



**IBM Storwize All-Flash**  
**IBM FlashSystem V9000**  
**IBM Storwize V7000 Gen2+**  
**IBM SAN Volume Controller (SVC)**  
**IBM Spectrum Virtualize Software**  
**IBM Spectrum Protect Copy Data  
Management**

**Flexible solutions designed for the cognitive business**



# What is IBM announcing on August 23?

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

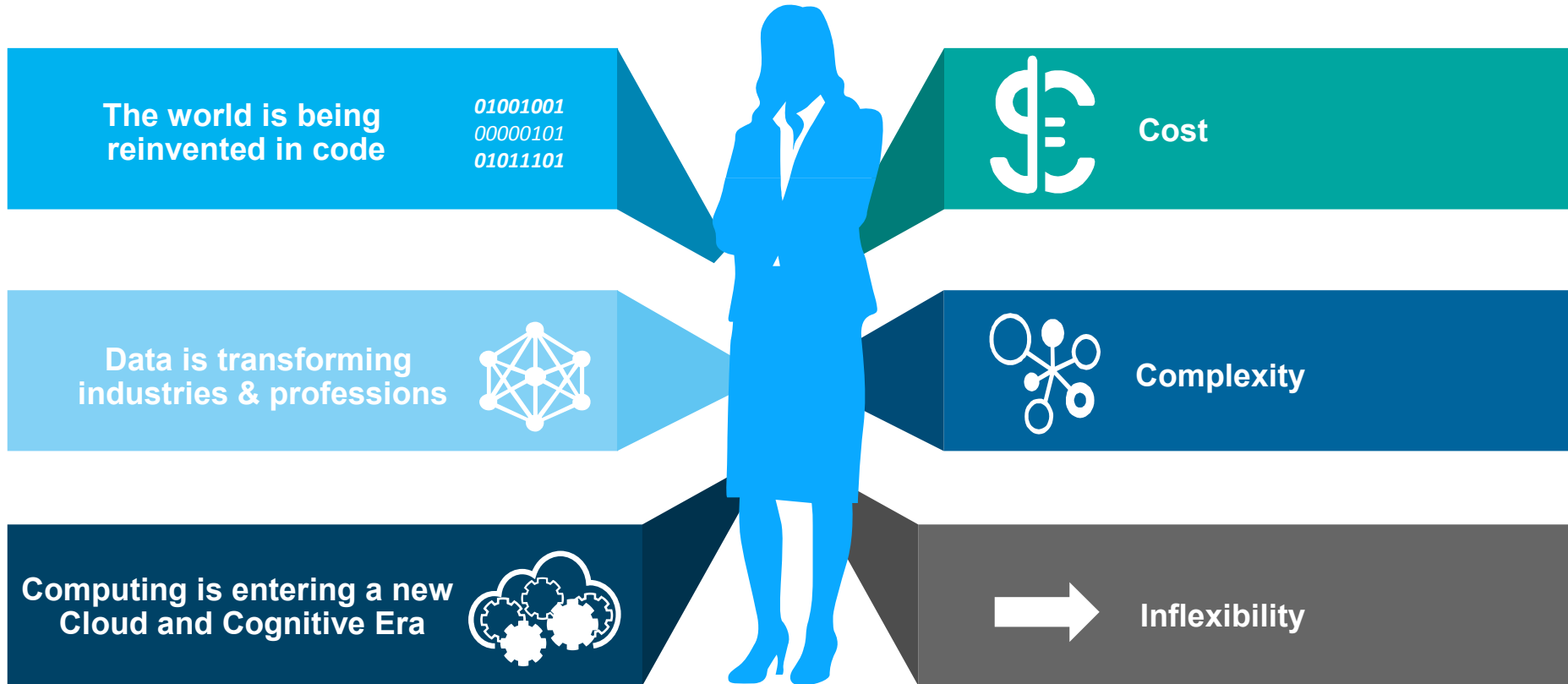
- **IBM Storwize All Flash : V7000F and V5030F**
- **IBM FlashSystem V9000**
- **IBM Storwize V7000 Gen2+**
- **IBM SAN Volume Controller (SVC)**
- **IBM Spectrum Virtualize Software**

**GA: 9/9**

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

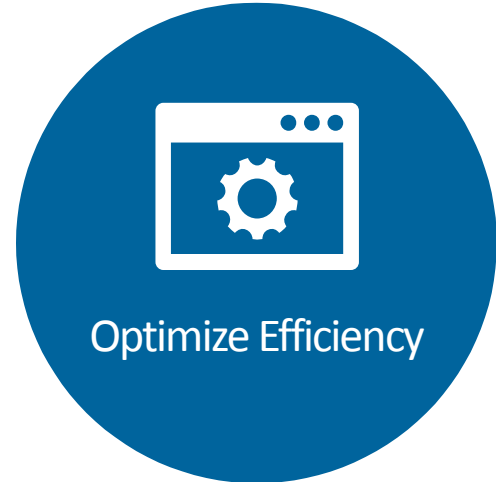
# Business and Data in a Cognitive World

