IBM TSM User Forum 2011

Neues zu Disk, SVC und Tape

Manuel Schweiger
IT Specialist

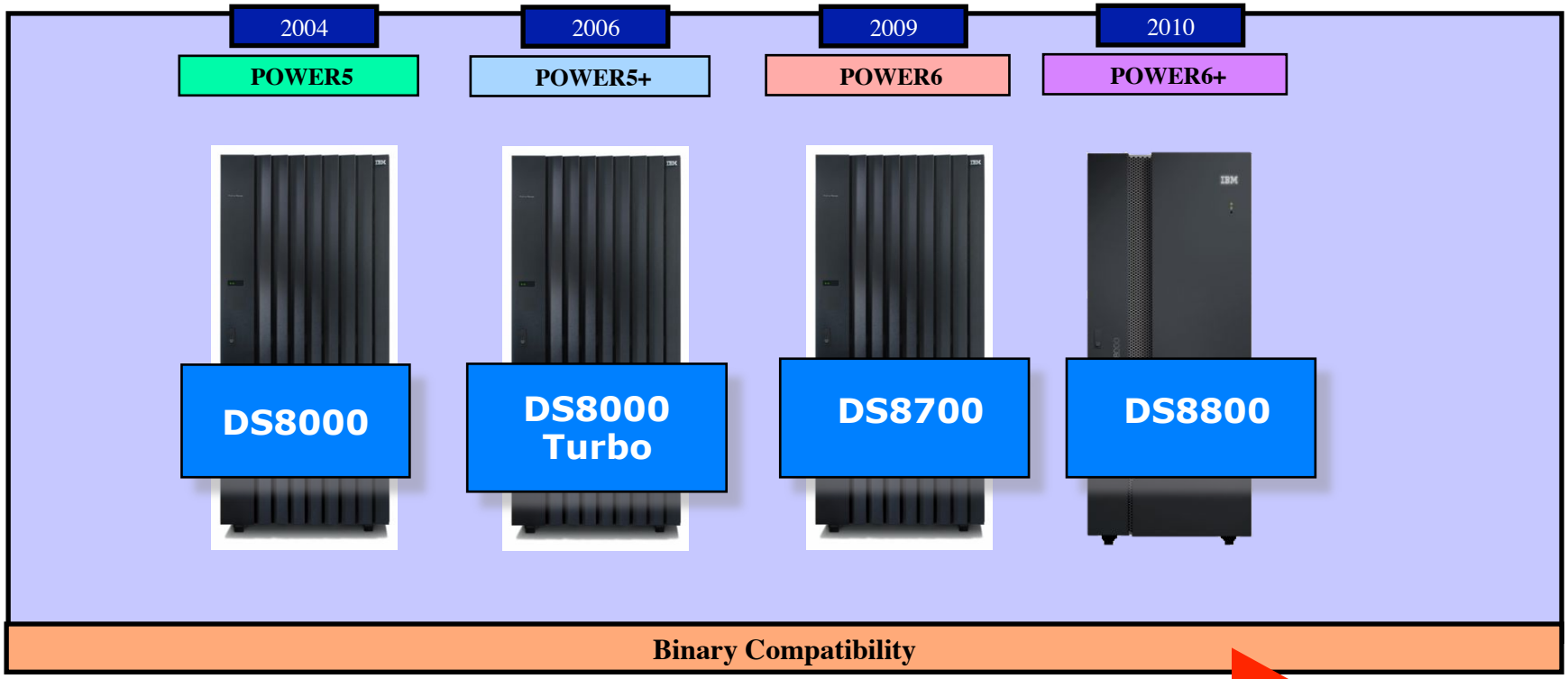
IBM

Agenda

- Disk
  - DS8800 Hard- & Softwareupdate
  - XIV – Gen3
- SVC
  - SVC v6.3
  - Storwize – V7000 Unified
- Tape
  - TS1140
  - TS3500 Shuttle Complex

4th-generation DS8000 enterprise disk system

The IBM POWER processor has been behind the success of IBM enterprise storage beginning with the Enterprise Storage Server in 1999

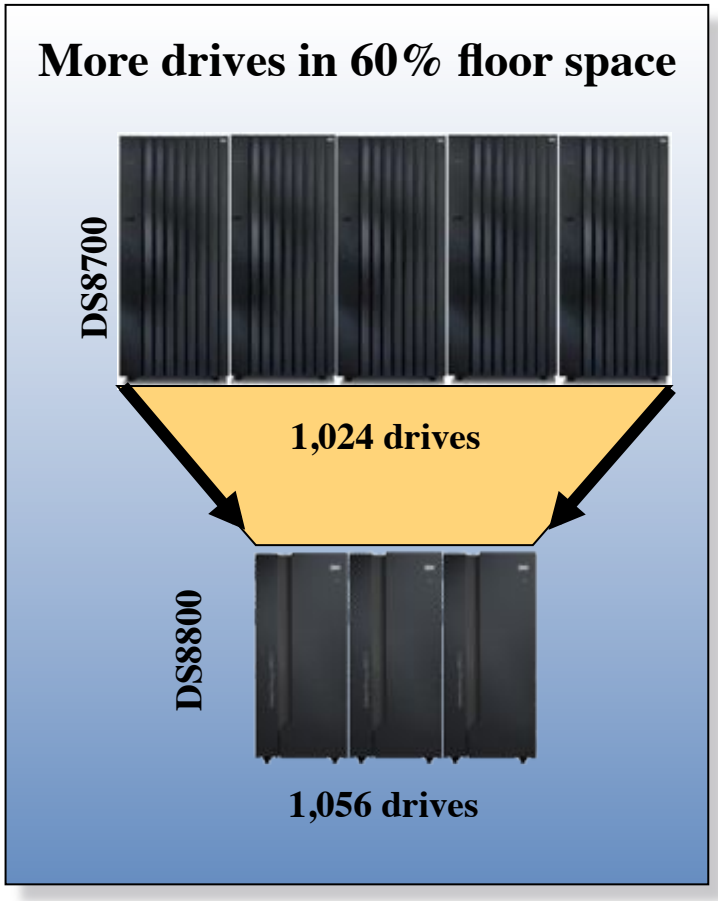


DS8800 builds on a market-proven, reliable code base!

