

Addressing Data Growth, Threats and Compliance: Unified Storage Management

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Business without **LIMITS 2012**

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Agenda

- Introduction
- Information Explosion
- Choices for reducing your data storage footprint
 - Avoid duplicating data – Treat the cause not the symptom
 - Categorize the data for migration & deletion
 - Automate the migration, archival and deletion
 - Compress and deduplicate what's left
 - Maximize utilization of storage resources



Information Explosion

Volume

Every day, **15 petabytes** of new information are being generated. **By 2010 onwards**, the codified information base of the world is expected to double every **11** hours.



Variety

80% of new data growth is unstructured content, generated largely by email, with increasing contribution by documents, images, and video and audio.



Velocity

An average company with 1,000 employees spends **\$5.3 million** a year to find information stored on its servers. **42%** of managers say they use the wrong information at least once per week.



Information Week Survey:

70% say Regulations drive up storage demands, businesses realizing they **must** classify, manage, delete data - not just keep adding storage

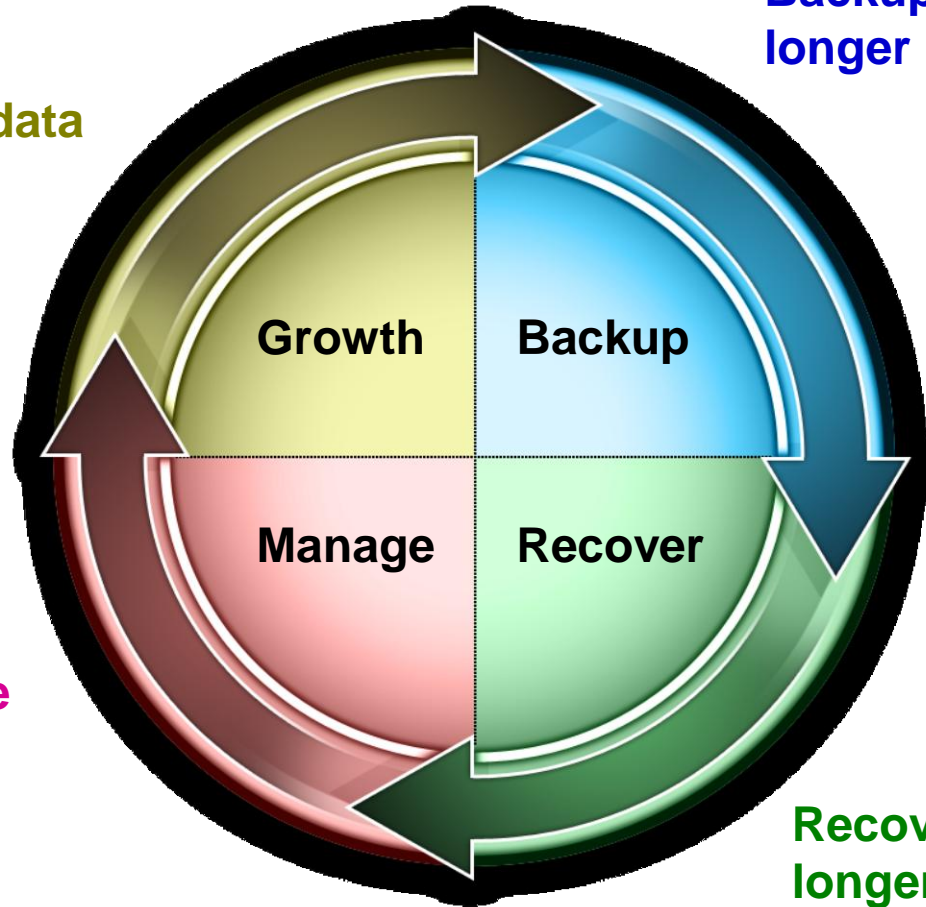


The pressures on administrators are growing

The consequences of data growth

More new data coming

Backup takes longer



Recovery Considerations



RPO



RTO



Labor, Systems Bandwidth Costs



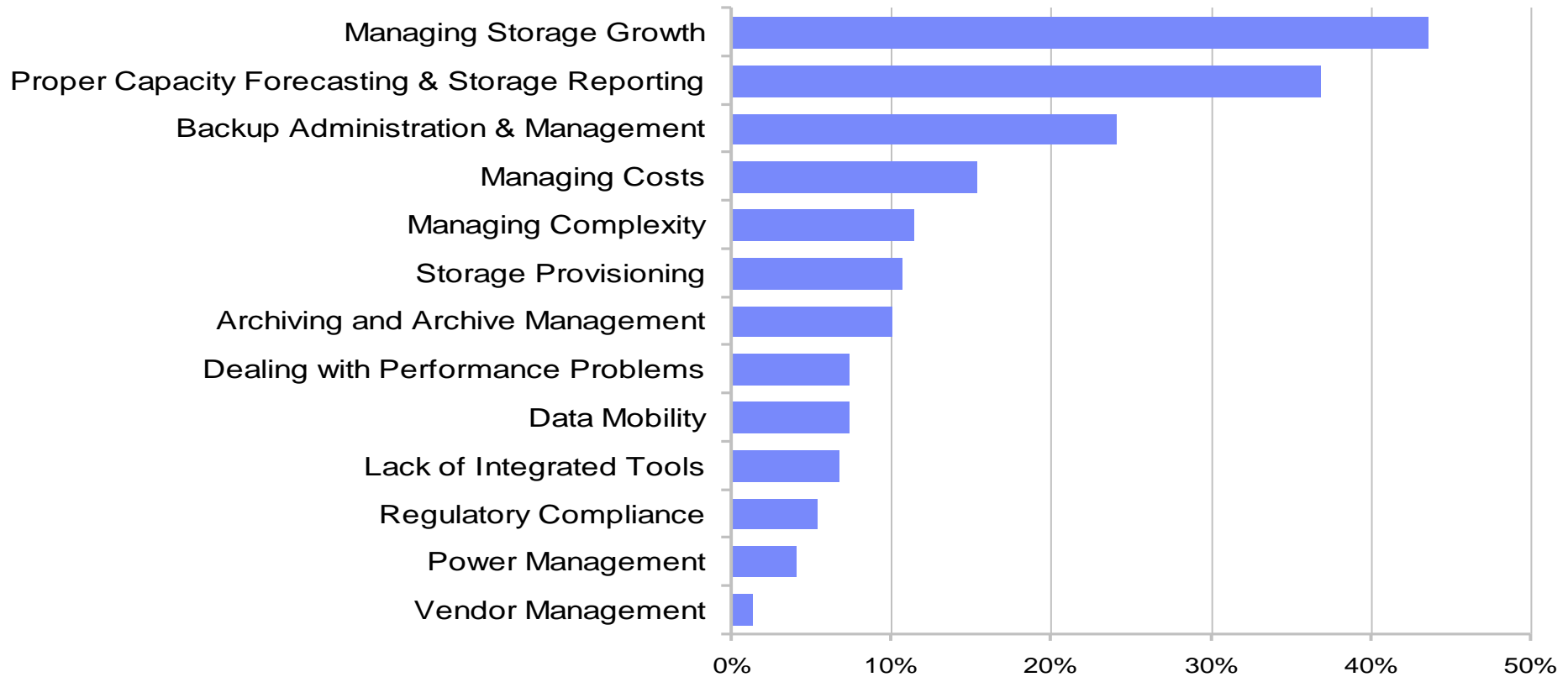
Impact on Applications

Can't buy more storage

Recovery takes longer



Survey - what are your two biggest storage pain points?



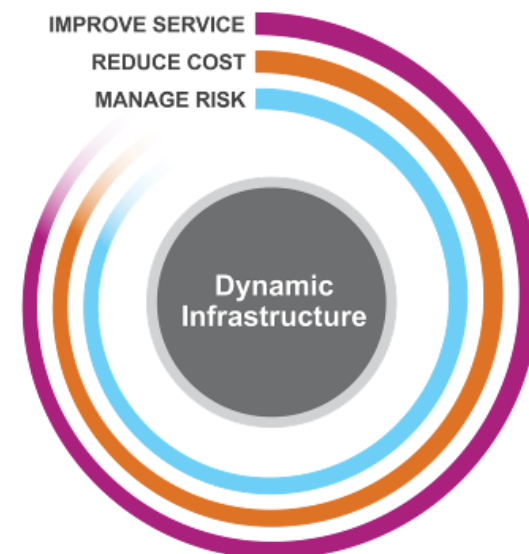
* TheInfoPro Wave 14 Storage Study: F1000 Sample. n=149. Other n=14. *Multiple responses recorded



Surviving the Tidal Wave

Reducing your data storage footprint will:

- Reduce your costs
 - Less storage = less capital expenditures
 - Less data = simplified management and administration
- Improve service levels
 - Less downtime = higher application availability
 - Improved competitiveness and customer satisfaction
- Mitigate **Risks**
 - Eliminate consequences of data loss
 - Respond faster to events and legal/government inquiries – **Aid Compliance**

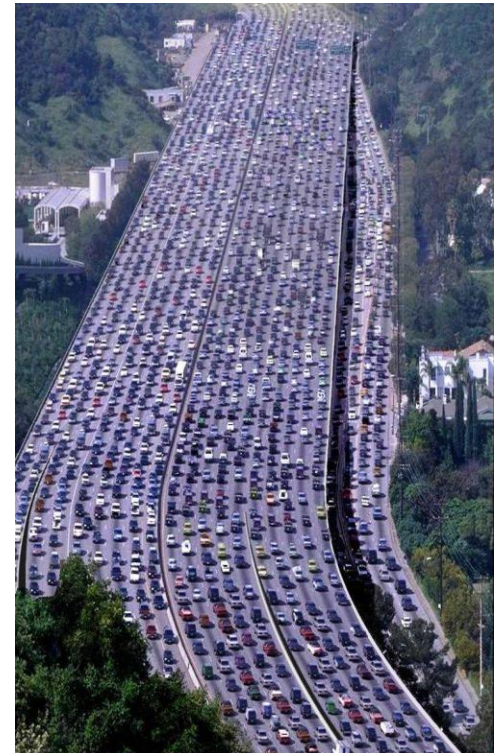


IBM can help you build a dynamic storage infrastructure that will intelligently improve service levels, reduce costs and manage risks



Choices for reducing your data storage footprint:

1. Avoid duplicating data – treat the cause, not the symptom
(Progressive Incremental BackUp)
 - **Periodic full backups** are the #1 cause of duplicate data
 - Performing progressive incremental backups eliminates duplication
2. Categorize the data for migration & deletion (TPC for Data)
 - Older data should be **moved off production systems**
 - This will shorten backup cycles and improve application performance
3. Automate the migration, archival and deletion (TSM HSM for Windows / TSM for Space Management)
 - Set policies based on business requirements
 - Move older, less-frequently accessed data to archive storage tiers
4. Compress and deduplicate what's left (Native De Dup & Appliance based De Dup)
 - Redundant copies may still exist on different source systems
 - **Deduplication** can reduce capacity requirements by another 40-95%
5. Maximize utilization of storage resources (VSC)
 - Gain better Visibility, Control and Automation - Management
 - **Virtualize heterogeneous storage** silos into a single pool of capacity



1. Avoid duplicating data – treat the cause, not the symptom



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Comprehensive Data Reduction

Treat the cause, not the symptom

- Reduce Windows backup storage costs by 94%
- Reduce Oracle deduplication results – 75% reduction of backup storage.



