



Networks Services

- Computer Networks

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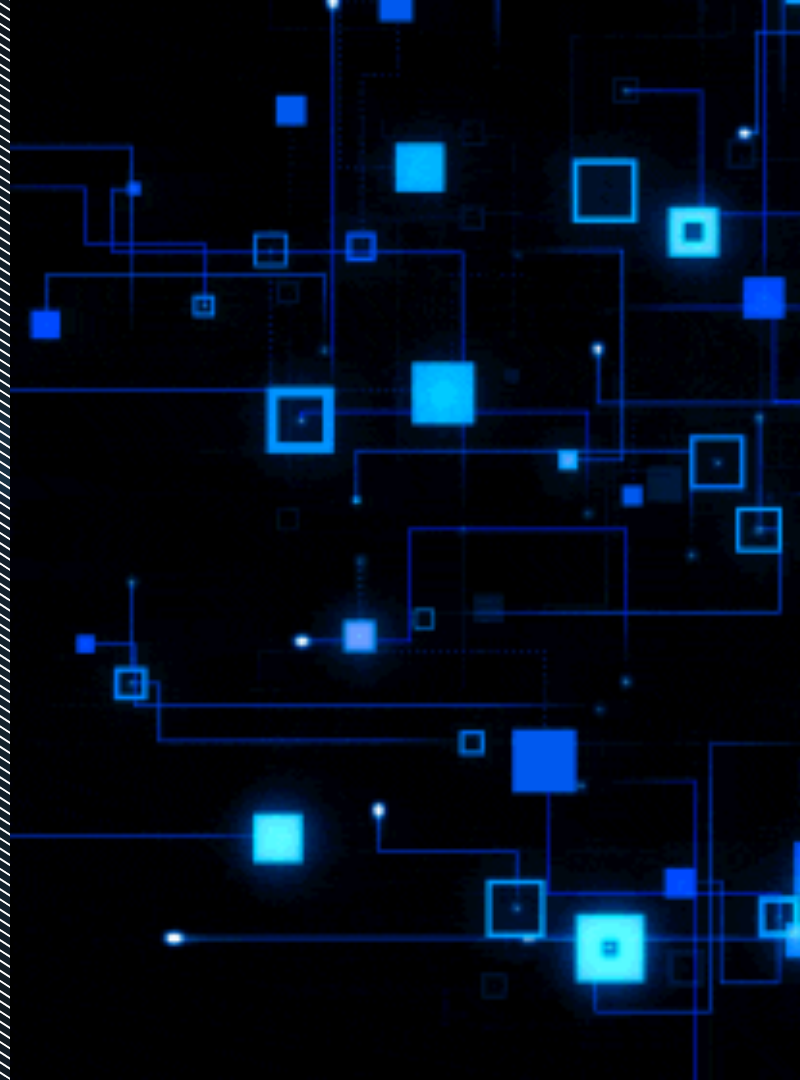
TRAINING
C E N T E R





Agenda

- NFS
- SMB
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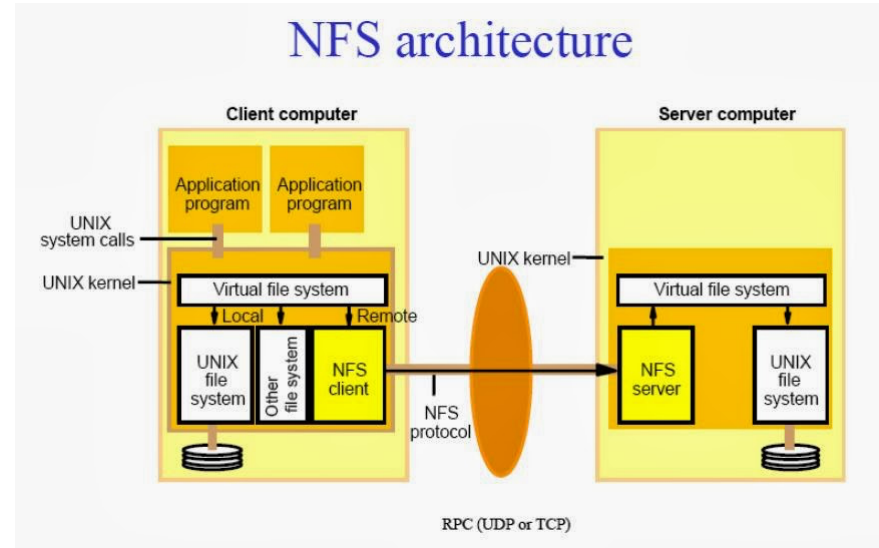
Network storage

Network File System (NFS) is a **distributed file system** protocol originally developed by Sun Microsystems in 1984, allowing a user on a client computer to **access files over a network much like local storage is accessed**.

Assuming a Unix-style scenario in which one machine (the client) requires access to data stored on another machine (the NFS server):

The server implements NFS [daemon](#) processes (running by default as `nfsd`) in order to make its data generically available to clients.