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



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

Extremely positive client feedback about substantial footprint reduction

Third Expansion Unit – DS8800

- DS8800 now supports an additional expansion frame
  - Base frame (951) + three expansion frames (95E)
    - Base frame holds up to 15 disk features
    - First expansion frame holds up to 21 disk features
    - Second expansion frame holds up to 30 disk features
    - Third expansion frame holds up to 30 disk features

1,536 drives!!

- DS8800 holds up to 1,536 drives
- Up to 1.4 PB of physical capacity when populated exclusively with 900 GB SAS disk drives
- Up to 2.3 PB of physical capacity when populated exclusively with 3 TB nearline disk drives (maximum of 768 of these 3 TB nearline drives)

Disk Drive Sets – DS8800

- 300 GB/15,000 RPM SAS drive set
- 900 GB/10,000 RPM SAS drive set
  - Planned availability date is December 9, 2011
- 3 TB/7,200 RPM SAS half drive set
  - Half drive set is 8 drives instead of the usual 16
  - Half drive set provides 24 TB raw capacity

Top Exit Power Cords – DS8800

- New feature now provides top exit power cord
  - Allows both power cord and fiber cabling to exit from top of machine
  - Applies to 951 and 95E frames
- Because of safety considerations, site must have a special tool for service

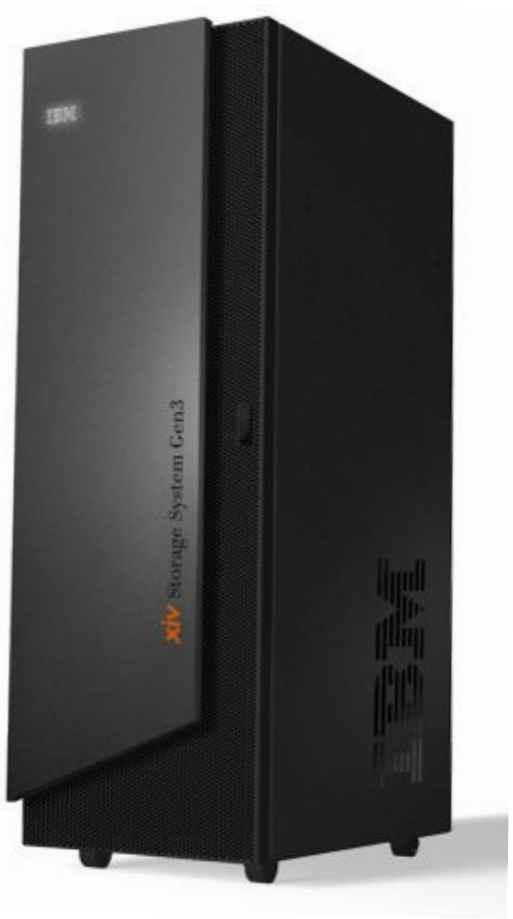
  - Universal ladder FC #1101
  - One universal ladder per site is sufficient

