19 Unix File System

Disks are statically subdivided into a number of *partitions*. Each partition may contain one *file system*. A file system consists of all the information relating to a collection of files.

A file system contains a *superblock* at a well-known block # that contains basic parameters:

- number of data blocks
- number of i-nodes (== max. number of files)
  - space for i-nodes is statically allocated. Typically, one i-node per 2048 bytes of disk space.
- information describing the *cylinder groups*
- disk characteristics

The disk cylinders of each file systems are statically partitioned into a number of cylinder groups. Each cylinder group contains:

- a replicated copy of the superblock
- space for i-nodes
- a bit map of available data blocks
- data blocks.

Disk allocation heuristics try to allocate the i-node, indirect blocks, and data blocks of a file within a single cylinder group, whenever possible. This eliminates long seeks during accesses to a single file.

Disk block allocation within a cylinder takes into account the rotational position of a disk block. When allocating a new data block to a file, try to choose a free block with an optimal rotational position, relative to the file's previous data block.