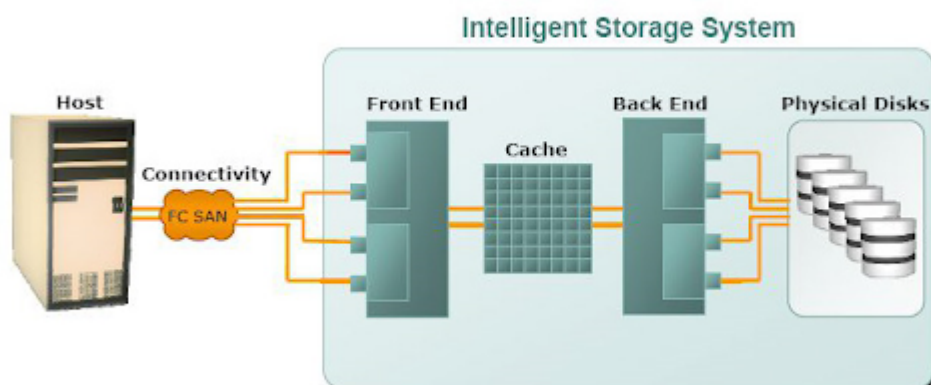# INTELLIGENT DISK SUBSYSTEM OVERVIEW

Introduction:

This system optimize all available storage solution automatically

Data must be automatically placed and stripped across multiple physical storage resources, including arrays, RAID groups, Disk types and Controllers.

Four main components:

1. Front End
2. Cache
3. Back End
4. Physical Disk

Front End:

Interface between host and storage system.

Consist of two components

1. Front End Ports: enable host to connect to intelligent subsystem
2. Front End Controllers: is used for routing data from cache using internal bus.

Uses command queueing algorithm for I/O processing.

Cache:

Improves performance

Made up of semiconductor memory.

Holds data for temporary purpose to reduce time required to service I/O request from host.

Structure of cache:

1. Organized into pages
2. Consist of data store and TAG RAM.
3. Track of each address line is recorded via Tag RAM

Read Operation:

1. Host sends read request, front end controllers search tag ram to determine required data is available in cache.
2. Cache hit data is found on cache while cache miss data is not found in cache but in main memory.
3. In case of miss read policies are:
    1. Read through
    2. No read through

Cache read hit
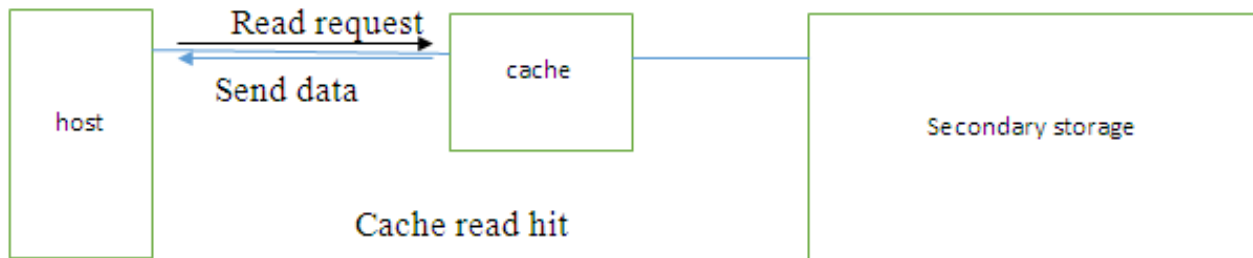
Write Operation:

Policies are:
- Write through cache
- Write back cache

Back End:

1. Interface between physical disk and cache

2. Controls data transfer

3. Two components:
   1. Back end ports
   2. Back end Controllers

Physical disk:

1. It stores data persistently.

2. Disks are connected to back end with either SCSI or a fibre channel.

3. Logical Unit Numbers(LUN) are used for identifying virtual hard disk patterns.

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10. Hot spare

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