

SONY

SCALABLE. RELIABLE. FOREVER.

Sony Optical Archive, Inc. Fundamentally Redefines Archive With Optical Technology



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# EVERSPAN – Optical archive solution for the Data Center

- Row level library design with up to 176PB capacity per row
- Array head 8-channel drive
- 280MB/s transfer rate per drive, 64 drives per system
- Restore 18GB/s throughput
- Power consumption 0.05kW/PB vs 2.5kW/PB for HDD
- Erasure code data protection
- 100YR media warranty
- Interfaces: S3 Object Store, Tape, NFS, HDS HCP

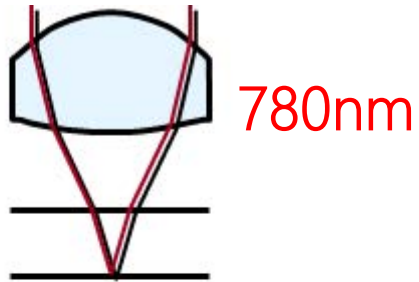
# Agenda

- Everspan Technology
  - Media
  - Drive
- Everspan Library
  - Row level design for Data Center use
- Connectivity Options
  - S3 Object store
  - Tape interface

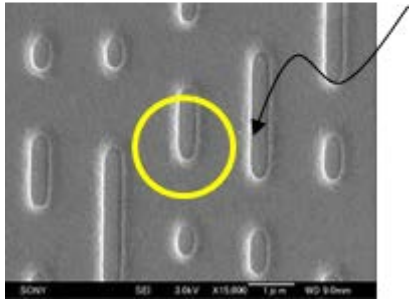
# Optical technology for professional archiving

