

Network File System

Priyanka Sahni, Abhinav Batra

Information Technology Dronacharya College Of Engg , Gurgaon , Haryana

Priyankasahni09@gmail.com ; abhinav.batra18@gmail.com

ABSTRACT

Network File System is a distributed file system protocol , allowing a user on a client computer to access files over a network a lot like local storage is accessed. Network File System, similar to many other protocols, builds on the Open Network Computing Remote Procedure Call System. The Network File System is an open standard which is defined in RPCs, allowing anyone to implement the protocol. In this research paper we are going to study about its platform, implementation, designed goals and conclusion.

INTRODUCTION

Network File System is a standard which allows anyone to implement the protocol .It is the one which provides transparent, remote access to file systems as well as a designed protocol .NFS is designed to be easily portable to other operating systems and machine architectures. It uses specification to describe protocols in a machine and system independent way. NFS is implemented on peak of a Remote Procedure Call package to help shorten protocol definition, implementation, and maintenance. NFS is build into the UNIX kernel in a way that is transparent to applications.NFS allows sharing of data between various computers. Its interface consists of two parts: the Virtual File System (VFS) interface defines the operations done on a file system, while the virtual node interface defines the operations

that done on a file within that file system. This new interface developed allows us to implement and install new file systems in much the same way as new device drivers are added to the kernel. In this paper we discuss the design and implementation of the file system.

Its versions are –

- 1 Version 1 only for in-house experimental purposes used by Sun
- 2 Version 2 NFSv2 was released in May 1985
- 3 Version 3 NFSv2 was released in June 1995
- 4 Version 4 NFSv2 was released in December 2000

PLATFORM

NFS is used with Unix Operating Systems (such as Solaris, AIX and HP-UX) and Unix operating systems (such as Linux and FreeBSD). SMB and NetWare Core Protocol are common than NFS on systems running Microsoft Windows, AFP is more common than NFS on Macintosh systems, and QFileSvr.400 was once more common on IBM systems .Haiku is recently added NFSv4 sustain as part of a Google Summer of Code project. It is available for operating systems such as the classic Mac OS, IBM, and some of the editions of Microsoft Windows and Novell NetWare. The remote file access protocols include the Server Message Block (also called as CIFS), Apple Filing



Protocol ,NetWare Core Protocol and OS/400 File Server file system (also called as QFileSvr.400).

IMPLEMENTATION

1. The server implements NFS daemon processes which are running by default as `nfsd` in order to make its data commonly available to clients.
2. The server administrator determines what to make available, exporting the names and parameters of directories.
3. The server security-administration ensures that it can identify and agree validated clients.
4. The server network configuration ensures that suitable clients can confer with it through any firewall system.
5. The client machine requests access to exported data, typically by issuing a mount command.
6. If all goes well, users on the client machine can then view and interact with mounted file systems on the server within the parameters permitted.

DESIGN GOALS

The designing of NFS was to simplify the sharing of file system resources in a network of non-homogeneous machines. Our main goal was to offer a approach of making remote files available to local programs without having to modify, or relink, those programs. We also want remote file access to be comparable in speed to local file access. Its designing consists of three major process : the protocol, the server side and the client side .The general design goals of NFS were: Machine and Operating System Independence, Sensible Performance ,Transparent Access, UNIX Semantics Maintained on UNIX Client , Crash

Recovery .The different types of clients. The protocols should also be simple enough that they can be implemented on low-end protocols used should be independent of UNIX so that an NFS server can supply files to many machines like the PC. When clients can mount remote file systems from many different servers it is very important that clients and servers be able to recover easily from machine crashes and network problems. It provides a system which allows programs to access remote files in the same way as local files. The Programs should not need or able to inform whether a file is remote or local. UNIX is a registered trademark of AT&T NFS is a trademark of Sun Microsystems. UNIX file system is a system in which semantics have to be maintained for remote files. Many of the people will not use a remote file system as it is not faster than the existing networking whereas RCP is easier to use. Our goal also involve to make NFS as fast as a small local disk.

CONCLUSIONS

NFS provides a powerful mechanism for sharing files across a network. NFS does not provide much security itself, so that careful administrator must use Linux standard tools such as `tcpd`, to protect their NFS files. The Combination of these tools with the guidelines present will help prevent any misuse of your NFS files.NFS protocols, along with RPC and XDR, provide most flexible method of remote file access available today. In order to encourage others to use NFS, Sun has made public all of the protocols associated with NFS. In addition, we have published the source code for the user level implementation of the RPC and XDR libraries. When these files are properly configured, remote computers can access whole file systems on the NFS server as if



they were locally stored. We the users never need to know the files reside remotely, so they can use any of the standard file manipulation tools. This convenience is appealing, but incorrectly configuring your NFS server is potentially devastating.

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