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## Advanced DevOps Experiment-9

**Aim**: To Understand Continuous monitoring and Installation and configuration of Nagios Core, Nagios Plugins and NRPE (Nagios Remote Plugin Executor) on Linux Machine.

**Theory:**

**What is Nagios?**

Nagios is an open-source software for continuous monitoring of systems, networks, and infrastructures. It runs plugins stored on a server that is connected with a host or another server on your network or the Internet. In case of any failure, Nagios alerts about the issues so that the technical team can perform the recovery process immediately.

Nagios is used for continuous monitoring of systems, applications, service and business processes in a DevOps culture.

**Why We Need Nagios tool?**

**Here are the important reasons to use Nagios monitoring tool:**

- Detects all types of network or server issues
- Helps you to find the root cause of the problem which allows you to get the permanent solution to the problem
- Active monitoring of your entire infrastructure and business processes
- Allows you to monitor and troubleshoot server performance issues
- Helps you to plan for infrastructure upgrades before outdated systems create failures
- You can maintain the security and availability of the service
- Automatically fix problems in a panic situation

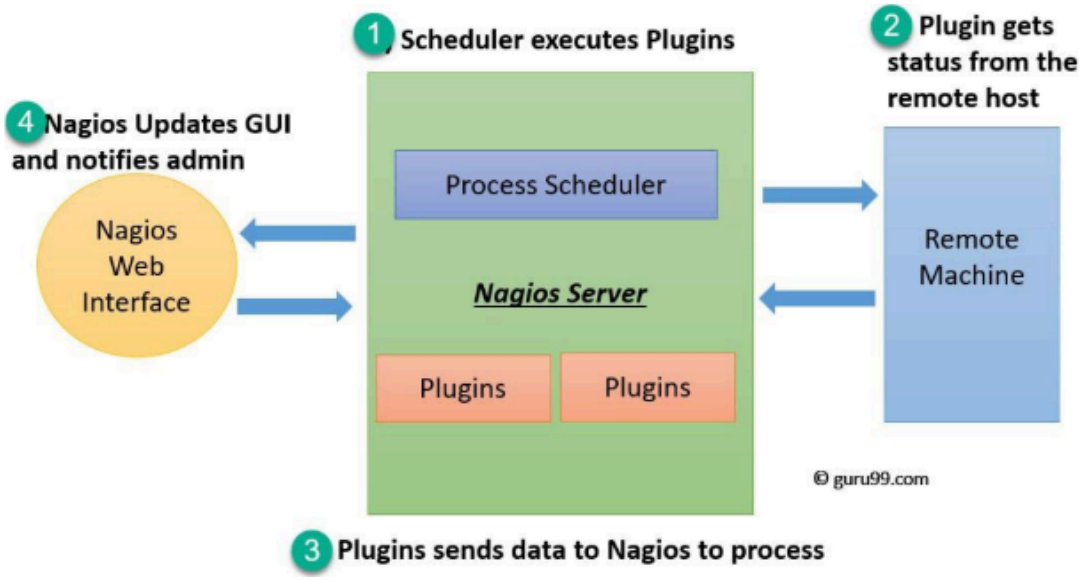
**Features of Nagios**

**Following are the important features of Nagios monitoring tool:**

- Relatively scalable, Manageable, and Secure
- Good log and database system
- Informative and attractive web interfaces
- Automatically send alerts if condition changes
- If the services are running fine, then there is no need to do check that host is an alive
- Helps you to detect network errors or server crashes
- You can troubleshoot the performance issues of the server.
- The issues, if any, can be fixed automatically as they are identified during the monitoring process
- You can monitor the entire business process and IT infrastructure with a single pass
- The product’s architecture is easy to write new plugins in the language of your choice

● Nagios allows you to read its configuration from an entire directory which helps you to decide how to define individual files
● Utilizes topology to determine dependencies
● Monitor network services like HTTP, SMTP, HTTP, SNMP, FTP, SSH, POP, etc.
● Helps you to define network host hierarchy using parent hosts
● Ability to define event handlers that runs during service or host events for proactive problem resolution
● Support for implementing redundant monitoring hosts

**Nagios Architecture**
Nagios is a client-server architecture. Usually, on a network, a Nagios server is running on a host, and plugins are running on all the remote hosts which should be monitored.

