Solid-State Solutions as a Catalyst for Evolving Data Center Requirements

Raymond Solone
Vice President
Corporate Marketing
STEC, Inc.

Monday, August 15, 2011

1.0 ZettaBytes

created or replicated each year
…and **doubling** every two years

source: IDC

Welcome to the World of Big Data

1,800,000,000,000,000,000,000,000

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created or replicated each year
...and **doubling** every two years

source: IDC

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Impact of the Data Explosion: An Opportunity for Innovation

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Impact of the Data Explosion: An Opportunity for Innovation

Server Platforms

$49 billion

Server-related spend

Storage Platforms

$28.7 billion

Enterprise storage-related spend

source: IDC

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How do we Drive Efficiency?

Server Modernization

Storage Modernization

- Integrating solid-state technology for data access
- Increasing overall performance
- Re-architecting drive implementation
- Removing costs from the equation

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SSDs are Improving Business Results Worldwide

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A growing number of enterprise applications require highly reliable, high-performance, long-lasting solid-state drives at a lower cost than today's SLC flash-based drives.

The Challenge

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Exchange Server Acceleration

SQL Server Acceleration

Large Metadata Storage

Key Value Store

Server Virtualization

Virtual Desktop Interface

Caching

Tier 0 Storage

Deduplication

Boot Applications

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Deployment of standard consumer-grade or so-called enterprise MLC (eMLC) in SSDs for enterprise applications do not meet requirements for performance, endurance, and reliability required.

But Why?

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SQL Server Acceleration

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Enterprise Endurance Defined

Writing the full capacity of the drive
10 times–a–day for **5** years

The Problem:
Not all NAND Flash is Created Equal

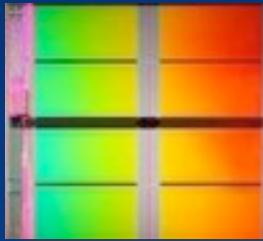| 3x nm Litho	SLC NAND	MLC NAND	eMLC NAND
Bits/Cell	1	2	2
Endurance	100K	3K	10K – 30K
ECC Capacity	8b/512B	24/b/1KB	24b/1KB
Density	16GB	32GB	32GB
Program Time	0.5ms	1.2ms	2.0–2.5ms
Erase Time	1.5–2.0ms	3.0ms	3.0–5.0ms
Useful Life Performance	Constant	Reduces	Reduces

How can you ensure 10X full drive capacity writes per day for five years under 24/7/365 enterprise work loads?

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Importance of the Controller Platform

Flash gets all the press…

SSD is not Flash alone.

but…it's static, not intelligent and does not interact with the host.

It is an
intelligent system.

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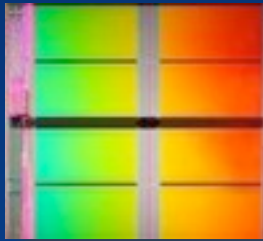
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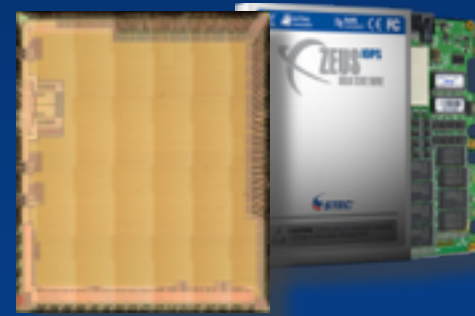
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<u>intelligent</u> <u>system.</u>

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3x nm Litho	SLC NAND	MLC NAND	eMLC NAND	MLC w/ STEC CellCare
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Erase Time	1.5–2.0m	3.0ms	3.0–5.0ms	10ms
Useful Life Performance	Constant	Reduces	Reduces	Constant

Why is this so important?

