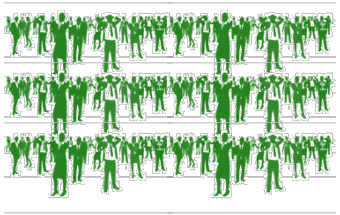
FLASH

REDEFINING THE POSSIBLE

Zahid Hussain
General Manager/SVP
Flash Products Division, EMC

BILLIONS
OF USERS



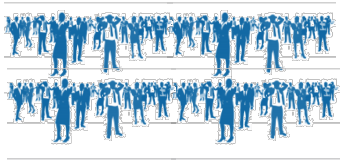
3RD PLATFORM

MILLIONS
OF APPS

Mobile Cloud Big Data Social

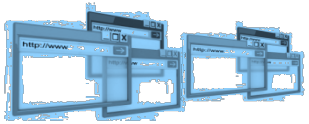
Mobile Devices

HUNDREDS OF MILLIONS
OF USERS



2ND PLATFORM

TENS OF THOUSANDS
OF APPS



LAN/Internet Client/Server

PC

MILLIONS
OF USERS

1ST PLATFORM

THOUSANDS
OF APPS

Mainframe, Mini Computer

Terminals

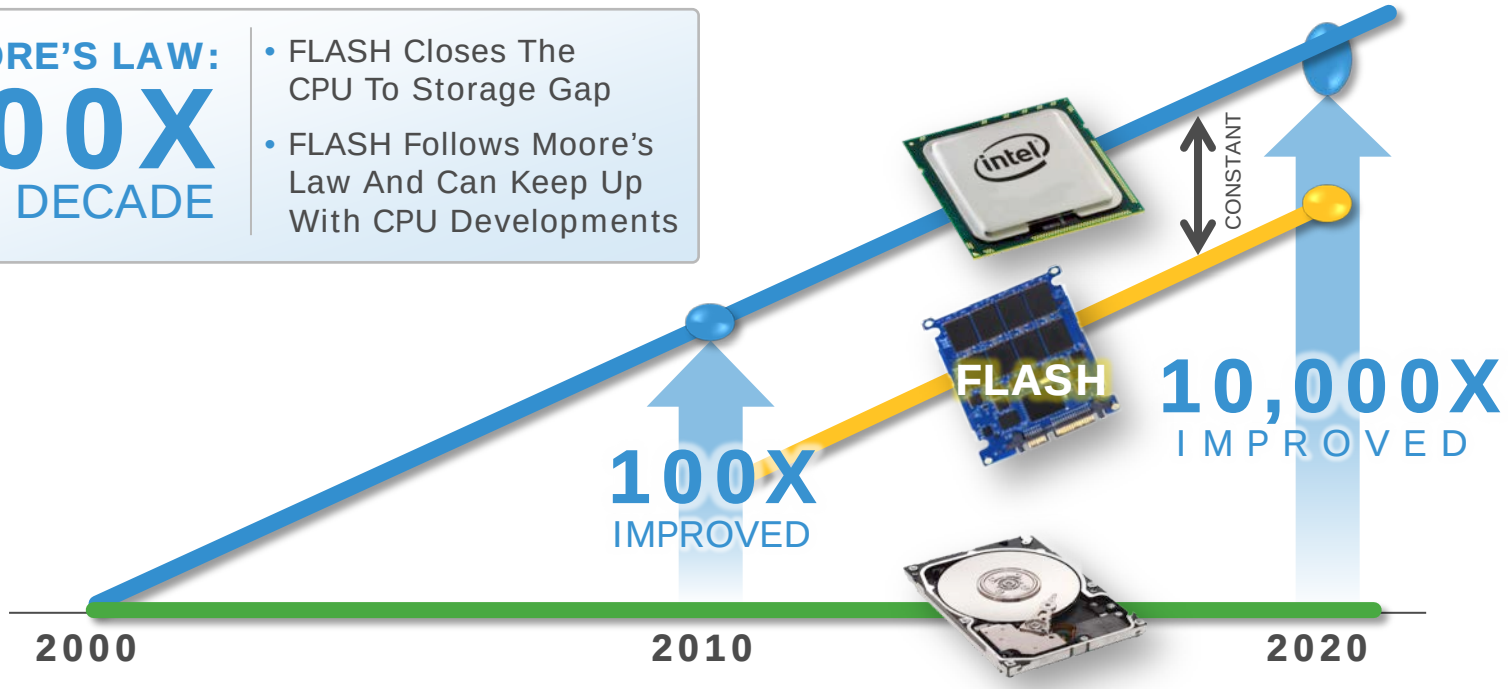
Source: IDC, 2012

New Workloads have created a performance Gap

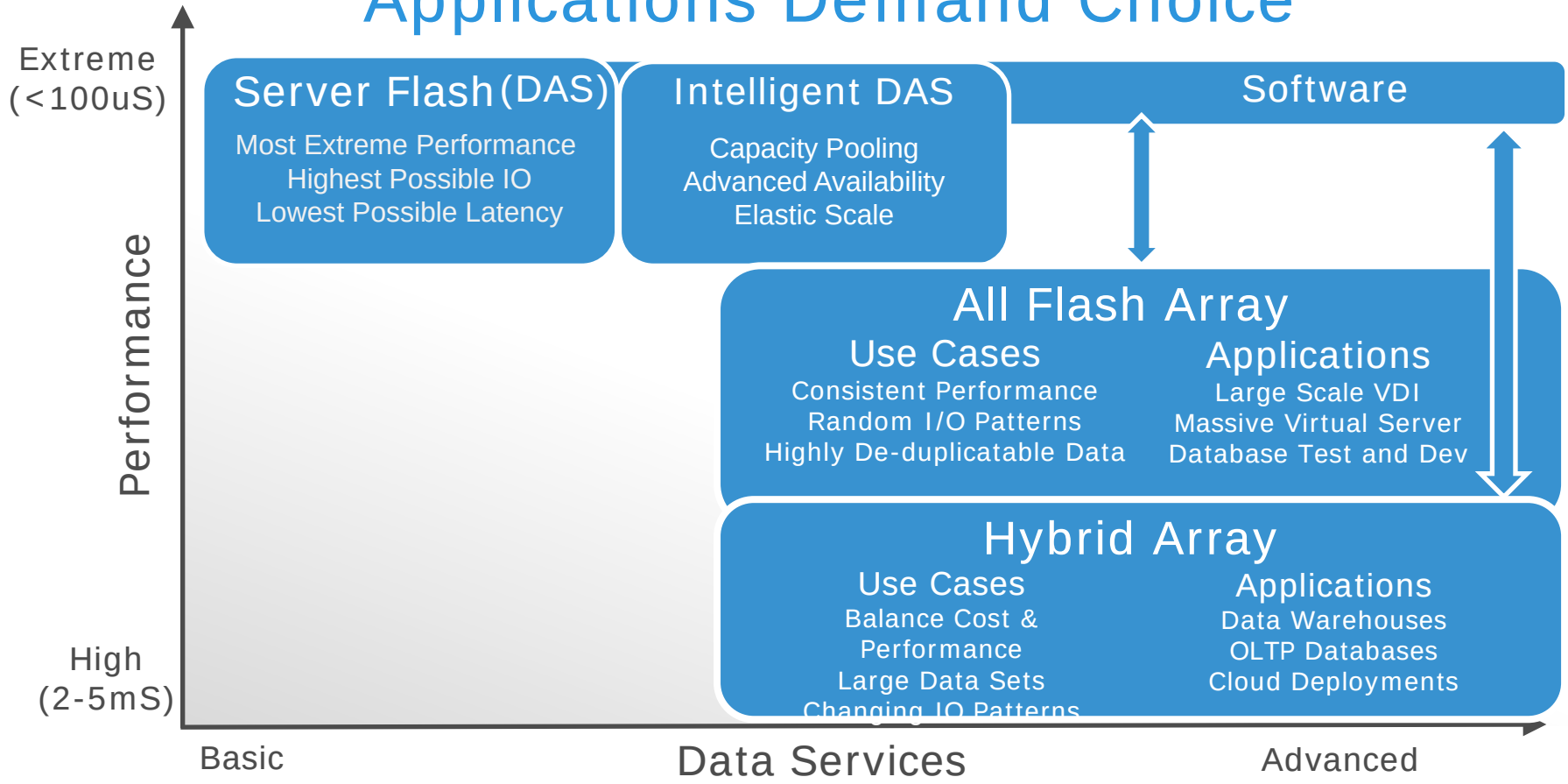
CPU Improves 100 Times Every Decade – Disk Speed Cannot

