Top 10 Things to Know About Flash: A Panel Discussion

- **Tom Coughlin, Coughlin Associates**
- **Dave Eggleston, Intuitive Cognition Consulting**
- **Eric Herzog, Infinidat**
- **Willie Nelson, Intel Corp.**
- **Andy Walls, IBM Storage**

- **Jean S. Bozman, Cloud Architects llc, Moderator**

35 YEARS OF NAND FLASH MEMORY INNOVATION

Top 10 Things Panel

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Top 10 Things to Know About Flash: The Presentations

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Top Ten Things to Know About Memory
”It’s more than flash, now!”

Tom Coughlin
Coughlin Associates Inc.
https://tomcoughlin.com

Top 10 Things to Know About Memory

Flash Memory Summit

1. **AI/ML, IoT and other big data applications are driving demand for all memory**

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10. **The FMS will return next year, increasing the focus on all solid-state memory (The world's biggest Memory Show)**

Top 10 Things to Know about Memory

Dave Eggleston
Intuitive Cognition Consulting

Top 10 Things to Know about Memory

1. The future of NAND is… NAND (and DRAM is… DRAM)
2. The memory wall is real (and getting worse)
3. Server DRAM bandwidth per core is… declining (since DDR2!)
4. DDR5 does not fix server bandwidth or capacity limitations
5. 40% - 60% of DRAM inside servers sits allocated but idle (i.e. wasted!)
6. Adding CPUs to add memory capacity is costly
7. Memory persistence isn't always desirable! (Quite often it's a risk!)
8. Datacenter memory usage and deployment is near a major inflection point
9. CXL is at the peak of the Gartner hype cycle! (get ready for the trough of disillusionment)
10. Memory tiering, pooling, and sharing requires heavy duty software innovation
11. [Bonus] Chiplets (heterogeneous integration) are cool and interesting! (Think Lego blocks)

Top 10 Things to Know about New I/O Industry Enablement

Willie Nelson
Technology Enabling Architect
Intel

Top 10 Things to Know about New IO Industry Enablement

1. **New IO technology transitions are NOT automatic (even when a single company owns)**
2. **Complexity increases non-linearly with the size of the ecosystem**
   - Differences in spec interpretation, validation HW/options, debug, third party involvement (OS's/test tools/etc.)…
3. **Enabling new technologies across the ecosystem requires cooperation & coordination**
4. **Evolutionary changes (speed bumps, iteratives) are generally single generational (i.e. PCIe x.0)**
5. **Revolutionary changes (new protocols, full HW interfaces) are often multi-generational (i.e. CXL, SAS, or even UCIe)**
6. **Crawl/Walk/Run is always required – but how quickly we run varies by technology and complexity**
7. **Revolutionary IO changes often have alternate/competing solutions in development – this can further complicate enabling efforts**
8. **SW & test tools to support/validate/utilize new technology is critical, but also often requires HW first – enabling is not limited to just the HW involved**
9. **Existing technology rarely disappears as quickly as predicted (however, new investment on existing technology does diminish)**
10. **It takes a village – & WE are the village!**

Top 10 Things to Know about Flash Platforms and Solutions

Eric Herzog
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Top 10 Things to Know: Flash Platforms and Solutions

Flash Memory Summit

1. **All-Flash Storage Systems are the #1 Revenue Platforms Globally Across all Price Points**
2. **The Need for Better Performance for Enterprise Application and Workloads will NEVER Diminish**
   - All-Flash Solutions at 35 microseconds of Latency are Available Today
3. **Key Differentiators for All-Flash Platforms and Solutions are Heavily Software-Driven**
4. **Cyber Storage Security is Critical for All-Flash Platforms**
5. **Cyber Storage All-Flash Platforms are ESSENTIAL for Comprehensive Corporate Cyber Security Strategies**
6. **All-Flash Platforms are Incorporating the Latest Interfaces – NVMe to Media and NVMe over Multiple Fabrics**
7. **End Users are Expecting Tight AIOps Integration Across Data Center and Hybrid Cloud Deployments and Autonomous Automation for Substantial Reductions in IT Manpower Needs**
8. **End Users Expect EVERY All-Flash Platform Generation to have Lower CAPEX, Lower OPEX, and Better TCO**
9. **All-Flash Platforms Incorporate all Types of Flash - Performance, Durability, and Reliability Vary Flash Type to Flash Type**
10. **Hybrid Storage Systems (Flash+HDDs) are NOT Dead – Very Important for Secondary Storage Workloads: Back-up; Cyber Resilience; Disaster Recovery and Business Continuity**

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