



"Demystifying Storage Hype" Life beyond Buzzword Bingo Fujifilm - Austin TX - February 25, 2010

Industry Trends and Perspectives: *What to watch for, and what to watch out for!*

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And "Resilient Storage Networks" (Elsevier)

Industry Trend: Whats the Buzz(words)

Some Buzz Word Bingo topics, technologies, techniques

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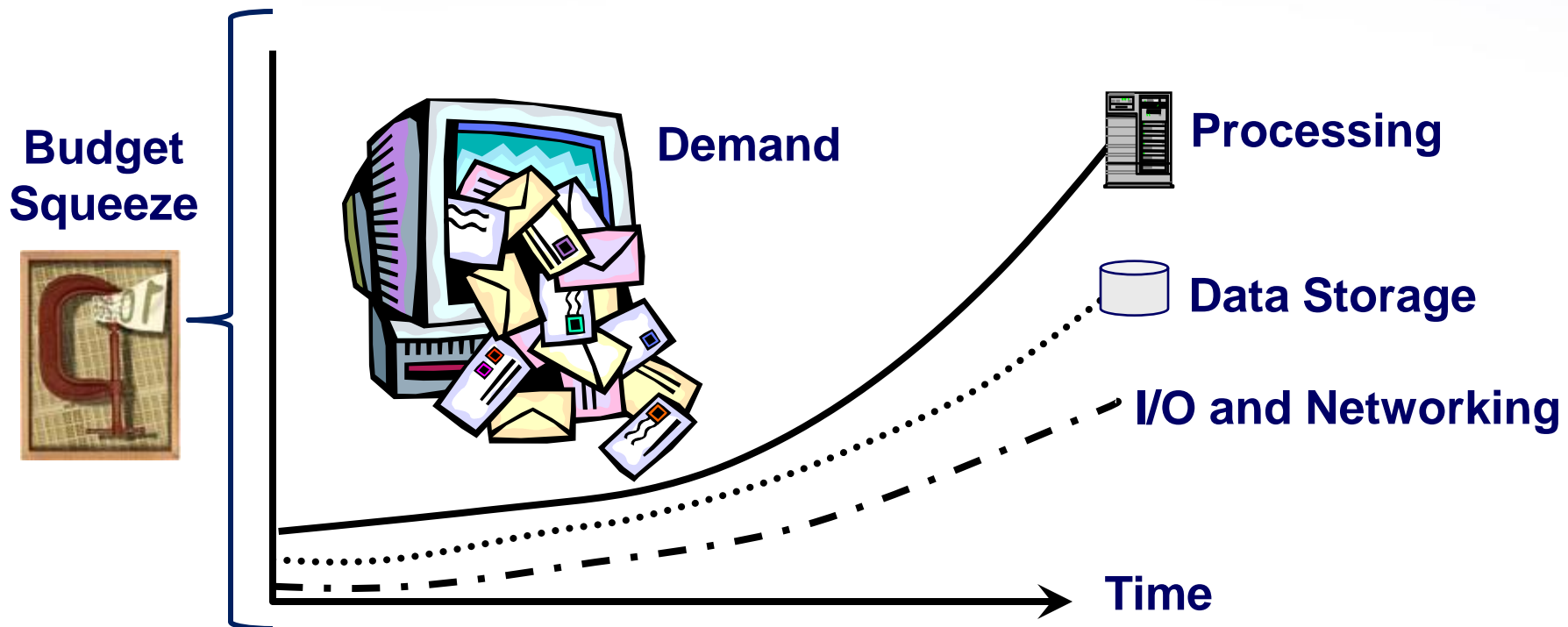
8 Gb Fibre Channel (8GFC), 10GbE, Agent-less, Authentication, Archiving, Backup, Backup Service Provider (BSP), BC/DR, Benchmarking, Blade servers, Bulk Storage, CAS, Capacity Planning, Capacity per watt, Converged Enhanced Ethernet (CEE), CIFS, Cloud Storage, Clustered Storage, CNA, Compliance, Compression, Converged Networks, DLP, D2D2D, Data management, Data migration, De-duplication, De-dupe debates, DPM, eDiscovery, Environmental Health and Safety (EHS), Encryption, Event Correlation, eWaste, Fibre Channel over Ethernet (FCoE), Federated, FRCP, File management, FLASH, Green, Grid, HA, I/O Virtualization (IOV), InfiniBand, Infrastructure Resource Management (IRM), IOPS per watt, IPM & MAID 2.0, iSCSI, Multi-Protocol Storage, Managed Service Provider (MSP), NAS, NFS, NPVID, Partitions, Policy Management, Power Cooling Floor-space EHS (PCFE), PCI SIG IOV, Performance, pNFS, Removable Hard Disk Drive (RHDD), RAID 6, Replication, RoHS, Replication, CDP, SAN, SAS, SATA, Security, Snapshots, SRM, SSD, Tape, Thin Provision, Tier 0, Unstructured data, VCB, Virtualization, Vmotion, VMware, VTL, WAAS, WADS, WAFS, WADM, Web 2.0, XaaS and many others...

