



Can Flash help you ride the Big Data Wave?

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Forward-Looking Statements

During our meeting today we may make forward-looking statements.

Any statement that refers to expectations, projections or other characterizations of future events or circumstances is a forward-looking statement, including those relating to market growth, industry trends and future products. This presentation contains information from third parties, which reflect their projections as of the date of issuance.

Actual results may differ materially from those expressed in these forward-looking statements due to factors detailed under the caption "Risk Factors" and elsewhere in the documents we file from time to time with the SEC, including our annual and quarterly reports.

We undertake no obligation to update these forward-looking statements, which speak only as of the date hereof.

**Did you know SanDisk is the
Enterprise SSD supplier
to HP, Dell, IBM, NetApp and
others?**

100 hours of video are uploaded to **YouTube every minute**

Multiple **private clouds** are already over **50 Petabytes** in size

Big Data market expected to grow to **\$16.9 Billion** in 2015

Big Data Explosion



90% of the Data in the world today was **created** within the last **2 years**

Unstructured information is 90% of Big Data and is human information like e-mails, videos, tweets, Facebook posts...







Big Data is Big Business - The Right Tools are Key

- Big Data is no longer just for the giants of the web, it is a critical tool for businesses to remain competitive
- Big Data projects are generating new opportunities and competitive advantages
- Unlocking what data is most valuable to making strategic and operational decisions, requires the right tools
- For those organizations not using analytics yet, risk being left behind



Who thinks Flash can help Big Data?

Four Waves of Big Data to Achieve Better Analytics

			Key Challenge
Hadoop		Distributed processing of large data sets across clusters of computers	Cost effective scaling
NoSQL		Unstructured databases	Cost effective scaling; fewer data migrations
In-Memory		Real-time analytics	Increased working set at low cost
eDiscovery		Load, index and archive data	Reduce legal fees

Big Data continues to expand ...

Lagging HDD Performance Changes Optimal Configuration

Server Configuration Evolution since the creation of Hadoop



The 2006 Wave	The 2014 Wave	Advancements
2 core CPU	12 core CPUs	6x more CPUs
DDR2 400 MHz [°]	DDR3 1,866 MHz [°]	5x Higher performance
1Gb Ethernet ports	10Gb Ethernet ports	10x more bandwidth
10K rpm HDDs @ 360/330 IOPS*	15K rpm HDDs @ 408/392 IOPS*	1.2x more IOPS
SSDs @ 52K/18K IOPS*	SSDs @ 190K/100K IOPS*	6x more IOPS

[°] Data & Strobe * Random Read/Write

A single SSD added to node(s) within the Hadoop cluster can reduce the cost per transaction significantly



