Ed Childers, STSM, DP&R Storage
Oct 2013

IBM

Storage (R)Evolution

Storage Evolution or Revolution

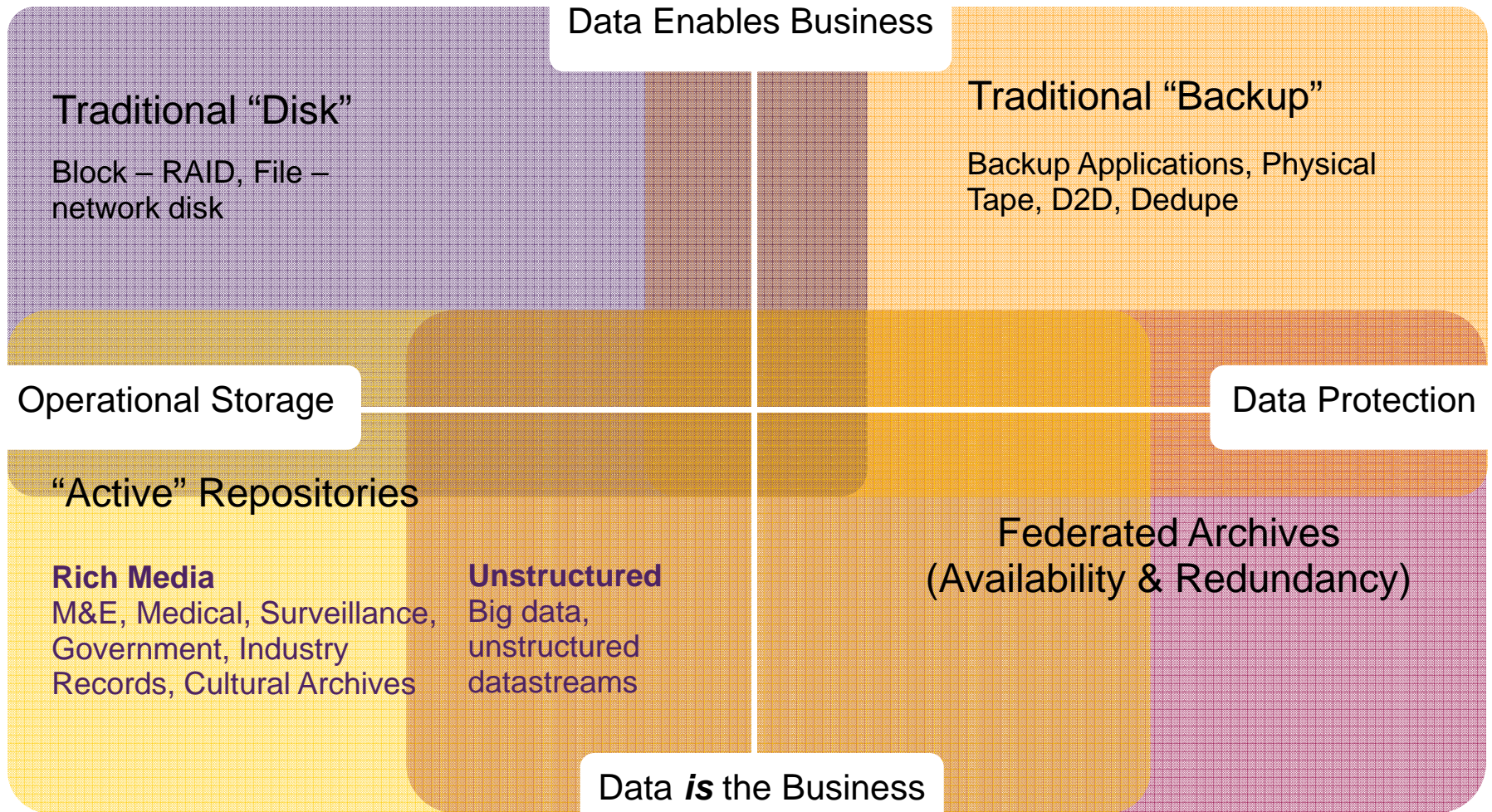- Bandwidth is changing everything
  - Enables Data as an Asset

Rich Media & unstructured data driving growth

Smarter Systems Are Creating an Information Explosion
Especially in Media and Entertainment (M&E)

- Storage requirements growing 20-40% per year

RFID, Digital TV, MP3 players, Digital cameras, Camera phones, VoIP, Medical imaging, Laptops, smart meters, multi-player games, Satellite images, GPS, ATMs, Scanners, Sensors, Digital radio, DLP theaters,Telematics, Peer-to-peer, Email, Instant messaging, Videoconferencing, CAD/CAM, Toys, Industrial machines, Security systems, Appliances

Source: Semantics, "LinkedData" guidelines, 2000.

