Information Lifecycle Management at Beth Israel Deaconess

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CIO

The Statistics

- We generate 1 terabyte of clinical text data (structured and unstructured) per year
- We generate 19 terabytes of image data per year
- We have 250,000 active patients
- 20 terabytes/250,000 = 80 megabytes per patient per year

The Cost of Storage

- Standard Performance
  - Unreplicated .34 per Gigabyte per year
  - Replicated .68 per Gigabyte per year
- High Performance
  - Unreplicated .55 per Gigabyte per year
  - Replicated to Standard Performance is .89 per Gigabyte per year

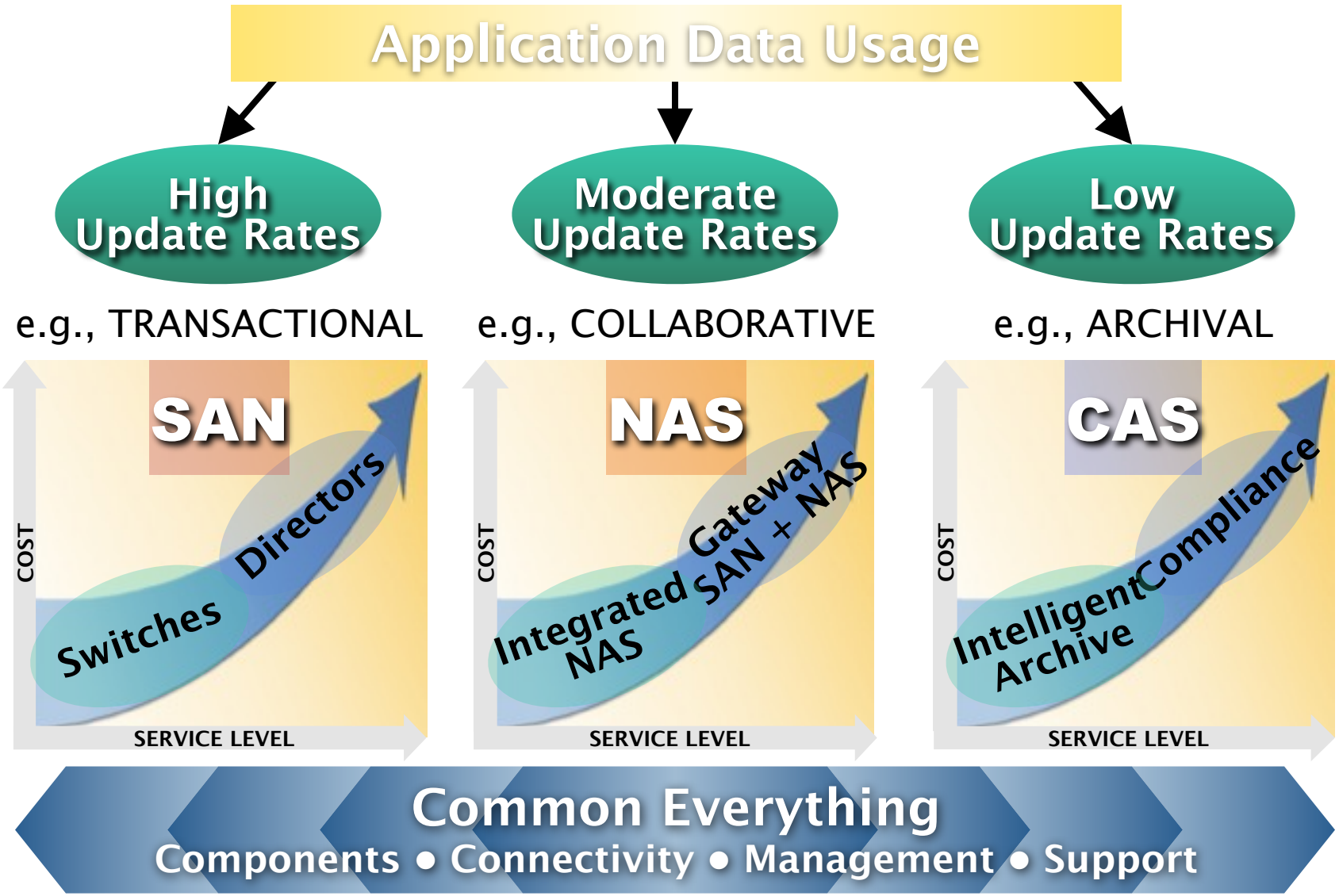
Cost for Storage in Regulatory timeframes

