

Vivekanand Education Society's

Institute of Technology

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Department of Information Technology A.Y. 2024-25

Advance DevOps Lab Experiment 09

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

Roll No.	53
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Class	D15B
Subject	Advance DevOps Lab
LO Mapped	LO1: To understand the fundamentals of Cloud Computing and be fully proficient with Cloud based DevOps solution deployment options to meet your business requirements.
	LO5: To use Continuous Monitoring Tools to resolve any system errors (low memory, unreachable server etc.) before they have any negative impact on the business productivity.
Grade:	

<u>AIM</u>: 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 Use Nagios?

Key reasons to use Nagios include:

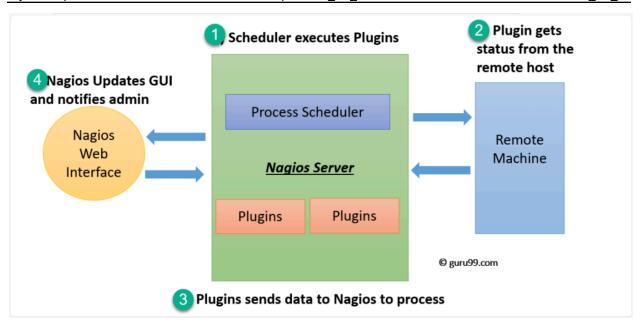
- Detecting network or server issues early
- Identifying the root cause for permanent fixes
- Active monitoring of your infrastructure and processes
- Troubleshooting server performance problems
- Planning upgrades to prevent failures
- Maintaining security and service availability
- Automating problem resolution in critical situations

Features of Nagios:

- Scalable, secure, and manageable
- Attractive web interface
- Automatic alerts for changing conditions
- Ability to monitor network services like HTTP, FTP, SMTP, SSH, and more
- Detecting server crashes and performance issues
- Easy plugin integration
- Monitors entire business processes with a single tool
- Event handlers for proactive issue resolution

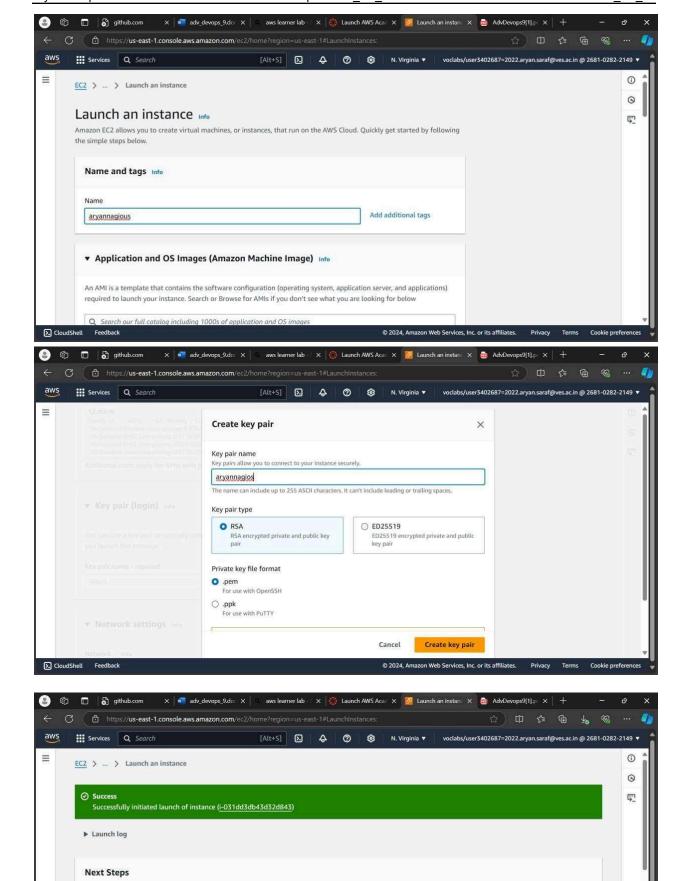
Nagios Architecture

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.



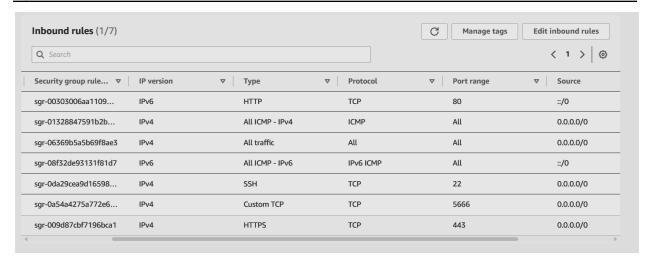
- 1. The scheduler is a component of the server part of Nagios. It sends a signal to execute the plugins at the remote host.
- 2. The plugin gets the status from the remote host
- 3. The plugin sends the data to the process scheduler

The process scheduler updates the GUI and notifications are sent to admins.



