



# Network

Storage

# Remote network connection - Storage

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*Then we talk about network we for sure come to talk about access over network to devices – one of one most common way to use network and one of most frequently needed services from network. This network functionality was and will cause for organize many of current networks.*

*In this chapter you get information about protocols for access to devices over network*

Most popular protocols for storage devices access is:

NFS – Most common used with UNIX, but now uses in all common OS.

SMB – Historically, associated with Windows, but now uses in all common OS.

## **SMB**

Developed: IBM; Microsoft; Intel; 3Com;

Introduced: 1980

## **NFS**

Developed: Sun Microsystems

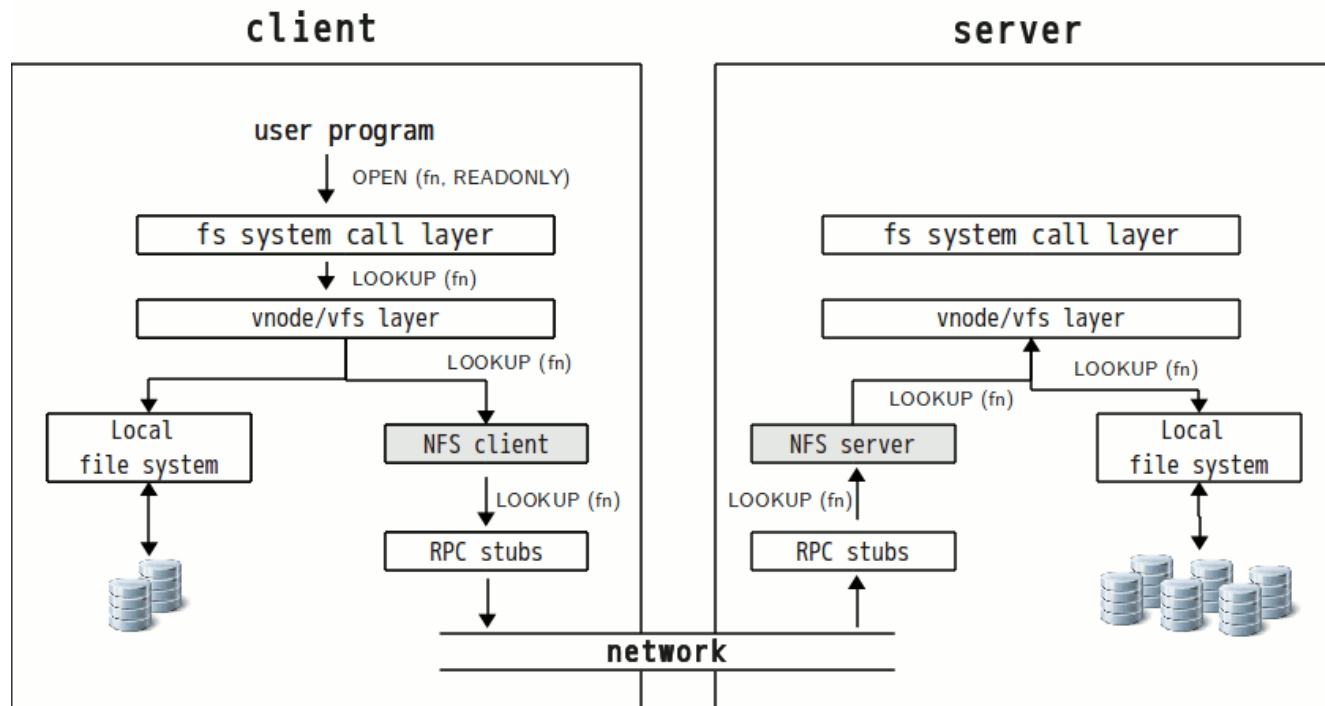
Introduced: 1984

We talk mostly about storage access , but - SMB protocol composed and used for devise access – not for files only.