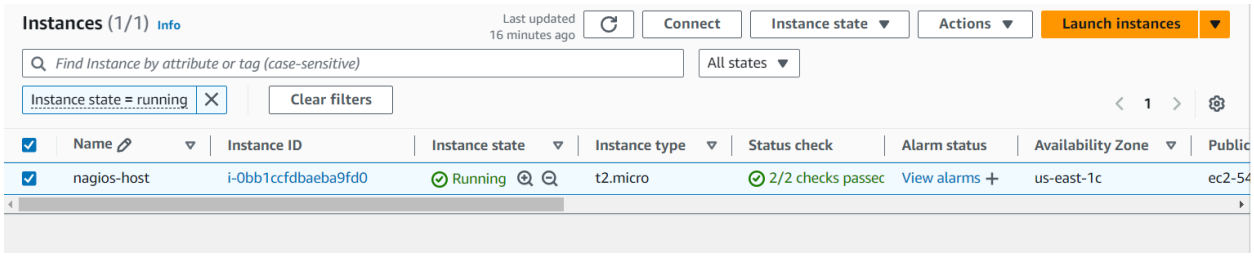



1. The scheduler is a component of the server part of Nagios. It sends a signal to execute the plugins at the remote host.
2. The plugin gets the status from the remote host
3. The plugin sends the data to the process scheduler
4. The process scheduler updates the GUI and notifications are sent to admins.

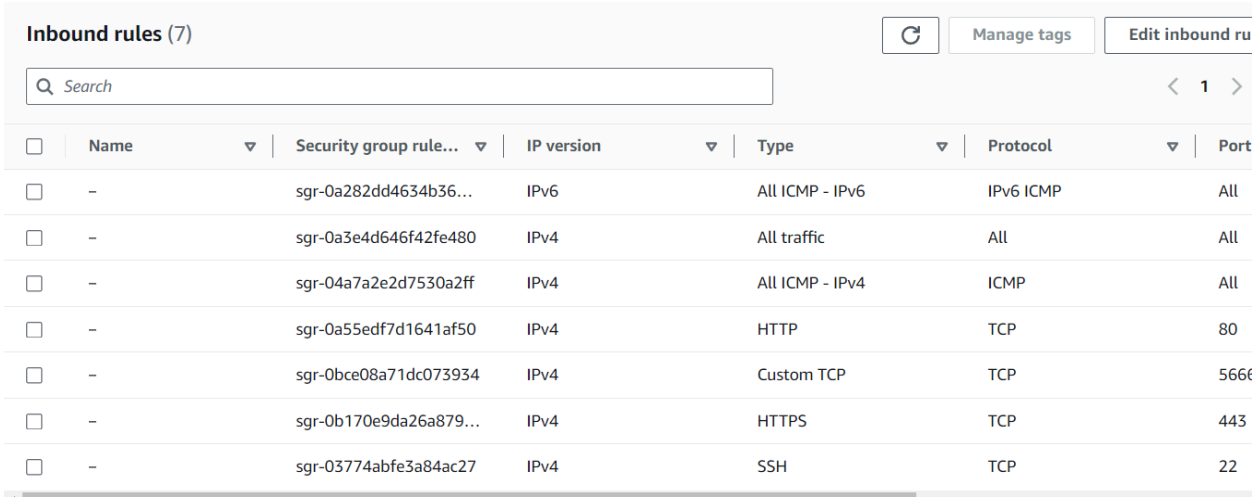
**Installation of Nagios**
Prerequisites: AWS Free Tier