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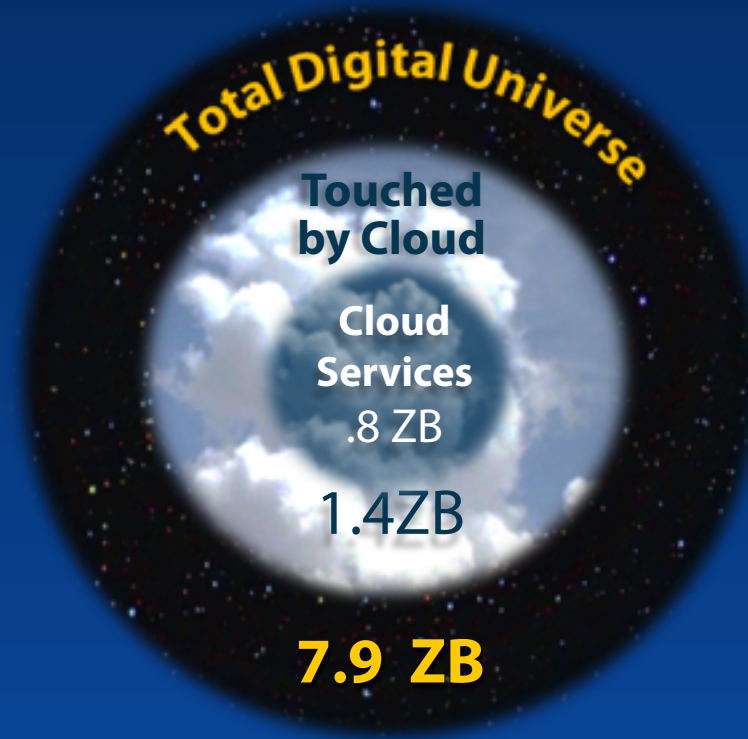# To Feed our Insatiable Appetite for More—and for "Now!"

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Total Digital Universe

Touched by Cloud

Cloud Services
.8 ZB

1.4ZB

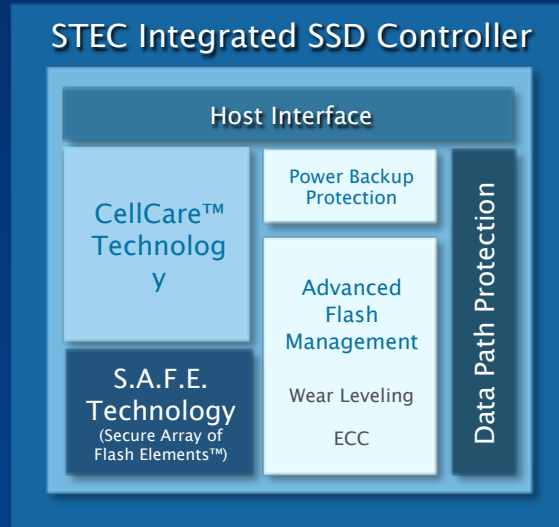**7.9 ZB**

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SSDs are the catalyst for developing new applications in the cloud

but . . .

They Must be Engineered for the Enterprise

- CellCare™ Technology for Endurance

- S.A.F.E. Technology for Reliability

- Advanced Flash Management

- Data Path Protection

- Power Backup Protection

STEC Integrated SSD Controller

Host Interface

CellCare™ Technology

Power Backup Protection

Advanced Flash Management

S.A.F.E. Technology
(Secure Array of Flash Elements™)

Wear Leveling

ECC

Data Path Protection

Enterprise SSDs Must Deliver a Robust Set of Features

Driven by the Controller Technology

How Do We Accelerate Access to Data?
Cost–Effectively Modernize the Data Center

Storage Platforms

- Auto–Tiering to Get to the Right Data at the Right Time
- Reduce Costs by Using the Right Storage for the Right Data
- Cost/IO becomes relevant

Server Platforms

- Reduce Server Sprawl
- Improve Server Utilization
  - PCIe Solid–State Accelerators
  - SSD Caching Software
- Cost/IO becomes paramount

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Maximize Server Consolidation.

Minimize Data Center Sprawl.

What's the Cost/IO or Cost/GB Inflection Point?

Accelerate Access to Data

download the white paper

STEC's Solid-State Technologies Enable Deployment of Enterprise-Grade, Cost-Effective MLC Flash-Based SSDs

More Information: www.stec-inc.com
White Paper: http://www.stec-inc.com/downloads/MLC_flash_based_SSDs_Reduce_TCO.pdf

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