

RAID

The information below provides a basic guide to the RAID modes available to the LaCie 8big Rack Thunderbolt 2. Note that the levels of performance and protection differ based upon the number of drives in a volume. For instructions on how to configure RAID, see the [LaCie RAID Manager User Manual](#).

RAID EXAMPLE

The level of RAID available to a volume is contingent upon the amount of hard drives. For example, a volume with four hard drives supports all levels of RAID except for RAID 1, which is not compatible with volumes greater than two hard drives. RAID 0 appears to be the best choice for a volume with four hard drives since it offers 100% storage capacity and the best performance. However, RAID 0 does not provide data protection in case of drive failure. Further, its performance is not much greater than RAID 5, which includes data protection in case one drive should fail.

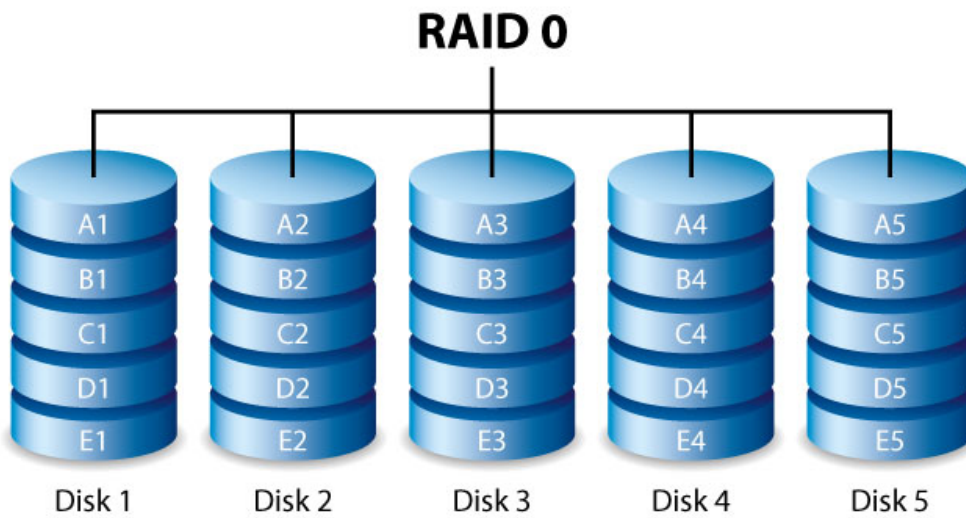
RAID 6 and, in unique cases, RAID 10, can provide data protection in the event that two drives fail.

RAID LEVELS

Review the summaries of each RAID before selecting the configuration for the LaCie 8big storage.

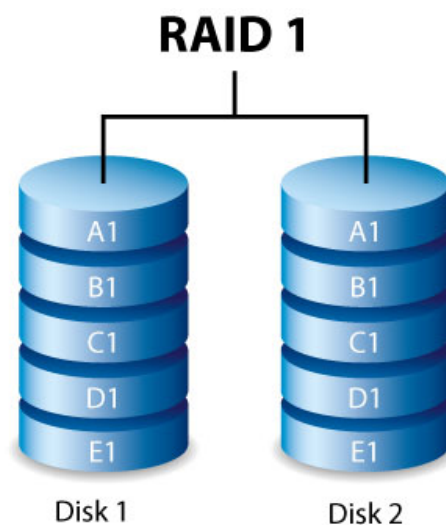
RAID mode	Minimum hard drives
RAID 0	2
RAID 1	2
RAID 5	3
RAID 6	4
RAID 10	4

