

PROCEDURE FOR THE INSTALLATION OF THE NAGIOS NETWORK MONITORING PROGRAM

Section One – Installation of Host Server Programs

I. Obtain Nagios

1. Download the Nagios core program from the appropriate website. At this writing, the URL for the website is <http://www.nagios.org>.
2. Obtain the plug-ins that Nagios uses to monitor the network. **This is an important point:** The core program is strictly the engine of the program, and does not have any monitoring functionality of its own. *The plug-in's are necessary for the network monitoring that will be taking place.*
3. The various nodes on the network will need a client program in order for them to be able to communicate with the Nagios application server. There are two such programs: NSClient (Windows) and NRPE (Linux). The homepage of NSClient is <http://nsclient.ready2run.nl>, while NRPE can be downloaded from the Nagios homepage. Refer to Appendix A for the documentation associated with the client software.
4. Periodically, there will be updates to the core program and various additions to the application. After installation is complete, regular checks on the Nagios and its associated websites is recommended.

2. Prerequisite Installs

1. Download and install the Apache web server from the www.apache.org website. Nagios uses a web interface for the front-end of the program. Additionally, be prepared to make modifications to the httpd.conf file to accommodate Nagios. An additional program that can be downloaded is the Comanche user-interface that serves as a front-end for the Apache program. The program can be downloaded from www.comanche.org. Refer to the documentation that comes with the download for proper installation.
2. Download and install the open-source MySQL database program from www.mysql.org. Certain aspects of Nagios use MySQL as a means to better organize data for the program. Refer to the documentation that comes with the download for proper installation.

3. Installing Nagios

1. Unpack the distribution file that was downloaded from the Internet. There are two commands.
A `gunzip nagios-version number.tar.gz`
B `tar -xvf nagios-version number.tar`

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Note: If the zip version of the program was downloaded, the syntax would be the following:

`Unzip nagios-version number.zip`

2. Create the installation directory for the program. The root or sudo user account should be used when this and future steps are done to insure there are no permissions issues later during the installation. The syntax to use is:

`mkdir /usr/local/nagios`

3. Create the User and Group associated with the program. Nagios has its own user account and private group. The command shown will accomplish both:

`adduser nagios`

4. Run the configure script. This shell script will automatically create the necessary directory structure for the program. The generic version of the script is the following

`./configure --prefix=prefix --with-cgiurl=cgiurl --with-htmurl=htmurl
--with-nagios-user=someuser --with-nagios-grp=somegroup`

- Replace ***prefix*** with the installation directory that was created previously. (the default is /usr/local/nagios)
- Replace ***cgiurl*** with the actual URL that will be used for accessing the CGI's (the default is /cgi-bin/nagios) **Do not append a slash at the end of the URL.**
- Replace ***htmurl*** with the actual URL to be used when accessing the html for the main interface and documentation (the default is /nagios)
- Replace ***someuser*** with the name of the user on the system that will be used for setting permissions on the installed files. (the default is nagios)
- Replace ***somegroup*** with the name of the group on the system that will be used for setting permissions on the installed files. (the default is nagios)

5. Compile the binaries. These are the executable files needed for Nagios' operation. The command syntax is:

`make all`

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6. Install the Binaries and HTML Files. After the binaries are compiled (created) the next step is to actually install them in their appropriate directories. This is coupled with doing the same for the html files. The command to accomplish this task is:

make install

7. Install the Init Script. This is the startup script used by Nagios to automatically start the program upon system boot. The script is created in `/etc/rc.d/init.d/nagios`. The script can be modified to reflect the correct paths for the operating system and Nagios installation. The command syntax is:

make install-init

Refer to Appendix B for the complete syntax of the script.

8. Verify the directory structure of Nagios is correct. The location of the program, by default, is `/usr/local/nagios`. Executing the command `ls -l` will provide a detailed view of the infrastructure. The directory structure for Nagios should be the following:

Sub-Directory	Contents
<code>bin/</code>	Nagios core program
<code>etc/</code>	Main , resource , object , and CGI configuration files should be put here

http://www.nagios.org/docs/1_0/installing.html (2 of 3) [5/14/2002 4:16:01 PM]

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<code>sbin/</code>	CGIs
<code>share/</code>	HTML files (for web interface and online documentation)
<code>var/</code>	Empty directory for the log file

9. Install the plug-in's that are associated with Nagios. The procedure to install the plug-ins is similar to that of the core program. Refer to Appendix C for the documentation associated with the plug-ins.

