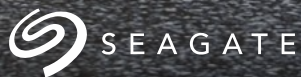




Data Storage At the Heart of any Information System



Ken Claffey, VP/GM - June 2015

Seagate: A Unique Vantage Point on the Data Centre Evolution



40% of the world's digital information



50,000+ work force



1 million
Nearly 1 million hard drives a day



End-to-end cloud solutions:
mobile > desktop
> data center,
25,000 recoveries/mo
98%+ satisfied customers



\$3.8B
in Q115
Revenues



Supplier to 8 of
the 10 world's
largest cloud
service providers



Technology leader:
1st in SMR*,
14,000+ patents,
\$900M R&D



Complete hard drive
portfolio: HDD, SAS,
SATA, SSD, hybrid



World-class
integrated
supply chain in
100+ locations

Data is Getting Bigger (Volume) Outstripping Capacity Nearly Everywhere

“There Will Be No Way to Put the
Storage Beast on a Diet:

**The Beast Will Always, Always
Be Hungry for More....”**

-John Monroe, Research VP
Gartner Data Center Systems

4 ZB



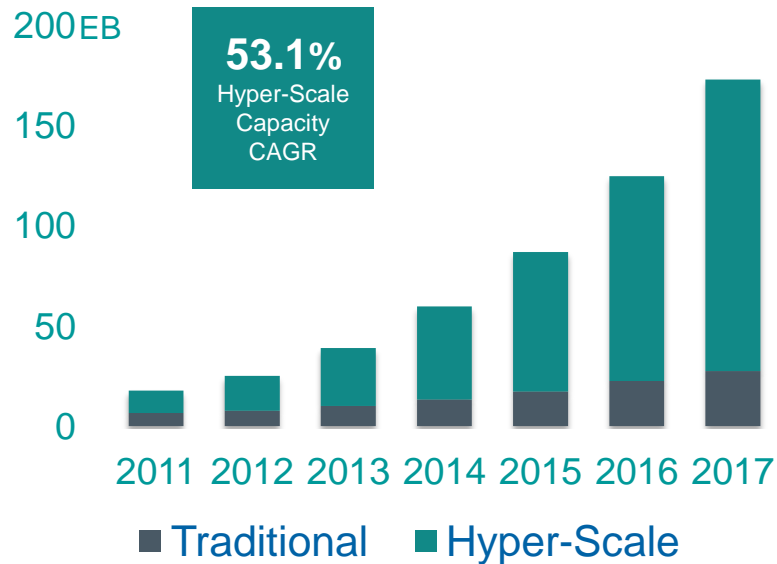
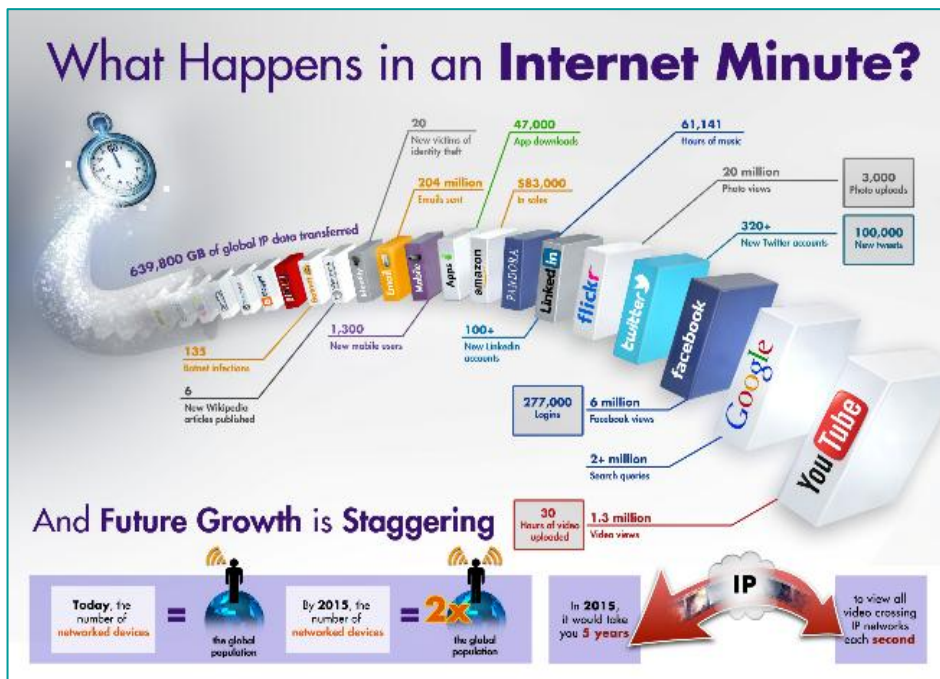
13 ZB