*Traditional Storage Approaches Do Not Meet The Needs of Your Cognitive Business*



# IBM Storage & Infrastructure Offers New Approaches for the Cognitive & Cloud Era

*Gain competitive advantage by harnessing your oceans of data*



Flash

IBM Spectrum Storage

IBM Spectrum Computing, Optimized Storage Solutions

# IBM All-Flash Solutions

The foundation for cloud and cognitive business

## IBM FlashCore™ Technology Optimized

### FlashSystem A9000



#### Cloud service providers

- Full time data reduction
- Workloads: Cloud, VDI, VMware

### FlashSystem A9000R



#### 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

### DS8888



#### High End Server

- Mainframe
- Power

### DeepFlash 150



#### All Flash for Big Data

- High capacity
- High density

VersaStack™  
Solution  
by Cisco and IBM

### FlashSystem 900





All flash array for application acceleration



- Extreme performance
- Targeting database acceleration & Spectrum Storage booster

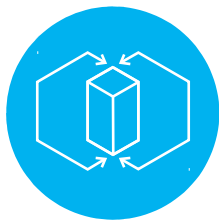
Announced  
July 26

# The Right Storage for the Workload

<i>Environments</i>	Virtual Storage Infrastructure	Grid Scale Cloud Storage	Big Data Storage	Business Critical Storage
<i>Typical Workloads</i>	Distributed block workloads <ul style="list-style-type: none"> <li>• SQL Server</li> <li>• MySQL</li> <li>• Traditional IT applications</li> </ul>	Large-scale distributed block workloads <ul style="list-style-type: none"> <li>• VDI</li> <li>• Hybrid cloud deployment</li> <li>• CSPs (Mixed workloads, Multi-tenancy)</li> <li>• SAP</li> <li>• VMware</li> </ul>	Distributed file or object workloads <b>Scale:</b> Hadoop, Media Streaming, SAS, Spark, HPC, Content Collaboration, High-performance backup target <b>Cleversafe:</b> Content Repositories, Active Archive	<ul style="list-style-type: none"> <li>• High-availability / Low RTO applications</li> <li>• High-performance OLTP</li> <li>• Real time analytics</li> <li>• High-performance data warehouse</li> </ul>
<i>IBM Systems</i>				
<i>Performance</i>				
<i>Capacity</i>				
<i>Built with</i>	 IBM Spectrum Virtualize	 IBM Spectrum Accelerate	 IBM Spectrum Scale	 Cleversafe
<i>Key Attributes</i>	<ul style="list-style-type: none"> <li>• Heterogeneous Enterprise-class Data Services</li> <li>• Dynamic Data Migration</li> <li>• Multi-Vendor Management</li> <li>• Data Reduction</li> <li>• Multi-site active-active</li> </ul>	<ul style="list-style-type: none"> <li>• Cloud-optimized (QOS, Multi-Tenancy)</li> <li>• Predictable High Performance w/ Data Reduction (including deduplication)</li> <li>• Ease-of-management</li> </ul>	<b>Scale:</b> <ul style="list-style-type: none"> <li>• Multi-protocol support</li> <li>• Policy-driven tiering</li> <li>• Single namespace data ocean</li> <li>• High-performance file storage</li> </ul> <b>Cleversafe:</b> <ul style="list-style-type: none"> <li>• Global data repository w/ multi-site load-balancing</li> <li>• Simple administration</li> </ul>	<ul style="list-style-type: none"> <li>• z/OS Support</li> <li>• High Performance</li> <li>• Highest Availability                             <ul style="list-style-type: none"> <li>• z/OS (GDPS)</li> <li>• Power HA</li> <li>• Power i HA</li> </ul> </li> <li>• Three-site/Four-site</li> <li>• Six 9's Reliability</li> <li>• Enterprise Scalability</li> </ul>
<i>Key Competitors</i>	HP 3PAR EMC Unity NetApp FAS Pure Storage	EMC XtremIO HP 3PAR NetApp SolidFire Pure Storage	EMC Isilon NetApp FS	EMC VMAX Hitachi G Series

# All-flash Virtualize Solutions

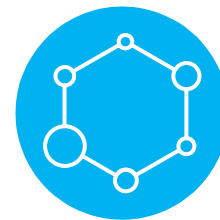
*The Right Solution For Flash Driven Application Performance*



**Accelerate critical business insight** with **all-flash performance** to improve core application response time



**Drive down the Total Cost of Ownership** by increasing the flash capacity by **over 4x<sup>1</sup>** while delivering cost-efficient deployment, space savings and vastly improved OpEx



**Improve your business agility** with **unique heterogeneous data services** that maximize efficiency and flexibility for almost 400 storage arrays



