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NFS
ESSENTIAL GUIDE

G|RACK™ 12

High-Performance NAS



G|RACK™ 12

NFS Essentials Guide



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Overview

There are many choices on the G-RACK 12 when it comes to network connections to data. One of the popular choices for network data sharing is NFS. NFS is traditionally a Unix file sharing protocol. Linux, of course, also supports it and now even Windows Servers supports it natively.

What is NFS

NFS - The Network File System (NFS) is a client/server application that lets a computer user view and optionally store and update files on a remote computer as though they were on the user's own computer. The user's system needs to have an NFS client software and the other computer, typically a server, needs the NFS server software.

How and when is NFS used

NFS is used for sharing files over a network.

NFS allows the user or system administrator to mount (designate as accessible) all or a portion of a file system on a server. The portion of the file system that is mounted can be accessed by clients with whatever privileges are assigned to each file (read-only or read-write). NFS uses Remote Procedure Calls (RPC) to route requests between clients and servers.

Many users find that the lower overhead of NFS provides faster access to data over the network.

Does G-RACK 12 support NFS?

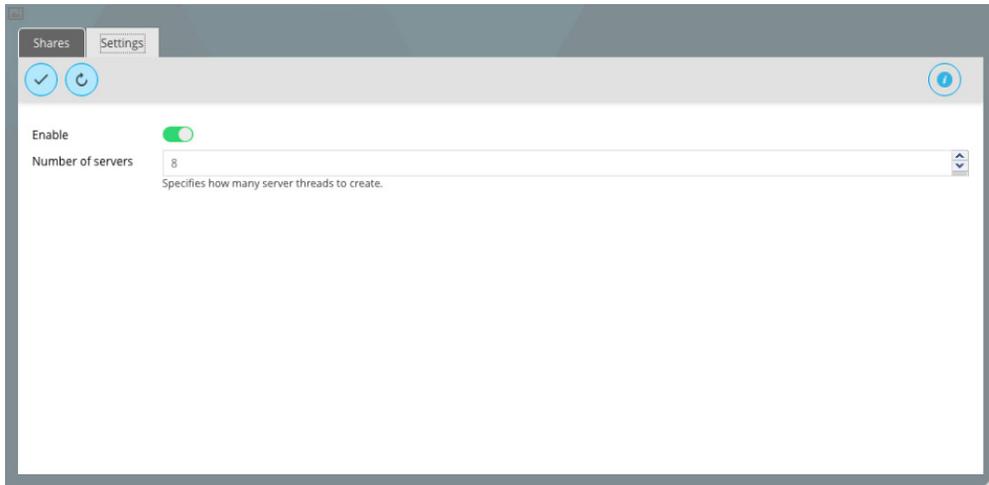
In short, absolutely. The G-RACK 12 support NFS and settings to limit access, control read/write or read-only, and define the boundaries of where the NFS data can be accessed from. In addition to NFS the G-RACK 12 share data from NFS and other protocols at the same time. This way you can have computers with well defined access using the protocol that best fits the operating system and network configuration.

What do I need to know to get the server ready to share data using NFS?

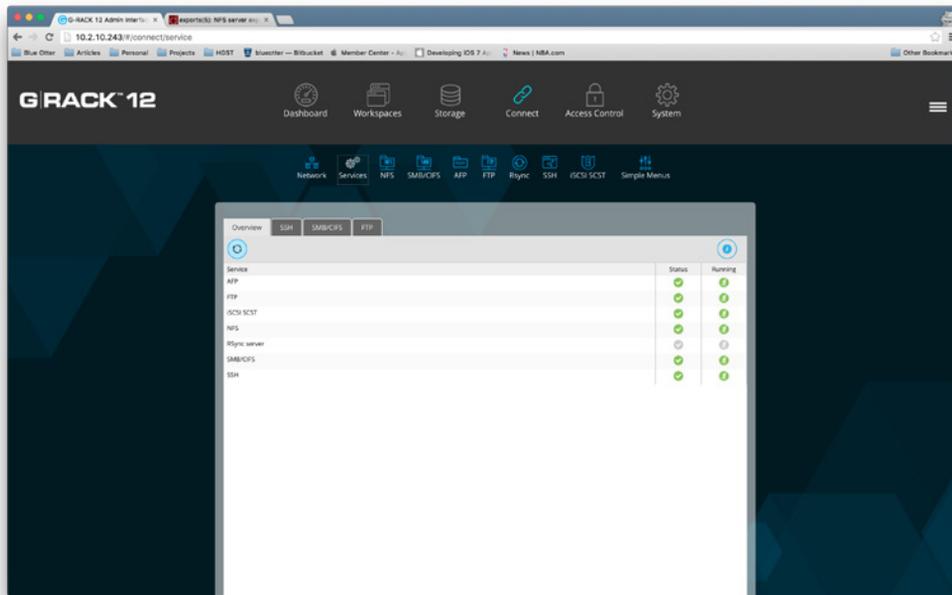
Before you can share a workspace on the G-RACK 12 using NFS you must first configure a workspace. The directions for getting your Workspaces in place can be found in the G-RACK 12 Users Guide.

