Topics

- What’s an HDD?
- Seagate: A new direction - Products, Systems & Services
- Storage Industry Snapshot - Market Share & Size Information
- Industry Trends - Tech & Society
- Trends Impacting Data & Storage
- Cloud - Partners, Solutions and TCO
- CSS: Cloud Systems and Solutions
- What’s a Business Analyst do – exactly?
What is an HDD
Some History
IBM 3380
The IBM 3380 Direct Access Storage Device was introduced in June 1980. It used new film head technology and had a capacity of 2.52 gigabytes with a data transfer rate of 3 megabytes per second. Average access time was 16 ms. Purchase price at time of introduction ranged from $81,000 to $142,200....
Seagate – traditionally known as manufacturer of HDDs

- **A hard disk drive (HDD)** is a data storage device used for storing and retrieving digital information using rapidly rotating disks (platters) coated with magnetic material.
- An HDD **retains its data** even when powered off. Data is read in a random-access manner, meaning individual blocks of data can be stored or retrieved in any order rather than sequentially.
- An HDD consists of one or more rigid ("hard") rapidly rotating disks (platters) with magnetic heads arranged on a moving actuator arm to read and write data to the surfaces.
HDD: Hard Disk Drive…

Source: Seagate Strategic Marketing and Research 2014
* Represents HDD and SSD
A New Seagate
Products, systems & Services
### How Q1 Stacks Up

<table>
<thead>
<tr>
<th>Qtr/Qtr &amp; Yr/Yr</th>
<th>Q1FY14</th>
<th>Q4FY14</th>
<th>Q1FY15</th>
</tr>
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<tbody>
<tr>
<td>Revenue</td>
<td>$3,489</td>
<td>$3,301</td>
<td>$3,785</td>
</tr>
<tr>
<td>Cost of Sales</td>
<td>2,514</td>
<td>2,376</td>
<td>2,734</td>
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<tr>
<td>Gross Profit</td>
<td>$975</td>
<td>$925</td>
<td>$1,051</td>
</tr>
<tr>
<td>% of Revenue</td>
<td>28%</td>
<td>28%</td>
<td>27.8%</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>$294</td>
<td>$323</td>
<td>$342</td>
</tr>
<tr>
<td>SG&amp;A</td>
<td>181</td>
<td>169</td>
<td>216</td>
</tr>
<tr>
<td>Net Income</td>
<td>$427</td>
<td>$320</td>
<td>$381</td>
</tr>
</tbody>
</table>

*$ in Millions*
Seagate Global Presence

Legend:
- HQs, Admin/Sales
- Design
- Manufacturing
- Customer Support

- New Delhi, India
- Pune, India
- Bangalore, India
- Beijing, China
- Gwanggyo, South Korea
- Tokyo, Japan
- Taipei, Taiwan
- Hong Kong, China
- Wuxi, China
- Suzhou, China
- Shenzhen, China
- Chengdu, China
- Shanghai, China
- Danderyd, Sweden
- Dublin, Ireland
- Springtown, N. Ireland
- Basel, Switzerland
- Brussels, Belgium
- Paris, France
- Massy, France
- London, UK
- Havant, UK
- Maidenhead, UK
- Zurich, Switzerland
- Munich, Germany
- Milan, Italy
- Amsterdam, Netherlands
- Moscow, Russia
- Navanakorn, Thailand
- Korat, Thailand
- Teparuk, Thailand
- Johor, Malaysia
- Penang, Malaysia
- Seremban, Malaysia
- Ang Mo Kio, Singapore
- Science Park, Singapore
- Woodlands, Singapore
- Calamba City, Philippines
- Sydney, Australia

- Kitchener, Canada
- Toronto, Canada
- Tigard, OR, USA
- Ft. Lauderdale, FL, USA
- Heathrow, FL, USA
- Sacramento, CA, USA
- San Francisco, CA, USA
- Fremont, CA, USA
- Cupertino, CA, USA
- Scotts Valley, CA, USA
- Valencia, CA, USA
- Salt Lake City, UT, USA
- Longmont, CO, USA
- Colorado Springs, CO, USA
- Chicago, IL, USA
- Schaumburg, IL, USA
- Oklahoma City, OK, USA
- Shockey, MN, USA
- Bloomington, MN, USA
- Rochester, MN, USA
- Shrewsbury, MA, USA
- Houston, TX, USA
- Round Rock, TX, USA
- New York, NY, USA
- Guadalajara, Mexico
- Manaus, Brazil
- São Paulo, Brazil
Enterprise & Data

Need capacity, speed and reliability at enterprise scale? **We’ve got this.**

- **Nearline Storage**
  High capacity meets cost efficiencies

- **Mission Critical Storage**
  Optimized for transactional data

- **Desktop Internal Drives**
  Fastest, most reliable & secure data storage

- **Wireless & Cloud**
  Back it up, organize and access – anywhere, anytime – on tablets, smartphones & PCs
OEM’s and Integrators

Need the ultimate, private-label solutions for your clientele? Your wish is our command.

