

# THE FLASH REVOLUTION IS RIGHT NOW

Introducing Pure Storage



이종혁  
2015년 1월 29일



# To get a competitive edge you need an Instant Infrastructure

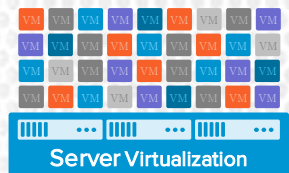
1. Silicon  
Speed

2. Cloud  
Economics

3. Resilient  
Everywhere

4. Simple +  
Agile

# Datacenter Unrest has been Brewing...



Virtualization

Consolidating data center architectures, new demands on storage



Cloud

New expectations for agility, economics, and performance



Moore's Law

Compute and networking moving forward at semiconductor speeds



Disk Bottleneck

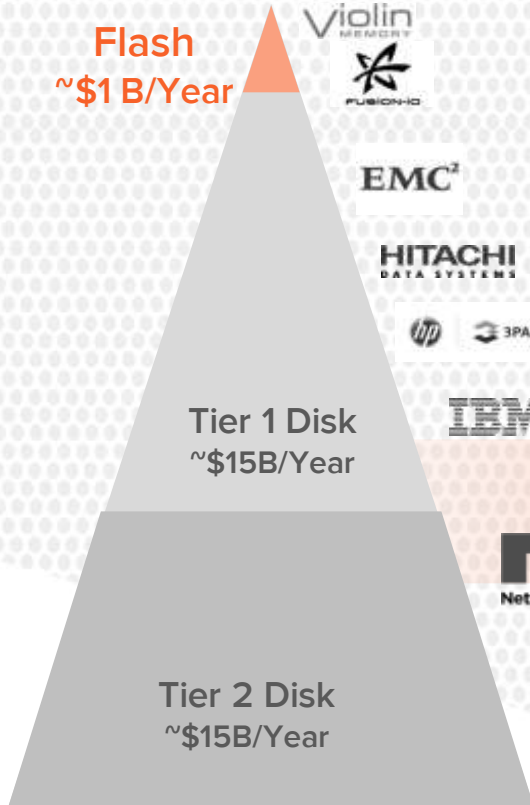
Fundamentally slowing data center performance and efficiency



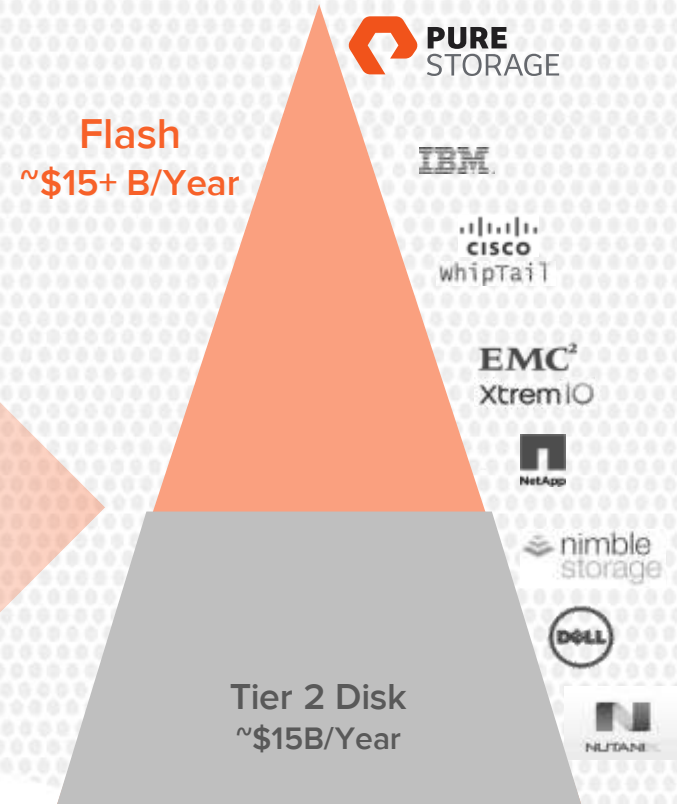
## FLASH IS THE ANSWER...