- Text storage growing at 4 megabytes per year, retained for 15 years
  - Use arithmetic progression formula n*(n+1)/2
  - Assume replicated storage of .89 cents per gigabyte
  - 4 megs*15*16/2*.89/1000 = 42 cents per patient for first 15 years
  - 4 megs*15*.89/1000 = 5 cents per year thereafter
- Image storage growing at 76 megabytes per year, retained for 7 years
  - 76 megs*7*8/2*.89/1000 = $1.89 per patient for first 7 years
  - 76 megs*7*.89/1000 = 47 cents per year thereafter

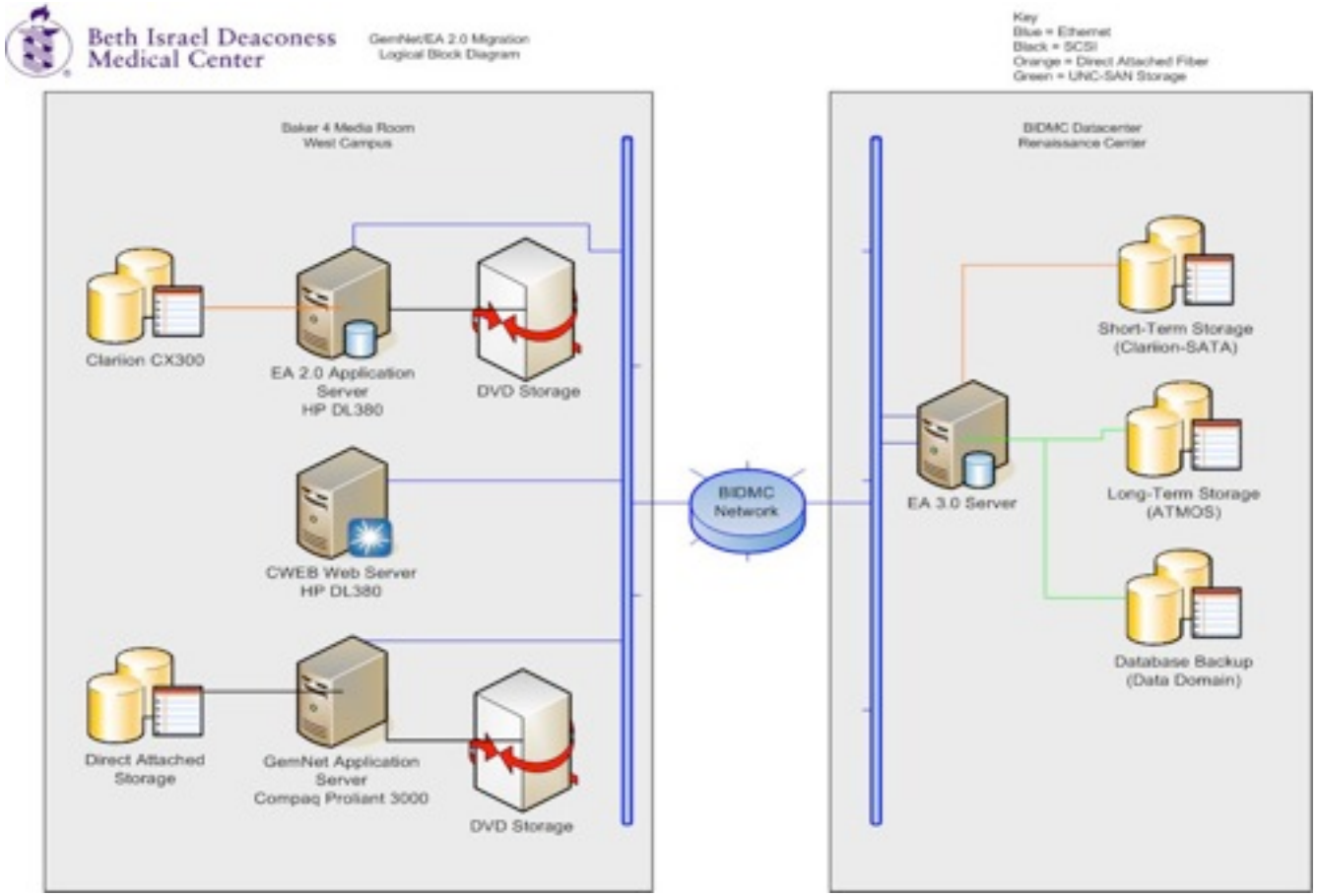
Other considerations

- The definition of the official medical record is in flux
- BIDMC's costs are low because of a stable set of technologies and vendors
- Multimedia may impact storage volumes
- Disaster recovery, high availability, and application life cycle requirements can impact storage volumes
- Emerging factors such as e-discovery will impact retention times

SAN, NAS, CAS


Application Data Usage
High Update Rates
Moderate Update Rates
Low Update Rates
e.g., TRANSACTIONAL
e.g., COLLABORATIVE
e.g., ARCHIVAL
SAN
COST
Switches
Directors
SERVICE LEVEL
NAS
COST
Integrated NAS
Gateway SAN + NAS
SERVICE LEVEL
CAS
COST
Intelligent Archive
Compliance
SERVICE LEVEL
Common Everything
Components • Connectivity • Management • Support

