

Part 4 - Install Nagios

Install the Nagios Server

In this step, we will install the required software to use nagios which utilises the Round Robin Database tool (RRDtool). For more information refer to <https://www.nagios.org>

The steps to complete this section are:

- Update software
- Install required software
- Install nagios
- Configure nagios
- Add targets to monitor

To install the required files open a terminal window and ssh to the server that will be used to install nagios.

```
ssh apnic@192.168.30.10
```

NOTE: Type `yes` if asked about wanting to continue connecting

Password = `training`

Update the software repository for Ubuntu

```
sudo apt-get update && sudo apt-get -y dist-upgrade
```

Password = `training`

Add a new repository for an older version of php. This step can be skipped if the LibreNMS lab was completed.

```
sudo add-apt-repository ppa:ondrej/php
```

Please **enter** to continue to add the repo.

Install required software

```
sudo apt-get install -y autoconf gcc libc6 make wget unzip apache2 php \
libapache2-mod-php8.1 libgd-dev libmcrypt-dev libssl-dev bc \
gawk dc build-essential snmp libnet-snmp-perl gettext
```

Download the nagios source code and extract the tar file.

```
cd /tmp
wget -O nagioscore.tar.gz https://github.com/NagiosEnterprises/nagioscore/archive/nagios-4.4.5.tar.gz
tar xzf nagioscore.tar.gz
```

Before building the Nagios source code, configure and specify the Apache web server configuration directory

```
cd /tmp/nagioscore-nagios-4.4.5/
sudo ./configure --with-httpd-conf=/etc/apache2/sites-enabled
```

```
*** Configuration summary for nagios 4.4.5 2019-08-20 ***:

General Options:
-----
Nagios executable:  nagios
Nagios user/group:  nagios,nagios
Command user/group: nagios,nagios
Event Broker:      yes
Install ${prefix}:  /usr/local/nagios
Install ${includedir}: /usr/local/nagios/include/nagios
Lock file:         /run/nagios.lock
Check result directory: /usr/local/nagios/var/spool/checkresults
Init directory:    /lib/systemd/system
Apache conf.d directory: /etc/apache2/sites-enabled
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):

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

apnic@group30:/tmp/nagioscore-nagios-4.4.5$
```

Compile nagios with this command:

```
sudo make all
```

Create a Nagios user and group. These will be used to run the Nagios process:

```
sudo make install-groups-users
```

Add the nagios user to the www-data group

```
sudo usermod -a -G nagios www-data
```

Run these make commands to install Nagios binary files, service files, and its sample configuration files:

```
sudo make install
sudo make install-daemoninit
sudo make install-commandmode
sudo make install-config
```

To use Apache to serve Nagios' web interface, run the following to install the Apache configuration files and configure its settings:

```
sudo make install-webconf
```

Enable the Apache rewrite and cgi modules with the a2enmod command:

```
sudo a2enmod rewrite
sudo a2enmod cgi
```

Create an Apache user account that can be used to log into Nagios.

```
sudo htpasswd -c /usr/local/nagios/etc/htpasswd.users nagiosadmin
```

Password = training

This command will create a user account called **nagiosadmin** and will be prompted to provide a password for the account. Remember the password, as it will be needed to access the Nagios web interface.

```

apnic@group30: /tmp/nagioscore-nagios-4.4.5
File Edit View Search Terminal Help
apnic@group30:/tmp/nagioscore-nagios-4.4.5$ sudo make install-webconf
/usr/bin/install -c -m 644 sample-config/httpd.conf /etc/apache2/sites-enabled/n
agios.conf
if [ 0 -eq 1 ]; then \
    ln -s /etc/apache2/sites-enabled/nagios.conf /etc/apache2/sites-enabled/
nagios.conf; \
fi

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

apnic@group30:/tmp/nagioscore-nagios-4.4.5$ sudo a2enmod rewrite
sudo a2enmod cgiEnabling module rewrite.
To activate the new configuration, you need to run:
    systemctl restart apache2
apnic@group30:/tmp/nagioscore-nagios-4.4.5$ sudo a2enmod cgi
Enabling module cgi.
To activate the new configuration, you need to run:
    systemctl restart apache2
apnic@group30:/tmp/nagioscore-nagios-4.4.5$ sudo htpasswd -c /usr/local/nagios/e
tc/htpasswd.users nagiosadmin
New password:
Re-type new password:
Adding password for user nagiosadmin
apnic@group30:/tmp/nagioscore-nagios-4.4.5$

```

Restart Apache to load the new configuration.

```
sudo systemctl restart apache2
```

Access the Web Interface

Nagios is now running, to confirm this you need to log into the Nagios Web Interface. Point the web browser to the ip address or Fully Qualified Domain Name (FQDN) of your Nagios Core server.

