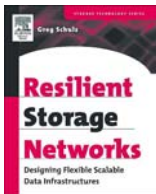




The StorageIO Group – Information Technology Analysts and Consultants
Storage Industry Trends and IT Infrastructure Resource Management (IRM)

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Greg Schulz



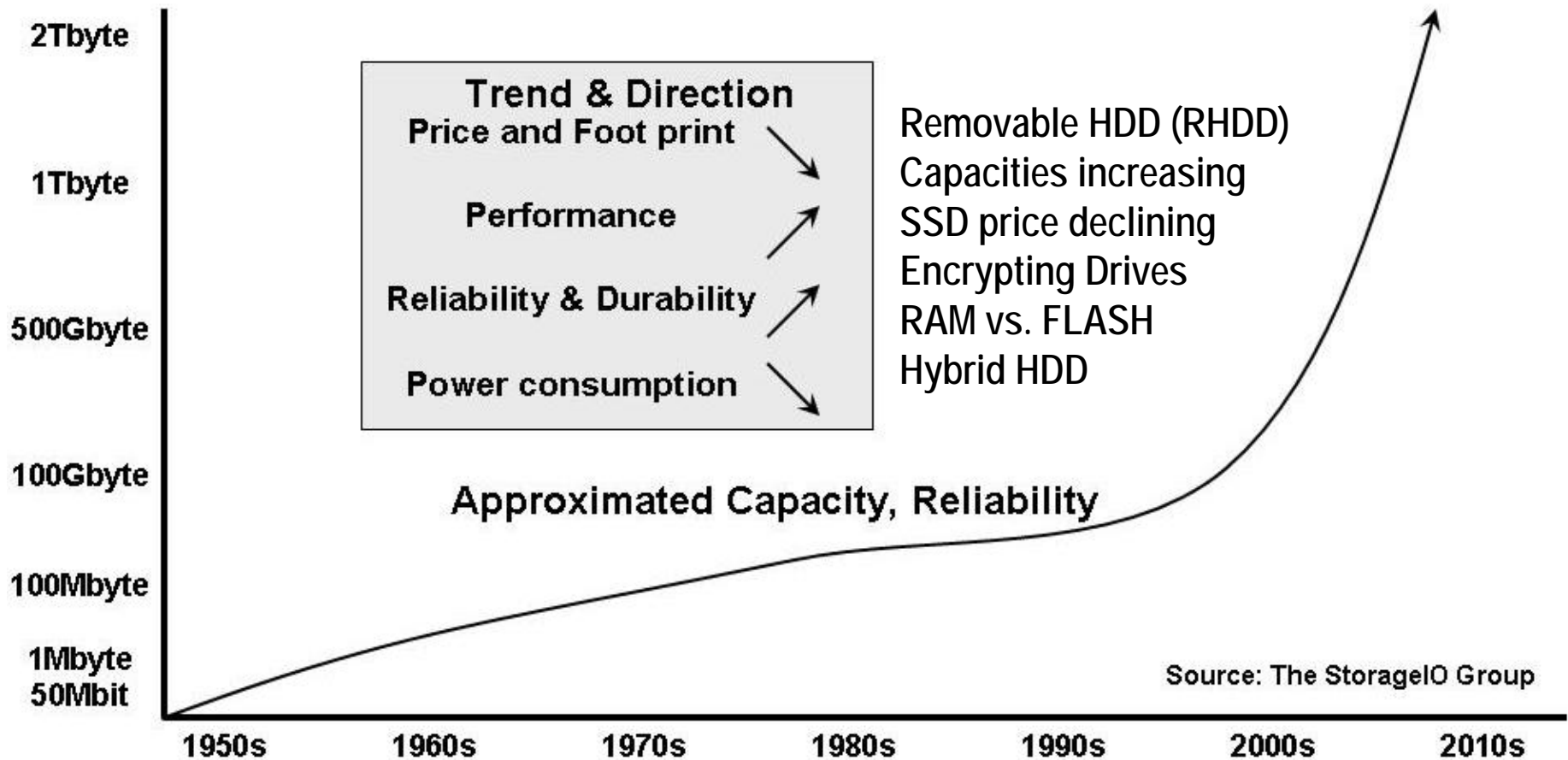
Founder and Senior Analyst, The StorageIO Group
Author “Resilient Storage Networks” (Elsevier Books)
greg@storageio.com

