



# Hitachi Universal Storage Platform™ V

Technical Presentation 1

Dec 7th, 2007

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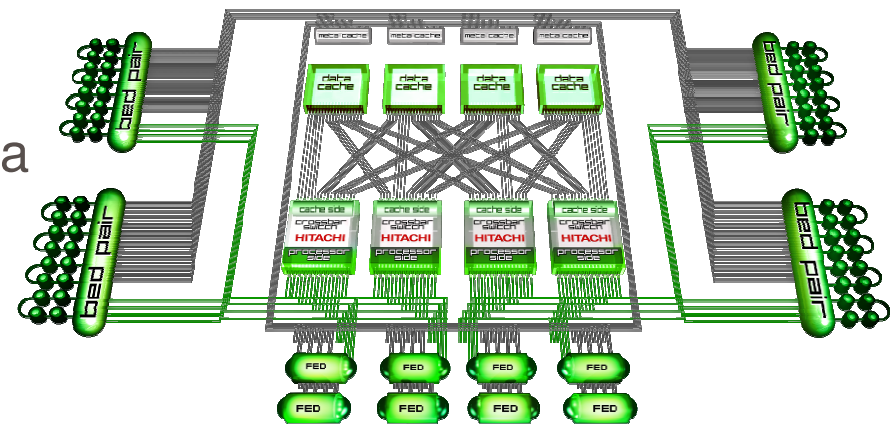
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# The Universal Storage Platform High Availability Architecture

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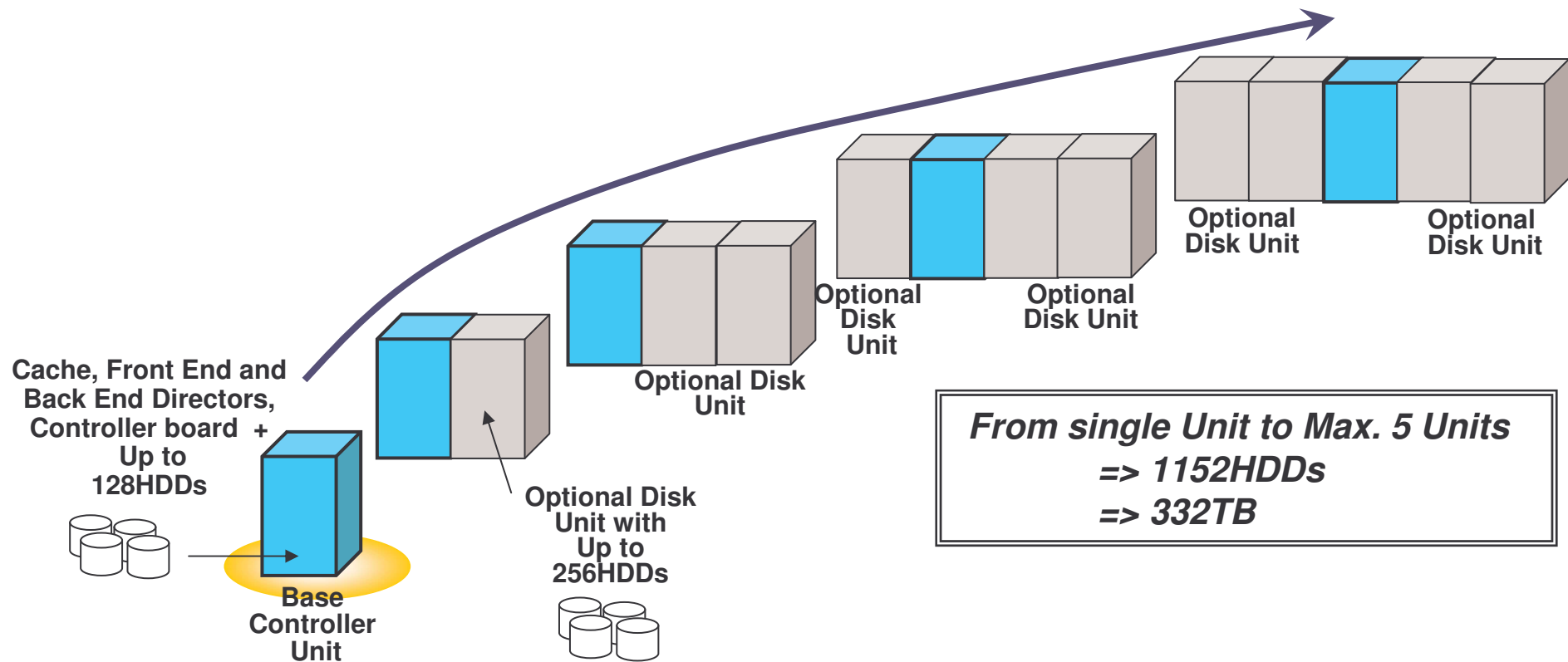
- The Hitachi Universal Storage Platform V is not a single server that needs to be clustered for availability
  - It is a cluster of 128 processors within a physical frame sharing a global cache
- The first enterprise storage system with a switched back-end
- No single point of failure and can be maintained disruptively
- RAID6
- Dynamic Sparing
- HiTrack® “call-home” service/remote maintenance tool
- 100% Data Availability guarantee



