Business needs

In a data-driven, multicloud world

Greater data collaboration, agility, & cost efficiency

Making highly informed decisions in real time

Accelerating customer service

Developing strategic insights for battling the competition

Recognizing & preventing fraud before it happens
Balancing legacy workloads, VMs, containers, & cloud native

Competitive pressure and headwinds challenge time to value

IT challenges

Oceans of data

Systems that deliver increased capacity, lower latency, greater bandwidth, & easier manageability

Flat or even declining IT budgets

10x growth in data 2016 to 2025
Modern Data Storage & Management

Infrastructure matters!

- Multicloud data availability
- Reliable infrastructure
- NVMe performance
- Solution choices for cost optimization
### Storwize V5000 Family

Lower cost end-to-end storage offerings

**Faster, smarter, more affordable**

- Faster response times at affordable prices
- NVMe-accelerated flash solution
- Built with IBM Spectrum Virtualize

<table>
<thead>
<tr>
<th>Faster, smarter data</th>
<th>Easy data mobility</th>
<th>Affordable without compromise</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Speedometer" /></td>
<td><img src="image2.png" alt="Data Mobility" /></td>
<td><img src="image3.png" alt="Affordability" /></td>
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**Multicloud enabled**

<table>
<thead>
<tr>
<th>Protected and secure</th>
<th>Proven enterprise availability</th>
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<tbody>
<tr>
<td><img src="image4.png" alt="Cloud" /></td>
<td><img src="image5.png" alt="Availibility" /></td>
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</table>

1. I can’t afford to rip & replace my older storage systems at this time!

2. How does V5000E improve performance?

3. Migrations are painful and time consuming.
The IBM Storwize Family delivers unique differentiation to solve clients’ concerns.

1. Rip & Replace
   - Advanced capabilities such as auto-tiering, data reduction, and mirroring bringing new life to older systems
   - No software licenses required, run simply as storage
   - Storage at a lower price point, with greater performance

2. Performance
   - Easy Tier can improve performance up to 3x with 5% of your data on flash
   - Data reduction delivers up to 5x additional capacity on storage you already own

3. Migration
   - Migration is easy and is included in the purchase price
   - Configure and run without IBM intervention
IBM Storwize Family

Compelling reasons to act

Faster, smarter data
- NVMe accelerated
- AI empowered
- Ready for modern workloads

Easy data mobility
- From old systems to new
- Between media types
- Between on-prem and cloud

Affordable without Compromise
- Inclusive software
- Lower CapEx and OpEx
- Cloud-like pricing
Multicloud Enabled
- Build private cloud with the ability to start small and grow
- Pre-tested hybrid multicloud solutions for Data Protection, Business Continuity and Private Cloud
- Public cloud for backup or disaster recovery

Protected and Secure
- Designed for Cyber Resiliency with encryption and cloud “air gap” snapshots
- Integrated with modern data protection solutions
- Peace of mind with comprehensive IBM FlashWatch guarantees

Proven Enterprise Availability
- Six 9s availability
- Maximize uptime with proactive support and predictive analytics delivered from the cloud
- Buy with confidence since IBM Spectrum Virtualize systems are proven in hundreds of thousands of deployments

Compelling reasons to act
IBM Storwize Family

Scalability

- Storwize V5100/F
  1,520 drives 23.4PB / 32PB
- Storwize V7000
  3,040 drives 32PB
- Storwize V5030E
  1,520 drives 23PB / 32PB
- Storwize V5010E
  392 drives 12PB
- Storwize V5030E
  1,520 drives 23PB / 32PB

Performance and Abilities
Storwize V5010E
Entry level system designed to meet clients’ budget requirements

- Designed for budget conscious applications without compromising service, performance or capabilities
- Ideal for edge storage, virtual & containerized environments
- 4x more cache than Storwize V5010 to support growing workloads
- Non-disruptive upgrade to Storwize V5030E
- 2x max IOPS of Storwize V5010
- 10% lower price than Storwize V5010*
- Scale to 12PB of flash in a single system with new high-density 30TB flash drives

* Based on estimated street price for typical config
Storwize V5030E

Designed for more demanding workloads where low cost is still important

- Designed for demanding workloads at affordable prices. Data reduction offers capacity efficiency
- Ideal for edge storage, virtual & containerized environments

- Data reduction (compression and deduplication)
- Scale to 23PB of flash in a single system; scale out to 32PB with 2-way clustering and new high-density 30TB flash drives and high-density flash

- 20% better max IOPS than Storwize V5030
- 15% lower price than Storwize V5030*

*S Based on estimated street price for typical config
General-Purpose NVMe-Based All-Flash Arrays to Dominate Revenue as the Enterprise NVMe Market Develops

This IDC study presents the 2018–2022 forecast for the NVMe-based all-flash array market.

"The NVMe-based all-flash array market will grow very quickly as it cannibalizes revenue from the SCSI-based all-flash arrays that today are dominating primary storage spend," said Eric Burgener, research vice president, Storage. "The rapid growth of new workloads that demand NVMe performance and the fact that the transition to NVMe will be much easier than the transition from spinning disk to persistent flash was over the past decade are two key factors driving the strong growth of this market."