Source (Client) -Side Data Deduplication

- Enables a 24:1 deduplication ratio



Target (server)-side deduplication

- Shortens backup times by 20 percent

Progressive Incremental backup for ever

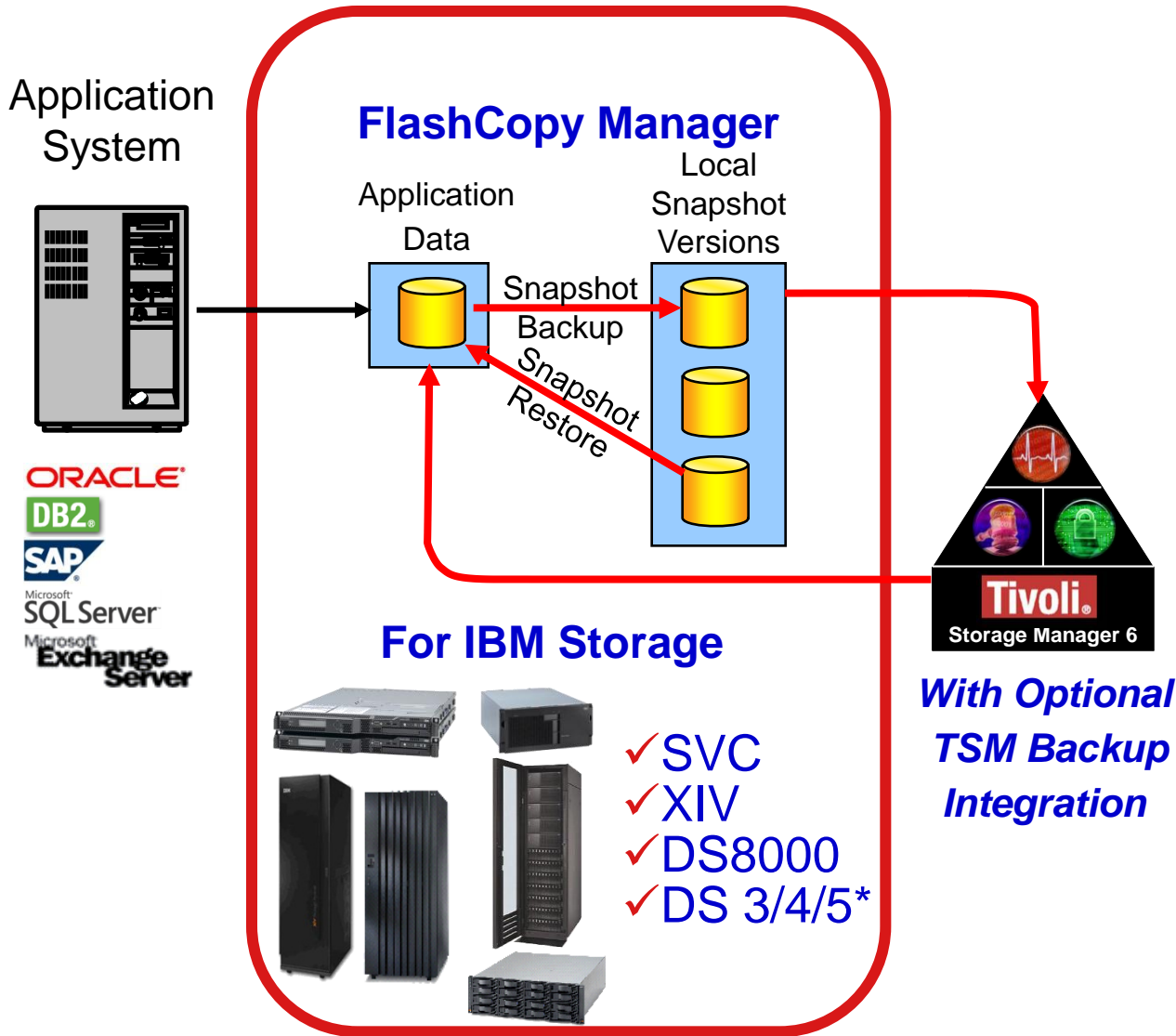
- Backup storage capacity reduction by 70%

Device side deduplication (ProtecTIER)

- Enables a 24:1 deduplication ratio
- Shortens backup times by 20 percent
- Reduces recovery times by more than 50 percent



FlashCopy Manager Overview (for Data)



- ✓ Online, near instant snapshot backups with minimal performance impact
- ✓ High performance, near instant restore capability
- ✓ Integrated with IBM Storage Hardware
- ✓ Simplified deployment

With Optional TSM Backup Integration

*VSS Integration



Where we've been ...

Leading the way for more than 19 years

**“Business runs on IT,
IT runs on Tivoli !”**

- Leading the way for more than 19 years
- IBM Continue to gain market share
- A major market share player
- Tivoli Storage Management Suite for Unified recovery will provide complete solution to meet RPO, RTO and SLAs.
- Comprehensive Data Reduction method
- *IBM has a highly scalable product*
- Realize measurable cost savings and superior ROI with a comprehensive storage management solution

Innovation from the start

- 1st disk-to-disk backup solution
- 1st to provide support for both disk and tape
- 1st to use hierarchical storage management for offline storage
- 1st to offer a fully incremental approach for backup window management
- 20,000+ loyal customers
- Industry's broadest range of OS and HW platform *from laptop to mainframe*
- *Emphasizing data reduction since 1993*



Where we've been ...

Tivoli Storage Manager – the INNOVATION continues

Tivoli Storage Manager has been designed to address our customers' most challenging issues: the continuing growth of data and the complexity of managing it.

New

in TSM v6.1 (03/2009):

- Increased scalability, availability & performance (embedded DB2 database)
- **Built-in target-side data deduplication**
- Simplified management & deployment
- Improved integration with VMware, NetApp / N series and Windows

New

in TSM v6.2 (03/2010):

- Tight integration with TSM FastBack
- **Built-in source-side data deduplication**
- Automatic deployment of Windows client updates
- Support for VMware vStorage API and VSS in Hyper-V

New

in TSM v6.2.2 (12/2010):

- Even better support for VMware, Windows and N series / NetApp environments
- High Availability of the TSM Server, using DB2 HADR Replication
- Introduction of **TSM for Virtual Environments** in March 2011 – optimized protection and flexible recovery for VMware vSphere
- Introduction of **TSM Suite for Unified Recovery** in June 2011 – capacity-priced bundle of 10 TSM and FastBack products



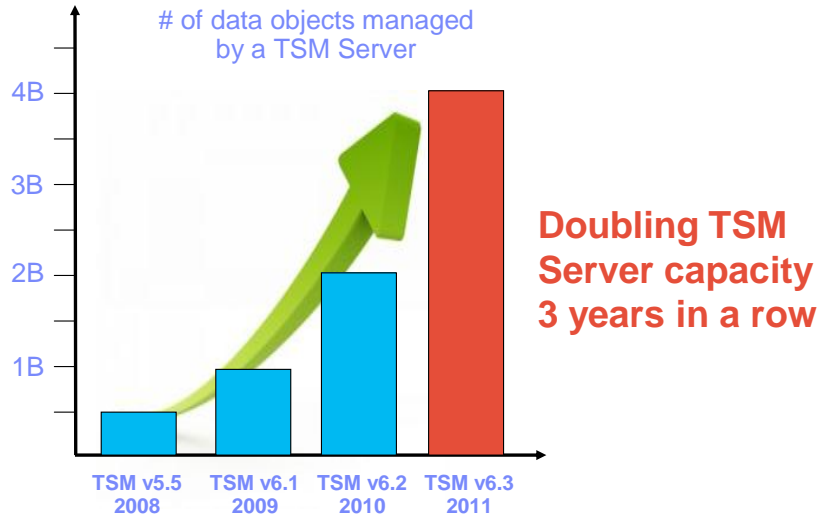
New enhancements in TSM 6.3

Tivoli Storage Manager v6.3

- Improve Return on Investment
 - Increase scalability to 4 Billion data objects per TSM Server
 - 800% improvement over TSM v5.5
- Simplify Administration
 - Automated client software updates across all platforms – simplify admin
 - Improved reporting and monitoring across the family; faster custom report creation
- Improve service levels and availability
 - New client data/metadata replication for warm standby disaster recovery
 - Faster internal database backup

TSM for Virtual Environments v6.3

- Simplify Administration
 - Support for VMware vSphere 5
 - Management plug-in for vCenter Client
 - Centrally manage multiple Linux and Windows vStorage Servers



Tivoli Storage Manager for z/OS Media

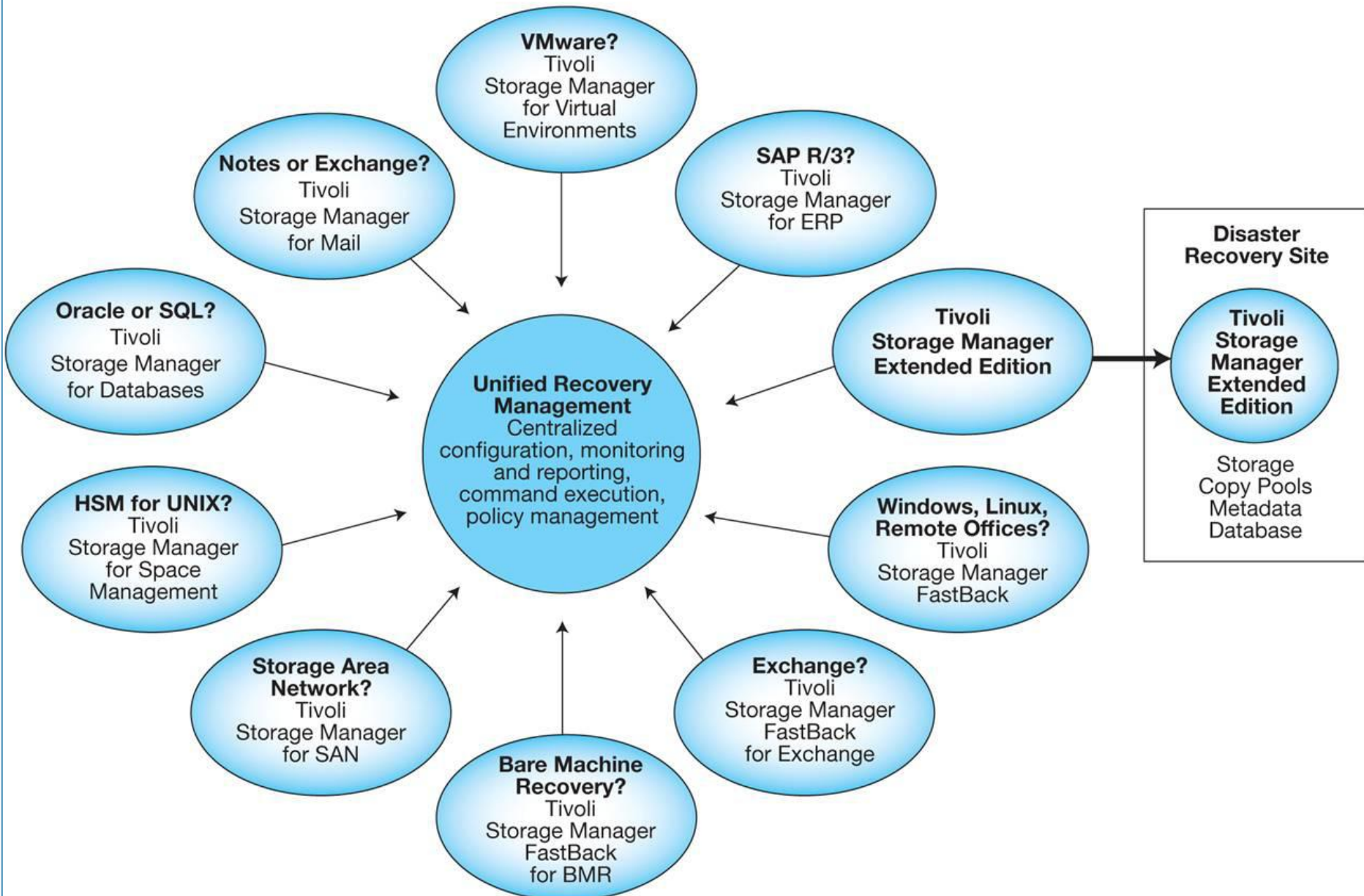
- Enable z/OS clients to take advantage of latest TSM features while leveraging existing mainframe-attached storage resources