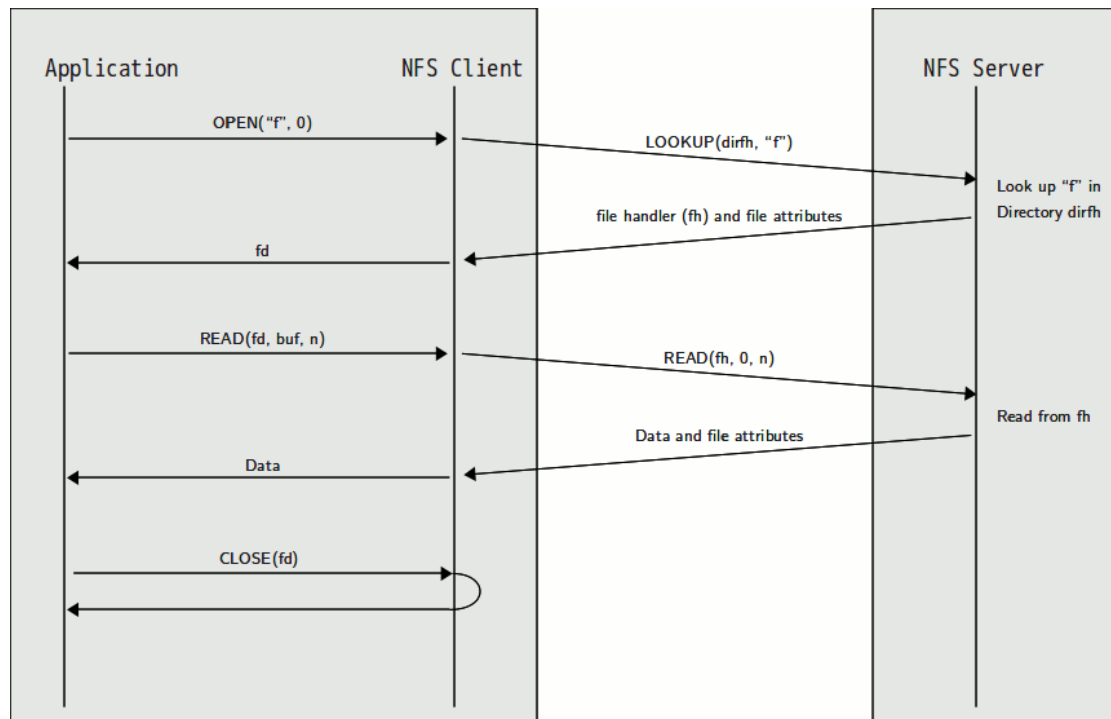
## NFS DEFINITION

- **Network File System (NFS)** is a distributed file system protocol originally developed by Sun Microsystems (Sun) in 1984, allowing a user on a client computer to access files over a computer network much like local storage is accessed. NFS, like many other protocols, builds on the Open Network Computing Remote Procedure Call (ONC RPC) system. NFS is an open standard defined in a Request for Comments (RFC), allowing anyone to implement the protocol.

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# NFS Sequence



# NFS Unix Client use case

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Use the steps below to manually mount a remote NFS share on your Linux system (You must have nfs package – nfs-common in Debian like, and nfs-utils in CentOS ):

1. *Create a directory to serve as the mount point for the remote NFS share:*

```
sudo mkdir /var/backups
```

*Mount point is a directory on the local machine where the NFS share is to be mounted.*

2. *Mount the NFS share by running the following command as root or user with sudo privileges:*

```
sudo mount -t nfs 10.10.0.10:/backups /var/backups
```

*Where 10.10.0.10 is the IP address of the NFS server, /backup is the directory that the server is exporting and /var/backups is the local mount point.*

*On success, no output is produced. If you want to specify additional mount options , use the -o option. Multiple options can be provided as a comma-separated list. To get a list of all mount options type man mount in your terminal.*

3. *To verify that the remote NFS volume is successfully mounted use either the mount or df -h command.*

*Once the share is mounted, the mount point becomes the root directory of the mounted file system.*

*When you are manually mounting the share, the NFS share mount does not persist after a reboot.*

*Automatic*

# NFS Server side use case.

- install the NFS package
- Check firewall or add
- Put rights
- Edit config /etc/exports
- Enable services and start it.
- Check.

```
$ sudo yum install nfs-utils
...
$ sudo firewall-cmd --permanent --zone=public --add-service=nfs
$ sudo firewall-cmd --permanent --zone=public --add-service=mountd
$ sudo firewall-cmd --permanent --zone=public --add-service=rpc-bind
$ sudo firewall-cmd --reload
$ sudo firewall-cmd --list-all
...
$ sudo chown -R nfsnobody:nfsnobody /mnt/storage
$ sudo chmod -R 777 /mnt/storage
...
$ sudo nano /etc/exports
/srv/nfs4
192.168.33.0/24(rw,sync,no_subtree_check,crossmnt,fsid=0)
/srv/nfs4/backups
192.168.33.0/24(ro,sync,no_subtree_check) 192.168.33.3(rw,sync,no_subtree_check)
/srv/nfs4/www
192.168.33.110(rw,sync,no_subtree_check)
/data 192.168.1.100/24(rw,insecure,nohide,all_squash,anonuid=1000,anongid=1000,no_subtree_check)
...
$ sudo systemctl enable rpcbind nfs-server
$ sudo systemctl start rpcbind nfs-server
...
sudo exportfs
```

