

# Seminar #2

## FILE SYSTEMS

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1: Briefly describe:

- a. EXT
- b. NTFS

A: The extended file system, or ext, was implemented in April 1992 as the first file system created specifically for the Linux kernel.

NTFS (New Technology File System) is a proprietary file system developed by Microsoft. Starting with Windows NT 3.1, it is the default file system of Windows NT family.

2: What additional functionality you get with NTFS when compared to FAT32?

A: Maximal file size (4GB to 16TB), maximal file name's length (8.3 char to 255 char), journaling (metadata changes of the volume), better file compression, encryption, ACL (Access control lists), quotas, resizing.

3: Can more than one user be the owner of a file or directory?

A: Yes, if they belong to the same group and have a specific type of permissions.

4: What are NTFS mounted drives?

A: A mounted drive is a drive that is mapped to an empty folder on a volume that uses the NTFS file system.

5: Does NTFS have support for symbolic links that are in e.g. Linux?

A: Yes, it does. The mklink command is used to create a symbolic link. It is a built-in command of cmd.exe in Windows Vista and later.

6: What kind of filesystems does:

- a. Linux support to be run on?
- b. Windows support to be run on?

A: Linux – ext2, ext3, ext4, btrFS, ReiserFS, XFS; Windows – fat32, NTFS, exFAT

7: Name two disadvantages with FAT32. Could it ever be a good idea to use FAT32 or ext2 in any context?

A: Permissions and other security features. FAT32/EXT2 – compatibility with almost all devices.

8: What is a journaling filesystem?

A: s a file system that keeps track of changes not yet committed to the file system's main part by recording the intentions of such changes in a data structure known as a "journal", which is usually a circular log.

## PERMISSIONS, LOCAL USERS AND GROUPS

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9: What files are handling the users and groups in Linux?

A: /etc/groups and /etc/passwd

10: Where are the passwords stored in Linux?

A: /etc/shadow

11: What does the following linux commands do and how do you use them? Chown/chgrp/chmod

A: Obvious

12: Using ls -l we get the following outcome from a directory:

a. What character denotes it is a folder?

b. (as superuser) What would be the permissions if you issued these commands: chmod 750 file1.  
Explain what changes from the original permissions setting.

c. Including the changes from b would adam be able to access file1? If you also(as superuser) issued chown bertil file1.

d. If you want to recursively change the owner to Adam of all subfolders and files including fodler1 what command would you issue?

e. file2 contains supersecret company information that only bertil should be allowed to see and change. What permissions would you have to set that only Bertil can see it? Are there any other users that you can think of that this information cannot be hidden from?

A: a. d – directory; b. owner – all op./group – read and execute/other – null; c. first condition – yes, second condition – only read and execute; d. chown -R /directory; e. I would change group for Bertil, providing special permissions, for other all – depends on RQ.

13: Explain how permission inheritance works in NTFS?

A: Full control/modify/read&execute/read/write/special permissions.

14: What is an ACL and what does it contain?

A: ACLs describe the groups and individuals who have access to specific objects; To give a group access to an object, you add the group to the ACL of the object. Then you can adjust the specific permissions that the group can exercise over the object. In terms of a local file folder, for example, the available permissions for a group begin with read, write, modify, and delete, but those are only the first four of thirteen available permissions.

15: What are cumulative NTFS permissions?

A: A user's effective permissions for a resource is the sum of the NTFS permissions assigned to the individual user account and to all of the groups to which the user belongs, so if a user has Read permission for a folder and is a member of a group with Write permission for the folder, the user has both Read and Write permission.

16: What happens with the NTFS permissions when we:

- a. move a file within the same NTFS volume
- b. copy a file within the same NTFS volume
- c. move a file to another NTFS volume
- d. copy a file to another NTFS volume

A: a. – stay, b – stay, c and d – check UID

## RAID

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17: Explain what RAID is and list some different types of RAID solutions.

A: RAID is a data storage virtualization technology that combines multiple physical disk drive components into a single logical unit for the purposes of data redundancy, performance improvement, or both. RAID-0,1,5,10

18: Windows has different naming for RAID solutions, explain the following disk storage methods, how they work and when it is recommended to use them:

- a. Simple
- b. Spanned
- c. Striped
- d. Mirrored
- e. RAID-5

A: a - simple volumes are the dynamic-disk equivalent of the primary partitions and logical drives found on basic disks; b - Spanned volumes combine areas of unallocated space from multiple disks into one logical volume; c - Striped volumes improve disk input/output (I/O) performance by distributing I/O requests across disks. Striped volumes are composed of stripes of data of equal size written across each disk in the volume; mirrored - A mirrored volume is a fault-tolerant volume that provides a copy of a

volume on another disk. Mirrored volumes provide data redundancy by duplicating the information contained on the volume; RAID-5 - A RAID-5 volume is a fault-tolerant volume that stripes data and parity across three or more disks. Parity is a calculated value that is used to reconstruct data if one disk fails.

## FILE SERVER – SMB AND SAMBA

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19: What are the differences between NTFS permissions and Share permissions?

- a. Why do Share permissions exist when we can use the NTFS permissions instead?

A: Share permissions and NTFS permissions are independent in the sense that neither changes the other. The final access permissions on a shared folder are determined by taking into consideration both the share permission and the NTFS permission entries. The more restrictive permissions are then applied.

Share permissions are generally used when dealing with folders shared over a network or across multiple user accounts. By changing a folder's share permissions, you can grant or prevent access to it on a user-by-user, group-by-group or all-encompassing basis.

20: Describe at least 3 ways to share a folder in Windows.

A: Local FTP, Shared folder, network volume

21: What are the big differences between the versions of SMB?

A: SMB Direct Protocol, Multichannel (multiple connections per SMB session), Transparent Failover, hashing algorithms, support for symbolic links, increased block size to 64kb.

22: Describe the early days of samba and how it was developed.

A: -

23: What SMB (Server Message Block) versions does the current samba version support?

A: 2.0+ version

24: Describe 5 options in the smb.conf file and what they do.

A: sections [section]; comment – obvious; path – route to folder; guest ok – anon. permissions; read-only – obvious; create mask – permissions rwx;

25: The smb.conf manual describe 3 special sections: [global], [homes] and [printers] explain how they work.

A: [global] – global parameters, related to the program overall; [homes] – home directory configuration; [printers] – configuration for printers.

26: What is swat in the samba suite?

A: The Samba Web Administration Tool