**Steps:**

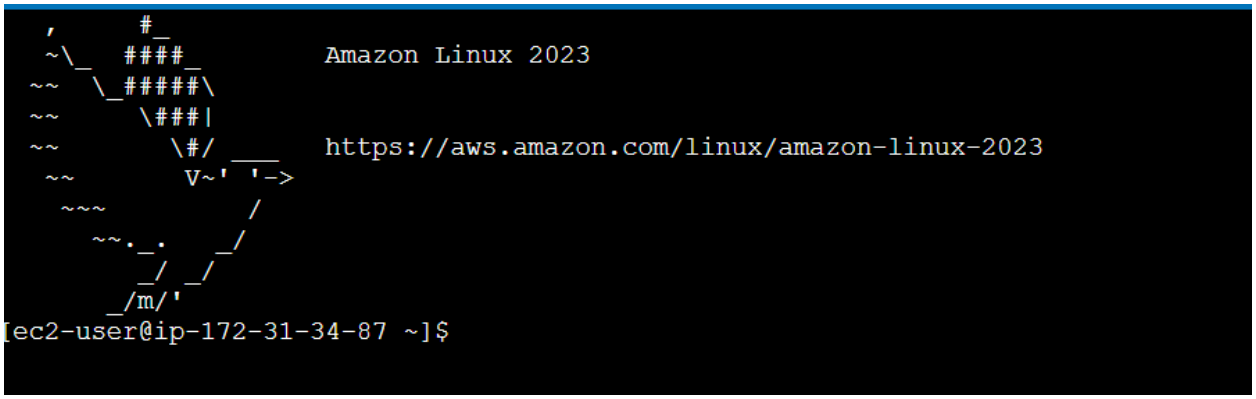
**1. Create an Amazon Linux EC2 Instance in AWS and name it - nagios-host**




**2. Under Security Group, make sure HTTP, HTTPS, SSH, ICMP are open from everywhere.**




**3. SSH into Your EC2 instance or simply use EC2 Instance Connect from the browser.**



**4. Update the package indices and install the following packages using yum**
**sudo yum update**
**sudo yum install httpd php**
**sudo yum install gcc glibc glibc-common**
**sudo yum install gd gd-devel**

```
  libtiff-4.4.0-4.amzn2023.0.18.x86_64                libtiff-devel-4.4.0-4.amzn2023.0.18.x86_64
  libwebp-1.2.4-1.amzn2023.0.6.x86_64                 libwebp-devel-1.2.4-1.amzn2023.0.6.x86_64
  libxcb-1.13.1-7.amzn2023.0.2.x86_64                 libxcb-devel-1.13.1-7.amzn2023.0.2.x86_64
  libxml2-devel-2.10.4-1.amzn2023.0.6.x86_64          pcre2-devel-10.40-1.amzn2023.0.3.x86_64
  pcre2-utf16-10.40-1.amzn2023.0.3.x86_64             pcre2-utf32-10.40-1.amzn2023.0.3.x86_64
  pixman-0.40.0-3.amzn2023.0.3.x86_64                 sysprof-capture-devel-3.40.1-2.amzn2023.0.2.x86_64
  xml-common-0.6.3-56.amzn2023.0.2.noarch             xorg-x11-proto-devel-2021.4-1.amzn2023.0.2.noarch
  xz-devel-5.2.5-9.amzn2023.0.2.x86_64                zlib-devel-1.2.11-33.amzn2023.0.5.x86_64

Complete!
[ec2-user@ip-172-31-34-87 ~]$
```

**5. Create a new Nagios User with its password. You'll have to enter the password twice for confirmation.**
**sudo adduser -m nagios**
**sudo passwd nagios**

```
[ec2-user@ip-172-31-34-87 ~]$ sudo useradd nagios
sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password fails the dictionary check - it is too simplistic/systematic
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-34-87 ~]$
```