44ZB Generated; 13ZB stored

The “New Data” is Different (Variety)

Unstructured data is fundamentally changing IT



Big Data- Cost Dynamics are Changing (Value)

Rapid Growth Expected for Software Defined Solutions Along with Relentless Price Competition

New dimensions in corporate and personal computing will demand **more performance, more capacity** and quick, seamless access to enormous datasets in **more cost-effective** and efficient infrastructures that take up less space and consume less power.

Features must be delivered for less money and this has created a receptive environment where **even the most conservative system administrators are willing to explore alternative storage approaches.**

Technology	Expected Growth
Software Defined Data Center	69%
Open Source Storage	40%
Object Storage	48%
Public Cloud Storage	33%

45%

Growth in data at enterprises over the last two years

9%

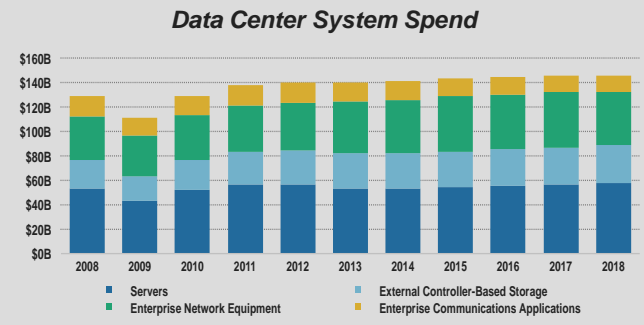
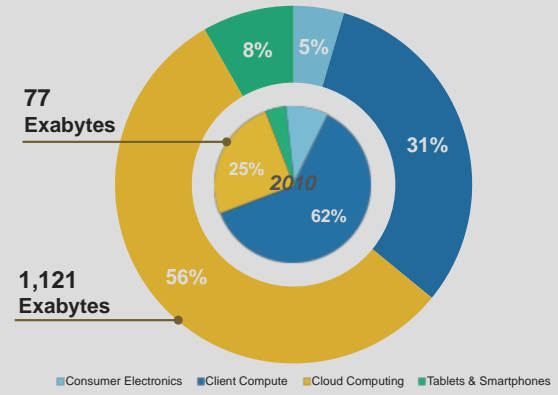
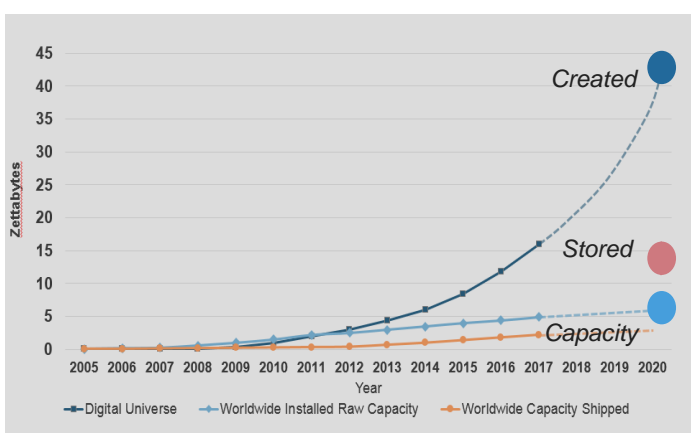
Enterprises with storage budgets increasing by more than 10%