Industry Trend: Demand = Data Growth

There is NO such thing as a data or information recession!



Various Applications and Business requirements



Industry Trend: Issues and Drivers

Balancing IT resources and constraint to business needs

- Demand – There's no such thing as a data recession
- Performance – The need for speed and productivity
- Availability – Increased reliance, threats and awareness
- Capacity – Support increased demand
- Efficiency – Boosting productivity and effectiveness
- Optimization – Doing more with what you have (or less)
- Data Protection – Guard against Increased threat risks
- Data Preservation – Data retention for longer time
- Un-Structured Data – NAS and file (non database) data

Industry Trend: Next Generation Data Centers

What the “Information Factory” of the future looks like **Today!**

New and Emerging



- Scalable
- Flexible
- Resilient
- Secure
- Efficient

Time Tested & Field Proven



Balance of new and old technologies

Time (Performance) + Availability + Space (Capacity) + Economics

Public and Private Clouds
CDP, SSD and Dedupe

Thin provisioning, Virtualization
pNFS, FCoE and SAS

Metrics

Rates vs. Ratios
IOPs per watt

Disk, Tape and Snapshots
RAID and Replication
Fibre Channel, iSCSI, NAS

Industry Trend: What's The Buzz?

Closing the Green Environmental and Economic Gap

In order to support demand:

Don't save as much data, limit expansion and QoS enhancements

Or

Leverage improved densities
Remove IT footprint constraints

Boost efficiency, lower unit costs
Improve performance

Do more with what you have
Avoid compromise of QoS
Enable agility and flexibility

Available Resources
Performance, Availability,
Capacity, Energy = PACE

E.g. Store and process more data in a denser footprint

QoS, Service Levels
Response Time, Availability

Unit Cost of Resource
\$/ Capacity, \$ per IOP
Capacity per watt, IOP per watt

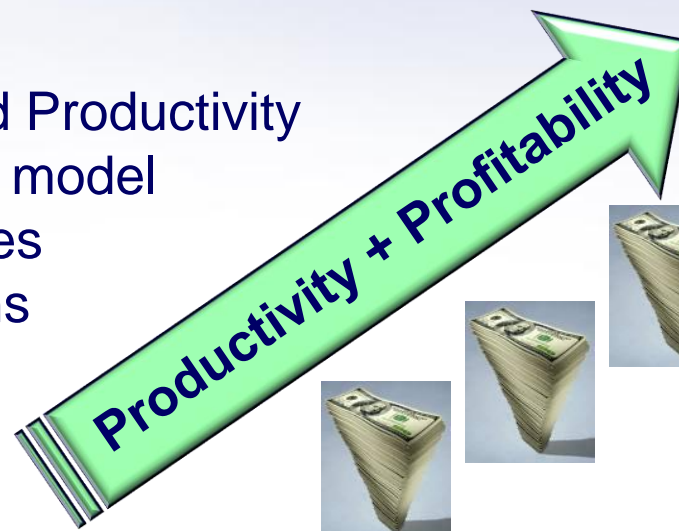
Note: Innovation = Do and enable more with less without compromising customer service

Industry Trend: What's The Buzz?