*The new IBM Storwize all-flash models demonstrate IBM's commitment to maintaining leadership in the mid-range and enterprise storage markets. IBM Storwize has been a very successful solution for our partners and their customers. Thanks to the new enhancements, including new flash drive options, it's clear that IBM Storage solutions will continue to be a marketplace leader.*



**Scott Zahl, VP and GM of Advanced Computing Solutions**  
Ingram Micro

<sup>1</sup> Planned availability by 4Q16, based on total capacity

# New IBM Storwize V5030F

*Low cost flash for entry-level and mid-sized workloads*

## AFFORDABLE

- All-flash solution at entry level price
- Lower deployment cost with new flash drive options: **1.92TB, 3.84TB, preview of 7TB & 15TB flash drives**
- Unique hardware upgrade path

## 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 **+380 arrays**
- 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 up to **45% improved performance\*** with flash drives
- Increase the data storage of flash by **4X** with multiple capacity flash drive options: **1.92TB, 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 **+380 arrays**
- Maximize storage efficiency with thin provisioning and snapshots
- Unique hardware upgrade path
- **Flash optimized with Hardware- Assist 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 FlashSystem V9000

*Enterprise class 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\***

## FLEXIBLE

- Intuitive user interface
- Asynchronous/ Synchronous Replication
- VMware integrated
- Linked to OpenStack
- 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)**



## EFFICIENT

- Lower TCO with flash-optimized compression
- Improve utilization by **2X** with virtualization support for **+380 arrays**
- Maximize storage efficiency with thin provisioning and snapshots
- **Flash optimized with Hardware-Assist Real Time Compression, distributed RAID, and multi-layer write caching.**

## DEPENDABLE

- IBM FlashCore technology with IBM Variable Stripe RAID™ protection
- 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 SAN Volume Controller

*Flexible virtualization for data center consolidation*

## FLEXIBLE

- Combine storage capacity from multiple vendors for centralized management
- **Up to 2x number of 10Gbps ethernet ports for server and storage attach**
- Protect investments by clustering with older generation hardware

## FEATURE RICH

- Intuitive user interface
- VMware vMotion support
- VMware integrated
- Linked to OpenStack and SoftLayer
- REST API



## EFFICIENT

- Increase effective storage capacity up to five times with hardware-accelerated Real-time Compression
- Pools the storage capacity of multiple storage systems on a storage area network (SAN)
- Thin provisioning and snapshots maximize storage efficiency
- More powerful hardware platform with **30% improved performance\***
- **4x more cache to improve application responsiveness**

## DEPENDABLE

- Non-disruptive data migration
- Five 9's availability
- HyperSwap
- Encryption
- Distributed RAID

# IBM Spectrum Virtualize transforms storage



## Improving data value

Reducing the cost of storing data by increasing utilization and using compression, and accelerating applications to speed business insights



## Increasing data security

Helping protect data from disclosure, and enabling a complete high availability strategy including data and application mobility and full DR protection



## Enhancing data simplicity

Data strategy independent of infrastructure choice with tightly integrated functionality and consistent management across heterogeneous storage

# IBM Spectrum Virtualize Software

- Continuing evolution of IBM storage software from system-based to software offerings
- Targeted to Service Providers (MSPs/ CSPs) who wish to deploy Software on commodity Intel HW, and lower their overall infrastructure costs through Storage Optimization.
- For all clients, IBM Spectrum Virtualize software provides a single point of management in hybrid cloud environments
- Lower cost, with agility & flexibility: SPs can virtualize servers and virtualize storage – all on the same Intel hardware without incurring costs/limitations of appliances
- On-ramp to hybrid cloud: Low Cost DRaaS without the need for duplicate storage at secondary site or at cloud data center



# IBM Spectrum Virtualize Software

- **Will be available for x86 servers**
  - Initially supports Lenovo x3650 M5 servers
  - Statement of direction for Cisco, Supermicro, HP
  - Statement of direction for hypervisor or container support
  - Statement of direction for complete iSCSI networking
- **Great choice for service providers and others requiring more flexibility in hybrid cloud deployment**



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# IBM Spectrum Virtualize Software Capability

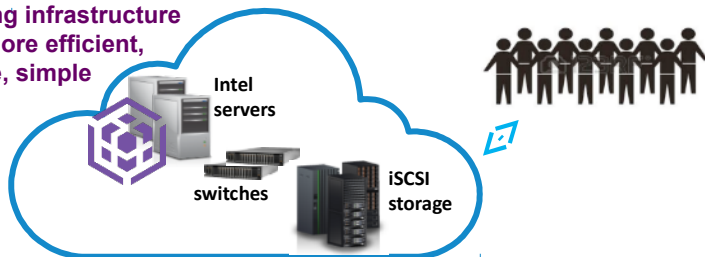
- **All SVC/Storwize family external storage function supported**
  - Virtualization, local and remote replication, compression, encryption, Easy Tier
- **All SVC/Storwize interoperability supported**
  - Storage system, server, and ISV support (VMware, Microsoft, data protection software, etc.)
  - Integrated support for VMware including SRM at no additional charge
- **Encryption and compression in software only**
- **Clustering only with other servers running IBM Spectrum Virtualize software**
  - Similar to today: no clustering with IBM SVC, Storwize, FlashSystem V9000
- **Remote replication between IBM Spectrum Virtualize software and other family systems**
  - Enables different systems and storage at each site
- **Call home enabled for software errors**
  - Will not call home for hardware errors