Summary: Big Data is Bigger than MORE Data

Bigger

Different

\$-Constrained



Demand **GROWING** and Exponential **RATE**

Location **SHIFTING** dramatically to the **CLOUD**

Stable but **SLOW** growth

Explosive growth in data

Shift in use and store model

Modest growth in IT budgets

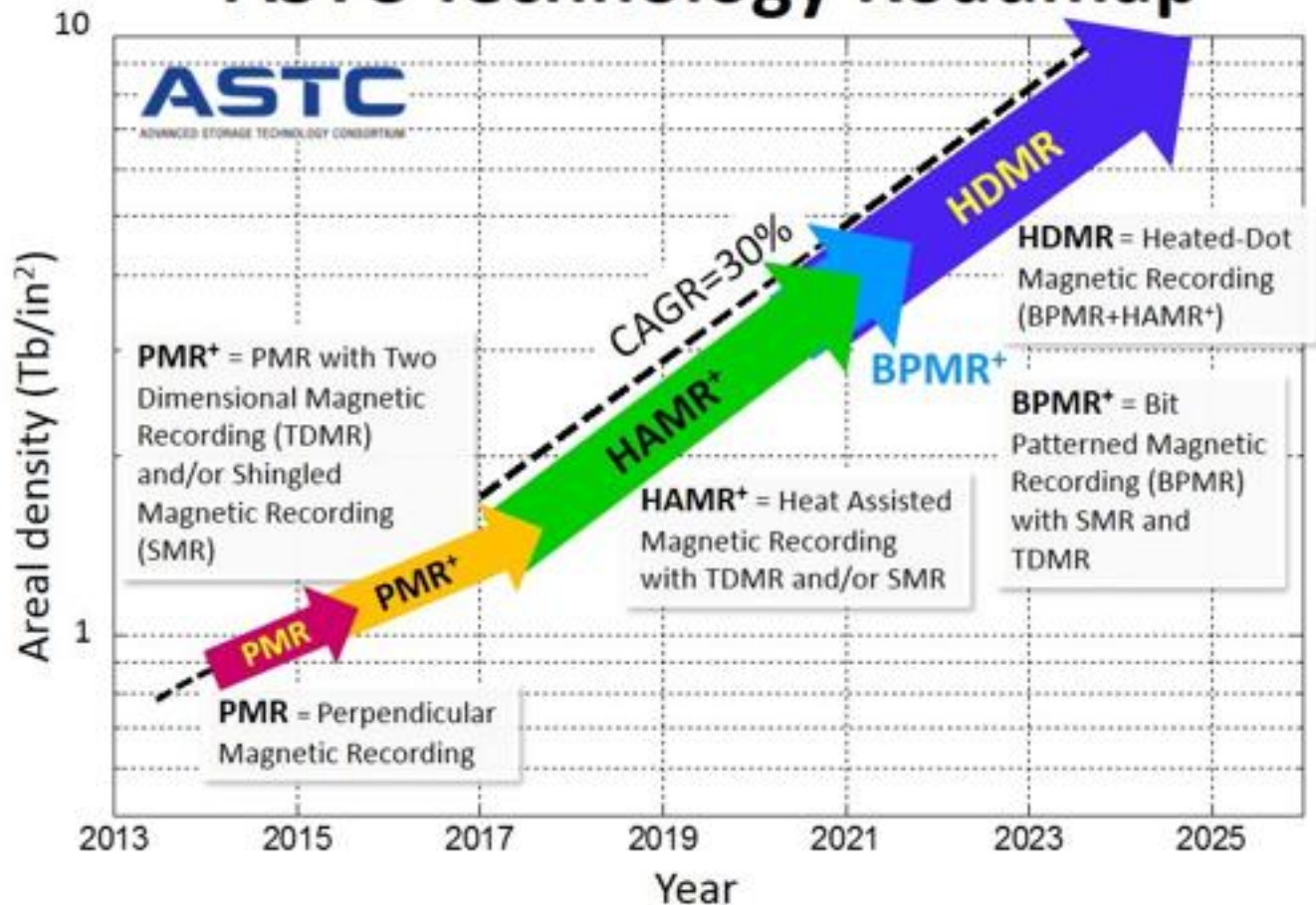
Applications- Simulation and Modeling

Big Data Requires High Performance Storage- (Velocity)