RAID 0



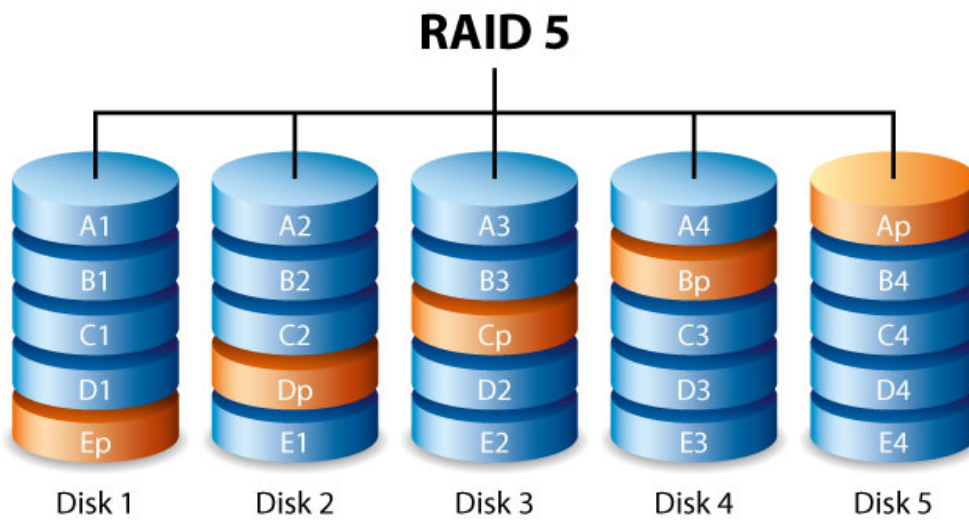
RAID 0 is the fastest RAID mode since it writes data across all of the volume's hard drives. Further, the capacities of each hard drive are added together for optimal data storage. However, RAID 0 lacks a very important feature: data protection. If one hard drive fails, all data becomes inaccessible. A recommended option is RAID 5, which offers comparable performance and data protection in case a single drive fails.

RAID 1



RAID 1 provides enhanced data security since all data is written to each hard drive in the volume. If a single hard drive fails, data remains available on the other hard drive in the volume. However, due to the time it takes to write data multiple times, performance is reduced. Additionally, RAID 1 will cut hard drive capacity by 50% or more since each bit of data is stored on all the hard drives in the volume.

RAID 5

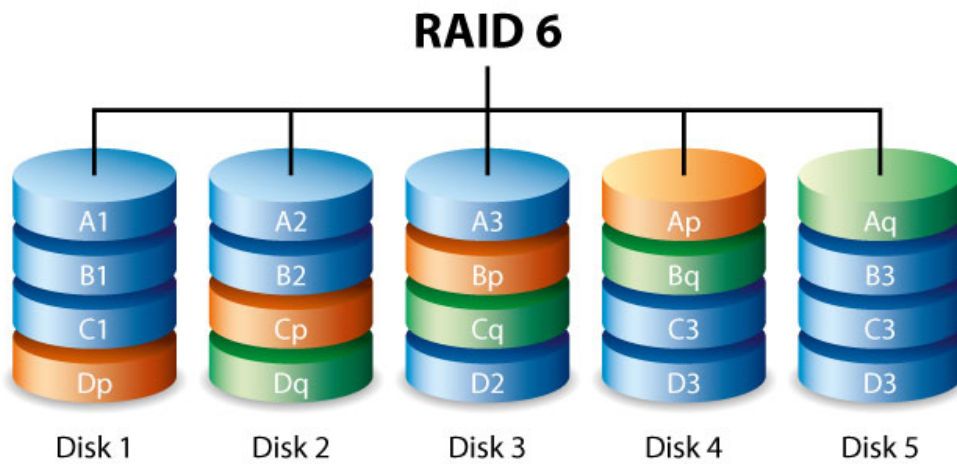


RAID 5 writes data across all hard drives in the volume and a parity block for each data block. If one physical hard drive fails, the data from the failed hard drive can be rebuilt onto a replacement hard drive. While the files stored on a RAID 5 volume remain intact should one hard drive fail, data can be lost if a second hard drive fails before the RAID is rebuilt with the replacement hard drive.

A minimum of three hard drives is required to create a RAID 5 volume.

RAID 5 offers comparable performance to RAID 0 with the advantage of protecting data. Additionally, you still have 75% of the storage capacity of a RAID 0 array (based upon total available hard drives and storage capacities).

