Evolution of Clustered Storage

Lance Hukill

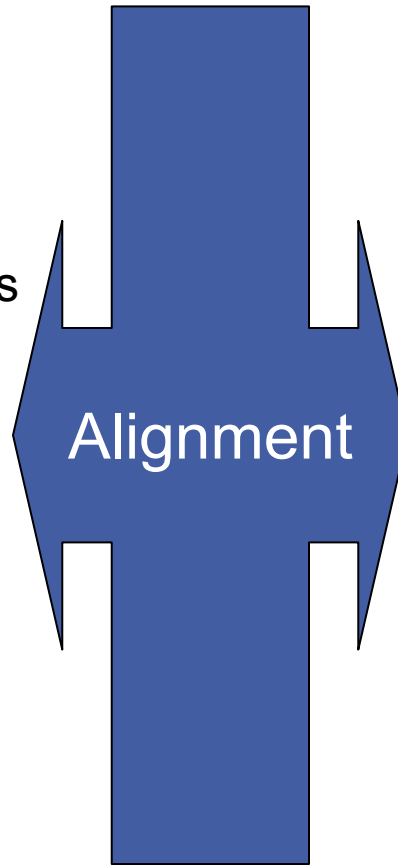*Vice President, Worldwide Software*

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Evolution of Clustered Storage

- Clustered Storage is Technology that is driven by business and mission applications.
- The evolution of Clustered Storage solutions starts first at the alignment between End-users needs and Industry trends.
  - Push-and-Pull between managing for today versus planning for tomorrow
  - Breaking down the real business problems to the core applications
  - Commoditization of clients, servers, and target devices
  - Interchangeability, Interoperability, Remote Access, Centralized control
  - Oh, and yes, there is a budget and the "real world" to deal with

Evolution of Clustered Storage

User Needs

- File Based Management
- Common Interfaces
- Distributed & Shared Access
- Centralized Management
- Remote Office
- Data Recovery
- Technology Insertion
- More with less
- All data is not created equal
- Storage Optimization
- Data Retention
- Compliance

Alignment

Industry Trends

- Closer Application Interfaces
- Enhanced File System access
- SMIS, SRM
- OS & HW independence
- Appliance enablement
- Continuous Data Protection
- Dynamic Resource Allocation
- Commoditization
- Data Classification
- Autonomous Archiving
- De-Duplication
- Authentification

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Evolution of Clustered Storage

User Needs

Industry Trends

Alignment

Interfaces & Independence

Management & Protection

Changing Environments

Discovery & Optimization

Interfaces & Independence

User Needs ⟺ Industry Trends

User Needs

- File Based Management
  - Key Proxy:
    - Enterprise Applications managing files/objects versus blocks
    - Oracle Grid
- Common Interfaces
  - Key Proxy:
    - Standards driven
    - Interchange and Exchange
- Distributed & Shared Access
  - Key Proxy:
    - Collaborative Workflows
    - Non Linear Editing (NLE)
    - Distributed Computing

Industry Trends

- Closer Application Interfaces
  - Key Proxy:
    - Well defined interfaces
    - EMC Centerra
    - SMTP MXF
- Enhanced File System access
  - Key Proxy:
    - Single Name Space
    - Apple Xsan, Lustre, Isilon
- OS & HW independence
  - Key Proxy:
    - OS not as "hardened" to CPUs anymore
    - Windows, Unix, OS-X
    - Compute Clusters

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Management & Protection

User Needs ⇔ Industry Trends

User Needs

- Centralized Management
  - Key Proxy:
    - Common Control Point
    - Dashboard of Operations
- Remote Office
  - Key Proxy:
    - Parent/Child relations to Branch and Corporate offices
    - Banking, Healthcare
- Data Recovery
  - Key Proxy:
    - Recovery Point Objectives
    - Recovery Time Objectives

Industry Trends

- SMIS, SRM
  - Key Proxy:
    - Common frameworks and logical interface points
    - SNIA
- Appliance enablement
  - Key Proxy:
    - Ease of Install, Operate, and Maintain
- Continuous Data Protection
  - Key Proxy:
    - Incremental forever
    - WAN optimization
    - WAFS

Changing Environments

User Needs ⬌ Industry Trends

- Technology Insertion
  - Key Proxy:
    - New OS revisions
    - Disk densities
    - CPUs
    - SCSI → SATA
    - FC → SAS
- More with less
  - Key Proxy:
    - Taking Non disruptive advantage of Mohr's law
    - Aligning Budgets to Needs

- Dynamic Resource Allocation
  - Key Proxy:
    - Non-disruptive
    - Growth, Shrink, Migration
- Commoditization
  - Key Proxy:
    - Linux driving compute with commodity hardware
    - Enabling software applications to focus on competency
    - Blades, Clusters, Grids

Discovery & Optimization

User Needs ⇔ Industry Trends

User Needs

- All data is not created equal
  - Key Proxy:
    - Service Oriented Architecture (SOA)
    - Exchange vs Project vs 'Home'
- Storage Optimization
  - Key Proxy:
    - Tiered pools
    - FC vs SATA vs Tape
- Data Retention
  - Key Proxy:
    - Lifecycle Management
    - Birth → Death
- Compliance
  - Key Proxy:
    - Regulations
    - Self or Federally induced
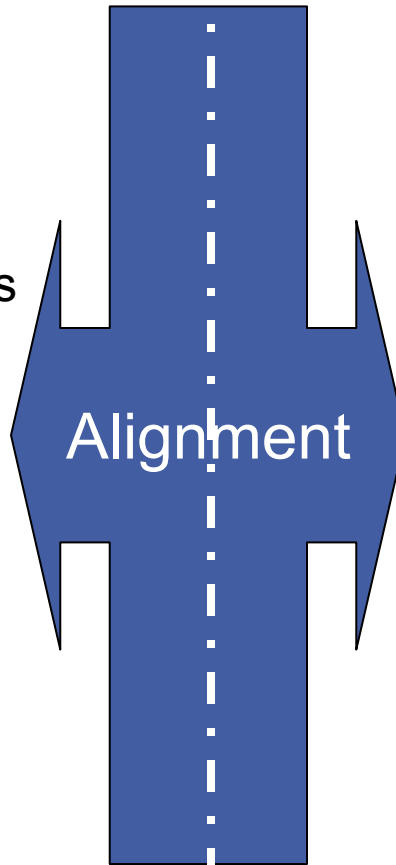
Industry Trends

- Data Classification
  - Key Proxy:
    - Tools to Discover, qualify, and quantify
- Autonomous Archiving
  - Key Proxy:
    - Policy Driven
    - Transparency to User
- De-Duplication
  - Key Proxy:
    - Block based, not File based
    - Grandfather → father → Son
- Authentification
  - Key Proxy:
    - By User/Group,
    - By Create/Read/Write/Delete

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Blurring lines, means we're working well together

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Why do we continue to align?

- Innovation today, becomes mainstream for tomorrow

- Innovation is driven by you:
  - Academia
  - Science & Engineering
  - Government Entities
  - Media & Entertainment

- We need more Wayne Gretsky's
  - Don't Skate to where the Puck is,
  - Skate to where the Puck is going to be…

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Thank You!

Questions?