Tech Check: Dedupe, Solid State, DR, Green, Content Addressed Storage
Today's Featured Speakers –
Tech Check: Dedupe, Solid State, DR, Green, Content Addressed Storage

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StorageIO Group
“Tech Check – Hot Storage Technology and Issues”

Industry Trends and Perspectives: 
*IT Resource Optimization*

Greg Schulz, Founder & Sr. Analyst - The StorageIO Group
Author “The Green and Virtual Data Center” (CRC)
And “Resilient Storage Networks” (Elsevier)
Next Generation Data Centers Today
What the “Information Factory” of the future will look like

New and Emerging

- Optimized
- Scalable
- Flexible
- Resilient
- Secure
- Efficient

Time Tested & Field Proven

- Magnetic disks and tape, clusters and tiered storage, RAID, tiered data protection, encryption, tiered access (FC, iSCSI, SAS, NAS)

Balance of new and old technologies
Time and Space

SSD (RAM & FLASH), Clouds, Clusters & Grids, policy based automation, Virtualization, dedupe, tiered access (FCoE, Object), bulk storage, Data Loss Prevention (DLP)
Industry Trend: Green Computing Shifting Focus
From green-wash to action, from energy avoidance to energy efficiency

“A little less conversation, a little more action please…” - Elvis

Energy Avoidance
Power Down, Over Consolidate
Decrease Amount of Useful Work
Decrease Energy Used

Some Energy Efficiency
Faster Components, Same Power
Increase Amount of Useful Work
Same Amount Energy Used

Some Energy Efficiency
Lower Power Draw Components
Same Useful Work Done
Decrease Energy Used

More Energy Efficiency
Faster Components/Less Power
Increase Amount Useful Work
Decrease Energy Used

1st Generation MAID, Turn Monitors or Servers Off, Idle Capacity per watt

MAID 2.0, Intelligent Power Management (IPM), Vary Energy to Performance, Active workload per watt

More work, more data per footprint per watt per person managing IT resources

Source: “The Green and Virtual Data Center” (CRC)
Industry Trend: Green Computing Shifting Focus

Various Optimization Approaches, Techniques and Technologies

Wheel of opportunity: PCFE optimization and IT productivity

PCFE: Power, Cooling, Footprint, EH&S

Source: “The Green and Virtual Data Center” (Auerbach)
Industry Trend: Increased Density

IT resource demand = Do more in same footprint = Efficiency

IT Demand Forecasts

<table>
<thead>
<tr>
<th>Power, Cooling, Floor space/Footprint, Environmental (PCFE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative Available IT Resources</td>
</tr>
<tr>
<td>Compute Capacity, Storage Capacity, IO Performance (IOPS &amp; Bandwidth)</td>
</tr>
<tr>
<td>IT Capacity Constrained</td>
</tr>
<tr>
<td>Business Growth Inhibited</td>
</tr>
<tr>
<td>Economic Penalties Lost Opportunity</td>
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</tbody>
</table>

Footprint Attributes

Ease of use, functionality, resources managed per person
interoperability, costs (capex/opex), performance
availability, capacity, power/cooling, Floor/Rack-Space

PCFE = Power, cooling, floorspace, energy
PACE = Performance, availability, capacity, energy
Industry Trend: Tiered Storage
Aligning Applicable Technology to Task at Hand to Meet Service Needs

- Video/Audio
- File Serving
- Billing, E-Tail
- Database, DSS
- Email Messaging
- CAD, EDA, SW Dev.
- Spreadsheets

Relative Comparison
Similar Capacities

Accelerate Performance
“Time is Money”

Performance
Power

Tier-0
Tier-1
Tier-2
Tier-3

Enterprise
Midrange
SMB
SOHO

Different Price Bands and Categories

Balancing Act
Footprint
Cost
Service Level
PCFE

Reduce capacity and data footprint costs

Consolidate
Space Capacity

Tape & Optical

Source: “The Green and Virtual Data Center” (CRC)
Industry Trends – Expanding Data Footprint

Address Expanding Data Footprint and Data Management

Sparse, Duplicate Files and Content

Original Data
Primary Database, Email, File serving

Copies – Data Proliferation and expanding data footprint
DSS, Training, Test, Dev QA, Operational, Needs Backup, BC, DR, HA, Archive, Compliance

In addition to storage space capacity IOPS and MBPS to move data also needs to be considered.

