



\* What makes you special?

# Governance & Data Continuity Storage Virtualization Solutions

**Sergio Resch**

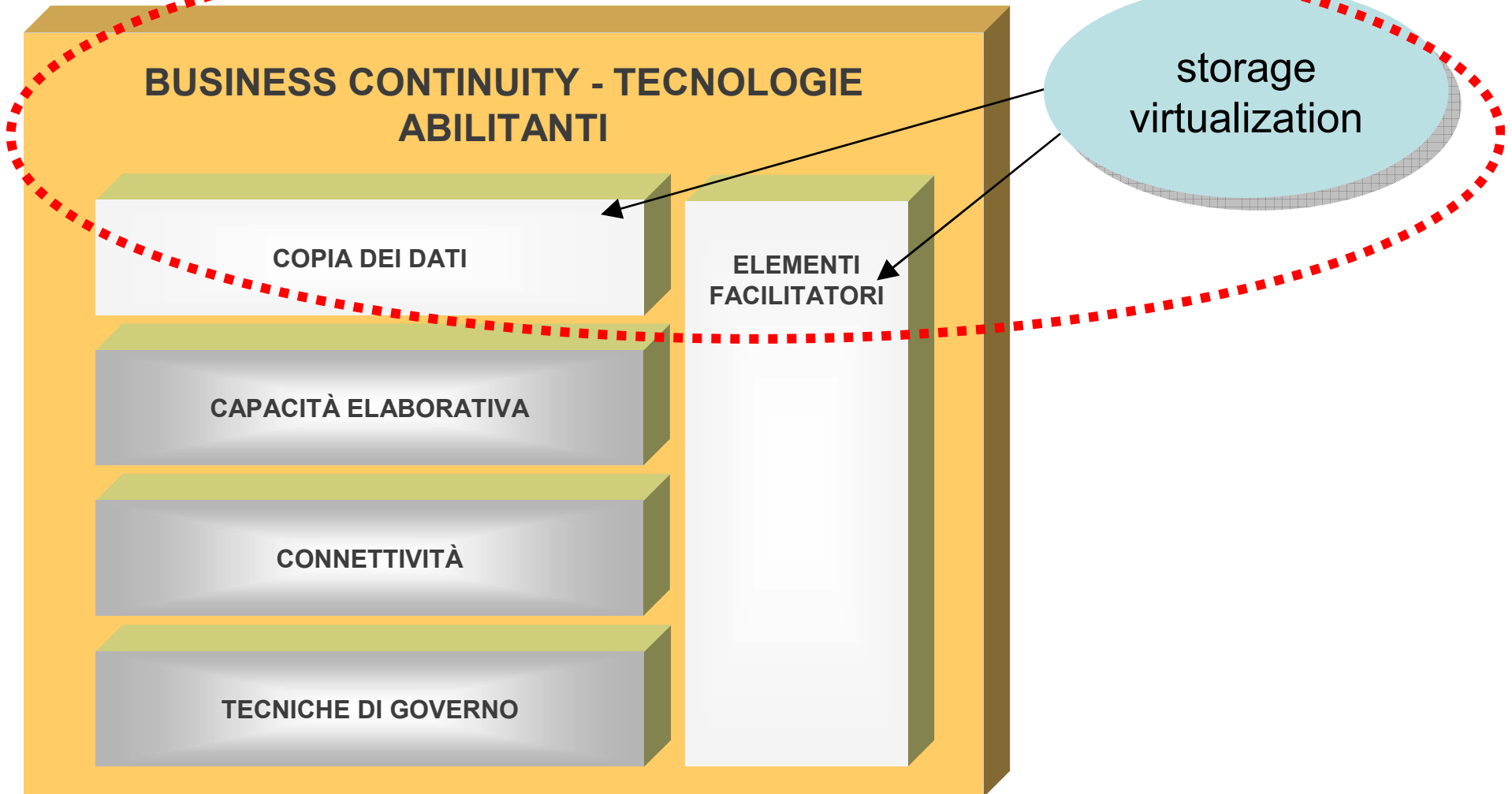
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IBM Governance and Risk Management \*  
Maximize Value, Manage Risk

L'offerta tecnologica a sostegno delle soluzioni di business continuity è in costante evoluzione.



# The Virtual Everything Trend

- Server, memory, storage, network, ...
- Virtual world example: people, locations, money, ...

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SECOND LIFE IS A 3D ONLINE DIGITAL WORLD IMAGINED, CREATED, & OWNED BY ITS RESIDENTS.

- BUY & SELL LINDEN DOLLARS
- OWN VIRTUAL LAND
- REFER FRIENDS

VIEW INTERACTIVE MAP

UNDER 18? CHECK OUT TEEN SECOND LIFE

Total Residents:	4,308,196
Logged In Last 60 Days:	1,549,396
Online Now:	22,622
US\$ Spent Last 24h:	\$1,466,950
LindeX Activity Last 24h:	\$241,907

## Why Storage Virtualization?

- Not “just another way of helping manage SANs”
- Storage virtualization complements server virtualization
  - Both technologies help increase flexibility and speed responsiveness
- Storage management used to be manually intensive, time-consuming and disruptive to the business
  - Storage virtualization with SVC can help change that to automatic, time-saving and non-disruptive to the business
- Radically changes the way you think about and work with storage to make it fundamentally more flexible than just disk boxes alone



# IBM SAN Volume Controller Delivers Value

## Application Availability

- Make changes to storage and move data without taking applications down
- Allocate more storage to applications automatically
- Reduce application failures from out-of-space conditions

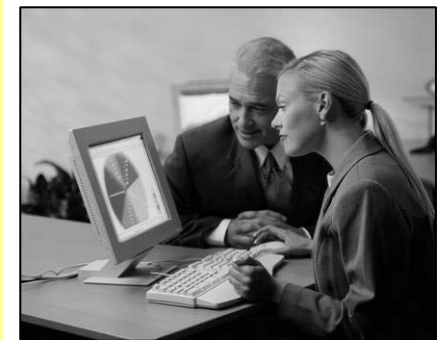
## Personnel Productivity

- Manage storage as a business resource, not as separate boxes
- Easier provisioning of new storage for applications
- Manage SAN data from a centralized point
- Easier storage and server consolidations