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Hard Disk Drive (HDD) Storage Trends

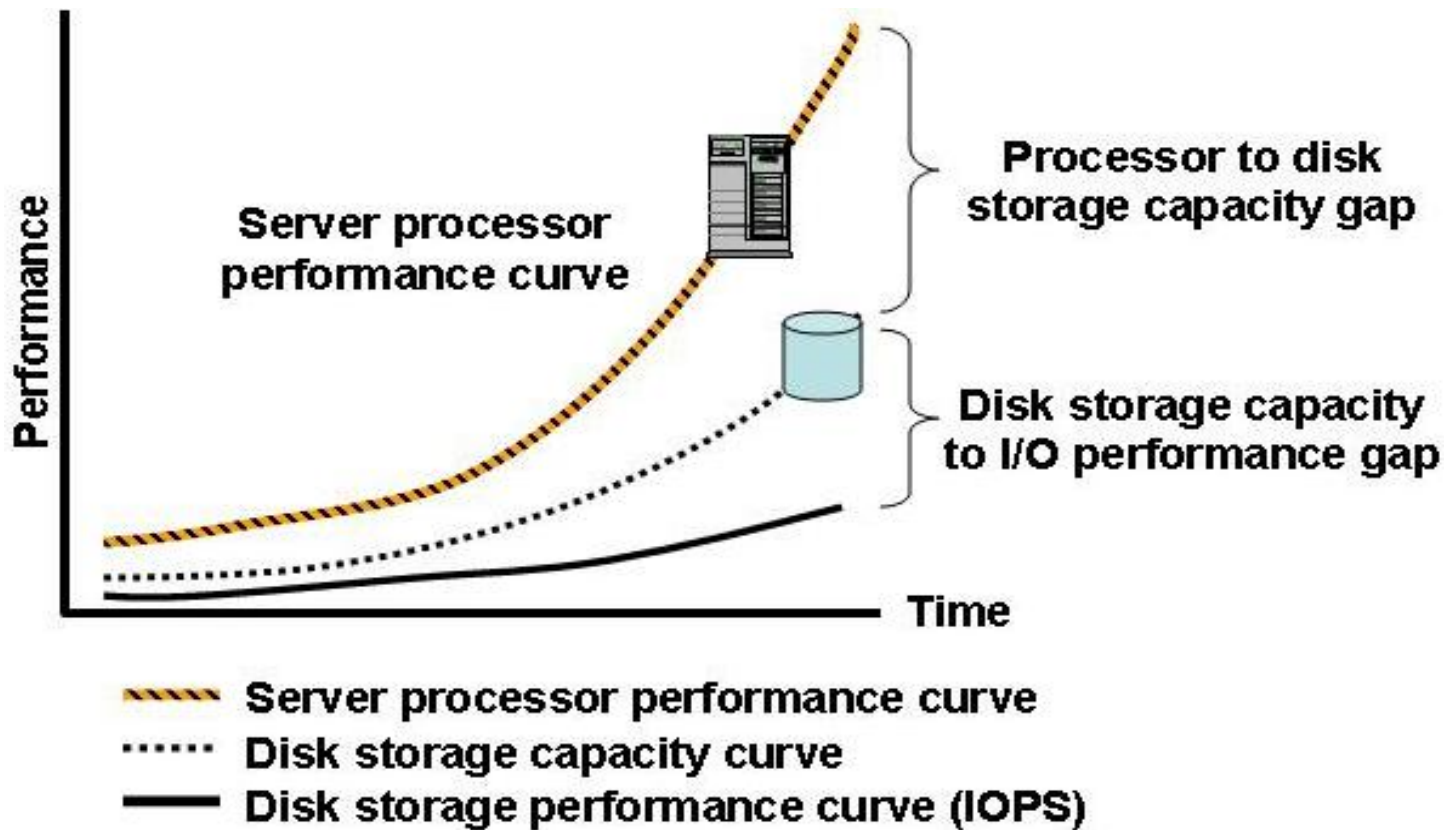
HDD Relative Trends and Directions