- Modular Systems
- Scale-out Systems
- Desktop Internal Drives
- Wireless & Cloud
- Laptop Internal Drives
- Surveillance Drives
- SSD’s, Controllers & Accelerators

Back it up, organize and access – anywhere, anytime – on tablets, smartphones & PCs
Growing Business of Every Size

Need to centralize, back-up & access business critical info anywhere, anytime? Put it here, partner.

Business Storage
Compact, affordable backup and access

Network Attached Storage
The perfect networked solution, SMB to enterprise.

Wireless & Cloud
Back it up, organize and access – anywhere, anytime – on tablets, smartphones & PCs

The perfect networked solution for BUSINESS, LARGER ENTERPRISE SERVER & RAID ARRAYS
Tech Disrupters, Creative Pros & Start-ups

Need to make it happen – without the hassles & headaches? Done and done.

- **Modular Storage**
  Flexible, extensible, energy-efficient HDD, SSD, hybrid drives, data enclosures, controllers and solutions – 17,000 petabytes of storage & counting

- **Scale-out Storage Systems**
  The industry’s most trusted, open, scalable modular components and solutions to speed time to market and boost bottom-line results

- **Media Backup & Storage**
  Keep it safe and secure – simply

- **Data Recovery**
  Fire, water, physical damage – no problem
A new Seagate - Our Progress So Far
What It Means to You

- 40% of the world’s digital information stored on Seagate products
- Supplier to 8 of the 10 largest global cloud service providers
- Technology leader with 14,000+ patents
- Over 2 Billion drives shipped
What It Means to You

- Broad solutions portfolio that scale as customers need
- Ability to combine silicon, component, system and software innovation in new ways
- Backed by world-class operations and supply chain and long-term financial strength
Market Share Estimates

Total Market—All Form Factors

Q4 FY14
137.8M Units

WDC: 38.0%
TOSH: 45.8%
STX: 16.2%

Q1 FY15
147.1M Units

WDC: 40.4%
TOSH: 44.0%
STX: 15.6%

Growth
Y/Y = 5%
Q/Q = 7%

Source: Seagate Strategic Marketing and Research 2014
Total HDD Market Share

All Form Factors – Exabytes Shipped*

Q4 FY14

120 Exabytes

41.0%

46.1%

12.9%

Q1 FY15

142 Exabytes

42.4%

45.7%

11.9%

Growth

Y/Y = 24%

Q/Q = 18%

Source: Seagate Strategic Marketing and Research 2014

*HDD and Hybrid only
To that End: Total Industry Units Shipped*…

Source: Seagate Strategic Marketing and Research 2014
* Represents HDD only
...And Total Industry Exabytes Shipped*

Source: Seagate Strategic Marketing and Research 2014
* Represents HDD only
Application Workloads Are Changing

- Mobile & Video
- Content Repository
- Transaction Processing
- Big Data
- High Performance Computing
Application Workloads at the Storage Layer

Hyper Active

Data

Inactive

Fast

Expensive

Small

DRAM
NAND

HDD

OPTICAL
TAPE

Slow

Economical

Large

Next Gen Workloads Require Technology Interlock

- **Ops / Second**
- **Cost**
- **Latency**
- **Capacity**

- **Highest $/IOPS**
  - DRAM

- **Lowest $/GB**
  - HDD

- **Cache**
- **Memory Class**
- **High Performance**
- **Compute Storage**
- **Big Content Storage**

- Picoseconds
- Nanoseconds
- Microseconds
- Milliseconds
- Seconds
Digital Universe: 2020

**44ZB**  
Amount of data will be created

**13ZB**  
Amount of data that will need to be stored

**6.5ZB**  
Amount of data that installed capacity will be able to hold

**56%**  
in the cloud

Demand **EXCEEDS** all providers – **COMBINED**

Digital Universe: 2020

How big is 6.5 Zettabytes?