MOORE'S LAW:
100X
PER DECADE

- FLASH Closes The CPU To Storage Gap
- FLASH Follows Moore's Law And Can Keep Up With CPU Developments



Applications Demand Choice



EMC's Flash Everywhere Strategy Delivers Choice

Extreme (<100uS)

Performance

High (2-5mS)

Basic

Data Services

Advanced

Server Flash (DAS)

SLC & eMLC PCIe Flash

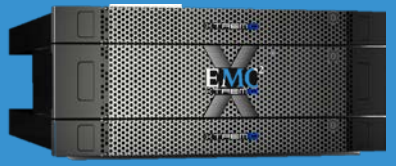
Intelligent DAS

EMC² | ScaleIO

Softwa

Integration & Intelligence

All Flash Array



Hybrid Array

VNXe, VNX, VMAX, Isilon

The XtremSF Family

All Cards Are HHHL – Highest Density In The Industry

XtremSF 2200

2.2 TB

XtremSF 1400

1.4 TB

XtremSF 700

700 GB

XtremSF 550

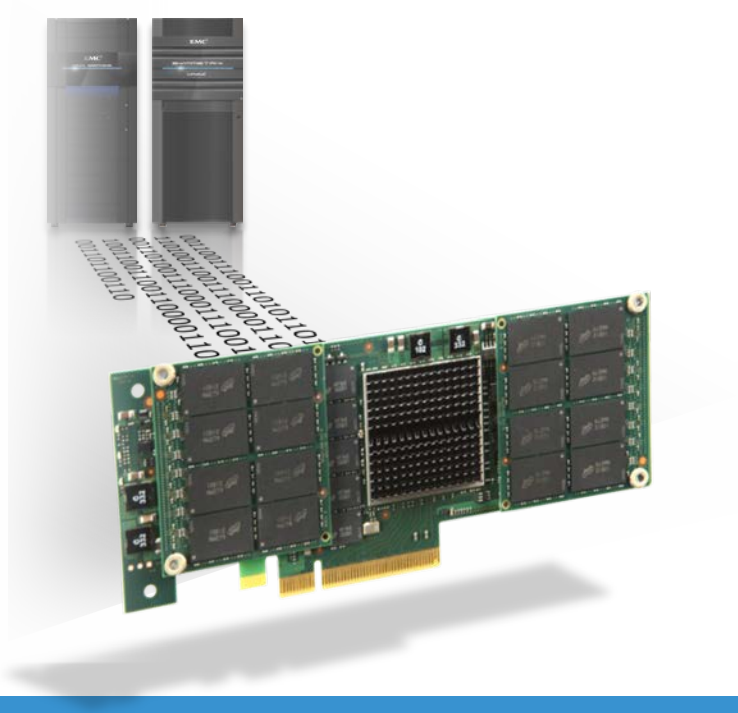
550 GB

EMC² PROVEN

UP TO 1,130,000 IOPS

EMC XtremSW Cache

Server Flash DAS becomes Cache



Performance

Dramatic improvements in latency and throughput

Intelligence

Extends EMC FAST architecture into the server

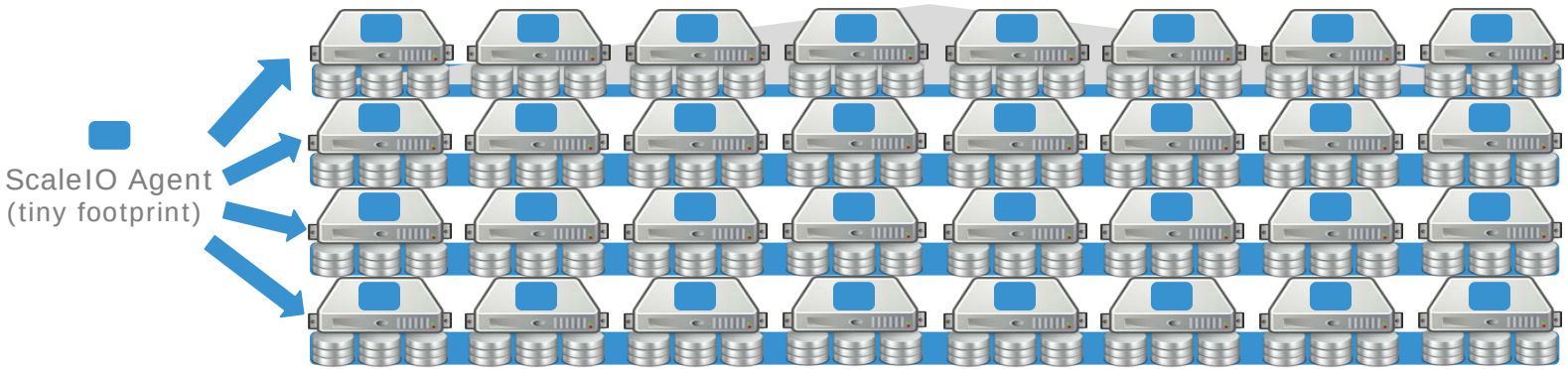
Protection

Backed by intelligent, resilient, highly available storage

ScaleIO

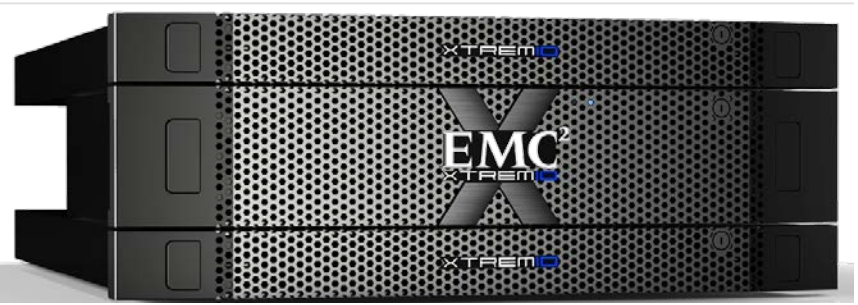
Creates Pools Of Server Flash

- Leverage application servers with local storage
  - Physical or Hypervisor Servers
- Aggregate total DC server capacity and I/O performance
- Add (and remove) storage and compute dynamically