Server to storage performance and capacity I/O Gap

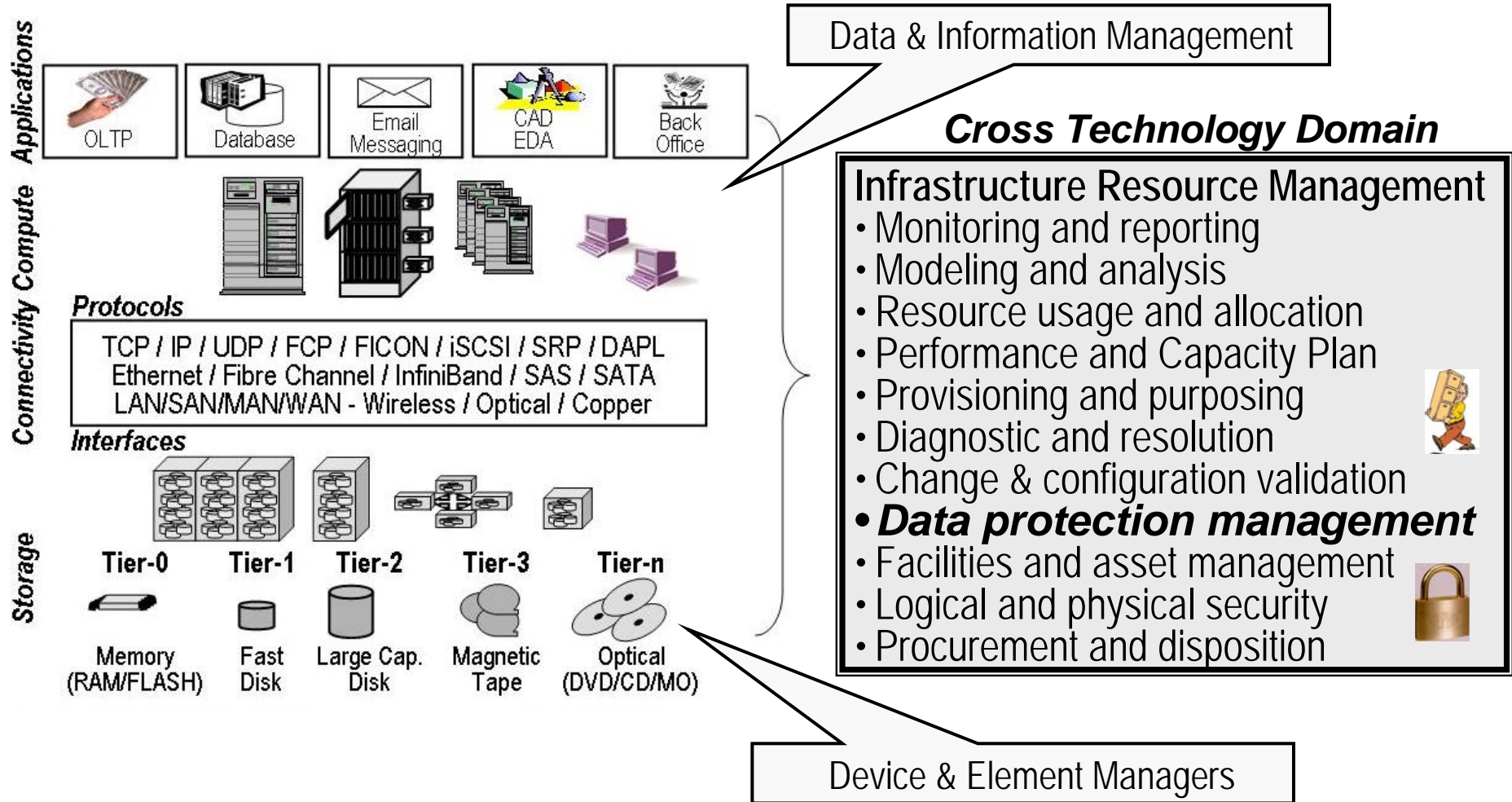
See “Data Center I/O Performance Issues and Impacts” white paper at www.storageio.com





