

SONY

SCALABLE. RELIABLE. FOREVER.

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

 EVERSPAN

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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

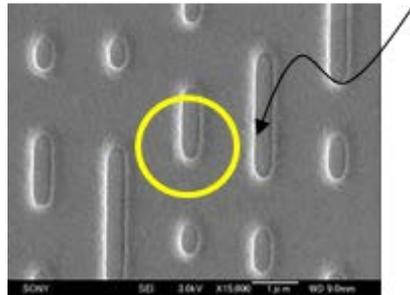
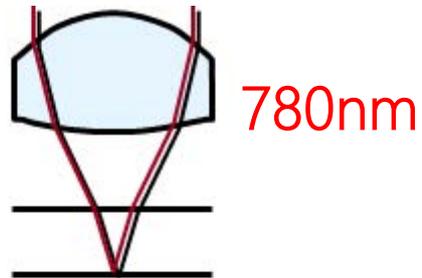
Agenda

- 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

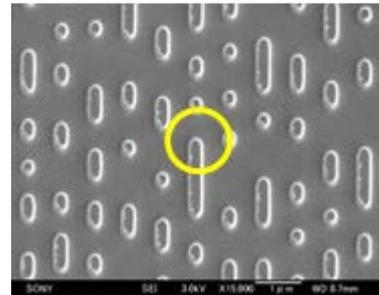
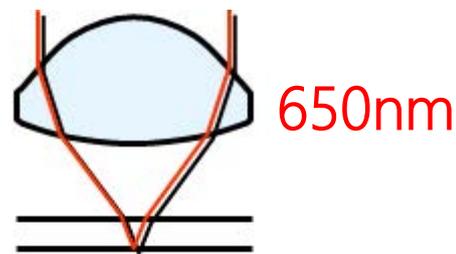
Consumer

CD(1982)



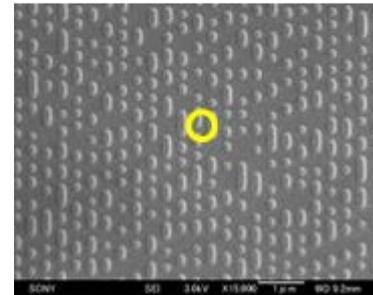
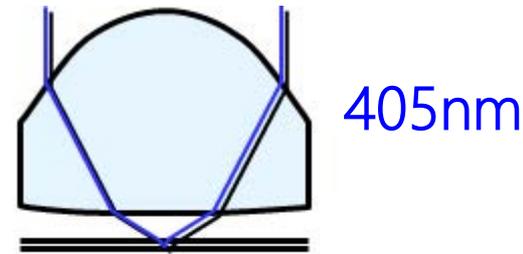
650MB

DVD(1996)



4.7GB

Blu-ray™(2003)



50/100GB

Professional
Archival Disc
(2015)



Archival Disc

300GB

Archival Disc

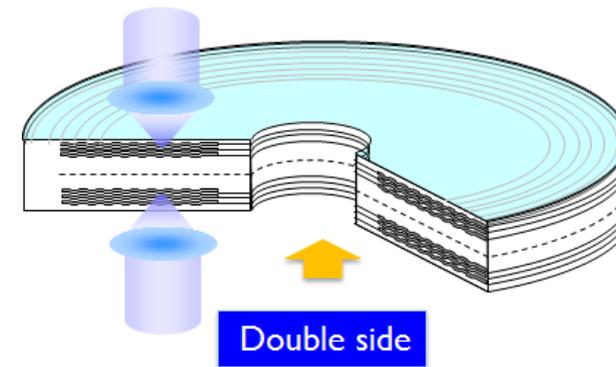
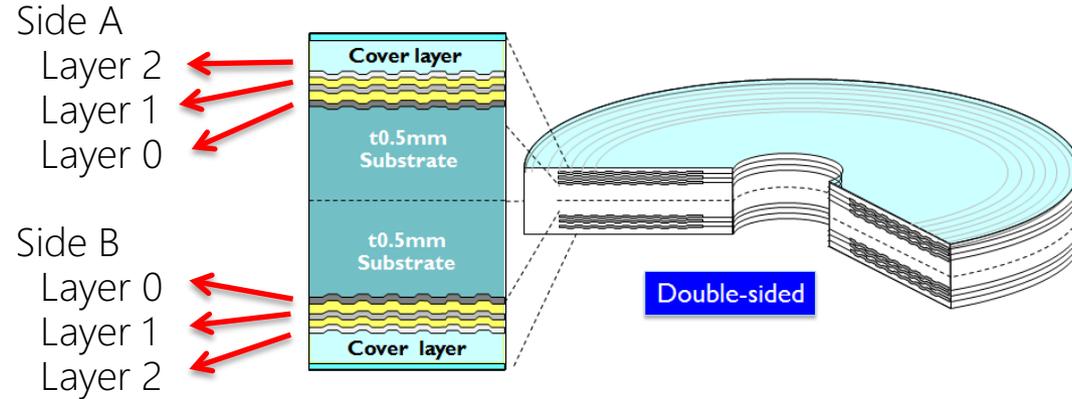
Disc structure