Tivoli Storage FlashCopy Manager v3.1

- Improved coverage
 - HP-UX
 - VMware vSphere 4 and vSphere 5
 - Improved functionality with Microsoft Exchange and SQL



IBM Tivoli Storage Manager Suite for Unified Recovery



2. Categorize the Data Migration & Deletion



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Questions ????? SRM Helps Answer

How much storage do I have available for my applications?

How is my storage being used?

How do I know the storage is not the bottleneck for user response time issues?

When do I need to buy more storage?

How well are my storage systems performing?

How do I maintain storage service levels?

How reliable is my SAN?

How do I simplify and centralize the management of my storage infrastructure?

How do I monitor and centrally manage my replication services?

How can I automate the provisioning of my storage systems, databases, file systems and SAN?

Which applications, users and databases are the primary consumers of my storage?

Is the storage infrastructure available and performing as needed?

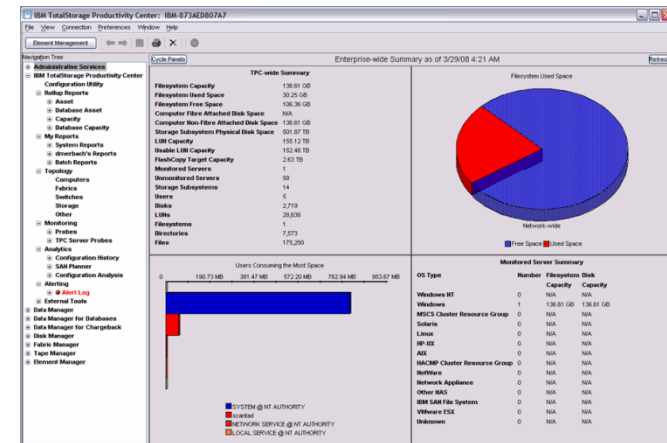
Which files must be backed up, archived and retained for compliance?



Determine What You Have BEFORE You Try To Fix It

IBM Tivoli Storage Productivity Center (for Data)

- Your files systems are probably bursting from data that is old and rarely accessed
- Some data can become a liability after it's outlived it's useful lifetime
 - Think e-discovery: do you know what was saved 5 years ago?
- Categorizing and then leaning out this old data from production systems will:
 - Reduce capacity requirements and lower CAPEX and OPEX
 - Improve backup and restore performance
 - Help meet data retention and expiration mandates
- TPC identifies data for migration and deletion:
 - By date saved or last accessed
 - By location and owner
 - By file type and size



Tivoli Storage Productivity Center – Summary of Offerings

What You Need to Manage

Servers

- ESX servers
- Apps, DB's, file systems
- Volume managers
- Host bus adaptors
- Virtual HBAs
- Multi-path drivers

Storage Networks

- Switches & Directors
- Virtual devices

Storage

- Multi-vendor storage
- Storage array provisioning
- Virtualization / Vol. mapping
- Block + NAS, VMFS
- Tape libraries

Replication

- FlashCopy
- Metro Mirror
- Metro Global Mirror

TPC Can Help

Start Here



TPC 5.1

- ✓ Single management console
- ✓ Heterogeneous storage
- ✓ Health monitoring
- ✓ Capacity mgmt.
- ✓ Provisioning
- ✓ Fabric management
- ✓ FlashCopy support
- ✓ Storage System Performance Management
- ✓ SAN Fabric Performance management
- ✓ Trend Analysis
- ✓ DR & Business Continuity
- ✓ Applications & Storage
- ✓ Hyperswap Mgmt.

... and Mature

IBM SmartCloud Virtual Storage Center

All this and more...

- ✓ Advanced SAN Planning and provisioning based on best practices
- ✓ Proactive configuration change management
- ✓ Performance optimization
- ✓ Tiering Optimization
- ✓ Complete SAN fabric performance mgmt.
- ✓ Storage Virtualization
- ✓ Application Aware flashcopy management



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3. Automate the Migration, Archival and Deletion



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Move data to the right place

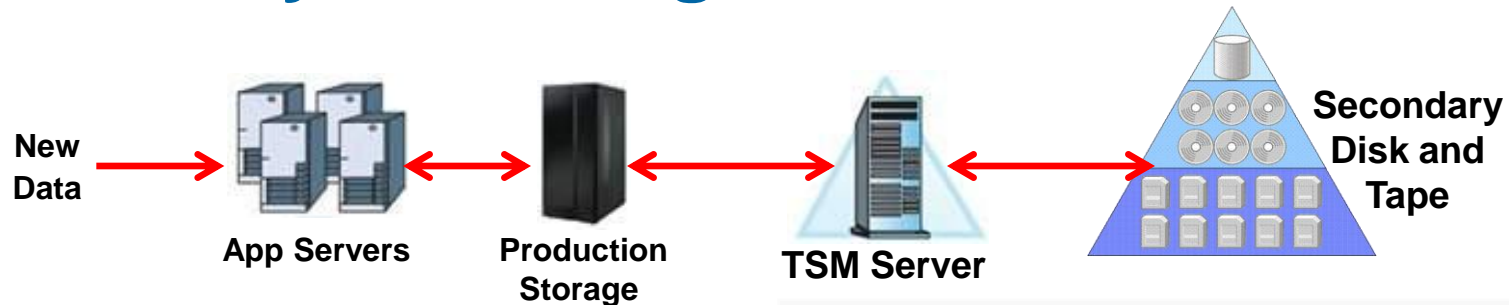
70% of data

hasn't been accessed
in **90 days** or more

**Why are you storing it on
expensive primary storage?**



Data lifecycle management



Regularly scrub production systems of old/stale data

- Automated processes based on business-driven policies

Reduce the growth of primary storage – reduce CAPEX

- Faster backup / restore



Migration / Hierarchical Storage Management (HSM):

- Leaves a pointer; enables transparent access to migrated data

Archive

- Completely removes files from production systems
- Supports data retention and version control policies



Is Long Term Preservation a Real Issue?

Finance

Rule 17a-4 requires broker-dealers to retain account record information for six years. The **six-year period begins either at the time the account is closed** or when the information is replaced or updated

Life insurance policies have to be kept for **life of policy plus 6-10 years**

Healthcare

Medical records should be preserved for the **life of the individual and beyond**

OSHA requires employers to keep records of both medical and other employees who are exposed to toxic substances and harmful agents. Employers must maintain these records for **30 years**

Government

Land registry records, social security records, etc. **Life of individual to forever**

X-rays are often stored for periods of **75 years**

The retention requirement for the [medical] records of minors is **20 to 43 years of age**

Aerospace

Aircraft designs records have to be retained for the lifetime of aircraft (**60+ years**)

Pharma

Pharma needs off-line electronic data storage for **50 to 100 years or longer**

Petroleum

Oil-field data is used over life of field (**50+ years**)

Scientific and Cultural

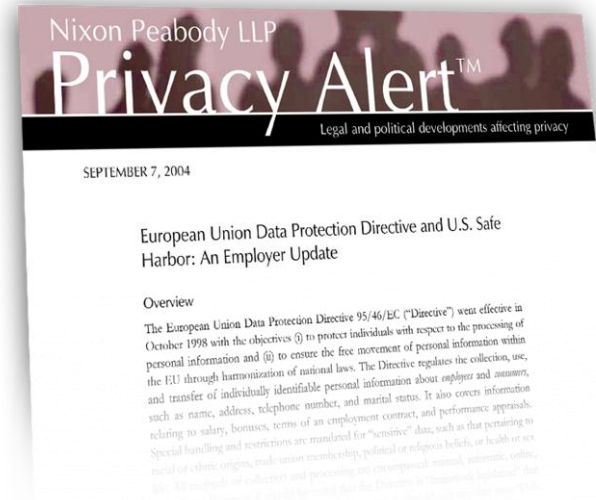
Satellite data is kept **for ever**

We would like to keep Libraries and Art data **for ever**



Most Important – It's The Law

- Regulatory and corporate governance issues are requiring firms to re-evaluate their current compliance and risk management infrastructure
- Companies may face multiple regulations which share or drive different requirements
- Corporations are mandated to:
 - **Ensure records are unaltered and undeleted**
 - **Adhere to internal & external records management policies**
 - **Quickly discover and produce business records for audit purposes**
- Sample regulations include:
 - **Sarbanes- Oxley, USA PATRIOT Act, Basel II, SEC 17a-4, HIPAA, Many others**



\$1.5 million

The average cost to defend a corporate lawsuit per case (Gartner, 2006)

The average e-discovery request can cost from

\$150K to \$250K

Sources: CIO Magazine survey 2007; IBM Tivoli Market needs and profiling study 2005;



IBM Strategic Archiving & Retention Offerings

Data content layer

- IBM CommonStore, IBM Content Manager, IBM Content Collector
- IBM FileNet P8 Content Manager, Image Services, SAP Connector
- IBM Records Crawler
- IBM Optim
- Grid Medical Archive Solution (GMAS)