If you stacked 4TB hard drives side by side, they would circle the earth.
Near-term Exabyte Shipment Forecast

By 2020 ~60% of storage will be IN THE CLOUD

Source: Gartner
Trends Impacting Data & Storage
Factors Driving Growth

PERSONAL DATA CREATION
Facebook users upload 300 million photos per day

MOBILE DEVICE PENETRATION
2.5 billion PCs and mobile devices shipped every year for the next three years

BIG DATA
Companies using big data analytics are 2X more likely to have top-quartile financial performance
Strong Data Growth Across Markets

Public Cloud  Private Cloud  Mobile PC  Desktop PC

Zettabytes

- 0.5  1.0  1.5  2.0  2.5  3.0

CY13  CY14  CY15  CY16  CY17  CY18  CY19  CY20

26% CAGR
Where Compute Takes Place Now

Today, **EIGHT OF TEN** compute devices are **TABLETS** and **SMARTPHONES**
This Move Toward Mobility Is Shifting the Location of Data

Location of Exabytes Shipped

In 2010, **62%** of the storage was shipped into the client market...

...By **2020**, that will dramatically shift to the cloud

Source: Seagate Strategic Marketing and Research 2014
We Look at the Market in Two Halves

Exabytes more important than units

Source: Seagate Strategic Marketing & Research
The Data Center Continues its Growth

Source: Seagate Strategic Marketing & Research
... It’s About the Exabytes

IDC: Worldwide market for IoT solutions
2013: $1.9 Trillion | 2020: $7.1 TRILLION

Source: Forbes, Internet of Things By The Numbers: Market Estimates And Forecasts, 08/22/2014
For the Connected Home

Need your memories & media files safe & available – anywhere, anytime?
We’ve got you covered.

Home Network
Save it, stream it, secure it – at home sweet networked home

Media Storage
From the set-top to the DVR – never miss another moment

Wireless & Cloud
Back it up, organize and access – anywhere, anytime – on tablets, smartphones & PCs
Cloud
Partners, Solutions and TCO
Winning in the Cloud

**ENTERPRISE HDD AND SSD**
Choose the Best Storage Technology

**POWER, SECURITY, RELIABILITY**
Increase Operational Efficiency

**KINETIC OPEN STORAGE**
Build for the Future

**Lower** Total Cost of Ownership
Data Explosion Creating a Major Headache

Need for more capacity & capabilities: Non-traditional/cloud-storage to fill gap:

- Commodity hardware
- Open-source software
- Extreme automation
- Ruthless standardization
77% of Market Moving to Public Cloud or Nontraditional Storage by 2016

Enterprise Storage by Consumption Model (PB)

- Traditional Enterprise
- Public Cloud
- Non-Traditional

600 x 100+ PB customers/yr.
Representative Deal Size* $1.2M
Typical sales cycle: 1 to 2 quarters

* Assumes 2PB of private cloud (usable) with managed & professional services + 1 PB of public cloud
Current Approaches Don't Work

CLUSTERED NAS
Expensive & won’t scale

TAPE
Slow & won’t support new use-cases

OTHER CLOUDS
Won’t meet compliance
Backup & Recovery Portfolio Overview

Comprehensive Set of Data Protection Offerings

Server Data Protection Services in Public Cloud
Server Data Protection Solutions for MSPs
Server B&R in Private Cloud (HW+SW)
Cloud-Based Disaster Recovery
Endpoint Backup (Laptops/ Desktops)
Content Archiving for Apps

Cloud-Connected Technology: HW + SW

Cloud Operations & Managed Services
How Much Needs to Be Stored?

The promise is: Big Data can make data **useful** and useful data is more likely to be **stored**.

Digital Universe Driven by Emerging Markets

Share of the bitstreams in 2020 will double to **60%**

China alone will account for **20%**

IDC Digital Universe Study, sponsored by EMC, December 2012
*United States, Western Europe, Japan, Australia, New Zealand
Cloud Systems and Solutions (CSS)
CSS Competitive Advantage

A truly unique combination

Seagate + xyratex (A Seagate Company) + EVault (A Seagate Company)

- Majority of cost = disk & systems disk drive innovation opportunity
- >2,000 petabytes of storage shipped in 2013
- Cloud Storage Expertise 43,000+ cloud storage customers
Our Strategy: Offer Customers a Portfolio of Choices

<table>
<thead>
<tr>
<th>Systems/Services</th>
<th>Converged Infrastructure</th>
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<tbody>
<tr>
<td>Arrays</td>
<td>Hybrid Data Systems</td>
</tr>
<tr>
<td></td>
<td>Software Defined Storage</td>
</tr>
<tr>
<td></td>
<td>Flash Arrays</td>
</tr>
<tr>
<td>Devices</td>
<td>Kinetic</td>
</tr>
<tr>
<td></td>
<td>Transitional Enterprise</td>
</tr>
<tr>
<td></td>
<td>Hyperscale</td>
</tr>
<tr>
<td></td>
<td>Hybrid</td>
</tr>
<tr>
<td></td>
<td>Client Devices</td>
</tr>
<tr>
<td></td>
<td>NAND: SAS, SATA, PCIe</td>
</tr>
<tr>
<td></td>
<td>Branded</td>
</tr>
</tbody>
</table>