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

Key technologies

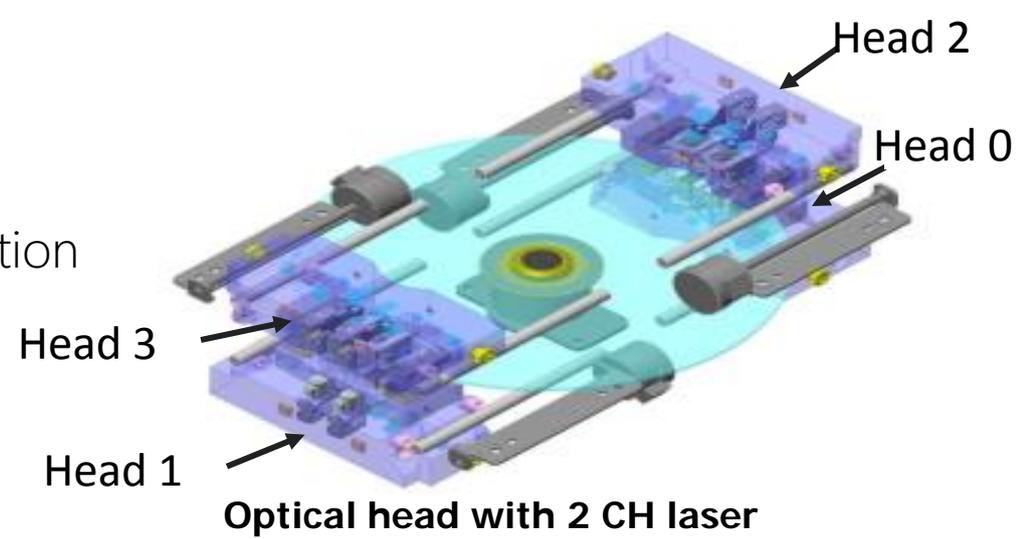
- Simultaneous recording on both sides
- 45MB/s Head

