

RAID

Redundant array of independent disks. A grouping of standard disk drives together with a RAID controller to create storage that acts as one disk to provide performance beyond that available from individual drives. Primarily designed for operation with computers RAIDs can offer very high capacities, fast data transfer rates and much-increased security of data. The latter is achieved through disk redundancy so that disk errors or failures can be detected and corrected.

A series of RAID configurations is defined by levels and, being designed by computer people, they start counting from zero. Different levels are suited to different applications.

Level 0: No redundancy

benefits only of speed and capacity--generated by combining a number of disks. Also known as "**striping.**"

Level 1 Complete mirror system

two sets of disks both reading and writing the same data. This has the benefits of level 0 plus the security of full redundancy--but at twice the cost. Some performance advantage can be gained in read because only one copy need be read, so two reads can occur simultaneously.

Level 2

An array of nine disks. Each byte is recorded with one bit on each of eight disks and a parity bit recorded to the ninth. **This level is rarely, if ever, used.**

Level 3

An array of n+1 disks recording 512 byte sectors on each of the n disks to create n x 512 "super sectors" + 1 x 512 parity sector on the additional disk which is used to check the data.

The minimum unit of transfer is a whole superblock. This is **most suitable for systems in which large amounts of sequential data are transferred--such as for audio and video.** For these it is the most efficient RAID level since it is never necessary to read/modify/write the parity block. It is less suitable for database types of access in which small amounts of data need to be transferred at random.

Level 4

the same as Level 3 but individual blocks can be transferred. When data is written it is necessary to read the old data and parity blocks before writing the new data as well as the updated parity block, which reduces performance.

Level 5

the same as Level 4, but the role of parity the disk is rotated for each block. In level 4 the parity disk receives excessive load for writes and no load for reads. In Level 5 the load is balanced across the disks.

Soft RAID

RAID system **implemented by low level software in the host system instead of a dedicated RAID controller.** While **saving on hardware, operation consumes some of the host's power.**