

Computer info



File Allocation Table Prof In the late 1970's and early 1980's, Microsoft Corporation developed the FAT (File Allocation Table). Initially, the FAT is just an ordinary file system for smaller size floppy disk but it was improve to sustain bigger and larger media. There are, at this time, three types of file system: FAT12, FAT16, and FAT32 with a fundamental distinction of sizes of entries in bits in a table in the actual FAT structure on a disk.

The function of this table is to keep track of which areas of the disk are free and which are in use or already allocated. All FAT types contain a Boot Record, which is located in an area of reserved sectors. While formatting with DOS, one sector is reserve for type FAT12 & FAT16 while a standard 32 sectors for a FAT32.

The Boot Record is at the very beginning of a FAT volume. The first few sectors of the volume, before the FAT, are the Reserved Sectors or the reserved area. This area in the Boot Record inform us how large the disk is and contains not only the boot sector but also a backup copy of the boot record. The Boot Record contains a field retaining the information of the sector size for a particular media and the BIOS Parameter Block.

The Bios Parameter Block or BPB contains vital information such as the number of bytes per sector on the disk, sectors per cluster, size of the reserved sectors, the number of FATs, root entries, media type, the number of sectors per FAT, the sectors per track, and the number of heads per cylinder. This information is use by the operating system to properly identify the disk and accurately read and write data into it.

The Data Area of the disk is divided into clusters, files and directories store their data in these clusters. The Root Directory comes immediately after the file allocation table and is formatted like any another directory on the disk.

A partition is divided up into equal size clusters, minute blocks of bordering space. Cluster sizes differ on the type of FAT and the size of partition. Files stored may reside in one or more of these clusters and files are characterized by a chain of these clusters stored contiguous to one another on the disk's surface.

The File Allocation Table is a record of entries that map into each cluster on the partition. Every record, at the start, usually has the address of the next cluster in a chain and an EOF (End of File) character to signal the end of a chain in the last part. This may also contain a special character to indicate a bad cluster, a character signifying a reserved cluster, or a zero to note that the cluster is not being used.

As we mentioned earlier, different FAT file systems use different sizes for FAT entries. This means that a FAT32 file system is using 32 bits for each entry and it can map a larger number of clusters. This will enable efficient and less wasted space because a 32-bit FAT file system can deal with smaller clusters.

References:

Microsoft, (2000), " Hardware White Paper", [online], <http://www.microsoft.com/whdc/system/platform/firmware/fatgen.mspx>

Kioemes, T., (2000), " File Allocation Table, How It Seems to Work", [online], <http://home.no.net/tkos/info/fat.html>