Closing the Green IT Gap: From Avoidance to Efficiency

Today and Tomorrow

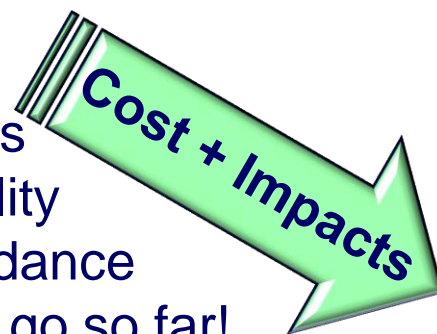
Focus expands to Effectiveness and Productivity
Expand from survival to productivity model
Sidestep political or scientific debates
Support growth and new applications
Remove barriers and constraints
Boost QoS levels per IT cost



Efficiency drive environmental and economic benefits

Past and Present

Focus on Cost and Carbon Footprints
Social and environmental responsibility
Some areas focused on energy avoidance
Conservation and consolidation only go so far!



Industry Trend: Myths and Realities

What you hear or read vs. what you see and opportunities

Read more about these at www.storageio.com and www.storageioblog.com

- Myth: Archiving is only for regulatory compliance purposes
- Myth: More tapes are lost or stolen today than in the past
- Myth: Green is all about reducing carbon footprints
- Myth: Fibre Channel is dead
- Myth: Virtualization is all about consolidation and cost avoidance
- Myth: Dedupe and VTL are mutually exclusive eliminating need for tape
- Myth: Disk has killed tape, SSD has killed disk
- Myth: Clouds eliminate the need for traditional IT (servers, storage, networks)

Industry Trend: Myths and Realities

There is NO such thing as a data or information recession!

Read more about these at www.storageio.com and www.storageioblog.com

Myth: Archiving is only for regulatory compliance purposes

Reality: Archiving is a multi-decade old time tested technique for all applications and types of data from structured to unstructured, compliance and non-compliance to boost performance, enhance BC/DR, reduce cost and address data footprint impacts

Myth: BC/DR are only for the rich and famous

Reality: Applicable and affordable to all from enterprise to SOHO, all industries!

Myth: There is less data and use of tape today

Reality: Dollar spending is down, there is more data on tape today than in history!

Myth: Innovation is cost cutting

Reality: Innovation is reducing costs, boosting productivity and enhanced service

Industry Trend: Myths and Realities

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Myth: RAID and replication are replacements for backup

Reality: They need to be combined with some form of time based protection

Myth: MAID is dead

Reality: While some early MAID vendors have been spun down, IPM and second generation MAID aka spin down, power management are very much alive

Myth: Dedupe and VTL are mutually exclusive eliminating need for tape

Reality: Most dedupe targets have VTL interfaces, most VTLs have dedupe, most have replication, some have path to tape for destaging/portability

Myth: More tapes are lost or stolen today than in the past

Reality: Fewer tapes lost or stolen than in past, more laptops and disks lost today

Industry Trend: Myths and Realities

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Myth: DAS = Dedicated Attached internal Storage or Dumb A\$\$ Storage

Reality: Also means shared external storage (SAS, iSCSI, FC) without switches

Myth: Networks are fast enough with emerging 40GbE/100GbE, 16GFC/32GFC

Reality: History shows us the need for speed, more data to move in less time requires continued innovation and optimization!

Myth: Virtualization is all about consolidation and cost avoidance

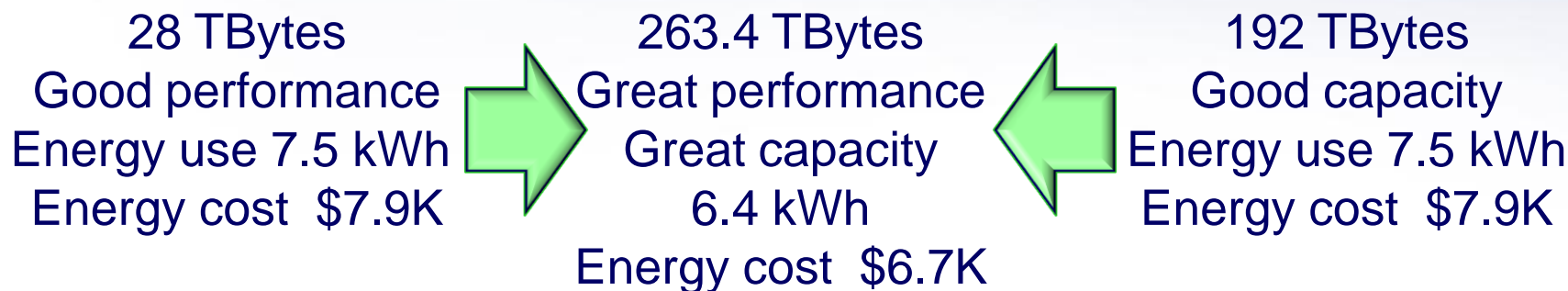
Reality: Also about life beyond consolidation, agility, abstraction, emulation, flexibility, ease of management, enabling shifting and dynamic workloads along with enhanced infrastructure resource management (IRM) tasks (BC/DR, load balancing, upgrades, refresh/replacement)

