Bridging the IT emerging technology gap
Navigating the maze of technology
New & existing vendors

November 10, 2015

Organized by Deltware Solutions

Presented by Greg Schulz, Founder & Sr. Advisory Analyst
Server StorageIO® and UnlimitedIO LLC.

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Industry Trends: Big Picture View, moving beyond buzzword bingo

Everything is not the same in the data center aka "The Information Factory"

What are your:

- ***Applications?***
- ***Usage profile?***
- ***Existing tools?***
- ***Constraints?***
- ***Needs vs. wants?***

What to choose?

Enterprise / Primary / Secondary / Bulk
Protection / Software Defined Storage (SDS)
Tin Wrapped / Appliance / VSA / VSAN / VTL
Cloud / Openstack / High-end / Legacy / SAN
Modular / Mid-range / Gateway / Scale-out
Converged / Hyper-Converged / Grid / RAIN
Server SAN / Hybrid / ASA / AFA / NAS / File
Block / Virtual / Object / Cluster / Start-up
Little Data / Big Data / Data Pond / Data Lake
Backup / Archive / PBBA / vPBBA / PBDPA

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Speeds, Feeds, Functions, Slots, Watts

DRAM / NAND / Flash / SSD / SLC / MLC / TLC / 3D
HDD / SSHD / HAMR / SMR / NVMe / PCIe / HDFS
SAS / SATA / mSATA / m.2 / Compress / Dedupe
Thin Provision / RAID / FEC / Erasure Code / Tape
Snapshot / CDP / Replication / SMI-S / REST / SMB
HTTP / API / S3 / ODX / VAAI / VASA / VVOL / IOPs

Buzzwords, Trends & Terms

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Industry Trends: What's Your Data Infrastructure Strategy?

Do you have a strategy? What determines and influences your strategy?

Initiatives from above
(Higher level vision, strategies, cost savings, resiliency, derive more value, faster time to market, mandates, M&A)

Needs vs. Wants
(requirements, budget, nice to have vs. must have)

Business Opportunities
(New markets, speed to market, gain market share, new functionality, M&A)

IT challenges
(Cost, budgets, growth, availability, security, privacy)

Constraints
(budgets, staffing, power, cooling, floor space, software license, time)

Technology opportunities

Ideas
(Innovation)

Buzzwords Trends

Influencers
(Management, peers, vendors, VARs/business partners, consultants, media/bloggers, adoption vs. deployment)

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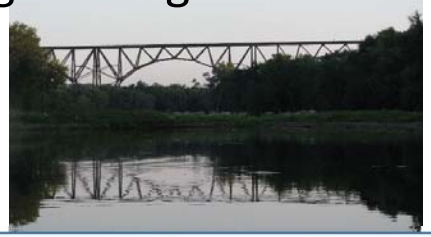
Industry Trends: Balancing *Your* Need's with Want's of others…

Evolve Your Data Infrasture protecting what you have while evolving to the future

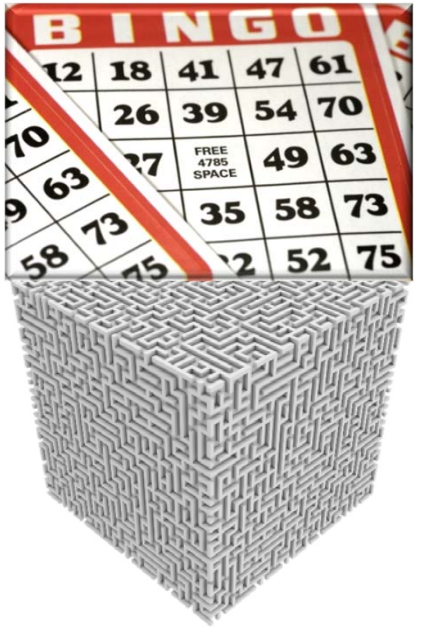
Your Vision, Mission, Charter
Objective, Strategy and Plans

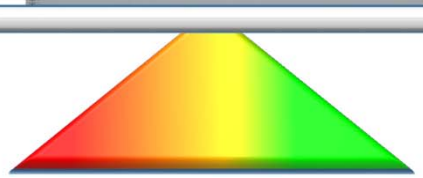
Minimize Disruption
Protect and Preserve
What you Have

Bridging Existing and New = Hybrid



Navigating Maze
Buzzwords and New Trends





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Industry Trends: IT should be about the Applications!