# Flash Storage Market is Transferring!!

2000s Storage Market



2010s Storage Market



# EARLY FLASH FAILURES



**Disk Caching  
& Tiering**



Performance risk  
& complexity



**Array  
Retrofits**



Flash requires a  
new architecture



**Flash  
Appliances  
& Cards**



Too expensive,  
single-  
purpose, disruptive  
deployment



# WHAT IF...

FLASH COULD  
BE EVERYDAY  
STORAGE?

STORAGE WAS  
FUNDAMENTALLY  
SIMPLER?

WE COULD BUILD  
A BETTER STORAGE  
COMPANY?

# In 2009 Pure Storage Pioneered the All-Flash Array, Sparking a Revolution

1

## Disruptive Performance & Economics

All-flash performance  
Less cost than disk  
Data reduction + MLC

2

## Built to Share & Scale

TBs to PBs scale  
Mixed workload consolidation

3

## Always On

100% performance all the time  
Resiliency, DR, backup built-in

4

## Simple & Invisible

No tuning at any layer  
Easy management or automation



**10X** faster

**10X** smaller

**10X** less power

**MORE** reliable

**∞** simpler





# Gartner® – Pure Storage a LEADER in the 2014 Gartner MQ

## Receives Strongest Position for Completeness of Vision



Gartner Magic Quadrant:  
Solid State Arrays, August 2014

“Pure Storage has a relatively mature platform — the FA-400 Series — and a **proven data reduction implementation.**”

“A **transparent attitude toward pricing** and guaranteed efficiency ...”

“Similarly, **innovative and competitive inclusive software licensing and inclusive controller upgrade programs...** have proven to be a fresh and welcome approach that challenges and disrupts ... general purpose disk array vendors’ license schemes and forklift product replacement cycles.”

Data Source: Gartner Magic Quadrant for Solid State Arrays, August 2014

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# Gartner – Pure Storage #1 SSA for OLTP, VSI and VDI



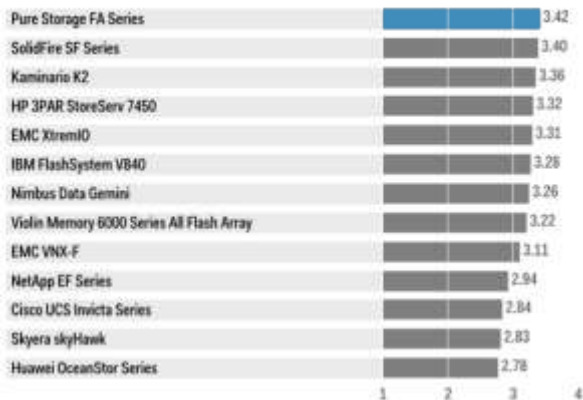
Gartner Critical Capabilities:  
Solid State Arrays, August 2014



#1

## Online Transaction Processing

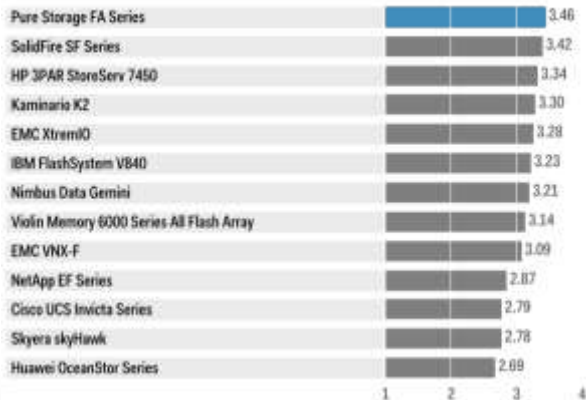
Product or Service Scores for Online Transaction Processing



#1

## Server Virtualization

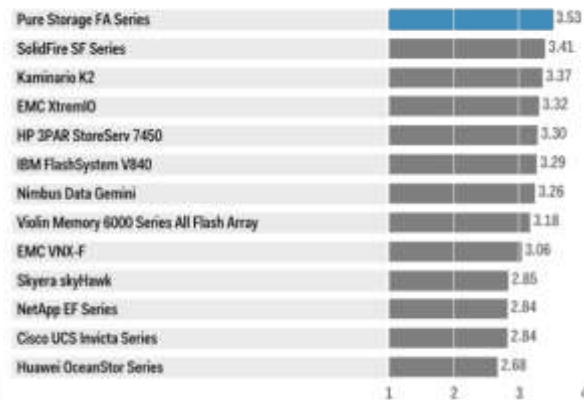
Product or Service Scores for Server Virtualization



#1

## Virtual Desktop Infrastructure

Product or Service Scores for Virtual Desktop Infrastructure



**THIS REVOLUTION IS ABOUT  
CREATING HEROES**

# 동국산업(주) 비즈니스 효율성 향상



동국산업(주)은 1967년 설립된 국내 독보적인 자동차용 고탄소강 냉연 제조 기업이다. 뛰어난 사업력과 기술력을 바탕으로 국내 1위의 독점적 지위를 확보하고 있다.