The first step in making NFS active on the G-RACK 12 is to enable the NFS Service. This activates the NFS protocol to be available on the network.

You get to this by navigating from the home menu of the administration tool. The path is Connect>NFS>Settings. There you will see an “Enable” toggle. If the toggle is not already on (green highlight) do so now by clicking once followed by the Checkmark “save” button.

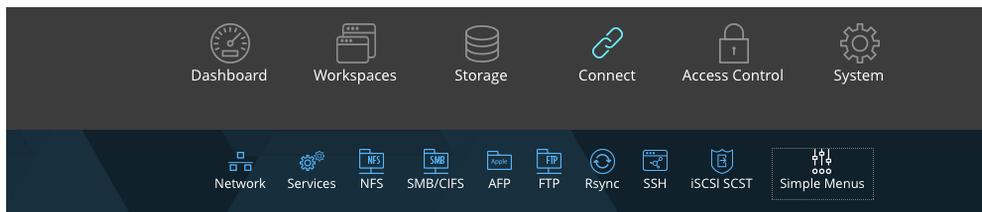


For improved performance, NFS server configurations should set the number of NFS threads. Each thread is capable of processing one NFS request. A larger pool of threads enables the server to handle more NFS requests in parallel. Which means if you have a large number of clients accessing this NFS server, you should consider increasing the number server threads to prevent users from experiencing significant amounts of lag in their operations. While you will have enabled it using the steps above, you can review if it is running by viewing the Service Status widget on the dashboard or you can view it in the [Connect>Services>Overview](#)

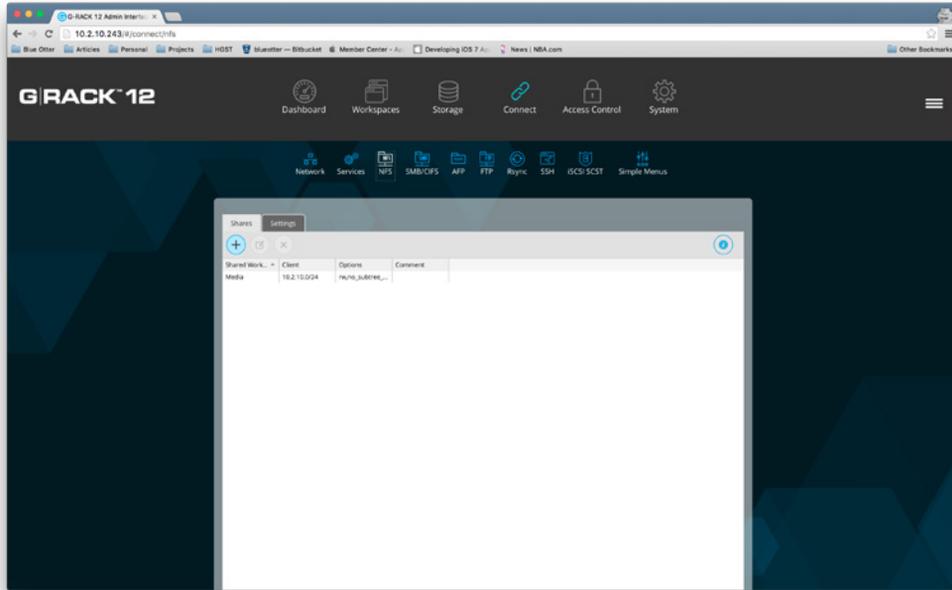


The next step is to navigate to the NFS Shares area of the Administration tool.

The path to that is Connect>NFS>Shares



Once you are there you will see a panel that allows you to add or remove a workspace to the NFS shares.