XtremIO

RETHINKING CORE DESIGN CRITERIA



Software-Defined

Commercial Off The Shelf Hardware

Inherently Balanced

Linear Scale-Out Architecture

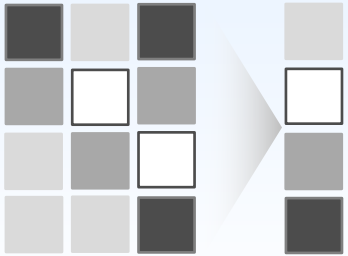
Flash-Optimized

“Always On” Data Services

XtremIO

Flash-Optimized Data Services

INLINE DATA REDUCTION

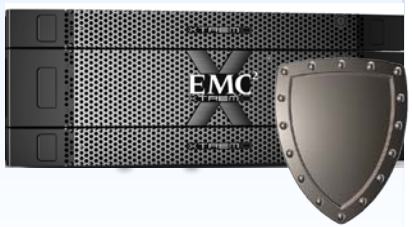


Never Write
Duplicate Data

THIN PROVISIONING

4KB Allocations
Optimal Utilization

DATA PROTECTION



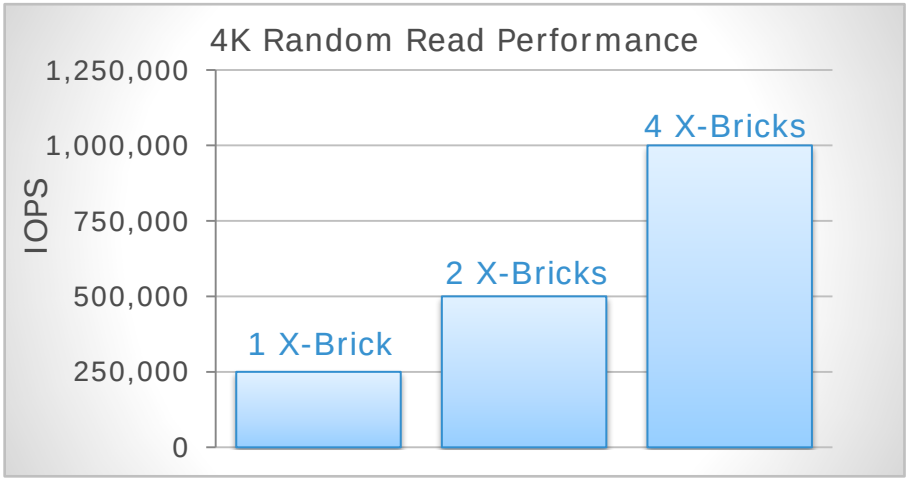
Flash-Optimized
Zero Configuration

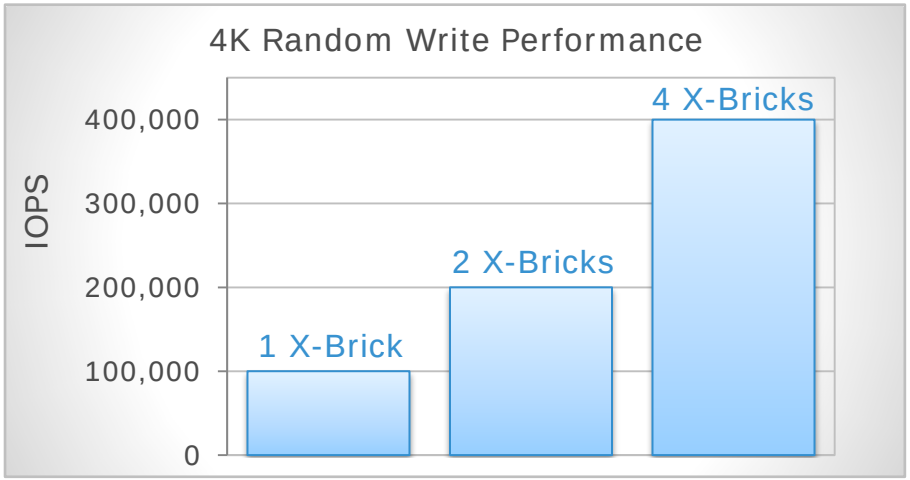
WRITABLE SNAPSHOTS

Instant Copies
Full Performance

XtremIO

Scale-Out Architecture Delivers Unparalleled Functional IOPS

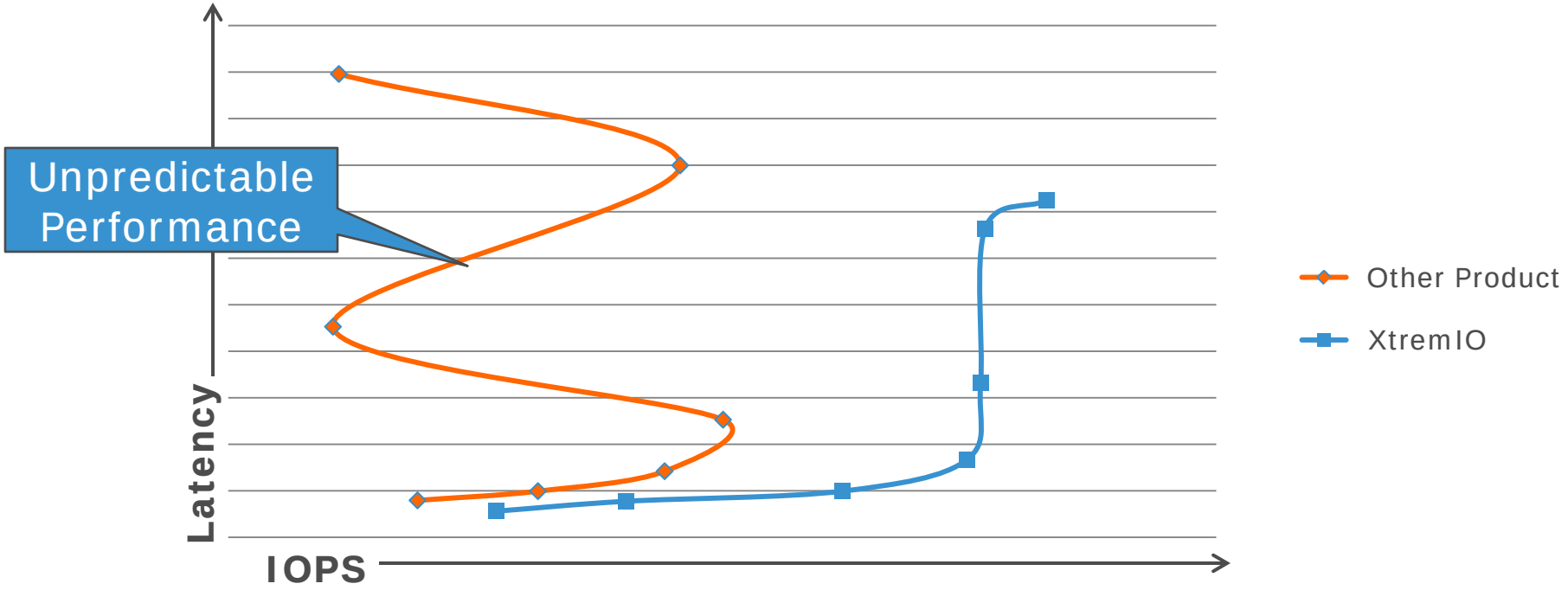