Policy Management layer

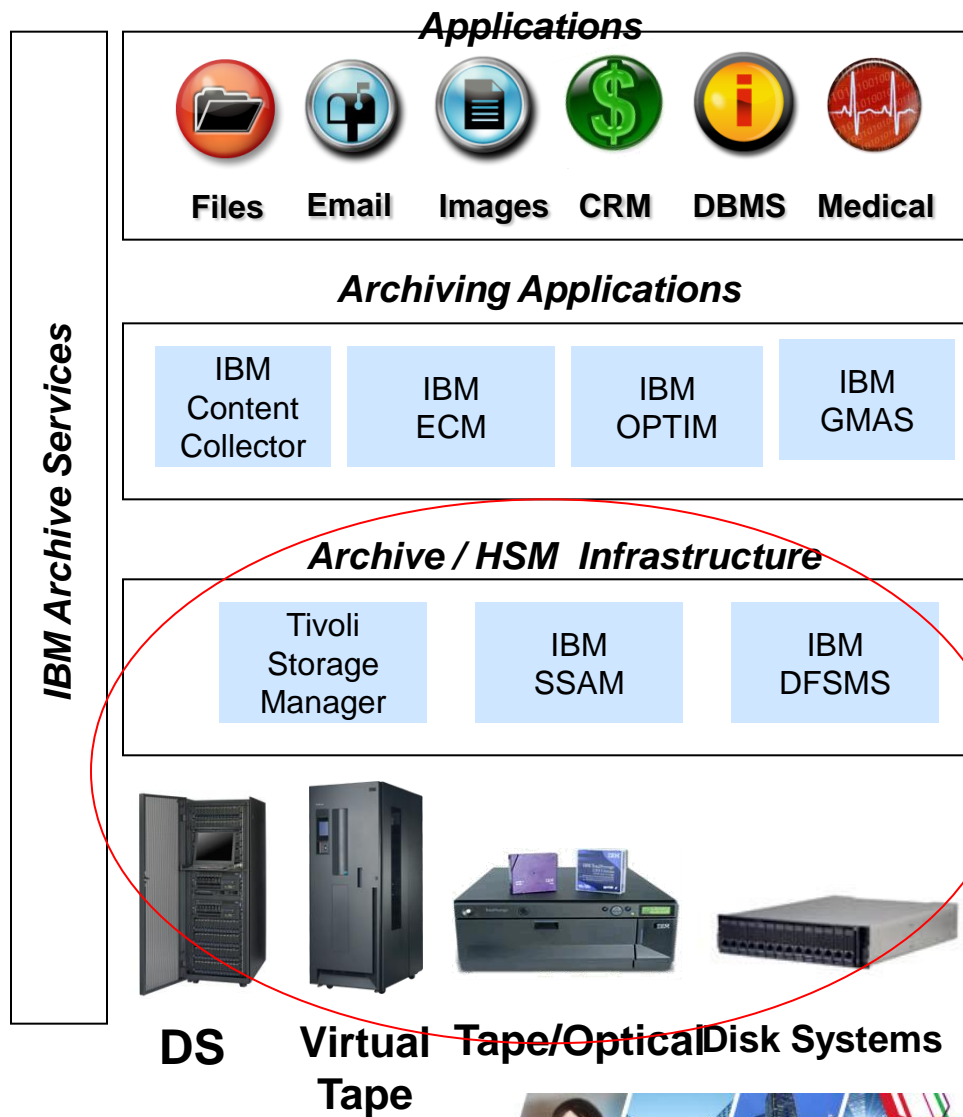
- Tivoli Storage Manager
- System Storage Archive Manager

Storage Media layer

- IBM Disk and Tape Systems

Services layer

- IBM Enterprise Archive Services



4. Deduplicate and Compress What's Left



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Enhanced Data Reduction in Tivoli Storage Manager 6



Built-in Data Deduplication (Server & Client side)

- Tivoli Storage Manager 6 Extended Edition includes data deduplication for disk storage pools, *at no extra charge (Natively)*
- Improves recovery times as many more recovery points can be stored on disk; or reduces the amount of capacity needed
- Effective with data from any source including: API, backup, HSM, archive
- Builds on automatic data compression
- [ESG Lab Report](#) confirms 95% reduction ratio after just 11 weeks of backups
- Complementary with the IBM TS7650G ProtecTIER Gateway
 - TSM 6 built-in data deduplication and the TS7650G ProtecTIER Gateway can coexist to meet different customer needs

Tivoli Storage Manager 6, combining progressive incremental data capture with data de-duplication, does a **better job** of reducing storage capacity requirements than pure data deduplication solutions



IBM is delivering deduplication across its entire storage portfolio

Addressing the full spectrum of customer requirements for data reduction

Complementary Solutions Today!

TS7650G ProtecTIER Gateway

10+TB/night, >100MB/s performance

Easy management (via an appliance model)

Minimal overall operational impact (via no post processing)



Dedup data from multiple backup vendors including TSM

Deduplication is only done once

- For customers who need to**
- ✓ Lower operational costs and energy usage
 - ✓ Simplify and accelerate information protection
 - ✓ Reduce amount of disk and improve manageability

But can be done at multiple enterprise locations

No impact during backups/ingest

Fully integrated into TSM



No specific hardware dependencies

Dedup TSM legacy data

Tivoli Storage Manager



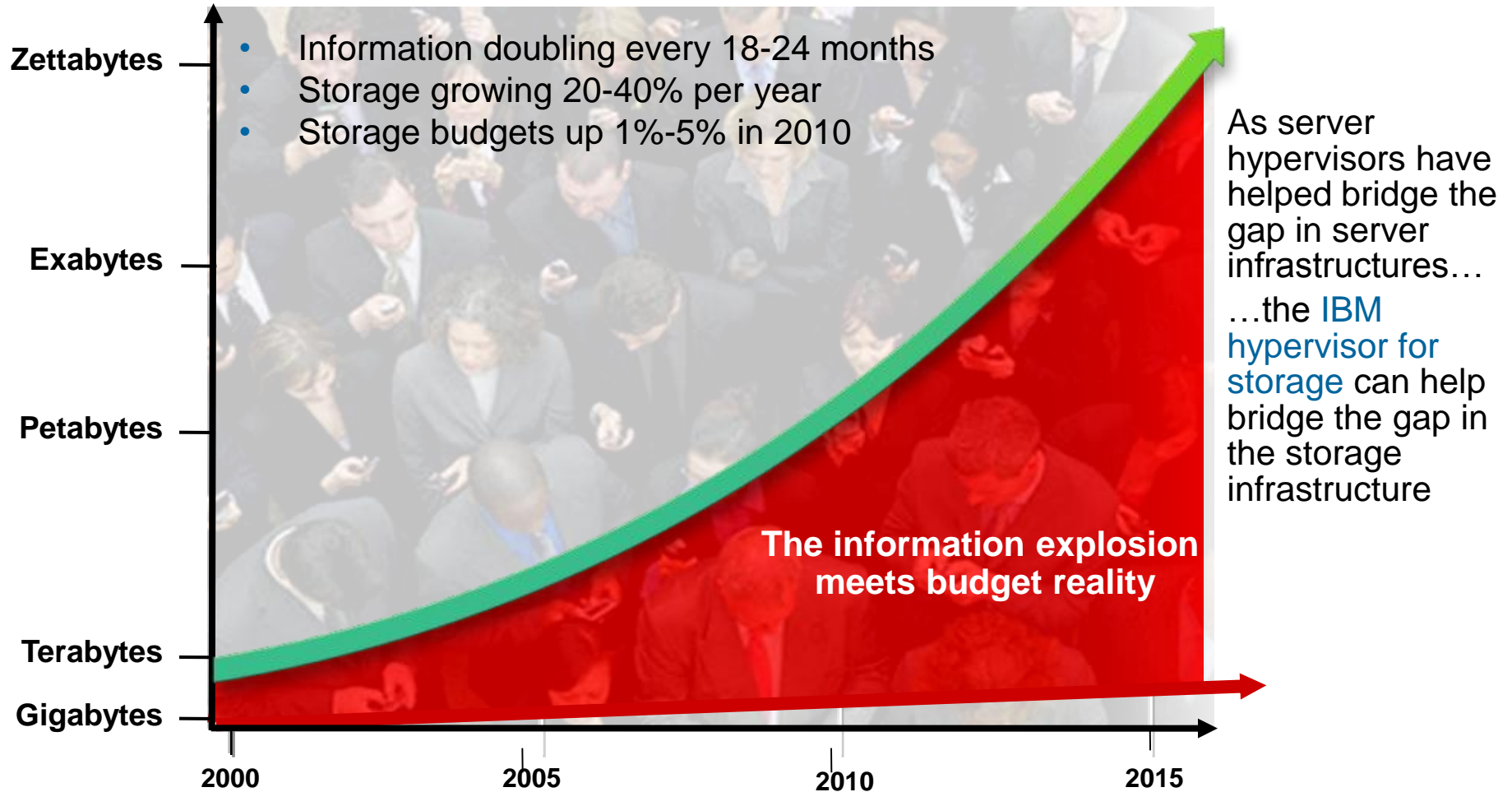
5. Maximize Storage Utilization



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The Information Explosion



What's a Storage hypervisor?

- **Server hypervisor** has a well understood value connotation
 - Pooled physical resources are consumed by virtual machines resulting in high asset utilization
 - Virtual machines are mobile giving CIO's their choice of physical server device
 - A common set of value capabilities and centralized management are provided for virtual machines regardless of what physical server they are sitting on
 - ...cost savings and flexibility!

On Intel systems

server virtualization platform (VMware vSphere) and
server virtualization management (VMWare vCenter)

On Power systems

server virtualization platform (IBM PowerVM) and
server virtualization management (IBM Director VMControl)

- **Storage hypervisor** is a rapidly emerging way of describing the same value points in a storage context

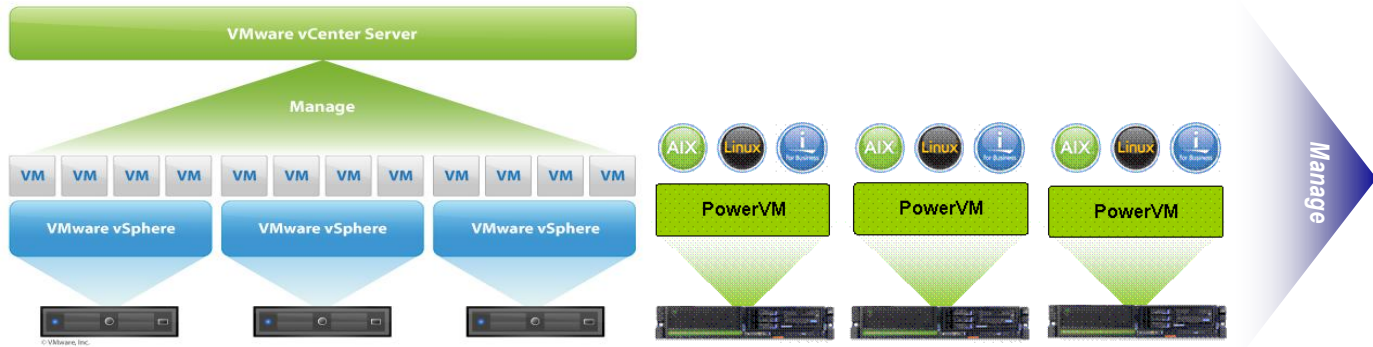


IBM's Storage hypervisor -



Storage Hypervisor

Virtual Server Infrastructure



VMControl

IBM Systems Director

Virtual Storage Infrastructure



(SAN Volume Controller)



Tivoli Storage Productivity Center

- **Virtual Storage Platform - SAN Volume Controller**
 - Common device driver - iSCSI or FC host attach**
 - **Common capabilities**
 - I/O caching and cross-site cache coherency
 - Thin provisioning
 - Easy Tier automated tiering to Solid-state Disks
 - Snapshot (FlashCopy)
 - Mirroring (Synchronous and Asynchronous)
 - **Data mobility**
 - Transparent data migration among arrays and across tiers
 - Snapshot and mirroring across arrays and tiers

- **Virtual Storage Platform Management - Tivoli Storage Productivity Center**
 - **Manageability**
 - Integrated SAN-wide Management with Tivoli Storage Productivity Center
 - Integrated IBM server and storage management (Systems Director Storage Control)
 - **Replication**
 - Application integrated FlashCopy
 - DR automation
 - **High Availability**
 - Stretch Cluster HA



IBM InterConnect 2012

October 9 - 11 | Resorts World Sentosa, Singapore



Turning Opportunities into Outcomes

In this era of interconnected industries, businesses and consumers, a new kind of leadership is required to turn opportunity into business outcomes. Smarter businesses are capitalizing on information as an indispensable resource and using technology as the catalyst for unleashing innovation. They are expanding the digital world of the back-office into the front-office.