## Consumer

**CD(1982)**

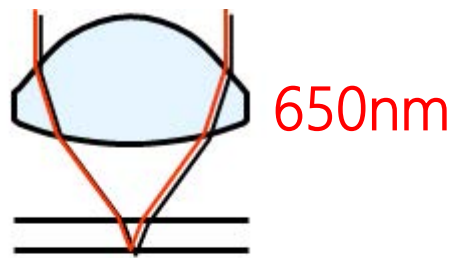


780nm

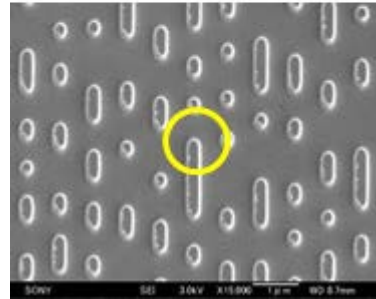


**650MB**

**DVD(1996)**

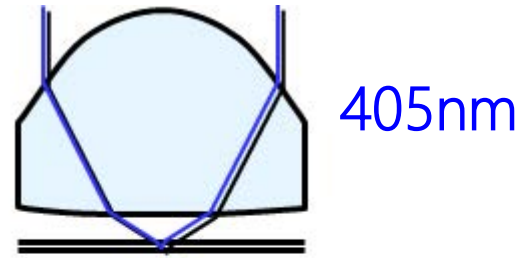


650nm

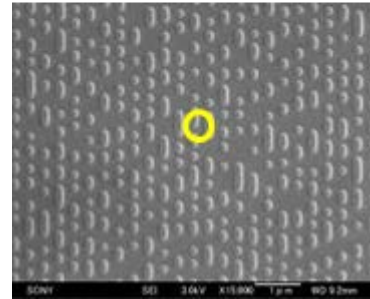


**4.7GB**

**Blu-ray™(2003)**



405nm



**50/100GB**

Professional  
**Archival Disc**  
**(2015)**



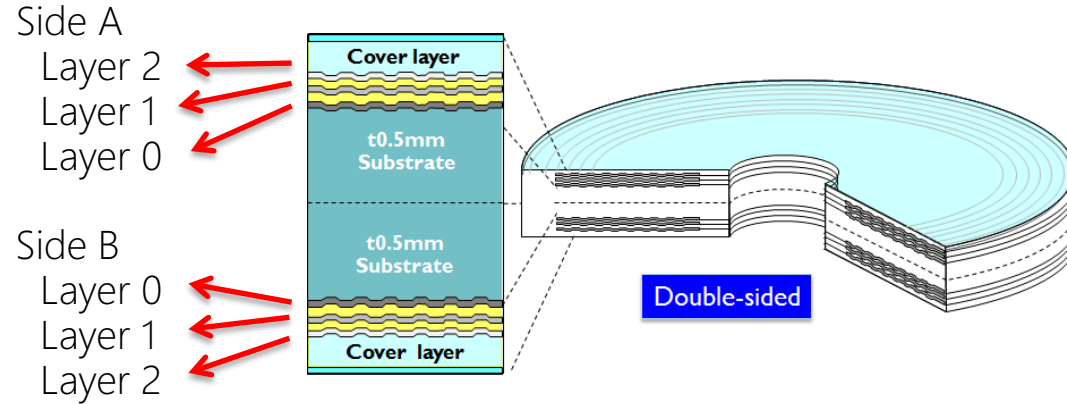
**300GB**

# Archival Disc

## Disc structure

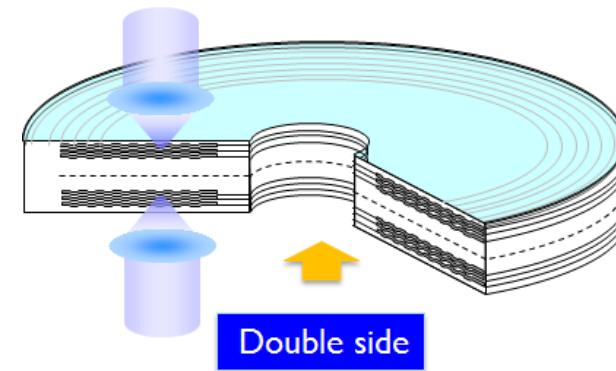
- 3 layers /side & Double-sided structure
- Inorganic recording layer
- Protective cover layer

## Recording Layer



## Key technologies

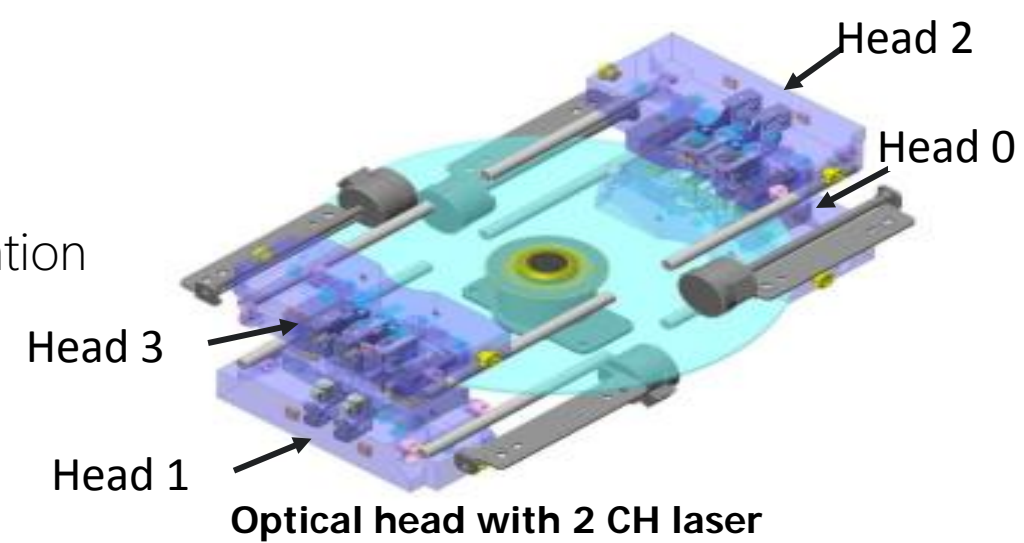
- Simultaneous recording on both sides
- 45MB/s Head



