Software Designed Infrastructure: the foundation of a cognitive business

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Traditional storage models are being disrupted by the explosion of data

**Data Explosion**
- 2.5 Billion gigabytes of data per day
- 90% of data created in last two years

**Data Economics**
- 0.4% overall IT budget growth in 2015
- 670% more data in 5 years for storage admin

**Data Innovation**
- 30% lower TCO with Flash
- 50% lower storage mgmt cost and hybrid delivery with Software Defined Storage

The top two challenges organizations face with IT infrastructure are storage related – Data Management and Cost Efficiency

SOURCE: *2014 IBM Institute for Business Value Study on Infrastructure Matters; Gartner IT Metrics*
This disruption is fueled by the different data paradigms:

<table>
<thead>
<tr>
<th>Transactional &amp; Application Data</th>
<th>Virtual Machines</th>
<th>Archive Data</th>
<th>Social Data/Machine Data/Analytics</th>
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</thead>
<tbody>
<tr>
<td>Structured</td>
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<td>Unstructured/Structured</td>
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<td>Throughput</td>
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<td>Ingestion</td>
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Requirements:

- Random Access
- Ultra-Low Latency
- Security
- Multi-site data protection
- Mirroring
- Multi-tier
- Point-in-time copy

- Random access
- Low latency
- Security
- Self-optimizing
- High capacity
- Multi-tenancy
- Multi-site data protection
- Point-in-time copy

- Low cost
- Long-lived
- High speed access
- Archival
- Security
- High capacity
- Multi-tier

- Compression
- Sequential
- High capacity
The storage landscape is changing as traditional IT gives space to the new wave of cognitive workloads

- Gartner’s Bimodal strategy is creating wave throughout Enterprise IT groups
- “Bimodal IT is the practice of managing two separate, coherent modes of IT delivery, one focused on stability and the other on agility”
- The definition of the IT needs for digital workloads is very different from traditional
- How Enterprise IT react to these new demands yet maintain their existing systems will be critical to their business
- Businesses are worried they will fall in the gap

<table>
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<th>Development</th>
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<td>Mode 1</td>
<td>Mode 2</td>
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<tr>
<td>Traditional and sequential</td>
<td>Exploratory and nonlinear, emphasizing agility and speed</td>
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<tr>
<td>emphasizing safety and accuracy</td>
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The Gap

Fit for no one

Operations: Known vendors, strong governance, minimized risk, plan based IT Centric
Development: New vendors, empirical, continuous, process based Business centric
The response to this changing landscape is also changing where the storage is provisioned

- Most organizations are speaking about ‘cloud’
- Many have not formulated what a cloud means
- This leads to further confusion over what to locate where

This new evolution of IT needs structure
Software-defined Storage restores order to a chaotic IT

- **Abstraction**
  - Separating the software from the hardware **produces flexibility and scalability**

- **Consolidation**
  - Pooling resources from multiple disparate storage sources **drives up utilization** and lowers cost

- **Automation**
  - Centralized management and policy-driven rules **reduce complexity**

- **Open**
  - Support for varying, heterogeneous, non-proprietary hardware storage **reduces costs**

- **Reduces storage complexity, eases administration, reduces costs**

- **Prepares the storage landscape for cognitive business future:**
  - Hybrid environments
  - Heterogeneous systems
  - Designed for volume and variety
Vestas Wind Turbines - Your typical IBM Power Systems IBM i Customer?  

No, they are also a very large Analytics customer

- Mid sized IBM Power System running IBM I and moving from internal disk to **FlashSystem**. Their database is in the order of **10s of TBs** – very typical

- Large dataset processing enabled analyzing over **20 PB** of data to pinpoint the optimal location for wind turbines and sensor data

- Parallel file access provided reduced response time for wind forecasting information by approximately **97 percent** — from **weeks to hours** — cutting development time

- IBM Spectrum Scale reduced IT footprint and costs, and **decreased energy consumption by 40%** — all while increasing computational power
Storage is Software-Defined with IBM Spectrum Storage

All of IBM Software-Defined Storage (SDS) can adapt to high performance or high capacity needs by leveraging appropriate underlying storage media – Flash, SAS, NL-SAS or Tape.
IBM Spectrum Storage comes from proven technology

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<td><strong>Family of Storage Management and Optimization Software</strong></td>
<td>Based on: Tivoli Storage Productivity Center (TPC) and management layer of Virtual Storage Center (VSC)</td>
<td>Virtualization of mixed environments stores up to 5x more data</td>
<td>Based on: Software from XIV Storage System (XIV)</td>
<td>Based on: General Parallel File System (GPFS)</td>
<td>Based on: Linear Tape File System (LTFS)</td>
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*Analytics-driven management to reduce costs by up to 50%*