Given this new reality, Business and IT leaders are collaborating to better align business and technology investments in order to respond to three business imperatives:

- **Re-invent relationships and uncover new markets**
- **Manage the velocity of business change**
- **Implement the new economics of IT to fund new innovations**



Hot Topics

- Changing the Economics of IT with IBM PureSystems
- Defending Against Cyber-Threats with Security Intelligence and Behavioral Analytics
- Rethink IT. Reinvent Business with Cloud Computing
- Transforming Critical Business Processes
- Unlocking Opportunities with Smarter Analytics and Big Data
- Gaining Competitive Advantage Through Software Innovation
- Creating Exceptional Experiences By Combining Social and Commerce Best Practices
- Speeding Innovation and Extend Reach Securely with Mobile Enterprise
- Transforming IT for Insight and Efficiency with Smarter Storage
- Enabling Growth with Enterprise Systems



Additional Resources

(use slideshow mode to access links)

- [Introductory Demo](#)
- Product Information:
 - Tivoli Storage Manager [Data Sheet](#) [Web Page](#) [Tech Info](#)
 - Tivoli Storage Manager Suite for Unified Recovery [Data Sheet](#) [Web Page](#) [Tech Info](#)
 - Tivoli Storage Manager for Virtual Environments [Data Sheet](#) [Web Page](#)
 - Tivoli Storage Manager FastBack [Data Sheet](#) [Web Page](#) [Tech Info](#)
 - Tivoli Storage Manager FastBack for Workstations [Data Sheet](#) [Web Page](#)
 - Tivoli Storage FlashCopy Manager [Data Sheet](#) [Web Page](#)
- White Papers:
 - [Ten ways to save money with Tivoli Storage Manager](#)
 - [ESG: Tivoli Storage Manager for Virtual Environments](#)
 - [Unified Recovery Management](#)
 - [Extend Tivoli Storage Manager to the Cloud](#)
 - [Migrate to IBM Tivoli Storage Manager Easily and Confidently](#)
 - [Leverage the IBM Tivoli Competitive Advantages in Storage Management](#)
 - [Using IBM Data Reduction Solutions to Manage More Data with Less Infrastructure](#)
- Solution information:
 - [Data Protection and Storage Management](#)
- DeveloperWorks: [TSM Wiki](#)



Thank You!

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Backup



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IBM Storage Software Suite

The Value:



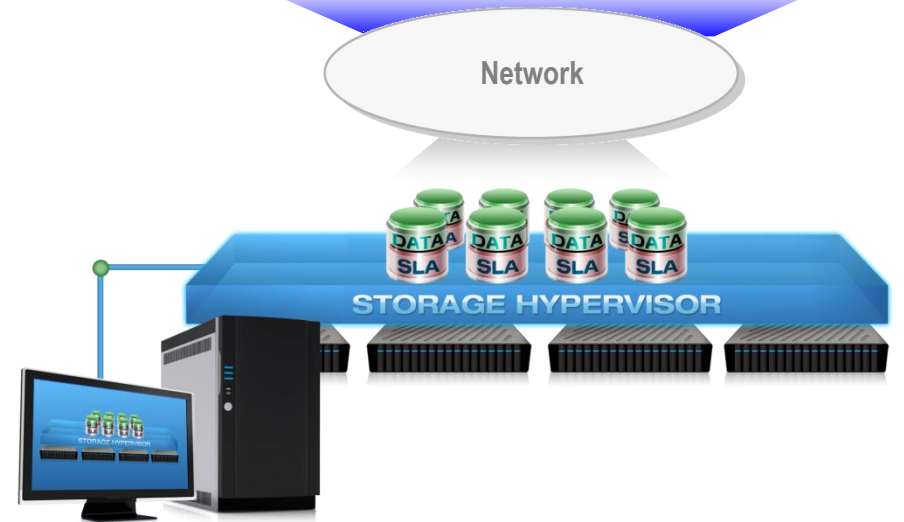
Unified Recovery

- Free IT from the cost and complexity of legacy data management products
- Get ahead of runaway data growth and Big Data
- Be online quicker and access clones faster
- Transform your backup infrastructure into a service



Central Management and Storage hypervisor

- Dramatically improve utilization of your physical storage assets
- Deliver tier-1 service regardless of hardware choice
- Balance workload, manage lease termination, improve datacenter performance
- Optimize your people for the challenges of day-to-day operations



YOUR data YOUR Business case

Butterfly Differential Business Case

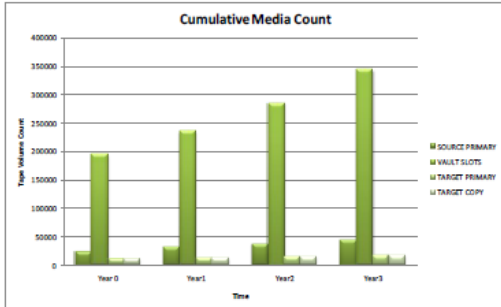
SOURCE Hardware Infrastructure

	INFRASTRUCTURE	VENDOR	TIER	MODEL	QTY	KVA	
Existing	VTL (TB)	NA	Enterprise	NA	209	14.3	
	Library	Mix	Enterprise	MIX	9	18.9	
	Master Server	Sun	Midrange	MASTER	4	17.6	
	Media Server	NA	Midrange	MEDIA	108	475.2	
	Drive	Mix	Enterprise	LTO/SLDT	157	15.2	
	Drive	Oracle	Enterprise	9940	134	13.4	
					TOTAL	555.1	
	Growth	VTL (TB)	NA	Enterprise	NA	152	10.4
		Library	Mix	Enterprise	MIX	1	3.2
		Master Server	Sun	Midrange	MASTER	2	8.8
Media Server		NA	Midrange	MEDIA	20	88.0	
Drive		Mix	Enterprise	LTO/SLDT	114	11.4	
Drive		Oracle	Enterprise	9940	96	9.8	
					TOTAL	131.6	
				TOTAL	686.8		

TOTAL COST OF OWNERSHIP 36 MONTHS

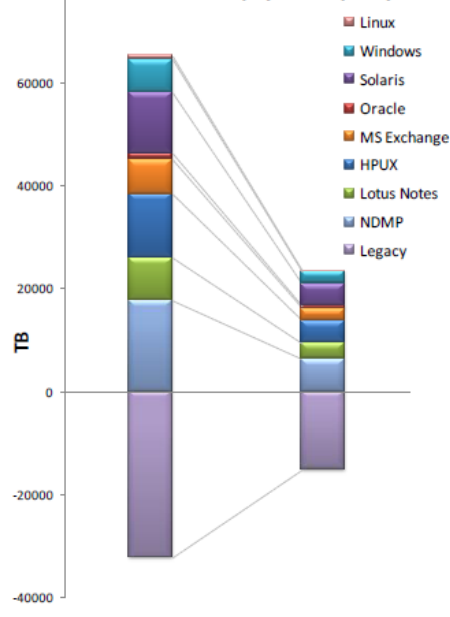
INFRASTRUCTURE	SOURCE		TARGET	
	UNITS	COST	UNITS	COST
TAPE VOLUMES	159137	7511161	30726	1382660
VAULT SLOTS	342591	2580710	14726	112517
LIBRARY	10	852073	4	173049
TAPE DRIVES	503	4985424	130	2921495
MASTER SERVER	6	229079	26	524971
MEDIA SERVER	128	2966661	30	605736
VTL/DISK TBs	361	1247532	805	5109819
TOTAL		\$ 20,472,640		\$ 10,830,248
OCCUPANCY (TB)	65304		26639	
POWER (KVA)	687		212	
INFRASTRUCTURE SAVINGS		\$ 9,642,392		47%
RESOURCE REQUIREMENTS	22.9	\$ 7,293,730	16.2	\$ 5,970,000
Man Years after 36 months				
TOTAL SAVINGS		\$ 10,966,122		39%

TOTAL MEDIA COUNT 36 MONTHS



Capacity

36 Month physical capacity



Source Target

Management Summary

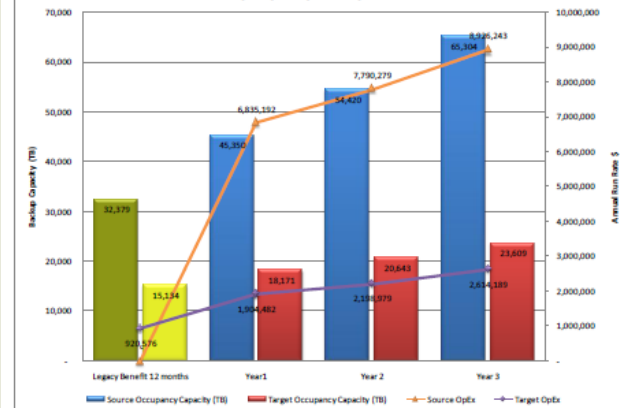
Up to 36 Months

TOTAL Capacity reduced by 38604 TB
 Long Term capacity reduced by 17055 TB
 Tape volume saving 138411
 KVA Saving 483 KVA
 Daily Backup volume is reduced by 147.86 TB
 Network load reduced by 38%
 FTE Reduction by 32%
 Growth rate applied 20%

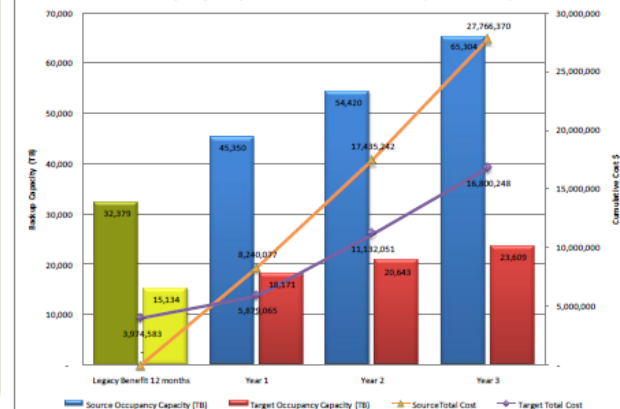
TARGET Hardware Infrastructure

	INFRASTRUCTURE	VENDOR	TIER	MODEL	QTY	KVA
Buy	Master Server	IBM	Enterprise	MASTER	26	78
	Media Server	IBM	Entry	MEDIA	30	60
	Disk	IBM	Enterprise		240	9.6
	VTL (TB)	IBM		7500	565	51.4
	Drive	IBM	Enterprise	LTO	130	13.0
				TOTAL	139.0	
Reuse	Library	IBM	Enterprise	3500	4	12.8
					TOTAL	12.8
				TOTAL	211.8	