# Target Use Cases for IBM Spectrum Virtualize Software

## Optimize CSP/MSP Cloud Data Centers

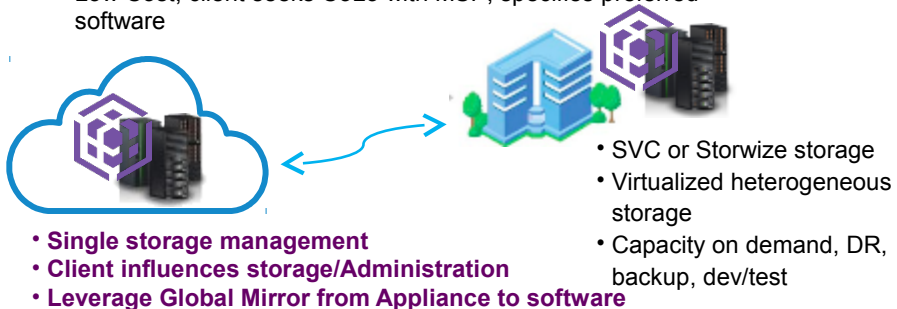
Flexible & agile deployment of infrastructure to fit “XaaS” business. Typically not an IBM client today

Existing infrastructure now more efficient, secure, simple



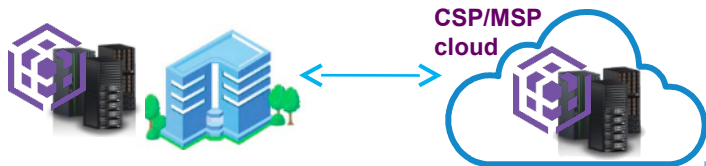
## Optimize CSP/MSP/SO CoLo Cloud Data Centers

Low Cost; client seeks CoLo with MSP; specifies preferred software



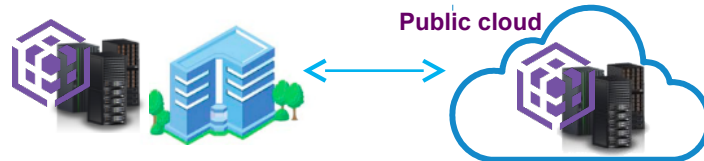
## Hybrid Cloud Option 1: Enterprise IT to CSPs

MSPs/CSPs offering DRaaS gain two benefits: existing SVC client base as potential clients; 2) offer low cost DR with common management



## Hybrid Cloud Option2: Enterprise IT to Public Cloud

Public cloud providers do not need to purchase special purpose appliances; offer low cost DR in public clouds







Virtualization is a key characteristic of cloud infrastructures: it adds flexibility and efficiency to both storage and servers. ATS Group has deployed IBM Spectrum Virtualize in IBM SAN Volume Controller and IBM Storwize systems in more than 130 client engagements. The new ability to implement IBM Spectrum Virtualize software on x86 servers will enable us to build even more flexible and cost-efficient cloud infrastructures to support our clients' cognitive and other workloads. We'll be able to help our clients deploy compute or storage virtualization on commodity Intel servers, just by loading different software. This will benefit our clients—who will get a better private cloud—and enable us to simplify and streamline our services and implementation processes.

**Timothy Conley,**  
**Principal, ATS Group, LLC**



As a trusted advisor and service provider to businesses with mission-critical IT operations, selecting solutions that can provide flexible, reliable, and easy to deploy infrastructure is key for our customers. Whether it's providing an agile private cloud infrastructure where you only pay for the capacity you need, or deploying Disaster Recovery solutions that keep businesses running 7x24, the new IBM Spectrum Virtualize software release that can be deployed on x86 intel servers gives us the ability to offer more flexible and easy to deploy solutions for managed service and cloud environments.

