Data Storage Trend in Cloud Era

May, 2016

Explosive Growth

"…the average returns from analytics have been increasing, reaching $13.01 for every dollar spent in 2014…"

Nucleus Research
http://nucleusresearch.com/research/single/analytics-pays-back-13-01-for-every-dollar-spent/

300x growth potential

< 5% actual

< 1 ZB

2013

2020

useful data for analysis

IDC 2014: Digital Universe of Opportunities, sponsored by EMC
http://www.emc.com/leadership/digital-universe/2014iview/index.htm

Traditional Data Storage

Traditional Data Storage

- Expensive Hardware

- Expensive Software

- Expensive Support

- Proprietary

- Vendor Lock-in

Breaking News

new jobs in Functional/Customer Domain will not be immediately filled, as those skills are scarce and the educational system is behind the curve

Chowdhry offers the following tally of what he thinks layoffs will look like:

- EMC: Total Employees: 70,000: Between 15% to 20% layoffs = between 10,000 and 14,000
- VMWare: Total Employees:17,000: Between 10% and 15% layoffs = between 1,700 and 2,500
- **HP Enterprise** (HPE): Total Employees 240,000: about 30% layoffs = about 72,000
- **HP Inc** (HPQ): Total Employees 287,000: about 30% layoffs = about 86,000
- **IBM** (IBM): Total Employees 379,000: about 25% layoffs = about 95,000
- **Cisco** (CSCO): Total Employees 72,000: about 20% layoffs = about 14,000
- **Juniper** (JNPR): Total Employees 8,800: about 15% layoffs = about 1,300
- **Oracle** (ORCL): Total Employees 132,000: about 20% layoffs = about 26,000
- **Microsoft** (MSFT): Total Employees 118,000: about 15% layoffs = about 18,000 (Microsoft is letting go about 200 to 250 people every week, and none of these are ever announced)
- **Network Appliance** (NTAP): Total Employees: 12,800: about 15% layoffs= about 1,800
- **Symantec** (SYMC): Total Employees: 19,000: about 15% layoffs = about 2,800
- **F5 Networks** (FFIV):Total Employees: 4,500: about 10% layoffs = about 450
- **Yahoo** (YHOO): Total Employees 12,500: about 30% layoffs = about 3,500
- **Yelp** (YELP): Total Employees 3,671: about 30% layoffs = about 1,000

Tech Trader Daily
News, analysis, and actionable investing ideas.

January 22, 2016, 3:36 P.M. ET

EMC, VMware, IBM, etc.: Here Come 333,000 Layoffs in Tech, Opines Global Equities

Amazon is eating the $3.5 trillion IT industry

Amazon Web Services revenue, billions

Amazon's cloud computing business has grown rapidly in the last five quarters.