IBM XIV Gen3 Technology Highlights

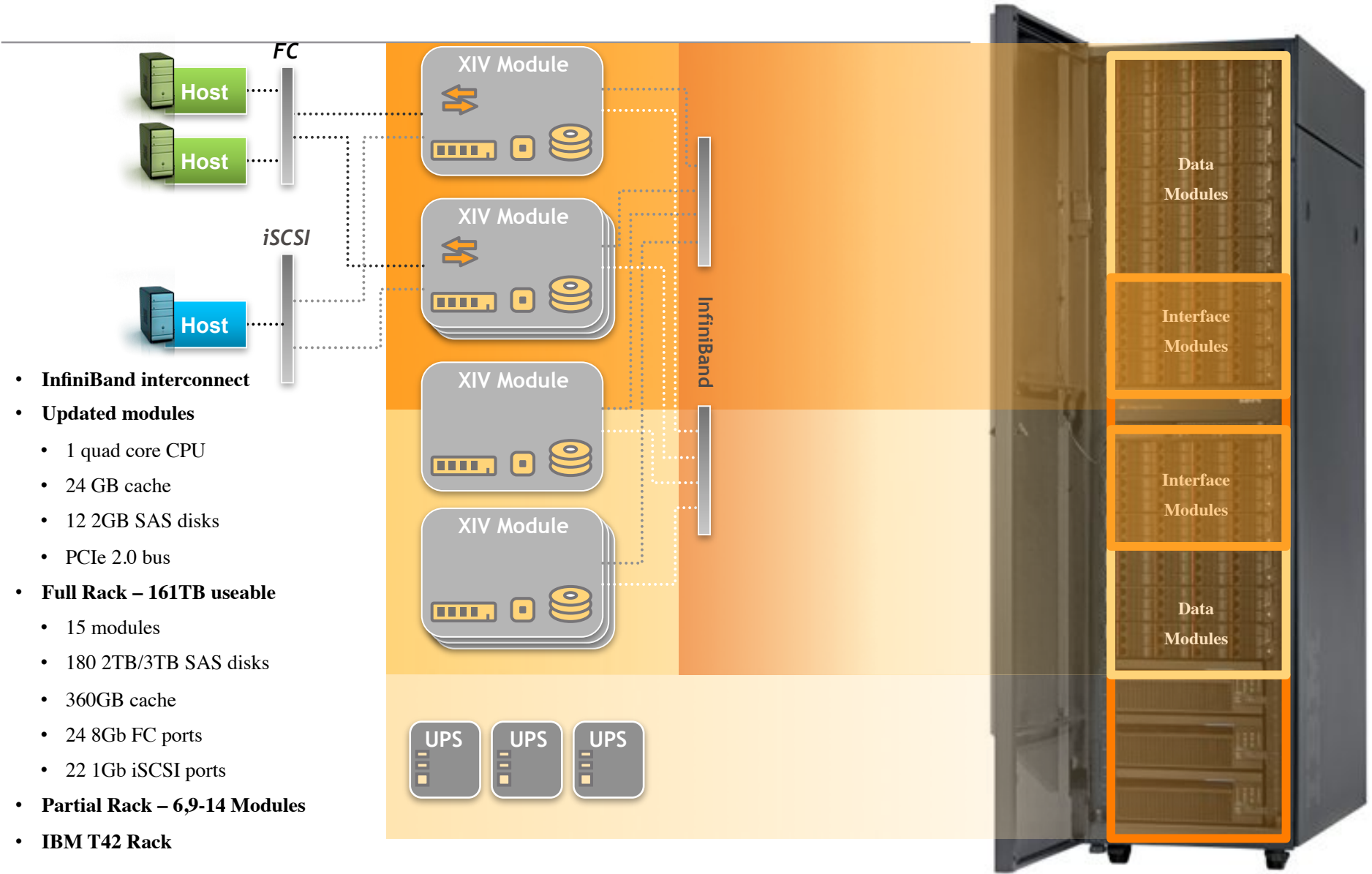
Built for Performance

End-to-end component upgrades deliver significant performance improvement

- **20X more internal bandwidth**, using an Infiniband interconnect fabric instead of Ethernet
- **Over 2X more external bandwidth**, with the availability of 8 Gbps fibre channel cards and support for over 3 times more iSCSI cards than current XIV models [6 to 22 ports]
- **New motherboards and processors**, to deliver more system throughput
- **50% more cache capacity** than current XIV models [16GB to 24GB per module], up to 360GB/system
- **SSD ready**, optional cache of up to 7.5TB can provide a performance boost for certain read intensive workloads (SoD, planned for 1H, 2012)



XIV Gen3 System Components

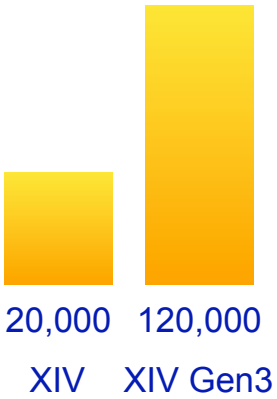


- **InfiniBand interconnect**
- **Updated modules**
  - 1 quad core CPU
  - 24 GB cache
  - 12 2GB SAS disks
  - PCIe 2.0 bus
- **Full Rack – 161TB useable**
  - 15 modules
  - 180 2TB/3TB SAS disks
  - 360GB cache
  - 24 8Gb FC ports
  - 22 1Gb iSCSI ports
- **Partial Rack – 6,9-14 Modules**
- **IBM T42 Rack**

IBM XIV Family Delivers Outstanding Performance Across Applications

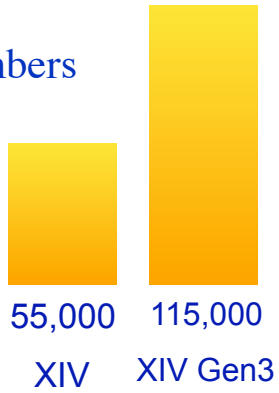
Microsoft Exchange Mailboxes

- 2 hour performance test
- Requires latency under 20 ms
- ESRP-Storage test



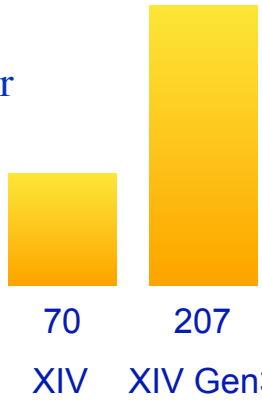
Oracle Data Warehouse (IOPS)

- Oracle DHW Workload
- ORION – Oracle I/O Numbers



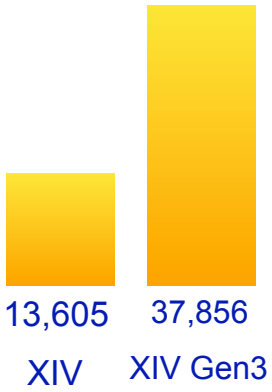
SAS Business Analytics Reports

- Analytics reports created
- Swingbench load generator



Microsoft HyperV (IOPS)