**Kim Quarnström,**  
**CEO, LOAD System AB**



# IBM Spectrum Virtualize Deployments Span Industries

## Finance



## Manufacturing



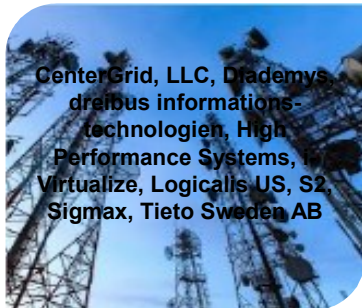
## Healthcare



## Government



## Computer Services



## Telco



## Energy & Utilities



## Education



# IBM Spectrum Virtualize Span ISV solutions



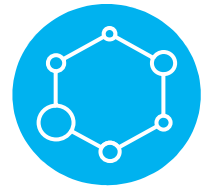
VersaStack™  
Solution  
by Cisco and IBM



# Revitalize your business opportunities

*The IBM All-flash Virtualize solutions combine powerful storage virtualization with a choice of all-flash platforms to revitalize your entire data center.*

- *Optimize data economics with a powerful combination of flash and storage virtualization*
- *Deploy the right all-flash solution to solve your unique business and IT requirements*
- *Revitalize your existing storage with a combination of IBM Spectrum Virtualize and IBM Storwize or IBM FlashSystem*



# Previews

IBM intends to offer a model conversions for Storwize V7000 Model 524 to the new V7000 Model 624

IBM intends to support 7.68TB and 15.36TB Flash Drives in the Storwize V7000 and Storwize V5000 second-generation SFF Models

IBM intends to support 7.68TB and 15.36TB Flash Drives in the SAN Volume Controller Expansion Model 24F

IBM intends to support a new high density expansion for attachment to the Storwize V7000 and V5000 second-generation control models

IBM intends to support a new high density expansion for attachment to the SAN Volume Controller (SVC) Storage Engine Models DH8 and SV1

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# Statements of Direction

IBM intends to enhance IBM Spectrum Virtualize with additional capabilities for flash drive optimization and management. These capabilities are intended to help increase the service life and usability of flash drives, particularly read intensive flash drives. The capabilities are planned to include:

- Data deduplication for workloads and use cases where it complements our existing industry leading compression technology
- Improved flash memory management ("garbage collection")
- Additional flash drive wear management and reporting.

By implementing these capabilities in IBM Spectrum Virtualize, they are planned to be available for IBM Storwize family, FlashSystem V9000, and SAN Volume Controller offerings as well as VersaStack and IBM PurePower systems.

IBM intends to implement support for the SCSI "unmap" command in IBM Spectrum Virtualize, which is designed to reclaim space on thin provisioned volumes that has been deleted by server software.

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# Statements of Direction

IBM intends to deliver additional leading Intel x86 based servers as supported platforms including models from Cisco, Supermicro and HP

As part of our growing support for more flexible and lower cost deployment options, IBM intends to provide the capability to cluster nodes with iSCSI technology

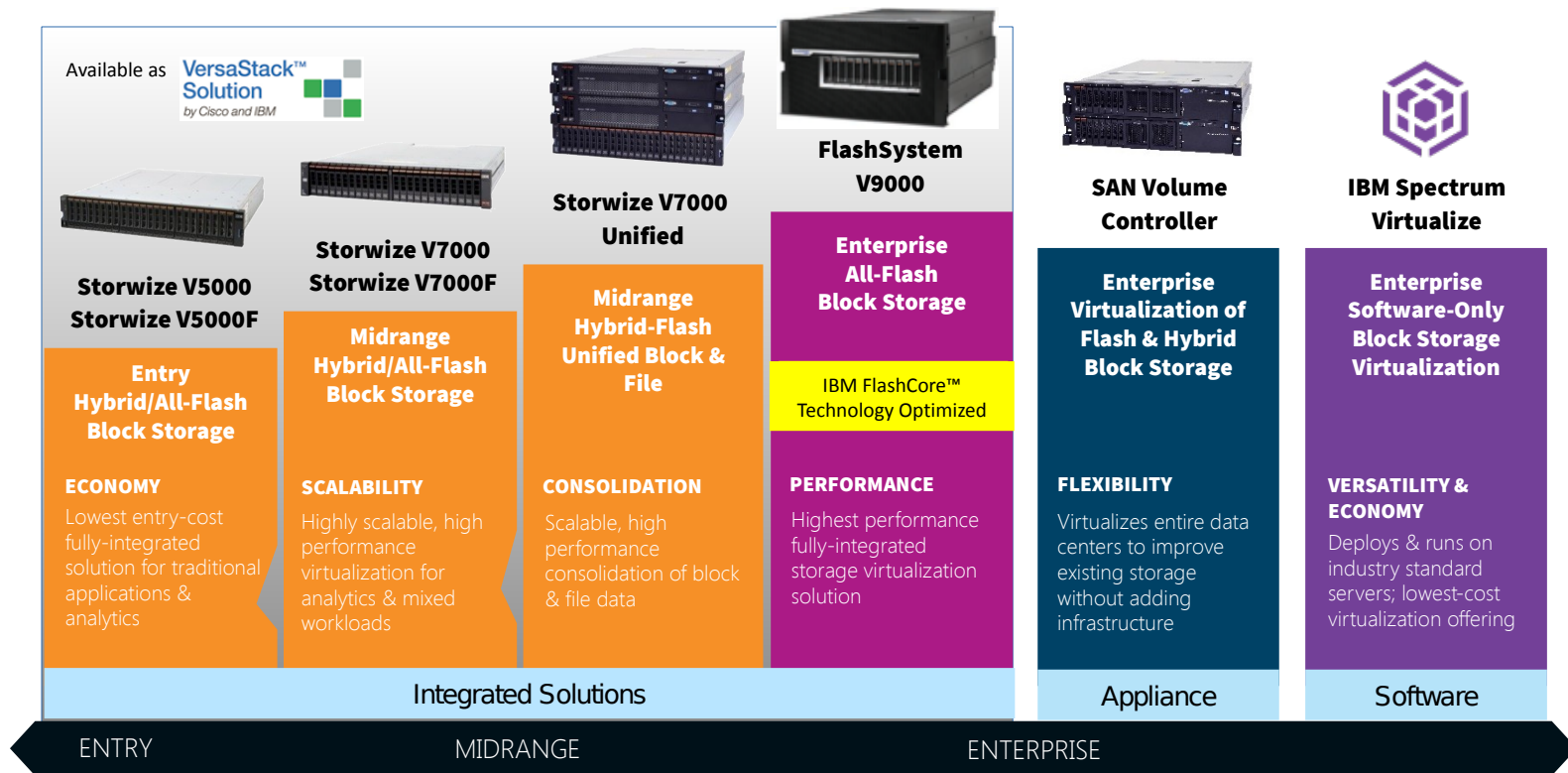
IBM intends to augment bare metal support of Spectrum Virtualize as Software, with the ability to run Spectrum Virtualize as Software in hypervisor and/or container technology