Q What would you like to do next with this instance, for example "create alarm" or "create backup"

< 1 2 3 4 5 6 >



C:\Users\harsh\OneDrive\Desktop\ADO

C:\Users\harsh\OneDrive\Desktop\ADO>ssh -i "harsh_padyal_09.pem" root@ec2-52-90-254-14.compute-1.amazonaws.com

C:\Users\harsh\OneDrive\Desktop\ADO>ssh -i "harsh_padyal_09.pem" root@ec2-52-90-254-14.compute-1.amazonaws.com The authenticity of host 'ec2-52-90-254-14.compute-1.amazonaws.com (52.90.254.14)' can't be established. ED25519 key fingerprint is SHA256:gwctOmy5JRo3yXqaTQqIJ5KTsuynPjQzwQXow7kUHms.

This key is not known by any other names

Are you sure you want to continue connecting (yes/no/[fingerprint])? yes

Warning: Permanently added 'ec2-52-90-254-14.compute-1.amazonaws.com' (ED25519) to the list of known hosts.

Package	Architecture	Version	Repository	Siz
 nstalling:				
gcc	x86_64	11.4.1-2.amzn2023.0.2	amazonlinux	32
nstalling dependencies:				
annobin-docs	noarch	10.93-1.amzn2023.0.1	amazonlinux	92
annobin-plugin-gcc	x86_64	10.93-1.amzn2023.0.1	amazonlinux	887
срр	x86_64	11.4.1-2.amzn2023.0.2	amazonlinux	10
gc	x86_64	8.0.4-5.amzn2023.0.2	amazonlinux	105
glibc-devel	x86_64	2.34-52.amzn2023.0.11	amazonlinux	27
glibc-headers-x86	noarch	2.34-52.amzn2023.0.11	amazonlinux	427
guile22	x86_64	2.2.7-2.amzn2023.0.3	amazonlinux	6.4
kernel-headers	x86_64	6.1.109-118.189.amzn2023	amazonlinux	1.4
libmpc	x86_64	1.2.1-2.amzn2023.0.2	amazonlinux	62
libtool-ltdl	x86_64	2.4.7-1.amzn2023.0.3	amazonlinux	38
libxcrypt-devel	x86_64	4.4.33-7.amzn2023	amazonlinux	32
make	x86_64	1:4.3-5.amzn2023.0.2	amazonlinux	534

Install 13 Packages

Complete!

[ec2-user@ip-172-31-2-207 ~]\$ sudo yum install gd gd-devel Last metadata expiration check: 0:02:22 ago on Sat Oct 12 09:34:48 2024.

Dependencies resolved.