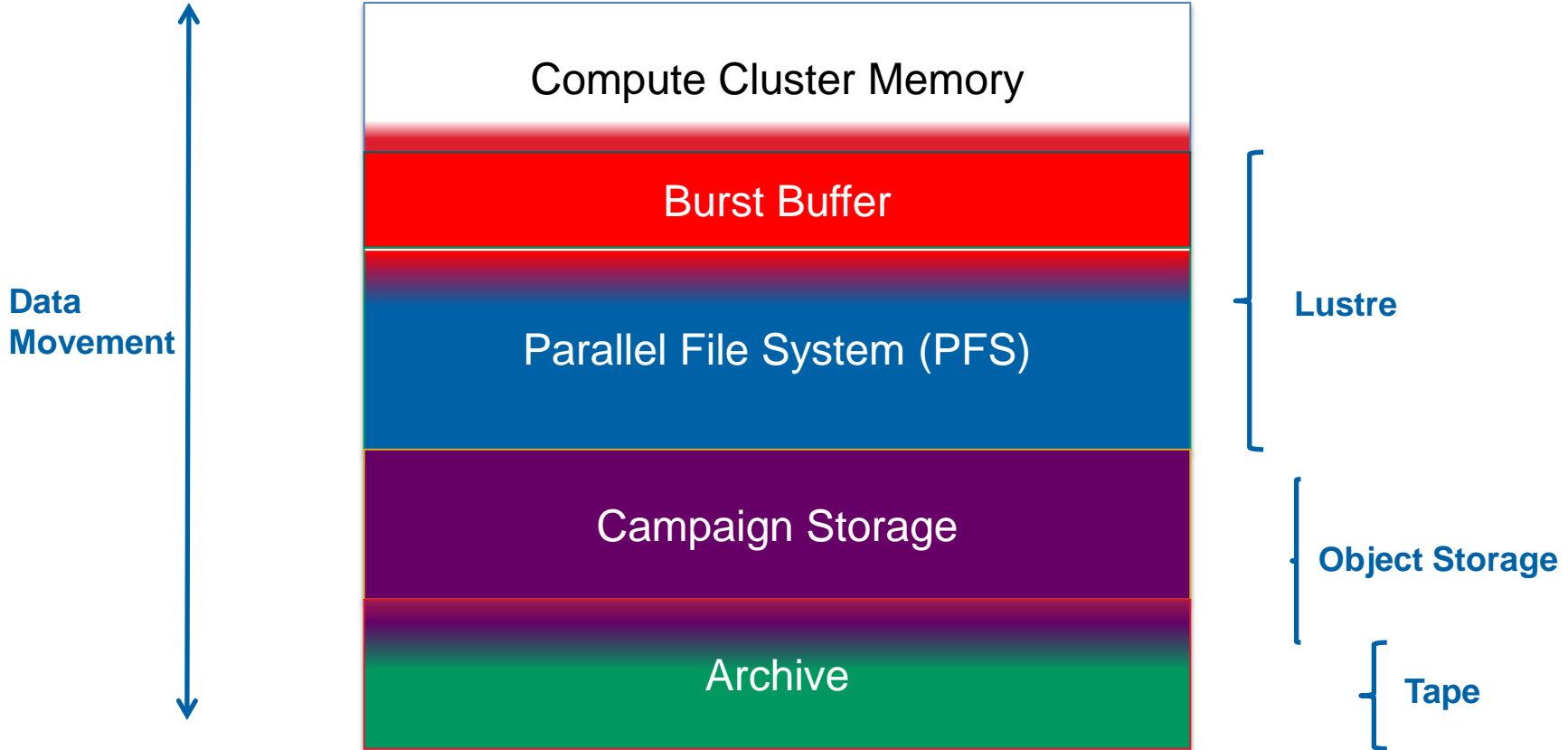
Improving Your Business, the Market and Our World