Flash Memory Summit 2014
Santa Clara, CA



Next wave: All Flash Hadoop

2014

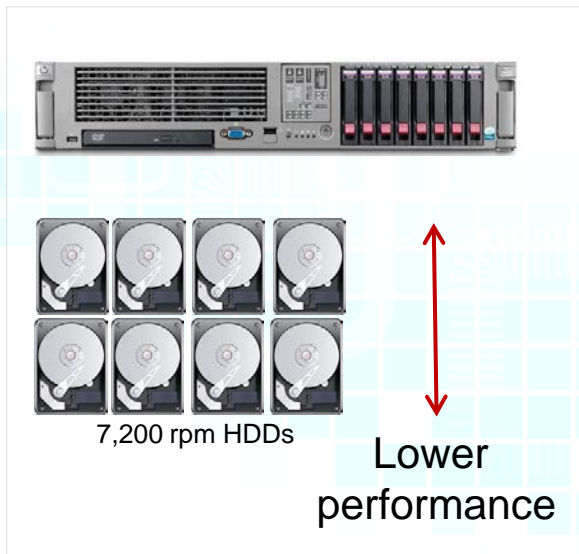


High capacity SSDs will enable cost effective All Flash Hadoop

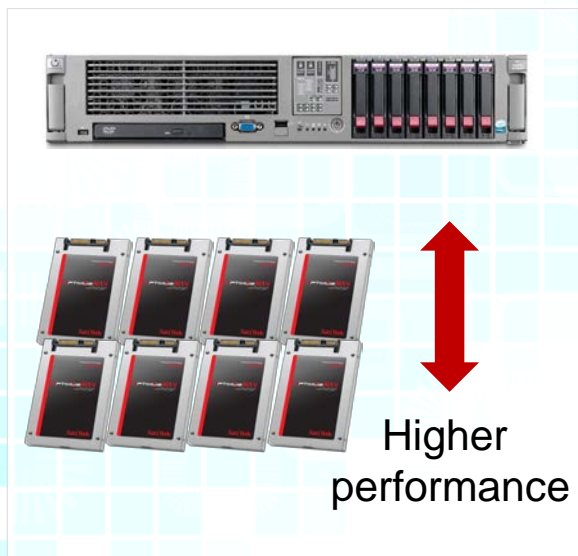


SSDs Increase NoSQL DB Efficiency

Old Wave Server + HDDs



New Wave Server + SSDs



Super-Charged Wave Server + SanDisk Software + SSDs

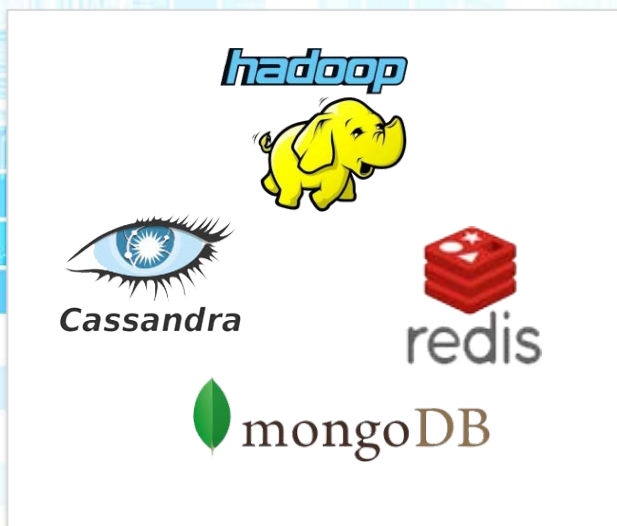


Flash supports much higher performance, reducing the total number of servers required to run the Cassandra workload

SanDisk Software Technology

Flash Optimized Key Value Store

- In-memory computing
- Real time analytics

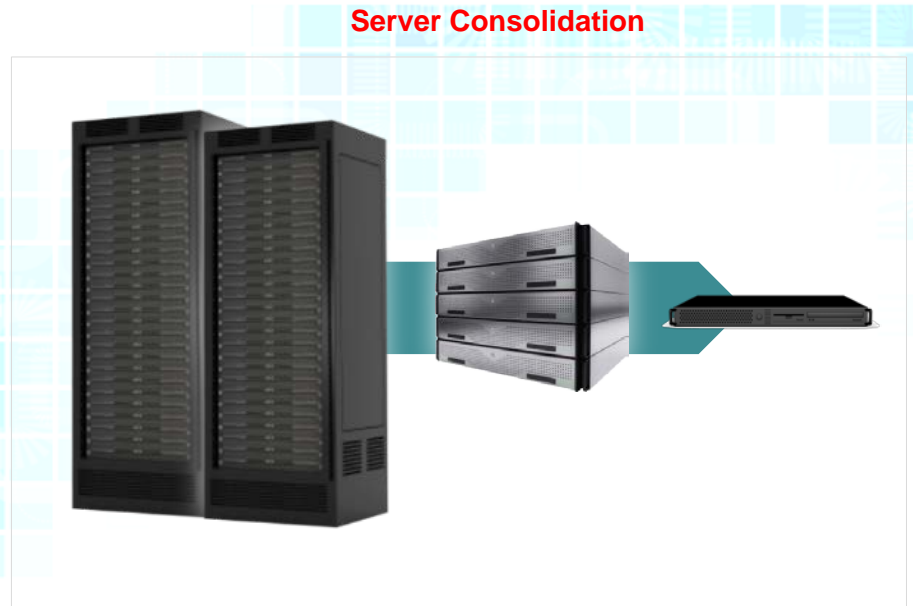
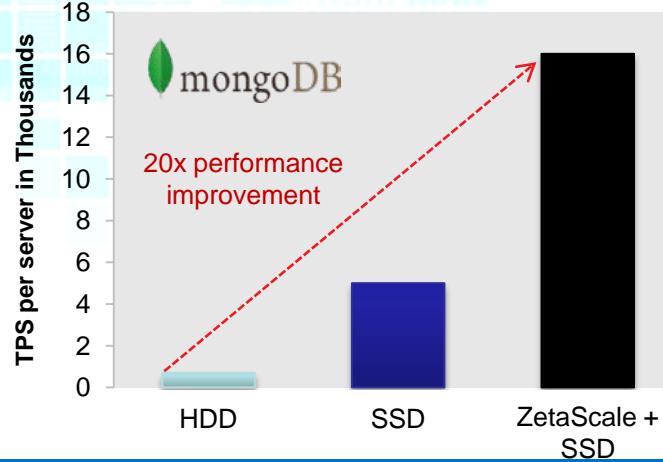
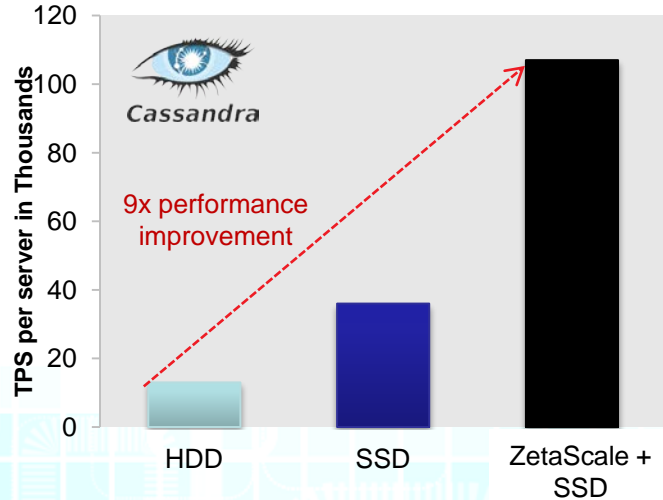