Backup Capacity and OpEx Forecast



Backup Capacity and Total Costs Forecast (Cumulative)



Before / After: Reducing the infrastructure

Media Servers **Management Servers**

SERVER X12 NDMP SERVER X5

MASTERBP001
NBU 6.5.5.0
Solaris 10 SPARC-Ent

21* LTO Ultrium-4 ROBOT0
IBM3584L32 226560403 7360

Media Servers

SERVER X14

Management Servers

ISDMARMASTER
NBU 6.5.5.0
Solaris 9 V430

2* Ultrium 2-SCSI ROBOT2 17* T9940B ROBOT13
LLC74001771 215 ACS-0-camsacth01

12* T9940B ROBOT4 8* ULTRIUM-TD2 ROBOT1
ACS-0-edwacsisa1 MPC74000516 310

3* ULT3580-TD4 ROBOT21 5* ULT3580-TD4 ROBOT20
IBM3584L32 78225630406 7360 IBM3584L32 78230480406 8140

Media Servers

SERVER X50 NDMP SERVER X16 SERVER X32 NDMP SERVER X5

52* T9940B ROBOT1 20* T9940B ROBOT0
ACS-0-ebactsa1 ACS-0-ibactsa1

1* T9940A ROBOT0

22* T9940B ROBOT13
5* ULT4-SCSI ACS-0-evaactsa1
6* SDLT600

Management Servers

NBU 6.5.5.0 NBU 6.5.5.0
Solaris 9 Netra-T12 Solaris 9 V850

Virtual Tape

24* ULT3580-TD3 ROBOT30-VTL IBM3584L32 4.02

2* Ultrium3-SCSI ROBOT14-VTL HP MSL6000 Series 2L027300032 520

24* ULT3580-TD3 ROBOT31-VTL IBM3584L32 4.02

4* T9940B ROBOT15-VTL 79H9000200 3.05 ROBOT11-VTL 7J11000200 3.05

4* T9940B ROBOT16-VTL 7J0C207PU00 3.05 10* T9940B ROBOT35-VTL 0XV2000200 3.05

20* T9940B ROBOT19-VTL 7J0P407PU00 3.05 10* T9940B ROBOT36-VTL 001A17PU06 3.05

37* ULT3580-TD4 ROBOT21 34* ULT3580-TD4 ROBOT20
IBM3584L32 78225630406 7360 IBM3584L32 78230480404 8140

21* ULT3580-TD4 ROBOT21 14* ULT3580-TD4 ROBOT20
IBM3584L32 78225630404 7360 IBM3584L32 78230480405 8140

Backup Servers

6 TB IBM TS7650G ProtecTIER
De-duplication gateway

Tivoli Storage Manager 6.2.1
Library manager Server

5* ULT3580-TD5 ROBOT0
IBM3584L32

Backup Servers

24 TB IBM TS7650G ProtecTIER
De-duplication gateway CLUSTER

Tivoli Storage Manager 6.2.1
Library manager Server

5* ULT3580-TD5 ROBOT0
IBM3584L32

Backup Servers

10 TB 10 TB

Tivoli Storage Manager 6.2.1
Library manager Server Tivoli Storage Manager 6.2.1
Library manager Server

Virtual Tape

45 TB IBM TS7650G ProtecTIER
De-duplication gateway CLUSTER

Physical Tape

10* ULT3580-TD5 ROBOT0
IBM3584L32

IP BASED BACKUP TO FILE DEVICE
SOURCE/SERVER DE-DUPLICATION

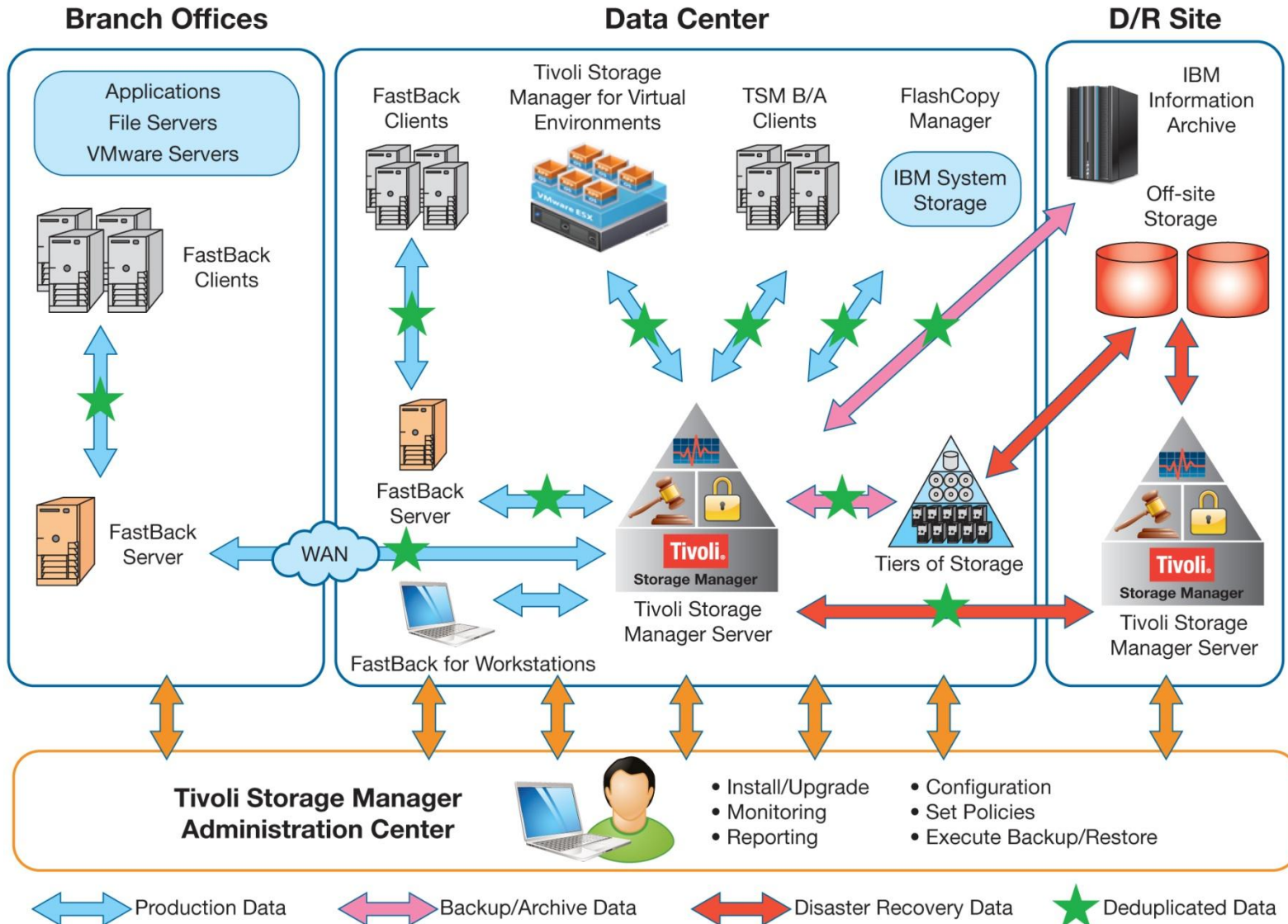
FC BASED BACKUP TO ProtecTIER

LONG TERM RETENTION/OFFSITE

X 12

TIVOLI STORAGE MANAGER BUILDING BLOCK

Unified Recovery Management



Leverage the Cloud



Business without **LIMITS 2012**



Storage Management in Private Compute Clouds

- You manage the storage systems and the data, but in a more virtualized environment
- Virtualized servers and storage are key enablers
- Requires advanced solutions for data protection and storage management



Storage Management in Public Compute Clouds

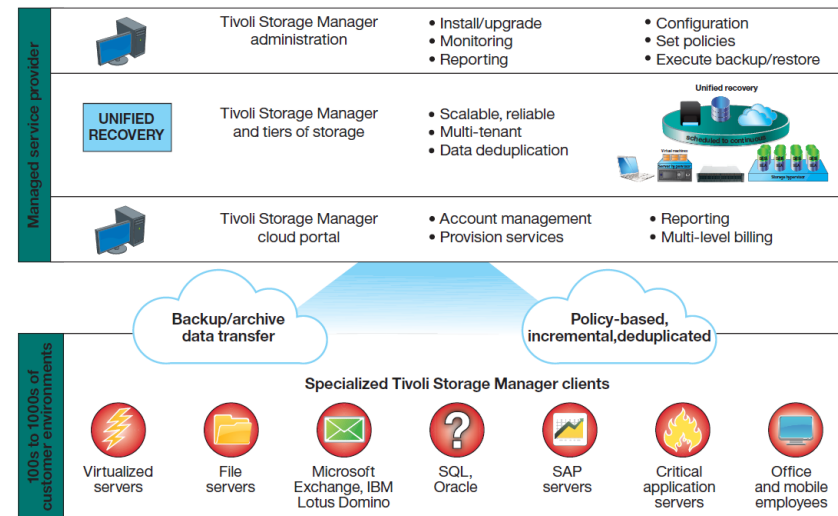
- The good news:
 - You don't have to worry about storage management
 - The cloud vendor handles it all
- The bad news:
 - You do have to worry about data management and network bandwidth
 - Is the vendor making multiple copies for backup and Disaster Recovery?
 - What are the data access, retention, and recovery SLAs?
 - Is the data secure and encrypted? Who has the keys?
- The bottom line: Ensure your vendor is using a scalable, enterprise-class data protection and recovery solution



