



Accelerating Enterprise Applications with Flash Memory

Session 201-B

8:30am to 9:35am Aug 6, 2014

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THE HIGH COST OF LATENCY



“...every 100ms of latency cost them 1% in sales”



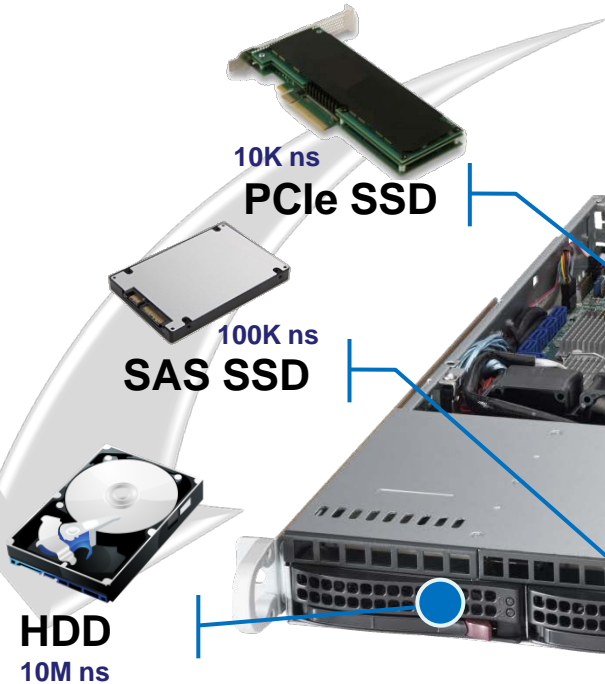
“...an extra 500ms in search page generation time dropped traffic by 20%”



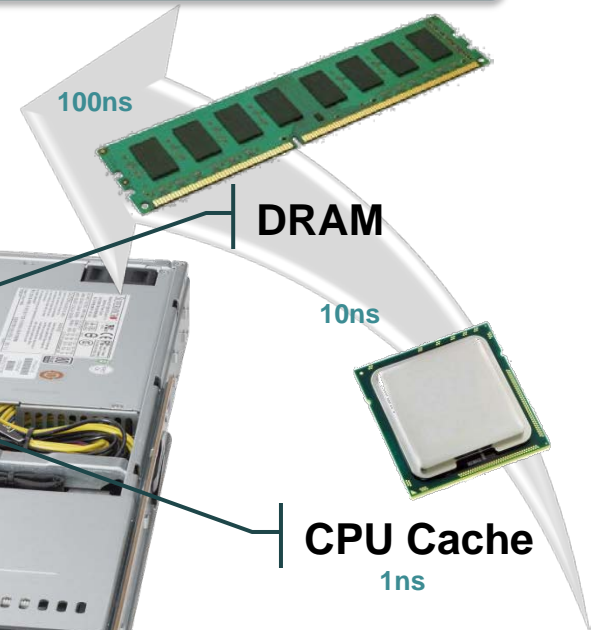
“...a broker could lose \$4M per millisecond if their electronic trading platform is 5ms behind the competition”