Recording Layer

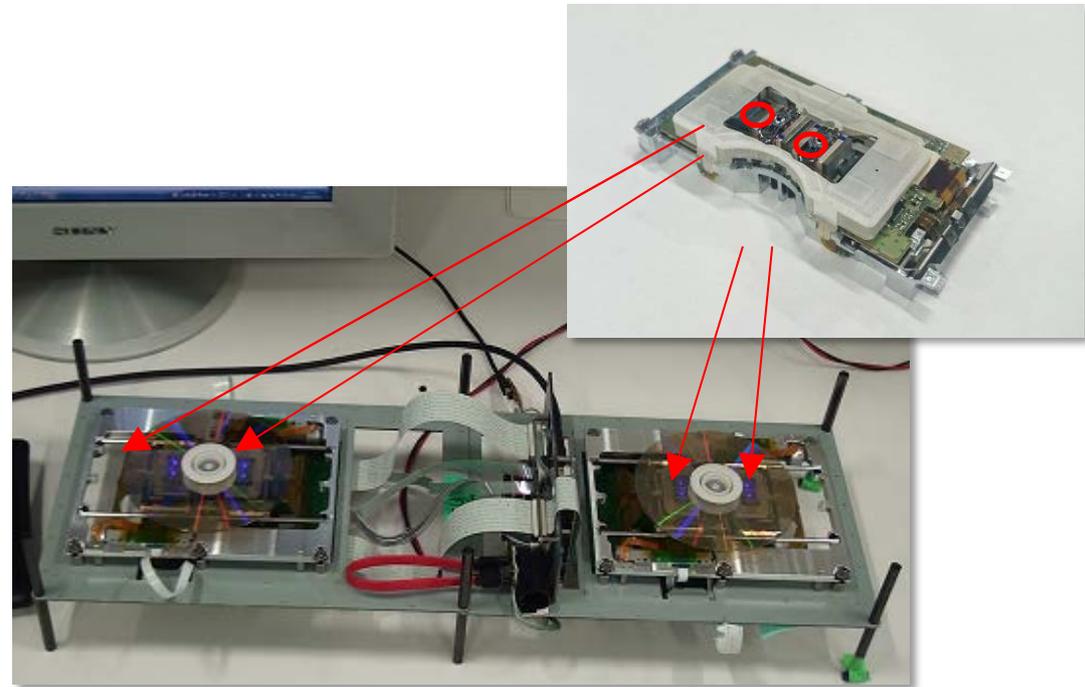
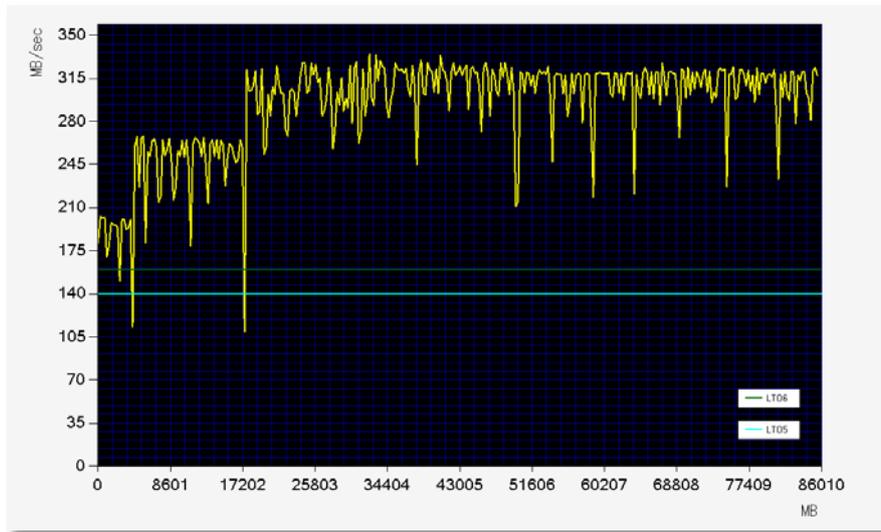