Sub-Millisecond Response Time With All Data Services Operating

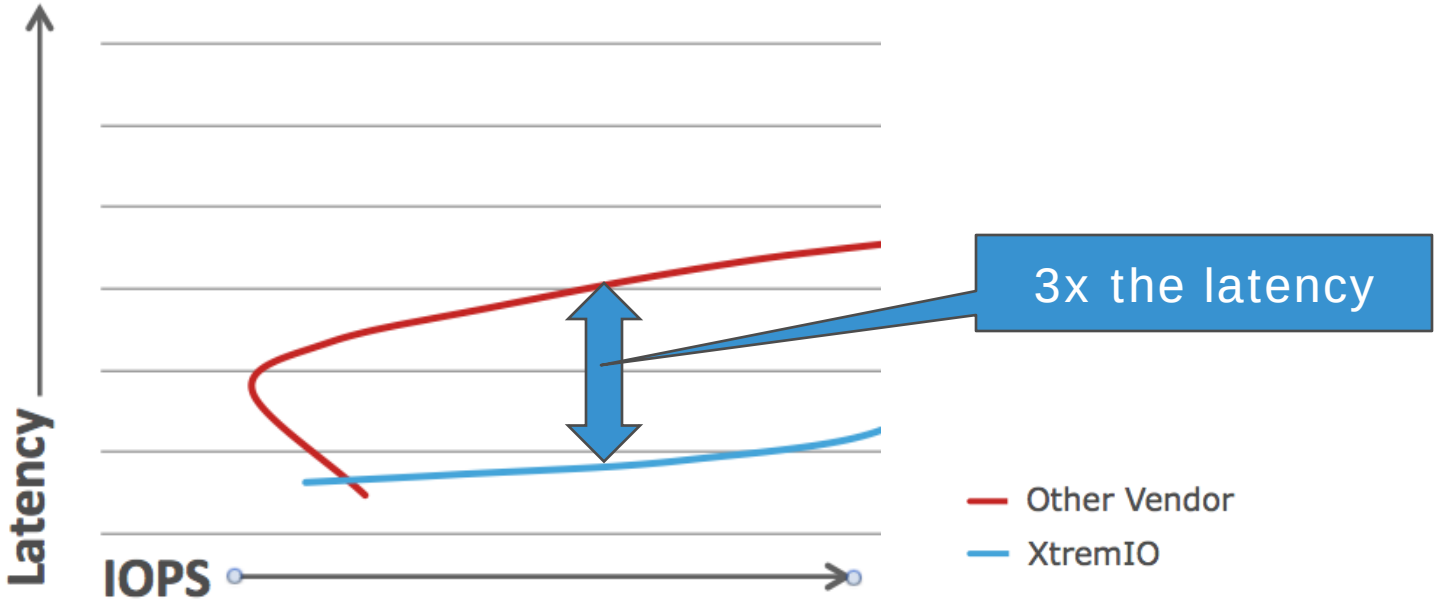
The Silver Bullet - Garbage Collection

8KB Random Writes



Flash Locking Effects

8KB 50% Writes / 50% Reads



XtremIO

Configure In Minutes – Zero Planning, Zero Tuning

Redefining the Possible

COMPLETE

FLASH PORTFOLIO

SET OF TOOLS

DEPLOYMENT EXPERTISE


EMC²