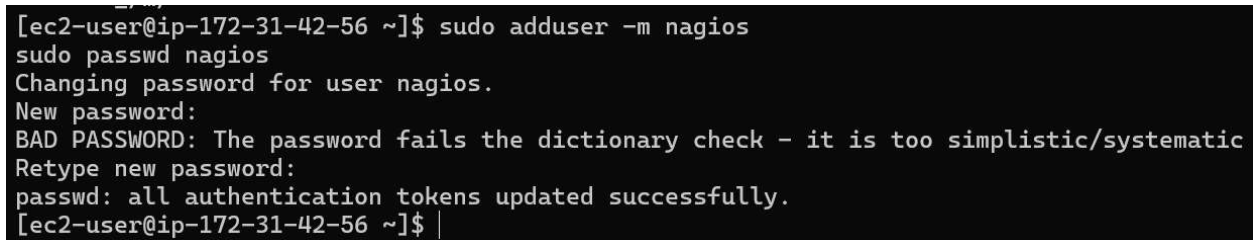
5. Create a user group named 'nagcmd' to execute nagios commands.
   sudo groupadd nagcmd

sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache
Add users apache and nagios to this user group.

```
[ec2-user@ip-172-31-42-56 ~]$ sudo groupdel nagcmd
[ec2-user@ip-172-31-42-56 ~]$ sudo groupadd nagcmd
sudo usermod -a -G nagcmd nagios
sudo usermod -a -G nagcmd apache
[ec2-user@ip-172-31-42-56 ~]$
```

6. Cd into the downloads folder, make one if there is no such directory and run the following command,
   cd ~/downloads
   wget https://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz
   wget https://nagios-plugins.org/download/nagios-plugins-2.4.11.tar.gz
   Run the last command to install the latest version of nagios

```
[ec2-user@ip-172-31-42-56 downloads]$ wget https://go.nagios.org/l/975333/2024-09-17/6kqcx
--2024-10-08 01:20:02--  https://go.nagios.org/l/975333/2024-09-17/6kqcx
Resolving go.nagios.org (go.nagios.org)... 3.215.172.219, 3.92.120.28, 18.208.125.13, ...
Connecting to go.nagios.org (go.nagios.org)|3.215.172.219|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: http://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz?utm_source=Nagios.org&utm_content=D
ownload+Form&utm_campaign=Core+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a7f01125e969f2a75b0e2254439d4a81
d8 [following]
--2024-10-08 01:20:02--  http://assets.nagios.com/downloads/nagioscore/releases/nagios-4.5.5.tar.gz?utm_source=Nagios.or
g&utm_content=Download+Form&utm_campaign=Core+4.5.5+Download+&pi_content=1e9662c93afb2ed6bd2e3f3cc38771a7f01125e969f2a75
b0e2254439d4a81d8
```

```
[ec2-user@ip-172-31-42-56 downloads]$ wget https://nagios-plugins.org/download/nagios-plugins-2.4.11.tar.gz
--2024-10-08 01:20:28--  https://nagios-plugins.org/download/nagios-plugins-2.4.11.tar.gz
Resolving nagios-plugins.org (nagios-plugins.org)... 45.56.123.251
Connecting to nagios-plugins.org (nagios-plugins.org)|45.56.123.251|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 2753049 (2.6M) [application/x-gzip]
Saving to: 'nagios-plugins-2.4.11.tar.gz'

nagios-plugins-2.4.11.tar.gz  100%[=============================================>]   2.62M  6.29MB/s    in 0.4s

2024-10-08 01:20:28 (6.29 MB/s) - 'nagios-plugins-2.4.11.tar.gz' saved [2753049/2753049]

[ec2-user@ip-172-31-42-56 downloads]$
```

7. tar zxvf nagios-4.5.5.tar.gz This extracts the nagios-core files into the same directory using the tar command.

```
[ec2-user@ip-172-31-42-56 downloads]$ tar zxvf 6kqcx
nagios-4.5.5/
nagios-4.5.5/.github/
nagios-4.5.5/.github/workflows/
nagios-4.5.5/.github/workflows/test.yml
nagios-4.5.5/.gitignore
nagios-4.5.5/CONTRIBUTING.md
nagios-4.5.5/Changelog
nagios-4.5.5/INSTALLING
nagios-4.5.5/LEGAL
nagios-4.5.5/LICENSE
nagios-4.5.5/Makefile.in
nagios-4.5.5/README.md
nagios-4.5.5/THANKS
nagios-4.5.5/UPGRADING
nagios-4.5.5/aclocal.m4
nagios-4.5.5/autoconf-macros/
nagios-4.5.5/autoconf-macros/.gitignore
nagios-4.5.5/autoconf-macros/CHANGELOG.md
nagios-4.5.5/autoconf-macros/LICENSE
nagios-4.5.5/autoconf-macros/LICENSE.md
nagios-4.5.5/autoconf-macros/README.md
nagios-4.5.5/autoconf-macros/add_group_user
```