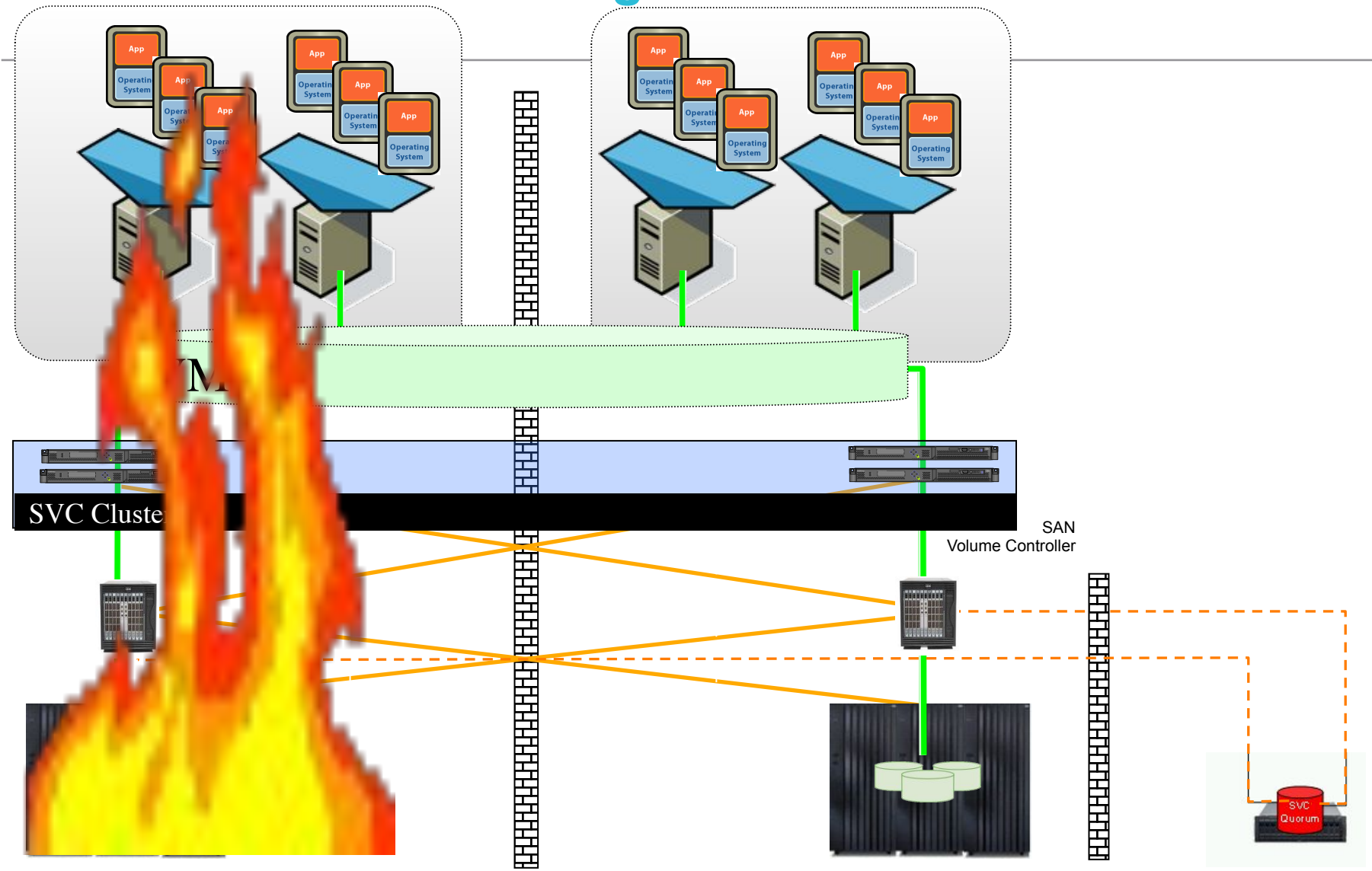
- 200GB simulation
- 60% write activity



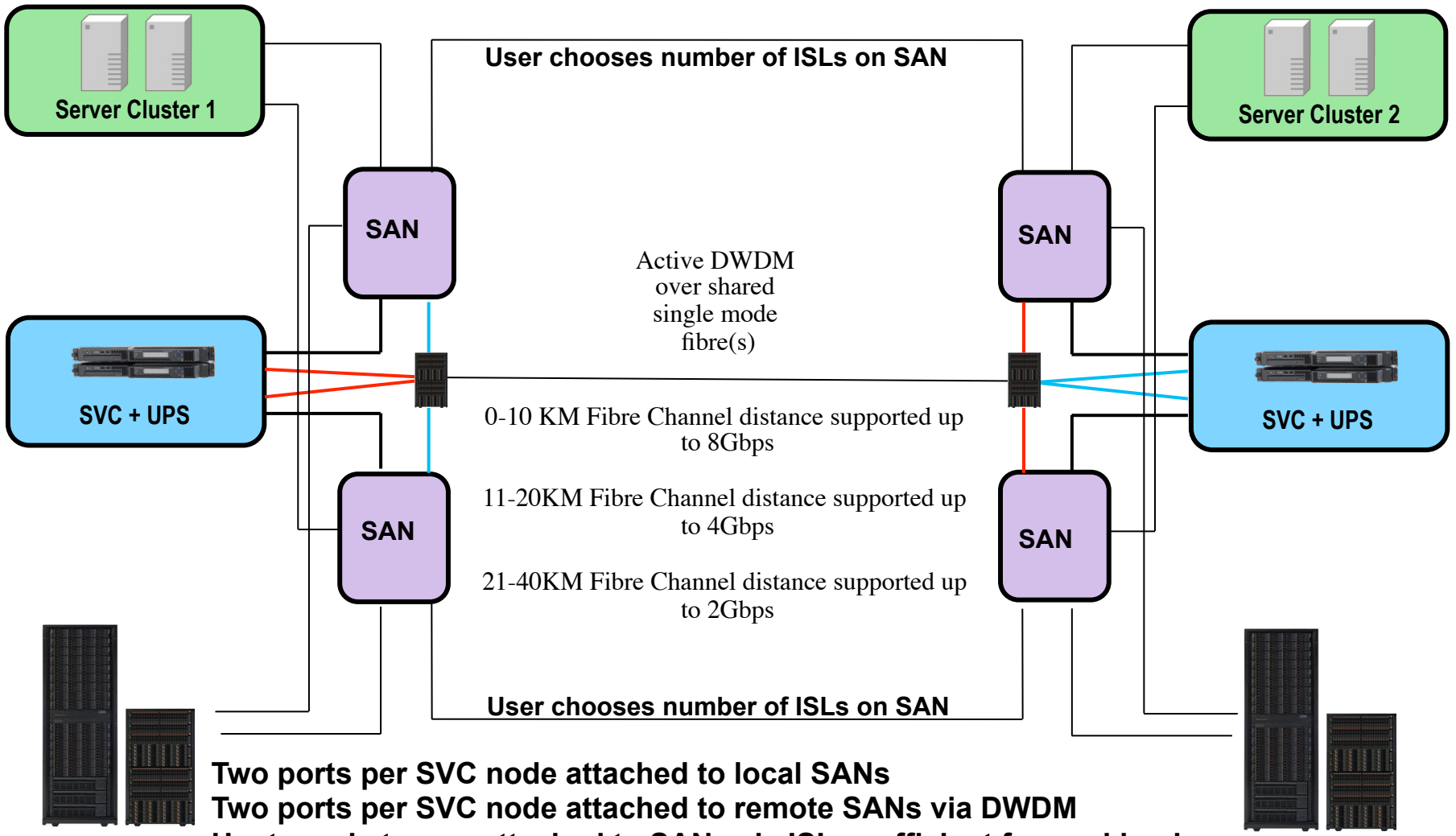
Agenda

- Disk
  - DS8800 Hard- & Softwareupdate
  - XIV – Gen3
- SVC
  - SVC v6.3
  - Storwize – V7000 Unified
- Tape
  - TS1140
  - TS3500 Shuttle Complex