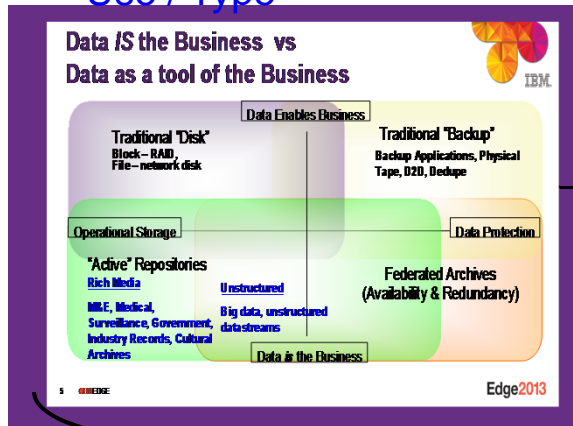IBM and BP Internal Use   © 2011 IBM Corporation

- Data as an asset is different
  - Traditionally, Data use as tool to run the business
    - Regulatory, compliance, disaster recovery for business critical data and processes
    - Value prop is technology to reduce cost of the tool
  - Data as an asset is stored for monetization
    - Entertainment, analytics, medical, surveillance, scientific
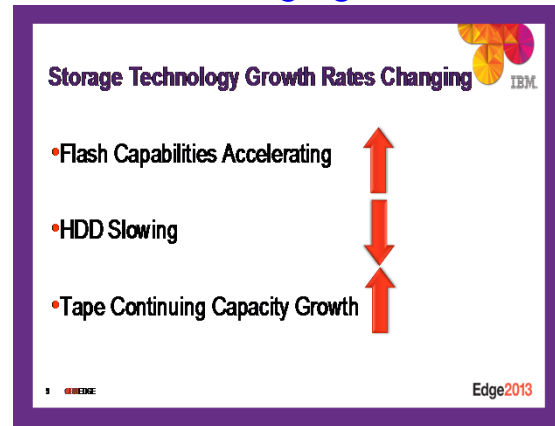   - Value prop is technology to optimize value of data

Data *IS* the Business vs.
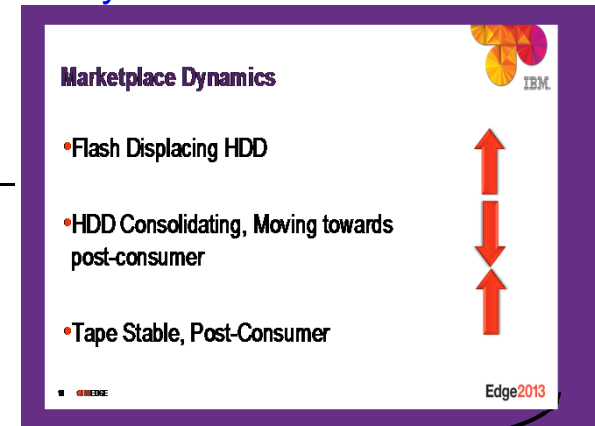# Data as a tool of the business

Data Enables Business

Traditional "Disk"

Block – RAID, File –
network disk

Traditional "Backup"

Backup Applications, Physical
Tape, D2D, Dedupe

Operational Storage

Data Protection

"Active" Repositories

Rich Media
M&E, Medical, Surveillance,
Government, Industry
Records, Cultural Archives

Unstructured
Big data,
unstructured
datastreams

Federated Archives
(Availability & Redundancy)

Data *is* the Business

Data Growth & Shift in Use / Type

Data *IS* the Business vs
Data as a tool of the Business

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File – network disk

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Data in the Business

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Storage Technology Growth Rates Changing