Everything is not the same in the data center aka "The Information Factory"

Are you treating everything the same?

- o From a performance perspective?
- o From space capacity or type of storage?
- o For data protection (HA/BC/BR/DR/Backup)?
- o Efficiency vs. Effectiveness?

All application ***data*** either ***has***:

- o *No value* = Ephemeral/temp/scratch = why keep?
- o *High value* = May be active or static
- o *Some value* = Current or emerging future value
- o *Unknown value* = Protect until value unlocked

All applications have ***PACE*** attributes

- o Some applications and their data are more active
- o While others have different access/activity

Primary ***PACE*** attributes for active/inactive are:

P – Performance (IOPS, Latency, Bandwidth)
A - Availability (Access Durable, RAS HA BC DR)
C - Capacity space (Raw, usable, protected)
E - Energy/Economics (upfront & recurring)

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Industry Trends: Data Infrastructure Decision Making Tips

Everything is not the same: Keep in mind your needs vs. somebody else's wants!

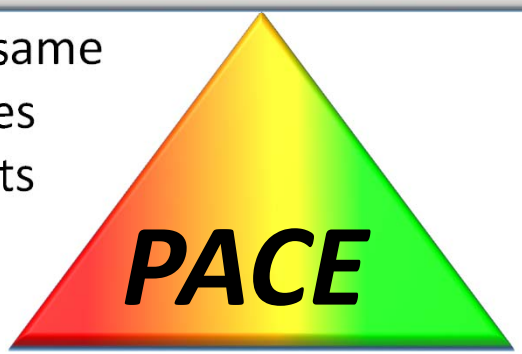
What you need
(e.g. basic requirements, must have, jacks or better)

Keep in focus Your

Everything is not the same
Strategy and plans
Needs and requirements
Environment and applications

What you want
(e.g. secondary requirements, nice to have, wish-list or somebody else's needs…

Everything is not the same
Various PACE attributes
Different environments
Different applications



P – Performance and Productivity

A – Availability, Durability, Protection

C – Capacity space and consumption

E – Economic costs and constraints

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Industry Trends: Why Hybrid is the IT Home-Run into next decade

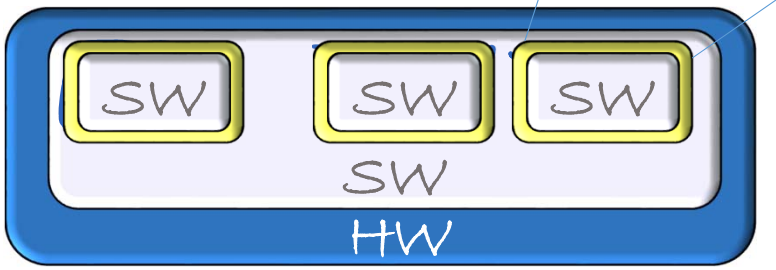
Technology and Services that adapt to your environment needs that can also evolve

Driving Return on Innovation – The New or Alternative ROI

Some Hybrid Technologies

Legacy

Emerging



On-premise **Service Provider**

PACE

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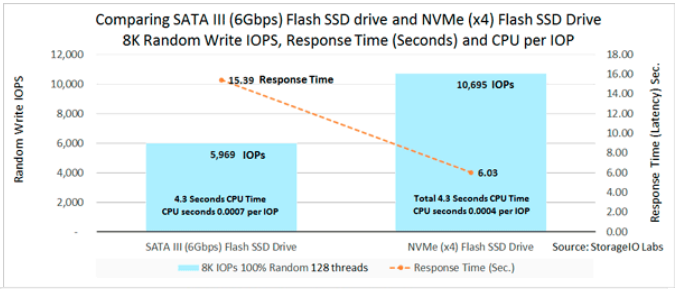
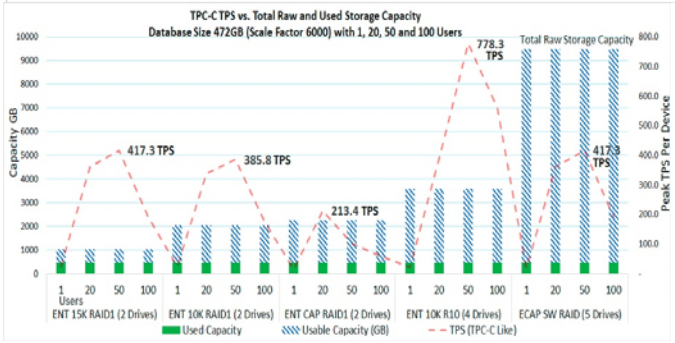
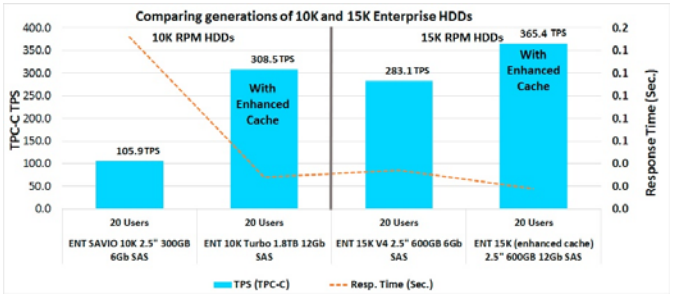
Industry Trends: Marketing Metrics vs. Metrics that Matter

