IBM All-Flash Solutions Built with IBM Spectrum

Spectrum Suite
VersaStack

Bob Condon
IBM Global Sales Leader, Storwize and VersaStack
What did IBM Storage announce on August 23?

New IBM all-flash and software-defined solutions to accelerate applications and drive efficiency for on-premises and hybrid cloud

- IBM Storwize V7000F and Storwize V5030F
- IBM FlashSystem V9000
- IBM Storwize V7000 Gen2+
- EMC Migration Program
- IBM SAN Volume Controller (SVC)
- IBM Spectrum Virtualize as software

A common software base, enabling enterprise-class storage services for heterogeneous workload virtualization, while improving CapEx profile, and driving down TCO.

Planned GA: September 9
Why IBM Storwize All-Flash and FlashSystem V9000?

Storage virtualization is the number one technology for improving efficiency (reduced capital and/or operating costs) of primary data storage infrastructure.

Flash-based storage has experienced explosive adoption rates.

Given their success and all the benefits they bring individually, integrating flash and virtualization in one storage platform is an unbeatable combination.

IBM Storwize & FlashSystem storage, built with IBM Spectrum Virtualize offer unparalleled value by assimilating and pooling storage resources creating a data center hybrid solution, delivering superior performance, functionality and management at a fraction of the cost of other solutions.

3 Best Kept Secrets of the Storage Economy: https://www.youtube.com/watch?v=ArZYomYE-Ag
IBM Storwize Whiteboard: https://youtu.be/zx0PL0dL6nl
Discovering the IBM Turbo Compression effect with IBM Storwize: https://www.youtube.com/watch?v=USrhI32RM1k

* ESG Solution Showcase: Primary Storage Data Reduction Trends, June 2016
External Enterprise Storage Forecast

2015–2020 Revenue ($B) with Growth (%)

Selected Segment Growth Rate

- All HDD array CAGR -11.2%
- Hybrid flash array CAGR 1.9%
- All-flash array CAGR 21.4%

Total Market CAGR 0.3%

Source: IDC, July 2016
The Evolution of AFAs

Dedicated application deployment 2011 - 2014
- Performance
- Reliability

Mixed workload consolidation 2014 -
- Enterprise data services
- Increased capacity
- Datacenter integration

AFAs evolving to become the general purpose enterprise storage platform

AFAs will drive over 70% of all primary storage revenue by 2020
# The Right Flash for the Right Workload

## Key Attributes

<table>
<thead>
<tr>
<th>Virtual Storage Infrastructure</th>
<th>Grid Scale Cloud Storage</th>
<th>Big Data Storage</th>
<th>Business Critical Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Heterogeneous Enterprise-class Data Services</td>
<td>• Cloud-optimized (QOS, Multi-Tenancy)</td>
<td>• Multi-protocol support</td>
<td>• z/OS Support</td>
</tr>
<tr>
<td>• Dynamic Data Migration</td>
<td>• Predictable High Performance with Data Reduction Technologies (including deduplication)</td>
<td>• Policy-driven tiering</td>
<td>• High Performance</td>
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<tr>
<td>• Multi-Vendor Management</td>
<td>• Ease-of-management</td>
<td>• Single namespace data ocean</td>
<td>• Highest Availability</td>
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<tr>
<td>• Data Reduction</td>
<td></td>
<td>• High-performance file storage</td>
<td>– z/OS (GDPS)</td>
</tr>
<tr>
<td>• Multi-site active-active</td>
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<td>– Power HA</td>
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</tbody>
</table>

## Typical Workloads, Applications & Use Cases

- Traditional structured workloads
  - OLTP
  - Data Warehousing w/ Oracle, DB2, SQL Server, MySQL, SAP, SAS
  - Analytics

- Large-scale distributed block workloads & applications
  - VDI
  - SAP (Oracle)
  - Exchange
  - VMware / KVM server environments
  - CSPs (Mixed workloads, Multi-tenancy)
  - Hybrid cloud architectures

- Distributed file/object
  - Hadoop
  - Media Streaming
  - SAS
  - Spark
  - HPC
  - Content Collaboration
  - High-performance backup target

## Key Competitors

- EMC XtremIO, HP 3PAR, EMC Unity, NetApp FAS, Pure Storage
- HP 3PAR, NetApp SolidFire, Pure Storage, Pure Storage Flash Blade
- EMC Isilon, NetApp FS, EMC DSSD
- IBM DS8888
- IBM FlashSystem 900 w/ IBM Spectrum Scale
  - WI – Performance, Endurance
- IBM DeepFlash 150 w/ IBM Spectrum Scale
  - RI - Capacity, Density, Economy
- IBM FlashSystem V9000
- Storwize V7000F
- Storwize V5000F
- FlashSystem A9000
- FlashSystem A9000R
- Storwize V7000
- Storwize V5000F
- FlashSystem A9000
- FlashSystem A9000R
- IBM Storage
- IBM CONFIDENTIAL
- IBM Systems
IBM All-Flash Solutions
The foundation for cloud and cognitive business