ZETASCALE™

- Runs DBs faster on SSDs
- Runs larger in-memory datasets
- Enables greater server density
- Get full benefits of SSDs



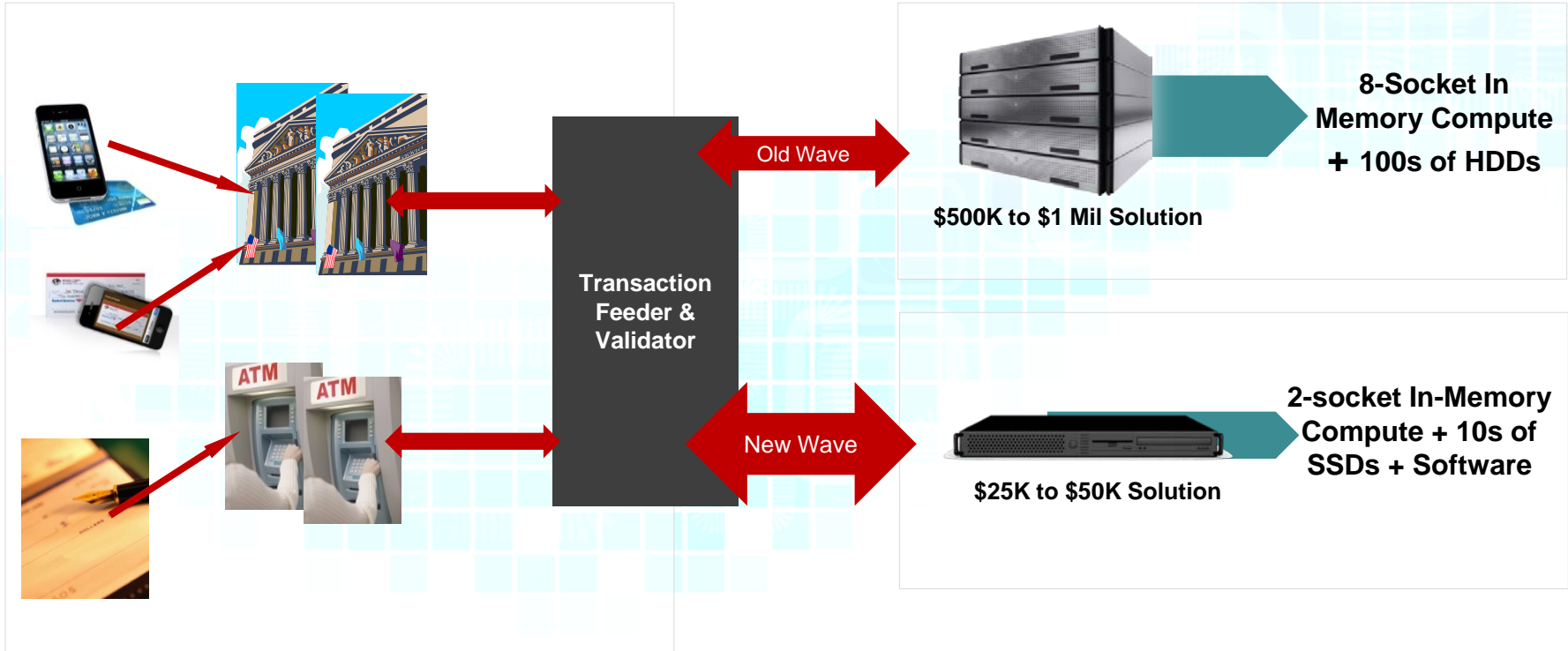
ZetaScale™ Software + SSDs



Faster performance with increased server consolidation

Have you ever had a credit card number stolen?