Marketing "hero" metrics vs. those that are applicable and matter to your environment







- Keep PACE and context in mind
- Various tools and technologies
- Old school (Iometer, SQLIO, dd, 512 byte or 4K IOPs)
- New school (Diskspd, vdbench, BMF, dfsio and others, 8K read/write,, random/sequential, Bandwidth, IOPs, latency, CPU usage, 128K and larger I/Os for block and file, TPS for Database, object tools, context matters as does being able to repeat or do tests/workloads yourself)

Component vs. Composite

www.storageperformance.us and www.thessdplace.com
http://storageioblog.com/part-ii-iops-hdd-hhdd-ssd/

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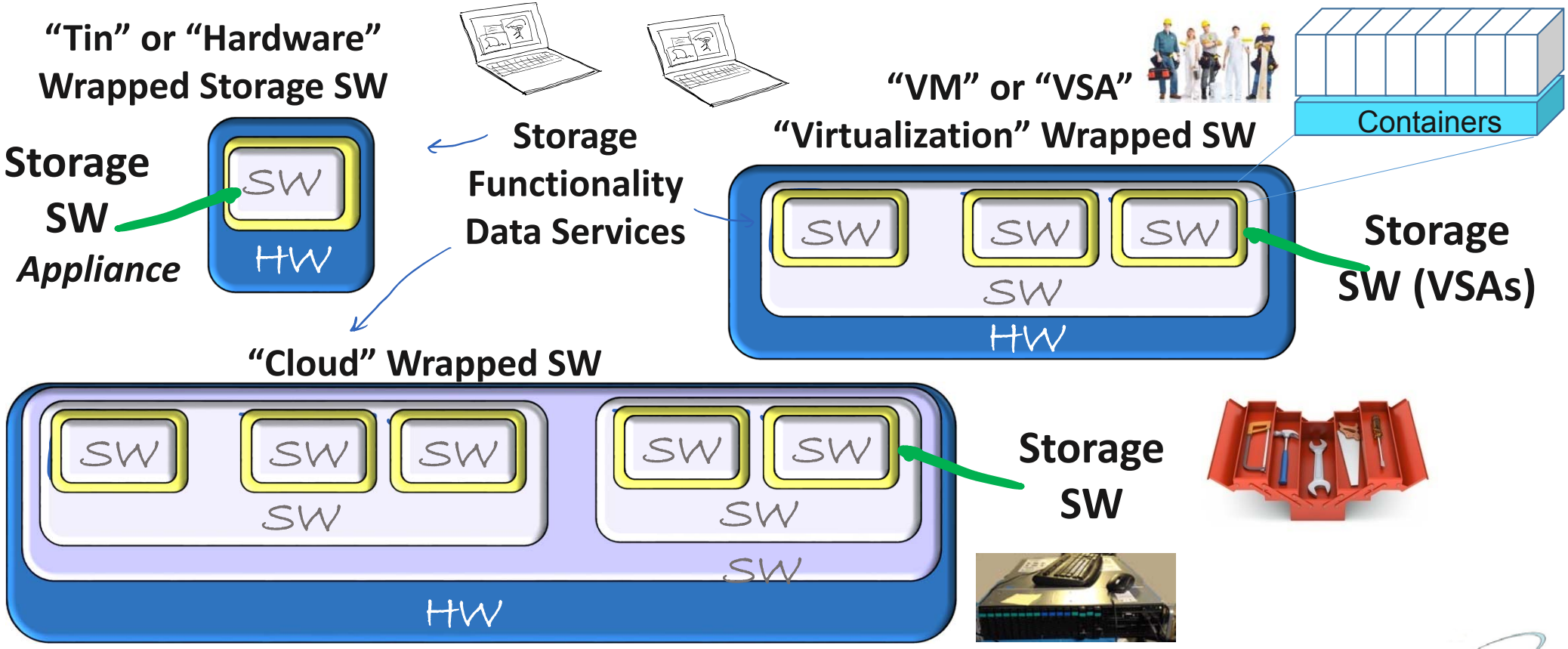
Industry Trends: Software Defined and Virtual Wrapped Storage

