



Purpose

This document describes how to use a RAM disk to boost performance on a Nagios XI server.

Target Audience

This document is intended for use by Nagios XI Administrators who need a boost in I/O performance.

Summary

Although having enough CPU power on a Nagios server is important, the biggest hardware limitation to a Nagios system is disk I/O. A large Nagios installation creates an enormous amount of disk activity, and if the hard disk can't keep up with the constant traffic flow that needs to happen, even a large number of CPU's are simply going to wait for the disk in order to write new information to the disk. This can cause check latencies to soar even though the CPU usage appears within a safe range. Some users have solved this by using creative file mounts on separate partitions, or purchasing extremely fast disks for their servers.

The information below will cover how to free up an enormous amount of disk activity, particularly on large systems by simply adding RAM disks on the local filesystem.

The following document will cover the topics below:

- Key Nagios Files That Affect Disk I/O
- Automatic RAM Disk Installation
- Manual RAM Disk Installation
 - Create Directories
 - Editing The Configuration Files
 - Update Performance Data Commands
 - Restart Services

Key Files That Affect Disk I/O

Lets look at some of the key files that create disk activity on a Nagios install. The examples below match a typical source install of Nagios Core, and any default Nagios XI install.

- `/usr/local/nagios/var/status.dat` – This is the bread and butter file of all of the “live” information on the monitoring environment. This file gets updated every 10-20 seconds (as specified in `nagios.cfg`) with all current status information.
- `/usr/local/nagios/var/objects.cache` – This file stores all of the object configuration data for Nagios. This file only gets updated upon a restart of the Nagios process.
- `/usr/local/nagios/var/host-perfdata` & `service-perfdata` – These files may be in a different location for Core install, but these files function as an intermediary file for PNP’s NPCD daemon that processes performance data results. These files get updated about every 10-15 seconds.
- `/usr/local/nagios/var/spool` – This directory tree acts as a dropbox for all incoming check results. The disk activity in this directory is almost constant, since both Nagios and NPCD are continually creating result files, and then reaping the results every X number of seconds.
- `/usr/local/nagios/var/*.log` – These log files were worth mentioning. Logging takes both CPU and disk activity, so minimize all unnecessary logging if you need to scale, particularly with performance data processing. Logging can be minimized by editing: `/usr/local/nagios/etc/pnp/npcd.cfg` and `/usr/local/nagios/etc/pnp/process_perfdata.cfg`, and setting the log level to 0.

Automatic RAM Disk Installation

The easiest way to install RAM disk on the Nagios XI is use our `install_ramdisk.sh` script. Establish a terminal session to your Nagios XI server and execute the following commands:

```
cd /tmp
wget https://assets.nagios.com/downloads/nagiosxi/scripts/install_ramdisk.sh
chmod +x install_ramdisk.sh
./install_ramdisk.sh
```

The script will prompt you for the size of the RAM Disk. Refer to the table on the following page for information on this.

Important: The automatic install is **NOT supported on RHEL 5 or CentOS 5**. If you have an older distribution, you will need to follow the manual install instructions below. The same is valid in cases when you have a "non-standard" Nagios XI instance (custom paths, custom config locations, etc.) or you want to set up the RAM disk in a "non-default" location.

Manual RAM Disk Installation

These steps should only be followed if using the `install_ramdisk.sh` script is not possible.

In these steps you will be required to edit files. This documentation will use the vi text editor. When using the vi editor:

- To make changes press `i` on the keyboard first to enter insert mode
- Press `Esc` to exit insert mode
- When you have finished, save the changes in vi by typing `:wq` and press Enter

You need to determine the size of the RAM disk that you will be using. You can determine the recommended size of the RAM disk based on the total number and hosts and services that you are monitoring. You will be need to define this value in the steps below.

Total Number of Hosts + Services	RAM Disk Size
Less than 1000	100 MB
1000 to 5000	300 MB
More than 5000	500 MB

Tip: It is always a good idea to use a higher number than the "recommended size" in order to give some leeway and allow for growth. Keep in mind that this will only make an improvement if you have enough available memory, otherwise this will mount the RAM disk and use swap memory for excess RAM allocated.

Establish a terminal session to your Nagios XI server and execute the commands in the following steps.

Create Directories

These commands create the required directories.

```
mkdir /var/nagiosramdisk/
mkdir -p -m 775 /var/nagiosramdisk/tmp
mkdir -p -m 775 /var/nagiosramdisk/spool
mkdir -p -m 775 /var/nagiosramdisk/spool/checkresults
mkdir -p -m 775 /var/nagiosramdisk/spool/xidpe
mkdir -p -m 775 /var/nagiosramdisk/spool/perfdata
chown -R nagios.nagios /var/nagiosramdisk
```

Editing The Configuration Files

`/etc/init.d/nagios`

If you are using Nagios XI 2014 or newer, the `/etc/init.d/nagios` script should have the following few lines added to it (around line 69):

```
if test -f /etc/sysconfig/nagios; then
    . /etc/sysconfig/nagios
fi
```

If these lines are missing, add them to the top of the `/etc/init.d/nagios` file below the comments.

