

## **Install and configure NFS server**

**i) Install NFS server component package on server X and NFS client component on client machine Y**

->sudo apt update

Install the NFS server package

->sudo apt install nfs-kernel-server

Create the directory to be shared

->sudo mkdir /sample

Setting the permissions for the directory

->sudo chown nobody:nogroup /sample

->sudo chmod 777 /sample

Edit the NFS exports file

->sudo nano /etc/exports

Add the line in above file

**/sample 65.0.27.81(rw, sync, no\_subtree\_check)**

->sudo exportfs -a

Restart the NFS server

->sudo systemctl restart nfs-kernel-server

Check the status of the NFS server

->sudo systemctl status nfs-kernel-server

**ii) Export folder /sample from NFS server X which should be available to client machine Y only. No other client should be able to access /sample**

->sudo apt update

Install the NFS client package

->sudo apt install nfs-common

Create a mount point(Folder)

->sudo mkdir /mnt

Mount the NFS share (IP address of server 13.234.122.91)

->sudo mount 13.234.122.91:/sample /mnt

iii) Mount exported nfs folder to the client machine Y on /mnt (client machine) and create folder, files inside mount point /mnt - troubleshoot if you are not able to create folder or files inside mount point /mnt

We can verify the mount & can see the NFS share mounted at /mnt

->df -h

Creating folder & file inside mount point on Client Machine

->cd /mnt

->sudo mkdir test\_folder

->sudo touch test\_file.txt

NFS(Network File System)

NFS stands for **Network File System**, a distributed file system protocol developed by **Sun Microsystems** in 1984. It allows a computer to access files over a network as if they were on its local disk, enabling file sharing between systems in a network.

NFS operates on a client-server architecture:

- The **server** exports directories (file systems) to be accessed by clients.
- The **clients** mount these directories over the network and can use them as local storage.

### Key Features of NFS

1. **File Sharing:** Enables multiple clients to access shared files from a central server.
2. **Transparency:** Users and applications experience seamless access, as if the files are stored locally.
3. **Security:** Supports authentication methods like Kerberos and allows control over which clients can access specific directories.
4. **Scalability:** Works well in both small and large-scale systems.
5. **Protocol Support:** Uses TCP/UDP and supports multiple versions (NFSv2, NFSv3, NFSv4).

### Why is NFS Used?

NFS is used to enable centralized file storage and sharing in network environments. Here are some practical scenarios:

1. **Centralized File Management:** NFS centralizes files on a single server, making it easier to manage backups, updates, and file permissions.
2. **Resource Optimization:** Instead of storing files on every machine, NFS allows sharing from one server, reducing redundant data and saving storage costs.

3. **Cross-Platform File Access:** NFS enables file sharing between UNIX/Linux and even Windows (with NFS client utilities).
4. **Home Directory Sharing:** NFS can be used to store user home directories on a central server, allowing users to access their data regardless of which workstation they log into.
5. **Ease of Collaboration:** In collaborative environments, NFS ensures that all team members can access and work on shared files in real time.

### Importance of NFS

1. **Efficiency:** Reduces the need to duplicate files across systems, saving storage space and administrative effort.
2. **Flexibility:** Files can be stored centrally but accessed and edited remotely by multiple users or systems.
3. **Integration:** Works well with other UNIX/Linux utilities, making it ideal for enterprise environments.
4. **Scalability:** Easily scales with the growth of networked systems.
5. **Cost-Effective:** By centralizing storage and reducing duplication, NFS lowers hardware and storage expenses.

### Common Use Cases

- **Web Servers:** Sharing common files like images or configuration files across multiple web servers in a cluster.
- **Database Applications:** Centralized storage for logs or configuration files.
- **Development Environments:** Shared codebase or build environments among developers.
- **Virtual Machines:** Sharing VM images or snapshots between hosts.

### Why is NFS Preferred Over Alternatives?

1. **Performance:** NFS is optimized for performance over LAN and is lightweight compared to alternatives like SMB or FTP.
2. **Simplicity:** It is simpler to configure in UNIX/Linux environments compared to Samba or other protocols.
3. **Compatibility:** NFS integrates well with UNIX/Linux systems, making it a natural choice for such environments.