## Purpose

This document discusses the snapshot repository requirements in Nagios Log Server and some of the pit falls you may come across.

## Target Audience

This document is intended for use by Nagios Administrators that need a deep understanding of the snapshot repository and how it is affected by different network technologies.

## Overview

In Nagios Log Server, when creating a **Snapshot Repository** it requires that the location MUST be a shared filesystem accessible to all data instances in the cluster, otherwise snapshots or restoration can fail.

A lot of people instantly think about using a NFS file share as a solution. This is a valid solution however problems can arise due to how NFS is integrated with authentication and user accounts. This document will explain the issue and provide workarounds and alternative solutions.

## The NFS Problem

The problem with NFS is that the user id (UID) and group id (GID) can differ per Linux machine and this creates issues with permissions between these Linux machines. When the UID and GID on separate Nagios Log Server instances is different, the files created by the snapshot process run by one instance may not be accessible by another instance and prevent restoration and future snapshots.

When Nagios Log Server is installed, the `nagios` user account and group is created in Linux using the next available UIG and GID. Here is an example from the VMware Virtual Machine image of Nagios Log Server:

```
[root@localhost ~]# grep nagios /etc/passwd /etc/group
/etc/passwd:nagios:x:500:100::/home/nagios:/bin/bash
/etc/group:nagios:x:500:nagios,apache
```

You can see from the output that the UID is 500 and the GID is 500. The number 500 is the first available UID and GID on a fresh install of CentOS 6.x (on CentOS 7.x it's 1000).

Now here's that same command on another server:

```
[root@nls-c6x-x64 ~]# grep nagios /etc/passwd /etc/group
/etc/passwd:nagios:x:502:100::/home/nagios:/bin/bash
/etc/group:nagios:x:502:nagios,apache
```

You can see from the output that the UID is 502 and the GID is 502. On this server, two other user accounts were created prior to Nagios Log Server being installed and hence next next available number was 502.

You also have to take into account the NFS server itself, the `nagios` user and group on that server may also have a different UID and GID. This is a critical factor as NFS uses RPC for communication, without the correct UID and GID the NFS server will deny access. There is no way for the NFS client to say "use this UID and GID instead of xxx", this is simply not how NFS was designed.

When researching this problem you will also come across information that says NFSv4 solves this problem with UID and GID mapping. Unfortunately it is not a solution to the problem. While NFSv4 does resolve the UID<->user and GID<->group problem, it does not apply to the RPC stack, RPC hasn't been updated to support such mappings.

Using NFS as your storage medium for the snapshot repository is still a valid solution, however you need to take what has been explained into consideration. The NFS Solution section explains how to make sure you are successful in implementing NFS.

Alternative solutions are discussed in The CIFS Solution and Other Solutions sections.

# The NFS Solution

The only solution for the problem is to ensure that the `nagios` user account and group has the same UID and GID on all Nagios Log Server instances AND the NFS server. The different methods to achieve this can be:

- Before installing Nagios Log Server ensure that the next available free UID and GID is going to be the same as what exists on the NFS server and all existing Nagios Log Server instances
- Before installing Nagios Log Server, manually create the `nagios` user and group and specify the UID and GID manually to ensure they match the NFS server
  - `useradd` command with the `--uid` argument
    - The `nagios` user must also be made a member of the `apache` group
  - `groupadd` command with the `--gid` argument
    - The `apache` user must also be made a member of the `nagios` group
- After Nagios Log Server has been installed you can change the `nagios` user and group UID and GID to ensure they match the NFS server
  - `usermod` and `groupmod` commands

You can also consider using CIFS as an alternative solution as discussed in [The CIFS Solution](#) section or review the [Other Solutions](#) sections.

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# The CIFS Solution

Common Internet File System (CIFS) is a similar to NFS, it allows files to be shared between computers.

- The Microsoft Windows operating system implements an enhanced version of this and is known as Server Message Block (SMB)
- The Linux operating system implements CIFS using the Samba suite

You are able to connect to a network share hosted on Windows or Linux and use this for your snapshot repository location. When mounting a CIFS share you can specify the UID and GID of the local `nagios` user and group. It does not matter if the `nagios` user and group have a different UID and GID on each Log Server instance, you just have to define it in your mount command.

Here is an example entry from `/etc/fstab` file:

```
//10.25.14.91/common_snapshot_repository_cifs /common_snapshot_repository cifs
rw,username=snapshot_user,password=Str0ngP@ssw0rd,uid=1001,gid=1001,file_mode=07
70,dir_mode=0770 0 0
```

That is one command that spans over three lines. The example entry is broken down and explained as follows:

- `//10.25.14.91/common_snapshot_repository_cifs`
    - This the CIFS network share I am connecting to, in this example it is located on a Windows 2016 server
- `/common_snapshot_repository`
    - This is the location on the Nagios Log Server instance where the CIFS share is mounted to
    - This location needs to be the SAME on ALL Nagios Log Server instances
- `cifs`
    - This tells Linux that the network location is CIFS based
- `rw,username=snapshot_user,password=Str0ngP@ssw0rd,uid=1001,gid=1001,file_mode=0770,dir_mode=0770`

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- ○ This are the specific options required, broken down as:
- ○ `rw`
  - Mount  with read/write permission
- ○ `username=snapshot_user` and `password=Str0ngP@ssw0rd`
  - This is the username and password required to access the CIFS share. In this example it is located on a Windows 2016 server and this user account is an active directory account. This example highlights that the CIFS server doesn't specifically require an account called `nagios`.
- ○ `uid=1001`
  - The user id for the `nagios` user on this Nagios Log Server instance
- ○ `gid=1001`
  - The group id for the `nagios` group on this Nagios Log Server instance
- ○ `file_mode=0770,dir_mode=0770`
  - This defines the permissions that will be use for files and directories. `0770` stands for:
    - User: read, write, execute
    - Group: read, write, execute
    - Other: no permission
- `0 0`
  - ○ These values are for the `dump` and `pass` settings, they are not explained in this documentation

You will need to determine the UID and GID of the `nagios` user and group, execute the following command in a terminal session on your Nagios Log Server instance:

```
grep nagios /etc/passwd /etc/group
```
This should produce output similar to:

```
/etc/passwd:nagios:x:1001:100::/home/nagios:/bin/bash
/etc/group:nagios:x:1001:nagios,apache
```

You can see from the output, the `passwd` line is for the user and the `group` line is for the group.

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It doesn't matter if the `nagios` user and group on your Nagios Log Server instances have a different UID and GID, you just need to make sure the entry in the `/etc/fstab` file has the correct numbers for that specific server.

The information provided here should allow you to easily implement CIFS for your common snapshot repository.

## Other Solutions

NFS and CIFS are not the only methods that can be used for your snapshot repository. You can also use technologies such as a volume on a Fiber Channel or iSCSI SAN. The important factor is ensuring that all of your Nagios Log Server instances have access to the same location and that the `nagios` user account and group has permission.

## Finishing Up

This completes the documentation on Nagios Log Server snapshot repository considerations.
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

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