High performance drive

- 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

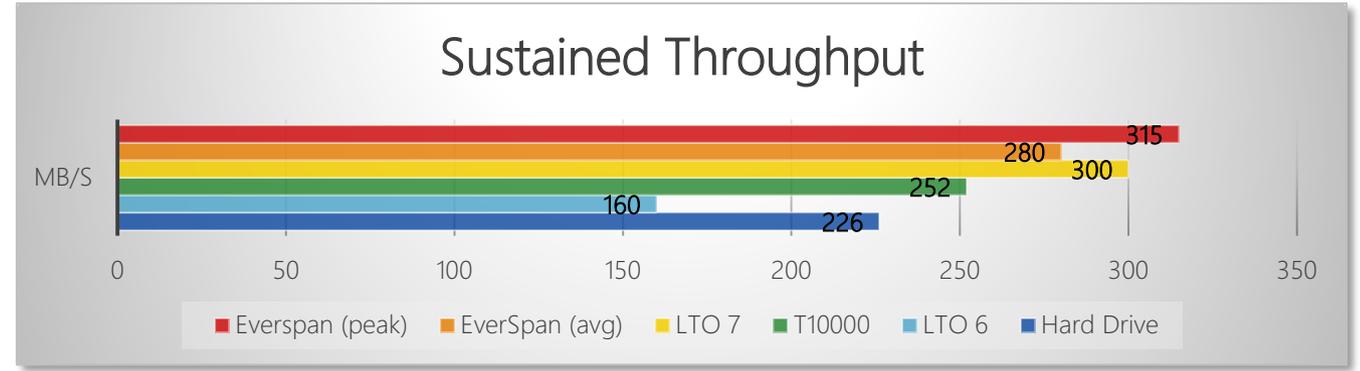


Read transfer rate



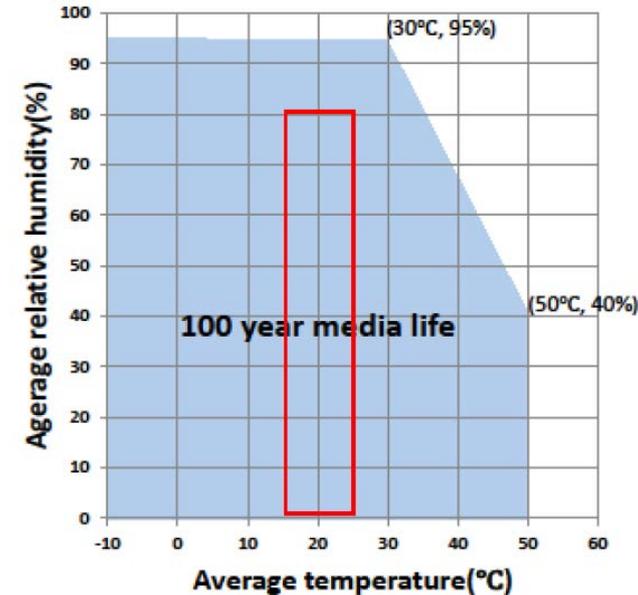
Performance

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



Reliability

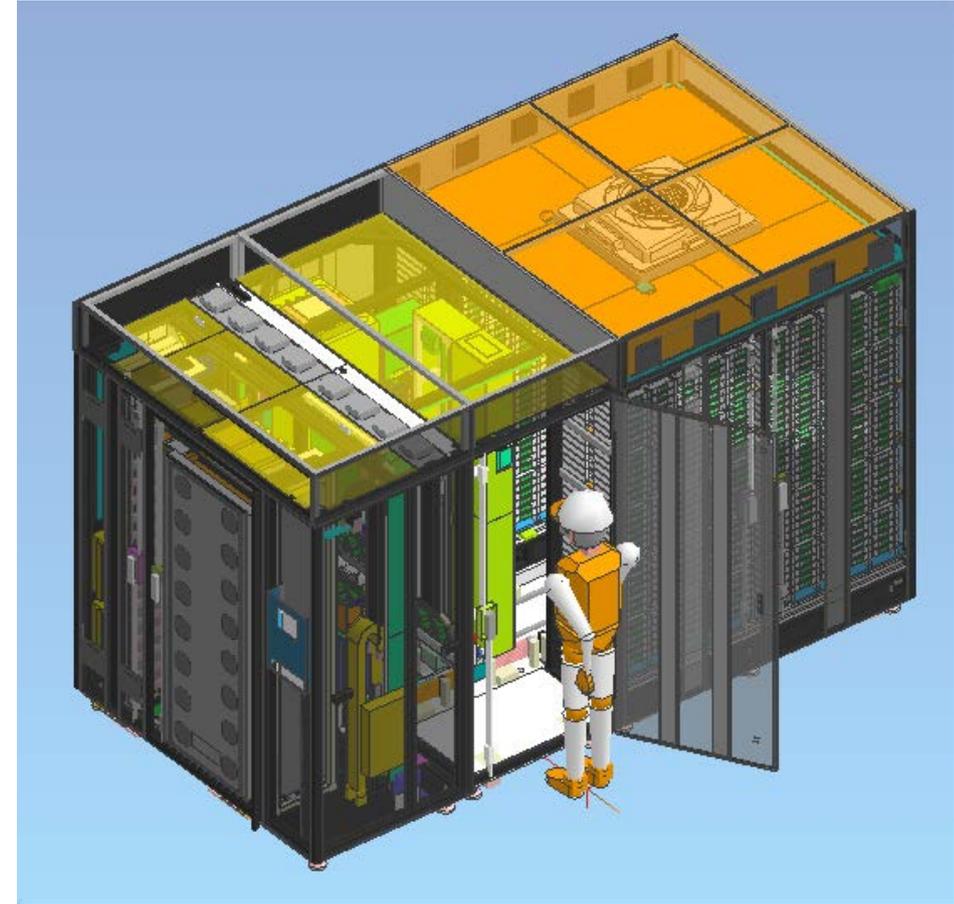
- Non contact recording technology
- Erasure coding option
 - Within library
 - Across 1,2 or 4 libraries
- 100 year media warranty



