# Understanding RAID 1 Mirroring and its Role in Data Safety

## Overview of RAID

In today's competitive environment, the most valuable asset for any business or organization is data. Data loss means business loss. Even though you take a regular backup of all your data, you will need to take the time to restore those backups and those backups could be hours or days old, resulting in data loss. A fool proof system is hence needed for ensuring data protection against online failure of disk.

RAID, an acronym for Redundant Array of Inexpensive Disks, is a way of logically configuring multiple disks together in a single array to increase performance as well as to prevent data loss in case of drive failure.

RAID technique leverages the idea that multiple disks working together will offer better reliability and speed than a single expensive disk and would also prevent single point of failure. Depending upon the RAID type in use,RAID alleviates different issues associated with traditional hard drives, including high failure rate and limited speed due to its physical limitations.

RAID levels 0, 1, 10 and 5 are the most popular. The choice of RAID levels depend on various factors that you need to consider before installing any RAID in your system:

- Budget for disk storage.
- Low/ Medium/High requirement for data protection and availability.
- Low/ Medium/High requirement for performance.

In this white paper, we will discuss RAID 1 in detail.

## Introduction of RAID 1

RAID 1, or disk mirroring, is the process of replicating the data to more than one disk. Both the disks are operational at the same time and so simultaneous reading of data can be done from both of them and this enhances the speed of read operations. However, the write operations are slower as each write operation is done two times.

RAID 1 facilitates data protection for those environments where outright data redundancy, performance and availability are crucial,and cost per usable gigabyte of capacity is a secondary consideration as RAID 1 usable capacity is only half of available disk drives in RAID set.
(which should be assumed, they die often),

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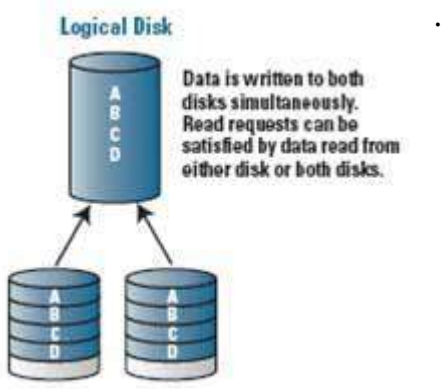
## RAID 1 Mirroring

RAID 1 Mirroring is implemented when fault tolerance is desired. Fault tolerance is the ability of the data contained in the array to remain intact if one of the drives fails. In a mirrored array, all of the data is duplicated across 2 or more hard drives. So even if one of the hard drives dies all of one's important data would be stored on a mirrored array, and accessible / usable from the other drive.

ZNetLive provides RAID 1 mirroring with all it's dedicated servers.




## Why Use RAID 1?

- RAID 1 is the longest used RAID than any other form of RAID as it is normally the most reliable and fastest way of protecting your online data.
- The user's work is never affected or interrupted because the computer keeps running even when a single drive fails, as the mirror functions to provide data from the functional drives while administrator replaces the failed drive.
- RAID 1 writes faster than other variants of RAID as it does not require performing calculations, math or reading from other disks every time a write command is generated.
- RAID 1 can be used to gain enhanced read speeds, performance and/or additional data redundancy at economical prices. It is a good RAID level for those looking for high uptime.
- RAID 1 can withstand multiple simultaneous drive failures under some circumstances.
- RAID 1 is the simplest RAID storage subsystem design among other RAID variants.

## Disadvantages of RAID 1

As mentioned earlier, the read operations in case of RAID 1 are comparatively faster as simultaneous reading is performed, but the

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writes are comparatively slower since writing is done twice and is constrained when writing to the slower disk, and hence the overall performance of RAID 1is impacted.

## Who should go for it?

RAID 1 is a good RAID level to use for applications that have critical data. Depending on the RAID controller used, performance with RAID 1 arrays can be very good. Applications requiring high performance and availability should hence go for RAID 1.

## Recommended Applications for RAID 1

- Transactional applications like
  - ✓ Payroll
  - ✓ Financial
  - ✓ Accounting
- Emails
- Operating Systems.

## Important Note:

A RAID 1 array should not be confused with a backup of your data. RAID 1 specifically addresses failures cause by hardware, and can do nothing by itself to recover files you may have deleted by mistake, or that became corrupt due to application crashes or other issues. RAID 1 is an exact copy, so as soon as a file is deleted, it is deleted from all members of the RAID 1 set.

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