Some new solutions, packaging, features, functionality, scale (up, down and out)

Time To Expand Conversation to Software Defined Storage Management!



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Industry Trends: Clouds (Public, Private, Hybrid), Object, CI, CiB, HCI

What's the best for you? Depends on what you need to do…

What are you trying or needing or wanting to do?

- Access shared, external, remote storage (block, file, object/application)
- Access remote database (SQL, NoSQL, little data, big data)
- Run applications or other software "in" the cloud
- Access cloud applications from local applications
- Archiving, Backup/BC/DR/HA of active or in-active data
- Higher performance, or lower cost "bulk" storage
- Shopping for cloud servers and storage is like traditional server storage shopping
  - You need to know your needs, requirements, options and their characteristics
  - Look beyond lowest cost and cost-cutting to avoid comprise
  - What level of availabity, access, durability and resiliency do you need
  - What level of performance, interoperability and management do you need?

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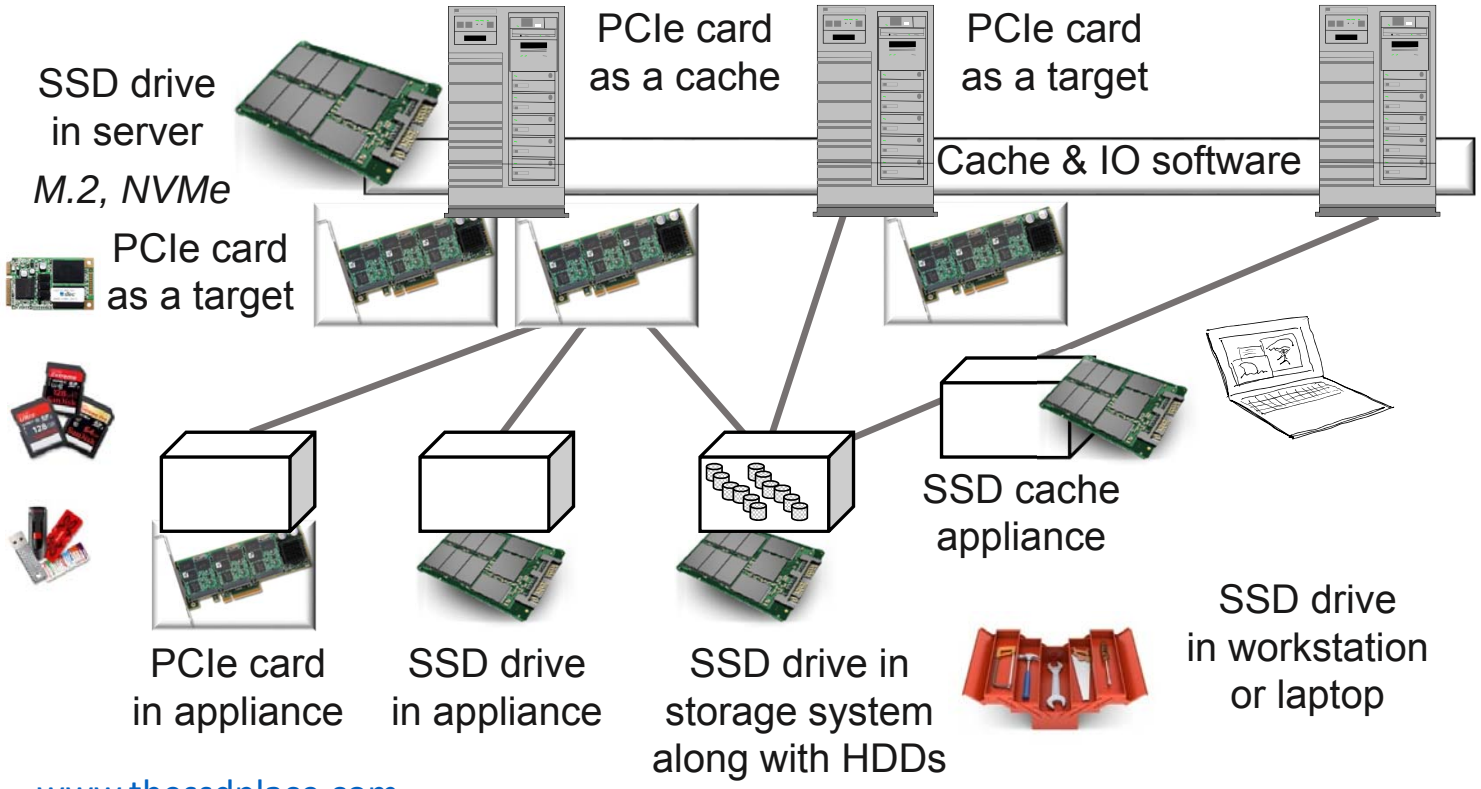
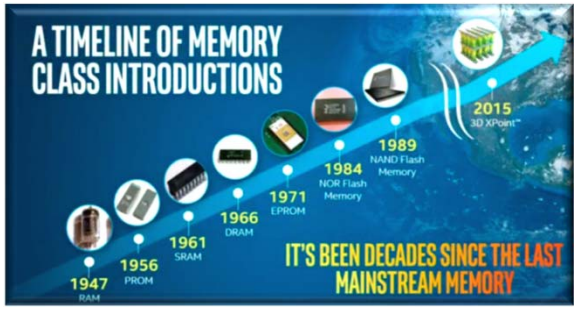
Industry Trends: Non Volatile Memory (NVM) aka flash SSD