$2.09

78%

$1.82

$1.57

$1.42

$1.17

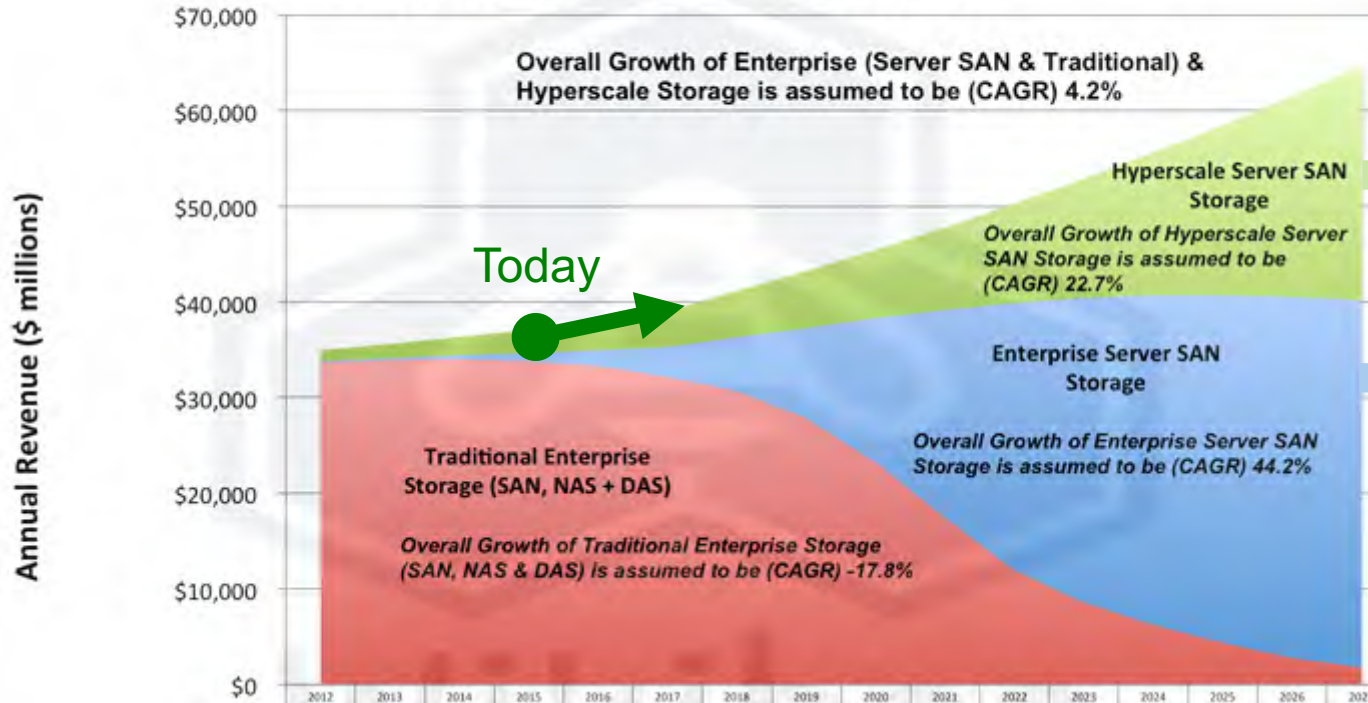| 2014 Q3 | 2014 Q4 | 2015 Q1 | 2015 Q2 | 2015 Q3 |
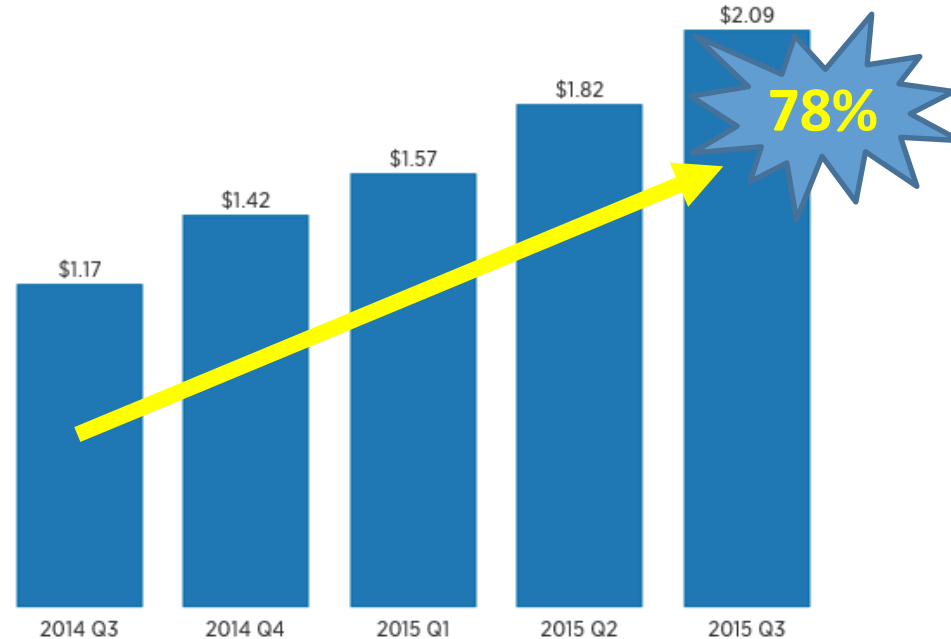
Source: Amazon

CNBC

Future Data Storage

- Open Source

- Commodity Servers

- Devops

Data Explosion Drives Scale-Out Server Storage Growth

Traditional Enterprise Storage, Hyperscale Server SAN & Enterprise Server SAN Revenue Projections 2012-2027

Overall Growth of Enterprise (Server SAN & Traditional) & Hyperscale Storage is assumed to be (CAGR) 4.2%

Hyperscale Server SAN Storage

Overall Growth of Hyperscale Server SAN Storage is assumed to be (CAGR) 22.7%

Today

Enterprise Server SAN Storage

Overall Growth of Enterprise Server SAN Storage is assumed to be (CAGR) 44.2%

Traditional Enterprise Storage (SAN, NAS + DAS)

Overall Growth of Traditional Enterprise Storage (SAN, NAS & DAS) is assumed to be (CAGR) -17.8%

ScaleFlux
Target Markets

Hyperscale
Internet Data Centers

Hyper-Converged
Enterprise

http://wikibon.org/wiki/v/The_Rise_of_Server_SAN

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Infrastructure Trends

	2010	**2015**	**2020**
storage	100MB/s HDDs	500MB/s SATA SSDs	10x PCIe Gen4
network	1 Gb/s	10 Gb/s	10x
compute	3 GHz	3 GHz	

