

StorageMojo

5 technologies in search of a data center

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About

- Writer, analyst, consultant & blogger
 - StorageMojo.com
 - Storage Bits at <http://blogs.zdnet.com/storage/>
- Over 25 years in the industry
 - DEC, Sun, Quantum more
- What's with the rocks?

Disclosure

- Companies hire me to help
- I sometimes buy or receive stock
- Marketing consultant
 - Video white papers, white papers
 - Competitive analysis, strategic planning
 - Writing, messaging, new media
- Inline disclosure of relationships, stock

Data center Mojo

- 2.5" enterprise drives
- High-end SSDs
- Guaranteed uptime
- 10 GigE
- Cloud storage

Disruptive technology

- Christensen's misleading name for changing the economic dynamic
- Technology = \$\$\$\$

2.5" disks

- 5-6 actuators - not 1
- $\sim 1/3$ - $1/4$ the power per spindle
- 3x the density
- + power cycles, shock & vibe

Big in a small way

2.5" use model

- Floor space, not power
- Re-architect the array: 2.5 + SSD
- Over-provision for availability

Enterprise flash SSDs

The marketing take:

- Miracle cure for data center ills!
- Based on quantum tunneling

Quantum = Wonderful!

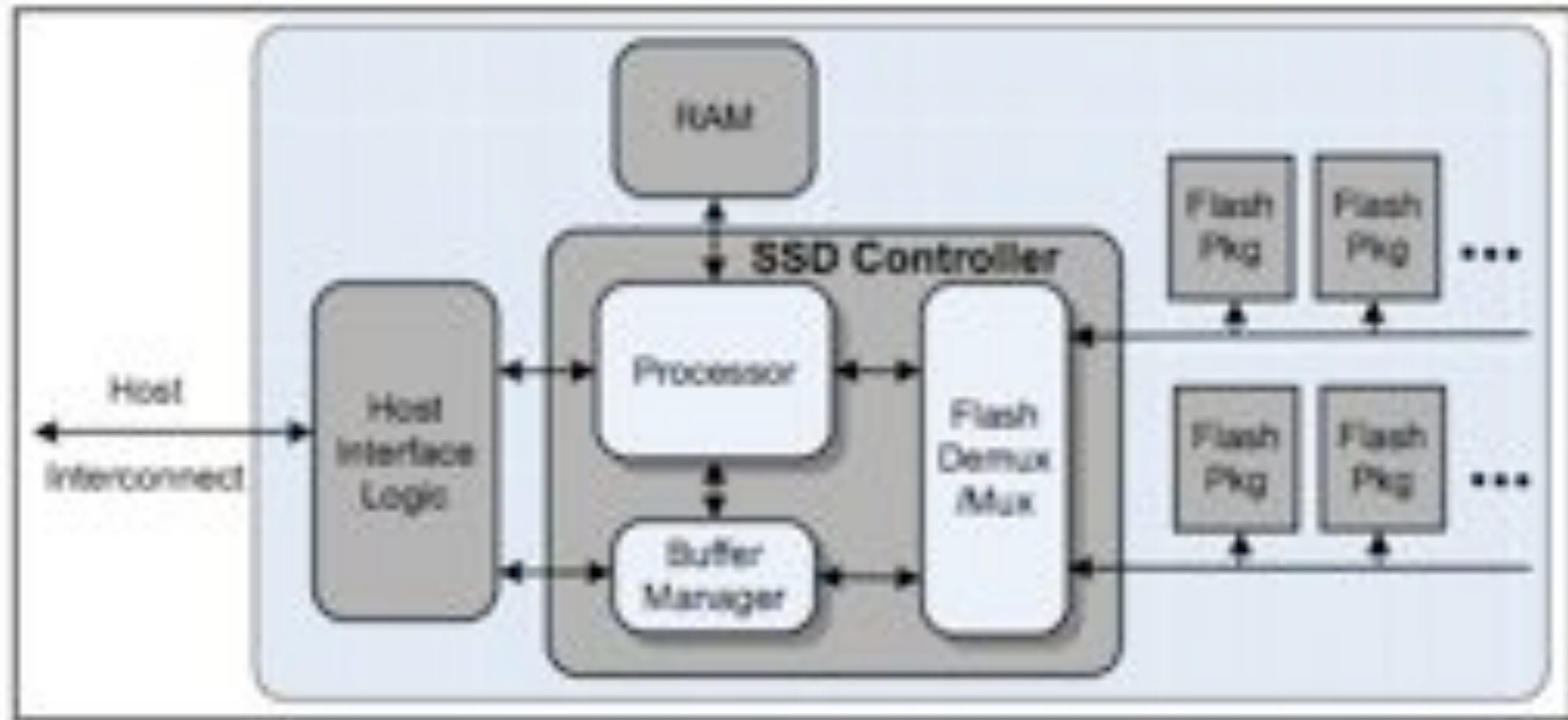
Enterprise flash SSDs

- How would we have used FLASH in 1957?
- In a DISK DRIVE?

The SSD problem

- The problem: flash translation layer
- IP secrecy
- Many trade-offs whose effects we don't yet understand
 - Data placement
 - Write ordering
 - Workload management

The flash problem



SSD Logic Components

The flash SSD take

- Great variety in performance
- Big potholes
- Complexity is the big surprise

Rethinking flash SSDs

- Array SSDs easy win - what next?
 - Network cache for write offloading
 - Array on a card
 - Massive memory servers

The future is not the past re-invented

Guaranteed uptime

- Do you miss the TV repairman? Your 3,000 mile tune-up?
- Xiotech's ISE
- Atrato's Velocity 1000

Guaranteed uptime

- IT is a factory
- Minimize variability
- More consistent results

10 GigE

- Fast and (still) expensive
- Will it kill Fibre Channel?

10 GigE

- No - but new SANs will move to 10 GigE
- Dynamics:
 - Shrinking FC advantage over 10 GigE
 - OLTP in decline - cooler data
 - FCoE - the final nail in the FC's coffin

Cloud storage

- S3 problem: ~99.9% uptime
- Options:
 - Private cloud
 - EMC's Maui: outsource or private
 - Other companies

Cloud over Maui

- EMC appears to be building a sophisticated geo-aware global cluster for cloud storage
- Pi Corp acquisition is adding advanced metadata management
- Very tough set of problems

Cloud architecture

- Global enterprises will need a geo-aware cluster-cloud
- Individuals and SME - less demanding
- Global cluster vs CDN

Conclusion

- Turmoil in data center architectures
- Google set it off
- Multiple competing technologies
- Evolving customer needs

Forecast: an interesting decade

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Questions?