Disk Virtualization

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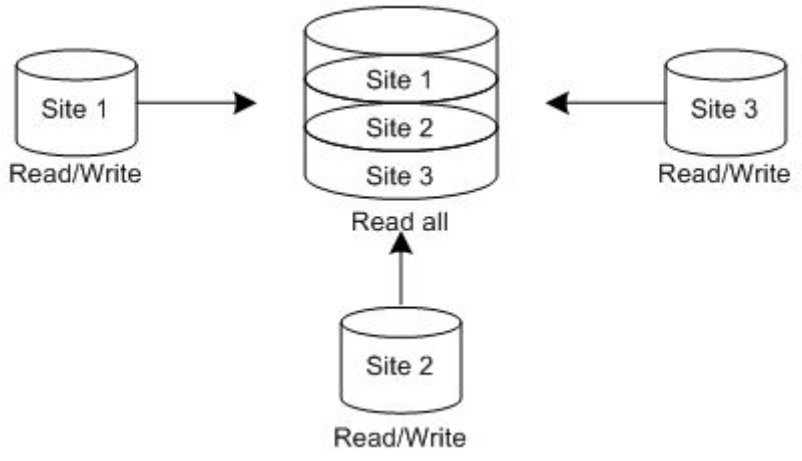
Consolidation :-

If write (or read) operation is requested, then these datas would be write into (or read from) physical disk at specified valid block number. Physical disk may contain multiple disk, but to applications it appears as a single disk. In this case, when a reads/writes from/to a block number less than 200, it is performed on A and otherwise on B if between 200 and 500. But this will not be visible to the user.

Partitioning :-

The physical disk is divided into disjoint disks for different virtual disks. If write (or read) operation is requested from one disk, then these datas would write into (or read from) respective disk inside large physical disk.



Block Replication :-

As there could be error in accessing data when read query is requested. So we need to provide reliable storage by storing multiple copies of data into different locations.

If write operation is requested, then data would be wrote into multiple disk locations (specified disk_ID and backup disk).
Initially, read operation would read from first copy. If error occurred, this accessed block would be set as bad flag and if free memory is available as much as one block size, then save this data(from second copy) into new location after reading second copy.

Snapshotting :-

The snapshot design helps to create checkpoints and restore the Disk's blocks to a previous version of themselves. We have a 'snapshots' dictionary which creates a mapping from ID to a dictionary, which itself consists of mappings from Checkpoint Number to an array of block contents.