IBM intends to enhance IBM Spectrum Virtualize Software for SVC to extend support for up to 256GB of memory on the new SVC Storage Engine Model SV1 from the current code limit of 64GB of memory per SVC node

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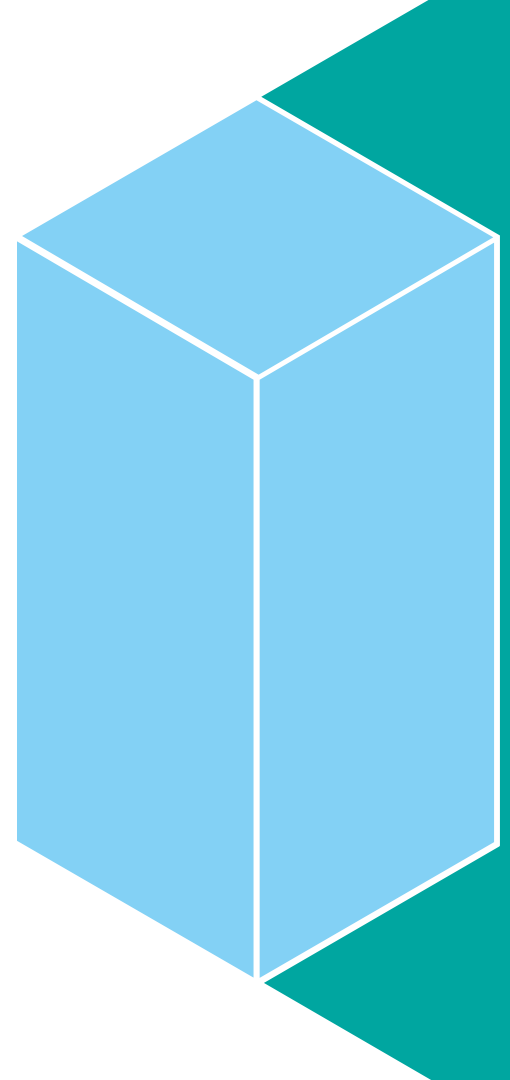
# Virtualized Storage | block migration w/ rich data services in heterogeneous environments

All-flash, hybrid, and software-only 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.**