Myth: Server and storage efficiency or optimization are all about consolidation

Reality: About boosting performance, effectiveness, economics and productivity

Industry Trend: Optimization

Balancing Performance, Availability, Capacity, Economics



Before

After

Before

All tier-1

192 x 146GB 15K Disks
Performance hot spots
Low space utilization
Low capacity per watt
Medium IOPS per watt
Limited or no growth

Tiered Solution

4 x 250GB SSDs
32 x 450GB 15.5K Disks
124 x 2TB 7.2K HDDs
Improved performance,
Capacity and energy use
Room for growth

All tier-2

192 x 1TB HDDs
Performance hot spots
Low IOPS per watt
Good energy use
Good utilization
Limited or no growth

(1) Assumes 12 cents per kWh

Industry Trend: Myths and Realities

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Myth: Data footprint reduction is all about dedupe ratios

Reality: Also about archiving, data management, compression, thin provisioning, space saving snapshots and reduction/restoration rates (performance)

Myth: Green is about reducing carbon footprints

Reality: Its about boosting productivity, business sustainability, economics

Myth: Fibre Channel is dead

Reality: As a physical cable medium, there will be a few more generations, however as a protocol, FC aka SCSI_FCP, FCSB2 (FICON), etc will live on via FCoE similar to how SCSI command stack exists on SAS, FCP, SRP, iSCSI and others, likewise 16GFC and 32GFC are in the works!

Myth: Holographic, T10 OSD Object storage etc... will be next big technologies

Reality: Perhaps some day, for now interesting and fun tto talk about!

Industry Trend: Myths and Realities

There is NO such thing as a data or information recession!

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Myth: Disk kills tape, SSD kills disk

Reality: Maybe some day down the road, however not today, the opposite
Disk keeping tape alive, SSD keeping disks alive, all have changing roles!

Myth: Clouds eliminate the need for traditional IT, servers, storage and networks

Reality: Clouds, public or private, services or solutions, architecture or products
still rely on physical servers, storage, networks, software, people, policies
and best practices along with metrics.

Clouds are complimentary to traditional IT, think of them as different
resource tiers, thus use them accordingly with best practices.

Don't be scared, however do your homework to understand differences.
Understand if you want a cloud or need a cloud as well as for what!