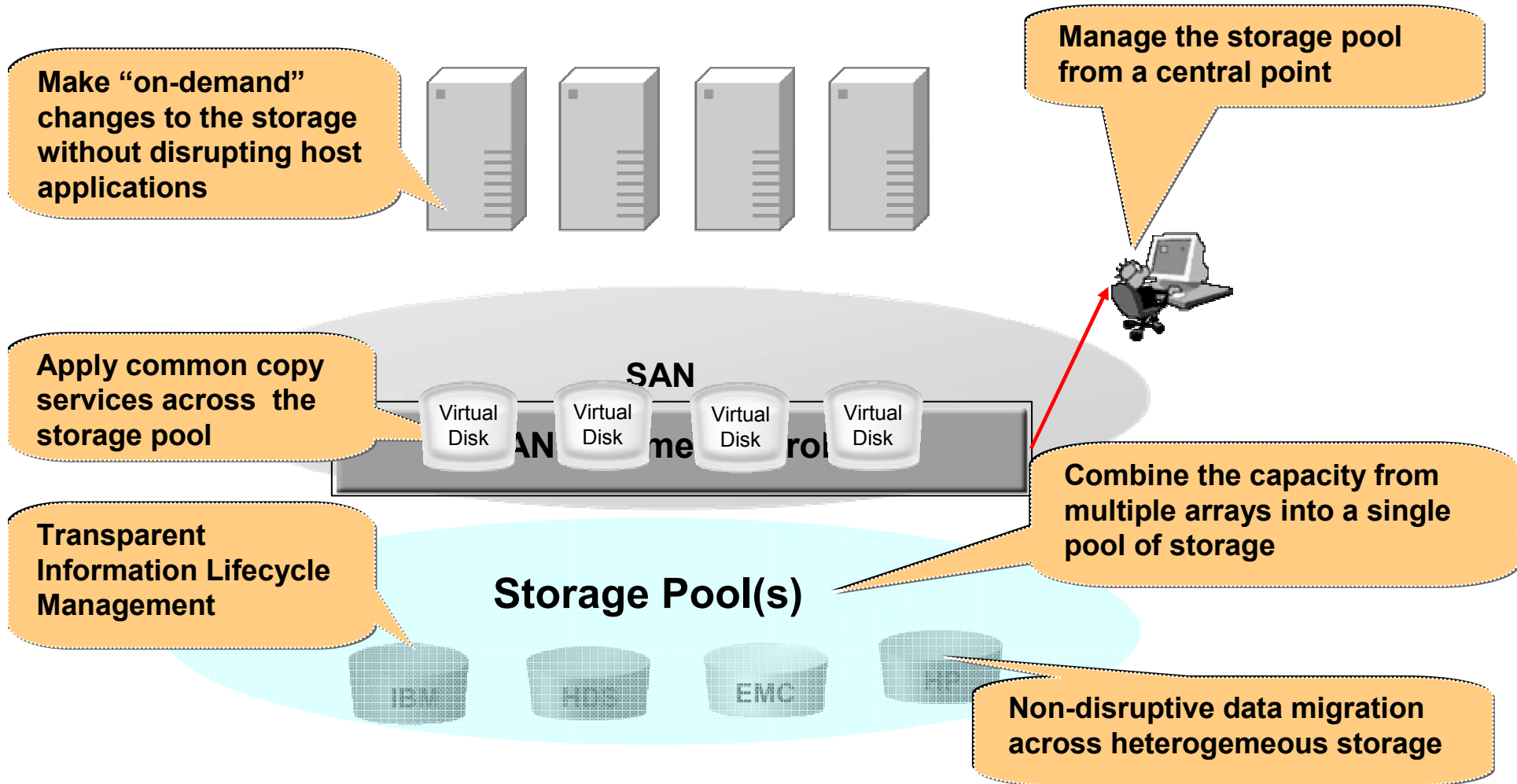


## Storage System Optimization

- Increase disk utilization from 45% to 70% or higher
- Implement storage 'classes' to align disk storage to data service needs
- Lower storage software costs with common advanced functions
- Enables lower cost storage devices at disaster recovery sites



# Flexible Storage Infrastructure with SVC



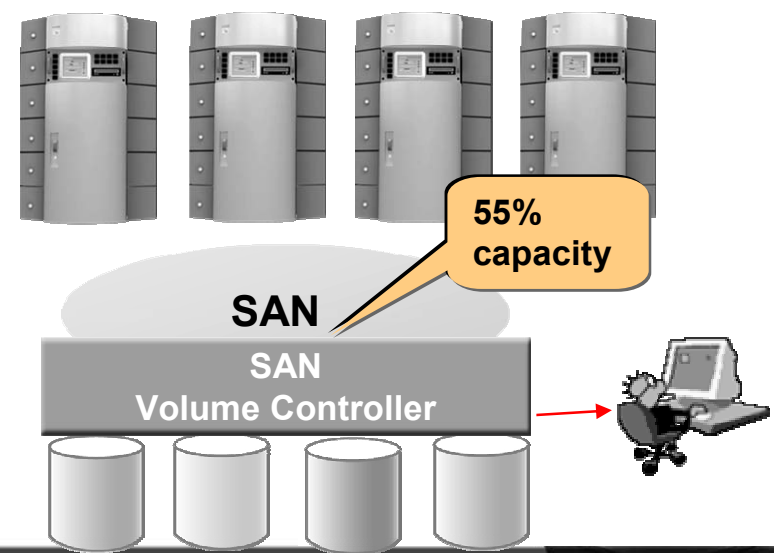
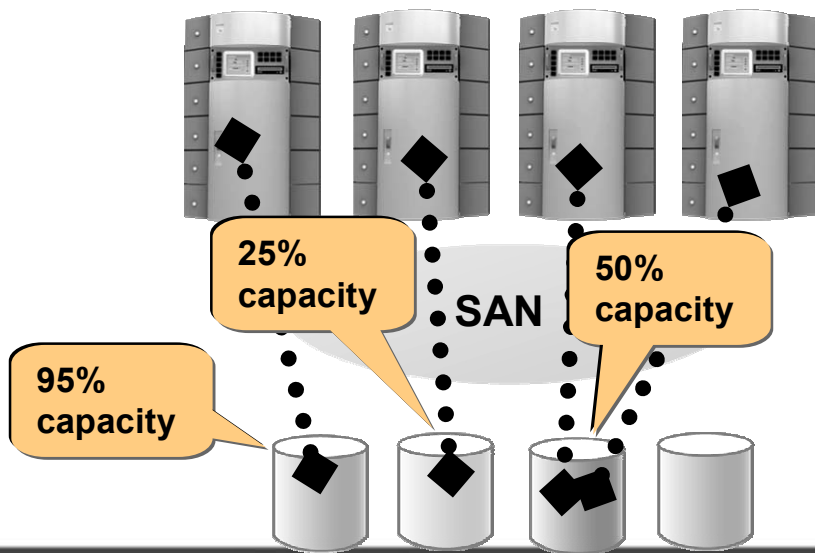
# Reduces Out of Space Outages

## Traditional SAN

- Capacity is isolated in SAN islands
- Multiple management points
- Poor capacity utilization
- Capacity is purchased for, and owned by individual processors

## SAN Volume Controller

- Combines capacity into a single pool
- Uses storage assets more efficiently
- Single management point
- Capacity purchases can be deferred until the physical capacity of the SAN reaches a trigger point.