SVC VDISK Mirroring …across locations

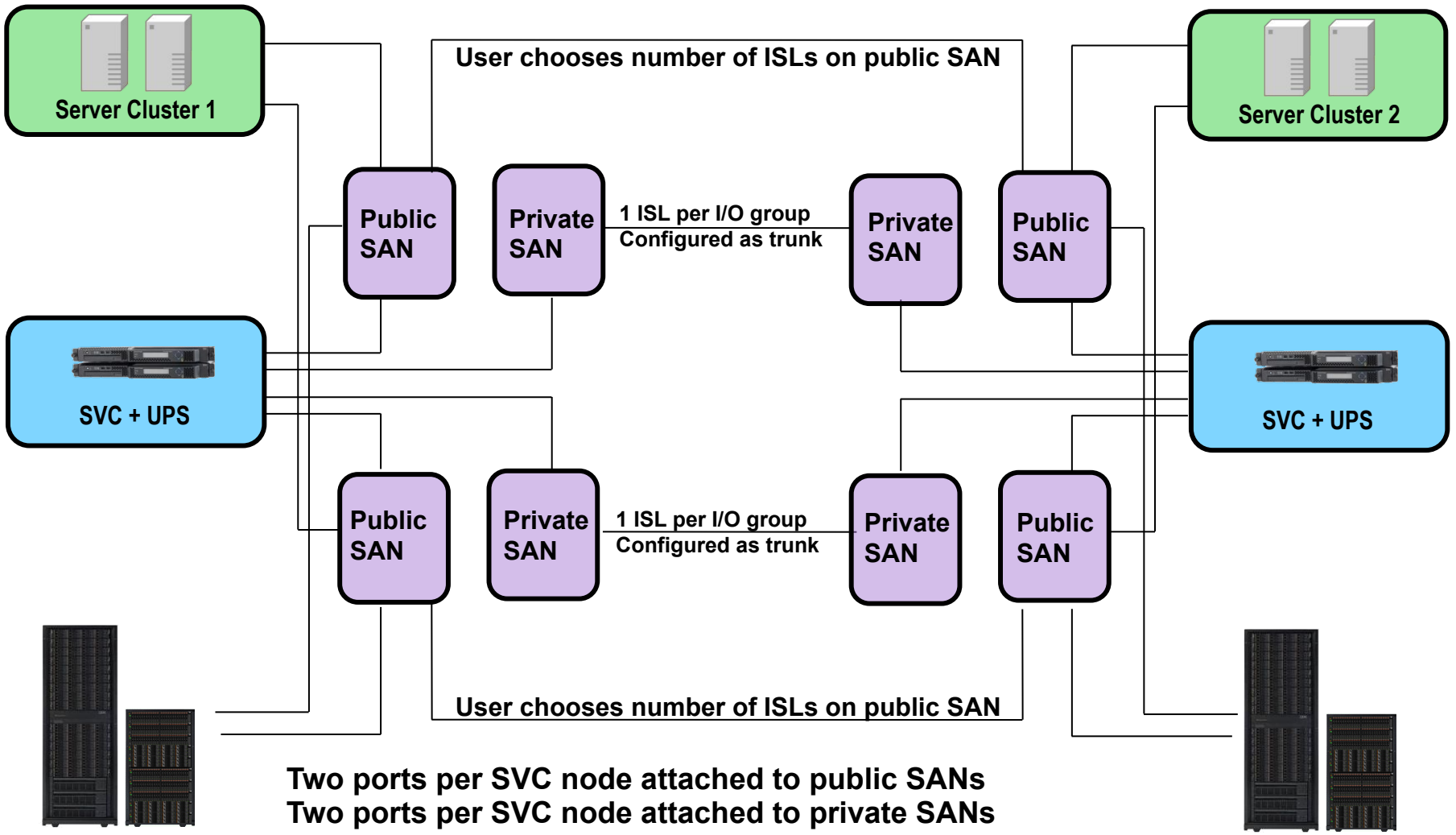


Extension of Currently Supported Configuration



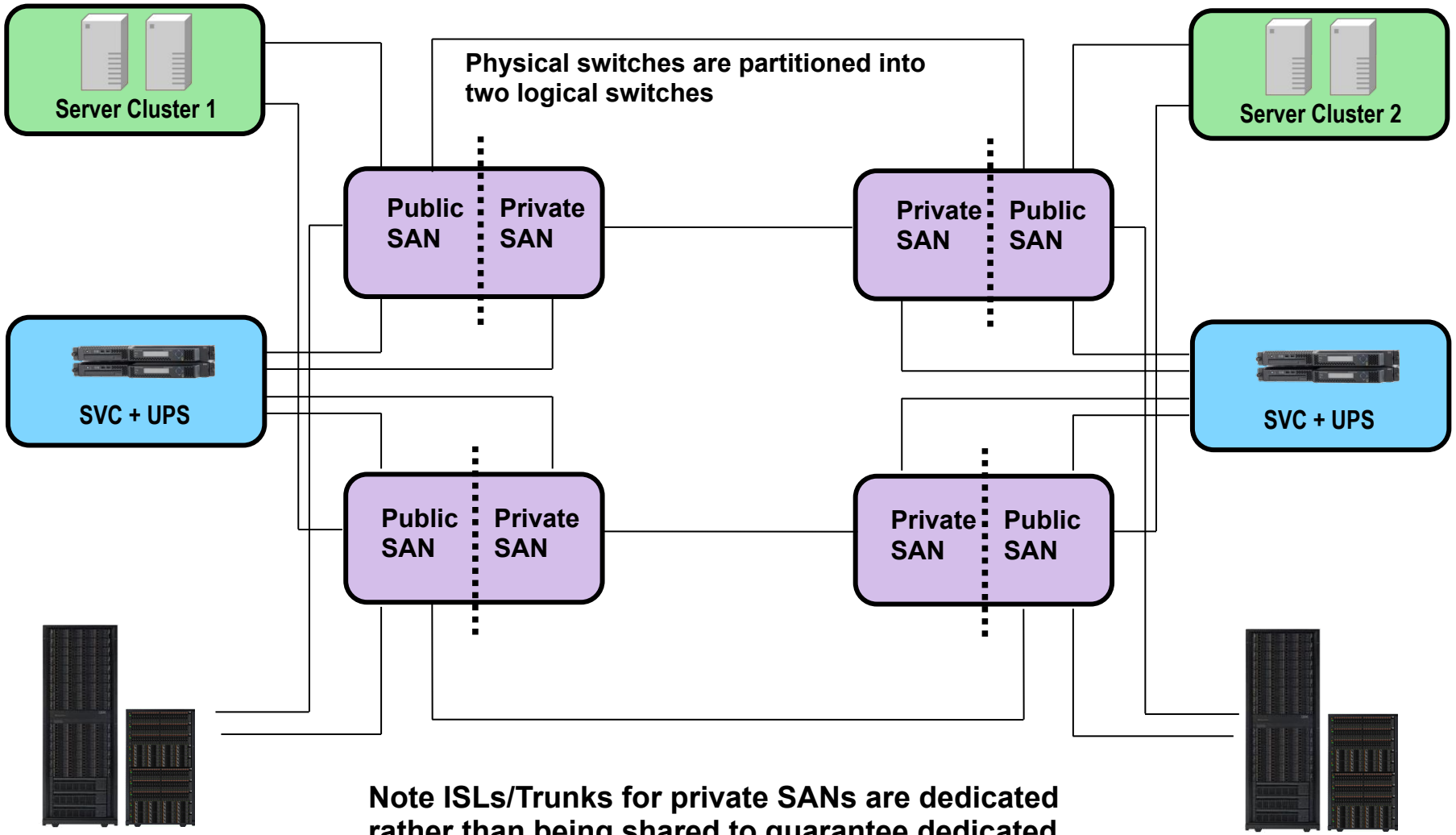
Two ports per SVC node attached to local SANs
Two ports per SVC node attached to remote SANs via DWDM
Hosts and storage attached to SANs via ISLs sufficient for workload
3rd site quorum (not shown) attached to SANs

