Chapter 15

Multiple Choice Questions

1. A file system may be mounted:
    a. during the boot time only.
    b. during the boot time or when the operating system is running.
    c. when the operating system is running.
    d. Only files systems included in a file systems table may be mounted when the operating system is running.

    Ans: b
    Feedback: 15.2
    Difficulty level: medium

2. The root-partition:
    a. contains an operating system kernel and it is not necessary to be mounted.
    b. contains an operating system kernel and it is mounted during boot time.
    c. contains a list of the operating systems which may be booted.
    d. does not contain the operating system kernel, but it is the first mounted file system during the boot time.

    Ans: b
    Feedback: 15.3
    Difficulty level: easy

3. Mounting a file systems means that:
    a. the file system is removed from the disk space.
    b. the file system is being created in the disk space.
    c. the file system is becoming available within the file system name space.
    d. the file system is becoming unavailable within the file system name space.

    Ans: c
    Feedback: 15.2
    Difficulty level: easy

4. The file owner:
    a. is the user who cannot change the file attributes, but can execute the file.
    b. is the user who can change the file attributes and grant access to the file.
    c. is the user who can change the file attributes, but cannot grant access to the file.
    d. is the only user who can execute the file.

    Ans: b
    Feedback: 15.4
    Difficulty level: easy

5. The virtual file system layer is dedicated to allow access to:
    a. different types of locally mounted file systems and remote file systems.
    b. locally mounted file systems only.
    c. remote file systems only.
    d. locally mounted file systems or remote ones, but for one type of file system only.

    Ans: a
    Feedback: 15.4
    Difficulty level: medium

6. Which UNIX inodes and/or vnodes used by the Virtual File System (VFS) have a file representation structure?
    a. UNIX inodes and vnodes are unique designators within a single file system only.
    b. UNIX inodes are not unique designators for a single file system.
    c. vnodes are wide network unique file designators.
    d. vnodes are unique file designators for remote file systems only.

    Ans: c
    Feedback: 15.5
    Difficulty level: Hard

7. Stateless File Servers:
    a. require that each client request is self-contained, i.e., all information needed to locate the file and perform the requested operation is given.
    b. track which clients have exported volumes.
    c. are very secure.
    d. maintain states of all open files.

    Ans: a
    Feedback: 15.6
    Difficulty level: easy

8. In file systems consistent with UNIX semantics:
    a. users cannot share the pointer of current location into a file.
    b. writes to a file by a user are immediately visible to other users that have this file open.
    c. writes performed by one user are not seen by other users .
    d. a file cannot be opened by one user only.

    Ans: b
    Feedback: 15.7.1
    Difficulty level: easy

9. A file may be associated with several images at the same time in:
    a. file systems consistent with UNIX Semantics.
    b. file systems consistent with Windows Semantics.
    c. file systems consistent with Session Semantics.
    d. file systems consistent with NFS (Network File System) Semantics.

    Ans: c
    Feedback: 15.7.2
    Difficulty level: easy

10. The NFS protocol:
    a. provides concurrency control mechanisms.
    b. does not provide concurrency control mechanisms.
    c. does not provide concurrency control mechanisms except file locking.
    d. may provide concurrency control mechanisms.

    Ans: b
    Feedback: 15.8.3
    Difficulty level: medium

11. NFS (Network File System):
    a. is consistent with UNIX Semantics.
    b. is consistent with Session Semantics.
    c. is consistent with Immutable-Shared-Files Semantics.
    d. is not fully consistent with UNIX Semantics.

    Ans: d
    Feedback: 15.8.5
    Difficulty level: medium/hard

Essay Questions

1. Why the directories are used in the file systems?

    Ans: Because, it is very useful to segregate files into groups and manage and act on those groups.
    Feedback: 15.1
    Difficulty level: easy

2. What does a mount point mean?

    Ans: It is the location within the file structure where the file system is to be attached.
    Feedback: 15.2
    Difficulty level: easy

3. Why may operating system disallow a mount over a directory that contains files?

Ans: The operating system may disallow a mount over a directory that contain files, because it imposes semantics to clarify functionality. If a directory contains files, then the mounted file system will obscure them, but after its unmounting, the files will be available again, what may be unclear for users.

Feedback: 15.2
Difficulty level: medium

4. What does it mean that a system is dual-booted?

Ans: The system is dual-booted if it allows to install multiple operating systems on a single system and a boot loader has to understand multiple file systems and multiple operating systems can occupy the boot space. The boot-loader can boot one of the operating systems available on the drive.

Feedback: 15.3
Difficulty level: medium

5. When is the raw disk used?

Ans: It means that it is disk which does not contain any file system. It may be used where no file system is appropriate, e.g., UNIX swap space can use a raw partition, some databases use It and format the data to suit their needs, or it also may hold information necessary by disk RAID systems, such as bitmaps indicating, which blocks are mirrored and which have changed and need to be mirrored.

Feedback: 15.3
Difficulty level: hard

6. Why should the boot loader understand the file system structure?

Ans: The boot loader should know enough about the file-system structure to be able to find and load the kernel and start it executing. It can contain more than the instructions for how to boot a specific operating system, e.g., for dual-booted systems.

Feedback: 15.3
Difficulty level: medium

7. What information is stored in an in-memory mount table?

Ans: Operating systems uses in-mount-memory to store information about mounted files systems and their types.

Feedback: 15.3
Difficulty level: easy

8. What conditions on user and group ids have to be fulfilled when a new file system is mounted?

Ans: The owner and group IDs of a given file are stored with the other file attributes and when a user requests an operation on a file, the user ID is compared with the owner attribute to determine if the requesting user is the owner of the file or belongs to groups which ID is associated with the file. Then we get the information which permissions are applicable. The system then applies those permissions to the requested operation and allows or denies it.
Many systems have In the cases, when a system has multiple local file systems, including volumes of a single disk or multiple volumes on multiple attached disks, the ID checking and permission matching are straightforward, once the file systems are mounted.

Feedback: 15.4
Difficulty level: medium

9. Enumerate the layers of the virtual file system.

Ans: (i) the file-system interface, (ii) virtual file system, (iii) local file systems
Feedback: 15.5
Difficulty level: easy

10. What do consistency semantics evaluate?

Ans:
Feedback: 15.7
Difficulty level: Consistency semantics is criterion for evaluating any file system that supports file sharing. They specify when modifications of data by one user will be observable by other users.

True/False Questions

1. You can access a file in an unmounted file system.

Ans: F
Feedback: 15.2
Difficulty level: easy

2. A disk drive may have many partitions each of which contains a different file system.

Ans: T
Feedback: 15.1
Difficulty level: easy

3. Each system should have at least one file system which is bootable.

Ans: T
Feedback: 15.3
Difficulty level: easy

4. An NFS (Network File System) is building on a RPC (Remote Procedure Call) system.

   Ans: T
   Feedback: 15.8.1
   Difficulty level: hard

5. In file systems consistent with Session Semantics, the changes in a file are made visible to new sessions only, but are not seen by current sessions.

   Ans: T
   Feedback: 15.7.2
   Difficulty level: medium