MAPPING AND OPERATIONS

A file system block is the smallest "Container" of a Physical disk space allocated for data.

Each file system block is a contiguous area on the physical disk.

The block size of file system is fixed at the time of its creation.

The mapping process of user files to the disk storage subsystem with an LVM is shown in fig:

1. Files are created and managed by user and applications.

2. These files reside in the file system.

3. The file system are then mapped to units of data, or file system blocks.

4. The file system blocks are mapped to logical extents.

5. In turn, these are mapped to disk physical extents either through the LVM or through the operating system.

6. These physical extents are mapped to the disk storage subsystem.

There is no logical extents, if there exists no LVM. File system blocks are directly mapped to disk sectors without LVM.

Operations:

There are following two operations with cache:

1. Read operation
2. Write operation

1. Read operation:

If a read request is issued by a host, the front end controller accesses the tag RAM to decide whether the needed data is present in cache.

If the data is present in the cache, it is known as read cache hit or read hit.

If the data is not present in the cache, it is known as cache miss.

2. Write operation:

A write operation is performed in following ways with the cache:-
   • Write through cache:

Data is put in the cache and written to the disk immediately. Then an acknowledgement is sent to the host. The risks of data loss are low because data is committed to disk as it arrives but write response time is longer due to the disk operations.
   • Write back cache:

Data is put in the cache and then an acknowledgement is sent to the host immediately. After

that, data from many writes are performed to the disk. The write response times are faster. Even through, in the case of cache failures uncommitted data is at risk of loss.

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