8. Cd into the nagios folder and run the following command.
./configure --with-command-group=nagcmd
This command ensures that Nagios uses a specific group (in this case, nagcmd) for executing external commands.

```
[ec2-user@ip-172-31-42-56 downloads]$ cd nagios-4.5.5
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ |
```

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ ./configure --with-command-group=nagcmd
checking for a BSD-compatible install... /usr/bin/install -c
checking build system type... x86_64-pc-linux-gnu
checking host system type... x86_64-pc-linux-gnu
checking for gcc... gcc
checking whether the C compiler works... yes
checking for C compiler default output file name... a.out
checking for suffix of executables...
checking whether we are cross compiling... no
checking for suffix of object files... o
checking whether the compiler supports GNU C... yes
checking whether gcc accepts -g... yes
```

```
checking for Kerberos include files... configure: WARNING: could not find include files
checking for pkg-config... pkg-config
checking for SSL headers... configure: error: Cannot find ssl headers
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ |
```

Error occurs which says that ssl headers cannot be found. To fix the above error, run the 'sudo yum install openssl-devel' command.
Then, run the './configure --with-command-group=nagcmd' command again.

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo yum install openssl-devel
Last metadata expiration check: 0:11:54 ago on Tue Oct  8 01:14:05 2024.
Dependencies resolved.
================================================================================
 Package              Architecture    Version                  Repository        Size
================================================================================
Installing:
 openssl-devel        x86_64          1:3.0.8-1.amzn2023.0.14  amazonlinux       3.0 M

Transaction Summary
================================================================================
Install  1 Package

Total download size: 3.0 M
Installed size: 4.7 M
```

9. Now we need to compile all the components of this software as given in the instructions.
   Run the command
   make all,

   After that run the following commands:
   sudo make install
   sudo make install-init
   sudo make install-config
   sudo make install-commandmode

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo make install
cd ./base && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/base'
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/bin
/usr/bin/install -c -s -m 774 -o nagios -g nagios nagios /usr/local/nagios/bin
/usr/bin/install -c -s -m 774 -o nagios -g nagios nagiostats /usr/local/nagios/bin
make[1]: Leaving directory '/home/ec2-user/downloads/nagios-4.5.5/base'
cd ./cgi && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
make install-basic
make[2]: Entering directory '/home/ec2-user/downloads/nagios-4.5.5/cgi'
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/sbin
```

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo make install-init
/usr/bin/install -c -m 755 -d -o root -g root /lib/systemd/system
/usr/bin/install -c -m 755 -o root -g root startup/default-service /lib/systemd/system/nagios.service
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo make install-config
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/etc
/usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/etc/objects
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/nagios.cfg /usr/local/nagios/etc/nagios.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/cgi.cfg /usr/local/nagios/etc/cgi.cfg
/usr/bin/install -c -b -m 660 -o nagios -g nagios sample-config/resource.cfg /usr/local/nagios/etc/resource.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/templates.cfg /usr/local/nagios/
```

10. We need to update the email linked with this server to our email for it to send notifications.
    sudo nano /usr/local/nagios/etc/objects/contacts.cfg

```
  GNU nano 5.8                    /usr/local/nagios/etc/objects/contacts.cfg                    Modified
# Just one contact defined by default - the Nagios admin (that's you)
# This contact definition inherits a lot of default values from the
# 'generic-contact' template which is defined elsewhere.

define contact {

    contact_name            nagiosadmin             ; Short name of user
    use                     generic-contact         ; Inherit default values from generic-contact template (defined abo>
    alias                   Nagios Admin            ; Full name of user
    email                   2022.rakshit.sharma@ves.ac.in ; <<***** CHANGE THIS TO YOUR EMAIL ADDRESS ******
}


########################################################################
#
# CONTACT GROUPS
#
########################################################################

# We only have one contact in this simple configuration file, so there is
# no need to create more than one contact group.

define contactgroup {

    contactgroup_name       admins
```

11. sudo make install-webconf
    This installs the necessary configuration files for the Nagios web interface.