Backup-as-a-Service Clouds

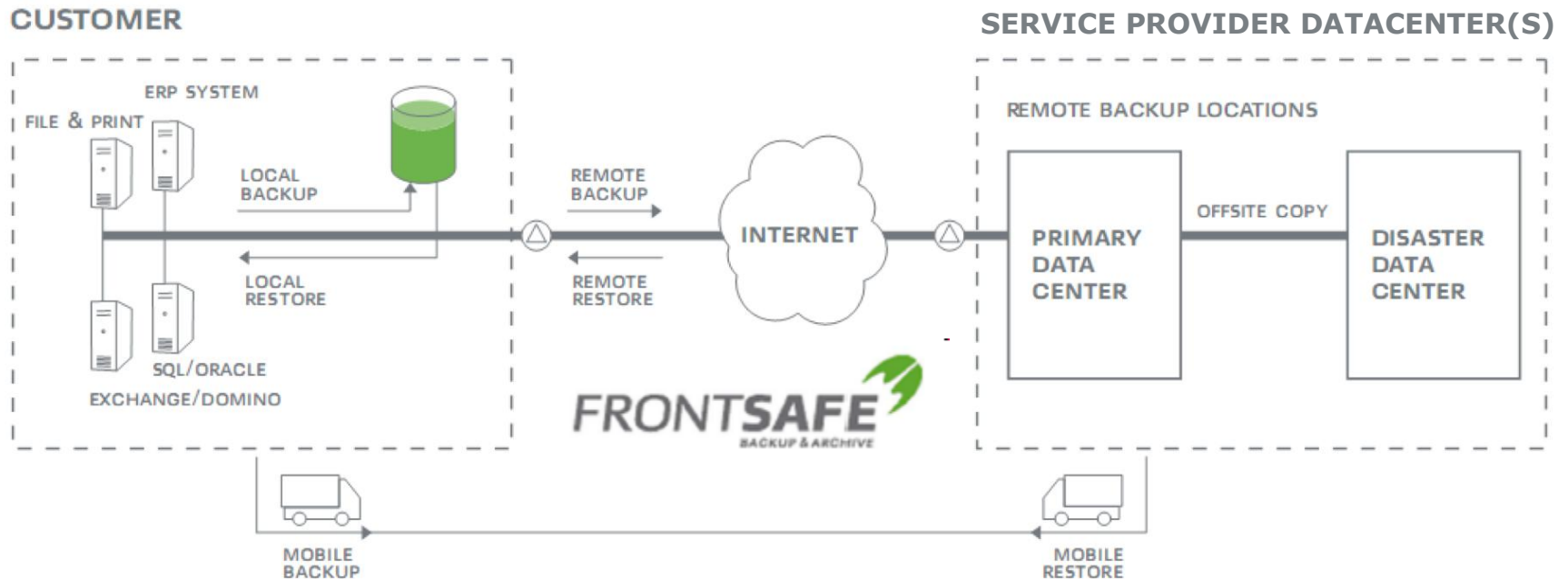
- Ideal for small-to-midsized companies and for remote / branch offices
 - Eliminates the need for some on-site technical staff
 - Pay per capacity on a monthly basis
 - Enables predictable expense control
- Considerations:
 - Support RPO and RTO for each data type?
 - Are you OK giving your data to a 3rd party?
 - Are they making multiple copies in different locations (as you would)?

Backed up by IBM Tivoli Storage Manager - architectural model



Backup-as-a-Service Clouds

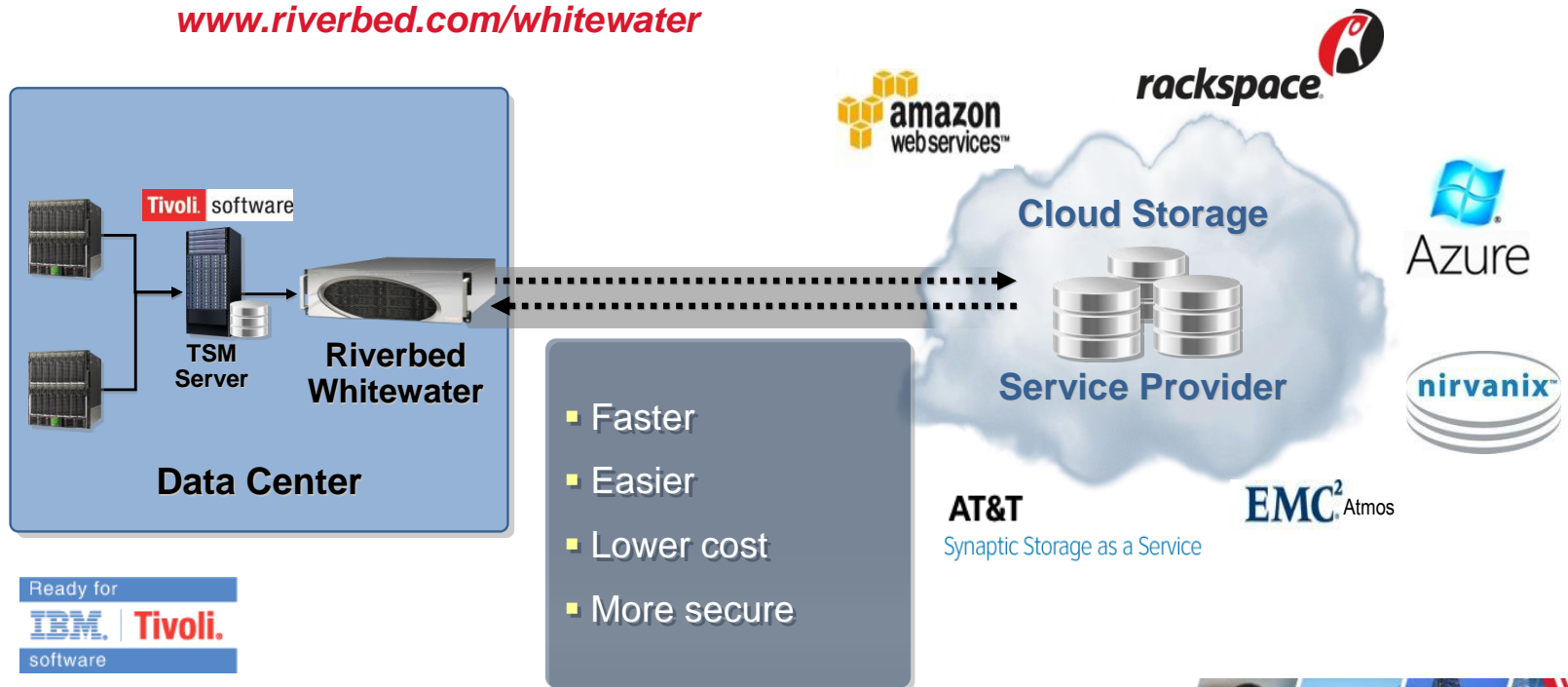
- Many backup-as-a-service options are available
 - IBM Information Protection Services: click [here](#) in slideshow mode
- Many use Tivoli Storage Manager as the backbone of their offerings
 - Scalability, functionality, performance, resilience, reliability
- **Business Partner:** see www.front-safe.com for a cloud portal to TSM



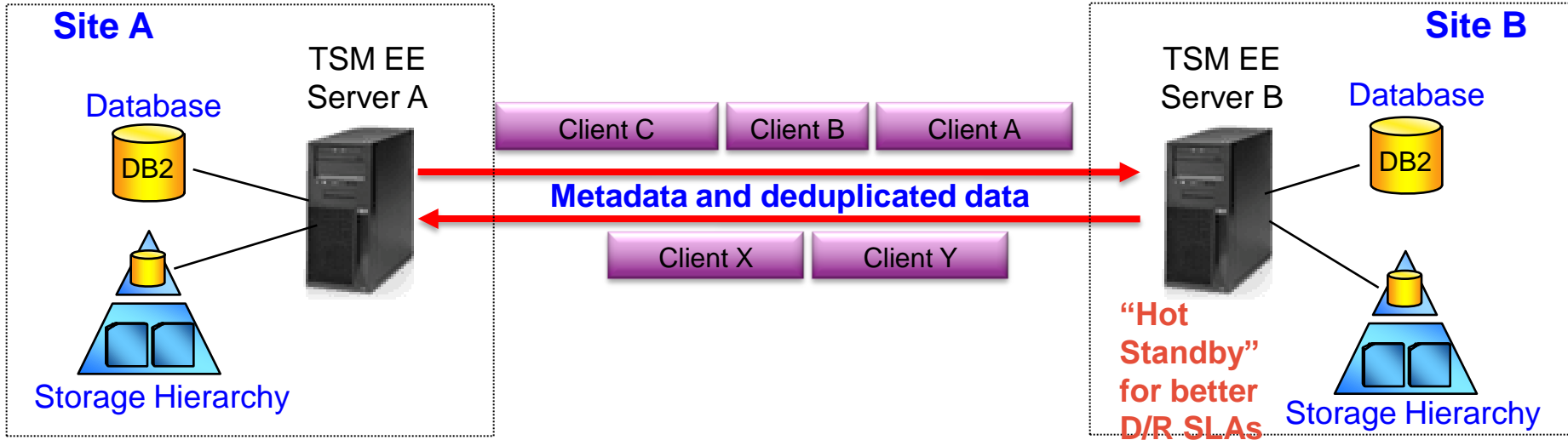
Extending in-house backup to the Cloud

- Use public clouds as the *n*th storage tier –
- Same concerns as mentioned earlier: bandwidth, security, resiliency
- Probably need a Cloud Service Gateway (Riverbed, Ctera, others)
 - Speeds transmission to and from the cloud
 - Locally-controlled encryption key provides security
 - Can reduce costs of tape and improve DR readiness

www.riverbed.com/whitewater



TSM client data replication for FASTER Disaster Recovery



- TSM server replicates all data and metadata for specified client data sets to another server, ensuring completeness and consistency of data/metadata
 - Incremental client data transfer with **deduplication** to minimize bandwidth consumption
 - Many-to-1 transfer to target server
- Remote TSM server could be **hot standby** for primary server, for improved RTO
- Native TSM solution with no dependency on specific storage device
 - Supports dissimilar hardware and configuration at primary and remote sites
- Restore on a **per-client basis** without re-hydrating deduplicated data

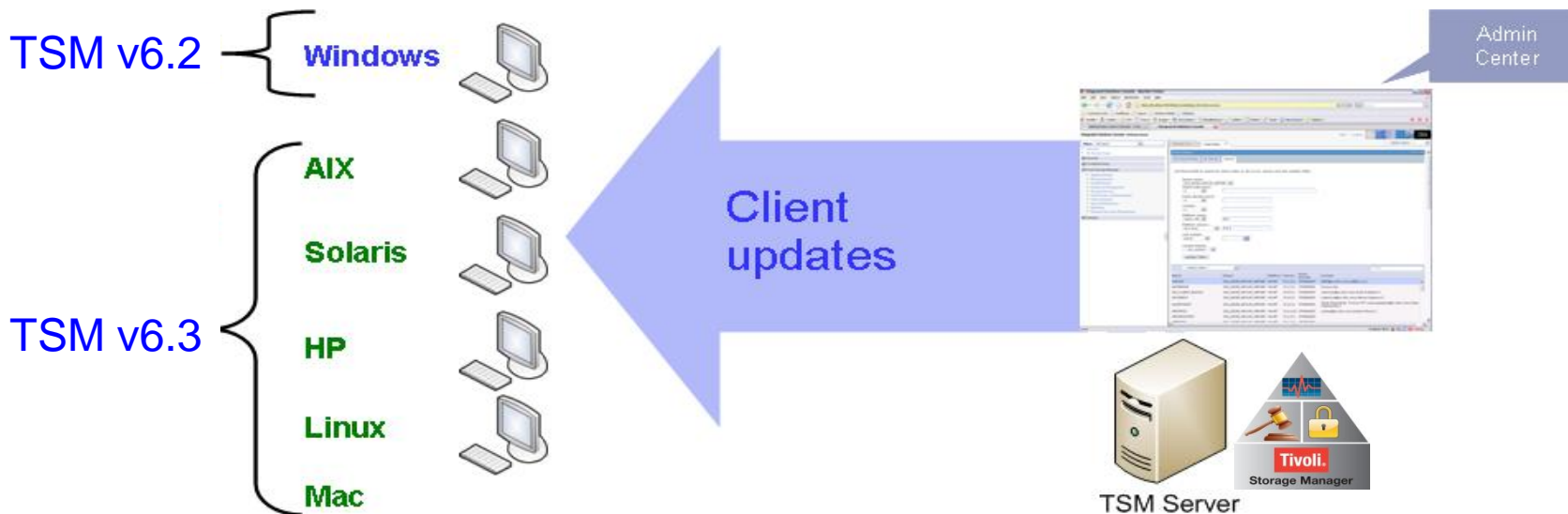


What's New?