Use Firefox and browse to the Nagios HTTP server <http://group30-server.apnictraining.net/nagios>

Username = nagiosadmin Password = training

Only the Nagios Core engine has been installed. For the next section it is necessary to install some of the Nagios Plugins. The official Nagios Plugins package contains over 50 plugins that allow you to monitor basic services such as uptime, disk usage, swap usage, NTP, and others. For more information refer to <https://www.nagios.org/downloads/nagios-plugins/>

To install the required plugins, return to the open terminal window to download and extract the archive.

```

cd /tmp
wget --no-check-certificate -O nagios-plugins.tar.gz https://github.com/nagios-plugins/nagios-plugins/archive/release-2.2.1.tar.
tar xzf nagios-plugins.tar.gz

```

Compile and install the plugins package.

```
cd /tmp/nagios-plugins-release-2.2.1/  
sudo ./tools/setup
```

Run the configure script to get ready to install Nagios plugin packages.

```
sudo ./configure
```

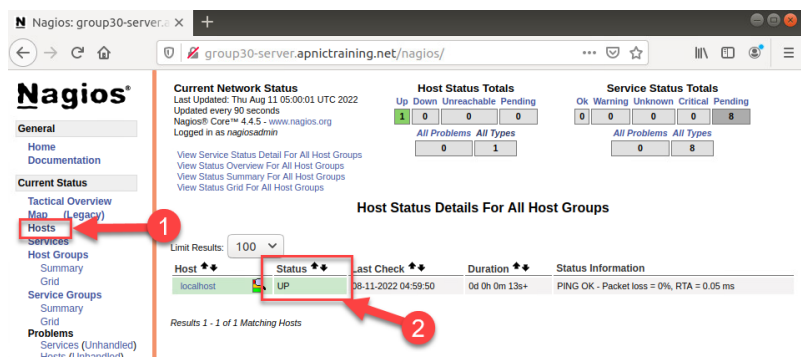
Run the make script and install Nagios plugin packages.

```
sudo make && sudo make install
```

Restart the nagios service

```
sudo systemctl restart nagios
```

Use Firefox and browse to the Nagios HTTP server <http://group30-server.apnictraining.net/nagios> On the left-hand menu select host and check the status of **localhost**.



Configure where nagios will look for configuration files for each server that will be monitored. Return to the open terminal window and type the following:

```
grep -n "\#cfg_dir" /usr/local/nagios/etc/nagios.cfg  
sudo sed -i 's/\#cfg_dir/cfg_dir/' /usr/local/nagios/etc/nagios.cfg  
cd /usr/local/nagios/etc/  
sudo mkdir servers printers switches routers  
cd ~
```

To monitor any hosts with Nagios, add configuration files for each host specifying what to monitor into the **/usr/local/nagios/etc/servers** directory. Printers, switches and routers can also be monitored the same way.

On the Nagios server, create a new configuration file for each of the remote hosts that is to be monitored. The following example is to monitor core-router.apnictraining.net

Create a new file called **core-router.cfg** and copy to /usr/local/nagios/etc/servers

```
cat > ~/core-router.cfg <<EOL
```

```
define host {  
    use                generic-host  
    host_name          core-router  
    alias              core-router  
    address            core-router.apnictraining.net  
    check_command       check-host-alive  
    max_check_attempts 5  
    check_period       24x7  
    notification_interval 30  
    notification_period 24x7  
}
```

EOL

```
sudo cp ~/core-router.cfg /usr/local/nagios/etc/servers
```

If Part 1 SNMP Lab was skipped, the router will need to be setup before continuing to the next section - [Configure SNMP on a Cisco device](#)

Restart the nagios service

```
sudo systemctl restart nagios
```

After several minutes, Nagios will check the new hosts.

The screenshot shows the Nagios web interface in a browser window. The left sidebar has a red circle with the number '1' pointing to the 'Hosts' link under the 'Current Status' section. The main content area shows the 'Host Status Details For All Host Groups' table, which has a red circle with the number '2' pointing to it. The table lists two hosts: 'core-router' and 'localhost', both with a status of 'UP'. The 'core-router' row is highlighted with a red box. The status information for 'core-router' is 'PING OK - Packet loss = 0%, RTA = 0.80 ms'.