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10. Set up the Web Interface for Nagios. As mentioned previously, the `httpd.conf`, main configuration, file for Apache will need to be modified in order for Nagios to work. It is recommended that an original file be kept intact in the event of a problem with Apache and/or Nagios. The simplest way to save an original version of the file is to copy the file with the same name and add a `.orig` suffix at the end. This can be accomplished by going to the appropriate directory where the conf file is located, for Apache 2 the location is `/usr/local/apache2/conf`, and make the change there. For example:

```
cp -pr httpd.conf httpd.conf.orig
```

11. After an original copy is made an alias for the CGI's needs to be made. The default installation expects to find them accessible at `http://machinename/nagios/cgi-bin/`. The following lines should be added to the `httpd.conf` file for this to happen:

```
ScriptAlias /nagios/cgi-bin/ /usr/local/nagios/sbin/  
<Directory "/usr/local/nagios/sbin/">  
    AllowOverride AuthConfig  
    Options ExecCGI  
    Order allow,deny  
    Allow from all  
</Directory>
```

12. The following entries should be added to the `httpd.conf` file in order for the HTML files to be accessible via the web server.

```
Alias /nagios/ usr/local/nagios/share/  
<Directory "/usr/local/nagios/share">  
    Options None  
    AllowOverride AuthConfig  
    Order allow,deny  
    Allow from all  
</Directory>
```

The entries shown above will allow for the viewing of the HTML web interface and documentation. The alias should be the same value that was entered for the `--with-htmurl` argument in the `configure` script. **The default is `/nagios/`.**

Important: The `Alias` directive must come *after* the `ScriptAlias` directive for the CGI's. If it doesn't users will be confronted with a 404 error when attempting to access the CGI's.

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13. After the directive entries have been entered, it is necessary for Apache to default to the Nagios CGI's as opposed to its defaults. The httpd.conf file contains a section for Apache's CGI's. Included in the file is the notation that the default setting /usr/local/apache2/cgi-bin should be changed to whatever the ScriptAliased CGI directory is if it is so configured for an application. The simplest way to insure the Nagios CGI's are referenced is to comment out the entire default directive. See below:

Excerpt from a typical httpd.conf file:

```
# "/usr/local/apache2/cgi-bin" should be changed to whatever your
# ScriptAliased CGI directory exists, if you have that configured.
#
# <Directory "/usr/local/apache2/cgi-bin">
#   AllowOverride None
#   Options None
#   Order allow,deny
#   Allow from all
# </Directory>
```

The above excerpt shows the default cgi-bin directive commented out. Appendix D provides the entire httpd.conf file with the changes made while Appendix E lists the file in its original format.

14. After the changes have been made to the httpd.conf file, the web server will need to be rebooted for the changes to go into effect. There are two commands that can be used to do this:

- A. `/usr/local/apache2/bin/apachectl restart`
- B. `/etc/rc.d/init.d/httpd restart`

15. Verify the changes that have been made are correct by pointing a web browser at <http://yourmachine/nagios>. If the web interface is displayed, then the configurations are correct. It is important to note the CGI's will not display information at this point.

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16. Configure Web Authentication by enabling access for specific users and/or groups to the CGI's.

A. The first step is to make sure the httpd.conf file contains the AuthOverride AuthConfig statement for the Nagios CGI-BIN directory. If it does not, the following entry should be added and the web server should be subsequently rebooted.

```
<Directory /usr/local/nagios/sbin>  
AllowOverride AuthConfig  
order allow,deny  
allow from all  
Options ExecCGI  
</Directory>
```

If authentication for access to the HTML pages in Nagios is desired, the following should also be added to the httpd.conf file.

```
<Directory /usr/local/nagios/share>  
AllowOverride AuthConfig  
order allow,deny  
allow from all  
</Directory>
```

B. The second step is to create a file named .htaccess in the root of the CGI, and optionally HTML, directory. The defaults for Nagios is /usr/local/nagios/sbin and /usr/local/nagios/share respectively. The file(s) should have similar to the following:

```
AuthName "Nagios Access"  
AuthType Basic  
AuthUserFile /usr/local/nagios/etc/htpasswd.users  
require valid-user
```

Refer to Appendix F for the complete syntax of the file.

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C. Set up authenticated users for Nagios. Use the `htpasswd` command that is bundled with Apache. Running the program will create a new file called `htpasswd.users` in the `/usr/local/nagios/etc` directory. While running the program, a password will be requested to be associated with users who will be authenticating to the web server. The example below shows the syntax of the command when entering the `nagiosadmin` user.