- 통합IDC센터 운영에 따른 스토리지 볼륨 구성의 유연성 및 자원 사용율 개선
- 노후화된 기 운영 스토리지의 성능 이슈로 발생하는 장애 신속 대응



## Results



2X

Performance



5:1

Data Reduction



50%

simplicity

- 스토리지 교체로 기존 150분 소요되는 마감 업무를 퓨어스토리지 도입 후 80분으로 감소해 약 50%의 시간 절감 효과
- 계열사 및 현업 실무자를 대상으로 성능 만족도 조사 시 90% 이상 매우 만족 (불만족 0.5% 이하)
- 고성능 인라인 중복제거 및 압축 기술을 통해 성능 저하 없이 스토리지 이용 용량 80%이상 절감
- 상면 공간이 3분의 1로 감소 및 이에 따른 전력비용 감소
- 실시간 모니터링 시스템 및 안정적인 기술 지원으로 인력 리소스 50% 절감
- 절감된 인력 리소스를 신규 비즈니스와 관련한 이익 창출을 위한 리소스로 활용

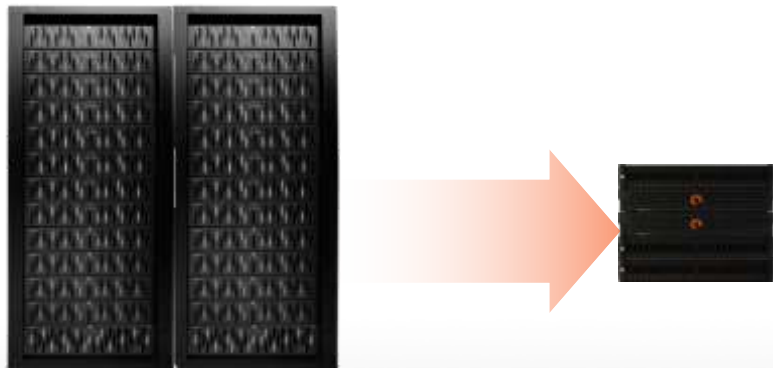


# Paylocity Delivers a Flash-Fueled Payroll Experience



**Leading cloud-based payroll provider** with over 1 million users, growing at 30%/year.

- Needed to improve performance of their mission-critical infrastructure based on MS SQL on VMware
- Customer experience is paramount, storage was bottleneck



## Results



8x faster



5x footprint reduction



reducing costs

- 800% query improvement
- 8X power reduction
- From 1.5 hours to 10 minutes: 9x faster backups
- 140TBs total raw
- >500 TBs total usable
- 4:1 data reduction
- 5.8x footprint reduction
- 8x faster payroll processing while reducing overall costs
- Low latency delivers consistent performance for customers

# Fremont Bank Cashes in with Pure

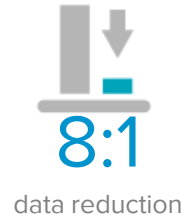


Largest independently owned bank in the San Francisco region with 20 branch locations specializing in banking, lending and investment management.

- Performance Legacy storage couldn't support VDI roll out initiative



## Results



- VDI boot times slashed from 10 minutes to less than one minute
- Maximum IOPS increased by 5x
- Sub-millisecond latency
- 8:1 data reduction
- Self-tuning array allows IT team to spend less time focused on storage