**6. Create a new user group**
**sudo groupadd nagcmd**
**7. Use these commands so that you don't have to use sudo for Apache and Nagios**
**sudo usermod -a -G nagcmd nagios**
**sudo usermod -a -G nagcmd apache**

```
[ec2-user@ip-172-31-34-87 ~]$ sudo groupadd nagcmd
[ec2-user@ip-172-31-34-87 ~]$ sudo usermod -aG nagcmd nagios
sudo usermod -aG nagcmd apache
[ec2-user@ip-172-31-34-87 ~]$
```

**8. Create a new directory for Nagios downloads**
**mkdir ~/downloads**
**cd ~/downloads**

**9. Use wget to download the source zip files.**
**Wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz**

```
nagios-4.4.6.tar.gz                 100%[=============================================================================>]  10.81M  12.0MB/s

2024-10-02 16:58:34 (12.0 MB/s) - 'nagios-4.4.6.tar.gz' saved [11333414/11333414]

--2024-10-02 16:58:34--  https://nagios-plugins.org/download/nagios-plugins-2.3.3.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: 2782610 (2.7M) [application/x-gzip]
Saving to: 'nagios-plugins-2.3.3.tar.gz'

nagios-plugins-2.3.3.tar.gz         100%[=============================================================================>]   2.65M  6.08MB/s

2024-10-02 16:58:35 (6.08 MB/s) - 'nagios-plugins-2.3.3.tar.gz' saved [2782610/2782610]

[ec2-user@ip-172-31-34-87 downloads]$
```

**10. Use tar to unzip and change to that directory.**
**tar zxvf nagios-4.0.8.tar.gz**

```
[ec2-user@ip-172-31-34-87 downloads]$ tar zxvf nagios-4.4.6.tar.gz
cd nagios-4.4.6
nagios-4.4.6/
nagios-4.4.6/.gitignore
nagios-4.4.6/.travis.yml
nagios-4.4.6/CONTRIBUTING.md
nagios-4.4.6/Changelog
nagios-4.4.6/INSTALLING
nagios-4.4.6/LEGAL
nagios-4.4.6/LICENSE
nagios-4.4.6/Makefile.in
nagios-4.4.6/README.md
nagios-4.4.6/THANKS
nagios-4.4.6/UPGRADING
nagios-4.4.6/aclocal.m4
nagios-4.4.6/autoconf-macros/
nagios-4.4.6/autoconf-macros/.gitignore
nagios-4.4.6/autoconf-macros/CHANGELOG.md
```

```
nagios-4.4.6/xdata/xodtemplate.c
nagios-4.4.6/xdata/xodtemplate.h
nagios-4.4.6/xdata/xpddefault.c
nagios-4.4.6/xdata/xpddefault.h
nagios-4.4.6/xdata/xrddefault.c
nagios-4.4.6/xdata/xrddefault.h
nagios-4.4.6/xdata/xsddefault.c
nagios-4.4.6/xdata/xsddefault.h
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$
```

**11. Run the configuration script with the same group name you previously created.**
**./configure --with-command-group=nagcmd**

```
 Web Interface Options:
 ------------------------
                 HTML URL:  http://localhost/nagios/
                  CGI URL:  http://localhost/nagios/cgi-bin/
 Traceroute (used by WAP):  /usr/bin/traceroute


Review the options above for accuracy.  If they look okay,
type 'make all' to compile the main program and CGIs.

[ec2-user@ip-172-31-34-87 nagios-4.4.6]$
```