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo make install-webconf
/usr/bin/install -c -m 644 sample-config/httpd.conf /etc/httpd/conf.d/nagios.conf
if [ 0 -eq 1 ]; then \
        ln -s /etc/httpd/conf.d/nagios.conf /etc/apache2/sites-enabled/nagios.conf; \
fi

*** Nagios/Apache conf file installed ***

[ec2-user@ip-172-31-42-56 nagios-4.5.5]$
```

12. sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
    This would create a user named 'nagiosadmin' to access the nagios web interface. Save
    the password that you create as it will be needed later.

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$
```

13. cd ~/downloads
    tar zxvf nagios-plugins-2.4.11.tar.gz
    This will extract the files for nagios plugins.

```
[ec2-user@ip-172-31-42-56 nagios-4.5.5]$ cd ~/downloads
tar zxvf nagios-plugins-2.4.11.tar.gz
nagios-plugins-2.4.11/
nagios-plugins-2.4.11/build-aux/
nagios-plugins-2.4.11/build-aux/compile
nagios-plugins-2.4.11/build-aux/config.guess
nagios-plugins-2.4.11/build-aux/config.rpath
nagios-plugins-2.4.11/build-aux/config.sub
nagios-plugins-2.4.11/build-aux/install-sh
nagios-plugins-2.4.11/build-aux/ltmain.sh
nagios-plugins-2.4.11/build-aux/missing
nagios-plugins-2.4.11/build-aux/mkinstalldirs
nagios-plugins-2.4.11/build-aux/depcomp
nagios-plugins-2.4.11/build-aux/snippet/
nagios-plugins-2.4.11/build-aux/snippet/_Noreturn.h
```

14. Next, we must compile all components of this software according to the instructions in
    the Makefile. To do so, use the following commands:
    make
    sudo make install

15. sudo chkconfig --add nagios
    sudo chkconfig nagios on

This registers the Nagios service with the system ensuring that it can manage the server status.

```
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$ sudo chkconfig --add nagios
sudo chkconfig nagios on
error reading information on service nagios: No such file or directory
Note: Forwarding request to 'systemctl enable nagios.service'.
Created symlink /etc/systemd/system/multi-user.target.wants/nagios.service → /usr/lib/systemd/system/nagios.service.
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$
```

16. sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg
    Run the following command to check and verify if the configuration files are correct or not.
    If you see total errors and warnings as 0, it means the configurations are correct.

```
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$ sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

Nagios Core 4.5.5
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2024-09-17
License: GPL

Website: https://www.nagios.org
Reading configuration data...
   Read main config file okay...
   Read object config files okay...

Running pre-flight check on configuration data...
```

```
        Checked 0 service escalations.
Checking for circular paths...
        Checked 1 hosts
        Checked 0 service dependencies
        Checked 0 host dependencies
        Checked 5 timeperiods
Checking global event handlers...
Checking obsessive compulsive processor commands...
Checking misc settings...

Total Warnings: 0
Total Errors:   0
```

17. Run the command to start nagios service
    sudo service nagios start

```
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$ sudo service nagios start
Redirecting to /bin/systemctl start nagios.service
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$
```

18. sudo systemctl status nagios
    This checks the status of Nagios. Ensure that it is 'active(running)'.

```
[ec2-user@ip-172-31-42-133 nagios-plugins-2.4.11]$  sudo systemctl status nagios
● nagios.service - Nagios Core 4.5.5
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Tue 2024-10-08 04:31:34 UTC; 31s ago
       Docs: https://www.nagios.org/documentation
    Process: 64732 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0>
    Process: 64733 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SU>
   Main PID: 64734 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 5.6M
        CPU: 79ms
     CGroup: /system.slice/nagios.service
             ├─64734 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─64735 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─64736 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─64737 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─64738 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─64739 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: qh: Socket '/usr/local/nagios/var/rw/nagios.qh' successful>
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: qh: core query handler registered
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: qh: echo service query handler registered
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: qh: help for the query handler registered
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: wproc: Successfully registered manager as @wproc with quer>
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: wproc: Registry request: name=Core Worker 64738;pid=64738
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: wproc: Registry request: name=Core Worker 64737;pid=64737
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: wproc: Registry request: name=Core Worker 64736;pid=64736
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: wproc: Registry request: name=Core Worker 64735;pid=64735
Oct 08 04:31:34 ip-172-31-42-133.ec2.internal nagios[64734]: Successfully launched command file worker with pid 64739
lines 1-28/28 (END)
```

19. Again go to your ec2 instance, click on the id of your instance. On the opened page, copy the public IPV4 address of the instance.

20. In google or any other browser, enter http://<publicipaddress>/nagios. You will get a prompt box asking for username and passwords. Enter the username as nagiosadmin and password is the one we set earlier in step 12. If the password is correct you will be directed to the Nagios home page.

Conclusion:

In this experiment, we successfully installed and configured Nagios Core and its essential components on an Amazon Linux EC2 instance. This setup involved creating a user for Nagios, configuring user groups, downloading and extracting Nagios and its plugins, and addressing SSL header errors by installing necessary dependencies. The Nagios service was successfully compiled and started, allowing us to access the Nagios web interface via a browser by using the instance's public IP address. With Nagios running, we now have a fully functional monitoring system in place for real-time monitoring and notifications.