IBM FlashCore™ Technology Optimized

FlashSystem A9000
FlashSystem A9000R

Cloud service providers
• Full time data reduction
• Workloads: Cloud, VDI, VMware

Large deployments
• Full time data reduction
• Workloads: Mixed and cloud

Improved
FlashSystem V9000
Storage services and selectable data reduction

Improved
Storwize V7000F
Mid-Range

Improved
Storwize V5030F
Entry / Mid-Range

Improved
DS8888
High End Server
- Mainframe - Power

DeepFlash 150
All Flash for Big Data
- High capacity - High density

Announced July 26

FlashSystem 900
All flash array for application acceleration
• Extreme performance
• Targeting database acceleration & Spectrum Storage booster

IBM / Business Partner Use Only
IBM All-Flash Solutions Built with IBM Spectrum Virtualize Software

All-flash and hybrid solutions built on IBM Spectrum Virtualize software virtualize external storage under single management, extending rich data services to externalized capacity to reduce both cap-ex and op-ex.
New IBM Storwize V5030F
Low cost flash for entry-level and mid-sized workloads

**AFFORDABLE**
- All-flash solution at entry level price
- New flash drive options for lower deployment cost: 1.92TB and 3.84TB Preview of 7TB & 15TB flash drives

**FEATURE RICH**
- Intuitive user interface
- Asynchronous Replication
- Synchronous Replication
- VMware integrated
- Linked to OpenStack
- 600+ Storwize API

**EFFICIENT**
- Lower TCO with flash-optimized compression
- Improve utilization by 2X with virtualization support for almost 400 systems
- Maximize storage efficiency with thin provisioning and snapshots
- Flash optimized with Real-Time Compression, distributed RAID and multi-layer write caching

**DEPENDABLE**
- Five 9’s availability
- Protect data from disclosure with encryption for internal and virtualized storage
- Get highest levels of data protection and availability with remote site replication options and IBM HyperSwap
New IBM Storwize V7000F
Cost optimized flash for heterogeneous environments

**FAST**
- More powerful hardware platform with 45% improved performance of previous Storwize V7000F
- RtC with Compression accelerator card
- Increase the data storage of flash by 4X with new flash drive options: 1.92TB and 3.84TB, preview of 7TB & 15TB flash drives

**FEATURE RICH**
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**EFFICIENT**
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**DEPENDABLE**
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New IBM FlashSystem V9000
Unmatched performance for critical applications

**ULTRA FAST**
- Flash-optimized array for virtualizing the tiered enterprise data center
- With IBM FlashCore technology: combine high-performance, ultra-low latency, and extreme reliability with a rich set of storage features and selectable data reduction
- More powerful hardware platform with up to 30% improved performance*

**EFFICIENT**
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- Improve utilization by 2X with virtualization support for almost 400 systems
- Maximize storage efficiency with thin provisioning and snapshots
- Flash optimized with Hardware-Assist Real Time Compression, distributed RAID, and multi-layer write caching

**FLEXIBLE**
- Intuitive user interface
- Asynchronous Replication
- Synchronous Replication
- VMware integrated
- Linked to OpenStack
- 600+ Storwize API
- Supports hybrid offering with up to 20 expansion enclosures
- New SFF enclosure available with 1.92TB and new 3.84TB flash drives (7TB and 15TB preview)

**DEPENDABLE**
- IBM FlashCore technology with IBM Variable Stripe RAID™ protection
- Five 9’s availability
- Protect data from disclosure with encryption for internal and virtualized storage
- Get highest levels of data protection and availability with remote site replication options and IBM HyperSwap

*Compared to previous model.
IBM All-Flash Solutions with Award-Winning IBM Spectrum Virtualize
Enterprise-Class Storage Capability

Improving data value
- Real-time Compression
- External virtualization
- Easy Tier
- Nondisruptive data migration

Increasing data security
- Encryption
- Distributed RAID
- HyperSwap
- Remote mirror
- FlashCopy

Enhancing data simplicity
- GUI
- Virtualization
- Thin provisioning
## Client Value Proposition

<table>
<thead>
<tr>
<th>IBM Storwize Capability</th>
<th>Business Value</th>
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<tbody>
<tr>
<td>Increase utilization up to double by pooling resources</td>
<td>Cut storage acquisition costs in half</td>
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<tr>
<td>Transparently virtualize almost 400 storage systems</td>
<td>Save migration costs up to $1K/TB, avoid costly downtime</td>
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<tr>
<td>Optimize data up to 5x with no performance degradation</td>
<td>Buy up to 5x less storage with the same or better performance…Guaranteed*</td>
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<tr>
<td>Balance performance and cost using analytics to match data activity and media cost</td>
<td>Buy what you need, not what someone wants to sell you</td>
</tr>
<tr>
<td>HyperSwap, optimized replication and snapshots</td>
<td>Enterprise business continuity and data protection features at a midrange price</td>
</tr>
<tr>
<td>Encryption</td>
<td>Improve data security on any supported storage</td>
</tr>
<tr>
<td>Award winning GUI</td>
<td>Manage more data with less time and resources</td>
</tr>
<tr>
<td>Buy it your way: entry, data center scale-out, ultra low latency, or all software</td>
<td>Buy the size, shape and flavor that best suits your business needs</td>
</tr>
<tr>
<td>Buy smarter storage…improve performance, functionality, manageability and reduce TCO</td>
<td>Lifetime management can be 8x acquisition cost. Storwize delivers enterprise class function with up to 73% less management cost than EMC</td>
</tr>
</tbody>
</table>

