Efficiently Managing Information

Sergio Resch
System Storage Platform Advocate, IBM

IBM System Storage

- **Heritage of Distinction**
  - 50+ years in storage business
  - Innovation leadership - Invented many of the storage technologies employed today
- **Leadership in Storage Today**
  - Over $5 billion revenues
  - Leading and growing market share
  - Over 5,000 people in 170 countries
  - Over 1,000 IBM Business Partners
- **Research for a Bright Future**
  - 15 development labs worldwide
  - Over $500 million in R&D annually
  - More US patents than any other vendor
  - Acquiring new technologies to bolster in-house innovation

- #1 Total Storage Hardware
- #1 Total Disk
- #1 Tape
- #1 Storage Services
- #1 Archive & HSM solutions
- #1 Enterprise Content Management
- #2 WW external Disk
  - #1 in SW IOT (and Italy)
  - #1 in AP
  - #1 in 15 regions
- #2 Data protection & recovery
- Fastest growth in Storage SW

Source: IDC Storage Tracker

IT organizations are challenged today

	Challenges
	***Costs & Service Delivery***
	Rising costs of systems and networking operations
	Explosion in volume of data and information
	Difficulty in deploying new applications and services
	***Business Resiliency & Security***
	Security of your assets & your clients' information
	Landslide of compliance requirements
	Systems and applications need to be available
	***Energy Requirements***
	Rising energy costs & rising energy demand
	Power & thermal issues inhibit operations
	Environmental compliance & governance mandates

IBM System z & System Storage:
A Winning Combination

- **IBM System Storage™ DS8000™ shows continued strong demand:**
  - **More than 1,000 systems shipped in Q407!**
  - **Over 25,000 enterprise disk storage shipped to date (leveraging same software)**
  - **IBM DS8000 has the leadership in mainframe external disk systems[1]**
- **Advanced function software is broadly used:**
  - **More than 50% installs with FlashCopy**
  - **More than 50% installs with remote mirroring**
  - **PAV on most System z-attached DS8000s and HyperPAV shipping on 25%**
- **DS8000 highly efficient architecture allows for 30% reduction in power consumption vs. traditional storage controllers[2]**
- **Tight collaboration between System z and storage enables IBM storage innovations for System z with a "system" view**

Source:
1. IDC Worldwide Quarterly Disk Storage Systems Tracker, 2007
2. ITG – Business Case for IBM System Storage DS8000 Turbo, 2007

The IBM DS8000 Architecture

*"**The DS8000 series architecture** differs from the architecture of other enterprise disk systems. The DS8000's structure is based on a Symmetrical Multi-Processing (SMP) server design. At the crux of this hardware design, the DS8000 integrates two IBM System p complex. In addition to the SMP processors, each of the host and the disk port adapter cards is powered by its own PowerPC processor. Thus, the **DS8000 uses a 3-level processor design, as opposed to the 2-level design of its major competitors**, which limit their processors to only their front-end and back-end directors with no shared middle level of processors. **The additional level of processors in the DS8000 provides two pools of shared processor capacity that can be applied towards all tasks in the system**. The net result is that more resource can be applied as needed to process an application workload which can positively impact throughput and application response time."*

Source: IBM System Storage DS8000 series Technology Highlights – Josh Krishner – Oct. 2007

Information infrastructure you can trust

Helping our clients manage information availability, integrity, security, and growth

- **Data protection with enhanced function, automation and reduced cost:**
  - **IBM System Storage FlashCopy SE**
  - **z/OS Global Mirror Multiple Reader**
  - **DS8000 zGM Extended Distance FICON**
  - **z/OS Global Mirror enabled for zIIP**
  - **GDPS z/OS Metro/Global Mirror Incremental Resync**
  - **IBM Basic HyperSwap**
  - **IBM System Storage Encryption**
  - **IBM System Storage TS7700 enhancements**

- **Growth into the future with a simplified storage infrastructure:**
  - **IBM Extended Address Volumes for IBM System z**
  - **IBM System Storage DS8000 performance enhancements**
  - **IBM System Storage DS8000 Dynamic Volume Expansion**
  - **IBM System Storage DS8000 Storage Pool Striping**
  - **IBM System Storage SAN768B**

IBM System Storage extends performance leadership for current and new clients.