Industry Trend: What to Watch

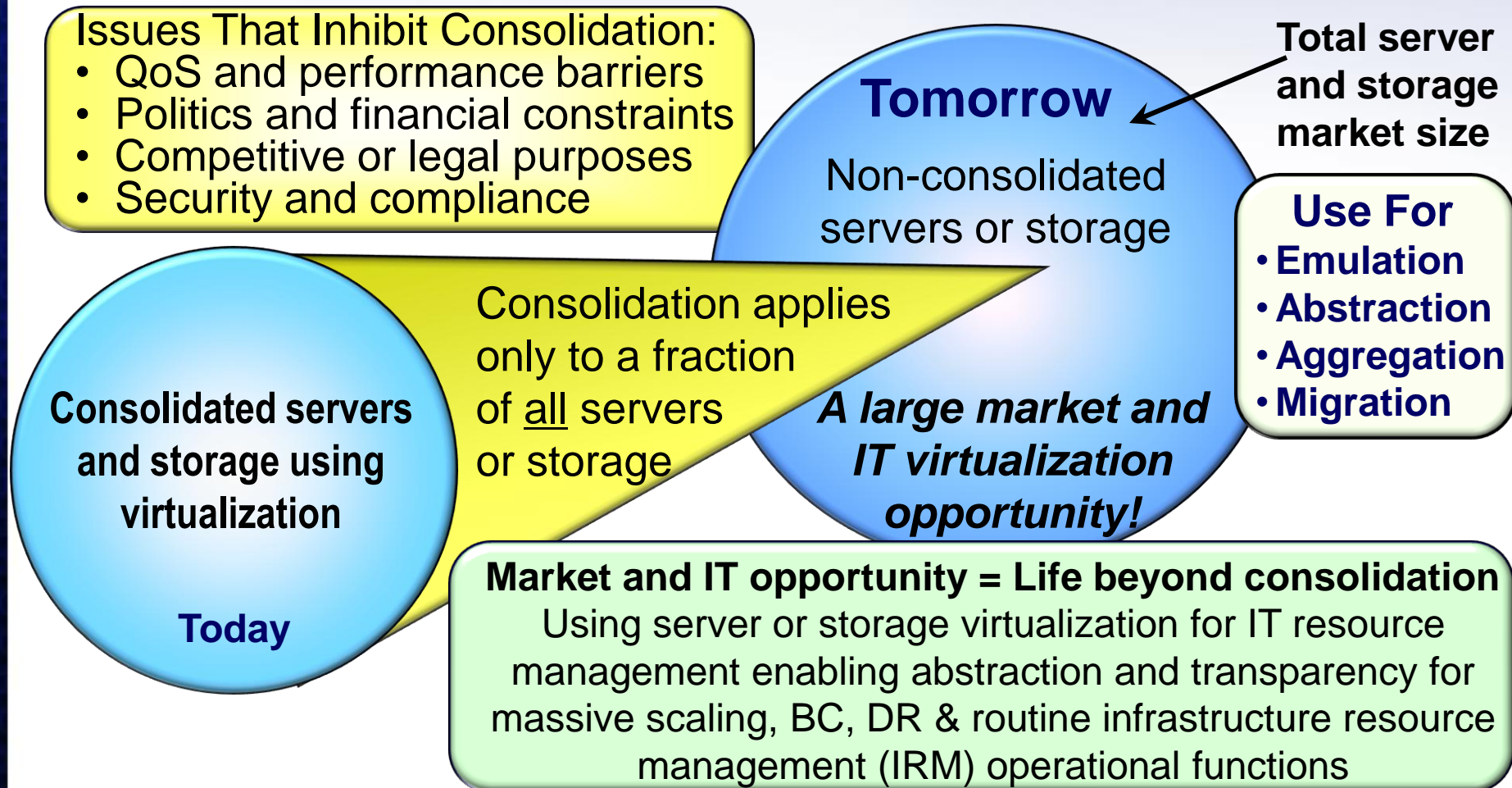
Keep an eye on these topics and technologies

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- IOV – I/O Virtualization (PCI Sig SR-/MR- IOV and others)
- Unified Computing – Generic and Cisco specific convergence
- FCoE – Fibre Channel on Ethernet, its not if, rather when
- Unstructured data growth – More file data to manage
- CDP – Comprehensive/Complete Data Protection is back
- SSD – Continues to evolve and mature as is the ecosystem
- Virtualization – Life beyond consolidation is the next big wave!

Industry Trend: Virtualization (Next Wave)

Life beyond consolidation: Abstraction, emulate and agility



Source: "The Green and Virtual Data Center" (CRC)