4Gb/sec end-to-end internal architecture  
including front-end, disks, and back-end

# Seamless Scalability with Single Model of the Hitachi Universal Storage Platform V

- Common components from base unit to maximum configuration.
- Non-Disruptive upgrade from base to maximum



# Capacity and Connectivity To Accommodate Massive Multi-Protocol Consolidation

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- Capacity
  - 332 TBs of Internal Storage
  - 247 PBs of virtualized heterogeneous storage
- Connectivity
  - 224 Fibre Channel Ports
  - 112 ESCON Ports
  - 112 FICON Ports
  - Hitachi High Performance NAS option
  - iSCSI planned
- Scalability
  - 2x the number of replication pairs per system
  - 2x remote replication port bandwidth
  - 4x the number of logical devices (LDEVs)
- Configuration Flexibility
  - Finer granularity of optional feature set - more precisely match your business needs
  - Improved availability and serviceability



**Hitachi Universal Storage Platform™ V**

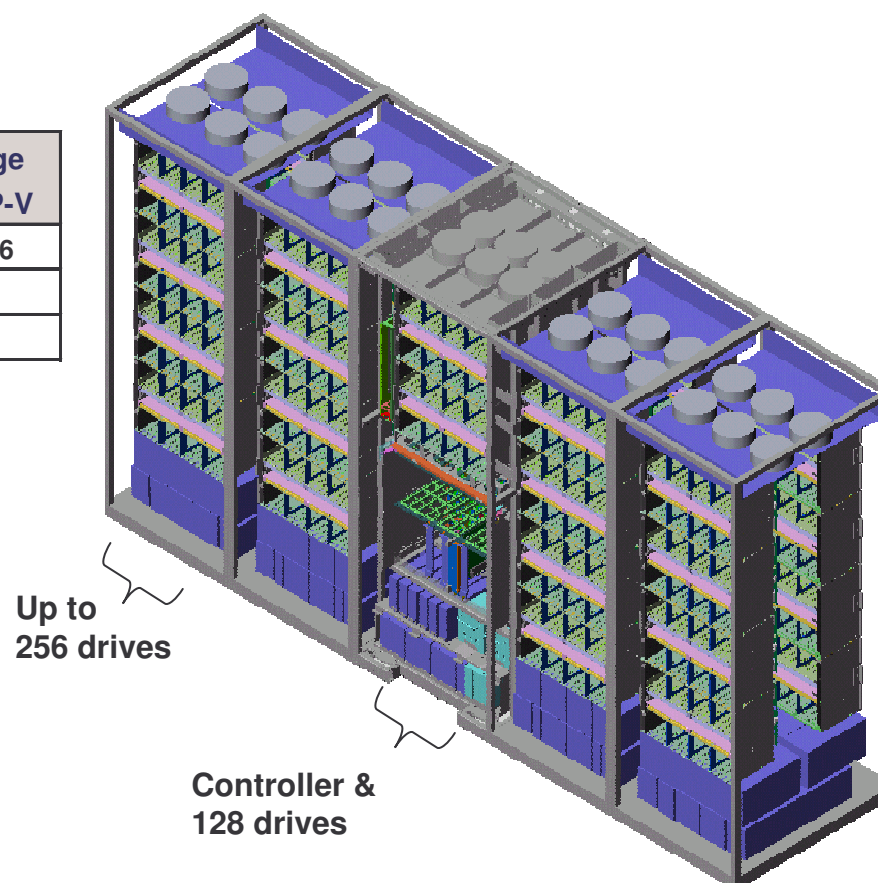
# Hitachi Universal Storage Platform V

## Form Factor and Packaging

- Base controller frame and 1 to 4 optional disk array frames
- Controller boards are reduced to half previous size, fewer resources affected by a service action
- Improved Availability, Configurability and Serviceability

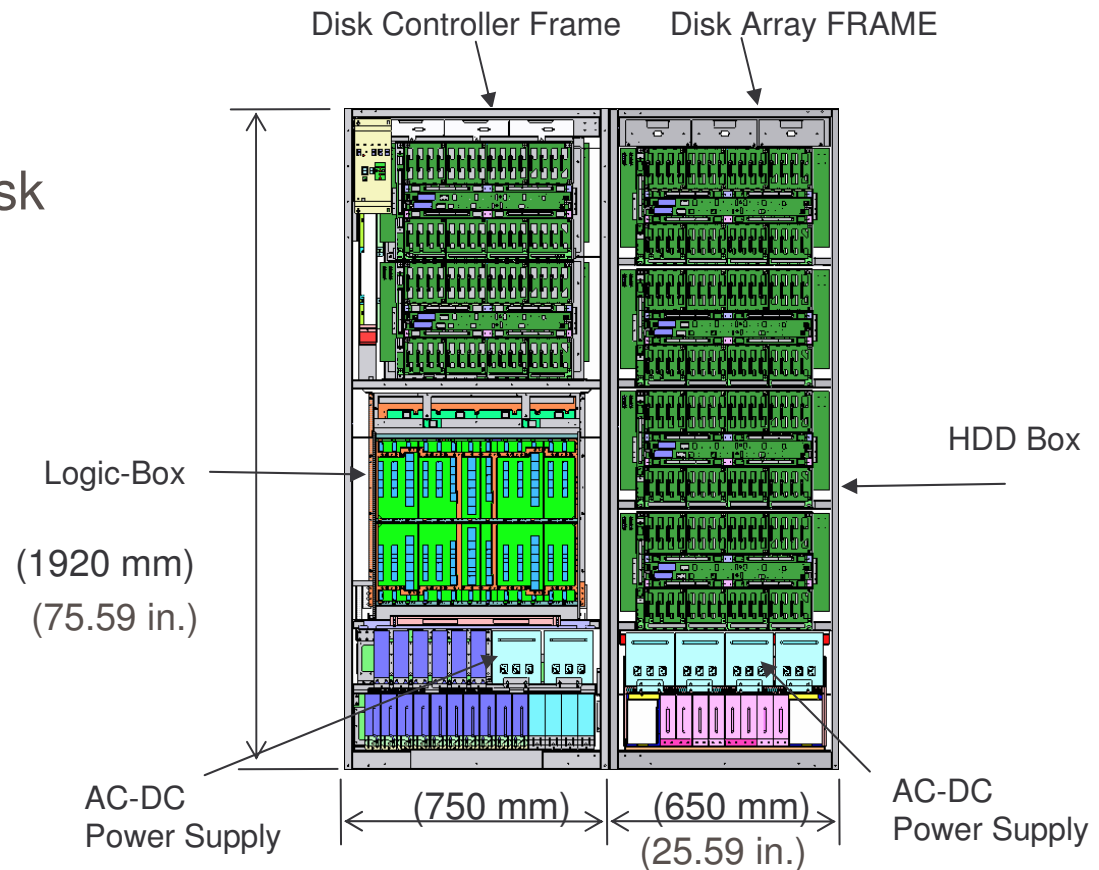
| CHA Type   | FED Packages |       | Ports / Package |       |
|------------|--------------|-------|-----------------|-------|
|            | USP          | USP-V | USP             | USP-V |
| Open Fibre | 4            | 8     | 16,32           | 8,16  |
| ESCON      | 4            | 8     | 16              | 8     |
| FICON      | 4            | 8     | 8,16            | 8     |