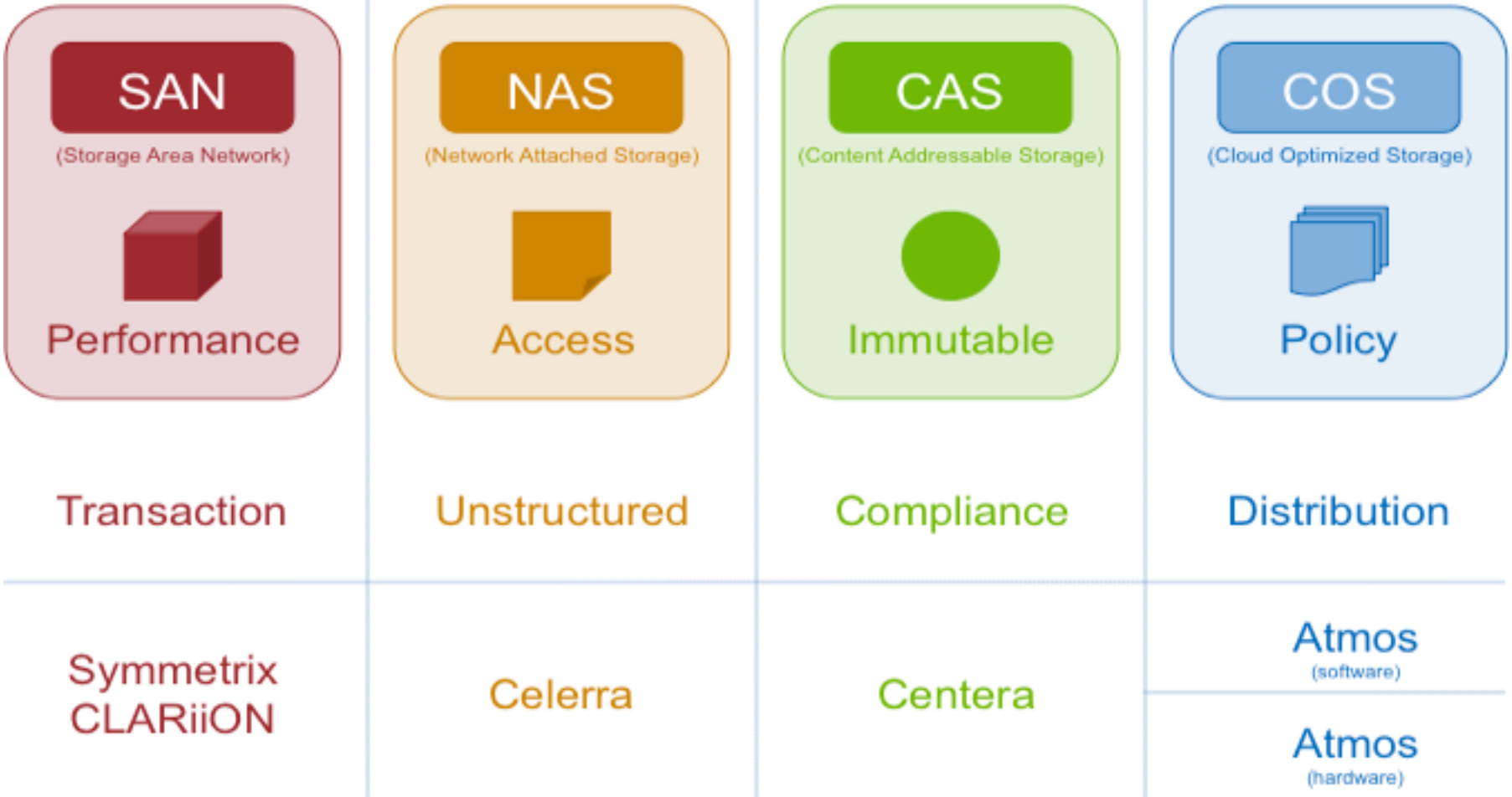
Migration from DVD to Atmos



Storage Tiering

- Tiering allows for cost appropriate storage choices through the complete data lifecycle.
- We have many tiers, across several platforms all designed to deliver a specific $/GB appropriate target for each different type of storage requirement.