*Virtualization of mixed environments stores up to 5x more data*

*Enterprise storage for cloud deployed in minutes instead of months*

*High-performance, highly scalable storage for unstructured data*

*Fast data retention that reduces TCO for active archive by up to 90%*

*Optimized data protection to reduce backup costs by up to 53%*
Software-defined storage addresses many data storage challenges

- Instead of each box having its own specialized software and hardware...
- ... *separate* the software from the hardware...
- Then extend the software with advanced capabilities
- ...and enable it to manage a variety of different *heterogeneous* hardware underneath

➢ This is *Software-Defined Storage*
IBM SDS provides flexible hybrid cloud storage with IBM Spectrum Accelerate

- IBM Spectrum Accelerate is a single software platform that delivers flexible enterprise-class block storage across your hybrid cloud
- Common design means less retraining
- Single management experience with Hyper-Scale Manager included

Manage with IBM Hyper-Scale Manager

IBM Spectrum Accelerate on customer-choice or pre-installed/pre-tested hardware

IBM Spectrum Accelerate on SoftLayer as Do It Yourself or As a Service

IBM Cloud
AND NOW IBM SDS provides flexible traditional storage with IBM Spectrum Virtualize

- IBM Spectrum Virtualize is a single software platform that delivers flexible enterprise-class block storage across your traditional landscape
- Common design means less retraining
- Single management experience with Spectrum Virtualize GUI/Spectrum Control

V9000, SVC, V7000F, V5030F
V7000, V5000
(Built with IBM Spectrum Virtualize)
The Broadest Storage and Software-Defined Portfolio

IBM Flash Solutions make fast storage simple

Fast applications, faster time to benefits, easy, efficient and versatile, certified and tested for you

Defining a new generation of software-defined computing infrastructure

Software-defined storage to speed innovation and hybrid cloud

IBM Storage Solutions

IBM All Flash
- IBM FlashSystem A9000
- IBM FlashSystem A9000R
- IBM FlashSystem V9000
- IBM FlashSystem 900
- IBM DS8888
- IBM Storwize V7000F/V5030F
- IBM DeepFlash 150

IBM Converged Infrastructure

VersaStack
- IBM FlashSystem V9000
- IBM FlashSystem A9000
- IBM FlashSystem 900
- IBM Storwize V7000/V7000F/V7000U
- IBM Storwize V5030F/V5030/V5020/V5010
- IBM SAN Volume Controller

IBM Software Defined Computing

• IBM Spectrum Symphony
• IBM Spectrum LSF
• IBM Spectrum Conductor

IBM Software Defined Storage

• IBM Spectrum Storage Suite
• IBM Spectrum Control
• IBM Spectrum Protect
• IBM Spectrum Accelerate
• IBM Spectrum Archive
• IBM Spectrum Scale
• IBM Spectrum Virtualize

IBM Cloud Object Storage

IBM Converged Infrastructure

IBM PurePower
- IBM Storwize V7000

IBM Business Continuity & Connectivity

IBM Tape & Virtual Tape Systems
- TS7700, TS7760
- Tape Libraries
- LTO7 and enterprise tape drives
- ProtecTIER Deduplication

IBM Storage Networking (SAN)
- Directors
- Switches
- Specialty Switches

IBM Hybrid Storage
- IBM DS8884/DS8886
- IBM XIV Storage System
- IBM Storwize V7000/V7000U/V5030/V5020/V5010

IBM Elastic Storage Server

Faster applications, faster time to benefits, easy, efficient and versatile, certified and tested for you

Defining a new generation of software-defined computing infrastructure

Software-defined storage to speed innovation and hybrid cloud

IBM Cloud Object Storage

Tape Storage for data protection and long term retention. Storage Networking for increased performance, security and flexibility

IBM Business Continuity & Connectivity

IBM Tape & Virtual Tape Systems
- TS7700, TS7760
- Tape Libraries
- LTO7 and enterprise tape drives
- ProtecTIER Deduplication

IBM Storage Networking (SAN)
- Directors
- Switches
- Specialty Switches

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IBM Storage – It’s Powerful, Agile and Efficient

Performance: Performance that helps you meet the demands of modern business with the data you rely on.

Agility: Adapt quickly and efficiently to changing technology without disrupting your business.

Efficiency: Affordably manages your data giving you the time to focus on innovation and business growth.