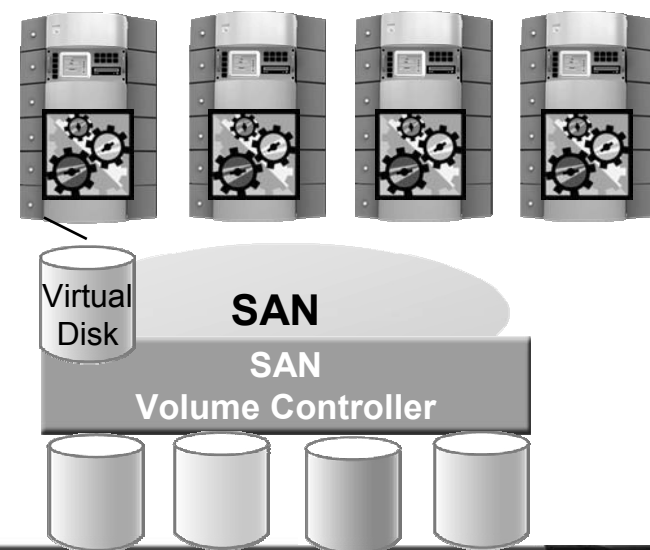
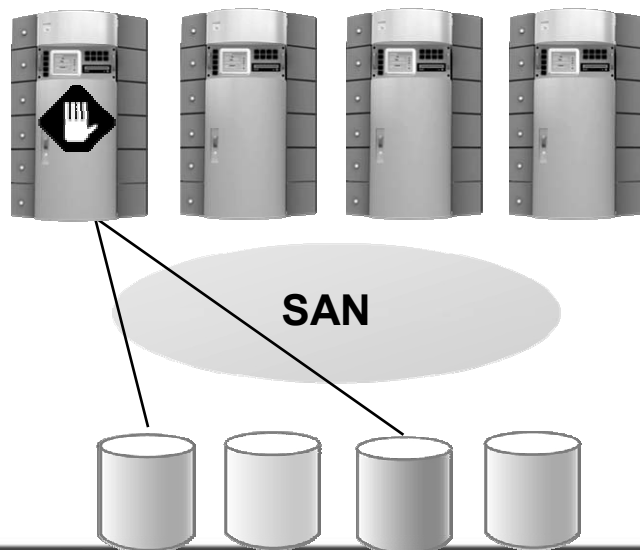
# Non-disruptive Data Migration

## Traditional SAN

1. Stop applications
2. Move data
3. Re-establish host connections
4. Restart applications

## SAN Volume Controller

1. Move data  
Host systems and applications are not affected.

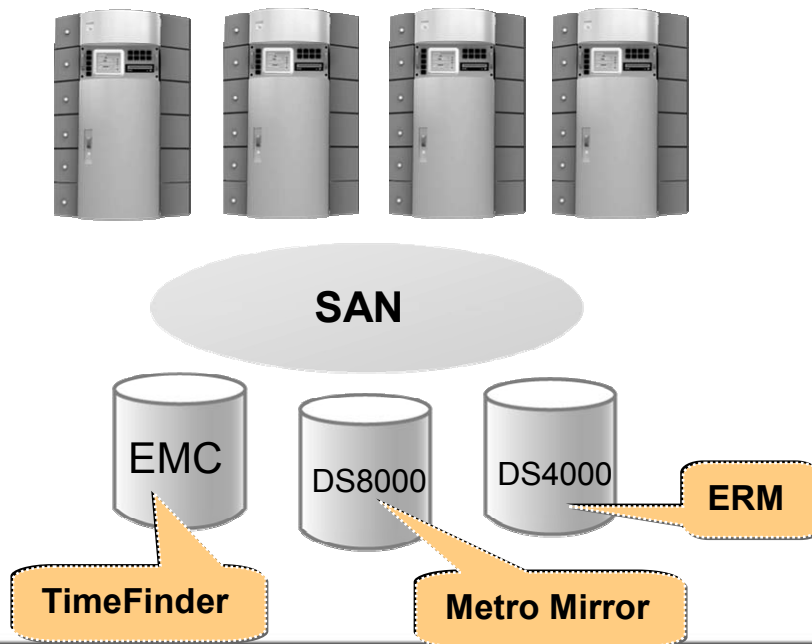




# Transparent Data Lifecycle Management

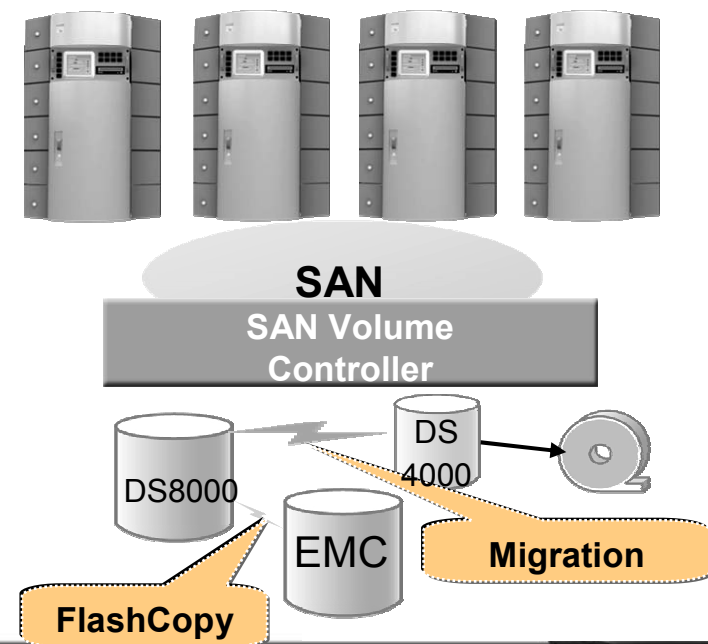
## Traditional SAN

- Moving data between arrays is disruptive
- Copy Services only between like arrays