SSD as cache, target or hybrid, which is right or best for you?

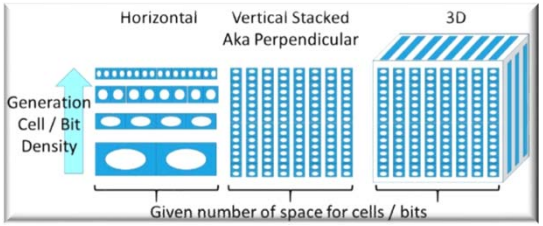
Answer: It depends on your needs, budget and preferences!





NAND flash trends

- SLC shifting to faster MLC
- Many types of MLC today
- TLC & 3D NAND appearing
- Improved write durability
- Some read optimizations
- Higher density, lower costs



www.thessdplace.com

http://storageioblog.com/volatile-memory-nvm-nvme-flash-memory-summit-ssd-updates/

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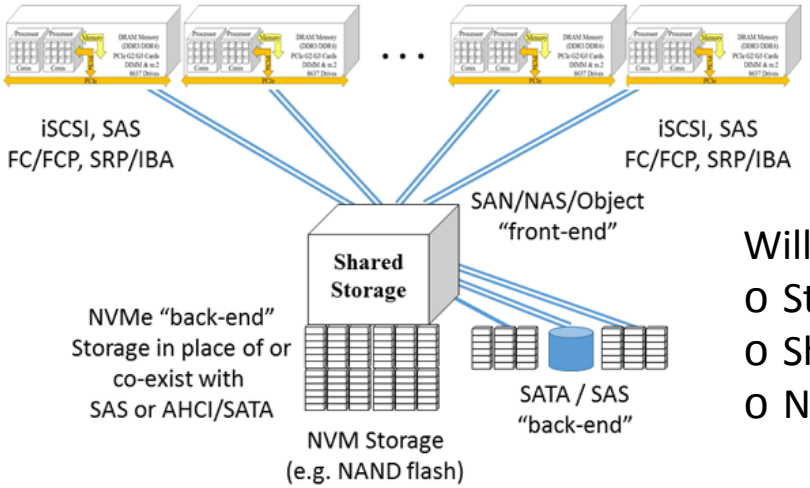
Industry Trends: NVM Express (NVMe) Evolving Role