Configuration With 4 Switches at Each Site



Two ports per SVC node attached to public SANs
Two ports per SVC node attached to private SANs
Hosts and storage attached to public SANs
3rd site quorum (not shown) attached to public SANs

Configuration Using Virtual Fabrics



Note ISLs/Trunks for private SANs are dedicated rather than being shared to guarantee dedicated bandwidth is available for node to node traffic

Stretch Cluster – Distance

- The new stretch cluster configuration will support distances of up to 300KM
  - Same recommendation as for Metro Mirror
- However typical deployment of stretch cluster will only be 1/2 or 1/3 of this distance because of added latency and buffer credit limitations/ considerations

IBM Storwize V7000 Unified

What this is

- Unified block and file storage system with a tightly integrated management console
- Support for NFS/CIFS/FTP/HTTP/SCP file protocols in addition to existing block functions
- File replication and file level snapshots for business continuity and disaster recovery

Why It Matters

- Provides greater flexibility for provisioning of storage resources and improves overall capacity utilization
- Unified console simplifies storage administration with a single user interface and common CLI
- Enables deployment of a broad set of applications from within a single storage system, especially in shared storage environments

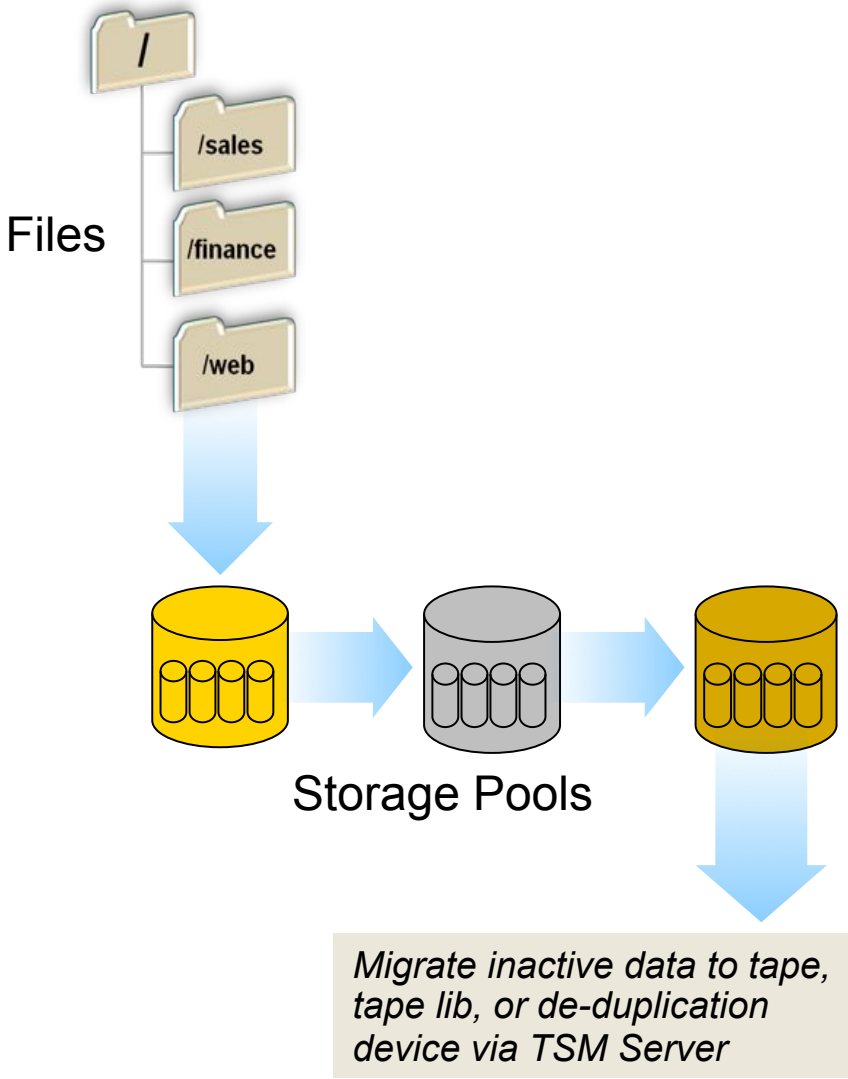
Intuitive GUI is Truly Integrated

- One administration interface for block and file data
  - Not a launcher for two different interfaces
- Integrated data protection
  - Built-in NDMP and IBM Tivoli Storage Manager client

IBM Active Cloud Engine™ for Storwize V7000 Unified

New!

- **Policy-based File Administration**
  - **Optimize performance** by placing files onto the most appropriate storage pool
  - **Lower storage costs over time** by moving inactive files to archive disk or tape, and deleting unwanted, expired files
  - **Improve administrator productivity** by automating file management
  - **Improve data protection** with policy-based file backup



Agenda

- Disk
  - DS8800 Hard- & Softwareupdate
  - XIV – Gen3
- SVC
  - SVC v6.3
  - Storwize – V7000 Unified
- Tape
  - TS1140
  - TS3500 Shuttle Complex

TS1140 Tape Drive Overview

- **4rd Generation of 3592 enterprise tape drive** - Ann May 9, 2011 – GA June 3, 2011
  - Introducing new Barium Ferrite media types with up to **4 TB native capacity**
    - Re-Writable and Write Once Read Many (WORM) cartridge at 4TB
    - Economy cartridge available at 500GB
  - **250 MBps** native drive data rate - **650 MBps** max compressed data rate
  - **Dual 8Gb** fibre channel ports
  - Supports **data partitioning and** data encryption
  - Differentiated Media
    - New media types usable at higher capacity on future drive generations
    - **Media re-use** of existing JB/JX media types with automatic Upformat support
    - **Read support** of existing JA media
  - Upgrade for TS1130 available (Model Conversion)
- Attaches to
  - AIX
  - Linux
  - Selected versions of Microsoft Windows™
  - Selected HP and Sun Microsystems servers