## SAN Volume Controller

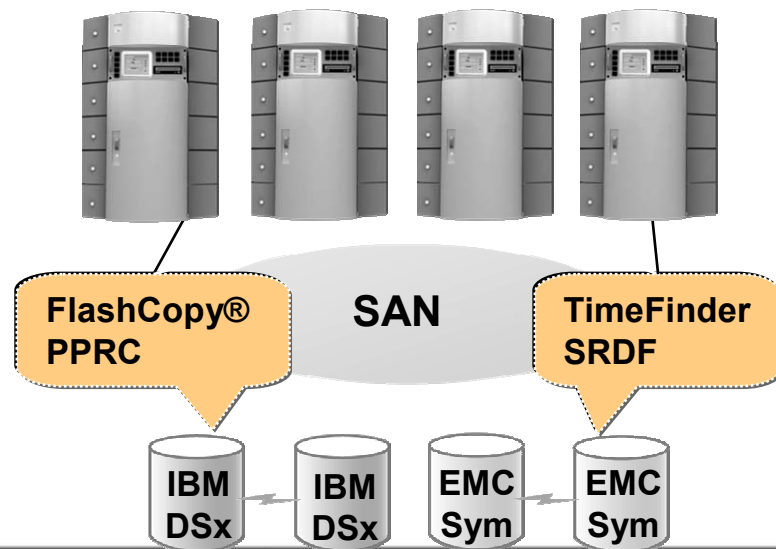
- Ability to move data between arrays without disruption
- Apply Copy Services from any to any
- Match the cost of storage to the business value of the data



# Lower Costs for Business Continuity

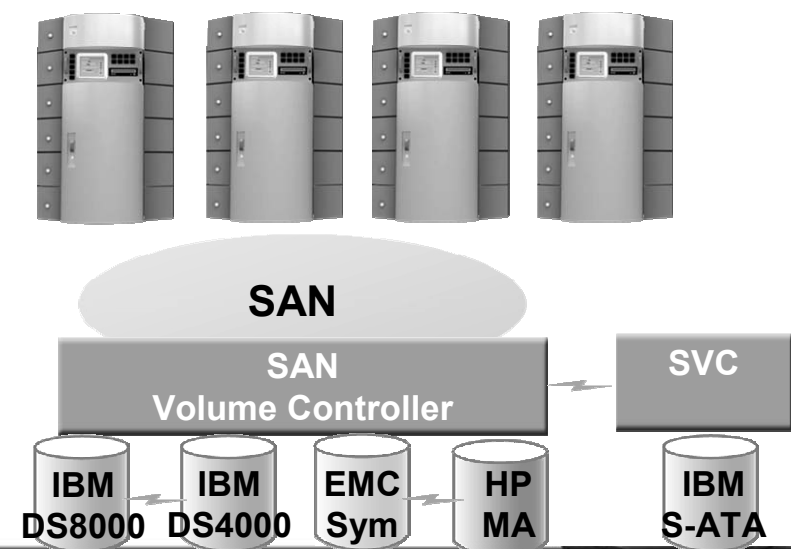
## Traditional SAN

- Replication APIs differ by vendor
- Replication destination must be the same as the source
- Different multipath drivers for each array
- Lower-cost disks offer primitive, or no replication services

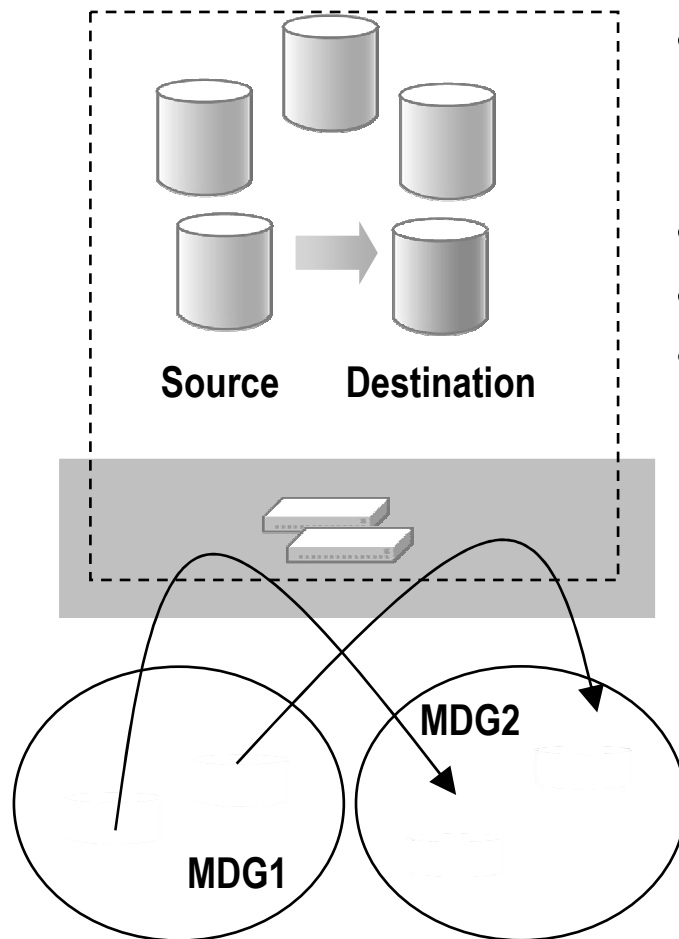


## SAN Volume Controller

- Common replication API, SAN-wide, that does not change as storage hardware changes
- Common multipath driver for all arrays
- Replication targets can be on lower-cost disks, reducing the overall cost of exploiting replication services



# SAN Volume Controller – Copy Services



- **SVC Copy Services performed on Vdisks**
  - Uses Consistency Groups for data integrity
- **FlashCopy:** Point-in-Time copy
- **Metro Mirror:** Synchronous Continuous Copy
- **Global Mirror:** Asynchronous Copy

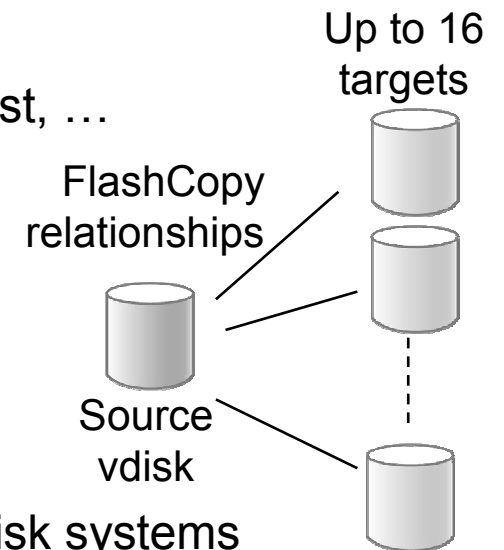
## SVC Copy Services enable

- Read/Write access to data
- Data integrity
- FlashCopy from any to any
- Mirror from any to any