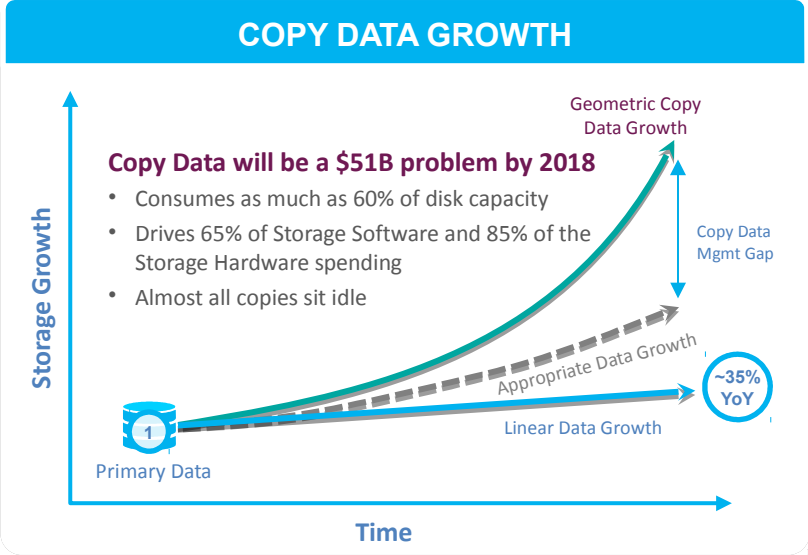




# IBM Spectrum Protect Copy Data Management



# The Challenge: Too Many Copies to Manage Easily

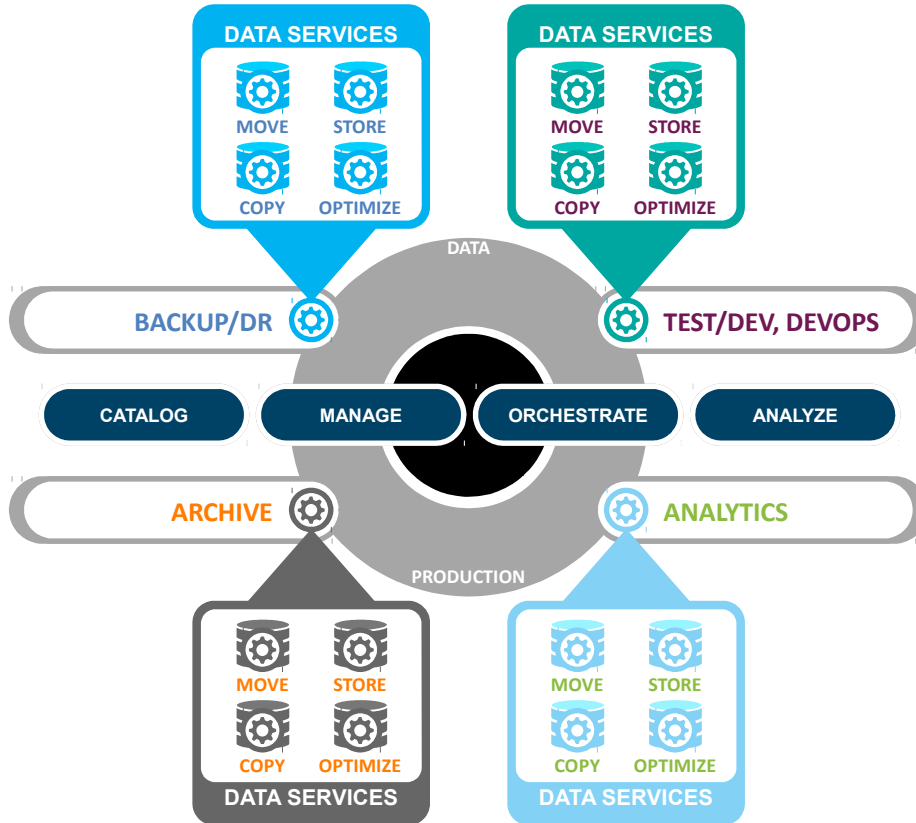


- Big Data workload (Analytics) [1]
- Compliance workload (Archive) [1]
- Resilient workload (Mirror) [1]
- Non production workload (Test/Dev or DevOps) [6]
- Resilient workload (Disk Backup) [23]
- Recovery workload (Tape Backup) [23]
- Primary Data [1]



**Result: Increased cost and complexity and no additional business value**

# Multiple Solutions – Multiple ‘Common’ Services



- Many use cases
- Unique needs depending on use case and user needs
- All with common, overlapping storage services
- Customer solutions complex to deploy
- Costly to implement & manage
- Results in data silos
- Creates software, hardware and