Industry Trend: What to Watch

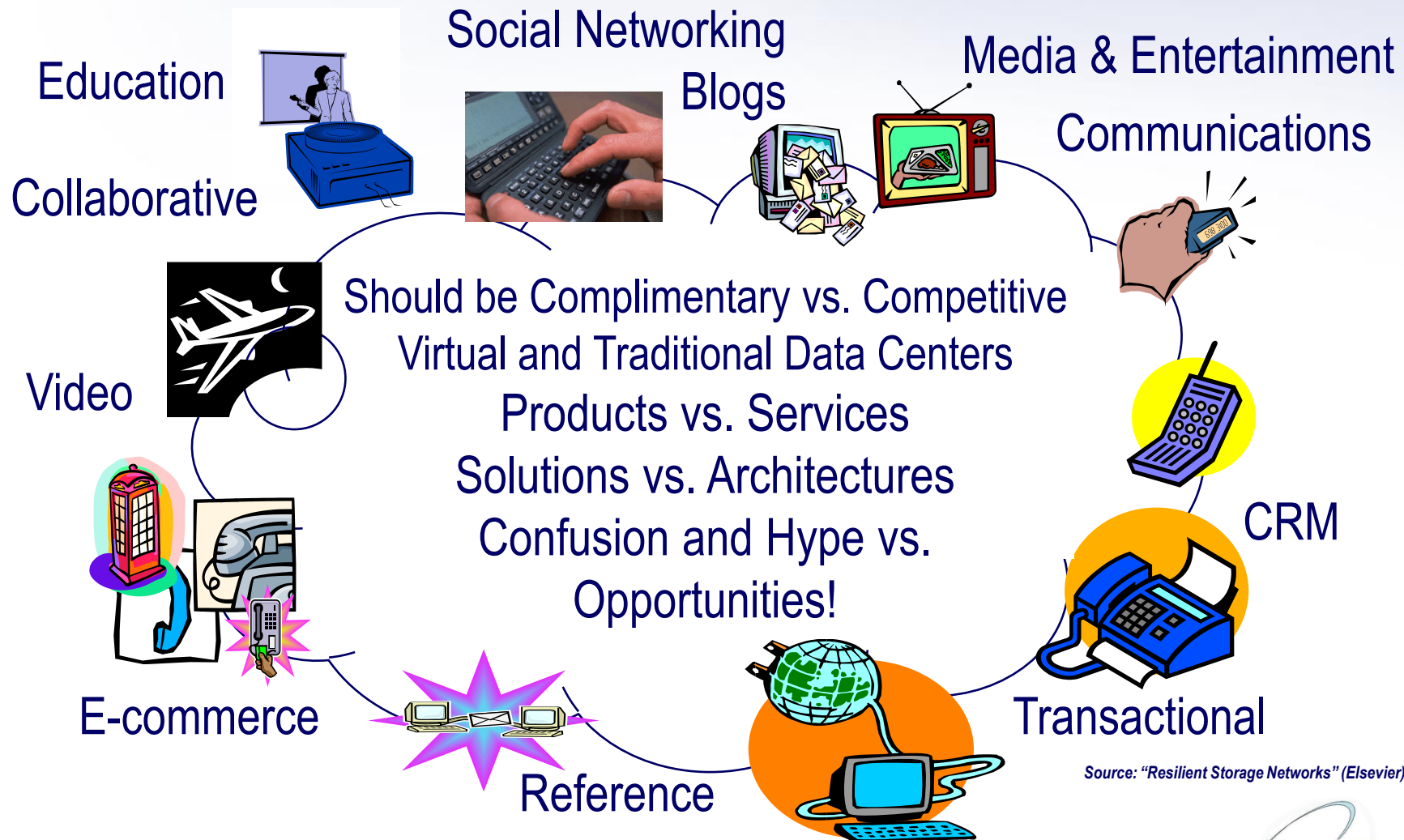
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- Scale out and bulk storage – Increased density, lower cost
- EPA EnergyStar® - Enterprise Servers, Storage and Data Centers
- Intelligent Power Management (IPM) – Servers and storage
- E2E – End to End cross technology domain management
- SRA – Systems (or Storage) Resource Analysis
- Green IT – Shift from avoidance to efficiency and productivity
- Cloud – Some will survive, they are complimentary, learn more