# SVC FlashCopy® Function



- Volume-level local SAN replication function
- Designed to create copies for backup, parallel processing, test, ...
- Copy available almost immediately for use
- Background copy operation or “copy on write”
- Up to sixteen copies of a single source volume
- Source and target volumes may be on any SVC supported disk systems



## SVC Metro Mirror Function

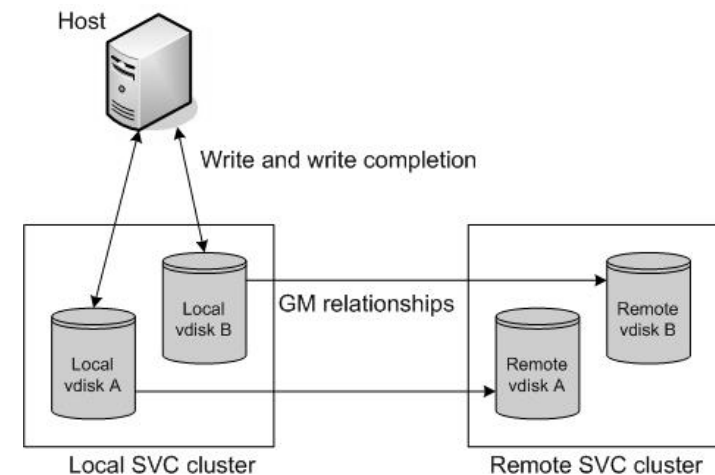


- “Metropolitan” distance synchronous remote mirroring function
- Up to 300km between sites for business continuity
  - As with any synchronous remote replication, performance requirements may limit usable distance
- Host I/O completed only when data stored at both locations
- Designed to maintain fully synchronized copies at both sites
  - Once initial copy has completed
- Metro and Global Mirror delivered as single feature
  - Offers great implementation flexibility
- Operates between SVC clusters at each site
  - Local and remote volumes may be on any SVC supported disk systems

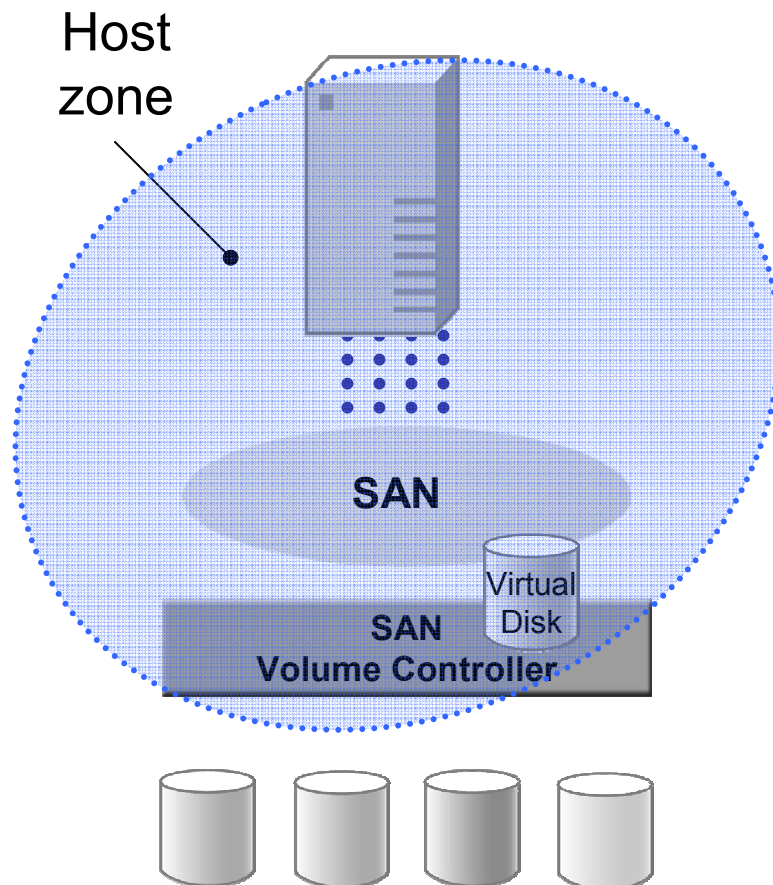
# SVC Global Mirror Function



- Long distance asynchronous remote mirroring function
- Up to 8000km distance between sites for business continuity
- Does not wait for secondary I/O before completing host I/O
  - Helps reduce performance impact to applications
- Designed to maintain consistent secondary copy at all times
  - Once initial copy has completed
- Built on Metro Mirror code base
- Metro and Global Mirror delivered as single feature
  - Offers great implementation flexibility
- Operates between SVC clusters at each site
  - Local and remote volumes may be on any SVC supported disk systems