Package 	Architecture	Version 	Repository	Size	
Installing:					
gd	x86_64	2.3.3-5.amzn2023.0.3	amazonlinux	139 k	
gd-devel	x86_64	2.3.3-5.amzn2023.0.3	amazonlinux	38 k	
Installing dependencies:					
brotli	x86_64	1.0.9-4.amzn2023.0.2	amazonlinux	314 k	
brotli-devel	x86_64	1.0.9-4.amzn2023.0.2	amazonlinux	31 k	
bzip2-devel	x86_64	1.0.8-6.amzn2023.0.2	amazonlinux	214 k	
cairo	x86_64	1.17.6-2.amzn2023.0.1	amazonlinux	684 k	
cmake-filesystem	x86_64	3.22.2-1.amzn2023.0.4	amazonlinux	16 k	
fontconfig	x86_64	2.13.94-2.amzn2023.0.2	amazonlinux	273 k	
fontconfig-devel	x86_64	2.13.94-2.amzn2023.0.2	amazonlinux	128 k	
fonts-filesystem	noarch	1:2.0.5-12.amzn2023.0.2	amazonlinux	9.5 k	
freetype	x86_64	2.13.2-5.amzn2023.0.1	amazonlinux	423 k	
freetype-devel	x86_64	2.13.2-5.amzn2023.0.1	amazonlinux	912 k	
glib2-devel	x86_64	2.74.7-689.amzn2023.0.2	amazonlinux	486 k	
google-noto-fonts-common	noarch	20201206-2.amzn2023.0.2	amazonlinux	15 k	
google-noto-sans-vf-fonts	noarch	20201206-2.amzn2023.0.2	amazonlinux	492 k	
graphite2	x86_64	1.3.14-7.amzn2023.0.2	amazonlinux	97 k	
graphite2-devel	x86_64	1.3.14-7.amzn2023.0.2	amazonlinux	21 k	

```
[ec2-user@ip-172-31-2-207 ~]$ sudo adduser -m nagios [ec2-user@ip-172-31-2-207 ~]$ sudo passwd nagios
Changing password for user nagios.
New password:
BAD PASSWORD: The password is shorter than 8 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[ec2-user@ip-172-31-2-207 ~]$ sudo groupadd nagcmd
[ec2-user@ip-172-31-2-207 ~]$ udo usermod -a -G nagcmd nagios
 -bash: udo: command not found
[ec2-user@ip-172-31-2-207 ~]$ sudo usermod -a -G nagcmd nagios
[ec2-user@ip-172-31-2-207 ~]$ sudo usermod -a -G nagcmd apache
[ec2-user@ip-172-31-2-207 ~]$ mkdir downloads
[ec2-user@ip-172-31-2-207 ~]$ cd downloads
[ec2_user@ip-172-31-2-207 downloads]$ wget http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
--2024-10-12 09:41:04-- http://prdownloads.sourceforge.net/sourceforge/nagios/nagios-4.0.8.tar.gz
Resolving prdownloads.sourceforge.net (prdownloads.sourceforge.net)... 204.68.111.105
Connecting to prdownloads.sourceforge.net (prdownloads.sourceforge.net)|204.68.111.105|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz [following] --2024-10-12 09:41:05-- http://downloads.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz
Resolving downloads.sourceforge.net (downloads.sourceforge.net)... 204.68.111.105
Reusing existing connection to prdownloads.sourceforge.net:80.
HTTP request sent, awaiting response... 302 Found
Location: http://excellmedia.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1 [following]
--2024-10-12 09:41:05-- http://excellmedia.dl.sourceforge.net/project/nagios/nagios-4.x/nagios-4.0.8/nagios-4.0.8/nagios-4.0.8.tar.gz?viasf=1
Resolving excellmedia.dl.sourceforge.net (excellmedia.dl.sourceforge.net)... 202.153.32.19, 2401:fb00:0:1fe:8000::5
Connecting to excellmedia.dl.sourceforge.net (excellmedia.dl.sourceforge.net)|202.153.32.19|:80... connected.
```

*** Configuration summary for nagios 4.0.8 08-12-2014 ***: General Options: Nagios executable: nagios Nagios user/group: nagios, nagios Command user/group: nagios, nagcmd Event Broker: yes Install \${prefix}: /usr/local/nagios Install \${includedir}: /usr/local/nagios/include/nagios Lock file: \${prefix}/var/nagios.lock Check result directory: \${prefix}/var/spool/checkresults Init directory: /etc/rc.d/init.d Apache conf.d directory: /etc/httpd/conf.d Mail program: /bin/mail Host OS: linux-gnu IOBroker Method: epoll 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-172-31-2-207 nagios-4.0.8]$ make all
cd ./base && make
make[1]: Entering directory '/home/ec2-user/downloads/nagios-4.0.8/base'
make[1]: Entering directory '/home/ec2-user/downloads/naglos-4.0.8/base'
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o nagios.o nagios.c
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o broker.o broker.c
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o nebmods.o nebmods.c
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o ../common/shared.o ../common/shared.c
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o nerd.o nerd.c
gcc -Wall -I.. -g -02 -DHAVE_CONFIG_H -DNSCORE -c -o query-handler.c
gcc -Wall -I.. -g -O2 -DHAVE_CONFIG_H -DNSCORE -c -o workers.o workers.c
In function 'get_wproc_list',
   inlined from 'get_worker' at workers.c:224:12:
workers.c:209:17: warning: '%s' directive argument is null [-Wformat-overflow=]
                                                                                   "Found specialized worker(s) for '%s'", (slash && *slash != '/') ? slash : cmd
   209 l
commands.c: In function 'process_passive_service_check':
commands.c:2247:19: warning: assignment discards 'const' qualifier from pointer target type [-Wdiscarded-qualifiers]
                       cr.source = command worker.source name:
commands.c: In function 'process_passive_host_check':
                                      g: assignment discards 'const' qualifier from pointer target type [-Wdiscarded-qualifiers]
commands.c:2339:19: wa
                       cr.source = command worker.source name:
 2339 l
```

ip-172-31-39-112 nagios-4.0.8]\$ sudo make install && make install intering directory '/home/ec2-user/downloads/nagios-4.0.8/base ill-basic