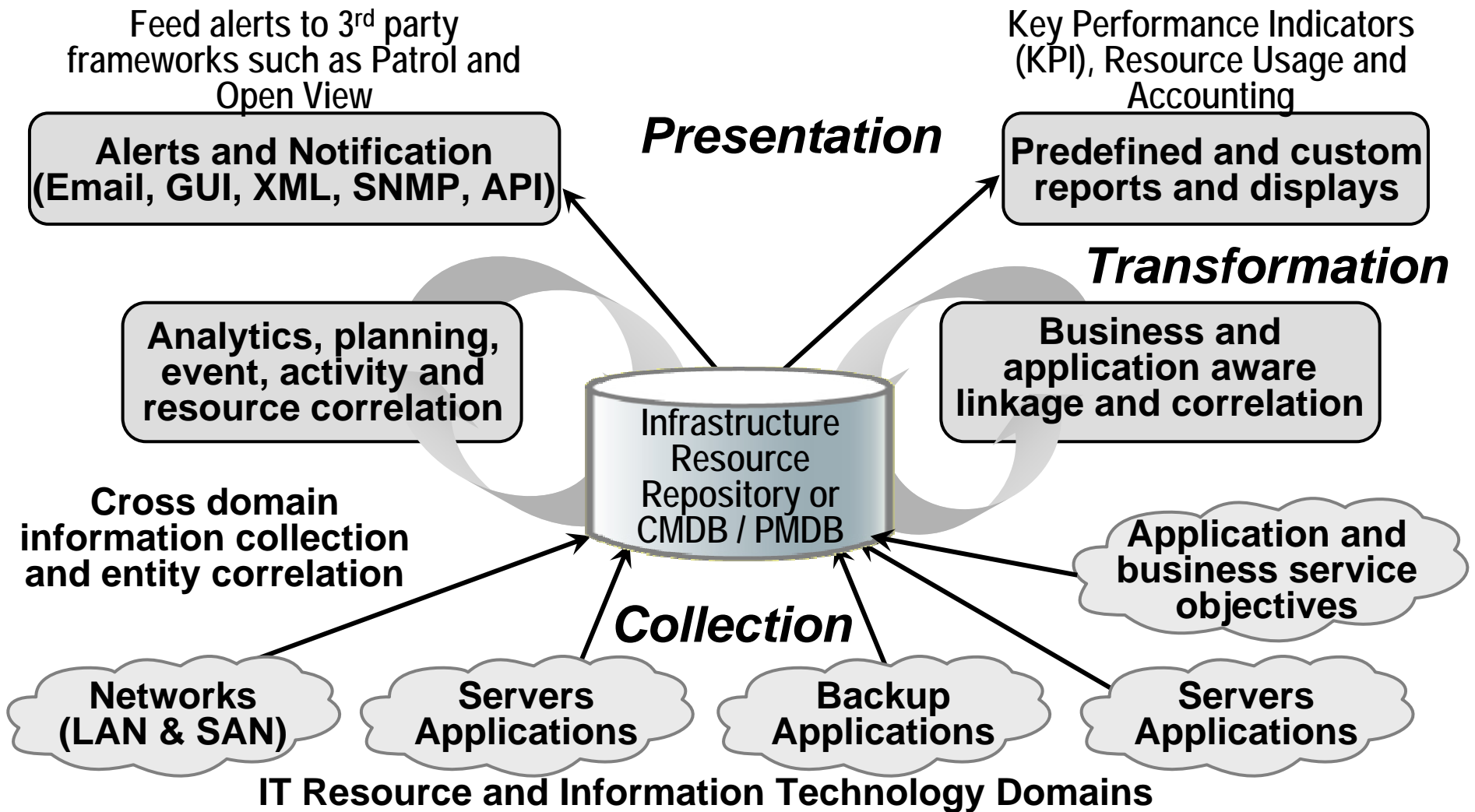
IT Infrastructure Resource Management (IRM)

Performance, Availability, Capacity, Energy (PACE)