Storage Technology Growth Rates Changing

- Flash Capabilities Accelerating

- HDD Slowing

- Tape Continuing Capacity Growth

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Marketplace Dynamics

Marketplace Dynamics

- Flash Displacing HDD

- HDD Consolidating, Moving towards post-consumer
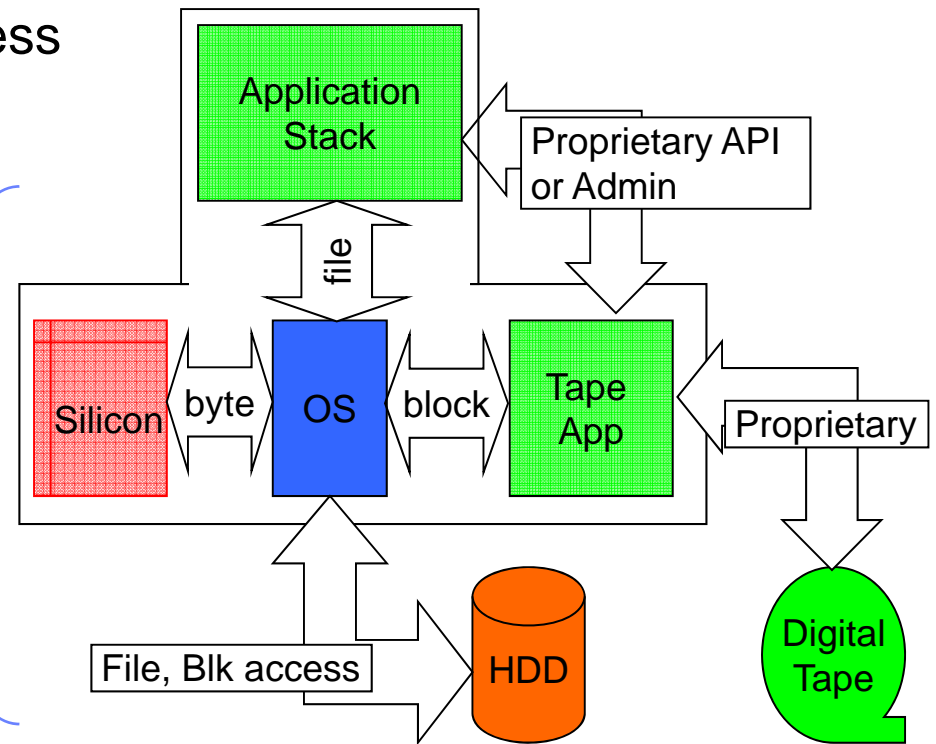
- Tape Stable, Post-Consumer

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- Scaling existing solutions break down
  - i.e. - can't keep doing what we've been doing
- Solutions designed for "Data is a Tool" don't work well for "Data is an Asset"
- Flexibility to adapt to changing requirements and shifts in storage technologies is critical
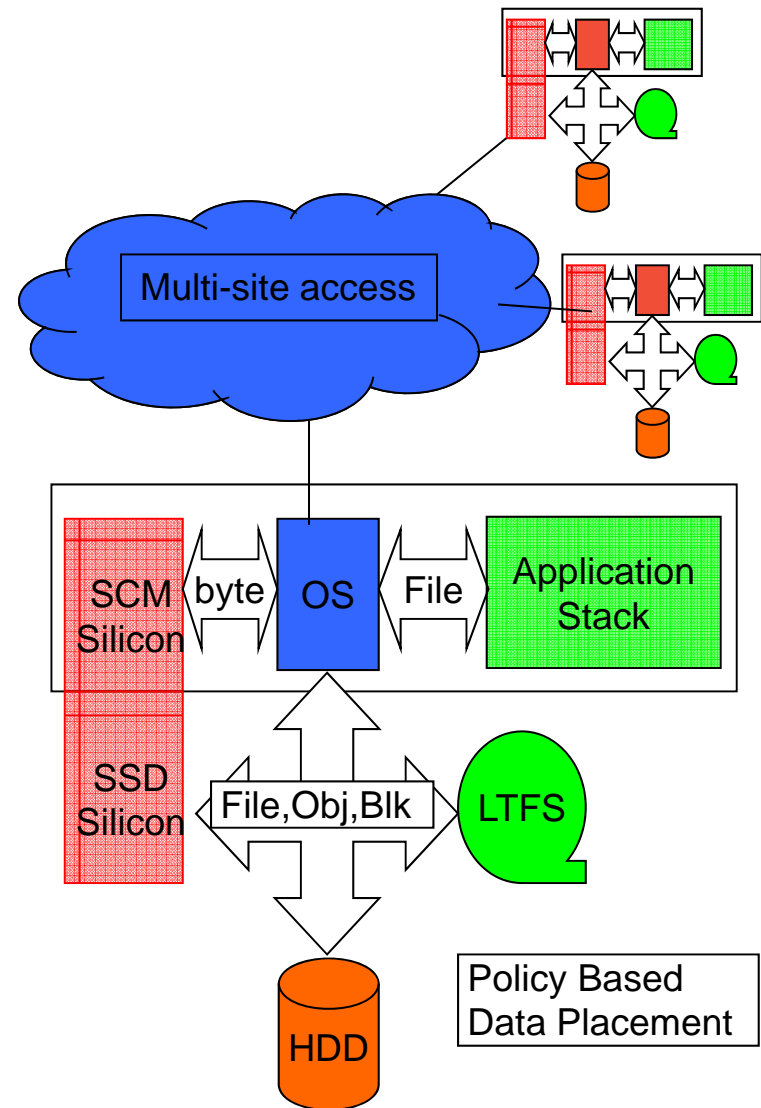
The Problem with Traditional Storage