```
[ec2-user@ip-172-31-2-207 nagios-4.0.8]$ sudo make install-init
/usr/bin/install -c -m 755 -d -o root -g root /etc/rc.d/init.d
/usr/bin/install -c -m 755 -d root -g root /etc/rc.d/init.d
/usr/bin/install -c -m 755 -o root -g root daemon-init /etc/rc.d/init.d/nagios

*** Init script installed ***

[ec2-user@ip-172-31-2-207 nagios-4.0.8]$ 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/bipcts
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/nagios.cfg /usr/local/nagios/etc/resource.cfg
/usr/bin/install -c -b -m 664 -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/etc/objects/templates.cf

g
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/commands.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/contacts.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/contacts.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/timeperiods.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/localhost.cfg /usr/local/nagios/etc/objects/contacts.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/windows.cfg /usr/local/nagios/etc/objects/windows.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/windows.cfg /usr/local/nagios/etc/objects/pinter.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/switch.cfg /usr/local/nagios/etc/objects/pinter.cfg
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/switch
```

[ec2-user@ip-172-31-39-112 nagios-4.0.8]\$ sudo make install-commandmode /usr/bin/install -c -m 775 -o nagios -g nagios -d /usr/local/nagios/var/rw chmod g+s /usr/local/nagios/var/rw

*** External command directory configured ***

[ec2-user@ip-172-31-39-112 nagios-4.0.8]\$ sudo nano /usr/local/nagios/etc/object s/contacts.cfg
[ec2-user@ip-172-31-39-112 nagios-4.0.8]\$ sudo make install-webconf /usr/bin/install -c -m 644 sample-config/httpd.conf /etc/httpd/conf.d/nagios.con

```
/usr/local/nagios/etc/objects/contacts.cfg
# CONTACTS
# 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
                            generic-contact
                                             ; Inherit default values from generic-contact template (defined above)
     use
     alias
                            Nagios Admin
                                             : Full name of user
/usr/bin/install -c -b -m 664 -o nagios -g nagios sample-config/template-object/switch.cfg /usr/local/nagios/etc/objects/switch.cfg
*** 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.
[ec2-user@ip-172-31-2-207 nagios-4.0.8]$ sudo make install-commandmode
/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-172-31-2-207 nagios-4.0.8]$ sudo nano /usr/local/nagios/etc/objects/contacts.cfg
[ec2-user@ip-172-31-2-207 nagios-4.0.8]$ sudo make install-webconf
/usr/bin/install -c -m 644 sample-config/httpd.conf /etc/httpd/conf.d/nagios.conf
*** Nagios/Apache conf file installed ***
[ec2-user@ip-172-31-2-207 nagios-4.0.8]$ sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
[ec2-user@ip-172-31-2-207 nagios-4.0.8]$
[ec2-user@ip-172-31-2-207 downloads]$ ls
nagios-4.0.8 nagios-4.0.8.tar.gz nagios-plugins-2.0.3.tar.gz
[ec2-user@ip-172-31-2-207 downloads]$ tar nagios-plugins-2.0.3.tar.gz
tar: Old option 'g' requires an argument.
Try 'tar --help' or 'tar --usage' for more information.
[ec2-user@ip-172-31-2-207 downloads]$ ls
nagios-4.0.8 nagios-4.0.8.tar.gz nagios-plugins-2.0.3.tar.gz
[ec2-user@ip-172-31-2-207 downloads]$ tar zxvf nagios-plugins-2.0.3.tar.gz
nagios-plugins-2.0.3/
nagios-plugins-2.0.3/perlmods/
nagios-plugins-2.0.3/perlmods/Config-Tiny-2.14.tar.gz
nagios-plugins-2.0.3/perlmods/parent-0.226.tar.gz
nagios-plugins-2.0.3/perlmods/Test-Simple-0.98.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile.in
nagios-plugins-2.0.3/perlmods/version-0.9903.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile.am
nagios-plugins-2.0.3/perlmods/Module-Runtime-0.013.tar.gz
nagios-plugins-2.0.3/perlmods/Module-Metadata-1.000014.tar.gz
nagios-plugins-2.0.3/perlmods/Params-Validate-1.08.tar.gz
nagios-plugins-2.0.3/perlmods/Class-Accessor-0.34.tar.gz
nagios-plugins-2.0.3/perlmods/Try-Tiny-0.18.tar.gz
nagios-plugins-2.0.3/perlmods/Module-Implementation-0.07.tar.gz
nagios-plugins-2.0.3/perlmods/Makefile
nagios-plugins-2.0.3/perlmods/Perl-OSType-1.003.tar.gz
nagios-plugins-2.0.3/perlmods/install_order
nagios-plugins-2.0.3/perlmods/Nagios-Plugin-0.36.tar.gz
```

```
[ec2-user@ip-172-31-2-207 nagios-plugins-2.0.3]$ sudo /usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg

Nagios Core 4.0.8
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 08-12-2014
License: GPL

Website: http://www.nagios.org
Reading configuration data...
Error in configuration file '/usr/local/nagios/etc/nagios.cfg' - Line 452 (Check result path '/usr/local/nagios/var/spool/checkresults' is not a valid directory)
Error processing main config file!

