



January 16th Pre-Launch Briefing

Woody Hutsell, Sales Enablement Manager, IBM Flash
Levi Norman, Marketing Manager, IBM Flash



IBM and the Tech Analyst Community

Pre-Launch Briefing and Preview

- Deliver an update on IBM Flash
 - IBM Flash Ahead Initiative that was introduced in April '13 in NYC
- Introduce new products/solutions
 - IBM FlashSystem 840
 - IBM FlashSystem Enterprise Performance Solution
- Q&A
- Speakers
 - Woody Hutsell, Sales Enablement Manager
 - Levi Norman, Marketing Manager



Key Points IBM FlashSystem Announcement on January 16th, 2014

1 The STG launch is focused on **Infrastructure Matters**

- Remaking enterprise IT for the new era of cloud
- Driving business transformation with big data and analytics

2 The **IBM FlashSystem 840** is data center optimized, extreme performance

- IBM is delivering extreme performance in an optimized format with enhanced RAS features and 2x performance
- This is the evolution of IBM's flash efforts and reiteration of the All Flash strategy as presented in April

3 The **IBM FlashSystem Enterprise Performance Solution** is the right answer for Tier 1 flash requirements

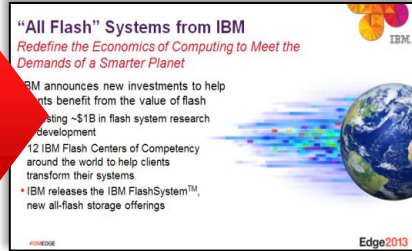
- Focus on a full flash solution with enterprise features



the possible with
Smarter Computing

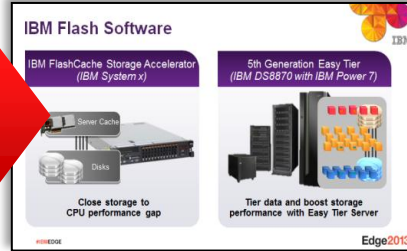


IBM Flash Initiative Gaining Momentum



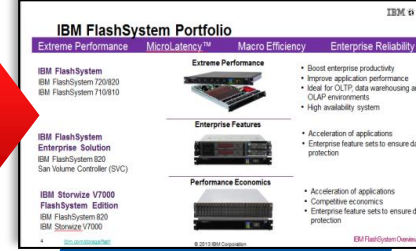
April 11th

- \$1B Flash Investment
- 12 Flash CoCs
- IBM FlashSystem 710, 810, 820, 720



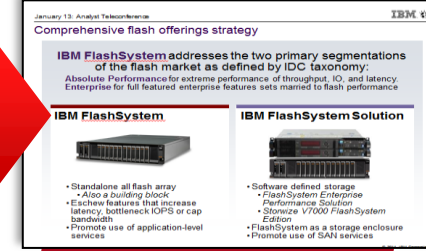
June 9th

- IBM Flash Cache Storage Accelerator
- IBM Easy Tier Cooperative Caching
- Intelligent Cluster with FlashSystem 820



October 8th

- Flash Adapter 90
- FlashSystem Enterprise Solution
- Storwize V7000 FlashSystem Edition



January 16th

- FlashSystem 840
- FlashSystem Enterprise Performance Solution
- IBM X6 w/ eXFlash DIMMs

1 Year Anniversary of TMS Acquisition

IBM FlashSystem Clients



300+ Client POCs - 1,500+ Systems Shipped - Channel Partner Growth 4X

Strong IBM Portfolio Enables Emerging Flash Storage

Virtualized Flash Mirror / Tier



FlashSystem + SVC, with all
LUs mirrored in SVC

Easy Tier also supported, used
by various clients

Partially Virtualized Flash



FlashSystem + SVC, with some
LUs exposed outside of SVC

Provides virt. benefit + “turbo
mode” for non-virtualized LUs

Virtualized Flash NAS



FlashSystem + Storwize V7000
Unified, w/some LUs accessible
via file and some via block



**Major Internet
Company**



Transforming **Data Economics & Business Velocity**



*Over 700 **Storage Infrastructure Studies**
and Industry Estimates:*

*Business
Initiatives
Demand Data*

...organizations use less than half of their storage
but **only 30%** leverage data virtualization...