RAID 6

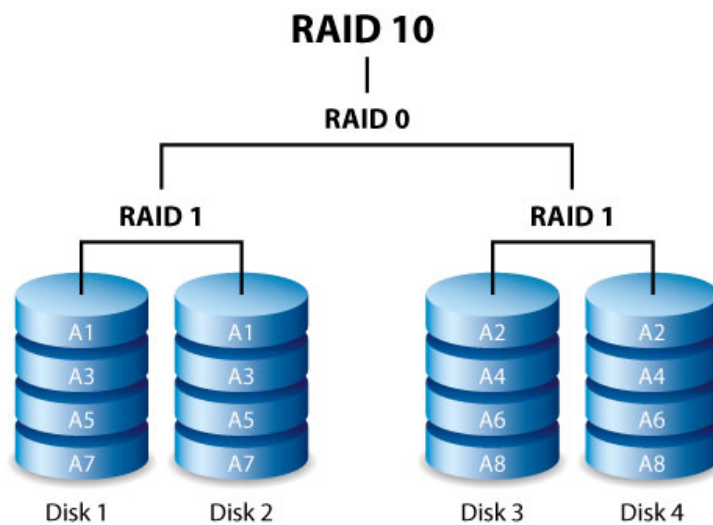


RAID 6 writes data across all hard drives in the volume and two parity blocks for each data block. If one physical hard drive fails, the data from the failed hard drive can be rebuilt onto a replacement hard drive. With two parity blocks per data block, RAID 6 supports up to two hard drive failures with no data loss.

RAID 6 synchronizing from a failed hard drive is slower than RAID 5 due to the use of double parity. However, it is far less critical due to its double-disk security.

A minimum of four hard drives is required to create a RAID 6 volume. RAID 6 offers very good data protection with a slight loss in performance compared to RAID 5.

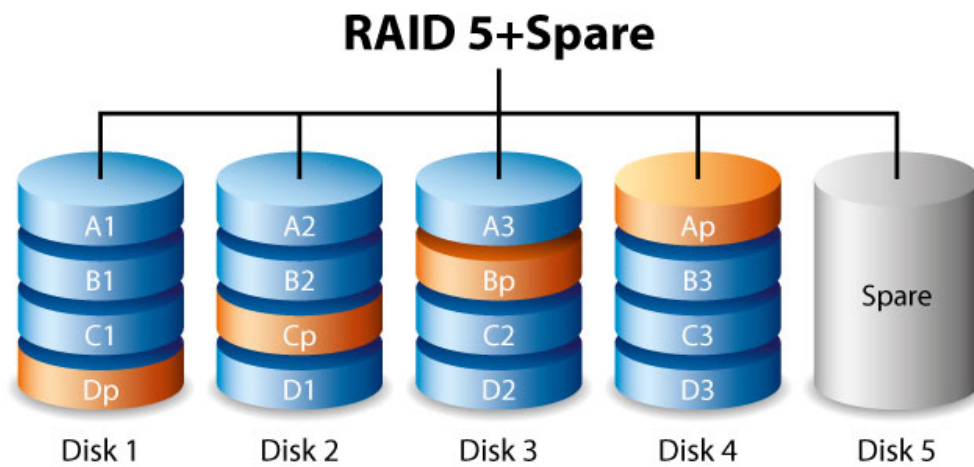
RAID 10



RAID 10 combines the protection of RAID 1 with the performance of RAID 0. Using four hard drive as an example, RAID 10 creates two RAID 1 segments, and then combines them into a RAID 0 stripe. With eight hard drive, the RAID 0 stripe will include four RAID 1 segments. Such configurations offer exceptional data protection, allowing for two hard drive to fail across two RAID 1 segments. Additionally, RAID 10 writes data at the file level and, due to the RAID 0 stripe, gives users higher performance when managing greater amounts of smaller files. This means a more generous input output per second for data, referred to as IOPS.

RAID 10 is a great choice for database managers that need to read and write a multitude of smaller files across the volume's hard drives. The impressive IOPS and data protection offered by RAID 10 gives database managers impressive reliability both in keeping files safe and rapid access.

RAID+Spare



A RAID+Spare volume gives you a “hot-spare” that is ready to synchronize data immediately should a hard drive fail. If a hard drive in the volume fails, the data starts to synchronize with the spare. The clear advantage for a RAID volume with a spare is that you do not have to wait for a replacement hard drive. However, the spare cannot be used as storage during standard operation since its sole task is to take over should a hard drive fail.

You can replace the failed hard drive once synchronization is complete and use it as the new hot spare.

Important info: For RAID+Spare volumes, data remains intact when a single hard drive fails and the spare begins synchronizing automatically. However, if a second hard drive in a RAID 5 volume fails before synchronization is complete, all data in the volume will be lost. The same is true for a RAID 1 volume. In the case of RAID 10, the second failed hard drive would have to be on the same mirrored set as the spare hard drive that is synchronizing data for the RAID to break. RAID 6 allows for two hard drives to fail.