**THIS REVOLUTION IS ABOUT  
ARCHITECTING  
FORWARD**

# Introducing the Pure Storage FlashArray



**FA-405**

Up to 40+ TBs  
2 controllers in 2U



**FA-420**

Up to 125+ TBs



**FA-450**

Up to 250+ TBs  
16 Gb/s FC

**A FlashArray for any application, and any budget!**



**FlashReduce:** inline data reduction

**FlashProtect:** end-to-end resiliency

**FlashRecover:** local/remote protection

**FlashCare:** global flash management



**All included at no additional cost!**



Private Cloud  
IaaS



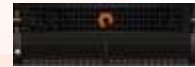
Accelerating  
Business Apps



Unlocking  
Data Analytics



Improving  
User Productivity



Building An All-Flash Foundation for *Your* Cloud

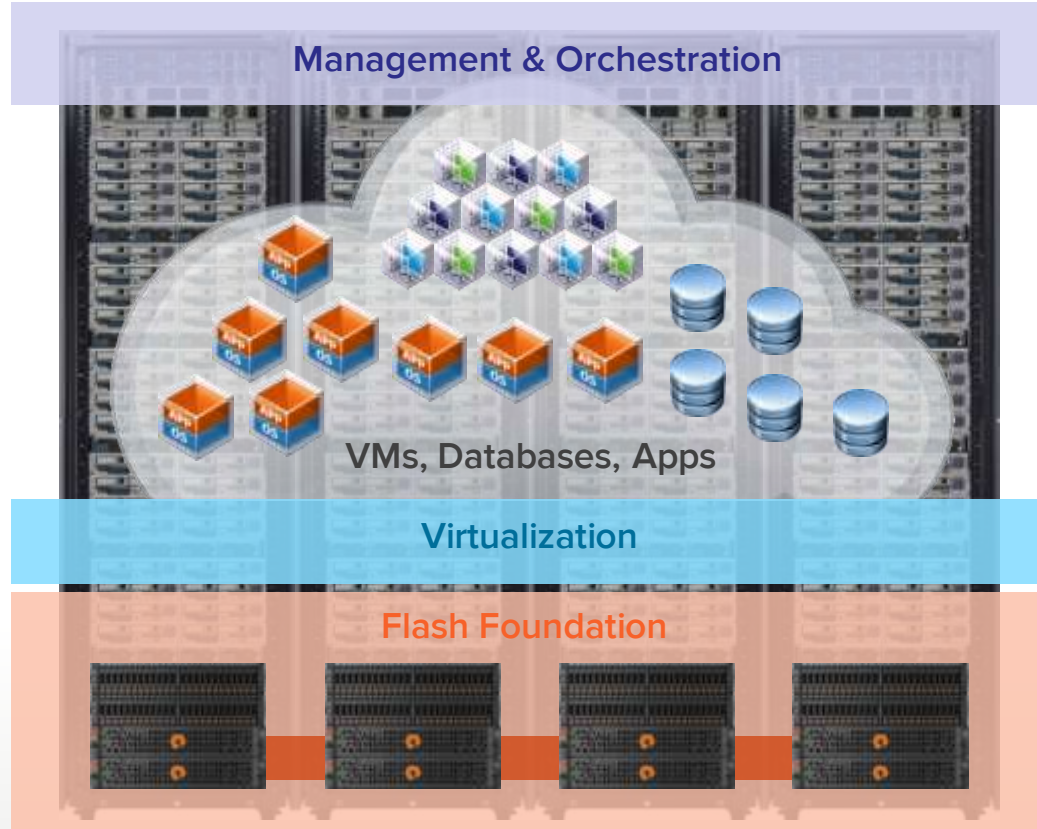
# Building a Shared, Scalable Flash Platform

## Virtualization Optimized

- VAAI
- vSphere Plug-In
- VMware vVols
- VSS
- OpenStack CINDER

## TB to PB Scale Deployments

- Modular architecture
- Pod-like deployment
- Fault isolation
- Forever Flash



## Application Agnostic

- No tuning at any layer
- Auto-aligning 512b architecture
- Performance at any IO size
- Mixed workload performance