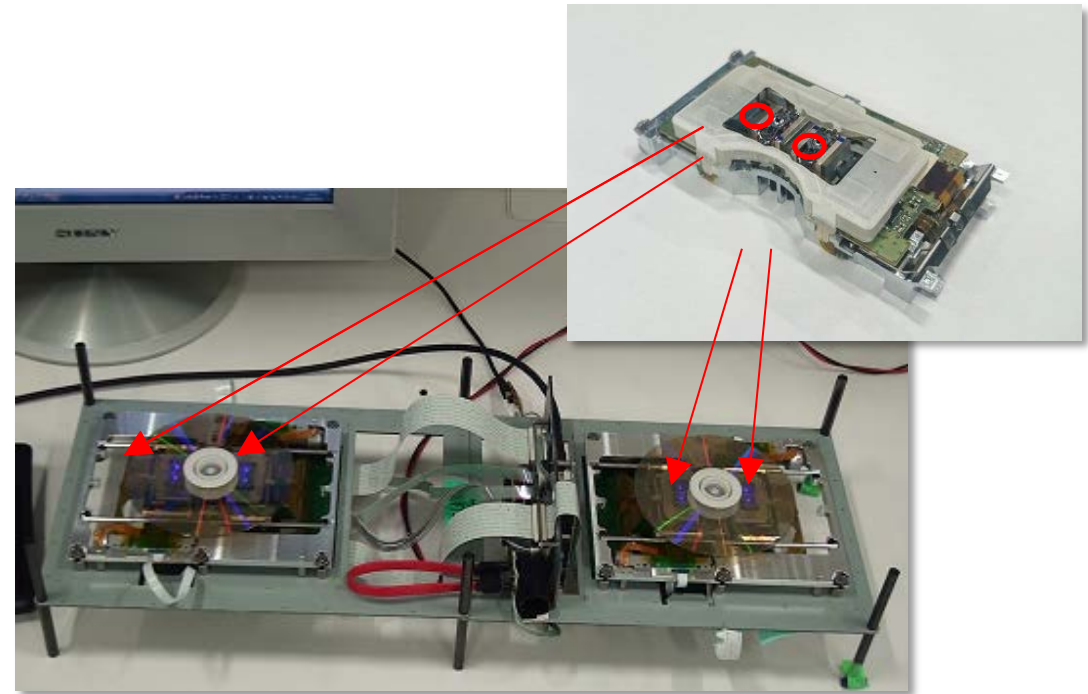
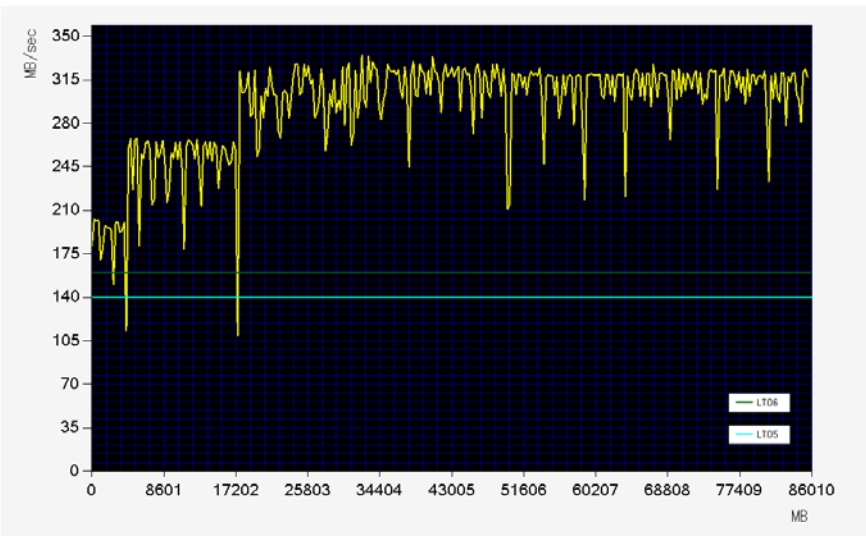