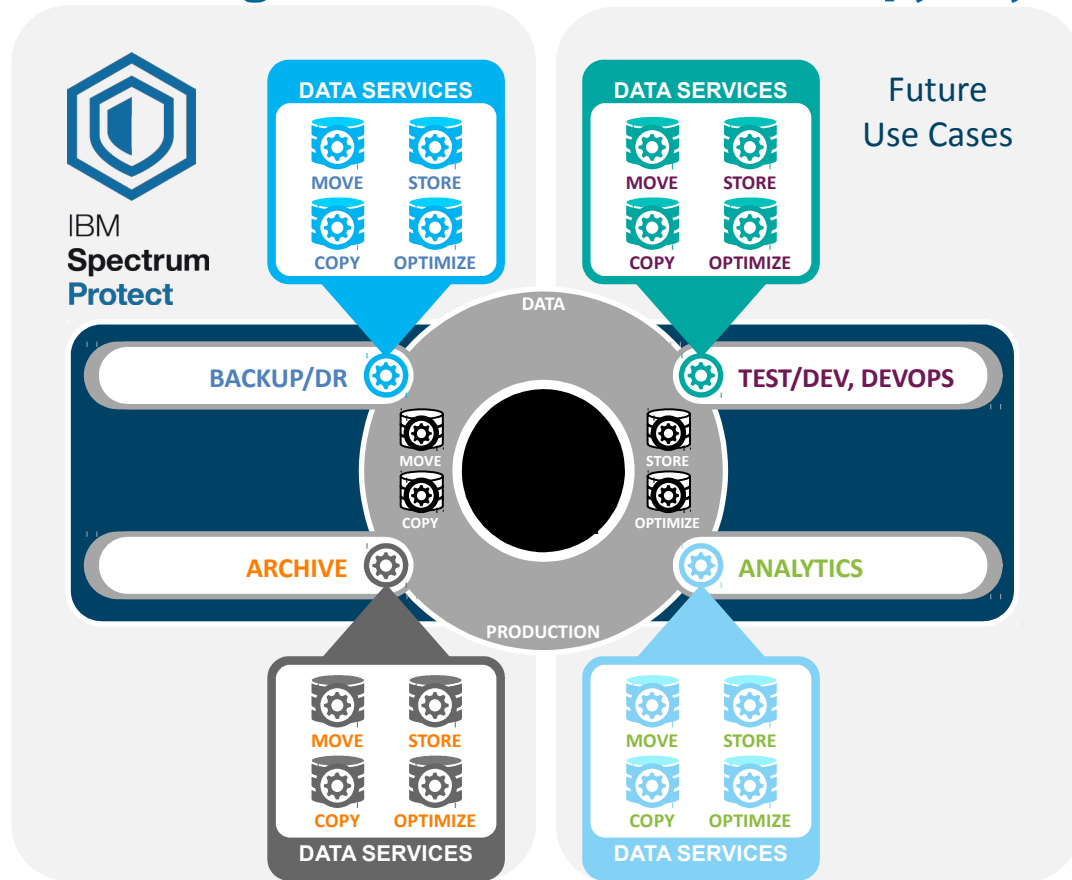
## Required:

### Single platform to:

- Catalog
- Manage
- Orchestrate
- Analyze

All copy data across all use cases

# Copy Data Management Solution for Backup, DR, and Archive



## IBM Spectrum Protect Copy Data Management

- Announcing 8/29/16 at VMworld
- Generally Available 9/20/16
- The first half of our CDM strategy
  - CDM appliance coming in Q4
- Available as a standalone product
- Powered by Catalogic ECX technology

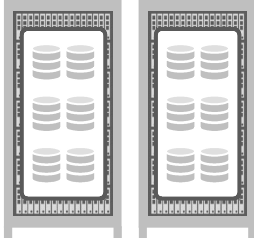
# Copy Data Management Platform

## Your Infrastructure



vmware  
Virtual snapshot and replication capabilities

AND/OR



IBM: Storwize, SVC, v9000, VersaStack and Flash Copy Manager

NetApp: 7-Mode, Clustered ONTAP, Cloud ONTAP, FlexPod

## CDM

Copy Data Management Platform



IBM  
Spectrum  
Protect  
Copy Data  
Management

Catalog, Manage, Orchestrate and Analyze Copy Data across your Enterprise and Cloud

Downloadable VM Agentless

LEVERAGE

## Use Cases

### Copy Data Orchestration & Automation

- Automated DR and Enhanced Recovery
- Orchestration and Automation of application consistent Snapshots and VMware VADP Copy Images

### Copy Data Lifecycle Management

- Efficient management of Copy Data through full lifecycle (Copy Creation, Copy Use, Compliance and EOL), across heterogeneous storage infrastructure
- Eliminate the need for scripting based upon unique APIs per storage platform

### Self-Service for App teams or Admins

- Self-service provisioning as well as Self-Service automated DR.
- App teams gain speed and IT keeps control and gains SLA management

### Copy Data Catalog and Analytics

- Full actionable catalog for Snapshot / File analytics / Protection Compliance
- Search, Report and Analyze

# IBM Spectrum Protect and Copy Data Management – Working Together

Advanced Copy  
Data Management



Copy Data  
Management

**CDM**

- Copy Data Orchestration and Automation
- Copy Data Lifecycle Management
- Self-Service for App teams or Admins
- Copy Data Catalog and Analytics

## SPECTRUM PROTECT



Data Protection Node Replication Snapshots

Data Retention Archive Snapshots



BACKUP/DR



ARCHIVE

Current Copy Data Management Use Cases

IBM Spectrum Virtualize • DS8000 • XIV • Virtual Environments • VersaStack • NetApp • FlashSystem • Storwize • Others via adapters

**INFRASTRUCTURE**

# Benefits of IBM Spectrum Protect Copy Data Management

## Next Generation Data Protection and Disaster Recovery

- Manages near instant snapshot backups and rapid application recovery
- Automates Copy Management
- Enables Hybrid Cloud for storage and DR

## Easy to use

- VM and database administrators (manage their own snapshots without complexity)
- Big data analysts (staging for big data analytics)
- Storage and backup administrators (consolidated snapshot management)

## Easy to try, buy and deploy

- Buy directly from IBM
- Deploys in 15 minutes

**Thank you.**



**ibm.com/systems**

