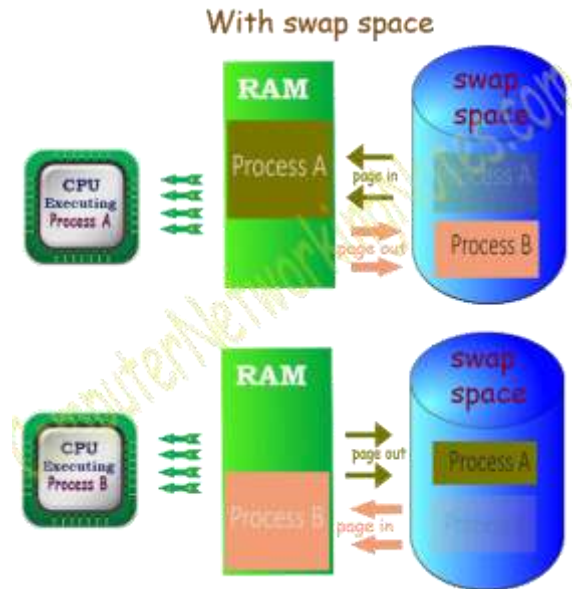
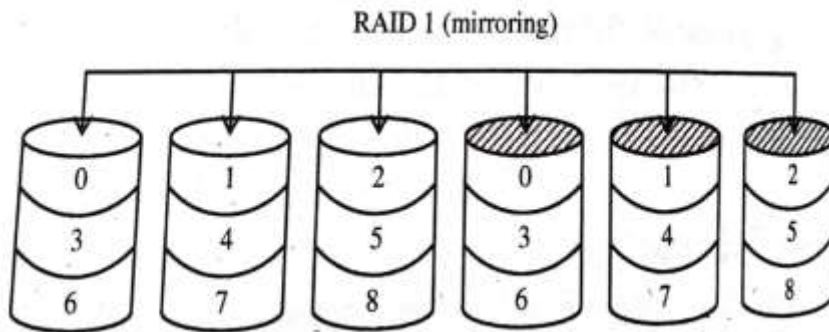




# SNS COLLEGE OF TECHNOLOGY

(Autonomous)  
COIMBATORE-35

## ***DISK MANAGEMENT & SWAP –SPACE MANAGEMENT***





## **Disk Management**

- **Low-level formatting**, or **physical formatting** — Dividing a disk into sectors that the disk controller can read and write
  - Each sector can hold header information, plus data, plus error correction code (**ECC**)
  - Usually 512 bytes of data but can be selectable



## Disk Management

- To use a disk to hold files, the operating system still needs to record its own data structures on the disk
  - **Partition** the disk into one or more groups of cylinders, each treated as a logical disk
  - **Logical formatting** or “making a file system”
  - To increase efficiency most file systems group blocks into **clusters**
    - Disk I/O done in blocks
    - File I/O done in clusters



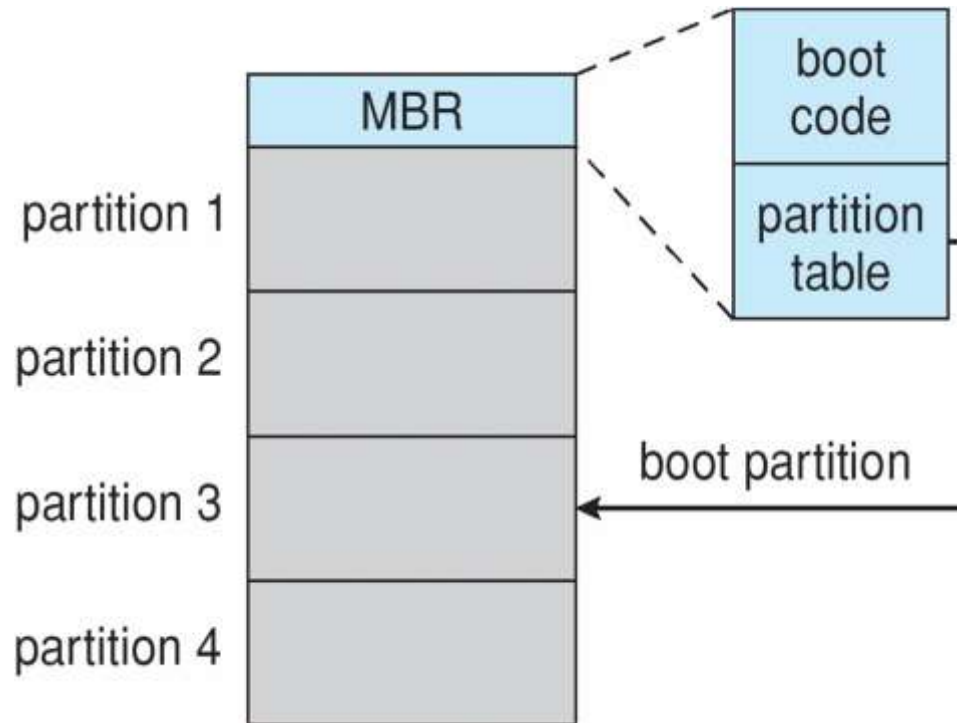
## **Disk Management**

- Raw disk access for apps that want to do their own block management, keep OS out of the way (databases for example)
- Boot block initializes system
  - The bootstrap is stored in ROM
  - **Bootstrap loader** program stored in boot blocks of boot partition
- Methods such as **sector sparing** used to handle bad blocks



# *Disk Management & Swap –Space Management*

## Booting from a Disk in Windows





## **Swap-Space Management**

### Swap-space management

- Swap-space — Virtual memory uses disk space as an extension of main memory
  - Less common now due to memory capacity increases
- Swap-space can be carved out of the normal file system, or, more commonly, it can be in a separate disk partition (raw)
- Swap-space management
  - 4.3BSD allocates swap space when process starts; holds text segment (the program) and data segment
  - Kernel uses **swap maps** to track swap-space use



## **Swap-Space Management**

- Solaris 2 allocates swap space only when a dirty page is forced out of physical memory, not when the virtual memory page is first created
  - File data written to swap space until write to file system requested
  - Other dirty pages go to swap space due to no other home
  - Text segment pages thrown out and reread from the file system as needed
- What if a system runs out of swap space?
- Some systems allow multiple swap spaces



## Data Structures for Swapping on Linux Systems