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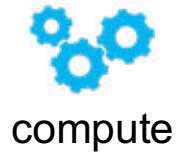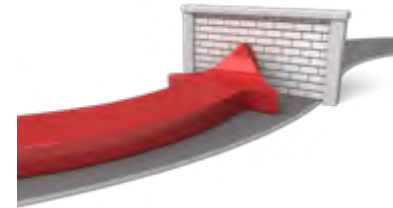
3D Changes the Flash Landscape

ISSCC, San Francisco: Jan 31 – Feb 4, 2016

- Planar NAND maxed at 128Gb for years
- 3D NAND introductions
  - Samsung: 48L 128Gb V-NAND (3D)
  - Tosh/SanDisk: 48L 128Gb MLC/256Gb TLC
  - SK-Hynix: 48L 256Gb TLC
  - Micron: 32L 256Gb MLC/384Gb TLC 3D
  - **Micron announced 768Gb device**
- **3D scale to 96 layers / 1Tb+ (2018)**

- Fast time-to-market for different capacities, performance & error correction
  - ASIC controllers challenged to keep up in with variety of enterprise apps
  - **Multi-flash supplier strategy is critical**
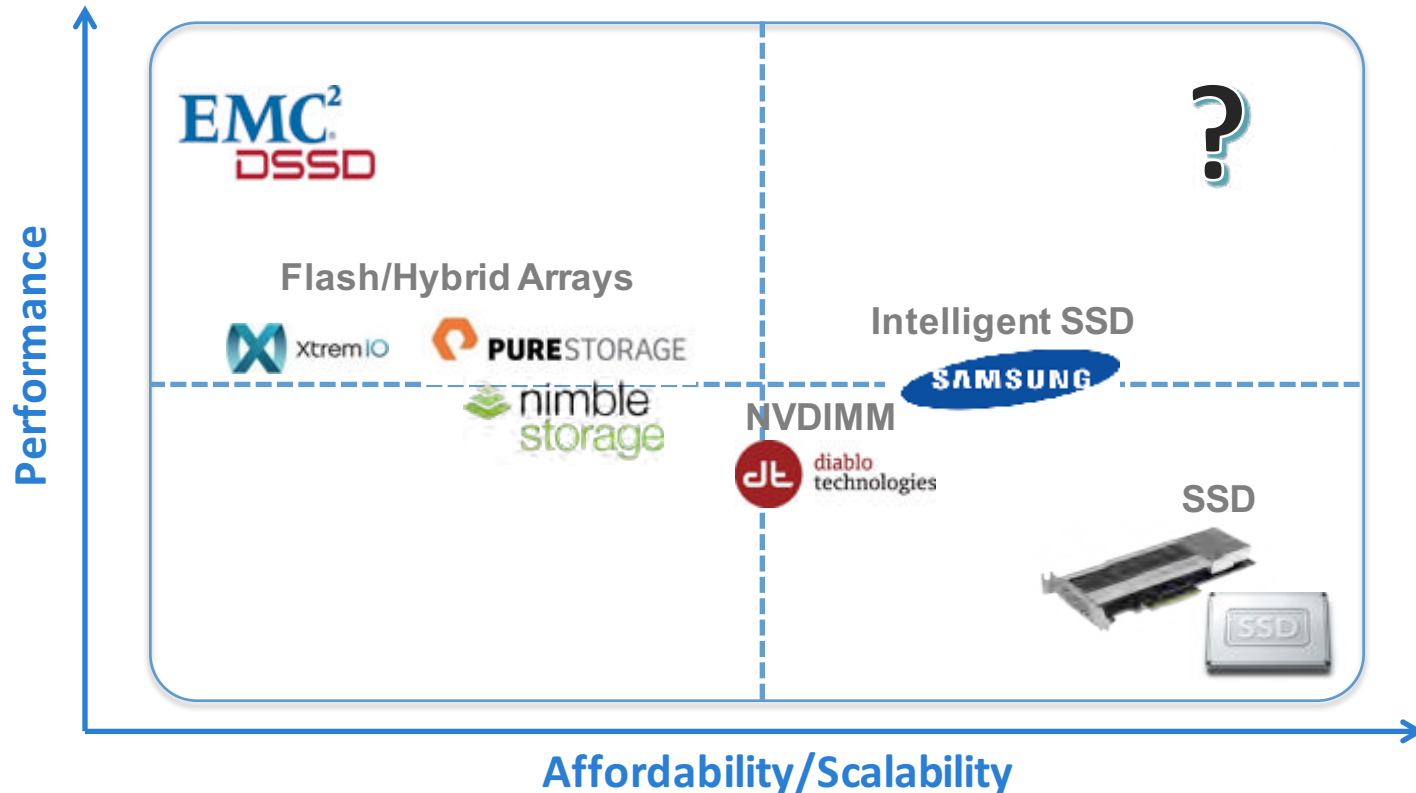
Trend of memory density