Enterprise Storage Categories



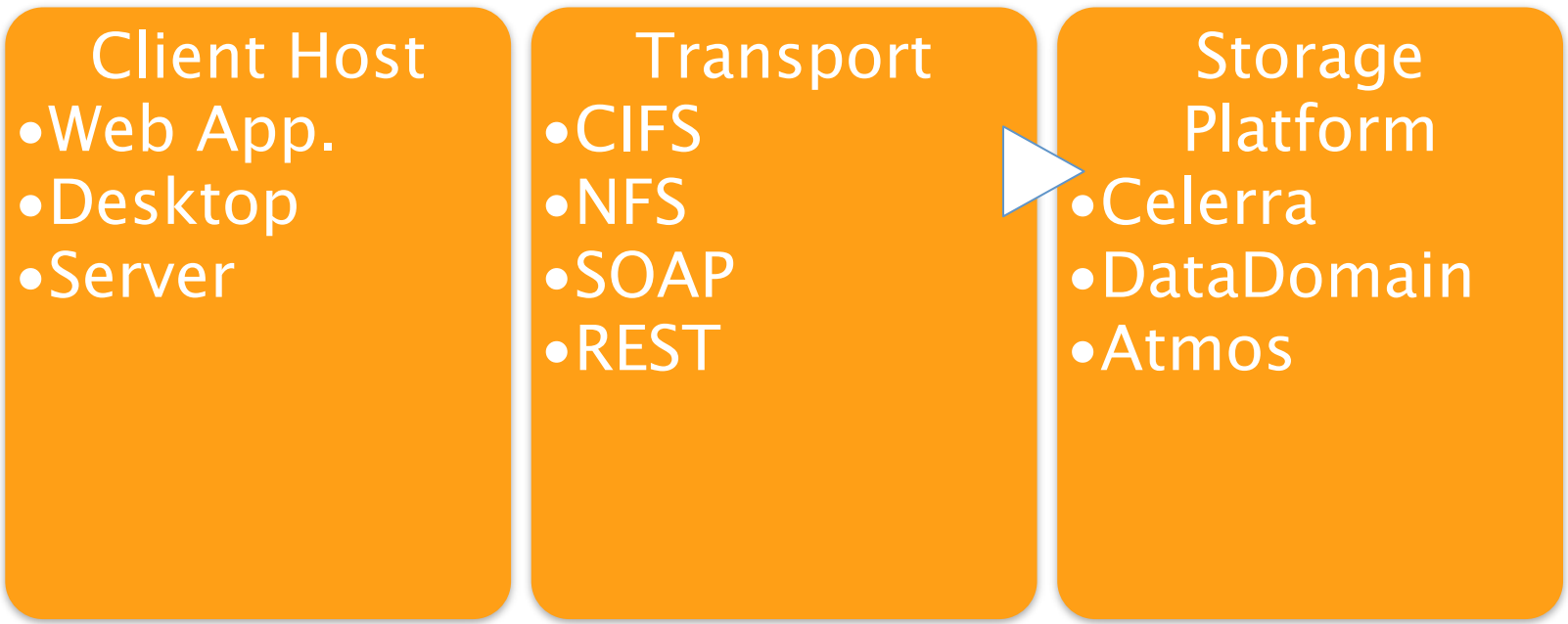
SAN Block Storage

Data Center Host
- CCC