- **Storage Systems have been traditionally defined by storage technology**
  - DRAM for random byte access
  - Hard disk for random block access
  - Tape for sequential streaming

Complexity in stitching together to satisfy requirements leads to custom & proprietary solutions

Application Stack

Proprietary API or Admin

file

Silicon | byte | OS | block | Tape App | Proprietary

File, Blk access

HDD

Digital Tape

The Solution

- **A single tiered storage system managing storage technologies seamlessly**

- **A single universal namespace for all your file data, regardless of online, offline**

- **Policy based placement of data**
    - Optimal data placement for cost and performance

- **Scalable, low cost**

- **Open, non-proprietary, cross platform interchange**

Multi-site access

SCM Silicon — byte — OS — File — Application Stack

SSD Silicon — File,Obj,Blk — LTFS

HDD

Policy Based Data Placement

LTFS Enterprise Edition (EE) Overview

- **Enterprise Edition software enables IBM tape libraries to replace tier 2/3 disk storage in GPFS-based environments**

- **Improves the efficiency and cost effectiveness of tiered storage**

  - LTFS EE creates tiered access storage with tape at 1/5[1] the cost of an equivalent disk-based tiered storage environments
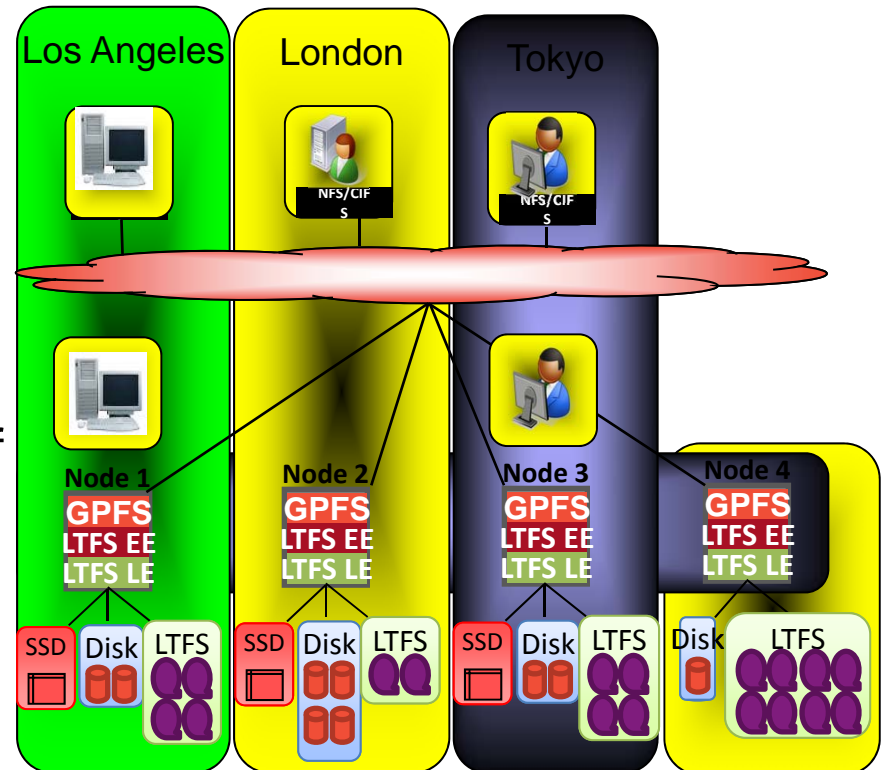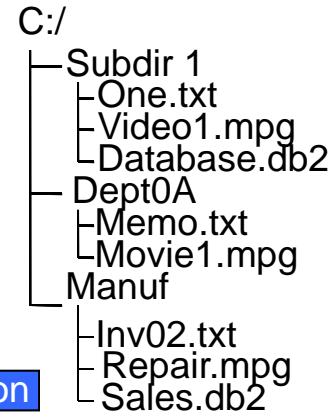