Host	Status	Last Check	Duration	Status Information
core-router	UP	08-12-2022 00:24:27	0d 0h 0m 14s+	PING OK - Packet loss = 0%, RTA = 0.80 ms
localhost	UP	08-12-2022 00:20:37	0d 0h 0m 14s+	PING OK - Packet loss = 0%, RTA = 0.05 ms

Create a new file called **core-switch.cfg** and copy to /usr/local/nagios/etc/servers

```
cat > ~/core-switch.cfg <<EOL
```

```
define host {  
    use                generic-host  
    host_name          core-switch  
    alias              core-switch  
    address            core-switch.apnictraining.net  
    check_command      check-host-alive  
    max_check_attempts 5  
    check_period       24x7  
    notification_interval 30  
    notification_period 24x7  
}
```

EOL

```
sudo cp ~/core-switch.cfg /usr/local/nagios/etc/servers
```

Create a new file called **group30-router.cfg** and copy to /usr/local/nagios/etc/servers

```
cat > ~/group30-router.cfg <<EOL
```

```
define host {  
    use                generic-host  
    host_name          group30-router  
    alias              group30-router  
    address            group30-router.apnictraining.net  
    check_command      check-host-alive  
    max_check_attempts 5  
    check_period       24x7  
    notification_interval 30  
    notification_period 24x7  
}
```

EOL

```
sudo cp ~/group30-router.cfg /usr/local/nagios/etc/servers
```

Restart the nagios service

```
sudo systemctl restart nagios
```

Use Firefox and browse to the Nagios HTTP server <http://group30-server.apnictraining.net/nagios> and confirm the new hosts can be seen.

The screenshot shows the Nagios web interface for a server named 'group30-server'. The interface includes a sidebar with navigation links like 'General', 'Current Status', 'Tactical Overview', 'Map', 'Hosts', 'Services', 'Host Groups', 'Service Groups', 'Problems', and 'Quick Search'. The main content area displays 'Current Network Status' (Last Updated: Fri Aug 12 00:28:49 UTC 2022), 'Host Status Totals' (Up: 4, Down: 0, Unreachable: 0, Pending: 0), and 'Service Status Totals' (Ok: 8, Warning: 0, Unknown: 0, Critical: 0, Pending: 0). Below these, there is a section for 'Host Status Details For All Host Groups' with a table listing hosts and their status.

Host	Status	Last Check	Duration	Status Information
core-router	UP	08-12-2022 00:24:27	0d 0h 1m 48s+	PING OK - Packet loss = 0%, RTA = 0.80 ms
core-switch	UP	08-12-2022 00:27:03	0d 0h 1m 48s+	PING OK - Packet loss = 0%, RTA = 0.99 ms
group30-router	UP	08-12-2022 00:28:16	0d 0h 1m 48s+	PING OK - Packet loss = 0%, RTA = 0.61 ms
localhost	UP	08-12-2022 00:25:37	0d 0h 8m 12s	PING OK - Packet loss = 0%, RTA = 0.06 ms

Results 1 - 4 of 4 Matching Hosts

In previous steps Nagios has been configured to monitor the uptime. Nagios will only tell if the host is up or down.

To monitor a service rather than a host is up or down, return to the open terminal window and type the following:

Create a new file called **group30-server.cfg** and copy to `/usr/local/nagios/etc/servers`

```
cat > ~/group30-server.cfg <<EOL

define host {
    use                generic-host
    host_name          group30-server
    alias              group30-server
    address            group30-server.apnictraining.net
    check_command      check-host-alive
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
}

define service {
    use                generic-service
    host_name          group30-server
    service_description HTTP
    check_command      check_http
}

EOL

sudo cp ~/group30-server.cfg /usr/local/nagios/etc/servers
```

The use generic-service directive tells Nagios to inherit the values of a service template called generic-service , which is predefined by Nagios.

Restart the nagios service

```
sudo systemctl restart nagios
```

Use Firefox and browse to the Nagios HTTP server <http://group30-server.apnictraining.net/nagios> and open the services tab to verify.

The screenshot shows the Nagios web interface. On the left sidebar, the 'Services' link is highlighted with a red circle and the number '1'. The main content area displays the 'Service Status Details For All Hosts' table, which is also highlighted with a red circle and the number '2'. The table lists various services for the 'group30-server' host, including HTTP, Current Load, Users, PING, Root Partition, SSH, Swap Usage, and Total Processes, all with a status of 'OK'.