Create a file called `nagios` in the `/etc/sysconfig/` directory and set permissions:

```
touch /etc/sysconfig/nagios
chown nagios:nagios /etc/sysconfig/nagios
chmod 775 /etc/sysconfig/nagios
```

Open the `/etc/sysconfig/nagios` file in vi:

```
vi /etc/sysconfig/nagios
```

Add the following lines:

```
USE_RAMDISK=1
RAMDISK_DIR=/var/nagiosramdisk
RAMDISK_SIZE=100
if [ "`mount |grep "${RAMDISK_DIR} type tmpfs" `X == "X" ]; then
    mount -t tmpfs -o size=${RAMDISK_SIZE}m tmpfs ${RAMDISK_DIR}
fi
mkdir -p -m 775 ${RAMDISK_DIR} ${RAMDISK_DIR}/tmp ${RAMDISK_DIR}/spool
${RAMDISK_DIR}/spool/checkresults ${RAMDISK_DIR}/spool/xidpe
${RAMDISK_DIR}/spool/perfdata
chown -R nagios:nagios ${RAMDISK_DIR}
```

Note:

- The command starting with `mkdir` and ending with `perfdata` (line 7) is all on one line
- There is a space between `${RAMDISK_DIR}/spool` and `${RAMDISK_DIR}/spool/checkresults`

When you have finished, save and close the file.

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

Open up the `/usr/local/nagios/etc/nagios.cfg` file in vi:

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

Update the following lines:

```
service_perfddata_file=/var/nagiosramdisk/service-perfddata  
host_perfddata_file=/var/nagiosramdisk/host-perfddata  
check_result_path=/var/nagiosramdisk/spool/checkresults  
object_cache_file=/var/nagiosramdisk/objects.cache  
status_file=/var/nagiosramdisk/status.dat  
temp_path=/var/nagiosramdisk/tmp
```

When you have finished, save and close the file.

```
/usr/local/nrdp/server/config.inc.php
```

Open `/usr/local/nrdp/server/config.inc.php` in vi:

```
vi /usr/local/nrdp/server/config.inc.php
```

Update the following line:

```
cfg["check_results_dir"]="var/nagiosramdisk/spool/checkresults";
```

When you have finished, save and close the file.

```
/usr/local/nagiosxi/html/config.inc.php
```

Open `/usr/local/nagiosxi/html/config.inc.php` in vi:

```
vi /usr/local/nagiosxi/html/config.inc.php
```

Update the following lines:

```
$cfg['xidpe_dir'] = '/var/nagiosramdisk/spool/xidpe/';  
$cfg['perfddata_spool'] = '/var/nagiosramdisk/spool/perfddata/';
```

When you have finished, save and close the file.

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

Open up `/usr/local/nagios/etc/pnp/npcd.cfg` in vi:

```
vi /usr/local/nagios/etc/pnp/npcd.cfg
```

Update the following line:

```
perfddata_spool_dir = /var/nagiosramdisk/spool/perfddata/
```

When you have finished, save and close the file.

```
/usr/local/nagiosmobile/include.inc.php
```

Open up `/usr/local/nagiosmobile/include.inc.php` in vi:

```
vi /usr/local/nagiosmobile/include.inc.php
```

Update the following lines:

```
$STATUS_FILE = "/var/nagiosramdisk/status.dat";  
$OBJECTS_FILE = "/var/nagiosramdisk/objects.cache";
```

When you have finished, save and close the file.

Update Performance Data Commands

Login to Nagios XI and navigate to **Configure > Core Config Manager > Commands > >_ Commands**.

In the search field type `file-bulk` and press **Enter**.

The screen will update with the two commands `process-host-perfdata-file-bulk` and `process-service-perfdata-file-bulk`.

Tip: Make a copy (backup) of the existing `process-host-perfdata-file-bulk` and `process-service-perfdata-file-bulk` commands, prior to modifying them. Leave the “old” commands (copies) inactive. This can be helpful if you need to go back.

Both of these commands need to be updated with the new directory locations as follows:

process-host-perfdata-file-bulk

```
/bin/mv /var/nagiosramdisk/host-perfdata /var/nagiosramdisk/spool/xidpe/${TIMET$}.perfdata.host
```


process-service-perfdata-file-bulk

```
/bin/mv /var/nagiosramdisk/service-perfdata /var/nagiosramdisk/spool/xidpe/$TIMET$.perfdata.service
```

After making these changes click the **Apply Configuration** button.

Restart Services

After making all of these changes, execute the following commands from the command line:

```
chown -R nagios:nagios /usr/local/nagiosxi/var/subsys/
```

RHEL/CentOS 6.x

```
service nagios restart
service httpd restart
service npcd restart
```

RHEL/CentOS 7

```
systemctl daemon-reload
systemctl restart nagios.service
systemctl restart httpd.service
systemctl restart npcd.service
```

Conclusion

Making use of a RAM disk can provide huge performance improvements on larger systems, or any system where check latencies are greater than 2 seconds. We recommend testing these settings in a non-production environment before implementing into production.

Finishing Up

This completes the documentation on how to use a RAM disk to boost performance on a Nagios XI server. If you have additional questions or other support related questions, please visit us at our Nagios Support Forums:

<https://support.nagios.com/forum>

The Nagios Support Knowledgebase is also a great support resource:

<https://support.nagios.com/kb>