IBM System Storage DS8800 Overview

Tran Thanh Tu
tutt@vn.ibm.com
Storage FTSS
IBM Vietnam
Agenda

- Introducing new DS8800 model
- What’s new and what’s not
- Dramatic efficiency and performance benefits
- Additional enhancements
- Storage and security management enhancements
# Storage Efficiency

Getting the most from your storage resources

<table>
<thead>
<tr>
<th>Tiered Storage</th>
<th>Consolidated Storage</th>
<th>Virtualized Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build out an <strong>automated tiered storage</strong> architecture to maximize performance and reduce operating expenses</td>
<td><strong>Consolidate storage</strong> to <strong>reduce administrative costs and improve cycle time</strong></td>
<td><strong>Quickly provision storage</strong>, support virtualized servers and increase flexibility</td>
</tr>
</tbody>
</table>

- Efficiently use **solid state disk** to increase performance up to 300% on critical apps
- Reduce costs by **migrating less critical data** to less expensive media

- **Scale out** storage to manage billions of files from a single, consolidated NAS system
- **Scale up** storage with systems that can scale to store petabytes of structured data

- **Increase utilization** of existing storage by up to 30%
- Reduce TCO up to 66% by deploying **automated, virtualized storage**
Introducing the DS8800

4th-generation DS8000 enterprise disk platform

- Faster hardware throughout
- Higher capacity with more efficient footprint
- Exceptional reliability for critical workloads

Announced on October 7…

Generally Available on November 19
The IBM POWER processor has been behind the success of IBM enterprise storage beginning with the Enterprise Storage Server in 1999.

DS8000 builds on a market-proven, reliable code base!
DS8000 family models

Two base models with scalable controllers and capacity

**DS8700**
- POWER6 controllers (2-way and 4-way)
- 4 Gb/s and 2 Gb/s host and device adapters
- 3.5” Enterprise Fibre Channel drives

**DS8800**
- POWER6+ controllers (2-way and 4-way)
- 8 Gb/s host and device adapters
- 2.5” Enterprise SAS-2 drives
New level of performance and efficiency… same outstanding reliability

- New model
- New hardware
- Same architecture

- Faster performance
- Greater efficiency and scalability
- Outstanding reliability
DS8800 hardware upgrades

Higher performance and efficiency

• Compact and highly efficiency drive enclosures
  • New 2.5”, small-form-factor drives
  • 6 Gb/s SAS (SAS-2)
  • New enclosures support 50% more drives

• Upgraded processor complexes
  • IBM POWER6+ for faster performance

• Upgraded I/O adapters
  • 8 Gb/s host adapters
  • 8 Gb/s device adapters

• More efficient airflow
  • Front-to-back cooling
  • Aligns with data center best practices
Disk enclosure comparison

New high-density enclosures

**DS8700 Megapack**
- **Disk Technology**
  - 3.5” (LFF) Fibre Channel
- **Throughput**
  - 2Gbps FC interconnect backbone
  - 2Gbps FC to disks
- **Density**
  - Supports 16 disks per enclosure
  - 3.5U of vertical rack space
- **Cabling**
  - Passive copper interconnect
- **Modularity**
  - Rack level power
  - Rack level cooling

**DS8800 Gigapack**
- **Disk Technology**
  - 2.5” (SFF) SAS
- **Throughput**
  - 8Gbps FC interconnect backbone
  - 6Gbps SAS to disks
- **Density**
  - Supports 24 disks per enclosure
  - 2U of vertical rack space
- **Cabling**
  - Optical short wave multimode interconnect
- **Modularity**
  - Integrated power
  - Integrated cooling
Storage efficiency with space-saving design

Saving money with high-density drives, enclosures, frames

- Client feedback is very positive on space-saving design
  - Small-form-factor drives
  - High-density drive enclosures
  - Almost double the drives in same frame footprint

- Benefits
  - More effective consolidation can lower operating costs
  - Support more workloads with smaller footprint
  - Reduce number of systems to manage
  - Reduce power and cooling costs

More drives in 60% floor space

- ~90% more drives in a single frame
- More drives in 60% floor space fully-configured

Extremely positive client feedback about substantial footprint reduction
Energy consumption comparison with DS8700 and DS88300

**DS8800 with 1056 drives**
- Base frame: 6.8kW
- Exp frame: 5.4kW
- Exp frame: 6.5kW
- TOTAL: 18.7kW

**DS8700 with 1024 drives**
- Base frame: 6.8kW
- Exp frame: 7.1kW
- Exp frame: 6.1kW
- Exp frame: 6.1kW
- Exp frame: 3.0kW
- TOTAL: 29.1kW

- 36% less energy usage; 40% less floor space
- $41,336 less for power/cooling
- $71,624 less for floor space

\[ \text{Saves client } $112,960 \]
New airflow design is also more energy efficient

Front-to-back airflow for hot-aisle-cold-aisle data centers

• More data centers are moving to hot aisle / cold aisle designs to optimize energy efficiency

• DS8800 is now designed with complete front-to-back airflow

Benefit: Greater energy efficiency and contributes to lower energy costs
**Performance comparison across DS8000 models**