Host	Service	Status	Last Check	Duration	Attempt	Status Information
group30-server	HTTP	OK	08-12-2022 00:34:29	0d 0h 11m 43s+	1/3	HTTP OK: HTTP/1.1 200 OK - 11192 bytes in 0.001 second response time
localhost	Current Load	OK	08-12-2022 00:41:12	0d 0h 21m 55s	1/4	OK - load average: 0.00, 0.07, 0.16
	Current Users	OK	08-12-2022 00:41:50	0d 0h 21m 17s	1/4	USERS OK - 1 users currently logged in
	HTTP	OK	08-12-2022 00:42:27	0d 0h 20m 40s	1/4	HTTP OK: HTTP/1.1 200 OK - 11192 bytes in 0.001 second response time
	PING	OK	08-12-2022 00:38:05	0d 0h 20m 2s	1/4	PING OK - Packet loss = 0%, RTT = 0.06 ms
	Root Partition	OK	08-12-2022 00:38:42	0d 0h 19m 25s	1/4	DISK OK - free space: / 5056 MB (26.39% inode=69%)
	SSH	OK	08-12-2022 00:39:20	0d 0h 18m 47s	1/4	SSH OK - OpenSSH_8.2p1 Ubuntu-4ubuntu0.2 (protocol 2.0)
	Swap Usage	OK	08-12-2022 00:39:57	0d 0h 18m 10s	1/4	SWAP OK - 100% free (472 MB out of 472 MB)
	Total Processes	OK	08-12-2022 00:40:35	0d 0h 17m 32s	1/4	PROCS OK: 18 processes with STATE = RSZDT

The keyword parents define the parent-child relationship between nodes. For example as per the lab topology below is the connectivity diagram:

```
group30-server -> group30-router -> core-switch -> core-router
```

Where core-router is parent of core-switch and core-switch is parent of groupX-router.

To update each of the nodes configuration with the details about the parent link. Type the following commands:

```
sudo sed -i '/n\_period/a \ \ \ \ parents' core\-router' /usr/local/nagios/etc/servers/core-switch.cfg
sudo sed -i '/n\_period/a \ \ \ \ parents' core\-switch' /usr/local/nagios/etc/servers/group30-router.cfg
sudo sed -i '/n\_period/a \ \ \ \ parents' group30\-router' /usr/local/nagios/etc/servers/group30-server.cfg
```

You can edit the files with vi or nano and add the line at the end of the file instead of using the sed command. To view the changes

```
cd /usr/local/nagios/etc/servers/
cat *.cfg
```

Look for the line that contains the word **parents**.

```

apnic@group30:~$ cd /usr/local/nagios/etc/servers/
apnic@group30:/usr/local/nagios/etc/servers$ cat *.cfg

define host {
    use                generic-host
    host_name          core-router
    alias              core-router
    address            core-router.apnictraining.net
    check_command      check-host-alive
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
}

define host {
    use                generic-host
    host_name          core-switch
    alias              core-switch
    address            core-switch.apnictraining.net
    check_command      check-host-alive
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
    parents            core-router
}

define host {
    use                generic-host
    host_name          group30-router
    alias              group30-router
    address            group30-router.apnictraining.net
    check_command      check-host-alive
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
    parents            core-switch
}

define host {
    use                generic-host
    host_name          group30-server
    alias              group30-server
    address            group30-server.apnictraining.net
    check_command      check-host-alive
    max_check_attempts 5
    check_period       24x7
    notification_interval 30
    notification_period 24x7
    parents            group30-router
}

define service {
    use                generic-service
    host_name          group30-server
    service_description HTTP
    check_command      check_http
}

apnic@group30:/usr/local/nagios/etc/servers$

```

Restart the nagios service

```
sudo systemctl restart nagios
```

Use Firefox and browse to the Nagios HTTP server

<http://group30-server.apnictraining.net/nagios> and open the map tab to verify.

Nagios: group30-server... X

group30-server.apnictraining.net/nagios/

Nagios®

General

[Home](#)

[Documentation](#)

Current Status

Tactical Overview

Map (Legacy)

Hosts

Services

Host Groups

Summary

Grid

Service Groups

Summary

Grid

Problems

Services (Unhandled)

Hosts (Unhandled)

Network Outages

Quick Search:

Reports

Name: **core-router**

Alias: **core-router**

Address: **core-router.apnictraining.net**

State: **up**

State Duration: **0d 0h 21m 49s**

Last Status Check: **Fri Aug 12 10:44:27 2022**

Last State Change: **Fri Aug 12 10:24:27 2022**

Parent Host(s): **None (This is a root host)**

Immediate Child Host(s): **1**

Services:

Click node to collapse/expand its children

Shift-click node to make it the root

Please click the Next button to begin Part 5 of this Lab.