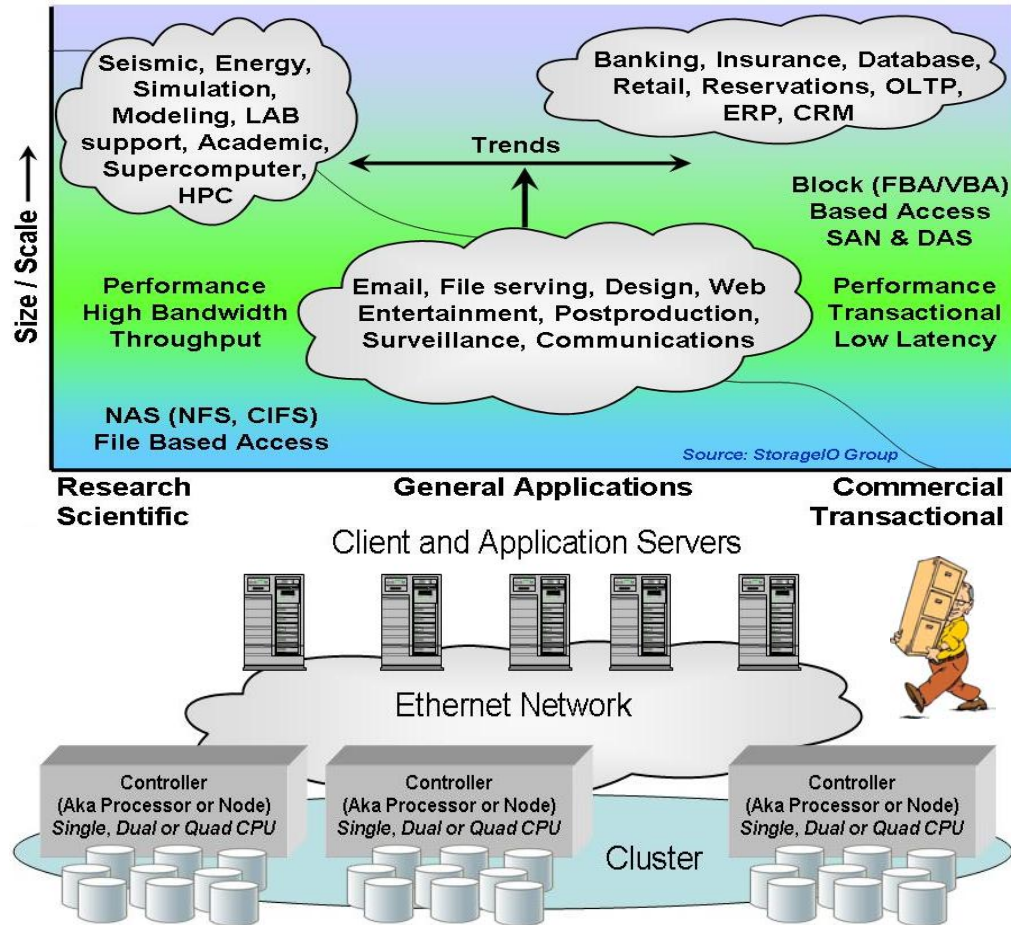


Data Protection Management (DPM) Provides Insight





Clustered Storage – Not just for HPC or NAS...