ASTC Technology Roadmap



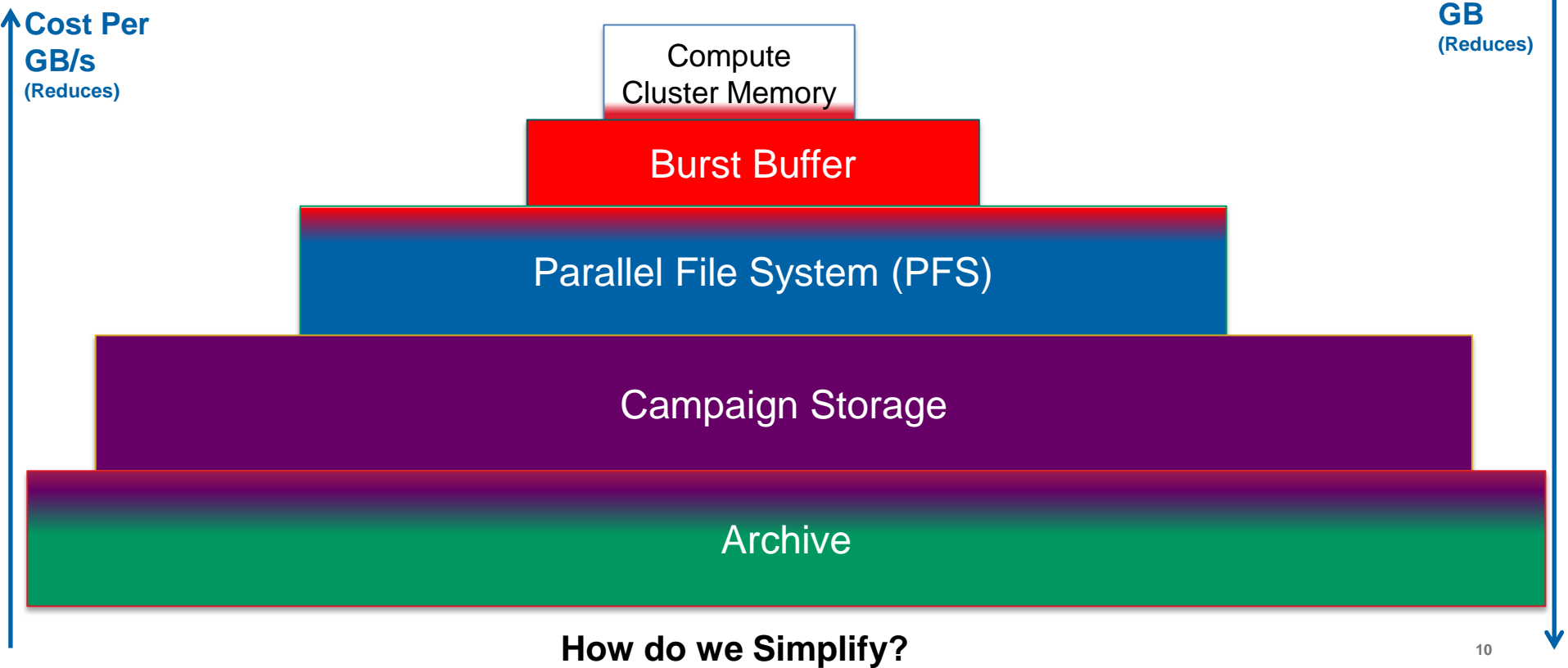
HPC I/O Stack Evolution: Objects in Context

DOE 'Trinity' System I/O Architecture



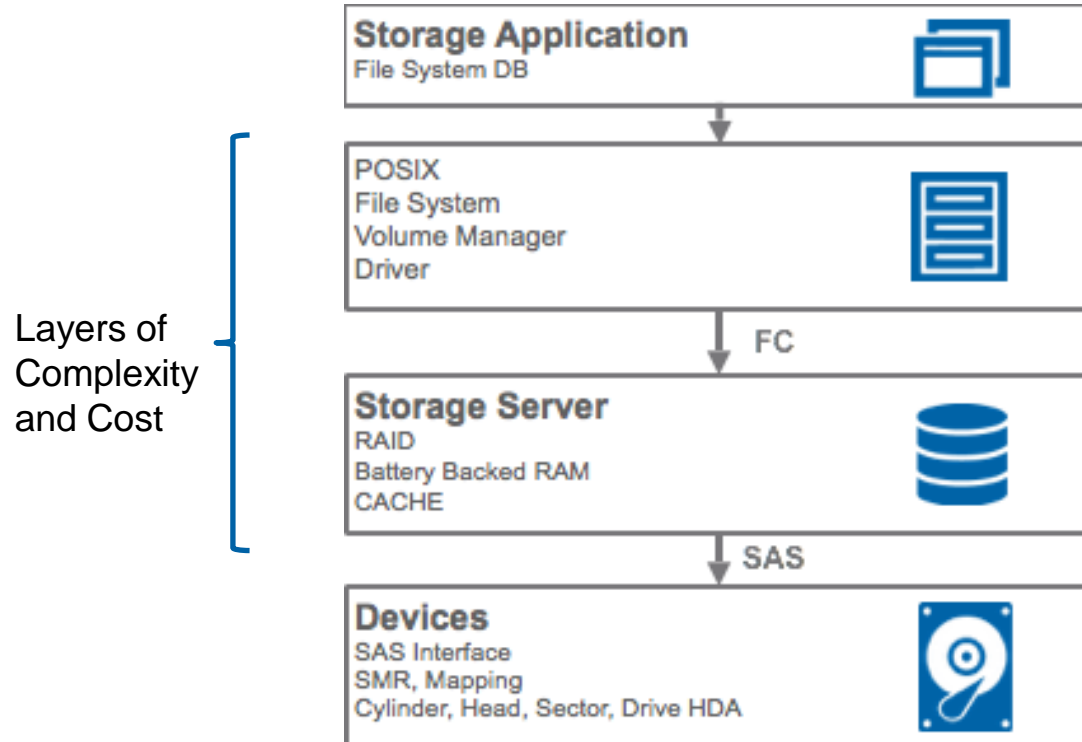
HPC I/O Stack Evolution: Objects in Context