3592 E07 JC/JY/JK Media

- Introducing three new enhanced Barium Ferrite (BaFe) particle media types
  - JC media : 4.0 TB IBM Enterprise Advanced Data Tape
  - JY media 4.0 TB IBM Enterprise Advanced WORM Tape
  - JK media : 500 GB IBM Enterprise Economy Data Tape
    - New media types re-usable at higher capacity on future generations
    - New media not usable in previous drive generations
- New media may be read/written up to 250 MB/s native sustained data rate (up to 650 MB/s at 3:1 compression) in the new 32-channel Jag-4 logical format
- Retains support for legacy JB/JX media including capacity upgrade
  - JB/JX media capacity may be upgraded to 1.6 TB at 200 MB/s
- Available:
  - initialized and labeled
  - labeled
  - not initialized or labeled

3592 Media Compatibility

JC media : 4.0 TB IBM Enterprise Advanced Data Tape
JY media 4.0 TB IBM Enterprise Advanced WORM Tape
JK media : 500 GB IBM Enterprise Economy Data Tape

Same Cartridge **Format dictates capacity** **Format and drive dictates performance**

3592 Cartridge Media		TS1140 Tape Drive		TS1130		TS1120 Tape Drive		3592 J1A Tape Drive	
Type	Format	Capacity	Performance	Capacity	Performance	Capacity	Performance	Capacity	Performance
JJ / JR	Gen 1			60GB	71MBps	60GB	50MBps	60GB	40MBps
	Gen 2			100GB	143MBps	100GB	104MBps		
	Gen 3			128GB	143MBps				
JA / JW	Gen 1			300GB	71MBps	300GB	50MBps	300GB	40MBps
	Gen 2	500GB	143MBps	500GB	143MBps	500GB	104MBps		
	Gen 3	640GB	143MBps	640GB	143MBps				
JB / JX	Gen2	700GB	150MBps	700GB	150MBps	700GB	104MBps		
	Gen3	1TB	160MBps	1TB	160MBps				
	Gen 4	1.6TB	200 MBps						
JK	Gen4	500GB	250MMBps						
JC/JY	Gen4	4000GB	250MBps						

Read Only

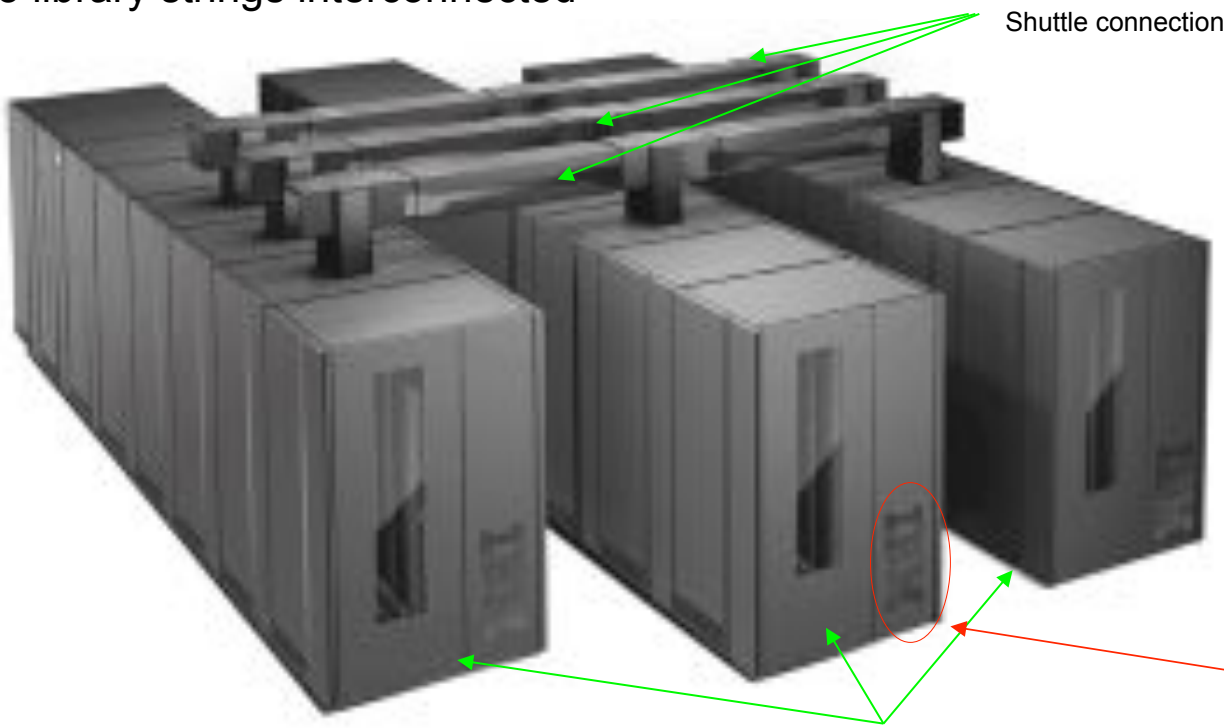
TS1130 to TS1140 Drive Upgrade

- TS1140 Tape Drive Model E07
  - Existing TS1130 (3592-E06) Tape Drive upgraded to TS1140 (3592 E07) Tape Drive
  - Upgrade ordered via Model Conversion