**12. Compile the source code.**
**make all**

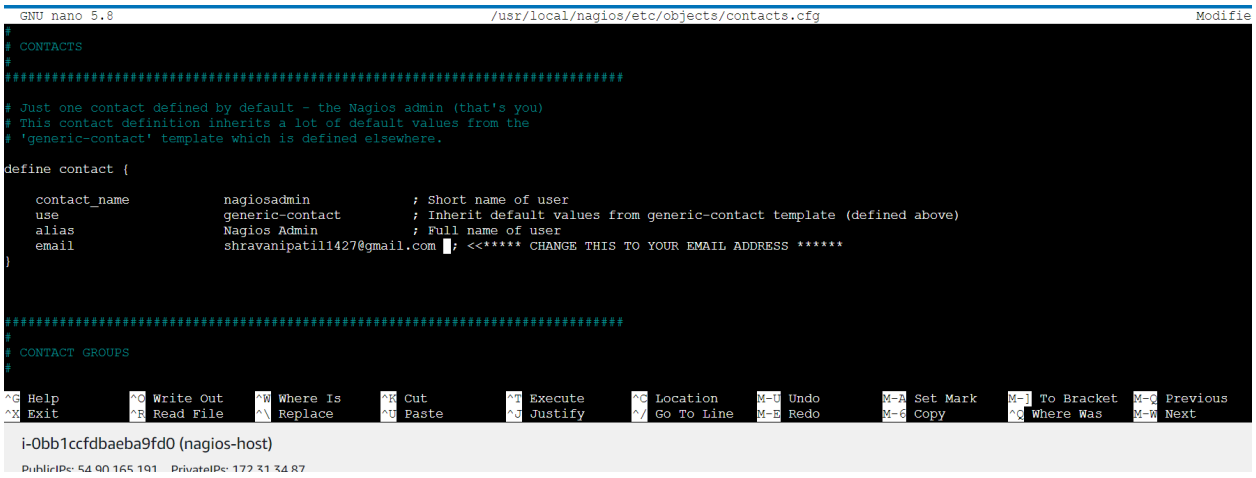
```
*** Support Notes *****************************************

If you have questions about configuring or running Nagios,
please make sure that you:

     - Look at the sample config files
     - Read the documentation on the Nagios Library at:
          https://library.nagios.com

before you post a question to one of the mailing lists.
Also make sure to include pertinent information that could
help others help you.  This might include:

     - What version of Nagios you are using
     - What version of the plugins you are using
     - Relevant snippets from your config files
     - Relevant error messages from the Nagios log file

For more information on obtaining support for Nagios, visit:

       https://support.nagios.com

************************************************************

Enjoy.

[ec2-user@ip-172-31-34-87 nagios-4.4.6]$
```

**13. Install binaries, init script and sample config files. Lastly, set permissions on the external**
**command directory.**
**sudo make install**
**sudo make install-init**
**sudo make install-config**
**sudo make install-commandmode**

```
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$ sudo make install
sudo make install-init
sudo make install-config
sudo make install-commandmode
cd ./base && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/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-4.4.6/base'
cd ./cgi && make install
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/cgi'
make install-basic
make[2]: Entering directory '/home/ec2-user/downloads/nagios-4.4.6/cgi'
```

```
*** Config files installed ***

Remember, these are *SAMPLE* config files.  You'll need to read
the documentation for more information on how to actually define
services, hosts, etc. to fit your particular needs.

/usr/bin/install -c -m 775 -o nagios -g nagcmd -d /usr/local/nagios/var/rw
chmod g+s /usr/local/nagios/var/rw

*** External command directory configured ***

[ec2-user@ip-172-31-34-87 nagios-4.4.6]$
```

**14. Edit the config file and change the email address.**
**sudo nano /usr/local/nagios/etc/objects/contacts.cfg**



**15. Configure the web interface.**
**sudo make install-webconf**

```
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$ 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-172-31-34-87 nagios-4.4.6]$
```

**16. Create a nagiosadmin account for nagios login along with password. You'll have to specify the password twice.**
**sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin**

```
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$
```