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International Solid-State Circuits Conference

7.7: A 768Gb 3bxcell 3D-Floating-Gate NAND Flash Memory

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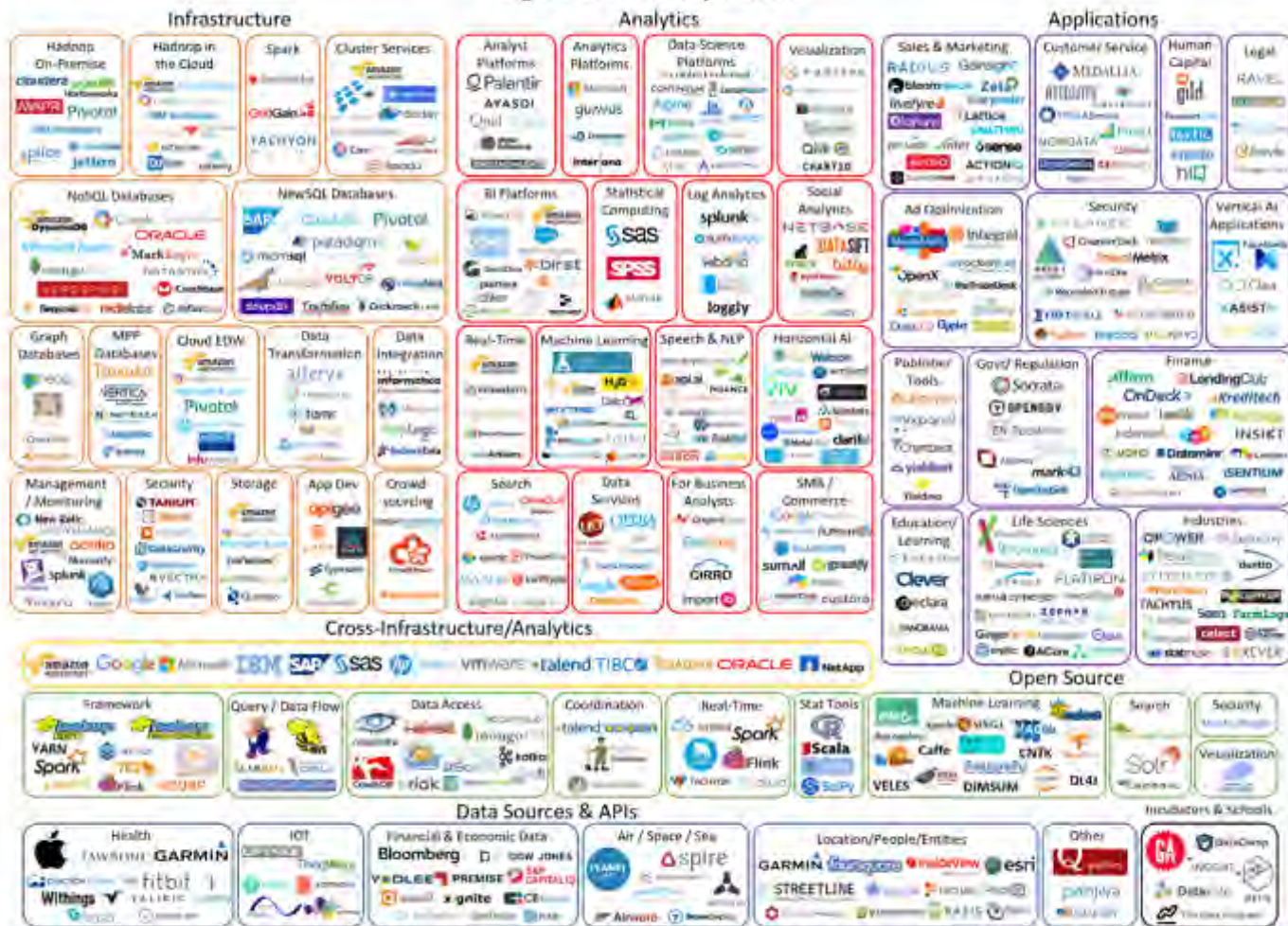# The Economics of NAND Flash

Market Landscape for Flash Usage

Big Data Landscape 2016

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Trend

Thank You