TS3500 Shuttle Connection Overview

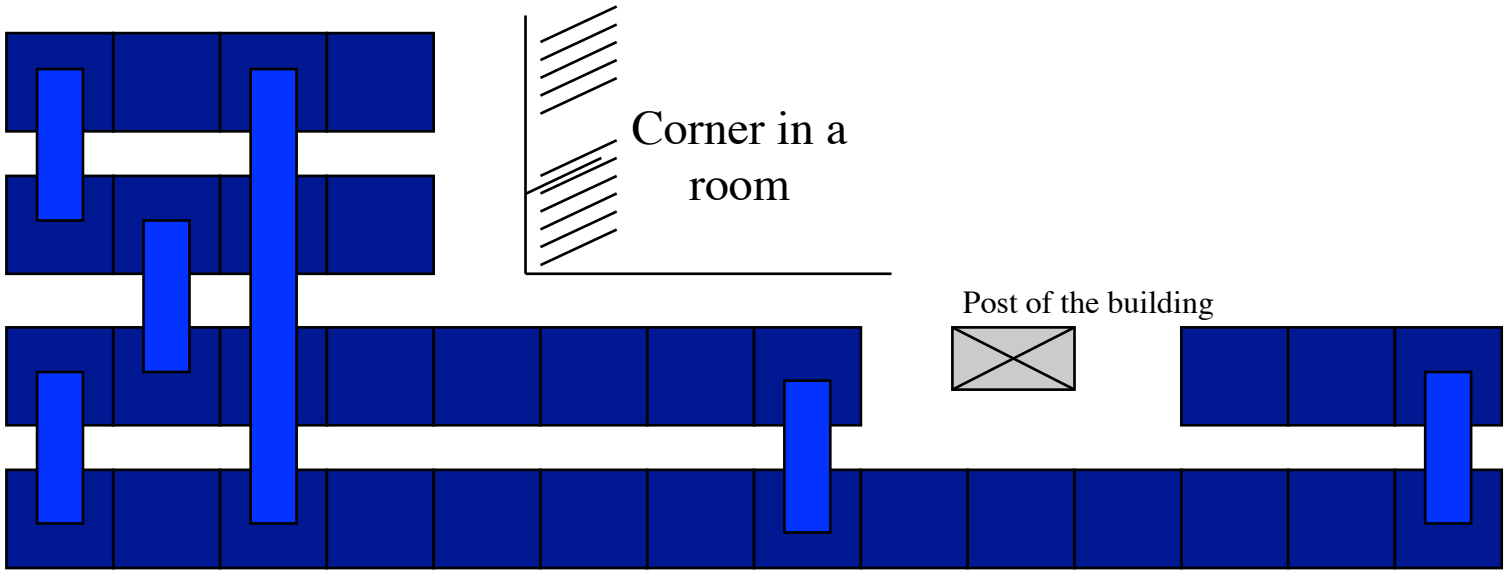
Supporting a very large ‘single’ library image

- Shuttle connection from any library string to any library string without intermediate robot “hand-offs”
- Up to 15 library strings interconnected

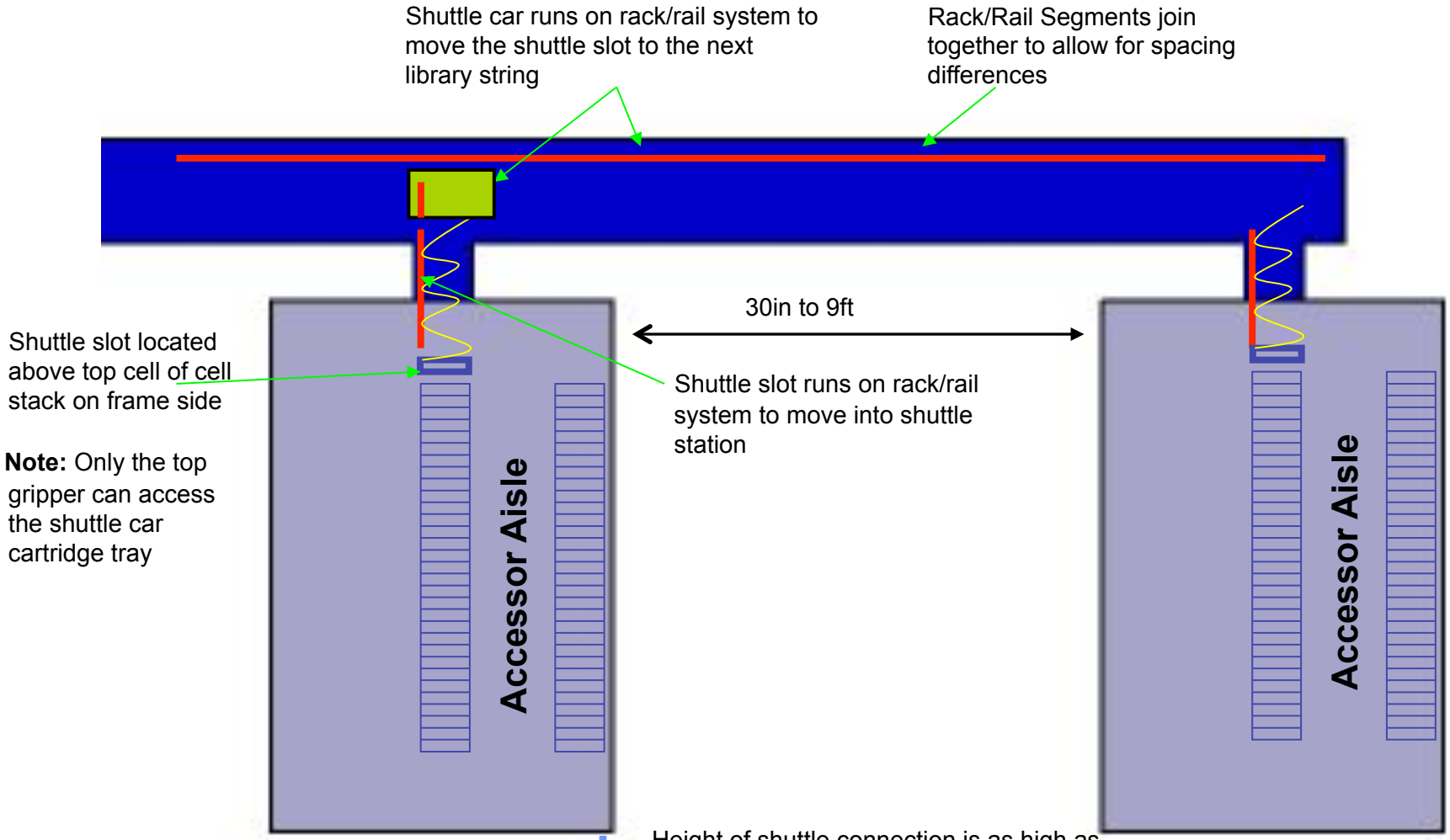


Flexible Floorspace Planning

- Flexible growth on the “z-axis” for constrained data center layouts
- Helps maximize floorspace
- “Shuttles” transfer routes and speed can planned and optimized via pathing algorithms



Side View - Interconnected TS3500 libraries with Shuttle



Note: Only the top gripper can access the shuttle car cartridge tray

Height of shuttle connection is as high as a typical doorway and still under an 8 foot high ceiling