* IBM offers 2 optimization guarantees. One up to 2x capacity no question asked…one up to 5x capacity with analysis of customer data
Buying Decision: Keep or Decommission Current Infrastructure

**Decommission**
- Nondisruptive migration
- Lab services implementation*
- IBM trade-in program**
- Purchase less using compression
- Lower cost: Buy 2 get 1 free flash

**Keep**
- Inherit Storwize functionality
- Lab services implementation*
- Purchase less using compression
- Lower cost: Buy 2 get 1 free flash

*With $80,000 or more system  
**For VNX systems
IBM Storwize financing from IBM Global Financing
Replace upfront costs with affordable monthly payments

Select your payment option

- 12 month 0% interest payment plan
- 36 month Fair Market Value leasing for lowest monthly payment*
- Low rate financing available for other terms with low or no upfront payments

*Hardware only, loan for sw/svc
IBM Global Financing offerings are provided through IBM Credit LLC in the United States, IBM Canada Ltd. in Canada, and other IBM subsidiaries and divisions worldwide to qualified commercial and government clients. Rates and availability are based on a client’s credit rating, financing terms, offering type, equipment type and options, and may vary by country. Some offerings are not available in certain countries. Other restrictions may apply. Rates and offerings are subject to change, extension or withdrawal without notice.

Learn More
Under embargo until announced
IBM Spectrum SDS - Get it your way

Software

Cloud service

Appliance
IBM Spectrum Storage Family
Proven Technology, Open Standards, Modular Adoption

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<th>IBM Spectrum Control</th>
<th>Analytics-driven hybrid cloud data management to reduce costs by up to 73%</th>
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<tr>
<td>IBM Spectrum Protect</td>
<td>Optimized hybrid cloud data protection to reduce backup costs by up to 53 percent</td>
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<tr>
<td>IBM Spectrum Archive</td>
<td>Fast data retention that reduces TCO for active archive data by up to 90%</td>
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<tr>
<td>IBM Spectrum Virtualize</td>
<td>Virtualization of mixed block environments stores up to 5x more data</td>
</tr>
<tr>
<td>IBM Spectrum Accelerate</td>
<td>Enterprise block storage for hybrid cloud deployed in minutes instead of months</td>
</tr>
<tr>
<td>IBM Spectrum Scale</td>
<td>High-performance, highly scalable hybrid cloud storage for unstructured data driving cognitive applications</td>
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Family of Storage Management and Optimization Software

- Control
- Protect
- Archive
- Virtualize
- Accelerate
- Scale

Any Storage
FlashSystem
Private, Public, or Hybrid Cloud
A new licensing model for IBM Spectrum Storage

Provides unlimited access to IBM’s comprehensive set of software-defined storage tools with convenient per-TB pricing
VersaStack – Scalable Storage Options

IBM All-Flash and Hybrid Storage arrays

- **Storwize V5000/V5030F w/UCS Mini**
- **Storwize V7000/V7000U V7000F w/UCS**
- **FlashSystem V9000/900 w/UCS**

**Entry to Mid-Size Business**
**Medium to Large Enterprise**
**Highest Levels of Performance**

Storage built with IBM Spectrum Virtualize software
VersaStack – Delivers faster ROI and lower TCO

• Efficient use of computing, networking, and storage resources with **up to 5x** more data storage with IBM Real-time Compression\(^1\)
  
• **84%** reduced provisioning times\(^2\)

• **293%** return on investment with ~4 month payback period\(^4\)

• **10x** performance acceleration with FlashSystem\(^1\)

• **61%** reduced management cost due to unified management by UCS Director\(^2\).

• Automated data placement and tiering with IBM Easy Tier feature.

• **33%** lower TCO than build your own

“VersaStack is a perfect fit for big data, cloud solutions and on-site virtualization”

*i-Virtualize*
VersaStack – A Worldwide Success

**Bandhan Financial Launches a Full Fledged Bank Quickly**

"Microfinance with VersaStack"

"Versatile, agile and cost-effective platforms allow us to reach our target group."

**Dutch Cloud embraces VersaStack™**

"85% Reduction in cloud solution roll-out"

**Henry Mayo Newhall Hospital**

"6 weeks order to operational"

**JJ Haines**

"30% reduction in time previously spent on IT management"

**ALPIQ Energy Powers Switzerland**

"VersaStack™ Powers ALPIQ Energy"

"The hosted high performance workload is massively parallel and enterprise ready."

**HALKBANK - Banking on the future with VersaStack™**

"50% Reduction in cost of design, deployment and management costs"

**GRUPO IBERSNACKS Runs SAP**

"Chipping away at expenses with VersaStack™"