Industry Trend: Public and Private Clouds

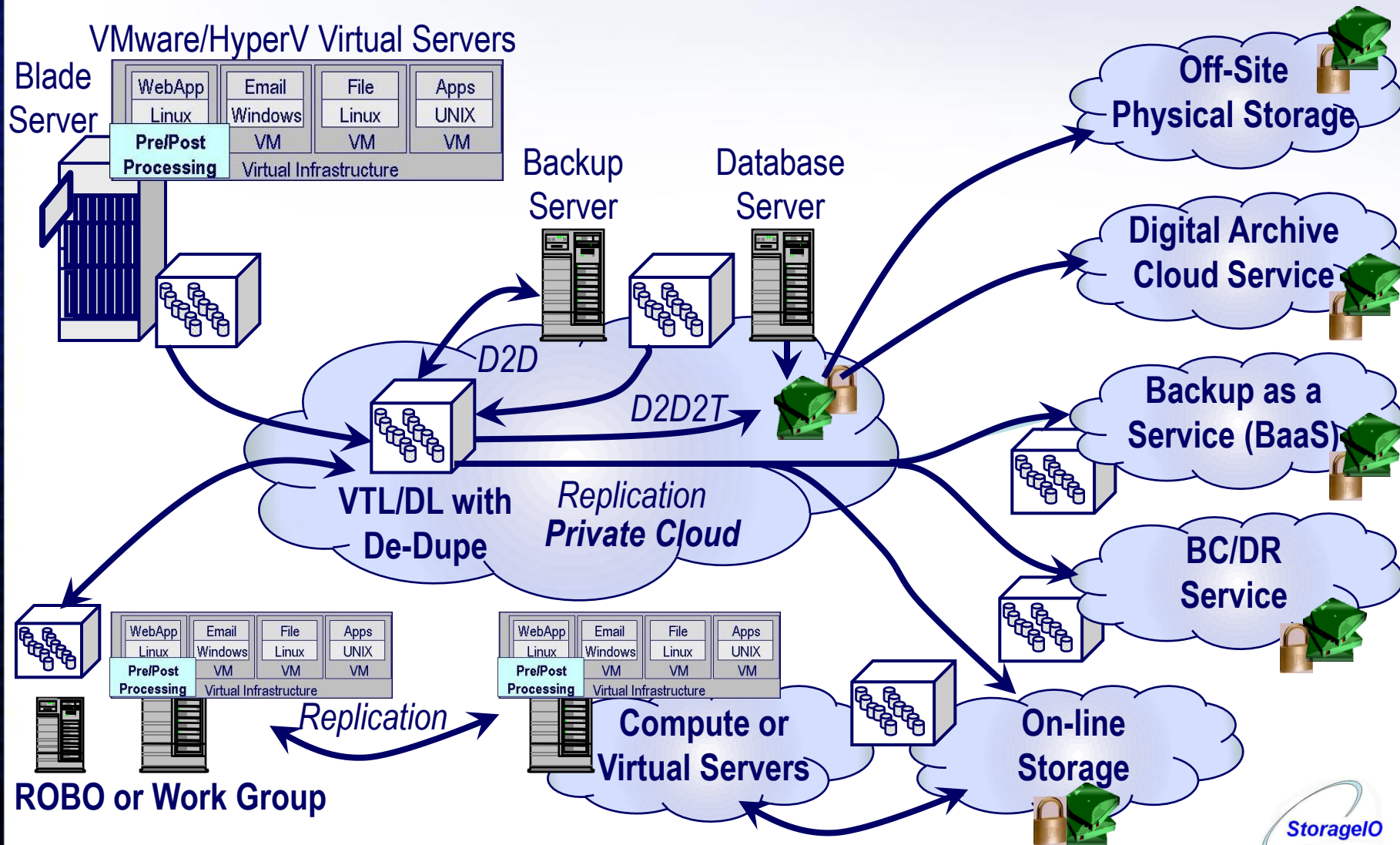
Don't be Scared, Look before you leap!



Source: "Resilient Storage Networks" (Elsevier)

Industry Trends: Cloud Examples

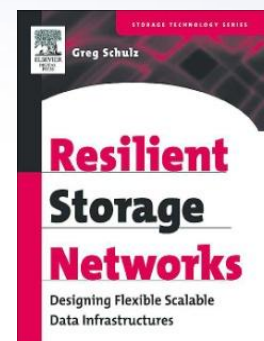
Local and Remote, Public and Private, Services and Products



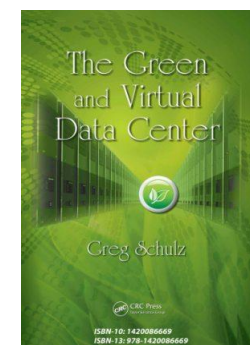
Closing Comments

Where to learn more, next steps...

- Sift through the hype and Buzzword Bingo
 - Identify what you need vs. what you want or would like
 - How will a technology or technique work for you, vs. you work for it?
 - Don't confuse industry adoption with customer deployment
 - Have a multi-year strategy, regularly revisit and update as needed
 - Something might be revolutionary if you have never seen it
 - Something might be evolutionary if you have Déjà Vu with it
 - Balance the old with the new, don't be afraid, look before you leap!
- Where to learn more
 - www.storageio.com articles, videos & webcasts
 - www.storageioblog.com and twitter @storageio
 - Feel free to call, IM, tweet, or email greg@storageio.com



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Thank You

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