The Memory / Storage Problem: Latency

NON-VOLATILE MEMORY HIERARCHY



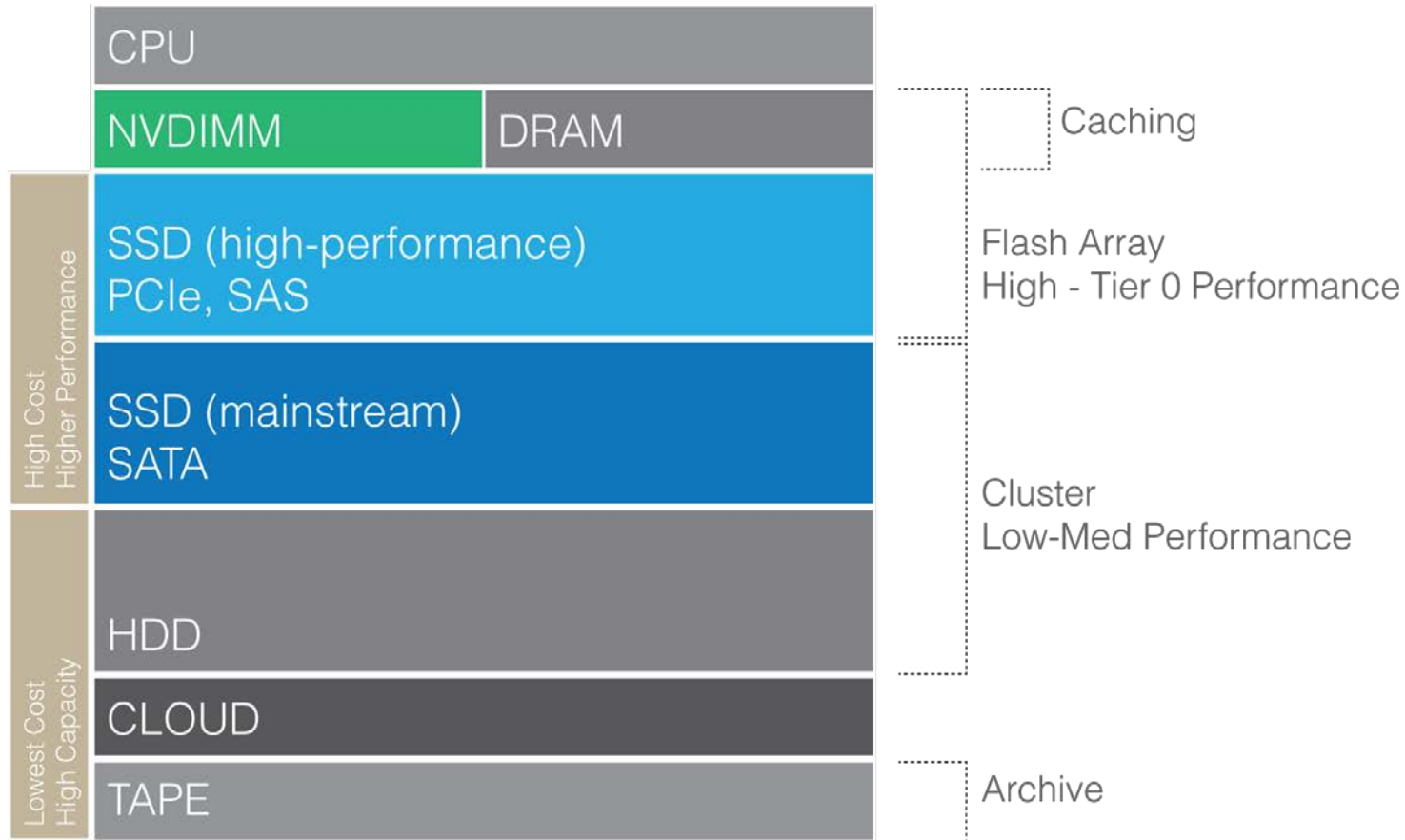
VOLATILE MEMORY HIERARCHY



- As CPU technology scales, memory IO creates significant performance bottlenecks
- The latency gap in memory / storage hierarchy needs to be bridged
- NVDIMM offers a solution today (Storage at DRAM Latency)

NEW STORAGE ECOSYSTEM

Storage hierarchy and synergistic ecosystem





SOLUTION DIFFERENTIATORS

Several alternatives solutions in the market, all for different usage and applications. Each solution has its purpose, the questions is “finding the right tool for the job”.

ATTRIBUTE	HDD	NVDIMM	Std. SSD	PCIe SSD
Transaction (IOPS)	350	1.4 Million	60K – 250K	70K – 300K
Capacity	Up to 4TB	2GB – 16GB	60GB - 4TB	400GB – 8TB
Latency	10,000,000 ns	10 ns	100,000 ns	10,000 ns
Ease of Integration	Plug n’ Play (Low)	DDR4 availability & NVDIMM enabled Server (High)	Plug n’ Play (Low)	Drivers (Medium)
Availability	Now	Now for DDR3 with DDR4 end of CY 2014	Now	Now
Scalability	Easy (24 per 2U)	DDR3/4 Socket (Medium)	Drive bays not always available (low – med)	PCIe Sockets (Very Low)
Market/Audience	All	OEMs	All	VARs / Integrators OEMs / Client

OPTIONS , FLEXIBILITY , PRO'S & CON'S

- Flash is cheaper than DRAM \$/GB
- NVDIMM is ~1000x lower latency than Flash
- DRAM has practically infinite endurance
- Hyperscale wants “Dense & Cheap” (WORM)
- Financial mkts want predictable, lowest latency
- Storage needs more performance & data security
- No individual “BEST” choice – There are OPTIONS....





THANK YOU

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