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

Organized by Deltware Solutions
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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?

What to choose?

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
- 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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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

Buzzwords Trends

Ideas
(Innovation)

Influencers
(Management, peers, vendors, VARs/business partners, consultants, media/bloggers, adoption vs. deployment)
Industry Trends: Balancing "Your" Need’s with Want’s of others...
Evolve Your Data Infrastructure protecting what you have while evolving to the future

Minimize Disruption
Protect and Preserve
What you Have

Your Vision, Mission, Charter
Objective, Strategy and Plans

Requirements
Wants vs. Needs

Bridging Existing and New = Hybrid

Navigating Maze
Buzzwords and New Trends
Industry Trends: IT should be about the Applications!
Everything is not the same in the data center aka “The Information Factory”

All application data either has:
- No value = Ephemeral/temp/scratch = why keep?
- High value = May be active or static
- Some value = Current or emerging future value
- Unknown value = Protect until value unlocked

All applications have PACE attributes
- Some applications and their data are more active
- 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)
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)

<table>
<thead>
<tr>
<th>What you want</th>
</tr>
</thead>
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| (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

**PACE**

- **P** — Performance and Productivity
- **A** — Availability, Durability, Protection
- **C** — Capacity space and consumption
- **E** — Economic costs and constraints

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

*Keep in focus Your*
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
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)

www.storageperformance.us and www.thessdplace.com
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!

“Tin” or “Hardware” Wrapped Storage SW

Storage SW Appliance

“VM” or “VSA” Wrapped SW

“Virtualization” Wrapped SW

Containers

Storage SW (VSAs)

“Cloud” Wrapped SW

Storage SW

Time To Expand Conversation to Software Defined Storage Management!
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 availability, access, durability and resiliency do you need
  - What level of performance, interoperability and management do you need?
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

M.2, NVMe SSD as cache, target or hybrid, which is right or best for you?

www.thessdplace.com
Industry Trends: NVM Express (NVMe) Evolving Role
Leverages PCIe as physical transport with new software driver stacks including block

Will be appearing in:
- Storage systems as “back-ends”
- Shared external PCIe (switched)
- NVMe over Fabric using RoCE

“Back-end” for Storage Systems

“Front-end” Over network “Back-end”
E.g. Alternative to FCP/SRP
Industry Trends: Different Types of Convergence
There are many different approaches for convergence, more than hyper-consolidate

- **Public Cloud**
  - Scale
  - Government
    - Web-Scale, Ultra-Large Organization

- **Mode of Consumption**
  - Deployment Model or Building Block
    - Community
    - DiY
      - Vendor or self supported
    - Standalone
    - Quad Hosts Node Scale
    - Simple Cluster
    - Rack Scale
    - Multiple Racks
    - Multiple
    - Government
    - Turnkey
      - Service provider supported

- **Scale**
  - SOHO, ROBO
  - Smaller SMB

- **Industry Trends:**
  - There are many different approaches for convergence, more than hyper-consolidate

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Industry Trends: Barriers to unlocking full value of Convergence

It's 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 it's converged virtual and physical teamwork!

The Power of Team Work
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…
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 tunnelled 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)
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?

Where to learn more

- [www.storageio.com](http://www.storageio.com) (articles, videos & webcasts)
- Delware Solutions [www.dwdsinc.com](http://www.dwdsinc.com)
- Feel free to call, IM, tweet, or email greg@storageio.com

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Ok, nuff said, Thank You…

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