

Tribhuvan University
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DISTRIBUTED SYSTEMS

Lab 4
Network File System

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Title

Network File System

Basic Theory

NFS stands for Network File System. It was developed by Sun Microsystems in 1985 and it is the most widely used file system since. Originally NFS was motivated by wanting to extend a Unix file system to a distributed environment, however it has been extended to support other OS too. NFS systems are stateless. This means that NFS doesn't store the state of client accesses to the files. This possesses some pros and cons. The main advantage being immediate backup in case of system failure. However the cons outweigh the pros. Clients can have conflicting copies of same file. Update process is slow. Cannot manage atomicity of transactions. Basically, an NFS is a file system that allows users to mount file systems over a network and interact with them as if they are locally mounted. NFS is a centralized file system pretending to be decentralized. Currently NFS have three versions

- NFSv2
- NFSv3
- NFSv4

NFS Configuration

- **Install client package and server kernel**

For server:

```
sudo apt install nfs-kernel-server
```

For client:

```
sudo apt install nfs-common
```

- **Create an NFS Export Directory**

```
sudo mkdir /dsl4/nfs
```

- **Grant NFS Share Access to Client Systems**

```
showmount -e
```

The following line is added to /etc/export

```
/dsl4/nfs *(rw, sync, no_subtree_check)
```

The first part of the line is the path for the folder we'd like to export. After that, we specify a single client, or subnet of clients by IP address that will have access to the export. * means any.

Finally, we add flags to the export such as:

- rw: Allow clients to read and write to the exported folder.
- sync: The server will only respond to the client write requests once the transaction has been written to disk. This protects against data loss in the event the NFS server or the network goes down mid-transaction.
- no_subtree_check: Subtree checking forces the NFS server to verify if a file is still available in an exported tree during each client request.

- **Restart NFS Server**

```
sudo systemctl restart nfs-kernel-server
```

Also firewall needs to be configured in this step.

- **Create Mount Point on client**

```
sudo mkdir /dsl4/nfsc
```

- **Mount on client**

```
sudo mount -t nfs -o vers=3 104.211.95.72:/ds14/nfs /ds14/nfsc
```

Discussion

Hence in this lab, we learned to implement the NFS for file sharing between server and client.

Conclusion

In this way "Lab4 :Network File System" was completed.