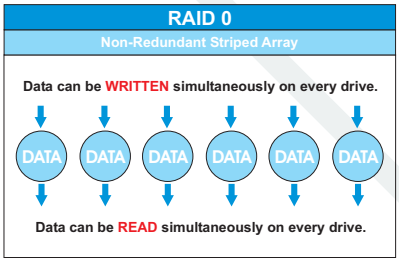
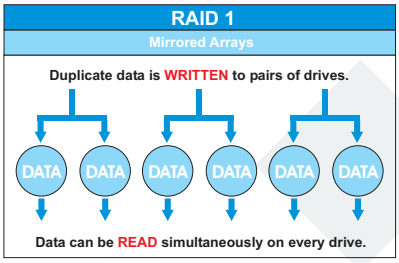
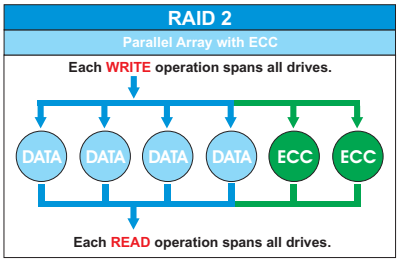
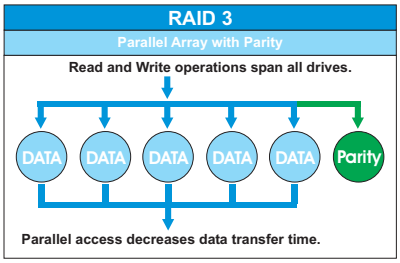
ON-LINE Computer Services Inc

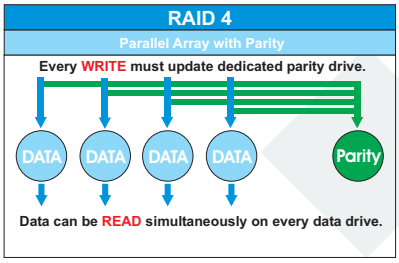
Disk Mirroring & RAID

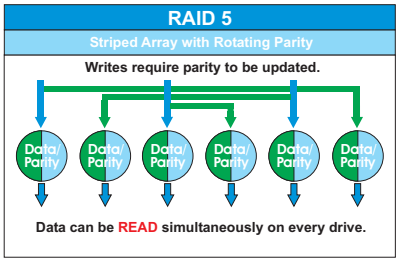












Disk Mirrorring

Corporate servers often use drive mirroring to keep data secure by storing it on multiple drives. Everything you write to one drive is copied automatically and instantly to the second drive hence the name *mirroring.* If the first drive fails, the second takes over automatically. While drive mirroring effectively creates always-up-to-date backups in real time, it's not foolproof. Bugs in one drive will be mirrored in the other, and a catastrophic computer failure that destroys one drive could also destroy the mirror.

RAID (Redundant Array of Inexpensive Drives)

A “RAID” array is a collection of drives which collectively act as a single storage system, can tolerate the failure of a drive without losing data, and can operate independently. There are six RAID levels. Each level is a different way to spread data across multiple drives balancing cost and performance.

RAID Level 0 is commonly referred to as striping. Data is split across drives resulting in high data throughput. No redundant information is stored so performance is very good but the failure of any disk in the array results in all data loss. It is recommended for any application which requires very high speed storage but does not need redundancy.

RAID Level 1 is commonly referred to as mirroring with 2 hard drives. It provides redundancy by duplicating all data from one drive on another drive. Performance is slightly better than a single drive and if either drive fails no data is lost. This is a good entry-level redundant system, since only two drives are required. Recommended for applications which require basic redundancy, entry-level systems where only two drives are available or for small file servers.

RAID Level 2 uses Hamming error correction codes, is intended for use with drives which do not have built-in error detection. All SCSI drives support built-in error detection, so this level is used primarily with EIDE drives.

RAID Level 3 stripes data at a byte level across several drives, with parity stored on one drive. It is otherwise similar to level 4. Byte-level striping requires hardware support for efficient use.

RAID Level 4 stripes data at a block level across several drives, with parity stored on one drive. The parity information allows recovery from the failure of any single drive. The performance of a level 4 array is very good for reads (the same as level 0). Writes, however, require that parity data be updated each time. This slows small random writes, in particular, though large writes or sequential writes are fairly fast. Because only one drive in the array stores redundant data, the cost per megabyte of a level 4 array is fairly low.

RAID Level 5 is commonly referred to as striping with distributed parity. RAID Level 5 is similar to level 4, but distributes parity among the drives. No single disk is devoted to parity. This can speed small writes in multiprocessing systems. Because parity data must be distributed on each drive during reads, the performance for reads tends to be considerably lower than a level 4 array. The cost per megabyte is the same as for level 4.

Tape Backup System:
RAID systems greatly increase the fault tolerance and reliability of your network server but don’t provide protection from catastrophes like fire or theft. To completely protect your data requires a regular backup with off-site storage. Tape backup is an affordable, proven, reliable method of accomplishing this goal.

Suite 101, 5663 Cornwallis Street
Halifax, NS, B3K 1B6, Canada
Email: consulting@on-line.net
Web Site: www.on-line.net
Toll Free: 1.866.6 ON-LINE
1.866.666.5463
Phone: 902.422.1171
Fax: 902.492.4608

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