## Security & Multi-tenancy

- Always-on encryption
- IO QoS
- Syslog integration

**THIS REVOLUTION IS ABOUT  
YOUR WEEKENDS**

# Always-On: No Downtime, No Performance Loss

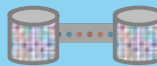
## Flash Recover

Protect  
Locally &  
Globally

Space-Efficient  
Snaps & Clones



Async Snapshot  
Replication



Protection  
Policies



Protection &  
DR Built-In

## FlashProtect

Maintenance, Upgrades  
& Expansion Without  
Performance Loss



Non-Disruptive  
HW Upgrades &  
Replacement

Non-Disruptive  
SW Upgrades



No More  
Maintenance  
Windows

Manage Component  
Failure Without  
Performance Loss

Active / Active  
High Availability



HA Without  
Performance Loss



Always High  
Performing &  
Available

Dual-Parity  
Data Protection

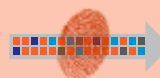
Adaptive  
Dual-Parity RAID-  
3D



Always-On  
Encryption



End-to-End Data  
Integrity Fabric



Never Lose  
Data







# The Best Storage Support – Period.



The Best People



The Best Technology



Proactive, “Remote Management” Approach



Global Consistency & Partnerships

## Demonstrated Results

9.5 / 10

CUSTOMER SATISFACTION

2013 AVERAGE

76

NETPROMOTER SCORE

EMC: 38 NetApp: 20  
Dell: 28 Hitachi: 15



# **SIMPLICITY IS THIS REVOLUTION'S MANIFESTO**

# Simple, Invisible and Automated



Never Think  
About  
Storage

- Block Alignment
- RAID optimization
- Protection work-arounds
- Downtime windows

Invisible



Operate or  
Automate

- Web-based GUI
- CLI
- REST
- OpenStack

Automated

Simple



No More  
Managing

- RAID
- Disk Layout
- Tiers/Pools/Caching
- Performance Tuning

Integrated with  
Your Stack

- VAAI
- vCenter Plug-In
- Log Insight Plug-In
- VSS Provider

**THIS REVOLUTION IS ABOUT  
SAVING MONEY**

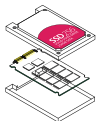


# Delivering Disruptive Economics with Flash



### Best-in-Class Data Reduction

Deduplication, compression, and pattern removal.



### Modular, Commodity HW

Harness flash and CPU advances quickly and independently.



### Flexible Scale

Buy only what you need, when you need it. Grow online.



### Consolidation Platform

The more applications you put on, the more you save.



FLASHREDUCE  
TICKER

Last Updated: 02:50:29PM PDT

1 6.08 4.04 3.53 6.65

0.00 11.31 >20.00 8.07

5.52:1

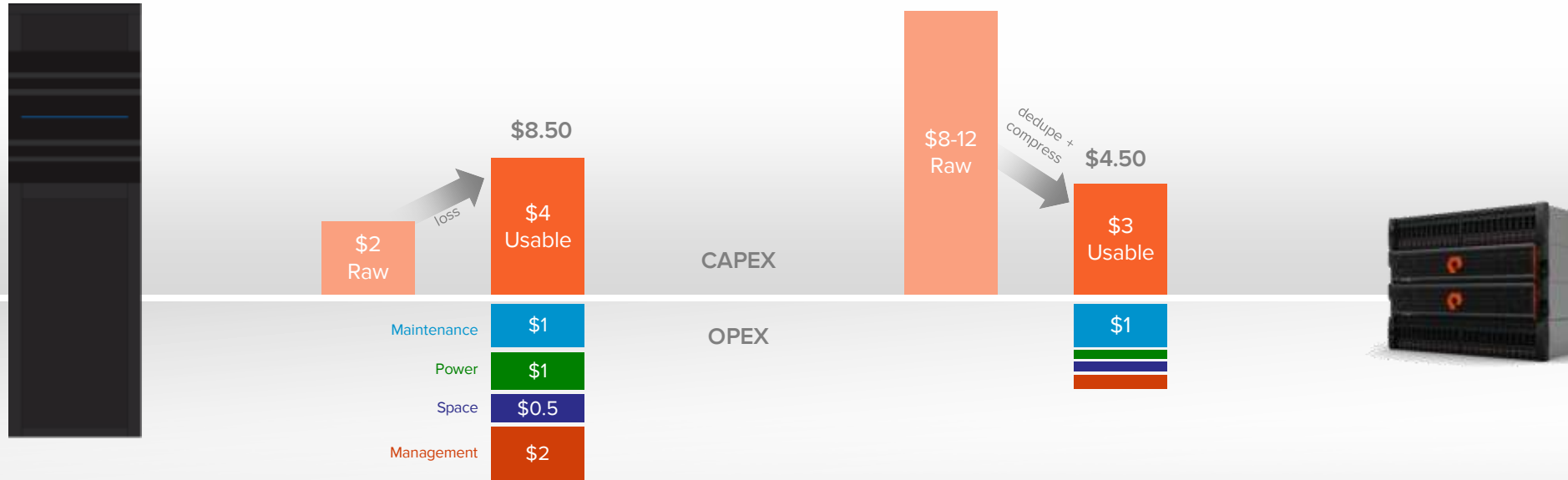
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Average Data Reduction Rate  
(Deduplication + Compression Only)