...**over 80%** of data uses the most
expensive storage, **only 20% needs it...**

...average customer **data growing 25% to 60%.**
Compression can shrink storage by half or more...

Costly and Time & Skill Intensive...

Radically Optimizing Data Architecture with Data Virtualization and Flash

Data Optimization

Real-time
Compression,
Adaptive Tiering,
Copy Services...

Data Virtualization

Diverse Storage
Assets...

Continuous Operations

New Apps,
Capacity Growth,
Data Availability...

Non-disruptive Data Migrations

Media Migrations,
Future Proofing...

Optimized & Integrated with Flash

Store, Access & Analyze Fast Moving Operational Data

Comprehensive Flash Offerings Strategy

IBM FlashSystem addresses the two primary segmentations of the flash market as defined by IDC taxonomy:

Absolute Performance for extreme performance of throughput, IO, and latency.

Enterprise for full featured enterprise features sets married to flash performance

IBM FlashSystem



- Standalone all flash array
 - *Also a building block*
- Eschew features that increase latency, bottleneck IOPS or cap bandwidth
- Promote use of application-level services

IBM FlashSystem Solution



- Software defined storage
 - *IBM FlashSystem Enterprise Performance Solution*
 - *Storwize V7000 FlashSystem Edition*
- FlashSystem as a storage enclosure
- Promote use of SAN services



IBM FlashSystem 840 – Data Center Optimized

*Data center optimized
to deliver extreme
performance,
flexible capacity
& total system protection*



- **2x Performance**
- **Nearly 5x faster to deploy**
- **Up to 50% lower \$/IOPS**

Extreme Performance

- **1.1M IOPS**
- **8 GB/s Bandwidth**
- **16Gb FC, 10Gb FCoE & IB**

IBM MicroLatency™

- **Low Latency** 135/90 μ s R/W
- **Purpose-built, highly parallel** design
- **Maximize CPU efficiency & productivity**

Macro Efficiency

- **Field upgradeable, granular capacity**
- **Intuitive, standardized GUI**
- **Efficient 2U, 625 watts footprint**

Enterprise Reliability

- **Fully redundant & hot swappable**
- **Concurrent code load**
- **AES 256, HW based encryption**



IBM FlashSystem 840 – Performance and Capacity



Data center optimized to deliver extreme performance, flexible capacity and total system protection

Performance at-a-glance

Minimum latency	
Write	90 μ s
Read	135 μ s
Maximum IOPS 4 KB	
Read (100%, random)	1,100,000
Read/write (70%/30%, random)	775,000
Write (100%, random)	600,000
Maximum bandwidth 256 KB	
Read (100%, sequential)	8 GB/s
Write (100%, sequential)	4 GB/s

Capacity Options

Flash module configuration	2 x 2 TB	4 x 2 TB	4 x 4 TB	8 x 2 TB	12 x 2 TB	8 x 4 TB	12 x 4 TB
Raw capacity	5 TB	11 TB	21 TB	21 TB	32 TB	42 TB	65 TB
RAID 0 usable capacity	4 TB	8 TB	N/A	16 TB	24 TB	32 TB	48 TB
RAID 5 usable capacity	N/A	4TB	8 TB	12 TB	20 TB	24 TB	40 TB



IBM FlashSystem Enterprise Performance Solution

Extreme Performance

with

Enterprise Capabilities



IBM FlashSystem 840 Storage Enclosure

Macro Efficiency 2U form factor
Variable Stripe RAID™ + Two-dimensional Flash
RAID for Enterprise Reliability
Extreme Performance with IBM MicroLatency™
All-flash 40TB protected data capacity

IBM FlashSystem Control Enclosure

Scalable Performance to 1.5M IOPS
Business Continuity with Copy Services
Flash Copy for Backup & Optimal Workload Availability
\$/TB Value with Thin Provisioning & Real Time Compression
Drive Storage Efficiency with Easy Tier
External Virtualization
Space Efficient Copies




High performance enterprise class featured solution
Scalable to 1.5M IOPS for large scale enterprise systems performance