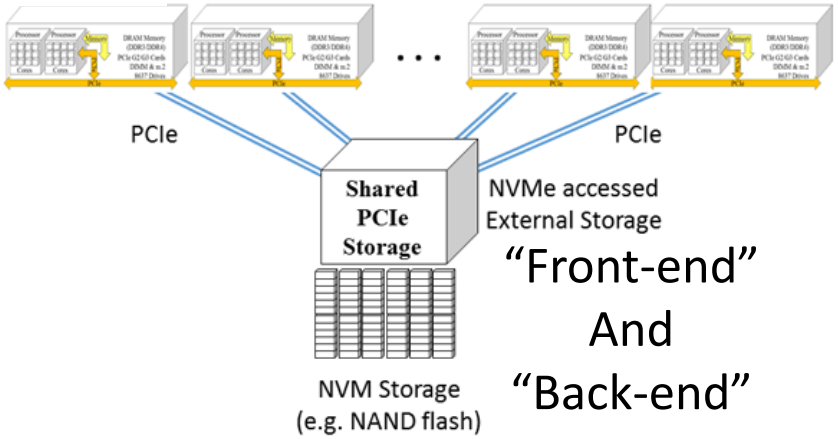
Leverages PCIe as physical transport with new software driver stacks including block



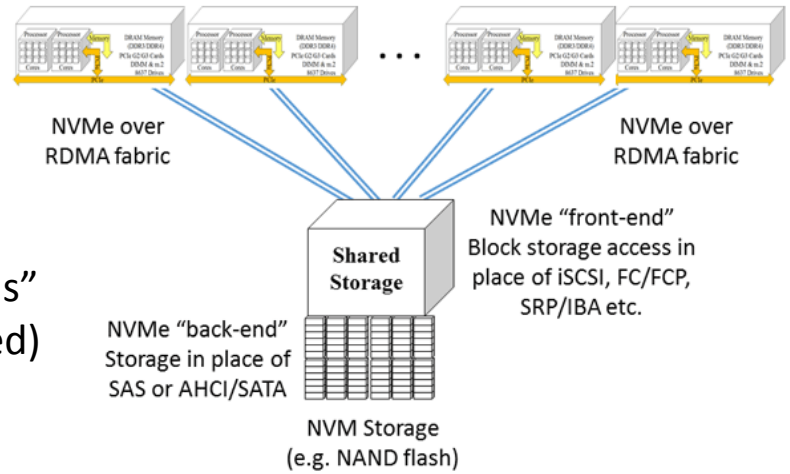
"Back-end" for Storage Systems

Will be appearing in:

- Storage systems as "back-ends"
- Shared external PCIe (switched)
- NVMe over Fabric using RoCE



"Front-end" And "Back-end"



