

Ingeniería Informática	Laboratorio – <b>Práctica 6</b>	<b>SI</b> <b>Módulo 6</b>
<b>Sistemas Informáticos</b>	Curso 2015/16	

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## Main goal

1. Understand basic concepts of filesystems, such as performance tuning and availability improvement.
2. Partition management (format, mount, umount, join resize,...)
3. Extending File System size through logical volumes.
4. Error protection (RAID systems) and recovery (Backup tools)

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## Chapter 6: Filesystems

1. Add, in the configuration of your virtual machine in VirtualBOX, a new disk to the SATA controller with 2GB of capacity (disk /dev/sdb).
2. Create an initial Snapshot for this part (snapShot\_mod6).
3. Basic (first session)
  - a. Create, in the new disk, 5 partitions of 400MB each and format them. One of them will have an **ext3** filesystem, other **reiserfs**, other **xfs** and the remaining two **ext2**
  - b. Mount the partitions permanently in “/disco{x}”, where x=1..5
  - c. What is the difference between */etc/mtab* and */etc/fstab*?
  - d. Which one of the employed filesystems requires more space? Why?
  - e. Is it possible to access to an ext3 partition if it has been mounted in ext2 mode? And in the other way around? Why?
  - f. Download the latest ISO version of the rescue system (live CD) (systemrescuecd) and boot the virtual machine from it. (rescue mode)
  - g. Join the first three partitions in a unique partition of ext3 type (the same way as we formatted before and without creating a new filesystem)
  - h. Restore the journaling mechanism once we have resized the filesystem.
  - i. Copy the partition's content that holds the root filesystem (/) in the new partition. Once this is done, resize it again, so the space in the partition is the less possible. This partition can be equivalent to a snapshot for the real system.
4. Advanced
  - a. Delete the created partitions in the previous section. (disk /dev/sdb).
  - b. Add a new auxiliary disk of 2GB to the virtual machine (/dev/sdc).
  - c. Create two partitions of the same size in each of the auxiliary disks. Create a logical volume with 3 of these 4 partitions and create an ext4 filesystem with 100% of the available space.
  - d. Mount the created filesystem in a directory and check its state, that is, copy some file of the root's filesystems on it.

- e. Add the 4th partition to the logical volume and extend the filesystem to the total size of the logical volume. Check that the copied content is still available.
  - f. Delete the previous logical volume (use the proper commands). Create a RAID 5 system with the three available partitions. Create an ext4 filesystem for the RAID 5 system and make it accessible. Copy the content of /var directory on it. Add a simulated failure on the third disk (-f). Recover the content of the lost information using the free available partition.
  - g. Check the recovery process of the RAID system.
  - h. Restore the virtual system to the initial Snapshot created at the beginning (snapShot\_mod6).
5. Backup
- a. Create 2 partitions of 1GB each in the added disks in the previous section (/dev/sdb) and format both with ext4. The **/var** directory must be mounted under one of the partitions (permanently...), and mount the other partition in a directory called /backups (permanently too...)
  - b. Perform a backup (at filesystem level) of the /var partition content (store the backup under /backups directory). This security backup must be designed to make incremental backups in the future. How/Where can you find evidence of the backup process performed by dump tool?.
  - c. Create an empty directory in /var. Reboot the system.
  - d. Make an incremental backup level 1 and check that it's registered.
  - e. Verify the content of both backups.
  - f. Restore all the backup files in the directory **/var/restore**
6. Restore the virtual system to the initial Snapshot.