Competitive Comparison IBM FlashSystem 840

Tier 0

Tier 1

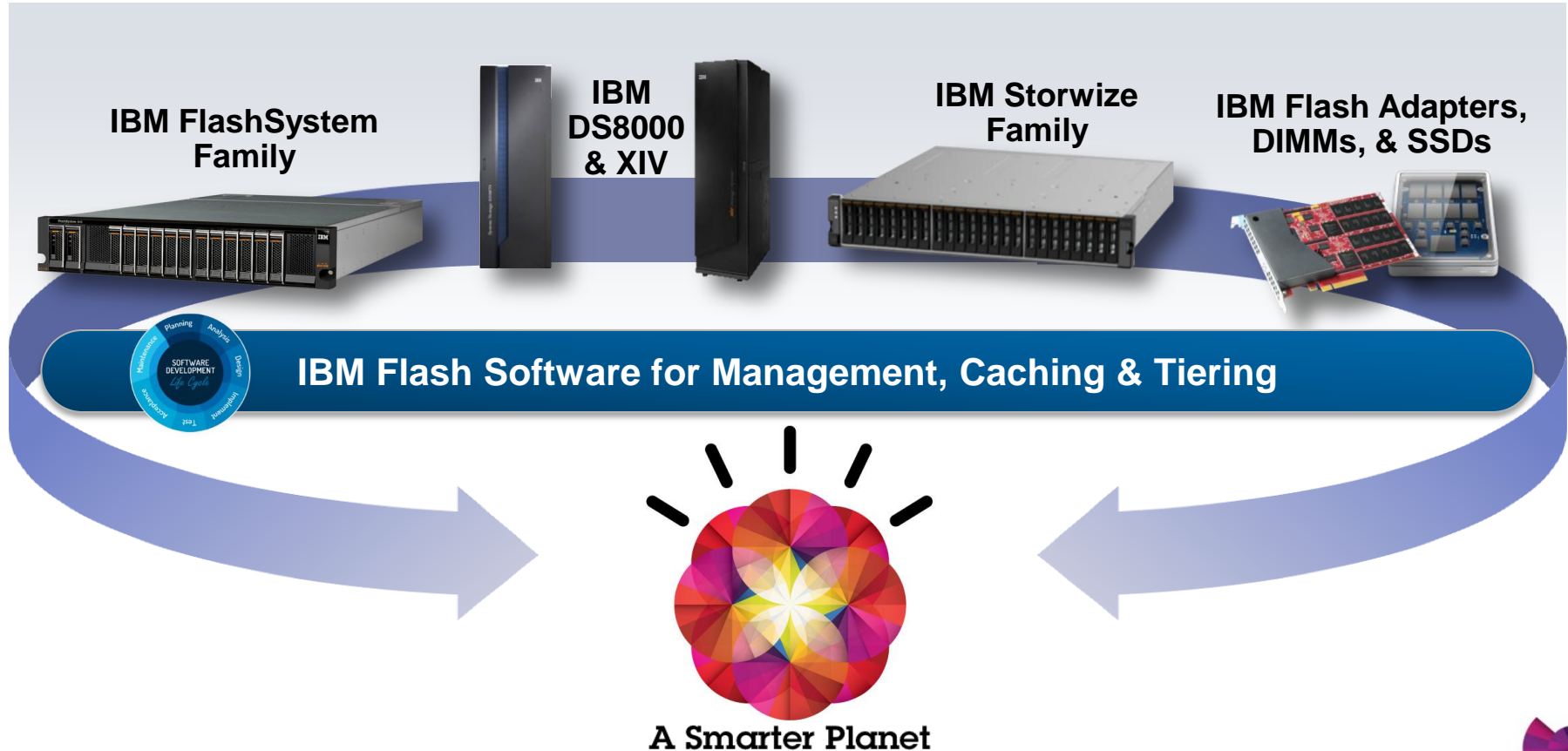
	IBM FlashSystem 840	Leading Flash Competitor	IBM FlashSystem Solution	Leading Storage Competitor
Performance	● 1.1M IOPS/~135μs	● 750K IOPS/~500μs	● 400K IOPS/~250μs	● 250K IOPS/~1000μs
Capacity*	● 40TB	● 44TB	● 40TB	● 7TB
Efficiency	● W/TB or W/IOPS	● W/TB or W/IOPS	● W/TB or W/IOPS	● W/TB or W/IOPS
Petabyte Density	● 2U / 1 Rack PB	● 3U / 1.64 Racks PB	● 6U / 3.57 Racks PB	● 6U / 20.04 Racks PB
Advanced Data Services			✓	✓
Concurrent Code Load			✓	—
Encryption			✓	✓
Data Reduction			✓	✓?
Snapshot			✓	—
Replication			✓	—
Virtualization & Tiering			✓	✓?
Scale Out			✓	✓?