# High performance drive

- The worlds 1st 8-CH dual-side drive for highly efficient operation
- Drive transfer rate:
  - Average write 140MB/s (with verification)
  - Average read 280MB/s (peak 315MB/s)
- High reliability laser

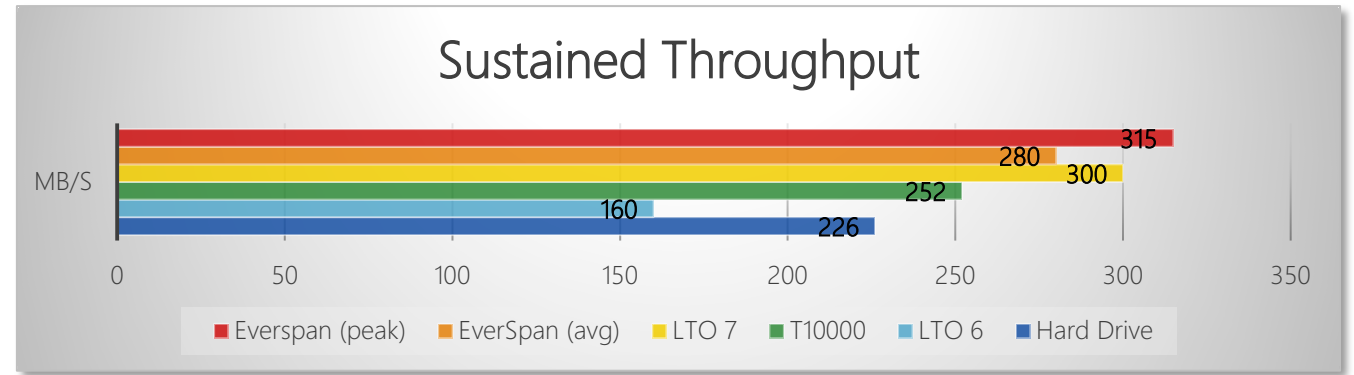


## Read transfer rate



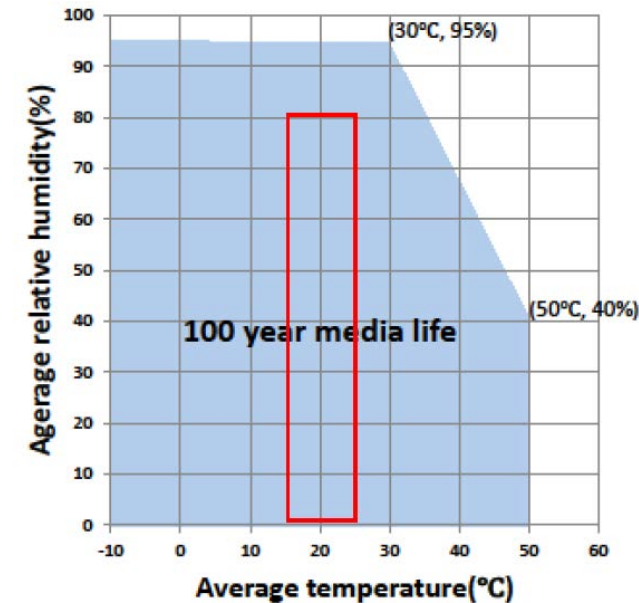
# Performance

- Array head drive
- Restore 18GB/s throughput
- Multi row options



# Reliability

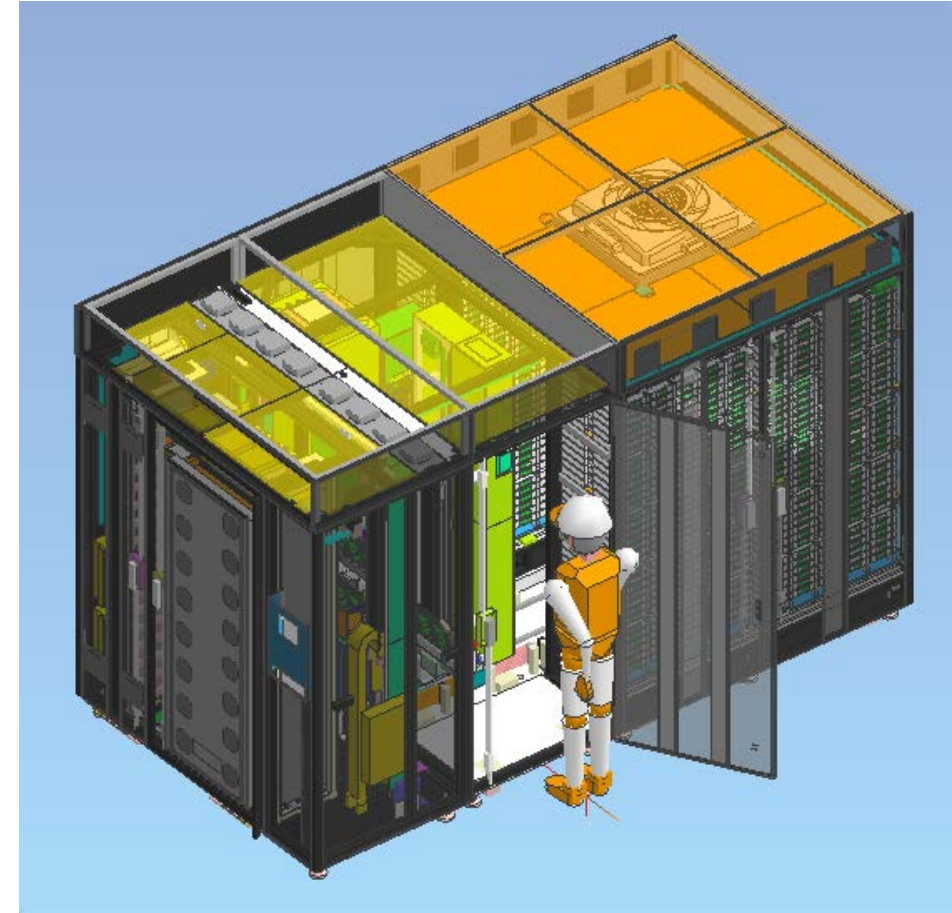
- Non contact recording technology
- Erasure coding option
  - Within library
  - Across 1,2 or 4 libraries
- 100 year media warranty



LTO-7 Archival Spec.

# Everspan brings *optical* to Data Center cold storage

- *Scalability* across expansion units:
  - 12.6PB increments
  - Up to 14 expansion units, 176PB
- *Performance: 18GB/s restore*
  - *Faster restore than LTO-7 (direct access, erasure code)*
- *Compatibility* through drive/media generations
  - No limitations like tape (2 generation limit)
- *Low cost/GB* acquisition cost
  - Tape needs dual copy and server HW for restore
  - HDD has higher cost, media life ~5-8 years
- *Lowest power consumption (typical 9kW/176PB)*
  - *Everspan: 0.05kW/PB (\$7,708/YR for 176PB at 10c/kWh)*
  - *HDD (8TB): 2.5kW/PB (\$385,440/YR for 176PB at 10c/kWh)*





# Everspan System

- Scalable to 14 expansion units = 176PB
- Expansion units are media racks
  - No power consumption in expansion units
- Compatible with warehouse environment



# Connectivity Options & Software Integration

## Device interfaces

- Robotic = SMC-3
- Optical drive = MMC-6 (iSCSI target)
- Optical drive with Tape Interface = SSC-4 (iSCSI target)

## Storage Interfaces

S3 Object Store (>80% market share)

- Erasure code implementation for redundancy and high bandwidth
- Active/Passive failover Gateway- and Metadata interface nodes