**Open Results Summary**

<table>
<thead>
<tr>
<th>DS8800 Component Results – 4port HA; RAID5 arrays</th>
<th>DS8700</th>
<th>DS8800</th>
<th>% increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>HA 4KB Read</td>
<td>4KB K IOPS</td>
<td>78</td>
<td>190</td>
</tr>
<tr>
<td>HA 4KB Write</td>
<td>4KB K IOPS</td>
<td>42</td>
<td>110</td>
</tr>
<tr>
<td>HA 64KB Read</td>
<td>GBps</td>
<td>530</td>
<td>2530</td>
</tr>
<tr>
<td>HA 64KB Write</td>
<td>GBps</td>
<td>400</td>
<td>1420</td>
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<tr>
<td>DA Pair 4KB Read</td>
<td>4KB K IOPS</td>
<td>53</td>
<td>77</td>
</tr>
<tr>
<td>DA Pair 4KB Write</td>
<td>4KB K IOPS</td>
<td>19</td>
<td>32</td>
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<tr>
<td>DA Pair 64KB Read</td>
<td>GBps</td>
<td>1.2</td>
<td>3.2</td>
</tr>
<tr>
<td>DA Pair 64KB Write</td>
<td>GBps</td>
<td>0.77</td>
<td>1.42</td>
</tr>
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<tr>
<th>DS8800 Full Box Results – 96x RAID5 Arrays</th>
<th>DS8300</th>
<th>DS8700</th>
<th>DS8800</th>
<th>% increase (vs. DS8300)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seq Read</td>
<td>GBps</td>
<td>3.9</td>
<td>9.7</td>
<td>11.8</td>
</tr>
<tr>
<td>Seq Write</td>
<td>GBps</td>
<td>2.2</td>
<td>4.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Database Open</td>
<td>4KB K IOPS</td>
<td>165</td>
<td>191</td>
<td>196</td>
</tr>
<tr>
<td>4K Read Miss</td>
<td>4KB K IOPS</td>
<td>111</td>
<td>137</td>
<td>160</td>
</tr>
<tr>
<td>4K Read Hits</td>
<td>4KB K IOPS</td>
<td>425</td>
<td>523</td>
<td>530</td>
</tr>
<tr>
<td>4K Write Hits</td>
<td>4KB K IOPS</td>
<td>164</td>
<td>203</td>
<td>222</td>
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</table>
### DS8800 Full Box Results – RAID5
384x 15K RPM HDDs, 48x 10K RPM HDDs, 8x DA Pair, 16x HA w/ 32x 8Gb ports

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<th>DS8700</th>
<th>DS8800</th>
<th>% increase (vs. DS8300)</th>
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<tbody>
<tr>
<td>FICON Seq Read</td>
<td>GBps</td>
<td>4.1</td>
<td>9.4</td>
<td>10.0</td>
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<tr>
<td>FICON Seq Write</td>
<td>GBps</td>
<td>2.1</td>
<td>5.6</td>
<td>5.7</td>
</tr>
<tr>
<td>zHPF 4K Write Hits</td>
<td>4KB K IOps</td>
<td>124</td>
<td>159</td>
<td>175</td>
</tr>
<tr>
<td>zHPF 4K Read Hits</td>
<td>4KB K IOps</td>
<td>344</td>
<td>423</td>
<td>440</td>
</tr>
<tr>
<td>zHPF DB zOS</td>
<td>4KB K IOps</td>
<td>165</td>
<td>201</td>
<td>204</td>
</tr>
<tr>
<td>FICON DB zOS</td>
<td>4KB K IOps</td>
<td>124</td>
<td>174</td>
<td>181</td>
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Additional DS8000 enhancements

• Simplifying volume management further with Storage Pool Striping default

• DS8800 Business Class option offers lower entry point for small configurations
  • Aligns with System z Business Class deployments
  • Many DS8000 clients have less than 10TB deployments

• New, larger 600GB solid-state drive option for DS8700
  • Significantly lower $/GB option
  • Enables more effective SSD and Easy Tier deployments
- **Ability to swap IBM DS8000 volumes in seconds**
  - Can be command driven or can be automated upon a storage system failure
  - Designed to scale to multi-thousands of volumes
- **Switches Metro Mirror primary storage system to the secondary storage system**
  - No operator interaction is needed for event driven operation
  - Function is configured and managed by TPC-R
- **Feature is non-disruptive**
  - Applications keep using same device addresses
- **Integration with AIX 5.3 (or later) provides higher availability for AIX environments**

Available on TPC-R Windows, AIX, Linux and z/OS installations with the TPC-R 2 Site BC License
Tivoli Key Lifecycle Manager v2.0

Advanced security for data at rest

• New features for TKLM V2.0
  • KMIP – Key Management Interoperability Protocol V1.0 standard from OASIS
  • Partners include Emulex, Brocade,…
  • RBAC – Role Based Access Control
  • Grouping of permissions
  • Grouping of Devices
  • Grouping of Administrators
  • Who can do what action
  • What device can see what keys
• Continues with Ease of Use, simple install and administration
  • Key store, key serving, key rotation, auditing

IBM is rated in the top 5 of “Most Trusted Companies in [Data] Privacy”*

If your information isn’t secure, your business isn’t safe.
The DS8800 announcement introduces the most advanced model in our high-end disk portfolio with another increase in performance, greatly improved energy efficiency, and almost double the capacity in the same footprint.

This new model not only offers the ability to process information faster and more efficiently, it also builds on the DS8000’s unrivaled reputation for reliability and investment protection by maintaining its market-proven, IBM POWER-based architecture over generations of new models.
Thank You!