* Useable & protected w/out data reduction

● Leader ● On Par ○ Laggard



Cross IBM Flash Deployment



IBM Flash in Server



Flash in Server

Flash Adapter 90 for Power

Power Systems (AIX, Linux)
900GB eMLC



High IOPS Adapters

Flash Adapter Enterprise Value

System x, BladeCenter, Flex
365GB to 3.2TB MLC



EXP30 or EXP24S Direct Attached Drawers

Power Systems (AIX, Linux, IBM i)
External SAS attach with 1.8" SAS SSDs



Flash Express for System z

Z/OS
Up to 5.6TB per I/O drawer



eXFlash DIMMs & SAS SSDs

DIMM, 1.8", and 2.5" form factor



IBM Flash in Storage



Flash in Storage

FlashSystem 840 & FlashSystem Solutions

All Flash Array
Fibre Channel, InfiniBand, FCoE
4TB to 48TB per 3U
IBM MicroLatency™



DS8870

Enterprise All Flash or Hybrid
Fibre Channel, FICON
Easy Tier

XIV

Cloud-optimized scale-out
Fibre Channel, iSCSI
Up to 12TB Flash cache

Storwize

All Flash or Hybrid
Software defined storage



IBM Flash Caching



Flash Caching

Easy Tier Cooperative Flash Caching

Power System

Flash Adapter 90 or SSDs as Cache

Tier data on server and on DS8K



FlashCache Storage Accelerator

Bare metal or virtual

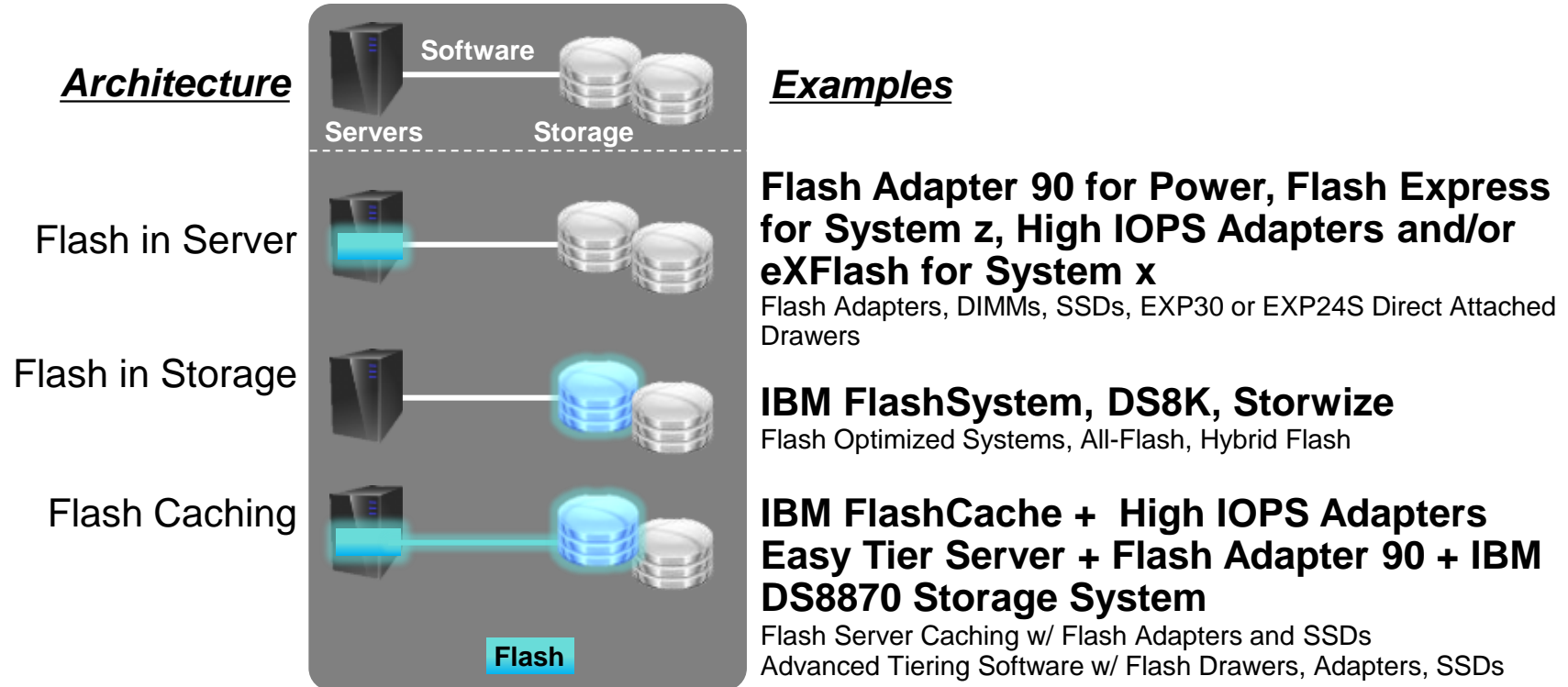
Cache to High IOPS Adapters, SSD

For read intensive environments

Supports VMware vMotion



Optimized IBM Flash Architectures