IBM System Storage DS8000 Turbo – Powerful Innovation

Performance innovation that builds on DS8000 world class performance:

- **DS8000 Storage pool striping (rotate extents)**
  - Maximizes performance without special tuning
- **AMP (Adaptive Multistream Pre-fetching)**
  - Self-optimizing caching technology can dramatically improve sequential performance
- **IBM z/OS Global Mirror Multiple Reader**
  - Improve throughput for z/OS remote mirroring

Available 4Q07

Innovations to simplify and increase efficiency:

- **IBM DS8000 FlashCopy Space Efficient**
  - Lower costs by significantly reducing disk capacity needed for copies
- **IBM DS8000 Dynamic Volume Expansion**
  - Simplifies management by enabling easier, online, volume expansion to support data growth
- **IBM System Storage Productivity Center**
  - Consolidated view for storage management and control across the SAN

New and existing customers can leverage the new capabilities!!

DS8000 z/OS Global Mirror (XRC)

a Premium Business Continuity Solution Gets Even Better

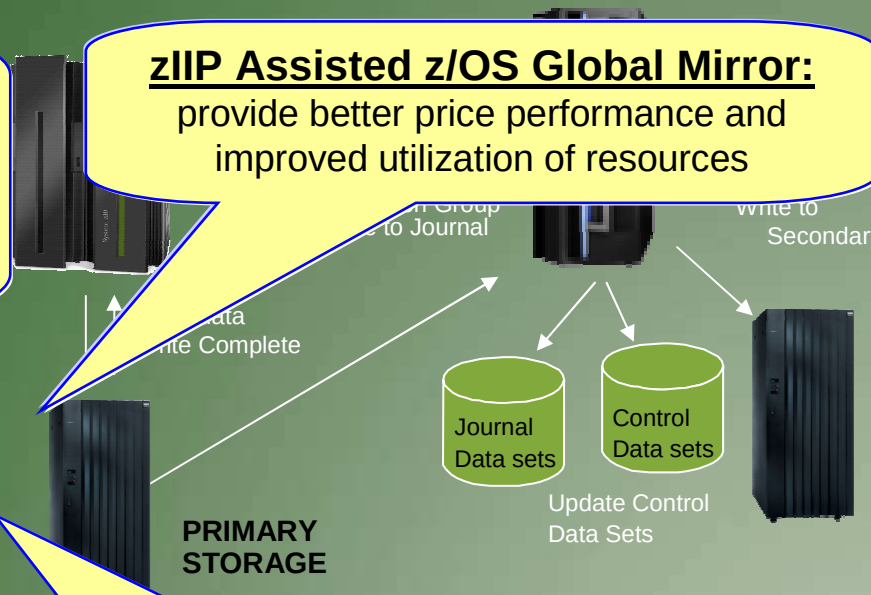
News
Feb. 08

z/OS Global Mirror Multiple Reader:

- **Implements parallel processing for higher performance**
- **Better sustain peak workloads for a given bandwidth**
- **Increase data currency over long distances**
- **Replicate more capacity while maintaining same RPO**
- **Easier support for Large Volumes**

zIIP Assisted z/OS Global Mirror:

provide better price performance and improved utilization of resources



DS8000 zGM Extended Distance FICON:

- **Increase the number of FICON commands in flight**
- **Less round-trip required**
- **Enables communication over greater distances**
- **Support increased link utilization**
- **Choice of selecting lower cost channel extenders**

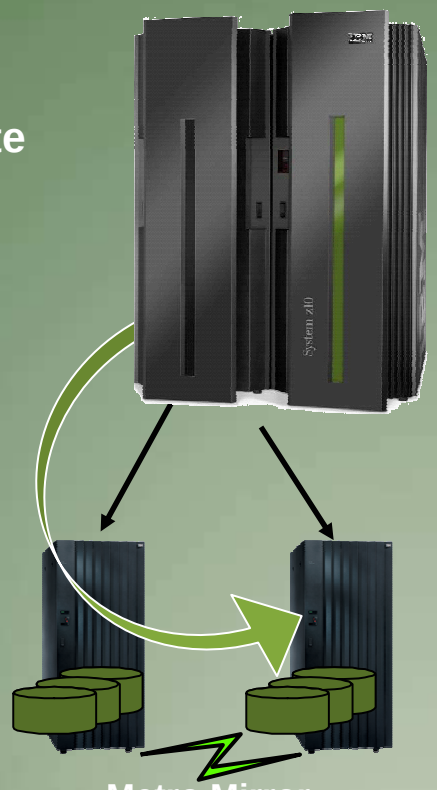
DS8000 MzGM GDPS Incremental Resync:

- **Enhancement for multi-site configurations**
- **Metro Mirror link up to 130km**
- **Fast resynchronization after GDPS HyperSwap**
- **Only for changed data from the Metro Mirror target**

IBM Basic HyperSwap:
enable cost effective data availability

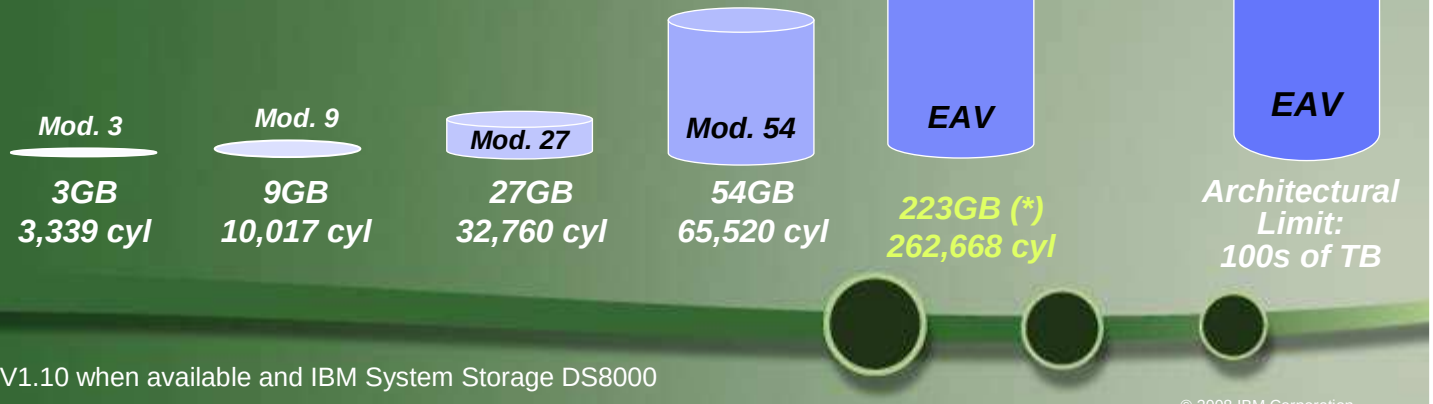
News
Feb. 08

- **Parallel Sysplex availability extended to disk systems in a single site**
  - Protects from unplanned storage outages
  - Enables planned fail-over (for upgrades or testing)
- **Managed via IBM TPC for Replication "Basic Edition" for System z (new offering integrated into z/OS)**
- **Based on IBM System Storage Metro Mirror (DS8000, DS6000, ESS)**
  - Leverage DS8000 - PPRC Failover / Failback for faster failback
- **GDPS/PPRC HyperSwap, HyperSwap Manager also available for complex disaster recovery and multi-site configurations**



Taking z/OS storage volumes to the extreme

- **Extended Address Volumes (EAV) address large capacity needs**
  - Volumes of more than 65,280 cylinders: up to 223 GB initially(*)
  - Simplify storage management: manage fewer, larger volumes
  - EAV architected to support volumes with 100s of TBs in the future
- **HyperPAV function complements EAV: no need for multiple copies created for performance reasons**
- **Non-disruptive data migration to larger volumes:**
  - DS8000 Dynamic Volume Expansion
  - IBM Softek Data Mobility Solutions