[ec2-user@ip-172-31-2-207 nagios-plugins-2.0.3]$
```

[ec2-user@ip-172-31-39-112 nagios-plugins-2.0.3]\$ sudo nano /usr/local/nagios/etc/nagios.c [ec2-user@ip-172-31-39-112 nagios-plugins-2.0.3]\$ sudo chown -R nagios:nagios /usr/local/nspool/checkresults

```
[Unit]
Description=Nagios Service
After=network.target

[Service]
User=nagios
Group=nagios
ExecStart=/usr/local/nagios/bin/nagios /usr/local/nagios/etc/nagios.cfg
[Install]
WantedBy=multi-user.target
```

[ec2-user@ip-172-31-39-112 nagios-plugins-2.0.3]\$ ls /usr/local/nagios/bin/nagios nagiostats
[ec2-user@ip-172-31-39-112 nagios-plugins-2.0.3]\$ sudo /usr/local/nagios/bin/nagios /usr/ls/etc/nagios.cfg

```
Nagios Core 4.4.9
Copyright (c) 2009-present Nagios Core Development Team and Community Contributors
Copyright (c) 1999-2009 Ethan Galstad
Last Modified: 2022-11-16
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...
Checking objects...
        Checked 8 services.
        Checked 1 hosts.
        Checked 1 host groups.
        Checked 0 service groups.
        Checked 1 contacts.
        Checked 1 contact groups.
        Checked 24 commands.
        Checked 5 time periods.
        Checked 0 host escalations.
        Checked 0 service escalations.
Checking for circular paths...
```

```
Things look okay - No serious problems were detected during the pre-flight check
ec2-user@ip-172-31-5-147 nagios-plugins-2.0.3]$ sudo service nagios start
starting nagios (via systemctl):
                                                                 [ OK ]
ec2-user@ip-172-31-5-147 nagios-plugins-2.0.3]$ sudo systemctl status nagios
nagios.service - Nagios Core 4.4.9
     Loaded: loaded (/usr/lib/systemd/system/nagios.service; enabled; preset: disabled)
    Active: active (running) since Sat 2024-10-12 13:09:24 UTC; 8s ago
      Docs: https://www.nagios.org/documentation
   Process: 93966 ExecStartPre=/usr/local/nagios/bin/nagios -v /usr/local/nagios/etc/nagios.cfg (code=exited, status=
   Process: 93967 ExecStart=/usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg (code=exited, status=0/5
  Main PID: 93968 (nagios)
     Tasks: 6 (limit: 1112)
     Memory: 5.6M
       CPU: 291ms
    CGroup: /system.slice/nagios.service
               -93968 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
              -93969 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-93970 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
-93971 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
               -93972 /usr/local/nagios/bin/nagios --worker /usr/local/nagios/var/rw/nagios.qh
              93973 /usr/local/nagios/bin/nagios -d /usr/local/nagios/etc/nagios.cfg
>ct 12 13:09:24 ip-172-31-5-147.ap-south-1.compute.internal nagios[93968]: qh: Socket '/usr/local/nagios/var/rw/nagios
oct 12 13:09:24 ip-172-31-5-147.ap-south-1.compute.internal nagios[93968]: qh: core query handler registered
Oct 12 13:09:24 ip-172-31-5-147.ap-south-1.compute.internal nagios[93968]: qh: echo service query handler registered
Oct 12 13:09:24 ip-172-31-5-147.ap-south-1.compute.internal nagios[93968]: qh: help for the query handler registered
ot 12 13:09:24 ip-172-31-5-147.ap-south-1.compute.internal nagios[93968]: wproc: Successfully registered manager as (
 Sign in to access this site
                                                                                   Authorization required by http://13.232.100.28
Your connection to this site is not secure
```



me nagiosadmin

CONCLUSION:

Thus, we learned about Nagios and successfully set it up on our Linux machine. Nagios proves to be an effective tool for continuous monitoring, helping to detect and resolve issues quickly, ensuring system reliability and smooth operations.