"Front-end" Over network "Back-end" E.g. Alternative to FCP/SRP

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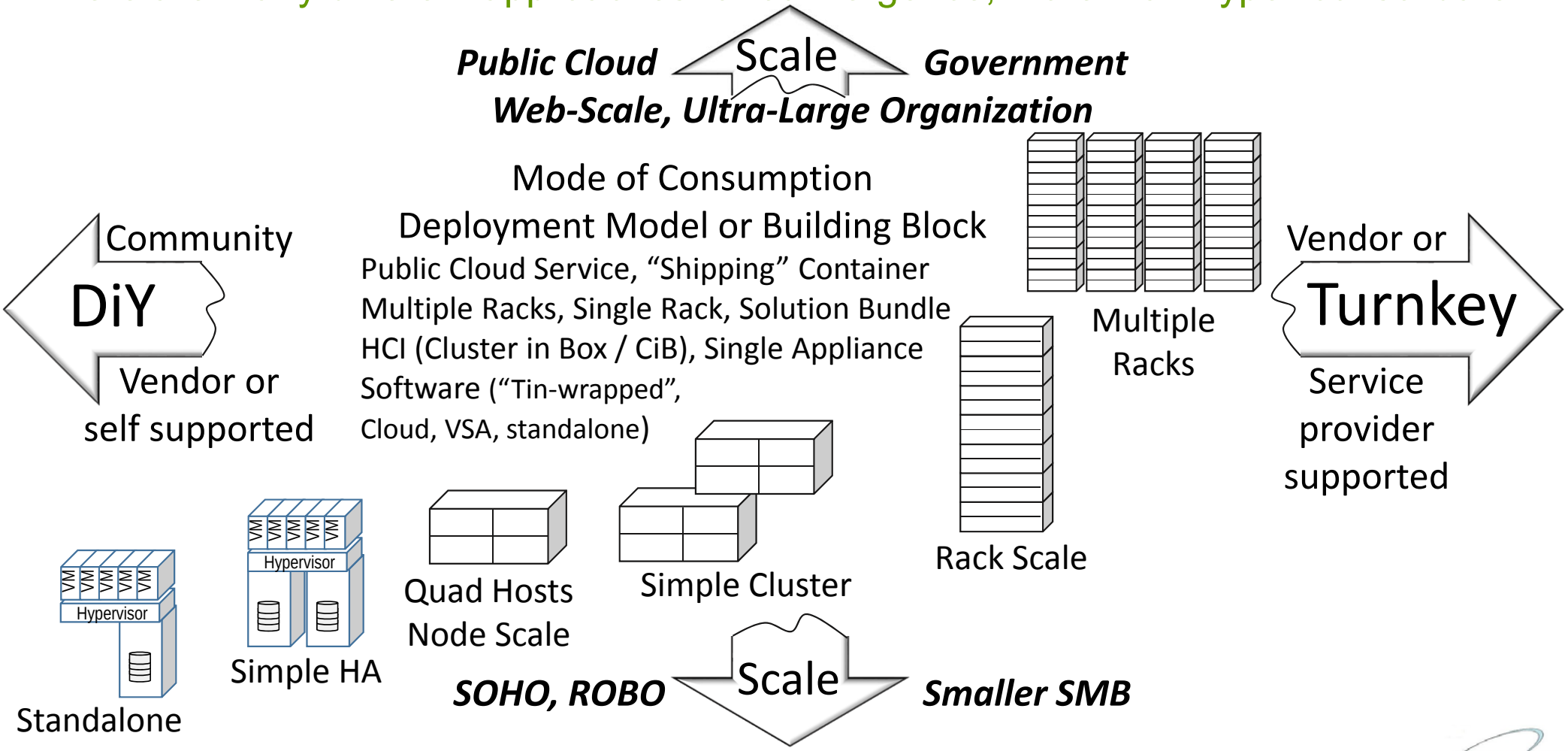
Industry Trends: Different Types of Convergence

There are many different approaches for convergence, more than hyper-consolidate



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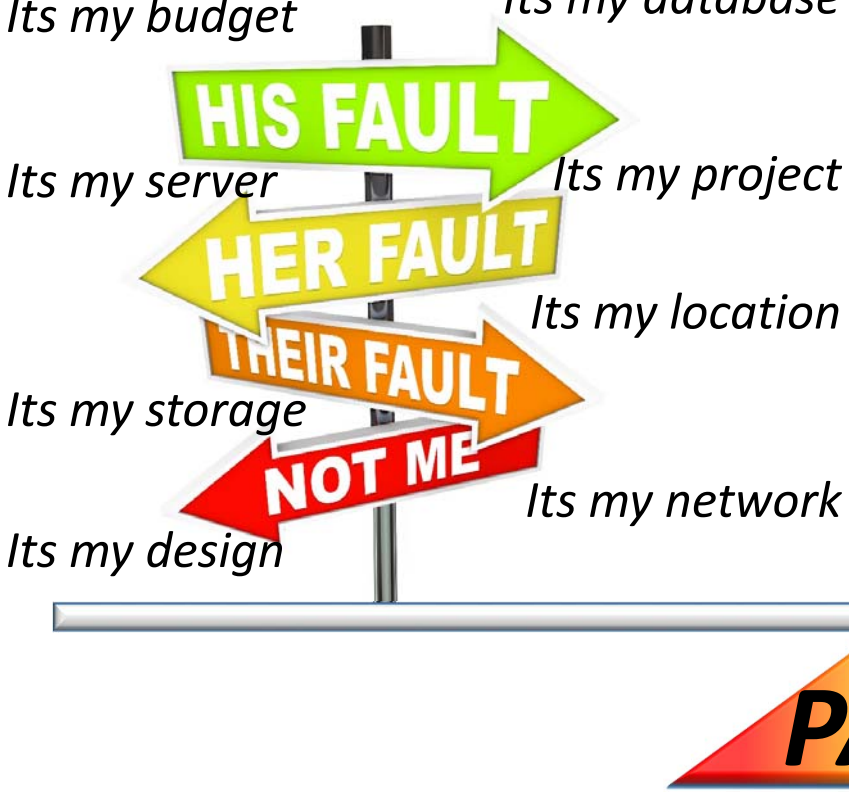
Industry Trends: Barriers to unlocking full value of Convergence