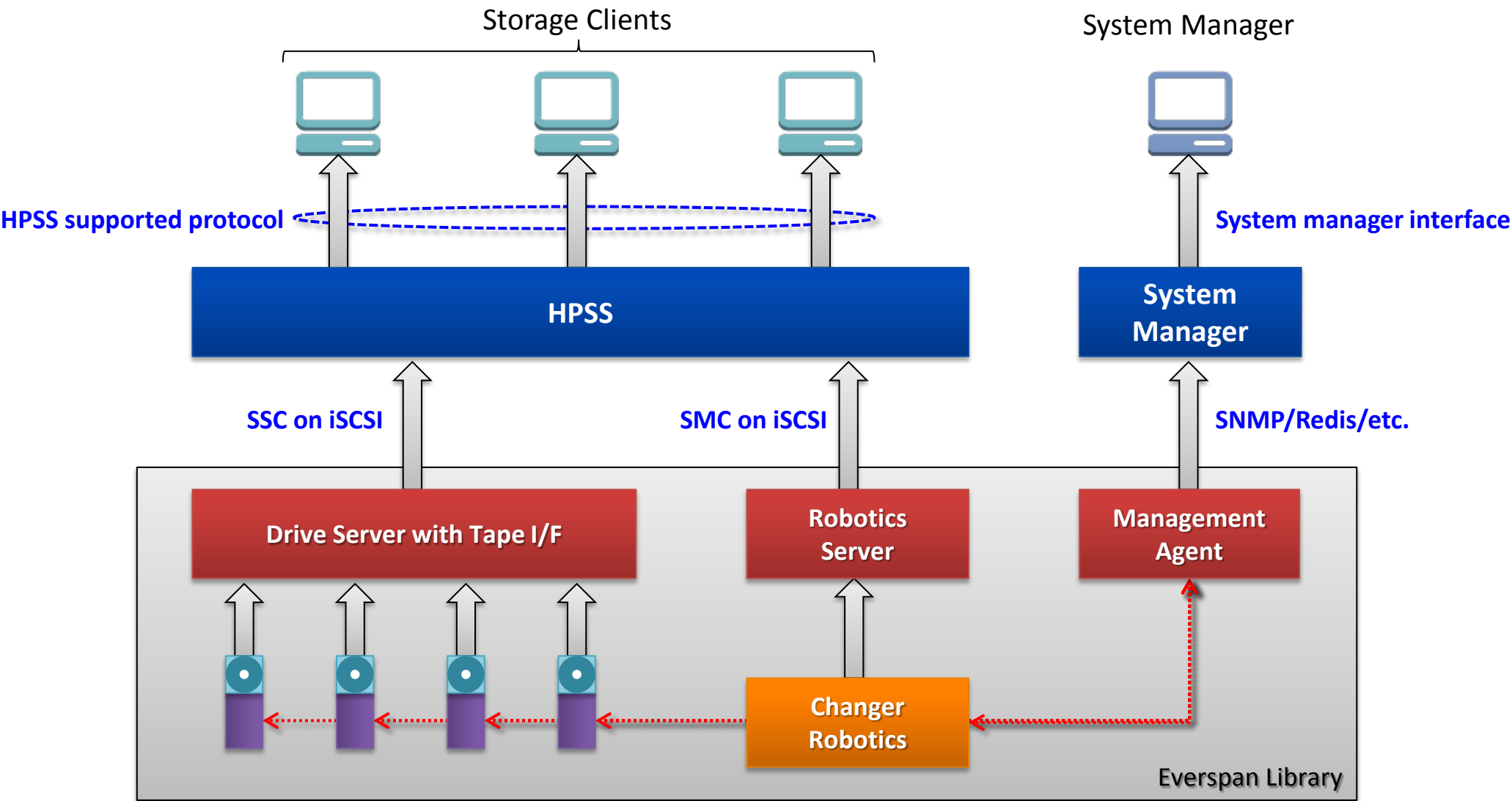
## Tape interface

- Connect to existing HPSS system
- Logical block protection supported

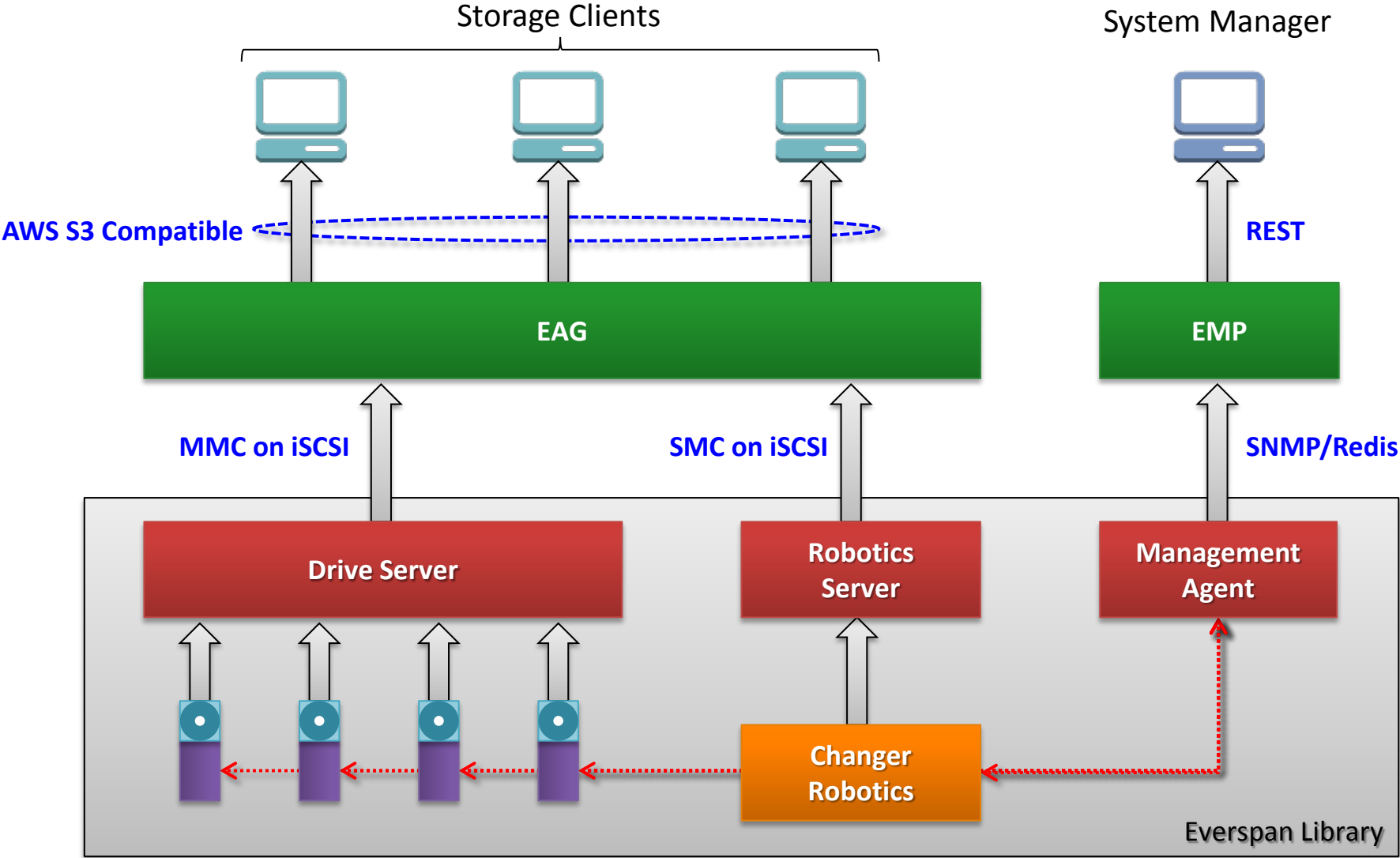
## NFS interface

HDS HCP (Hitachi Content Platform) support

# AD middleware components for HPSS



# AD middleware components for Object Store





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