By pressing the Plus (+) you are shown the fields needed to define access to NFS enabled workspace.

Add Workspace ✕

Shared Workspace ▼ + 🔍
The location of the files to share. The share will be accessible at /export/.

Client
Clients allowed to mount the file system, e.g. 192.168.178.0/24.

Privilege ▼

Advanced options
Please check the [manual page](#) for more details.

Comment

There are several options here.

Shared Workspace - The name of the workspace you wish to share. You can choose an existing workspace or create a new one. Find your Workspace by using the drop down option or you can use the search feature to locate the Workspace desired. The NFS share will be accessible at /export/ when your NFS client is pointed to the share.

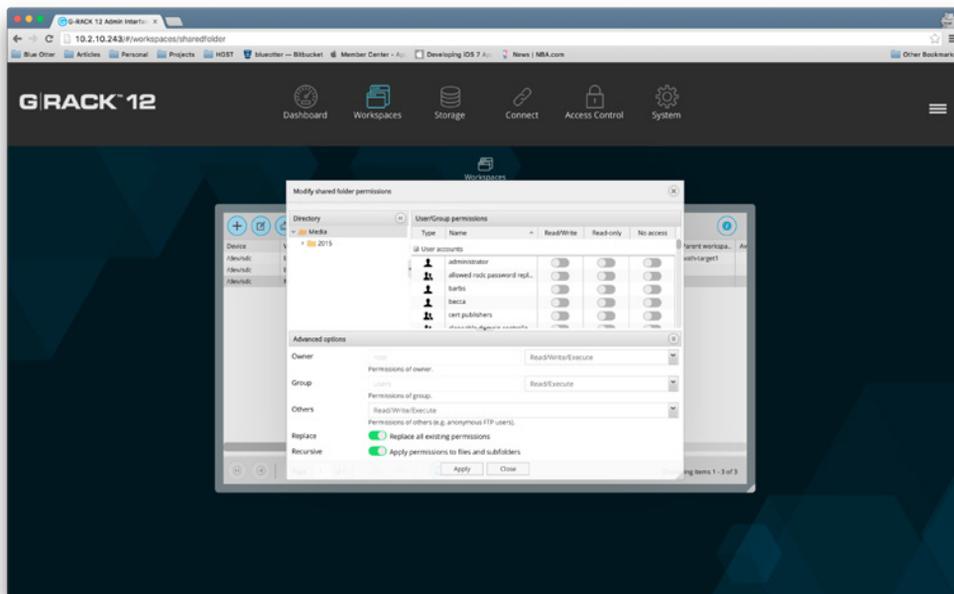
Client - This defines the scope of network access to the NFS share. You can limit or expand access to the NFS share by setting these parameters.

The most limiting parameter would be to type in an exact IP address. An example of this is setting of 192.168.0.12 and by doing so you would limit the NFS share to exactly the one computer that had that IP address.

The next level of access is to provide access to all computers on a specific subnet. An example of this is a setting of 192.168.0.0/24 and by doing so you would limit the NFS share to all computers that have a matching subnet. This means all computers with IP addresses in the 192.168.0.0 to 192.168.0.254 range would be able to mount this NFS share.

Finally, the least restrictive setting available for this Client parameter is leaving it blank. If you leave it blank then any computer that can negotiate traffic to the IP address of the G-RACK 12 will have access to the NFS share. You will only want to use this in networks where outside traffic is limited by other means such as a secure firewall.

Privilege - This is a drop down box that has two options that are fairly clear. 1) Read-only which means you will be able read and copy the files on this NFS share but you will not be able to edit them and 2) Read-Write that gives you privileges to read, edit, copy, and delete the files available on this NFS share. In addition to setting Read-Write here you will also need to allow "Others" to have Read-Write-Execute on the Workspace you are using for NFS. See this example:



Advanced Options - Our default settings are created for additional security strength. Nevertheless, you may desire the highest performance available on NFS and to gain that performance you can change these settings to: `no_subtree_check,insecure,async` Additional information on these settings can be found online at <http://linux.die.net/man/5/exports>

Comment - This is fairly self explanatory. Place text in this box that you want associated with this NFS share. It can be notes on why it was created or any other information you choose.