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

The process can be continued to add more users as needed to the list of authenticated users. The syntax used for adding more users is similar to the one shown above except the `-c` option should not be used. This option actually creates the file, and using it again would overwrite the existing file with another one. Hence, the correct syntax for additional users would be:

```
htpasswd /usr/local./nagios/etc/htpasswd.users username
```

D. Enable authentication and authorization functionality to the CGI files. This is accomplished by editing the `cgi.cfg` file. The `user_authentication` variable should be modified to a non-zero value (typically 1) to activate the basic feature. The correct syntax is the following:

```
use_authentication=1
```

Once this is complete, it is necessary to remove the comment (`#`) symbol from the `authorized_for_servicename` lines and add the usernames created in the `htpasswd.users` file at the end of the lines. Each one of these authorization lines allow the user who is logging into the machine to be able to view from the web browser the information that would be displayed on the screen. If the username is not entered, or if the authorization line was left commented out, the screen in question would display a message indicating the permissions were not valid. Refer to Appendix G for the modified and original versions of the CGI.CFG files for further information.

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17. Verify Nagios is configured properly. Affectionately known as the sanity check, a shell command is executed to verify that all configuration settings are in order. Nagios automatically runs a “pre-flight” check before it starts monitoring, but the option is also available to run this check manually before starting the program. This is accomplished by adding the `-v` command line argument as follows:

```
/usr/local/nagios/bin/nagios -v <main configuration file>
```

The pathname of the main configuration file typically is:

```
/usr/local/nagios/etc/nagios.cfg
```

18. There are four methods for starting Nagios:

- A. Manually as a foreground process
- B. Manually as a background process
- C. Manually as a daemon
- D. Automatically at system boot

For the purposes of this installation procedure, the focus will be on items C and D. Further information of the other startup methods can be found in the Nagios Documentation guide.

C. Running Nagios in daemon mode requires the inclusion of the `-d` switch on the command line as follows:

```
/usr/local/nagios/bin/nagios -d <main configuration file>
```

As mentioned previously, the main configuration file is normally `/usr/local/nagios/etc/nagios.cfg`.

D. Running Nagios automatically at system boot requires a startup script file and two symbolic links in the appropriate runlevel. The startup script is normally found in the `/etc/rc.d/init.d` directory, while the symbolic link is located in `/etc/rc.d/rcx.d`. The default is usually `/etc/rc.d/rc3.d`. The init script for Nagios, known as **Nagios**, can be found in Appendix B. The two symbolic links, Start and Kill, can be created to reference the initialization script. Listed below are the links as they appear in one such configuration:

```
S96nagios -> /etc/rc.d/nagios
```

```
K21nagios -> /etc/rc.d/nagios
```


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19. Stopping and restarting Nagios is accomplished via the Init Script that was described previously, or through the kill command. The focus here will be on using the former. The chart shown below provides the information.

Desired Action	Command	Description
Stop Nagios	<code>/etc/rc.d/init.d/nagios stop</code>	This kills the Nagios process
Restart Nagios	<code>/etc/rc.d/init.d/nagios restart</code>	This kills the current Nagios process and then starts Nagios up again
Reload Configuration Data	<code>/etc/rc.d/init.d/nagios reload</code>	Sends a SIGHUP to the Nagios process, causing it to flush its current configuration data, reread the configuration files, and start monitoring again

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Section Two – Installation of the Linux Client Software (NRPE)

I. Obtain the NRPE Client Program

1. Download the NRPE client program from the appropriate website. At the time of this writing, the URL for the website is <http://www.nagios.org>.
2. Periodically, there will be updates to the core program and various add-ons to the application. After installation is complete, regular checks on the Nagios and its associated websites is recommended.

II. Installing NRPE

1. Unpack the distribution file that was downloaded from the Internet. There are two commands:
 - A. `gunzip nrpe-version number.tar.gz`
 - B. `tar -xvf nagios-version number.tar`

Note: If the zip version of the program was downloaded, the syntax would be the following:

`unzip nagios-version number.zip`

Refer to Appendix H for additional documentation on how to compile and install the program.

2. Create the installation directory on the remote host for the program. The root or sudo user account should be used when this and future steps are done to insure there are no permissions issues later during the installation. The syntax to use is:

`mkdir /usr/local/nagios`

3. Create the libexec directory under the nagios directory created in the previous step. The complete path to the directory should read:

`/usr/local/nagios/libexec`

4. The check_nrpe plugin should be placed on the Nagios **application server** along with the other plugins. The default location is the /usr/local/nagios/libexec directory.