Challenge: More data to backup, protect and manage
Action: Reduce footprint impact: Archive, Compress, De-dupe, Tiered Storage
Closing Comments

Basic Premises – Gain Management Insight and Control

- Where you can learn more:
  - www.storageio.com (free articles, tips, reports, podcasts etc)
  - www.storageioblog.com – Blog on related topics
  - www.twitter.com/storageio - Twitter
  - www.thegreenandvirtualdatacenter.com


ISBN: 1555583118
Greg Schulz
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What’s Been Driving Data Centers?

- Connectivity
  - Multiple Carriers/Redundant Paths; Tier 1; Fiber

- Power
  - Multiple Feeders/Suppliers; Utility Reliability; Available Backup
  - HVAC
  - Cost

- Server Horsepower
  - Density; Blade Technology; Virtualization

- Competitive Advantage = Bandwidth, Power, Density, Speed, Lower Cost
What’s Next For Data Centers?

• Social Responsibility
  • Green/Sustainable
  • Community Engagement

• Scalability
  • Containerized/Modular Growth Solutions
  • Infrastructure on Demand

• Leverage
  • Financial Incentives
  • Public/Private Partnerships

• Competitive Advantage = Engagement, Scale, Leverage
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**Competitive Advantage = Engagement, Scale, Leverage**
Social Responsibility

- Community Engagement
  - Economic Development
    - Diversification of Local Economy
    - Globally Competitive Career Options for Residents
  - Workforce Development
    - Role of Local Universities, Continuing Education Outlets
    - Social Fabric of Neighborhoods, Towns, Cities – Global Competition
- “Minority Spend”
  - Traditional Vernacular: 8A, Hub Zone, Disadvantaged
  - New Vernacular: clients want “diversity spends” & devote budget to it

- Do Well By Doing Good
Leverage

- Financial Incentives
  - Shared Success/Performance Based
    - Looking for alignment of Data Center and Community Goals
- Public/Private Partnerships
  - Pooling of Interests; Leveraging Capital Investment
  - Create Win-Win Scenarios Instead of Working at Cross Purposes

*Do Well By Stretching Your Profits; “Financial Scale”*
UVI Research and Technology Park

eCommerce Economic Development for the United States Virgin Islands (USVI)
See Virgin Islands Code Title 17 Chapters 34 & 43

- RTPark chartered as an instrumentality of the USVI government affiliated with the University of the Virgin Islands (UVI)

- Mission & Value-Add
  - Position the USVI as a near-shore, world-class provider of eCommerce & IT infrastructure solutions for knowledge-based, eCommerce & digital content companies
  - Leverage fiber landings for collocation facilities (Global Crossing, AT&T); carrier-neutral for local service providers
  - Extend local corporate tax incentives as a strategic partner

- Public-Private Partnerships
  - Apply best practices derived from over 200 technology park communities in North America
USVI Fiber Assets

- “Carrier Class” Hub to 12+ Major Submarine Fiber Cable Routes
  - 150+ 10GB “rails” & growing
  - Major switching center for voice and broadband traffic
  - Lowest latency cross connection between North & South America
  - 2nd largest concentration of bandwidth in the western hemisphere
RTPark Tax Incentives

- Up to 90% reduction in income tax liability (on applicable income sourced in the USVI), plus local exemptions
- U.S. Treasury issued permanent income sourcing regulations for eCommerce companies in April, 2008 (IRB 2008-20, T.D. 9391), harmonizing USVI incentives to US Federal law
- On-shore, not off-shore (USVI residents are U.S. citizens; Federal laws apply).

Exemptions are typically for 15 years & may be renewed for an additional 10 years initially & five 5 years thereafter
What’s Next For Data Centers?

• Was Bandwidth, Power, Density, Speed, Lower Cost

• Becoming Engagement, Scale, Leverage

• New Differentiators:
  • Community Engagement
    • Economic Development
    • Workforce Development
    • “Minority Spend”
  • Leverage
    • Financial Incentives
    • Public/Private Partnerships
2009 State of the Data Center – Storage
New Options to Consider

Panel Three

Tech Check: Dedupe, Solid State, DR, Green, Content Addressed Storage

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