# Reduce Cost & Complexity: Server Management

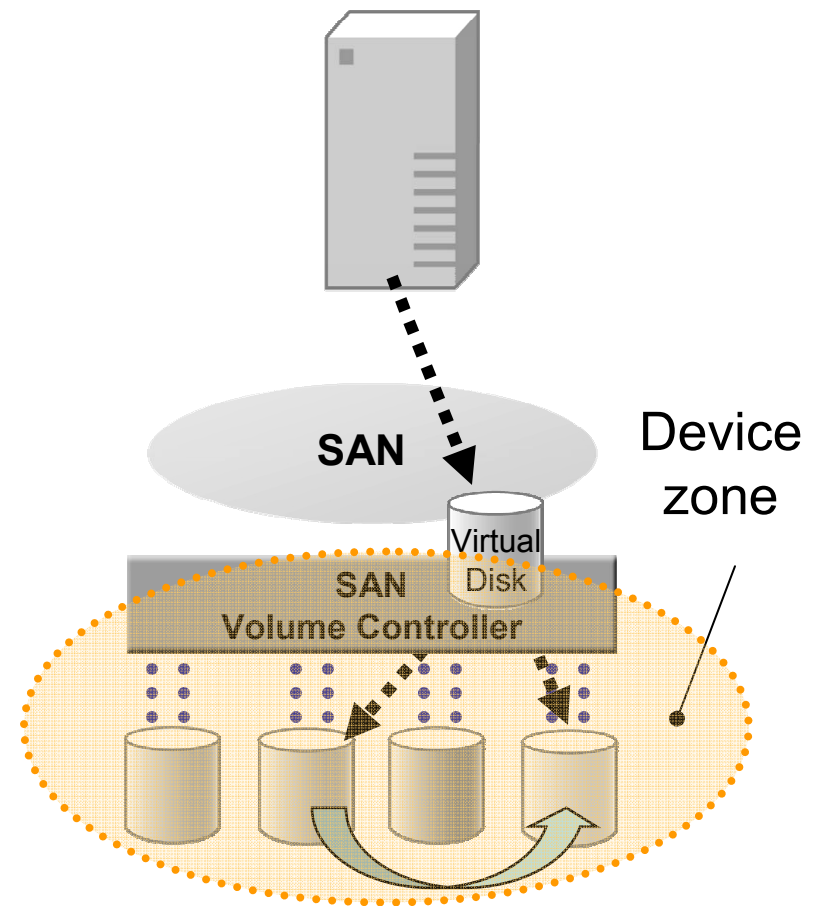


- Requires only one multipathing device driver on the server
  - Multiple data paths, failover/failback, load-balancing
  - Server only sees SVC, not disk arrays
  - Adding a new disk array does not require additional server tasks
- Choice of Driver is yours<sup>(\*)</sup>
  - IBM SDD (Subsystem Device Driver)
  - MPIO
  - HP PV-Links
  - Symantec DMP

(\*) For the most current, and more detailed, information please visit [ibm.com/storage/svc](http://ibm.com/storage/svc) and click on "Interoperability".

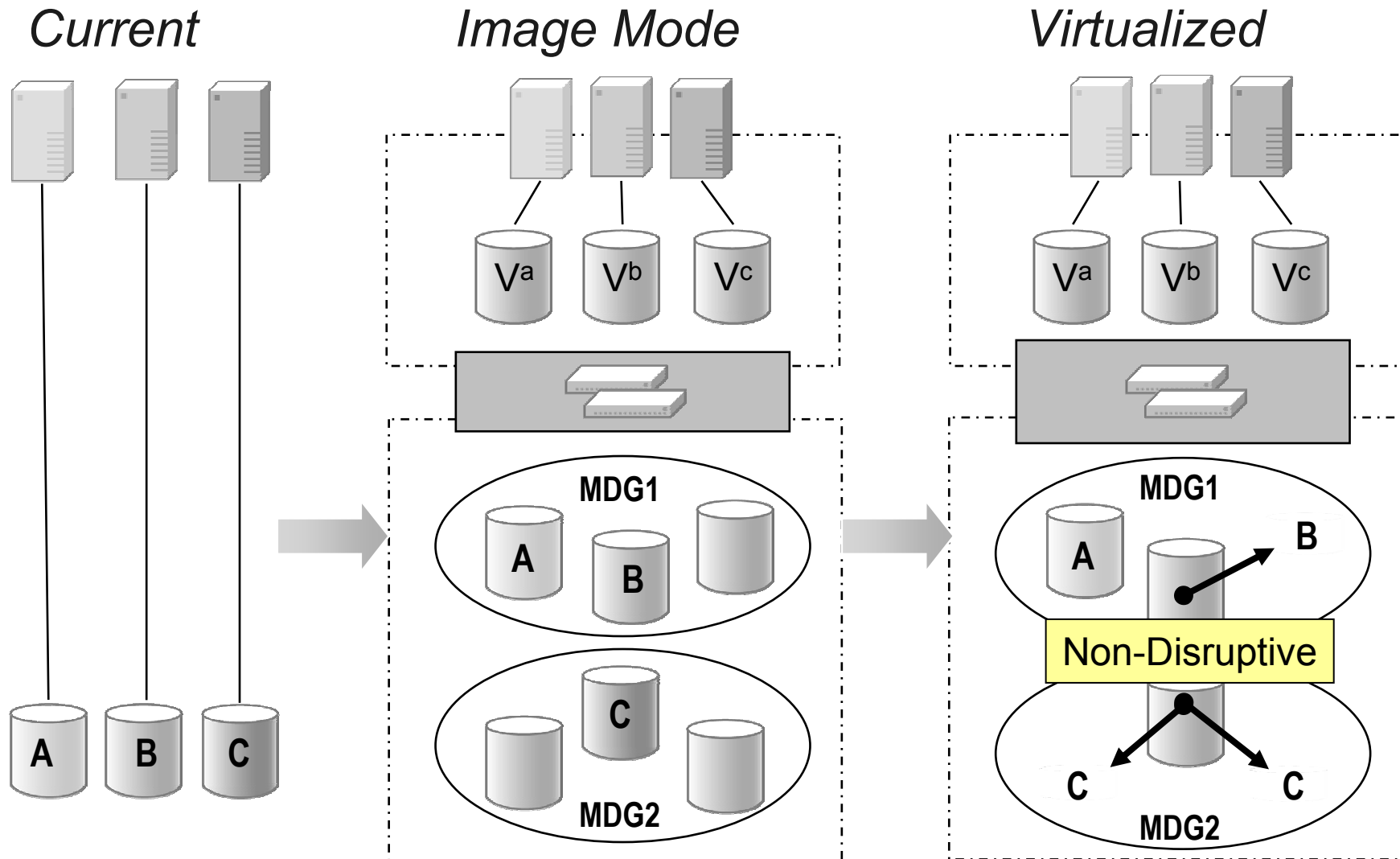
# Reduce Cost & Complexity: Storage Management

- Disk storage arrays only see SAN Volume Controller
  - No costly device drivers needed
  - No advanced function software licensing required
  - SVC provisions all the storage
  - Replace disk arrays without disrupting applications