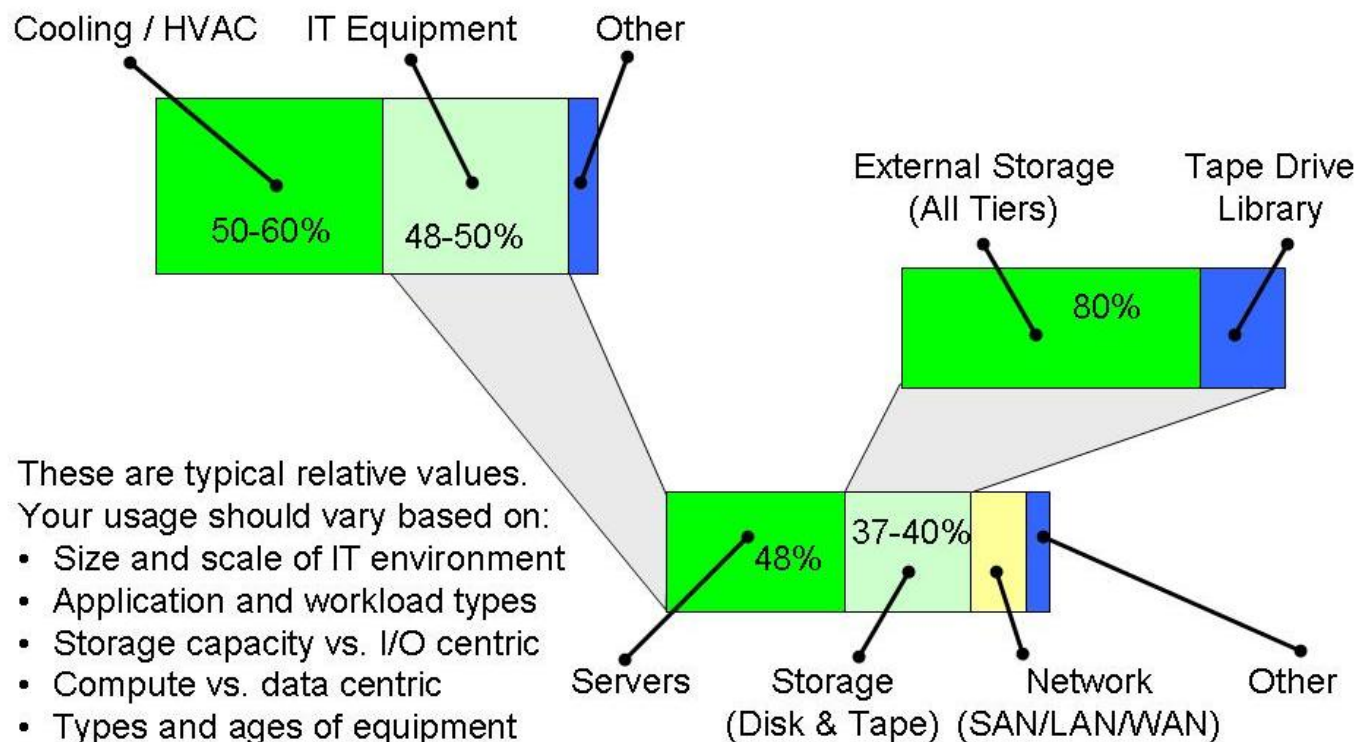


- Aka – Grid, Peer, RAIN, Etc...
- Host and server connectivity access
 - Block, File, Object based access
 - iSCSI, Fibre Channel, NAS, CAS, VTL
- Tightly or loosely coupled cluster
 - Dedicated or shared storage devices
- Open or closed, tight or loosely coupled
 - Share everything, nothing, something
- Workload and application optimization
 - Small random vs. large sequential
- Workload and capacity load balancing
 - Management tools and interfaces

Power and Cooling, The Green Factor

- What are your power, cooling and energy concerns?
- Do you know how much power your environment is using?

IT Data Center Typical Power Consumption



These are typical relative values. Your usage should vary based on:

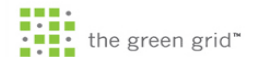
- Size and scale of IT environment
- Application and workload types
- Storage capacity vs. I/O centric
- Compute vs. data centric
- Types and ages of equipment
- Management approaches



Power and Cooling, The **Green** Factor



- PACE = Performance, Availability, Cooling, Energy
- Some marketing initiatives include:
 - Carbon Credits to off-set power consumption (www.terrapass.com)
 - Carbon credits being traded on www.chicagoclimatex.com
 - www.Thegreengrid.org trade organization group
 - www.greendatastorage.com – Various data storage energy topics
 - Focus on increased storage utilization, reduced data footprint
 - Some metrics may not reflect effective or usable storage



- Some focus areas include:



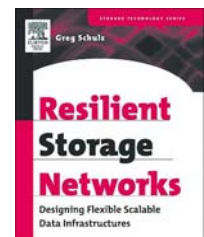
- Reducing your carbon output impact to meet green initiatives
- Reducing your power consumption (costs, energy footprint)
- Improving storage effectiveness (performance and utilization)



Closing Comments

- IRM is about managing IT resources
 - Service delivery, resource usage and effectiveness
 - Cross domain tools provide systems view of IT services
- Caveats of consolidation to watch out for
 - Reduced performance with improved capacity utilization
 - Single points of failure with consolidation if HA ignored
- I can be reached at greg@storageio.com
- Of course the obligatory plugs:
 - Resilient Storage Networks – Elsevier
 - www.storageio.com (see portfolio for articles, presentations, webcasts, reports, etc)

*SNIA
Recommended
and endorsed
Reading*

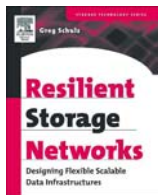


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Thank You



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