By: Eric Burgener
Research Vice President, Infrastructure Systems, Platforms and Technologies Group

, Jeff Janukowicz
Research Vice President, Solid State Drives and Enabling Technologies

, Natalya Yezhkova
Research Vice President, Infrastructure Systems, Platforms and Technologies Group

https://www.idc.com/getdoc.jsp?containerId=US44265318
How fast is NVMe Drive.
NVMe (Non-Volatile Memory Express) is an interface protocol built especially for Solid State Drives (SSDs). NVMe works with PCI Express (PCIe) to transfer data to and from SSDs.

NVMe enables rapid storage in computer SSDs and is an improvement over older Hard Disk Drive (HDD) related interfaces such as SATA and SAS.
Storwize V5100F & V5100

High-performance end-to-end NVMe at a new, more affordable price point

- NVMe performance at a new, more affordable price point
- For clients needing faster response times and high efficiency while controlling costs
- 9x more cache than Storwize V5030
- High performance data reduction
- Optimized end-to-end NVMe
- IBM FlashCore Modules
- Ready for SCM
- 32 Gbps FC
- 2.4x max IOPS of Storwize V5030F with data reduction
- 10% higher price than Storwize V5030F*
- Scale up to 23PB of flash and scale out to 32PB with 2-way clustering and high-density flash

* Based on estimated street price for typical config
IBM Storwize V5100F, V5100 FlashCore Modules

NVMe accelerated flash solution

- Hardware-assisted data reduction and compression with no performance impact
- Endurance without penalty
- Unequalled NVMe flash capacity per module

- FIPS 140-2 certification
- Supported by IBM FlashWatch guarantee

- 4.8TB, 9.6TB, 19.2TB capacity options
- Up to 5:1 compression
IBM Spectrum Virtualize Storage Systems Portfolio

Delivering six 9’s of availability

**Storwize V5000 Family**
- Lowest AFA starting price

**Storwize V7000 Family**
- Enterprise for Everyone

**FlashSystem Family**
- Large-scale Enterprise

- Storwize V5010E
- Storwize V5030E
- Storwize V5100/F
- Storwize V7000
- FlashSystem 9110
- FlashSystem 9150

**Capability**
- All Flash
- Hybrid

**Performance**
- SAS
- NVMe

**Support**
- Enterprise Class Support
  - IBM install & maintain, w/ TA

**Maintenance**
- 9x5 NBD / WSU (upgradeable to 24x7) / client install & maintain

NBD = Next Business Day
WSU = Warranty Service Upgrade
## Storwize product family

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<tr>
<th>Features &amp; abilities</th>
<th>IBM Spectrum Virtualize Software</th>
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<tr>
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<td>Storage Insights (AI Predictive Analytics and Proactive Monitoring)</td>
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<tr>
<td>FlashSystem 9100 Family</td>
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</table>

| VMware & Container Integration |
| Multi-tenancy                 |
| 3-Site Data Copies (In combination with Spectrum Copy Data Management) |
| Metro/Global Mirror (Remote copy inc. to Cloud) |
| FlashCopy (local copy snapshots) |
| Easy Tier                     |
| Data Migration from >450 supported arrays |

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<th>DRP – Software Only</th>
<th>Data Reduction Pools (Hardware Assist Compression)</th>
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<td>Clustering</td>
<td>HyperSwap</td>
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<tr>
<td>Encryption</td>
<td></td>
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| NVMe Flash and NVMe-oF Host Connections |
| FCMs - Highest Performance NVMe with Compression & encryption |
| External Storage Virtualization |
| Storage Class Memory Capable |

* V5010E can be non-disruptively upgraded to a V5030E
IBM FlashSystem 9100
FlashSystem 9110 and FlashSystem 9150

Dual Active-Active Array Controllers w/NVMe to Flash Media - Dual-ported 2.5” NVMe Flash bays (24)

Flash Core Modules redesigned to 2.5” industry standard form factor
(Includes: HW Compression, HW Encryption and 64 Layer 3DTLC)

**FS9110**
- Dual 8-core processors per controller
- Up to 1.5TB Cache per controller enclosure

**FS9150**
- Dual 14-core processors per controller
- Up to 3 host adapters per controller

- Interface Card Slot (3)
- Tech Port
- 10Gbe Ports (4)
- USB Ports (2)
- 2KW PSU (2)
IBM Storwize V7000 Gen 3

Dual Active-Active Array Controllers w/NVMe to Flash Media - Dual-ported 2.5” NVMe Flash bays (24)

Flash Core Modules redesigned to 2.5” industry standard form factor
(Includes: HW Compression, HW Encryption and 64 Layer 3DTLC)

**V7000 Gen 3**

- dual 10-core processors per controller
- Up to 1.1TB Cache per controller enclosure
- Up to 2 host adapters per controller

- Interface Card Slot (2)
- Tech Port
- 10GbE Ports (4)
- USB Ports (2)
- 2KW PSU (2)
IBM Storwize V5100

Dual Active-Active Array Controllers w/NVMe to Flash Media - Dual-ported 2.5” NVMe Flash bays (24)

Flash Core Modules redesigned to 2.5” industry standard form factor
(Includes: HW Compression, HW Encryption and 64 Layer 3DTLC)

V5100
one 8-core processors per controller

Up to 576 GB Cache per controller enclosure

Up to 2 host adapters per controller

Interface Card Slot (2) Tech Port 10GbE Ports (4) USB Ports (2) 2KW PSU (2)
Thank you

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