In-Memory Compute Real-time Fraud Detection Deployment



Fraud Detection Backend: DRAM + SSDs + SanDisk Software

As Big Data outpaces current technology, the New Wave leverages industry standard servers with SSDs and SanDisk Software to lower cost, increase capacity of In-Memory Compute



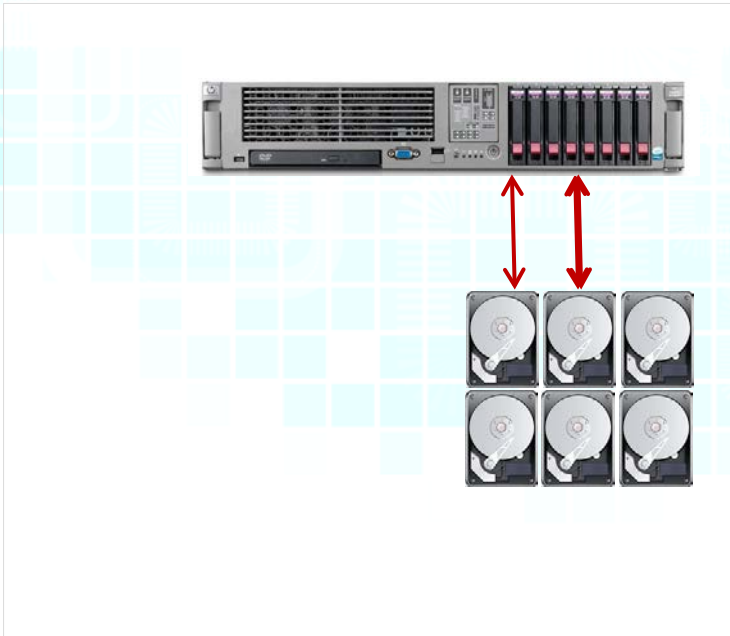
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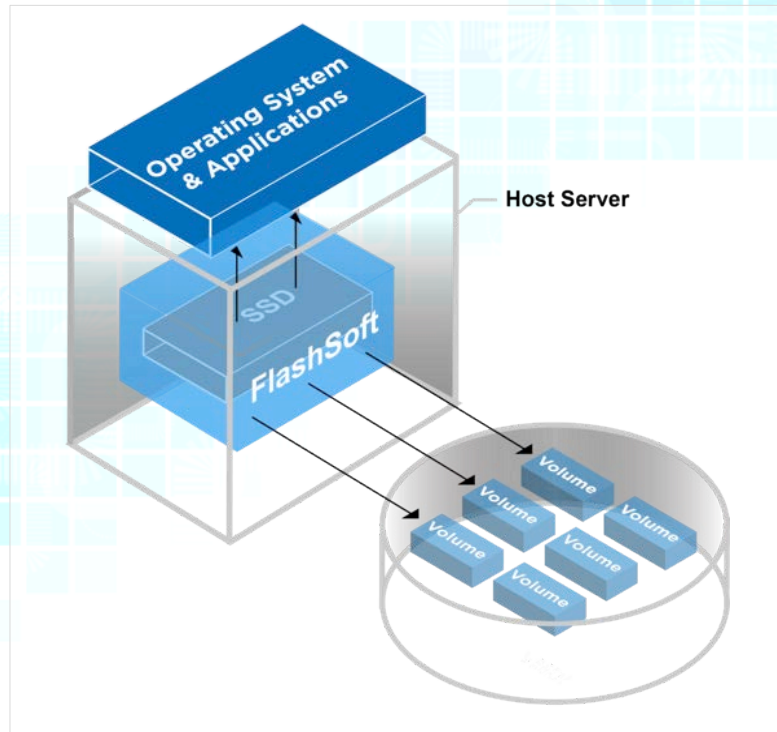
Who thinks a server could
replace a lawyer?