Do more layers = More Complexity?



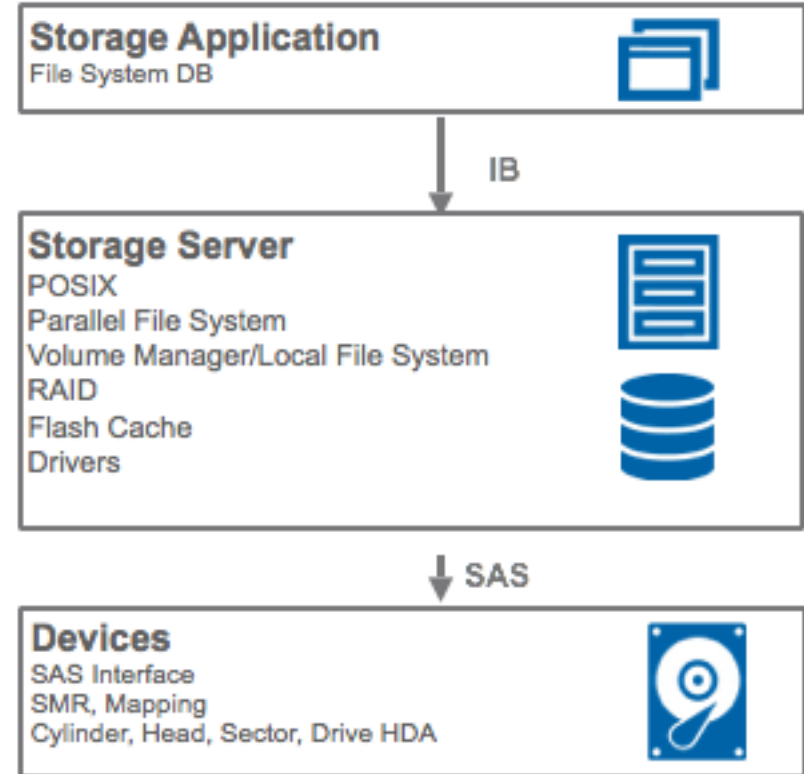
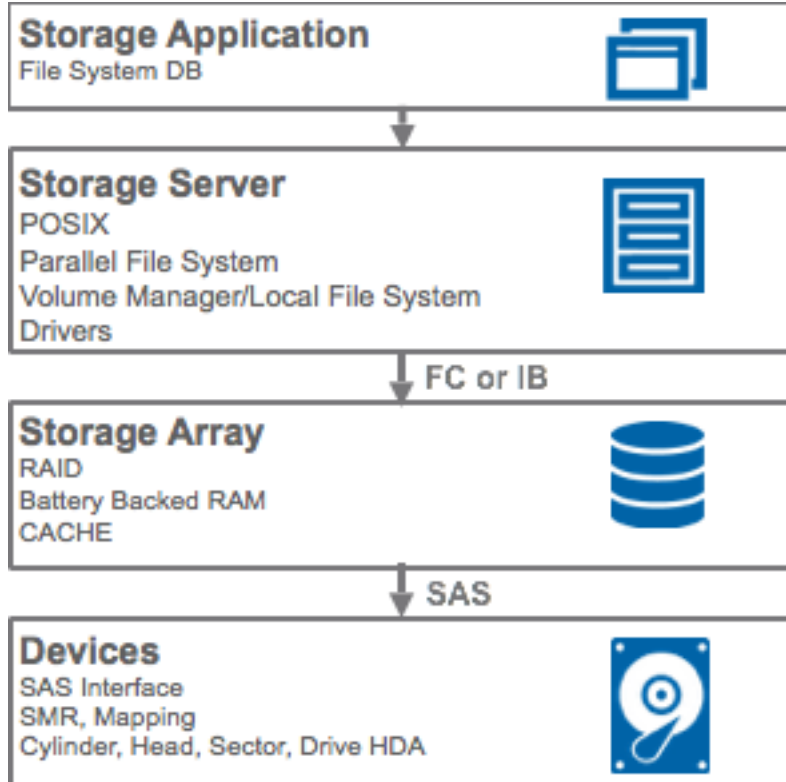
Data Centre Storage Stack

