Synchronous Mirroring Option– At a Glance

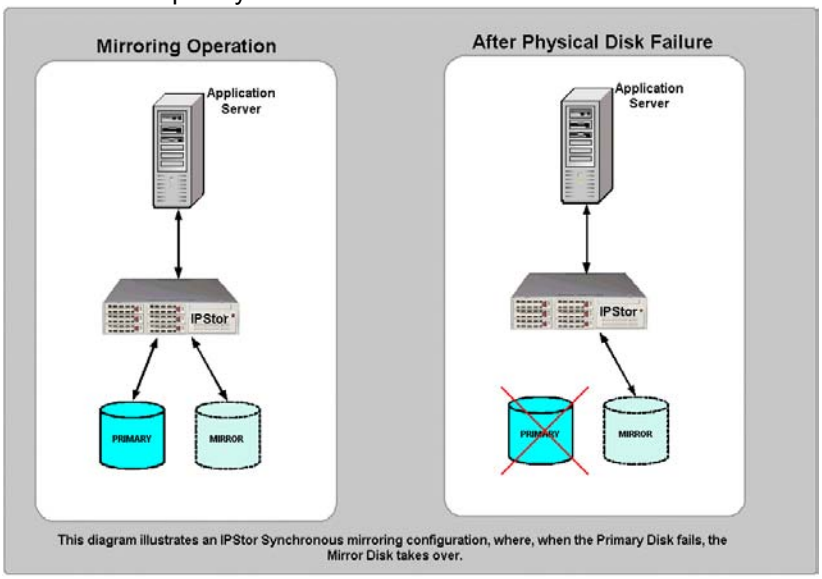
What is it?
The IPStor® Synchronous Mirroring option offers the ability to define a synchronous mirror for any disk managed by IPStor (virtualized or service-enabled[1]). The mirror can be defined on disks that are not necessarily identical to the primary disk in terms of vendor-brand, type, or even interface (SCSI, FC, iSCSI, Infiniband…). The process of creating the mirror does not cause any down time to the application.

How is it used?
A mirror can protect against the consequences of device/cabinet/frame level failure. It is also a good tool to migrate data from older disks to newer disks without any downtime.

How does it work?
When a mirror is first created, the primary and mirrored disks (virtual or service-enabled) are synchronized to match data on both sides. This process is driven by IPStor software, and does not involve the application server. After the synchronization is complete, all write-requests from the associated application server are delivered simultaneously by the IPStor appliance to both sides of the mirror. It is important to realize that the dual-write process is controlled at the IPStor appliance, not at the application server. With this design, only a single I/O request needs to traverse the front-end of the storage network, thereby eliminating the extra storage traffic created by host-based mirroring as well as relieving the host CPU from having to process dual write commands.

The primary and its mirror can be swapped any time. Mirror-and-swap is a technique to effectively migrate data from old disks to new disks without any down time for the application server. After the swap, the mirror (which was the primary/old disk) can be removed and retired.

All mirroring is managed from a single console, using the same creation process. Storage administrators no longer have to contend with application and/or OS-specific host-based mirroring schemes, thereby greatly reducing management cost and complexity.



This diagram illustrates an IPStor Synchronous mirroring configuration, where, when the Primary Disk fails, the Mirror Disk takes over.

[1] Enables existing disks to make use of the full suite of IPStor storage services, including Mirroring, Replication, Snapshot Copy, TimeMark, HotZone, SafeCache, etc. Original disk partitions/volumes are not changed; no data conversion or migration is necessary.

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How does this benefit me?

Real time protection against disk/frame/channel errors
The mirror can reside on the same storage device (for instance, on separate physical drives within a RAID array or JBOD) or on a different storage device (across cabinets, which do not have to be similar). This capability provides for inter-cabinet redundancy to protect data from cabinet-level failure, while at the same time leveraging hardware-based RAID functionality for disk-level protection *within* a cabinet. In this manner, a dual protection scheme can be implemented for ultra-high availability.

Vendor-neutral, protocol independent (FC, SCSI, iSCSI)
Mirroring is done at the block-level and can cross drive, vendor/brand, and interface (SCSI /FC) boundaries. Furthermore, the failure protection of RAID storage systems is greatly enhanced by IPStor's ability to mirror across the cabinets - even if they were of different vendor brands.

Disk upgrade without downtime
System administrators are alerted whenever a drive failure is detected. The IPStor Console is used by administrators to identify the failed drives, create a new mirror drive for the surviving primary drive, and shut down the failed drive for replacement . Throughout this process, the application servers continue to run without interruption.

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