The server administrator determines what to make available, exporting the names and parameters of directories (typically using the `/etc/exports` configuration file and the `exportfs` command).



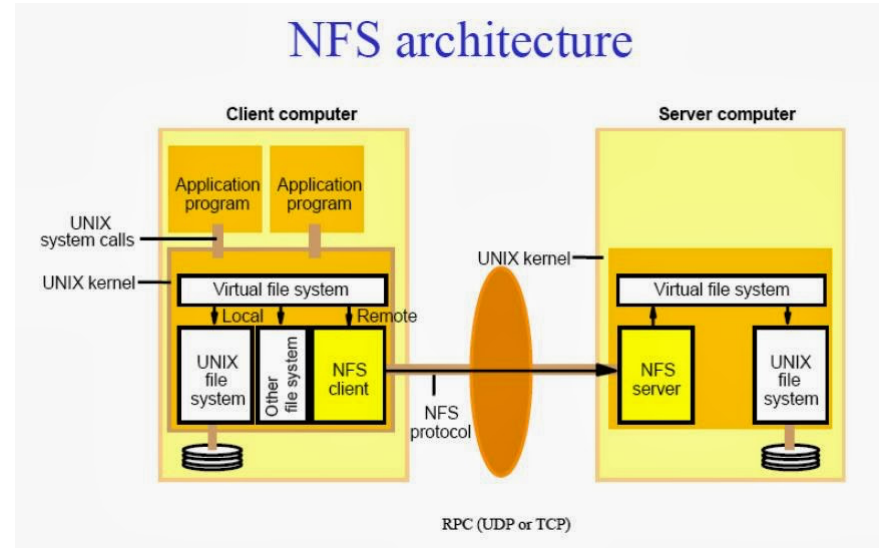
Network storage

The server security-administration ensures that it can recognize and approve validated clients.

The server network configuration ensures that appropriate clients can negotiate with it through any firewall system.

The client machine requests access to exported data, typically by issuing a mount command. (The client asks the server (rpcbind) which port the NFS server is using, the client connects to the NFS server (nfsd), nfsd passes the request to mountd)

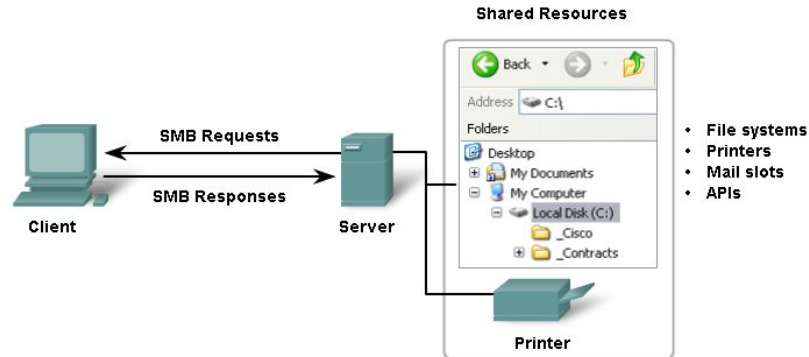
If all goes well, users on the client machine can then view and interact with mounted filesystems on the server within the parameters permitted.



Network storage

The SMB protocol creates a connection between the server and the client by sending multiple request-response messages back and forth. It can do this using the [TCP/IP](#) or other network protocols. Imagine your team is working on a large project that involves a lot of back and forth. You might want to be able to share and edit files that are stored in one place. The SMB protocol will allow your team members to use these shared files as if they were on their own hard drives. Even if one of them is on a business trip half a world away, they can still access and use the data.

SMB – Server Message Block Protocol



SMB is a client-server, request-response protocol. Servers can make their resources available to clients on the network.

- The Server Message Block (SMB) is a client/server file sharing protocol. IBM developed Server Message Block (SMB) in the late 1980s to describe the structure of shared network resources, such as directories, files, printers, and serial ports.

Network storage

In 1996, Microsoft tried to rename SMB to CIFS (Common Internet File System). It was an updated version of the same protocol and had more functions, but the name didn't stick. Because of this, many still think it's the same thing. CIFS is now only one of many dialects (variants) of SMB.

Here're all the variants of the SMB protocol:

SMBv1 was released in 1984 by IBM for file sharing in DOS. Microsoft modified and updated it in 1990.

CIFS was released in 1996 with more features and support for larger file sizes. It came together with the new Windows 95.

SMBv2 debuted in Windows Vista in 2006. It featured a notable boost in performance because of increased efficiency — fewer commands and subcommands meant better speeds.

SMBv2.1 came with Windows 7, bringing improved performance.

SMBv3 was introduced with Windows 8 with many updates. Most notable of which is enhanced security — the protocol started supporting end-to-end encryption.

SMBv3.02 came together with Windows 8.1. It offered the ability to increase security and performance by completely disabling SMBv1.

SMBv3.1.1 was released in 2015 with Windows 10. It added more security elements to the protocol, like AES-128 encryption, protection from man-in-the-middle attacks, and session verification.