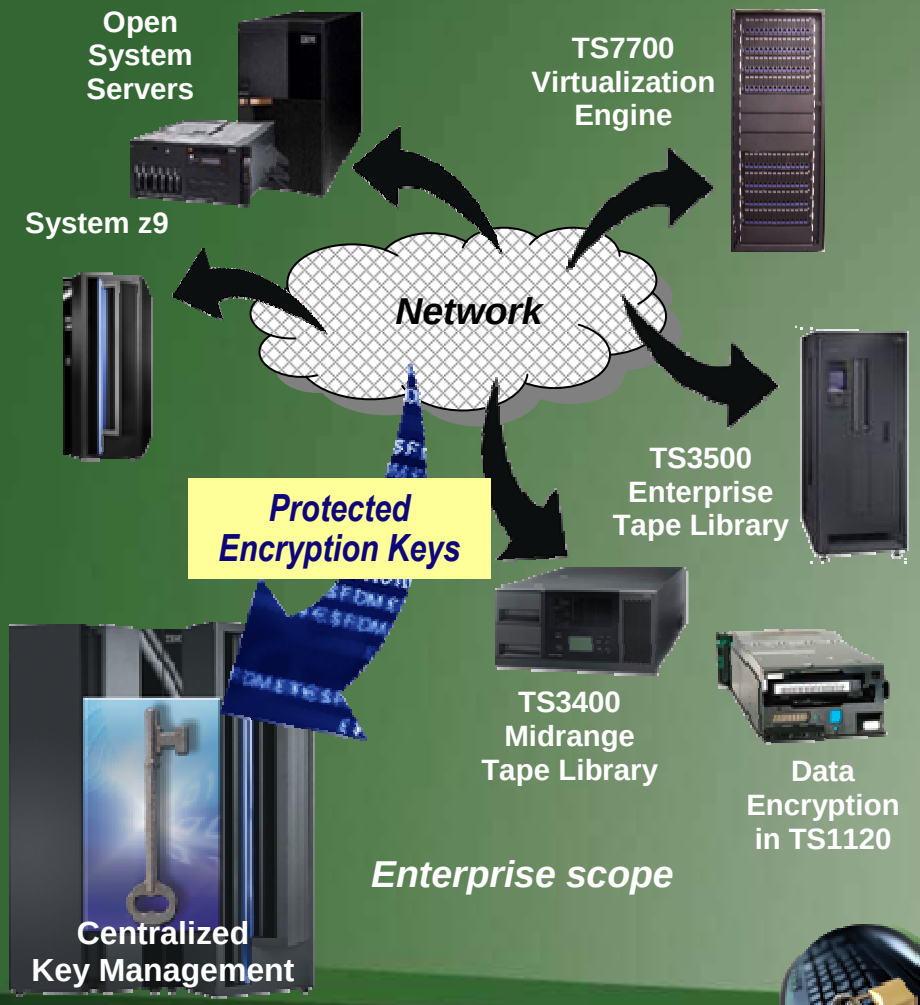


(*) Supported on z/OS V1.10 when available and IBM System Storage DS8000

The System z and System Storage encryption solution delivers integrated security

z/OS Centralized Key Management

- Can help to protect and manage keys across entire enterprise
  - Highly secure and available key data store
  - Long term key management
  - Disaster recovery capabilities
  - Access control and audit-ability
- Single point of control
- Leverage robustness of z/OS and IBM System z with over a decade of production use



System Storage Tape Encryption

- Designed to provide:
  - z/OS encryption controlled via Data Policy (SMS) and user Policy (JCL)
  - Open systems encryption controlled via data source, VolSer or drive
  - Avoid Host MIPS overhead
  - Minimize impact to existing processes and applications

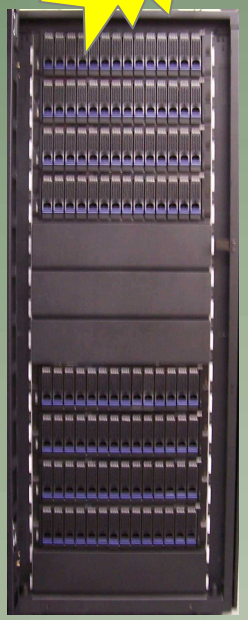
IBM Tape Brings Innovation to Manage Risk!

IBM System Storage TS7700 Virtualization Engine Releases 1.3 and 1.4

- **Innovation that protects. New three Site GRID configuration automatically copies tape data to remote sites for enhanced business continuity**
  - **IBM System Storage TS7700 GRID can expand to three clusters**
- **Innovation for improved disaster recovery with new Copy Export function**
  - **Allows export of a copy of the data from a TS7700 used for disaster recovery, while the original data still accessible by production site**
- **Innovation that improves control with Host Copy Control**
  Allows host control of logical volume copying on a cluster basis
- **Innovation for enhanced operations with Dynamic Grid Network Balancing**
  - **Compensates for unbalanced customer network performance**
  - **Controls GRID performance in adverse conditions**