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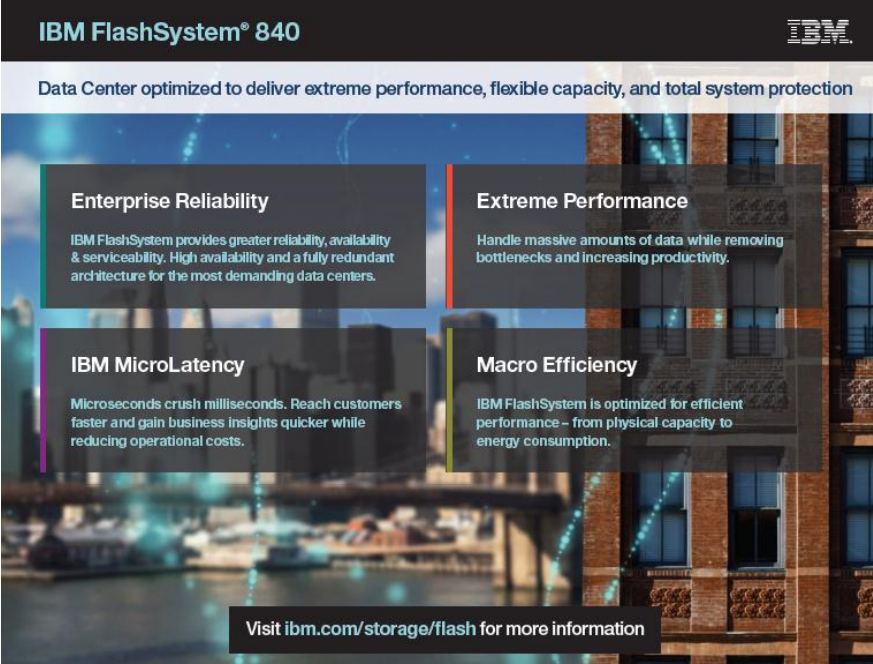
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Question and Answer

The advertisement features a dark header with the product name and IBM logo. Below is a light blue banner with a descriptive sentence. The main body is a collage of four grey boxes with colored borders (green, orange, purple, and yellow) containing key benefits. The background is a blurred image of a city skyline with a river and bridge, overlaid with glowing blue data lines.

IBM FlashSystem® 840 

Data Center optimized to deliver extreme performance, flexible capacity, and total system protection

Enterprise Reliability

IBM FlashSystem provides greater reliability, availability & serviceability. High availability and a fully redundant architecture for the most demanding data centers.

Extreme Performance

Handle massive amounts of data while removing bottlenecks and increasing productivity.

IBM MicroLatency

Microseconds crush milliseconds. Reach customers faster and gain business insights quicker while reducing operational costs.

Macro Efficiency

IBM FlashSystem is optimized for efficient performance – from physical capacity to energy consumption.

Visit ibm.com/storage/flash for more information