|       | Back-end Loops |       | Max Disks |       |
|-------|----------------|-------|-----------|-------|
|       | USP            | USP-V | USP       | USP-V |
| 1 BED | 16             | 8     | 384       | 192   |
| 2 BED | 32             | 16    | 640       | 384   |
| 3 BED | 48             | 24    | 896       | 512   |
| 4 BED | 64             | 32    | 1152      | 640   |
| 5 BED | -              | 40    | -         | 768   |
| 6 BED | -              | 48    | -         | 896   |
| 7 BED | -              | 56    | -         | 1024  |
| 8 BED | -              | 64    | -         | 1152  |



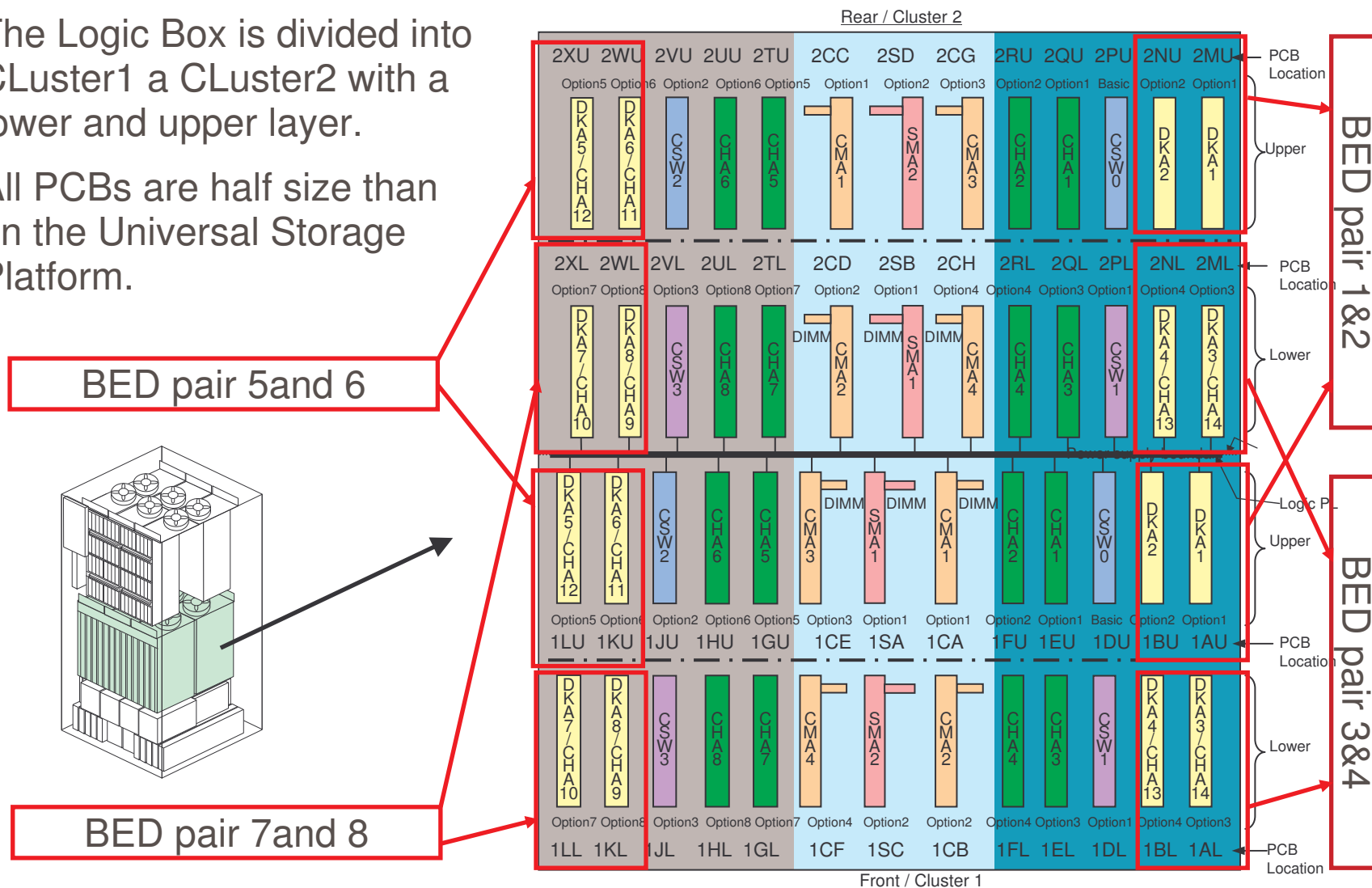
# USP V Frame Types

- Disk Controller (DKC) Frame
- Disk Unit (DKU) or Disk Array Frame



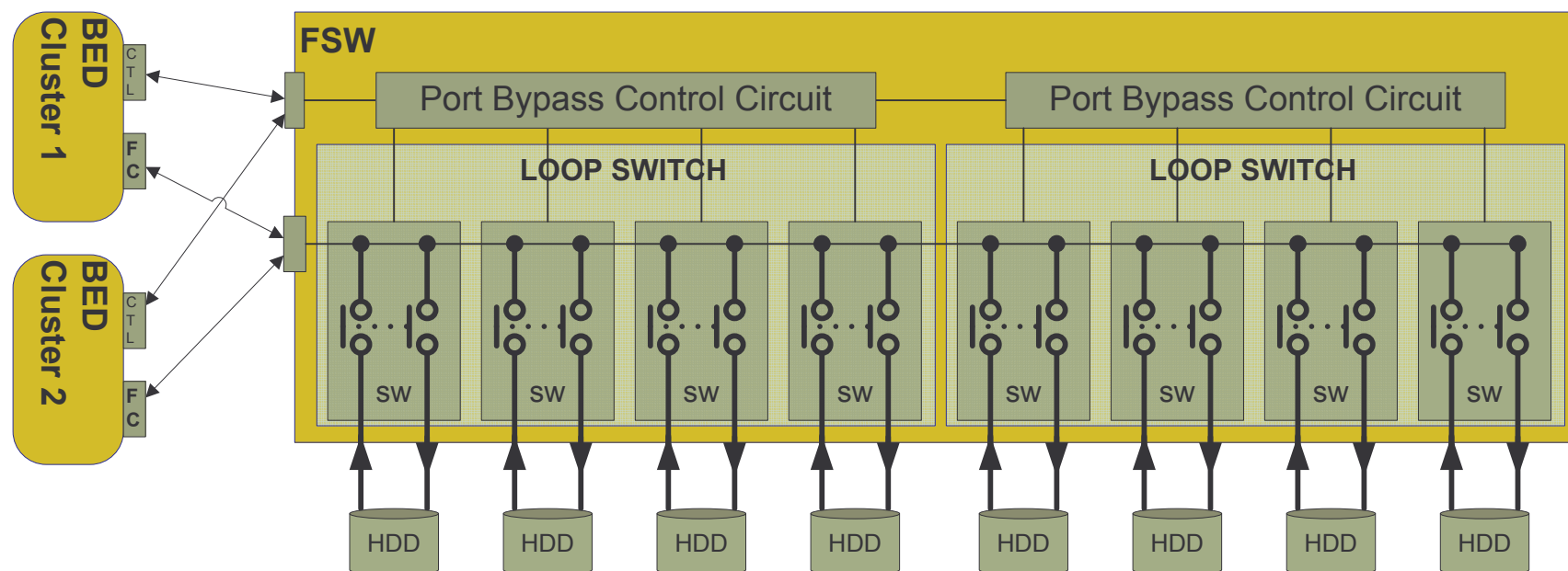
# USP V Disk Controller Frame's New Logic Box Design

- The Logic Box is divided into CLuster1 a CLuster2 with a lower and upper layer.
- All PCBs are half size than on the Universal Storage Platform.