**17. Restart Apache**
**sudo service httpd restart**
**18. Go back to the downloads folder and unzip the plugins zip file.**
**cd ~/downloads**
**tar zxvf nagios-plugins-2.3.3.tar.gz**
**cd nagios-plugins-2.3.3**

```
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$ sudo systemctl restart httpd
[ec2-user@ip-172-31-34-87 nagios-4.4.6]$ cd ~/downloads
tar zxvf nagios-plugins-2.3.3.tar.gz
cd nagios-plugins-2.3.3
nagios-plugins-2.3.3/
nagios-plugins-2.3.3/perlmods/
nagios-plugins-2.3.3/perlmods/Config-Tiny-2.14.tar.gz
nagios-plugins-2.3.3/perlmods/parent-0.226.tar.gz
nagios-plugins-2.3.3/perlmods/Test-Simple-0.98.tar.gz
nagios-plugins-2.3.3/perlmods/Makefile.in
nagios-plugins-2.3.3/perlmods/version-0.9903.tar.gz
nagios-plugins-2.3.3/perlmods/Makefile.am
nagios-plugins-2.3.3/perlmods/Module-Runtime-0.013.tar.gz
nagios-plugins-2.3.3/perlmods/Module-Metadata-1.000014.tar.gz
nagios-plugins-2.3.3/perlmods/Params-Validate-1.08.tar.gz
nagios-plugins-2.3.3/perlmods/Class-Accessor-0.34.tar.gz
nagios-plugins-2.3.3/perlmods/Try-Tiny-0.18.tar.gz
```

```
nagios-plugins-2.3.3/plugins-scripts/check_mailq.pl
nagios-plugins-2.3.3/plugins-scripts/check_wave.pl
nagios-plugins-2.3.3/plugins-scripts/check_ircd.pl
nagios-plugins-2.3.3/plugins-scripts/utils.sh.in
nagios-plugins-2.3.3/plugins-scripts/check_ifstatus.pl
nagios-plugins-2.3.3/plugins-scripts/check_sensors.sh
nagios-plugins-2.3.3/pkg/
nagios-plugins-2.3.3/pkg/fedora/
nagios-plugins-2.3.3/pkg/fedora/requires
nagios-plugins-2.3.3/pkg/solaris/
nagios-plugins-2.3.3/pkg/solaris/preinstall
nagios-plugins-2.3.3/pkg/solaris/solpkg
nagios-plugins-2.3.3/pkg/solaris/pkginfo.in
nagios-plugins-2.3.3/pkg/solaris/pkginfo
nagios-plugins-2.3.3/pkg/redhat/
nagios-plugins-2.3.3/pkg/redhat/requires
[ec2-user@ip-172-31-34-87 nagios-plugins-2.3.3]$
```

**19. Compile and install plugins**

**cd nagios-plugins-2.3.3**

**./configure --with-nagios-user=nagios --with-nagios-group=nagios**

**make**

**sudo make install**

```
  done; \
  for file in Makevars; do \
    rm -f /usr/local/nagios/share/gettext/po/$file; \
  done; \
else \
  : ; \
fi
make[1]: Leaving directory '/home/ec2-user/downloads/nagios-plugins-2.3.3/po'
make[1]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.3.3'
make[2]: Entering directory '/home/ec2-user/downloads/nagios-plugins-2.3.3'
make[2]: Nothing to be done for 'install-exec-am'.
make[2]: Nothing to be done for 'install-data-am'.
make[2]: Leaving directory '/home/ec2-user/downloads/nagios-plugins-2.3.3'
make[1]: Leaving directory '/home/ec2-user/downloads/nagios-plugins-2.3.3'
[ec2-user@ip-172-31-34-87 nagios-plugins-2.3.3]$
```

```
[ec2-user@ip-172-31-34-87 nagios-plugins-2.3.3]$ sudo chkconfig --add nagios
sudo chkconfig nagios on
sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg
sudo systemctl start nagios
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.

Nagios Core 4.4.6
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2020-04-28
License: GPL
```

```
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

Things look okay - No serious problems were detected during the pre-flight check
[ec2-user@ip-172-31-34-87 nagios-plugins-2.3.3]$
```

