

How to choose the right RAID for your Dedicated Server

Overview of RAID

Let's first address, "What is RAID and what does RAID stand for?" RAID, an acronym for "Redundant Array of Independent Disks," is a storage technology that links or combines multiple hard drives so that data can be stored on them as if they were one logical unit. Simply put - RAID takes multiple physical disks and makes them appear and function as one single drive.

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 1, 5 and 10 are the most popular.

1) What is RAID 1?

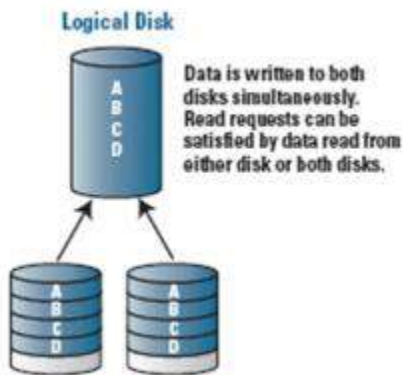
RAID 1, or disk mirroring, is the process of replicating the data to more than one disk.

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.

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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.
- Simultaneous reading is performed, but 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.

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- RAID 1 is the simplest RAID storage subsystem design among other RAID variants.

Why not use RAID 1?

As mentioned earlier, the read operations in case of RAID 1 are comparatively faster as 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 1 is impacted.

Who should use RAID 1?

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.

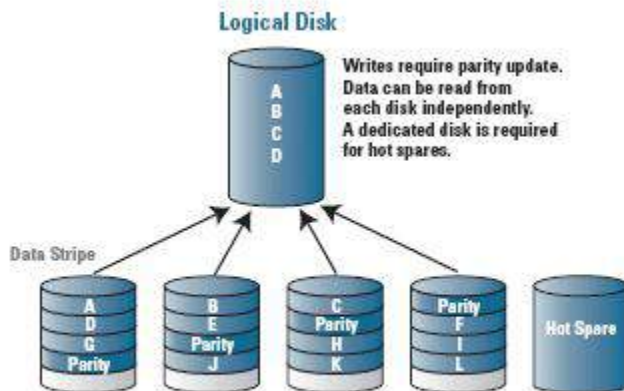
2)What is RAID 5?

RAID 5 is block-level striping with distributed parity. Striping and data are distributed by independent read and write operations (not in parallel like RAID 3). Instead of using a dedicated parity disk (such as RAID 3 and 4) parity is distributed across all the drives and a minimum of 3 disks are required for a RAID 5 array.

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Why use RAID 5?

Quite simply RAID 5 is the most secure RAID level that offers accelerated read performance. Further, in RAID 5, a single disk can be lost without encountering any data loss. RAID 5 is considered to be one of the best all-around systems that combine a high level of security, accelerated performance, and an extremely efficient use of storage. In many instances RAID 5 is a perfect combination and it is for these reasons we recommend the use of RAID 5 on many of our dedicated servers. RAID 5 has become one of the most popular levels as it is simply the ideal RAID solution for many server applications.

Why not use RAID 5?

RAID 5 has been the standard in server environments requiring fault tolerance. The RAID parity requires one disk drive per RAID set, so usable capacity will always be one disk drive less than the number of available disks in the configuration of available capacity.

Who should use RAID 5?

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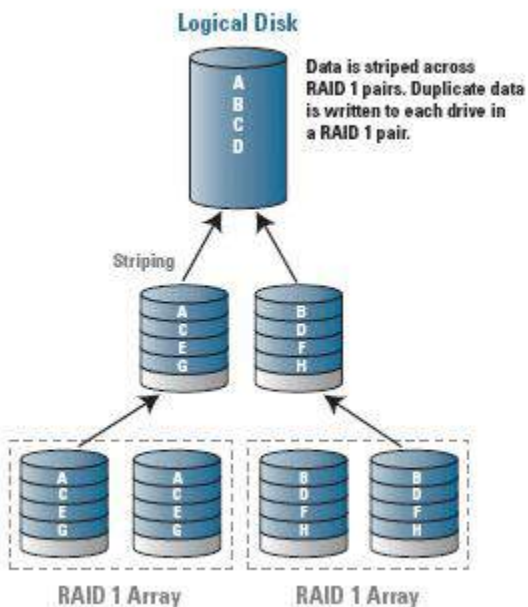
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The Series 5 adapters are ideal for bandwidth-intensive storage applications:

NAS, online transaction processing servers (OLTP), web servers, digital surveillance and applications where high levels of sustained read and write operations are required, such as video streaming, web content, video-on-demand, security and surveillance, fixed content, and reference data storage.

3)What is RAID 10?

RAID 10 is a combination of RAID 0 and RAID 1 into one single system and is commonly thought of as the "striping of mirrors". RAID 10 affords security by mirroring all data on a secondary set of disks while striping across each set of disks to increase read and write performance. RAID 10 requires a minimum of 4 member disks. The addition of further members must be paired to account for the mirroring that will take place.



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Why use RAID 10?

RAID 10 offers increased write operation performance and data redundancy is more robust than RAID 5 (multiple drive failures are tolerated).

Why not use RAID 10?

The read performance of RAID 5 is faster and the storage capacity is less efficiently used as the data is mirrored. Overall, if the higher redundant cost overheads of RAID 10 can be tolerated, RAID 10 offers very high performance with some of the highest level of data protection possible.

Who should use RAID 10?

RAID 10 is a good choice for general data storage, including serving as a startup drive, and as storage for large files, such as multimedia.

Conclusion:

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.

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