Available

Nov. 07



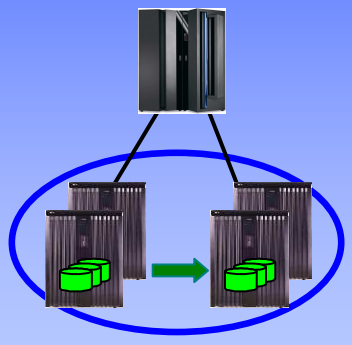
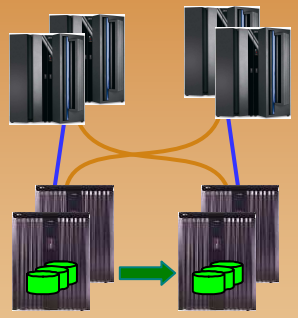
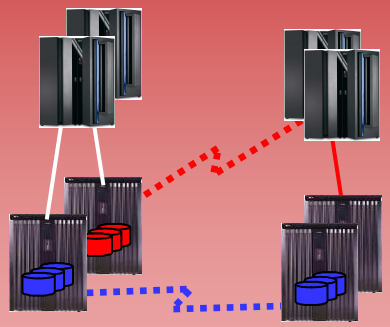
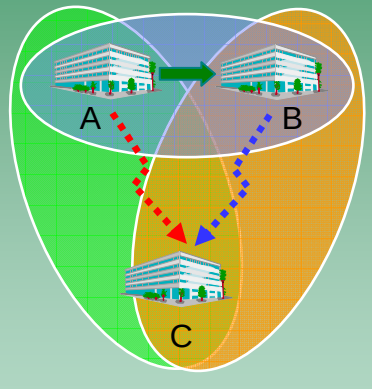
IBM System Storage SAN and IBM System z: Innovation that Scales

News
Feb. 08

IBM System Storage SAN768B

- **New "super-director" fabric backbone for next-generation enterprise datacenter fabrics**
  - Drive new levels of performance with 8 Gbps FC technology capability
  - Reduce total cost of ownership (TCO) through consolidation of network resources
  - Protect existing infrastructure investment while positioning for future technologies
  - Manage your Infrastructure with greater flexibility and scalability
  - Improve energy efficiency by combining higher bandwidth with reduced power consumption

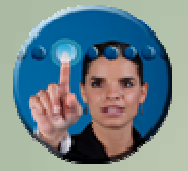
Business Continuity for System z: solutions

Continuous Availability of Data within a Data Center	Continuous Availability / Disaster Recovery within a Metropolitan Distance	Disaster Recovery at Extended Distance	Continuous Availability Regionally and Disaster Recovery Extended Distance
Single Data Center **Applications remain active** **Continuous access to data in the event of a storage subsystem outage**	**Two Data Centers** **Systems remain active** **Multi-site workloads can withstand site and/or storage failures**	**Two Data Centers** **Rapid Systems Disaster Recovery with "seconds" of Data Loss** **Disaster recovery for out of region interruptions**	**Three Data Centers** **High availability for site disasters** **Disaster recovery for regional disasters**
			
GDPS/HyperSwap Mgr **Basic HyperSwap** **RPO=0 & RTO=0**	**GDPS/PPRC** **RPO=0 & RTO<1 hr**	**GDPS/GM & GDPS/XRC** **RPO secs & RTO <1 hr**	**GDPS/MGM** **GDPS/MzGM**

IBM System Storage: The best gets better

- ***Simplified management***
- ***Improved performance***
- ***Lower TCO***
- ***Faster restart and recovery***
- ***Improved data security***

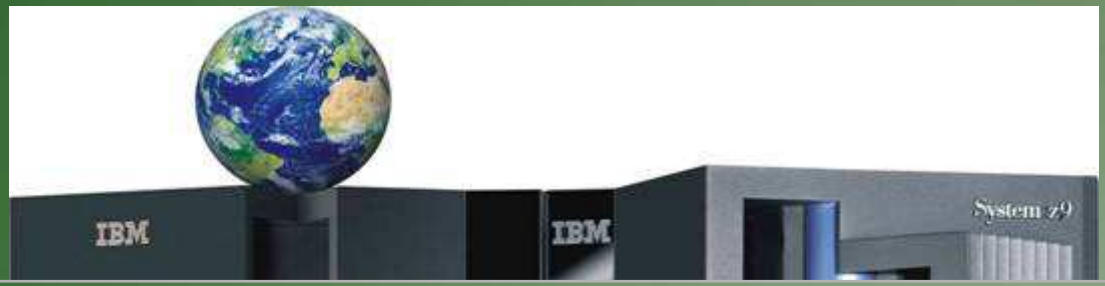


Getting ready for the

New Enterprise Data Center

Most of all, you matter.



Innovation matters

Availability matters

Trust matters

Thanks

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