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5. The nrpe program and the configuration file (nrpe.cfg) should be placed in the directory that was created in the previous steps on the **remote host**. Additional plugins will need to be installed on the remote host in order for the add-on to function properly. The add-ons can be copied from the application server's libexec directory and pasted into the appropriate directory on the remote host.

6. Configure the nrpe client to run under the control of inetd or xinetd. Refer to Appendix H for detailed information on the proper syntax for this operation.

7. Configure the proper settings on the Nagios host (application server). Examples for configuring the nrpe daemon are found in the sample nrpe.cfg file included in the distribution. The config file resides on the remote host(s) along with the nrpe daemon. The check_nrpe plugin is installed on the Nagios host (application server). In order to use the check_nrpe plugin from within Nagios, several things in the host configuration (hosts.cfg) file need to be defined. An example command definition for the check_nrpe plugin would look like this:

```
define command{
    command_name      check_nrpe
    command_line      /usr/local/nagios/libexec/check_nrpe $HOSTADDRESS$ -c $ARG1$
}
```

In any service definitions that use the nrpe plugin/daemon to get their results, you would set the service check command portion of the definition to something like this (sample service definition is simplified for this example):

```
define service{
    host_name          someremotehost
    service_description someremoteservice
    check_command      check_nrpe!yourcommand
    ... etc ...
}
```

where "yourcommand" is a name of a command that you define in your nrpe.cfg file on the remote host (see the docs in the sample nrpe.cfg file for more information).

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An example of the correct syntax on the application server for running the check_disk plug-in on the remote host would be the following:

```
define service{
    use                generic-service      ; name of service template to use

    host_name          bugzilla.mgh.harvard.edu
    service_description Free Space
    is_volatile         0
    check_period        24x7
    max_check_attempts 3
    normal_check_interval 5
    retry_check_interval 1
    contact_groups      linux-admins
    notification_interval 120
    notification_period 24x7
    notification_options w,u,c,r
    check_command        check_nrpe!check_disk1
}
```

The nrpe.cfg file on the remote machine would have something like or similar to the following to allow the application server to run the above plug-in:

```
command[check_disk1]=/usr/local/nagios/libexec/check_disk 80 95 /dev/hda1
```

It is important to remember that whatever services are to be monitored from the application server, the appropriate plug-ins must be installed on the remote host(s) libexec directory. Also, the accurate command syntax must be present in the nrpe.cfg file on the remote host as well as the services.cfg file on the application server.

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Excerpt from posting on the Nagios Users discussion group:

You only have to provide `check_command` `check_nrpe!check_disk1` in your `services.cfg`.

The `nrpe` on the target machine should translate that into `././check_disk 80 95 ...`

-----Ursprüngliche Nachricht-----

Von: Kaplan, Andrew H. [mailto:AHKAPLAN@PARTNERS.ORG]

Gesendet: Mittwoch, 2. Oktober 2002 15:24

An: nagios-users@lists.sourceforge.net

Betreff: [Nagios-users] Incorrect command line arguments supplied error message

Hi,

I have installed the `nrpe` plugin on the nagios host and the daemon on a remote host. However, when I try to monitor the disk space usage on the remote host, I encounter the following error on via the web browser:

INCORRECT COMMAND LINE ARGUMENTS SUPPLIED

The text that I added on the host machine is as follows:

```
checkcommands.cfg:
# 'check_nrpe' command definition
define command{
    command_name    check_nrpe
    command_line    /usr/local/nagios/libexec/check_nrpe $HOSTADDRESS$ -c $ARG1$
}

services.cfg
# Service definition
define service{
    use              generic-service           ; Name of service template to use

    host_name        bugzilla.mgh.harvard.edu
    service_description Free Space
    is_volatile      0
    check_period     24x7
    max_check_attempts 3
    normal_check_interval 1
    contact_groups   linux-admins
    notification_interval 120
    notification_period 24x7
    notification_options w,u,c,r
    check_command    check_nrpe!command[check_disk1]=/usr/local/nagios/libexec/check_disk 80 95
/dev/hda5
```

I installed the `nrpe` daemon and `nrpe.cfg` files onto the remote host at `/usr/local/nagios`. I created the `/usr/local/nagios/libexec` directory there as well. I copied the `check_disk`, `check_load`, `check_procs`, and the `check_users` plugins from the host machine into the `libexec` directory on the remote machine. The `nrpe` file was created in the `/etc/xinetd.d` directory. Also, I added the following line to the `nrpe.cfg` file:

```
command[check_disk1]=/usr/local/nagios/libexec/check_disk 80 95 /dev/hda5
```

What arguments did I miss or have the wrong syntax for?

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