SSDs Increase eDiscovery Efficiency

Old Wave
Server + SAN



New Wave
Server + SAN + FlashSoft SW + SSD



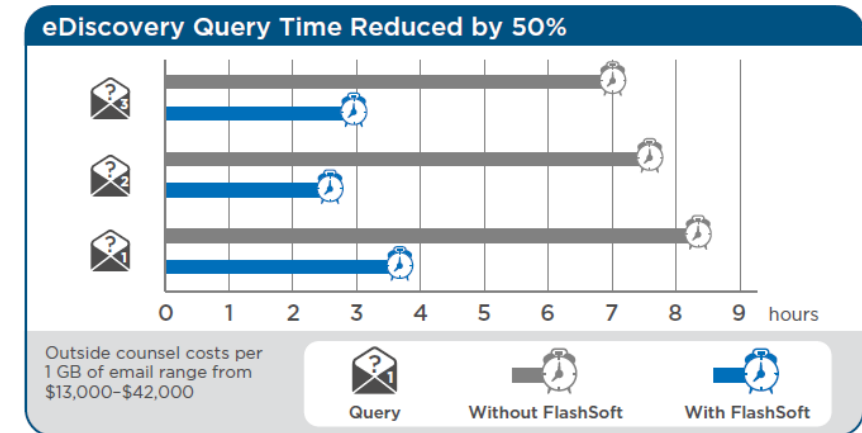
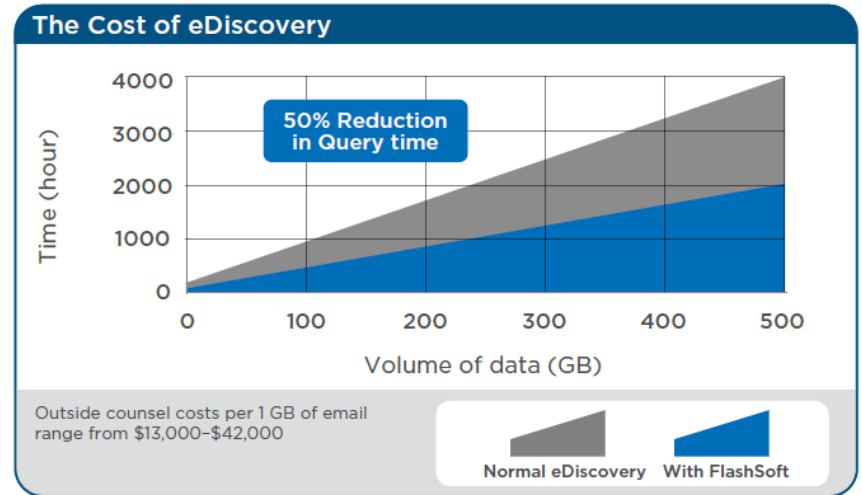


eDiscovery

Metric: \$/GB of email + time






eDiscovery

- For a typical FORTUNE 500 company eDiscovery costs can quickly add up to millions of dollars annually
- SanDisk's own legal department uses SanDisk SSDs and FlashSoft® Software to speed up the eDiscovery process and save money



50% reduction in query time + cost in the time lawyers spend on each case

Flash Helps You Ride the Big Data Wave of Adoption

Hadoop		32% faster and at 15% less cost - fewer servers for the same job output
NoSQL	 	9-20x higher performance for greater data density per node and server consolidation
In-Memory		2 to 3.6 times better TPS/\$ to maximize better business decision making through real time analytics
eDiscovery		50% reduction in query time and cost reduction in the time lawyers spend on each case

Flash helping Big Data's continued expansion

So now... who thinks Flash can help Big Data?



Pick the right Partner to ride the Big Data wave

Captive NAND	SATA	SAS	PCIe	DDR	Software
✓	✓	✓	✓	✓	✓

SanDisk has the storage solutions for you!



Thank You!

Find out more about how
SanDisk accelerates Big Data:
Sandisk.com/Enterprise
SanDisk Booth 204

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Enterprise Data Center Solutions



Solid State Drives

SanDisk's portfolio of SAS and SATA SSDs offers high-performance solutions for demanding enterprise environments, I/O-intensive applications, and low-latency



PCIe and DIMM Flash

Lightning PCIe SSAs, the Atomic Series PCIe cards, and ULLtraDIMM SSDs provide speed and scalability for uses that require high performance and ultra-low

FlashSoft
ZETA5 SCALE

Enterprise Software

SanDisk enterprise software maximizes the efficiencies of solid state flash technology.



SanDisk Innovations

SanDisk's innovative solutions deliver endurance, performance, and efficiency for improved uptime, value, and workload throughput.

SanDisk