- SQL
- Oracle
- Exchange

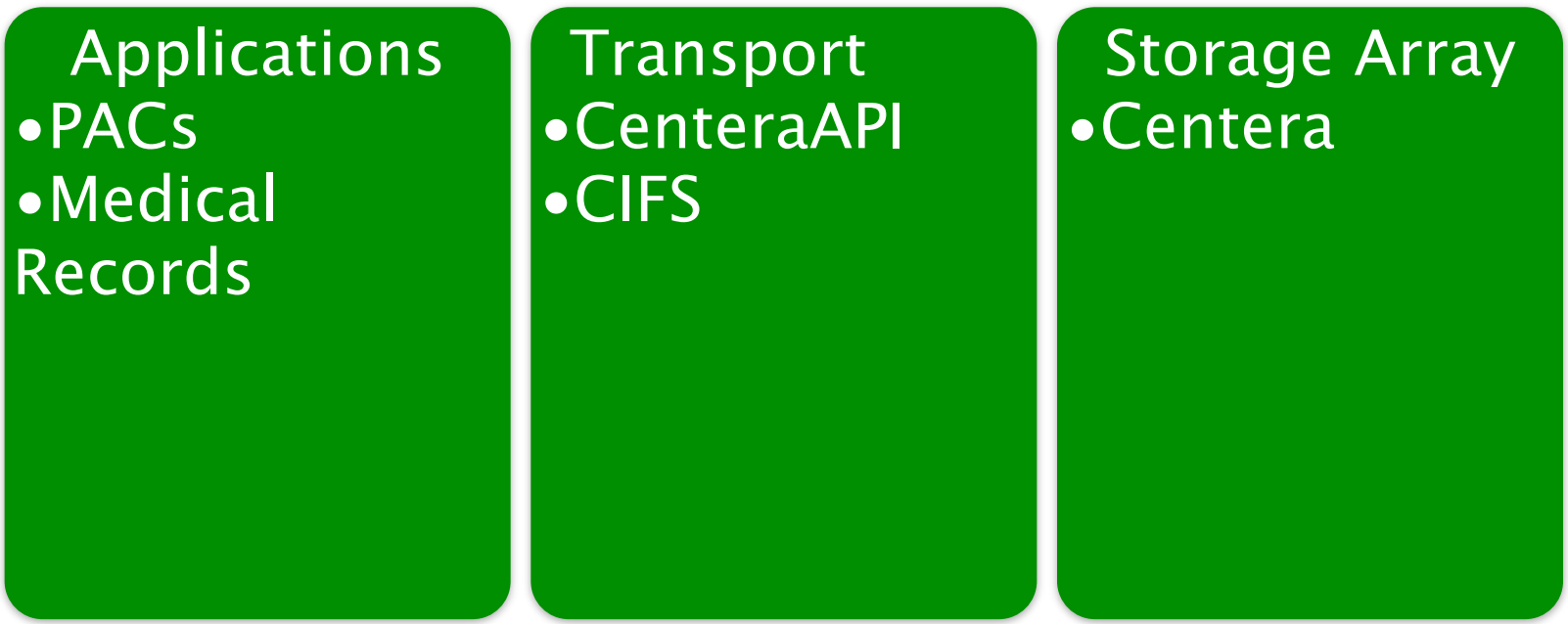
Transport
- Cisco FC Switch
- iSCSI to FC bridge