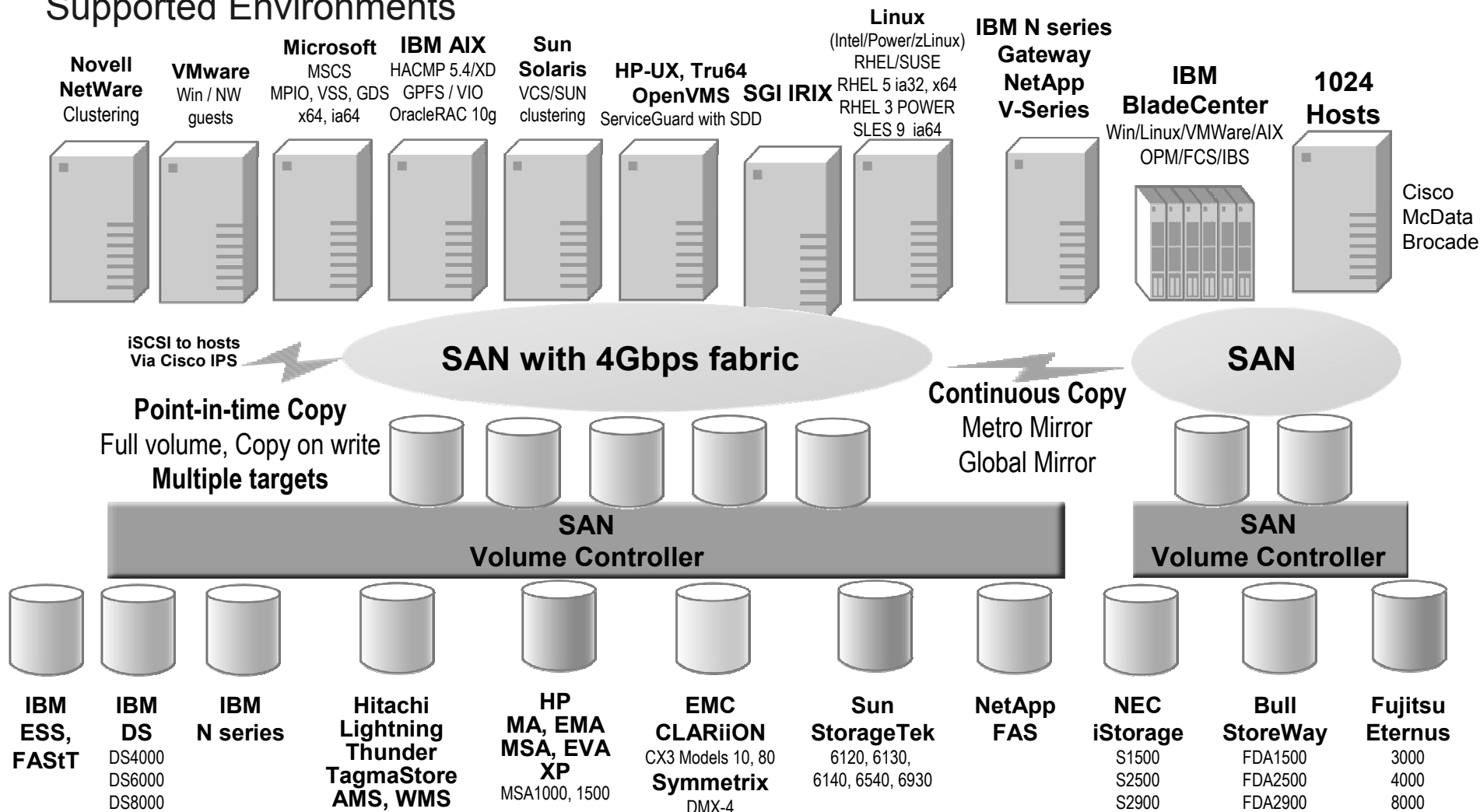


# Easy Deployment of SVC



# SAN Volume Controller Version 4.2

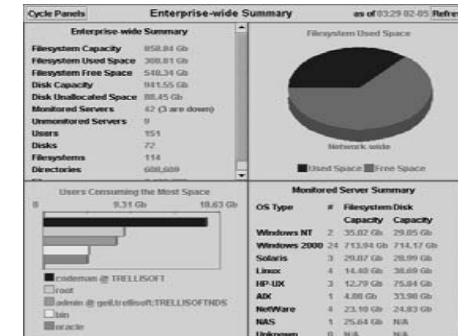
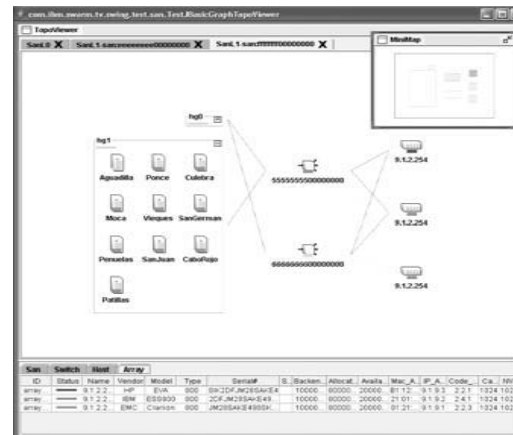
## Supported Environments



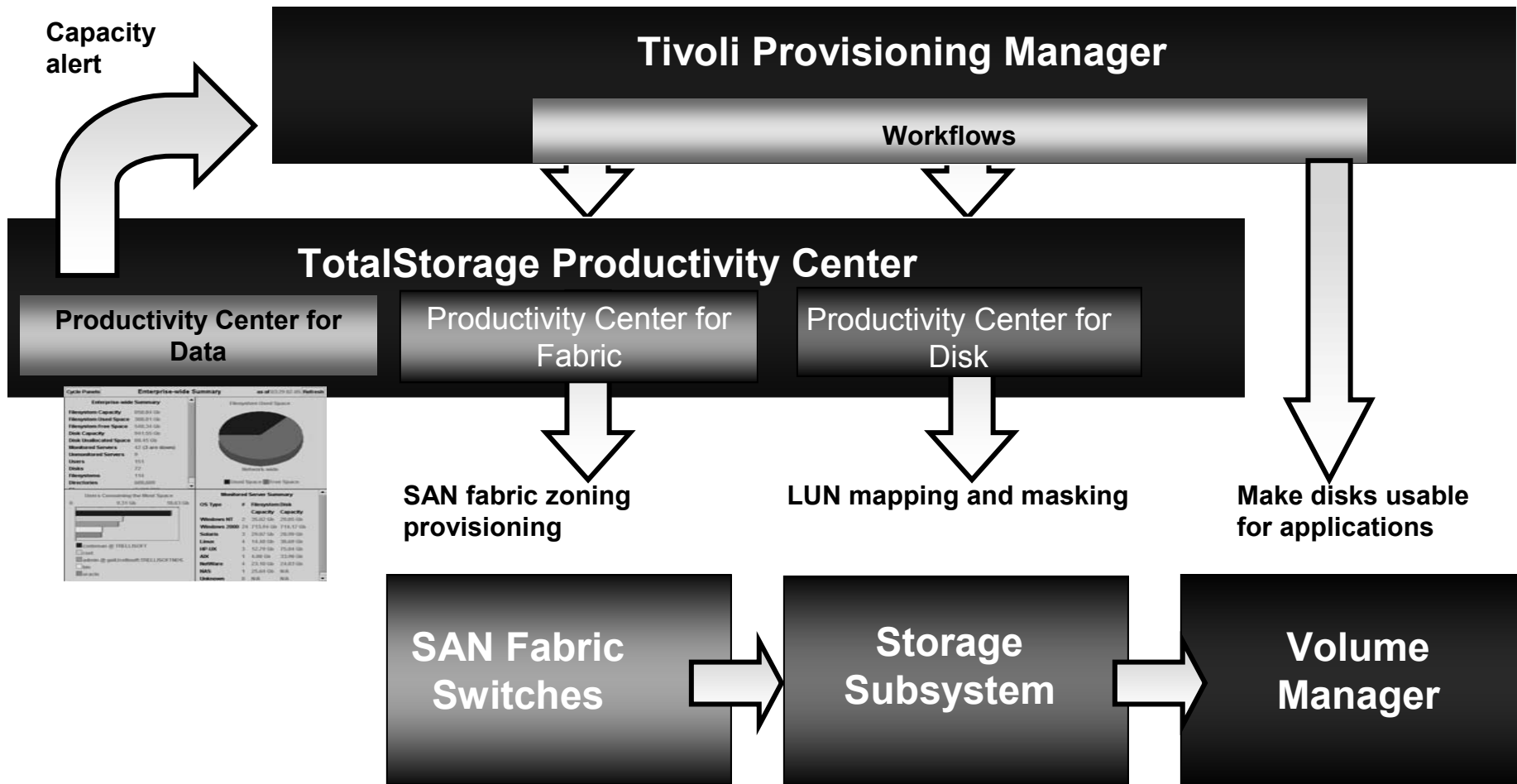
For the most current, and more detailed, information please visit [ibm.com/storage/svc](http://ibm.com/storage/svc) and click on "Interoperability".