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**What do I need to know about
configuring my computer to attach
to a G-RACK 12 NFS
mount?**



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Each computer operating system handles the client side of NFS slightly differently. In this document we will explain what you need to do for Windows, OSX and Linux. Please understand that as OS versions are different even within a family like Windows these steps may need to be used only as a guideline with additional research being done on the web for your exact version of your operating system.

Windows 10 & 7 Enterprise

The Windows Enterprise versions (Win10 & Win7) are the only types of Microsoft OS's that have built-in software allowing for Windows clients to mount an NFS share with a drive letter. This allows the Windows client to create and access share files.

- **Windows mount point on Windows command line (search for "cmd"):**
- **mount \\10.2.10.220\export\NFSshareWindows H:**
- the word "mount" followed by a space \\GRACKsIPaddress\the-word-"export"\Name-of-your-NFS-share followed by a space then drive letter and a colon

OS X - Version 10.11: "El Capitan" and Version 10.10: "Yosemite"

How to mount the NFS Workspace on OS X?

- Using the Finder press Command-K Or use the Finder's "Connect to Server" option under Go on the top toolbar.
- Enter the server address. Example:
nfs://192.168.99.101/export/workspacename
- It will mount to your desktop after you press connect.
- Open terminal and do sudo -s. Enter password of client machine.
- cd /etc on client machine, run ls after
- Use nano or vi to open up nfs.conf file
- If your system has not been used for NFS before you may find your nfs.conf file empty at first. (This is where you can insert the mount_nfs commands as well so that you won't have to keep doing it through the command line each time you mount.)
- For performance enhancements and using NFS with Final Cut Pro enter the lines below into the nfs.conf:

```
nfs.client.nfsiod_thread_max = 128
nfs.client.allow_async = 1
nfs.client.mount.options = nfc,tcp,async,rwsize=65536,rdirplus,intr,locallocks
nfs.server.async = 1
nfs.server.nfsd_threads = 16
```

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Troubleshooting



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This is intended as a general guide to what to do when things go wrong using NFS. Usually trouble first rears its head on the client end, so this diagnostic will begin there.

Unable to See Files on a G-RACK 12

First, check to see if the Workspace you are looking for is actually shared using the G-RACK 12 Administration Tool. If the Workspace appears to be created and enabled, then confirm that NFS is turned on in the Connect panel of the G-RACK 12 Administration Tool.

File requests hang or timeout waiting for access to the file.

This usually means that the client is unable to communicate with the server. Check network connections to make sure something has not physically interrupted the data flow.

Review the Dashboard of the G-RACK 12 Administration Tool to make sure there are no conditions that could slow down the server.

Unable to mount a file system.

There are two common errors that mount produces when it is unable to mount a volume.

These are:

failed, reason given by server:

- Permission denied. This means that the server does not recognize that you have access to the volume. Make sure you are in the right subnet for the NFS share.
- RPC: Program Not Registered: (or another "RPC" error): This means that the client does not detect NFS running on the server. This could be for several reasons. The most common is NFS was turned off. Reactivate or cycle the NFS protocol on the Connections option and retest.

I do not have permission to access files on the mounted volume.

Confirm that the NFS Workspace settings match the client IP address and that the file is not marked Read-only when you need Read-Write access.

If you look at the Dashboard and see the NFS service is not running.

The typical reason for this is that you have no Workspaces added to use the NFS protocol. Creating or assigning a Workspace to NFS should clear this up. The NFS server only runs when there is a share being exported.

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Links and References



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General NFS Info

- History and more links that you can imagine: https://en.wikipedia.org/wiki/Network_File_System

Windows and NFS

- <http://www.sevenforums.com/network-sharing/87414-nfs-client-problemmounting.html>

OS X and NFS

- Performance tuning network stack
- Part 2 performance tuning
- best practices for nfs clients
- Stackoverflow
- mount_nfs for mac
- nfs.conf file for mac
- <http://www.emc.com/collateral/hardware/technical-documentation/h10643-cfg-isilonatto.pdf>
(ATTO card document since some Mac Pros use a Thunderbolt adapters with ATTO card)
- <http://www.cyberciti.biz/faq/apple-mac-osx-nfs-mount-command-tutorial/>

Helpful sites with informative articles

- [https://technet.microsoft.com/en-us/library/cc772500\(v=ws.11\).aspx](https://technet.microsoft.com/en-us/library/cc772500(v=ws.11).aspx)
- <https://wiki.archlinux.org/index.php/NFS/Troubleshooting>