Storage Systems- Layers of Complexity and Cost



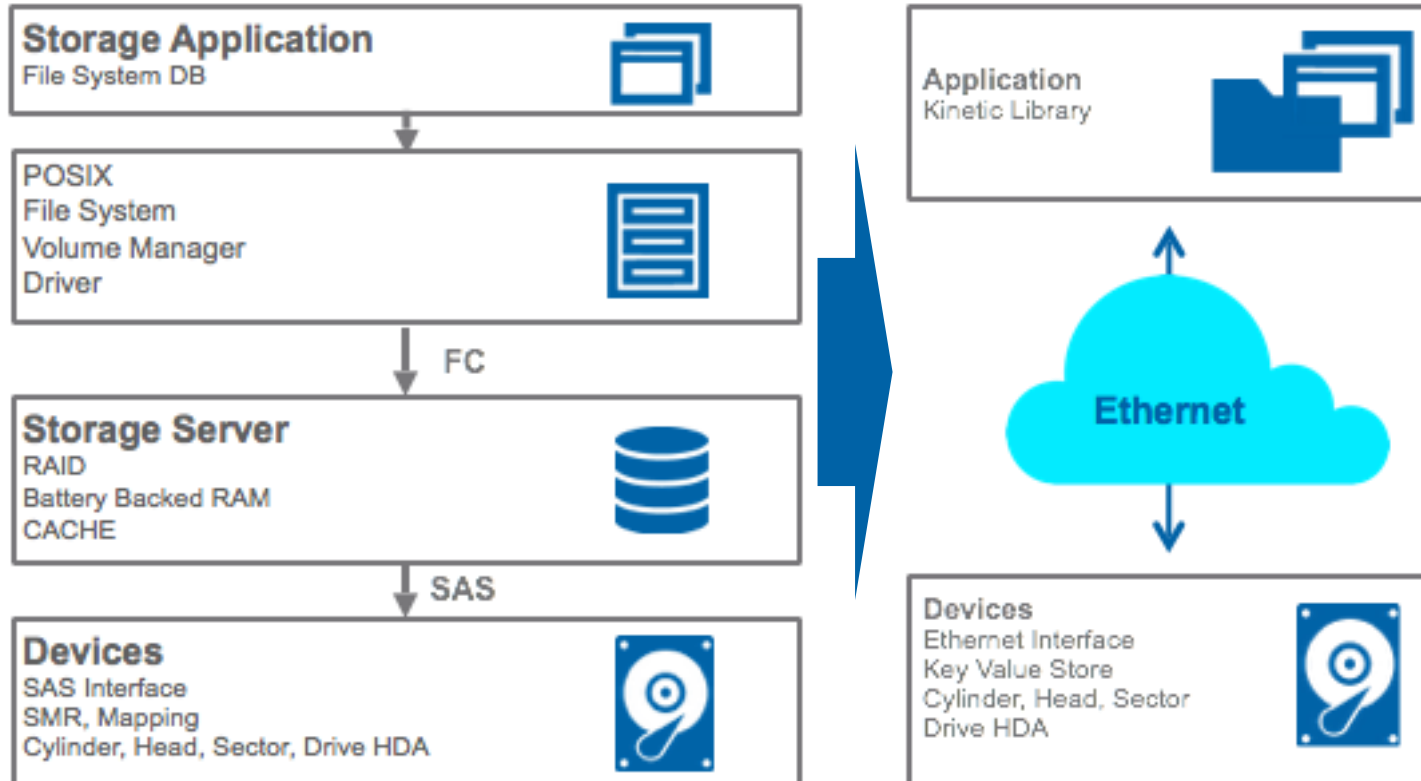
HPC Data Centre Storage Software Stack

I/O Layer Reduction



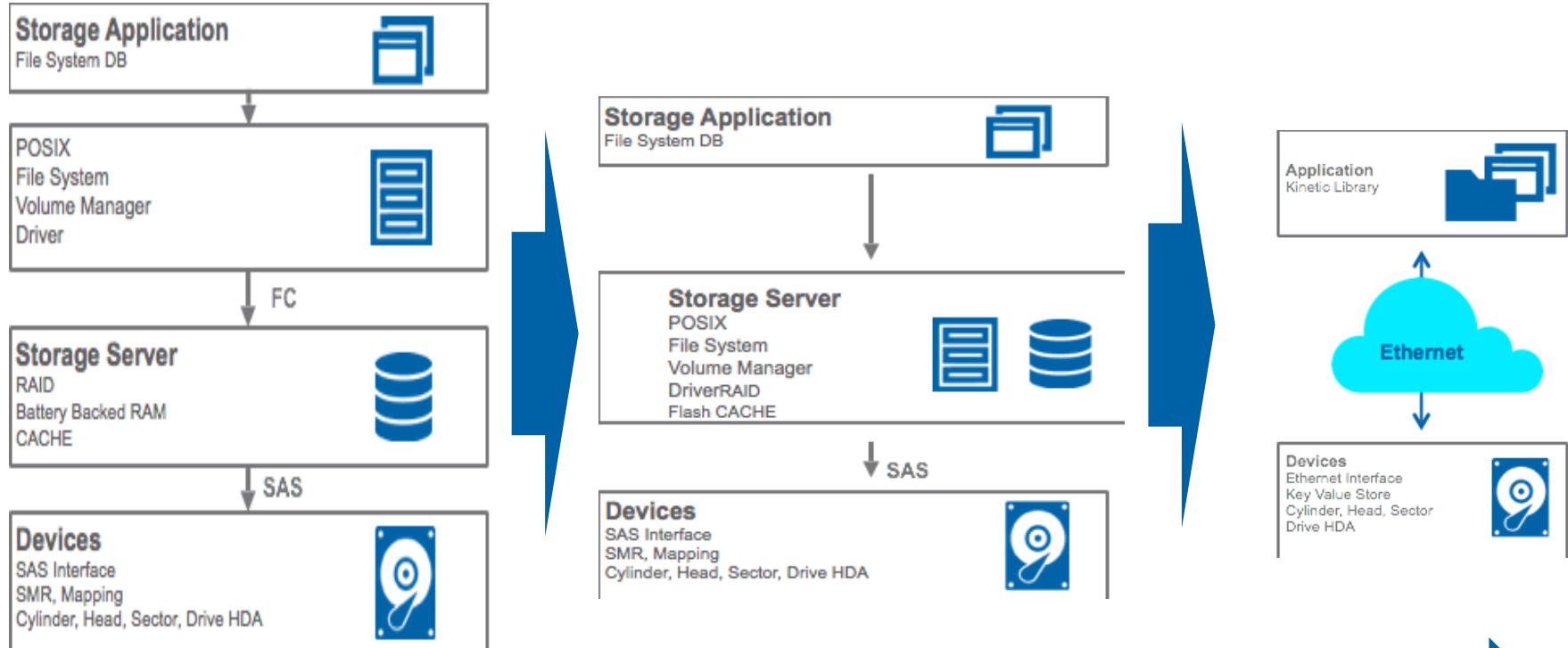
Data Centre Storage Software Stack

Conventional Vs Kinetic



Data Centre Evolution- Storage Stack

We Must Reduce The I/O Layers



A Possible Future Path to Simplification, Reduced Complexity and Cost

Thank you!



www.seagate.com/cses

Seagate ClusterStor HPC- Unique Business Value

High performance, Highly Scalable Storage Systems for Unstructured Data

Vertically Integrated Innovation
Delivers Performance Efficiency
at any Scale



Available through a network of OEM
Partners: Cray, Bull, SGI, HP, DELL....

Seagate Storage Media



PCIe
SSD



SAS
SFF SSD



15K
SFF HDD



10K
SFF HDD



7.2K
SFF HDD



Performance
3.5 HDD



Traditional
Nearline



Value
Nearline



Kinetic
HDD



Archive
HDD