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

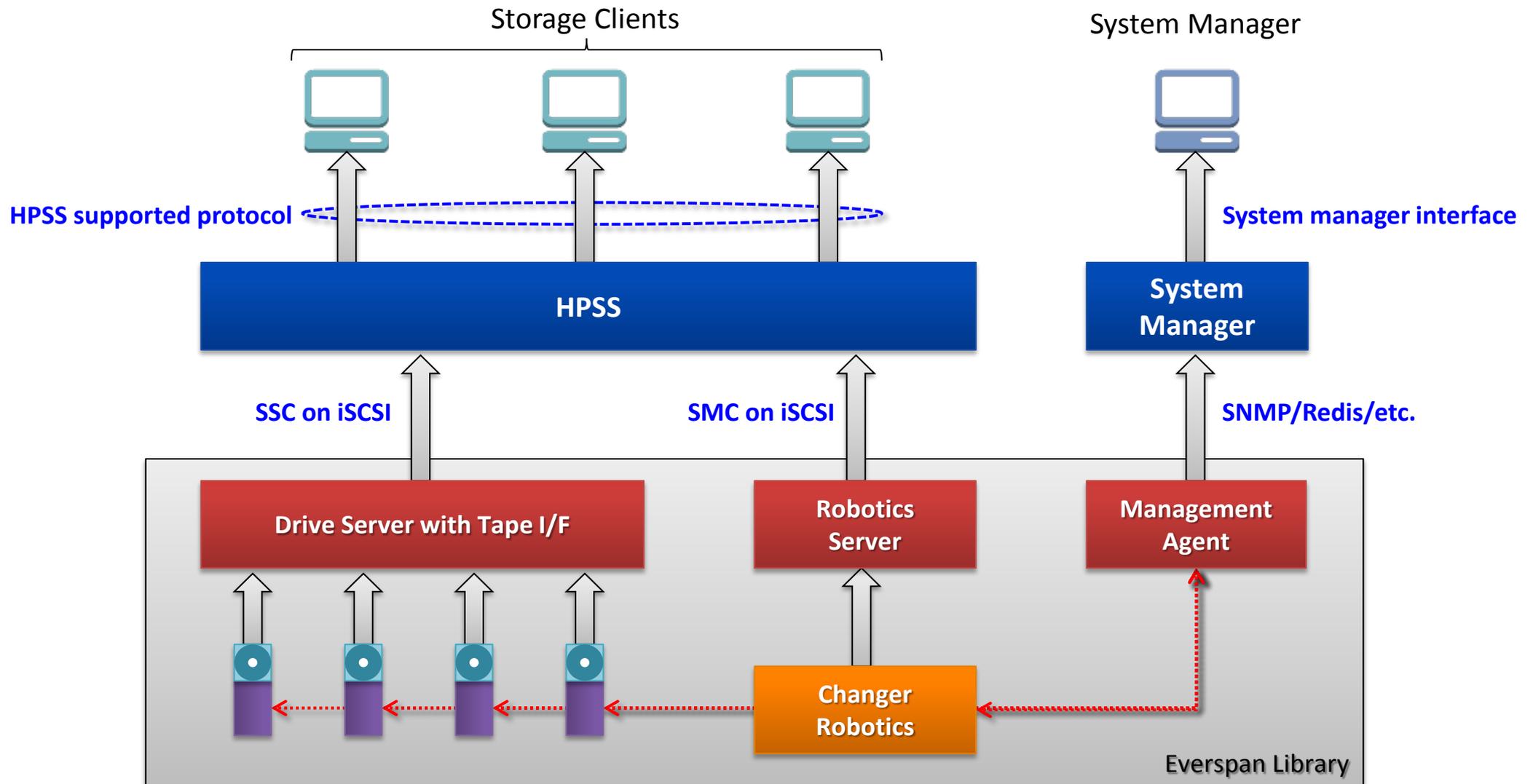
Tape interface

- Connect to existing HPSS system
- Logical block protection supported

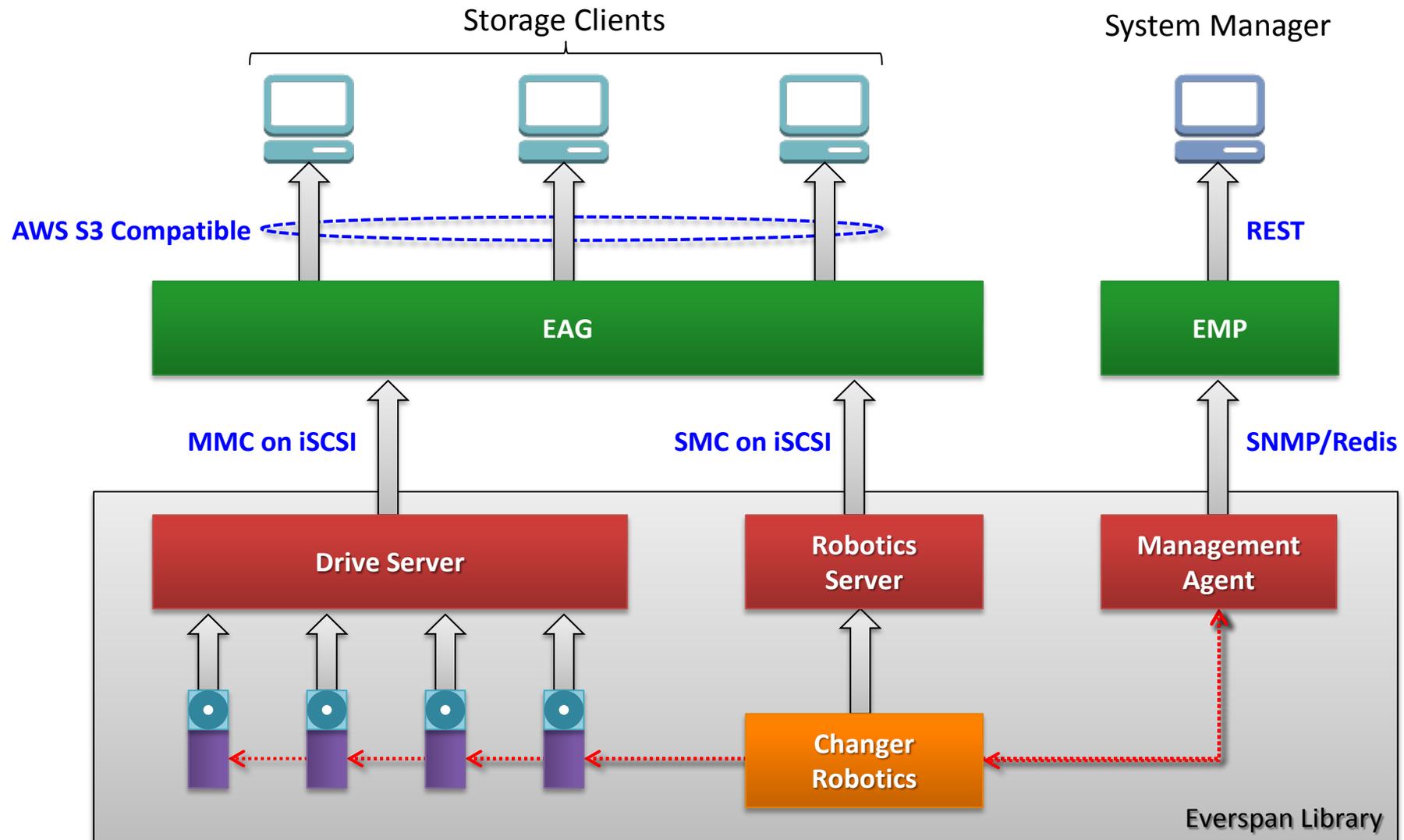
NFS interface

HDS HCP (Hitachi Content Platform) support

AD middleware components for HPSS



AD middleware components for Object Store



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