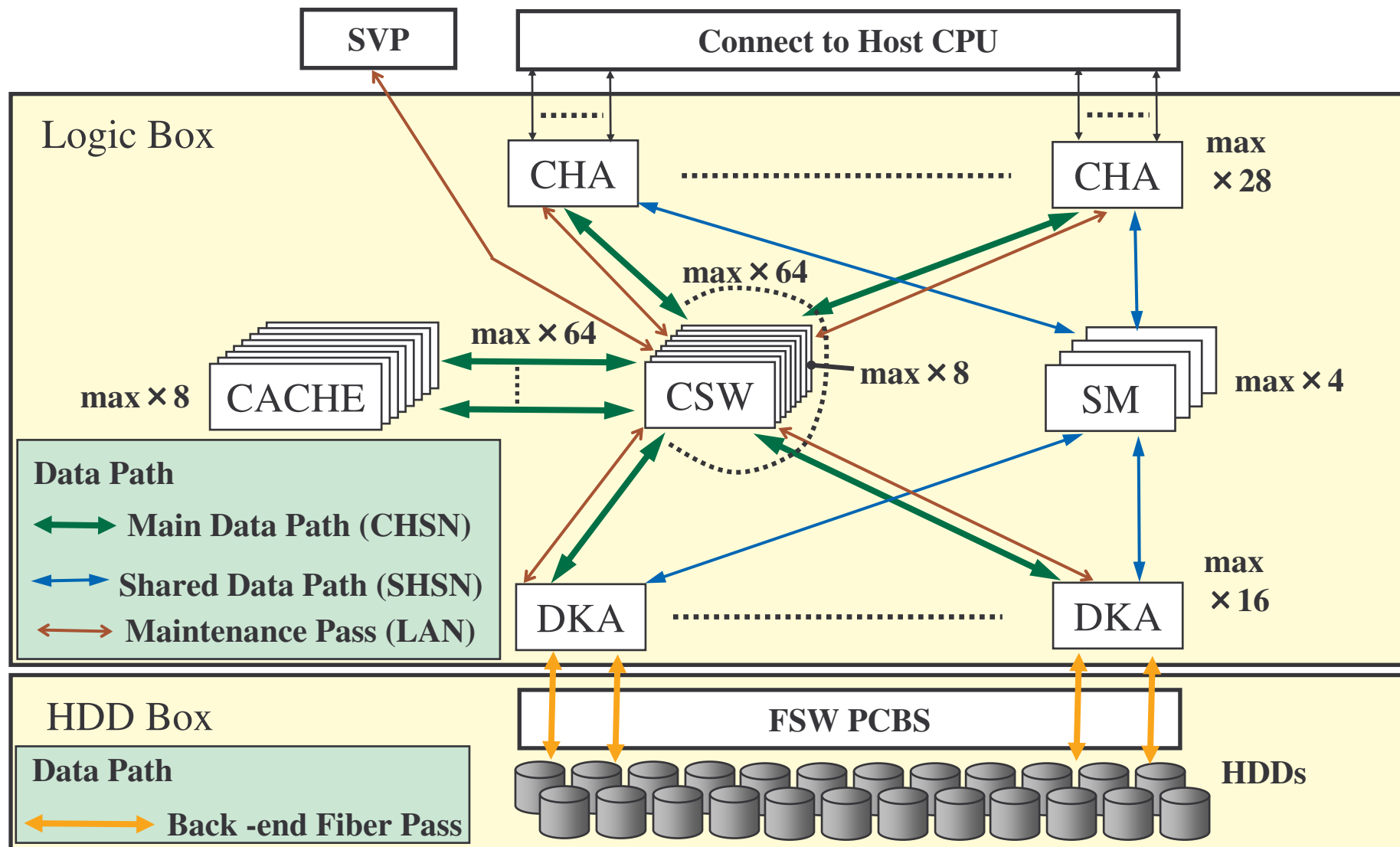


## Switched Loop Back-End

- Reduces impact during drive failure and/or sparing
- Improves Performance by reducing disk-to-disk daisy chain latency.