**20. Start Nagios**

**Add Nagios to the list of system services**

**sudo chkconfig --add nagios**

**sudo chkconfig nagios on**

**Verify the sample configuration files**

**sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg**

**If there are no errors, you can go ahead and start Nagios.**

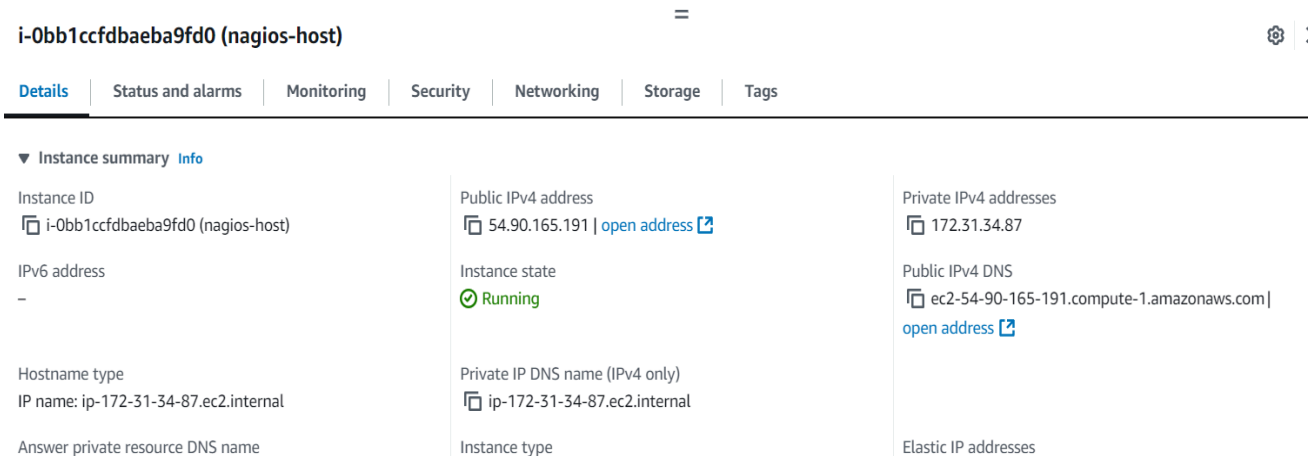
**sudo service nagios start**

**21. Check the status of Nagios**

**sudo systemctl status nagios**

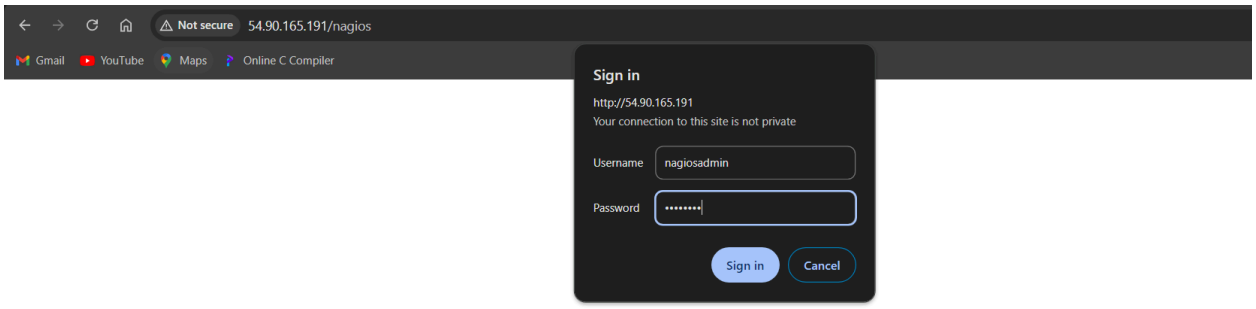
```
● nagios.service - Nagios Core 4.4.6
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
     Active: active (running) since Wed 2024-10-02 17:07:23 UTC; 50s ago
       Docs: https://www.nagios.org/documentation
    Process: 67754 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
    Process: 67755 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/SUCCESS)
   Main PID: 67756 (nagios)
      Tasks: 6 (limit: 1112)
     Memory: 2.1M
        CPU: 27ms
     CGroup: /system.slice/nagios.service
             ├─67756 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
             ├─67757 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67758 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67759 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             ├─67760 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
             └─67761 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg

Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: qh: Socket '/usr/local/nagios/var/rw/nagios.qh' successfully initialized
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: qh: core query handler registered
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: qh: echo service query handler registered
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: qh: help for the query handler registered
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: wproc: Successfully registered manager as @wproc with query handler
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: wproc: Registry request: name=Core Worker 67760;pid=67760
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: wproc: Registry request: name=Core Worker 67759;pid=67759
Oct 02 17:07:23 ip-172-31-34-87.ec2.internal nagios[67756]: wproc: Registry request: name=Core Worker 67758;pid=67758
lines 1-26
```