Fibre Channel Array
- CLARiiON
- DMX

Network Access Storage



Content Addressable Storage



Cloud Optimized Storage

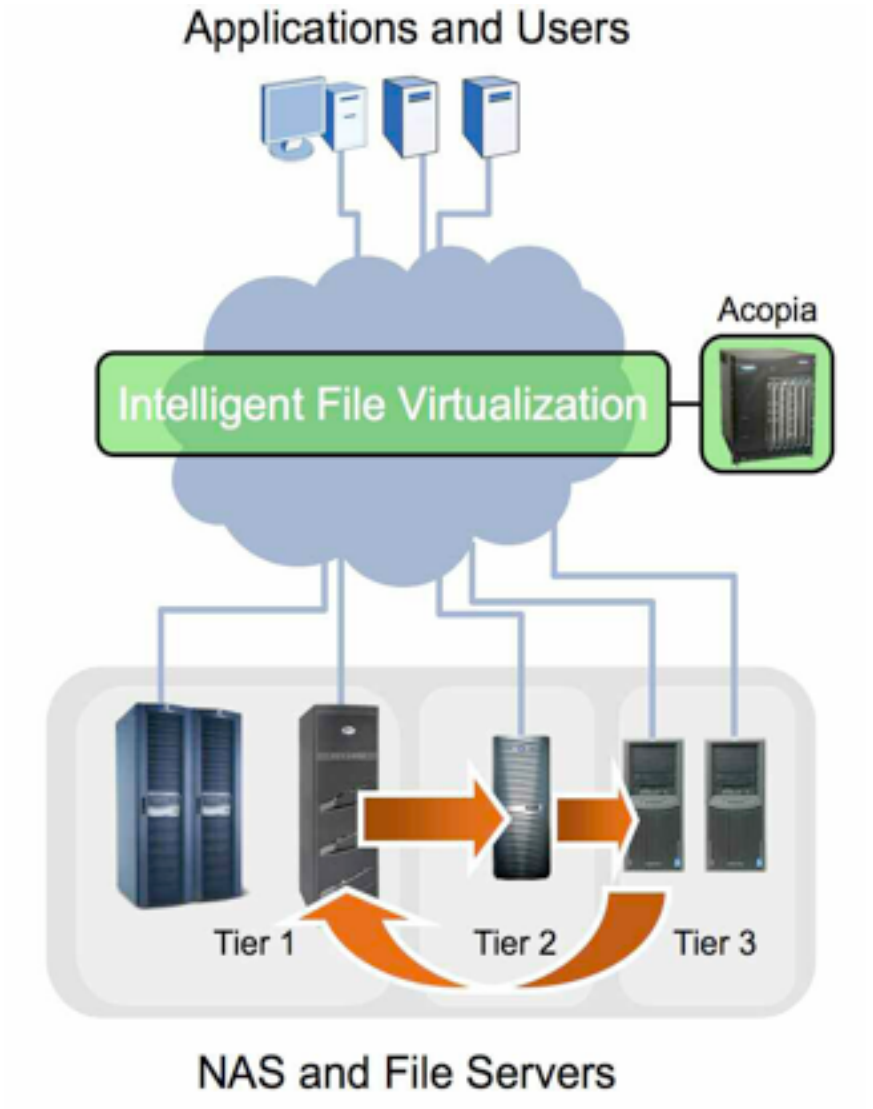
Application/ Host
- PACs
- Medical Records
- Unstructured Data
- Other Image Formats

Transport
- CIFS
- NFS
- SOAP
- REST

Storage Platform
- Atmos (SW)
- Any disk (HW)

Business Rules

- Seamless data migration from tier to tier
- Policy based movement of data based on date, file type, size
- Tiering for infrequently used data to be removed from the backup process saving resources



Questions?

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