[1]based on a list price comparison of a 500TB TS3310 tape library + 1 GPFS license and 1 LTFS EE license compared to a DCS3700 hardware and annual maintenance

LTFS Enterprise Edition
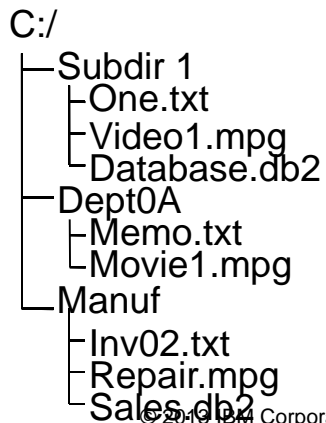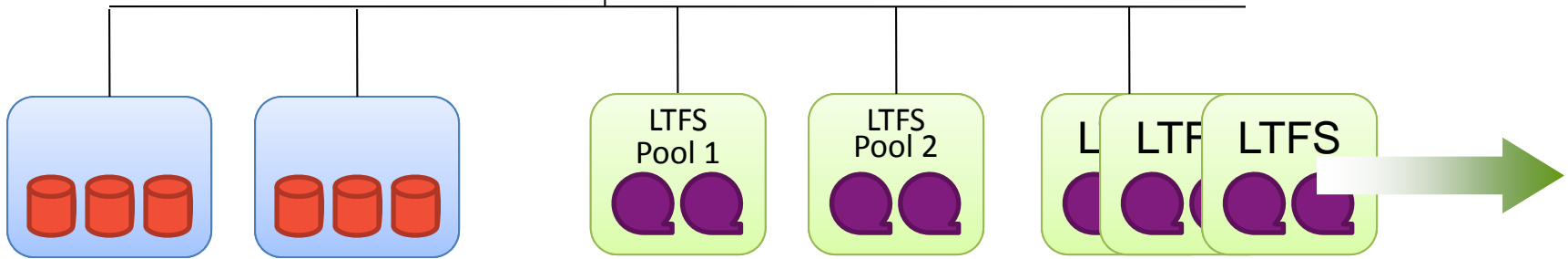
- Single file system view
  C:/user defined namespace

File Namespace

Move files older than X

Move files named *.mpg

Never move files named *.db2

Move files opened for modification

```
C:/
└─Subdir 1
   ├─One.txt
   ├─Video1.mpg
   └─Database.db2
└─Dept0A
   ├─Memo.txt
   └─Movie1.mpg
└─Manuf
   ├─Inv02.txt
   ├─Repair.mpg
   └─Sales.db2
```

File Storage Tiers

LTFS Pool 1	LTFS Pool 2	L LTF LTFS

```
C:/
└─Subdir 1
   ├─One.txt
   ├─Video1.mpg
   └─Database.db2
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   ├─Memo.txt
   └─Movie1.mpg
└─Manuf
   ├─Inv02.txt
   ├─Repair.mpg
   └─Sales.db2
```

One.txt
Memo.txt
Inv02.txt
Memo.txt

Video1.mpg
Movie1.mpg
Repair.mpg

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Thank You