**22. Go back to EC2 Console and copy the Public IP address of this instance**

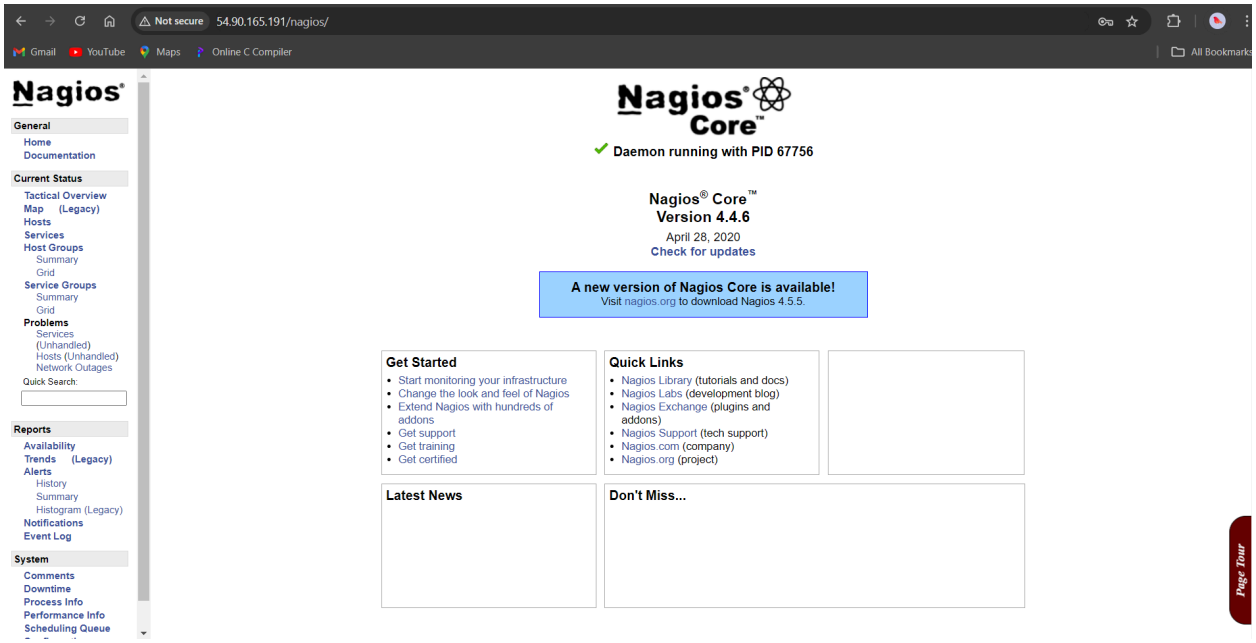



**23. Open up your browser and look for http://<your_public_ip_address>/nagios**

**Enter username as nagiosadmin and password which you set in Step 16.**



**24. After entering the correct credentials, you will see this page.**




**This means that Nagios was correctly installed and configured with its plugins so far.**