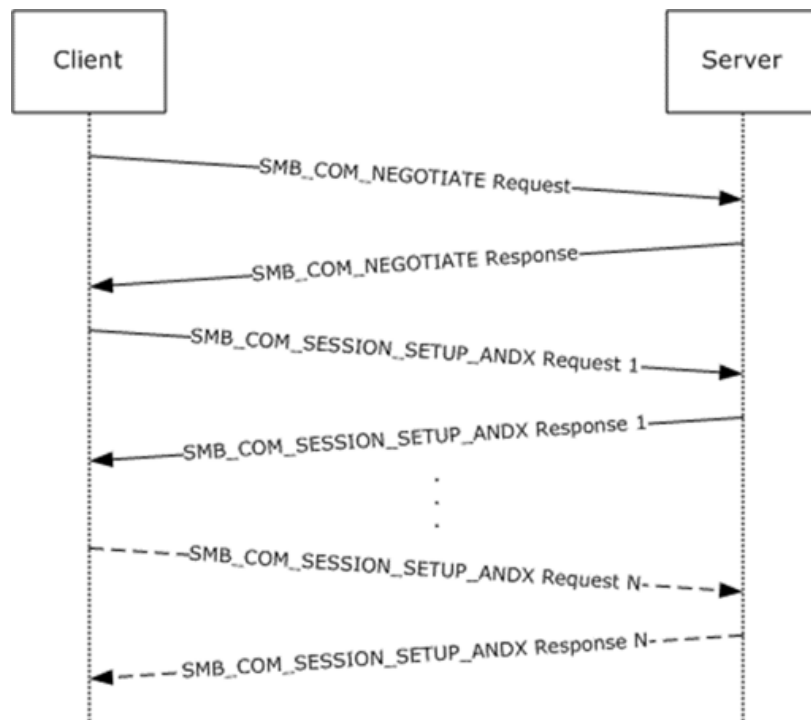
## SMB DEFINITION

**Server Message Block (SMB)**, one version of which was also known as **Common Internet File System (CIFS)** is a communication protocol for providing shared access to files, printers, and serial ports between nodes on a network. It also provides an authenticated inter-process communication (IPC) mechanism. Most usage of SMB involves computers running Microsoft Windows, where it was known as "Microsoft Windows Network" before the introduction of Active Directory. Corresponding Windows services are LAN Manager Server for the server component, and LAN Manager Workstation for the client component.

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## SMB Sequence



# SMB use case

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## Create an SMB share (PowerShell)

```
New-SmbShare -Name "VMSFiles" -Path "C:\ClusterStorage\Volume1\VMFiles" -FullAccess "Contoso\Administrator", "Contoso\Contoso-HV1$"
```

Name	ScopeName	Path	Description
----	-----	----	-----
VMSFiles	Contoso-SO	C:\ClusterStorage\Volume1\...	

## Create an SMB mapping (PowerShell)

```
New-SmbMapping -LocalPath 'X:' -RemotePath '\\Contoso-SO\VMFiles'
```

Status	Local Path	Remote Path
-----	-----	-----
OK	X:	\\Contoso-SO\VMFiles

# Self study

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## GOAL:

Repat use case with NFS configure on you own virtual environment

### *What to do:*

- install NFS packages
- Config NFS service and export
- Mount NFS resource on client VM.

### *Environment:*

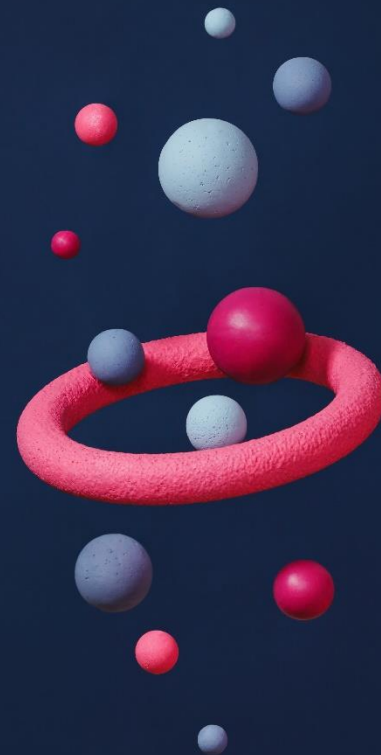
2 Virtual machines (VM) with ethernet adapters in same network.

Suggest use VirtualBox and CentOS 7 image.

### *How to check:*

Create NFS resource on server VM, mount NFS share on Client VM and do  
\$ mount -l | grep nfs

Get nonempty result.



**THANK YOU**