# IBM TotalStorage Productivity Center

- **Centralized Storage Management With Focus on the User Experience**
  - Single Management Interface / Point of Control / SMI-S Based
  - Data, Disk, Tape, Fabric, Replication Management Services
  - IBM and non-IBM device management
  
- **Single Data Repository for Storage Infrastructure Monitoring, Reporting and Management**
  - Single management server and database



# TPM + TPC Automate Storage Provisioning



# IBM Virtualization Leadership

- IBM has shipped over 9,000 SVC engines running in more than 3,100 SVC systems
- There are more than 130 customer references for SAN Volume Controller in all major industries
- SAN Volume Controller is a proven offering that has been delivering benefits to customers for four years
- SAN Volume Controller demonstrates scalability with the fastest Storage Performance Council (SPC-1 & SPC-2) benchmark results
- SAN Volume Controller can virtualize IBM and non-IBM storage (over 120 storage systems supported)

AND

- IBM can virtualize most of a client's infrastructure
- Over 30,000 UNIX, mainframe, and System i customers exploiting systems-level virtualization
- System x customers deploy over 1,000 virtual servers a day
- Over 3,400 Virtual Tape Systems supporting 1 Exabyte of data
- Over 500 grid implementations



## Breakthrough Performance with SVC 4.2





- SPC-1 benchmark: Simulates I/O characteristics of OLTP workloads
  - SVC 4.2 delivers **75% better throughput** than SVC 4.1: **272,500 SPC-1 IOPS**
- SPC-2 benchmark: Simulates heavy sequential workloads
  - SVC 4.2 delivers **over 50% better throughput** than SVC 4.1: **7,080 SPC-2 MB/s**
- SVC leads the industry in both SPC benchmarks
- High SVC throughput supports virtualizing multiple storage systems


Measurements conducted using 8-node SVC configurations; SVC 4.1 used 8F4 nodes; SVC 4.2 used 8G4 nodes.  
For more information, see [www.storageperformance.org/results](http://www.storageperformance.org/results)



# Virtualization is Real!!!

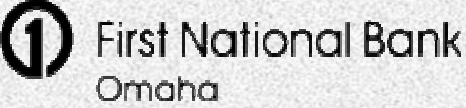


From our vantage point, we see three crucial keys to IBM's success - a comprehensive product capability designed for the enterprise, a



**SVC is a mature, interoperable and rock-solid storage virtualization solution. With over 2,200 production deployments, IBM is the leading storage vendor in the market. For customers shopping for their next storage infrastructure upgrade, especially those considering IBM storage, SVC is a no-brainer. Try it for the migrations that you know you need to get done, and ESG believes you'll like it for your newfound ability to turn an out-of-control heterogeneous storage infrastructure into a centrally managed on-demand storage utility.**

- Perlstein



**"We've seen huge benefits in staffing."**  
- Michael O'Neill,  
First National Bank of Omaha

## Key Areas of Cost Saving Observed by Forrester in SVC Customers



- **Reduction in storage management and administration cost**
  - Allowing a core group of administrators to control multiple assets across a distributed storage environment (*50% efficiency improvement*)
- **Improved storage utilization**
  - Improve capacity utilization of existing storage assets
  - Control the growth of future spending (*improved utilization by 30%*)
- **Reduced cost of storage**
  - Capitalize on being able to purchase the lowest cost storage resources (*controlled growth on average by 20%*)
- **Improved customer and end user availability to data-driven applications**
  - Minimize downtime associated with migrating data between storage assets (*\$240,000 in annual savings*)



Source: *The Total Economic Impact™ of IBM® System Storage™ SAN Volume Controller*



# Summary: SVC Delivers Clear Financial Benefits



- Forrester Consulting Total Economic Impact™ study of SVC
- Surveyed four SVC customers to understand costs and benefits
  - Created composite model based on interview findings
- Risk-adjusted payback period: 1.4 years

Summary financial results	Original estimate	Risk-adjusted
ROI	83%	53%
Payback period (years)	1.2	1.4
Total costs (PV)	(\$581,225)	(\$616,256)
Total benefits (PV)	\$1,061,106	\$943,750
Total (NPV)	\$479,881	\$327,494
Internal rate of return (IRR)	75%	55%

Source: *The Total Economic Impact™ Of IBM® System Storage™ SAN Volume Controller*

## Value of Storage Virtualization



- Enterprise Strategy Group reports that early virtualization adopters on average *every year* save:
  - 24% on hardware costs
  - 16% on software costs
  - 19% on SAN administration costs
- With a \$1 million budget spending \$500,000 on hardware, \$200,000 on software, and \$300,000 on administration

*Annual savings would be \$209,000*

Source: [http://searchstorage.techtarget.com/tip/1,289483,sid5\\_gci1122304,00.html](http://searchstorage.techtarget.com/tip/1,289483,sid5_gci1122304,00.html)

# Many Thanks !!!