Its not the products, protocols or technology, it's the people policies, politics, processes

Instead of pockets or silos of influence, decisions, management, support and control its converged virtual and physical teamwork!



PACE

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Industry Trends : Some Vendors & Technology To Keep an Eye on

They may or may not be applicable to your needs…

CloudHQ (Cloud management tools), EMCcode (Rex-Ray, s3motion and more), Enmotus (FUZEdrive Microtiering, physical, virtual, cloud), Formation (Software defined storage management for DAS and open stack), InfiniteIO (Cloud and NAS cache), Iofabric (SAN/NAS pooling), Microsoft (Diskspd, Nano, Storage Spaces Direct and Replication, SOFS, Azure among others), Mesosphere (Messo tools), Plexxi (Networks), OpenStack (Manila and Trove), Qumulo (insight and management enabled storage), ScaleMP (Data Center Operating System), Reduxio (hybrid storage without compromise), Rubrik (Software Defined Data Protection), Tesora (OpenStack trove tools), Virtunet systems (VMware flash cache software), Xangati (software defined management tools) and many many others…

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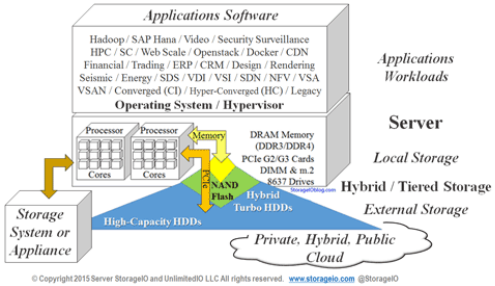

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Industry Trends: Data Infrastructure decision making tips

Everything is not the same, keep in mind your needs vs. somebody else's wants!

Do's (try to accomplish these)

- Have a proactive forecast (PACE items)
- Be an informed shopper vs. low cost focus
  - Manage the process and vendors
  - Have a plan, prepare and do your homework
  - Execute the plan and play the game
    - ✓ Listen and learn from others
    - ✓ Keep your environment needs in focus
    - ✓ Filter out noise, do an RFI/RFP/RFQ
    - ✓ Shop around, leverage sales, look for value
    - ✓ Ask tough yet fair questions
    - ✓ Ask for help, guidance and assistance
      - Be respectful of peoples time
    - ✓ Make a smart storage decision

Don'ts (try to avoid these)

- Shop based on just lowest cost per TBytes
- Become tunneled vision (keep options open)
  - Get competing solutions and ideas
  - For price/costs competition or comparison
  - Compare apples to oranges vs. apples to apples
  - Let somebody else's wants become your needs
- Get stuck in analysis paralysis
  - Longer you wait delays ROI benefits
  - Leverage assistance, be respectful of others time
- Ignore your needs vs. wants
  - Current environment and investment
  - Risk vs. reward for change
  - Buying shelf-ware (what you wont be using)

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Closing comments, for now…

Look leverage technology / solutions that work for you, vs. you working for them

Industry Trends and Perspectives

- Have a vision, strategy and plan (e.g. an itinerary and road map)
- Have insight and awareness into your environment (avoid flying blind)
- Increase your Return on Innovation using new & old things in new ways
- A little bit of flash SSD in the right place goes a long way (location matters)
- Many of these technologies or trends are interesting or fun to watch
- What's applicable for your environment, what can you actually use?
- How can you leverage old and new things in new ways
- How can you facilitate change without causing disruption?

Head in the clouds, feet on the ground!

Where to learn more

- www.storageio.com (articles, videos & webcasts)
- Deltaware Solutions www.dwdsinc.com
- Feel free to call, IM, tweet, or email greg@storageio.com

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Bridging the IT emerging technology gap
Navigating the maze of technology
New & existing vendors

Ok, nuff said, Thank You…

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