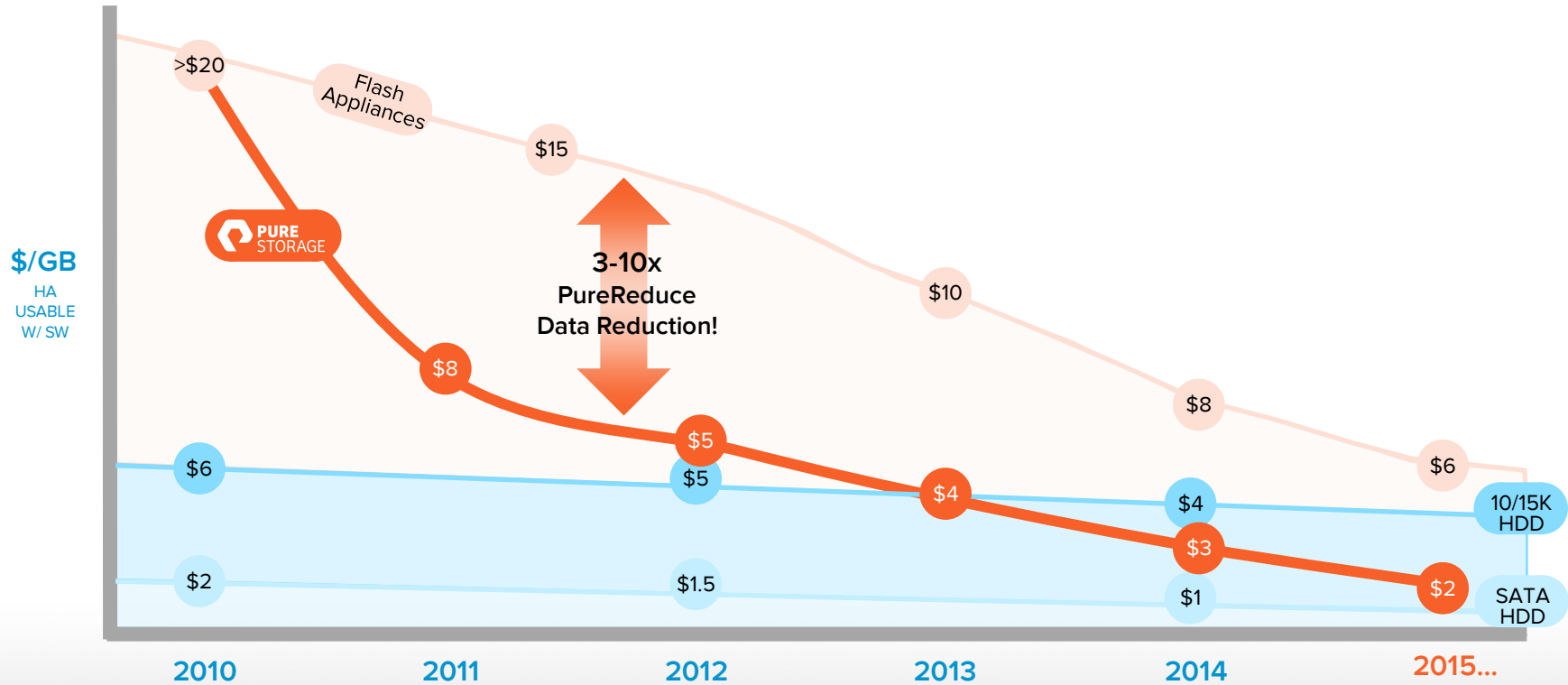
Average Total Reduction  
(Including Thin Provisioning)

# Delivering Immediate ROI

Typical 3-year cost per usable-HA GB:



# Economics Below Disk: Starting at \$2/GB



# THE FLASH REVOLUTION HAS ARRIVED

Will you join?