Increasing customer value as they move up

Customers choose from any level
How CSS Addresses New Markets

Cloud Storage Systems and Solutions
- Innovative new capabilities
- High performance/high capacity
- Low lifecycle cost

Offered in Different Ways
- Public cloud
- Private cloud
- Hybrid cloud

Complete Solutions
- Converged scale-out architectures
- Enables new business models
CSS Guiding Principles

Market Transition +$50B

Sustainable Differentiation

Joint Innovation

Velocity

Product Execution

Customer Driven
CSS Industries Served

- Credit Unions
- Banks
- Healthcare
- Legal
- Education
- Weather
- Finance
- Manufacturing
- Retail
- Government
- Nonprofit
- Digital Media
- Genomics
- Pharmacology
- Energy
- Engineering
- Defense
CSS – How We Deliver Value

- Multisite backup leader
- Ultimate in CloudDRasS
- Best Customer Experience
- Purpose-Built for HPC
- Anatomical/price advantage
- Chassis + disks
- Disaggregated HW/SW

- Highest-quality enclosures
- Best storage tech
- Top storage experts

Cloud Services

Engineered Systems

Reference Architectures

Built to Order
Kinetic Value Proposition

CAPEX

OPEX

PERFORMANCE

SCALE & SIMPLICITY

APPLICATION

Kinetic Library

ETHERNET

DEVICES

- Ethernet Interface
- Key Value Store
- Cylinder, Head, Sector
- Drive HDA
Kinetic

TCO Case Study for 500PB Deployment

Price Comparison

<table>
<thead>
<tr>
<th></th>
<th>Conventional</th>
<th>Kinetic</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Storage Deployed (TB)</td>
<td>500,000</td>
<td>500,000</td>
<td>0.0%</td>
</tr>
<tr>
<td>HDD Quantity</td>
<td>180</td>
<td>180</td>
<td>0.0%</td>
</tr>
<tr>
<td>Total Capex</td>
<td>$48,482,292</td>
<td>$37,394,345</td>
<td>26.2%</td>
</tr>
<tr>
<td>Avg. Power per Rack (W)</td>
<td>13200</td>
<td>7200</td>
<td>45.5%</td>
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<tr>
<td>Annual Power Expense</td>
<td>$8,099,925</td>
<td>$3,120,750</td>
<td>61.0%</td>
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<tr>
<td>TCO Cost/TB</td>
<td>$42.11</td>
<td>$25.46</td>
<td>39.53%</td>
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</table>
Kinetic

Performance

Raw throughput
IO utilization

- Data streams to drive as written
- Drive handles space mgmt.
  (no file system metadata)

Devices
- Ethernet Interface
- Key Value Store
- Cylinder, Head, Sector
- Drive HDA
Libraries, API enable Applications

- Application
- Clustering
- Management

LibKinetic

- Interconnect
  - ProtoBuf
  - TCP/IP/GbE

- Storage

C++, Java, Python, Erlang, DIY

Proprietary to System Vendor

GPL Standard

Proprietary to Seagate

Kinetic
Kinetic – Multiple Masters, Multiple Drives: P2P Operation
Kinetic Summary Value Proposition

- **Performance**: up to 4x Faster
- **Rack Density**: up to 1.5x Increase
- **Scalability**: Infinite
- **Device Innovation**: up to 2 years Faster

- **CAPEX**: $$$
  - up to 15% Reduction
- **OPEX (Power & Staffing)**
  - up to 70% Reduction
- **TCO**: up to 40% Reduction
- **Storage Servers**: up to 100% Reduction
Optional Product Slides
Internal Desktop Drives

Optimized for desktop computers for blazing fast performance at affordable price points

**Desktop SSHD 1TB-4TB**
Hybrid drive for speed & capacity for gaming & high-performance apps

**Desktop HDD 500B-4TB**
High-capacity drive for desktop apps, at affordable prices

**NAS HDD 2TB-4TB**
Designed for home network storage, business NAS, server & RAID arrays
Next generation workloads with Intelligent Information Infrastructure™
Offering unmatched capacity, performance, reliability, and value

ClusterStor™ 9000 Engineered Lustre® Solution
Fastest time-to-results at any scale

ClusterStor™ 1500 Engineered Lustre® Solution
Best-in-class performance, value and return on investment

ClusterStor™ Secure Data Appliance
World’s first secure, scale-out, parallel file system designed for the intelligence community