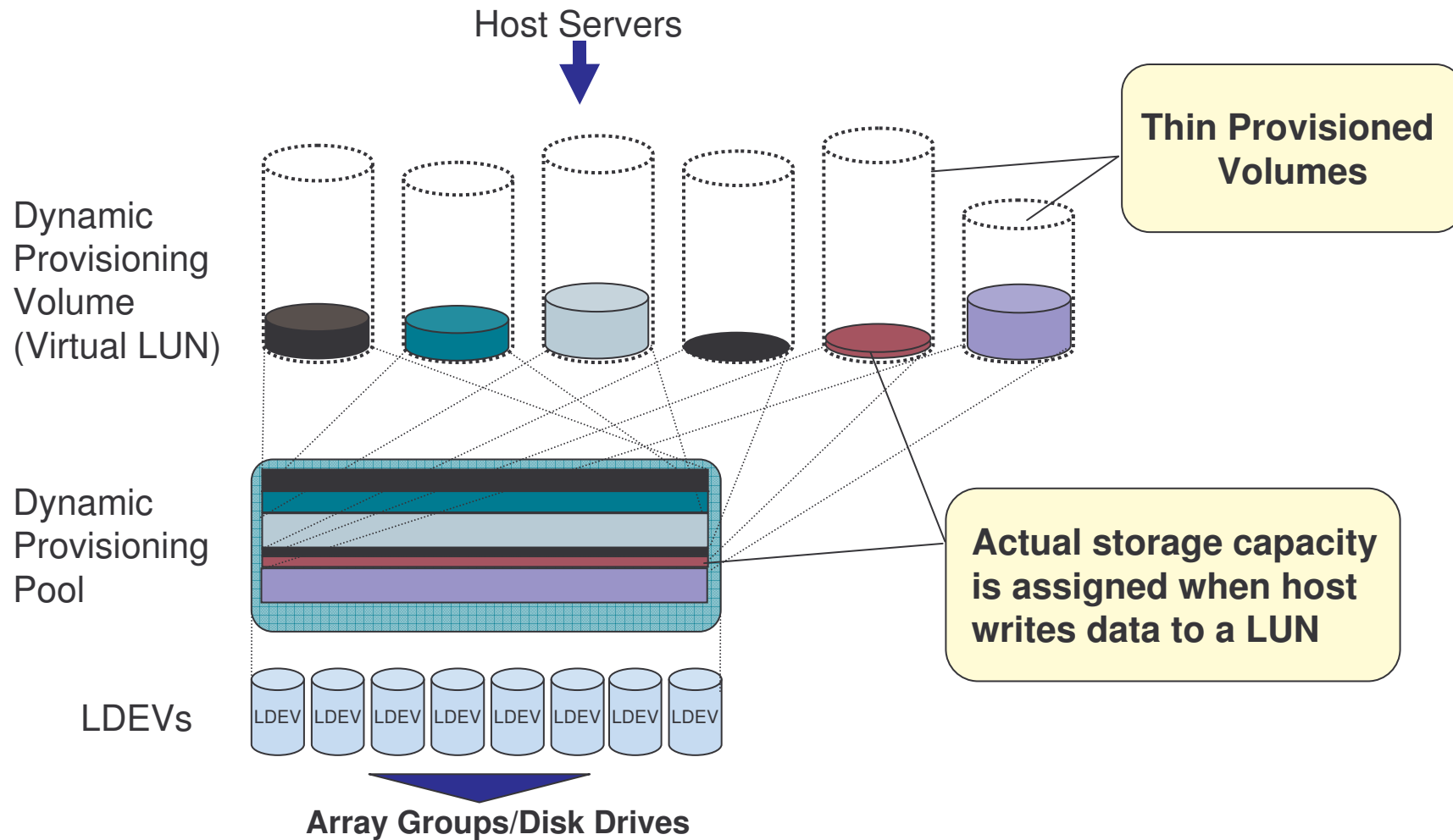
# Hardware Architecture



# Hitachi Dynamic Provisioning

How does it work?

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## Questions/Discussion