Automatic distribution and installation of client updates

For AIX, Solaris, HP-UX, Linux, Mac OS X; Windows support added in V6.2

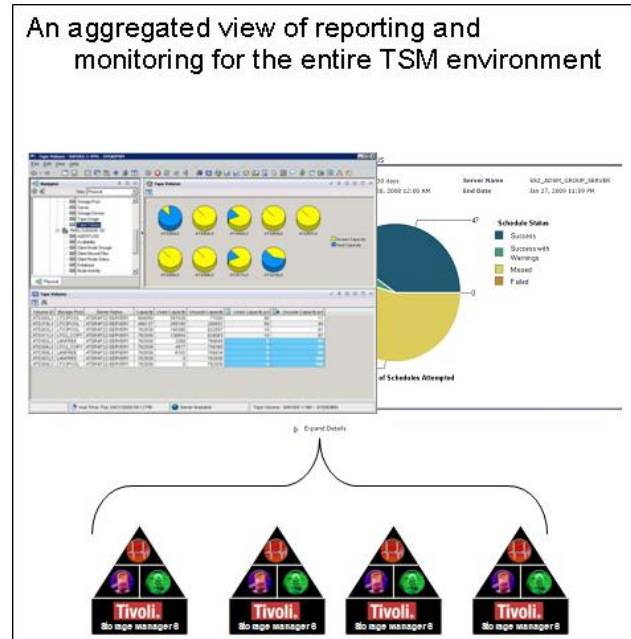
- Automatically push updates for TSM b/a client v5.5, v6.1, v6.2 or v6.3
- **Reduce admin time for updates by 80%; improves accuracy**
 - 50 minutes vs. 250 minutes to update 50 client systems
 - Huge benefit for cloud and backup-as-a-service providers
- Executed based on user-defined policies and schedules



What's New?

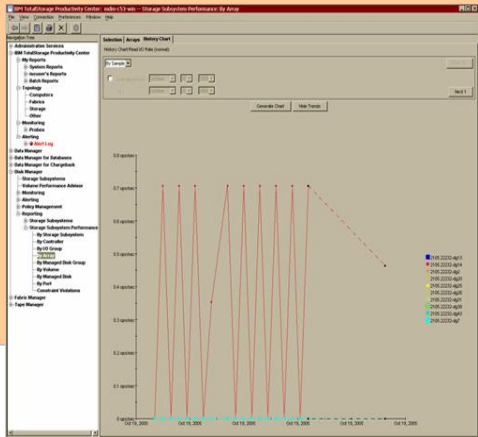
Improved reporting and monitoring in TSM Server v6.3

- Simplifies the creation and administration of custom reports
 - Install in less than 2 hours
 - Create custom reports in less than 30 minutes
- Provides faster, more intuitive capabilities and a simplified interface for new users
 - Retains the existing full functionality for experienced users
- Automatic e-mailing of reports
- Export reports to XML and Microsoft Excel
- **New 'Processor Value Unit' report** to assist in license compliance

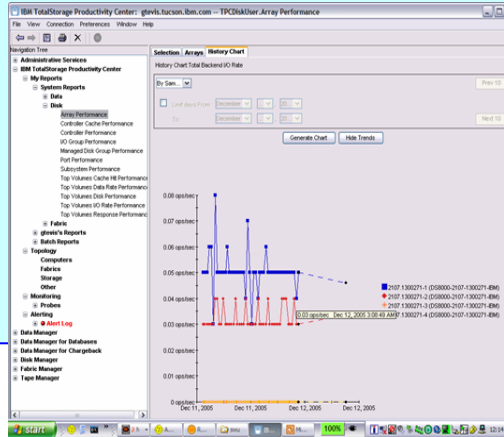


Integrated IBM Cognos®
Business Intelligence
reporting suite
COGNOS®
AN IBM® COMPANY

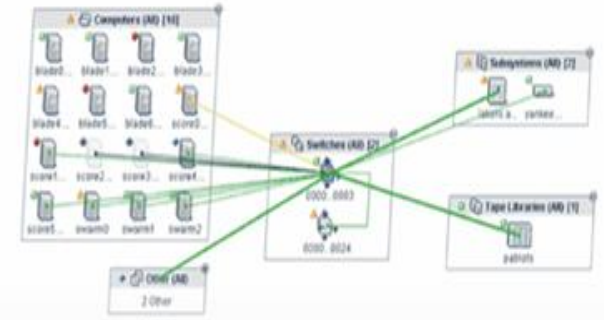
Bottlenecks??



Trending



Data Path Explorer

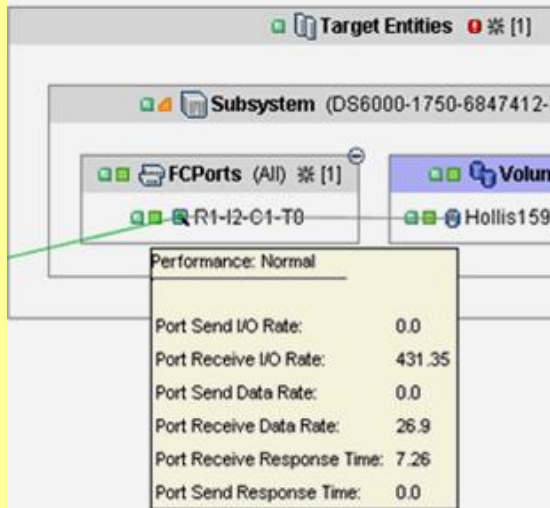


Green Tools

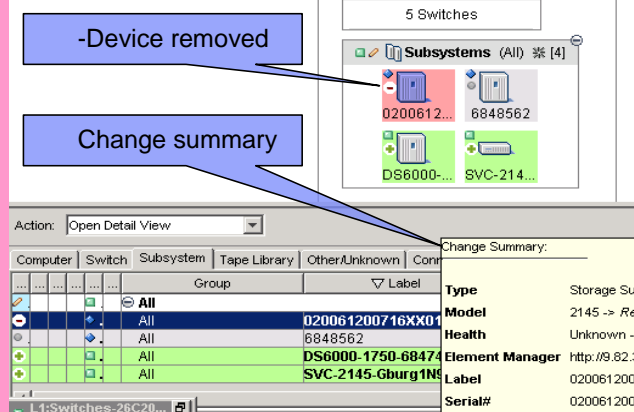
Is your technology power hungry?
Rising energy costs are zapping your bottom line



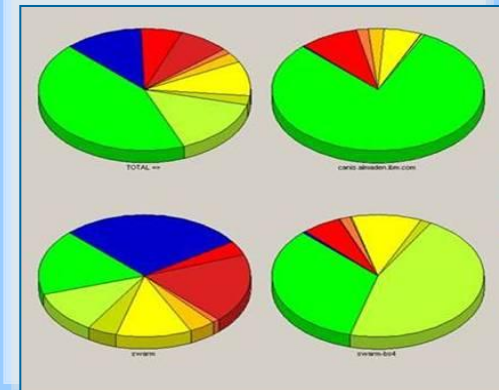
Performance & Health Checking



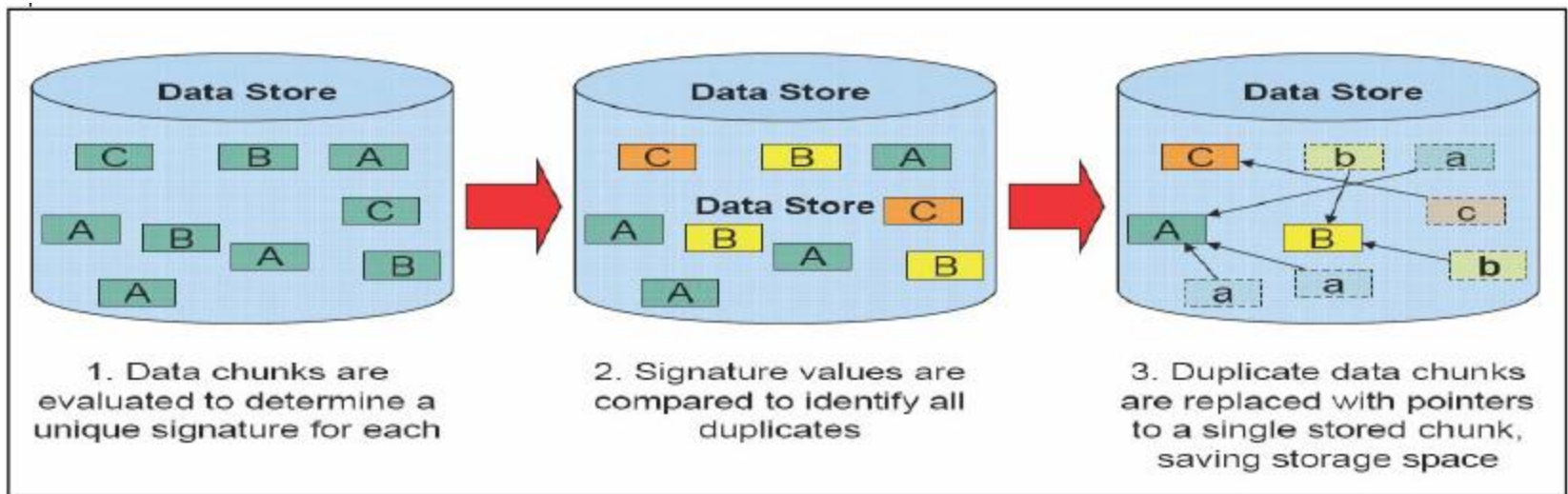
Changed Configuration History



Disk Utilization

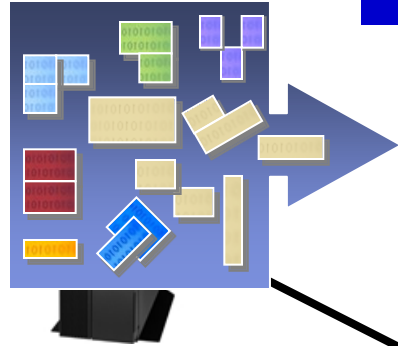


- A 'hot' data reduction technology
- Eliminates redundant subfiles (known as chunks, blocks, or extents)
- Only one instance is stored for each common chunk
- Duplicate instances of the chunk point to the stored chunk



New Data Stream

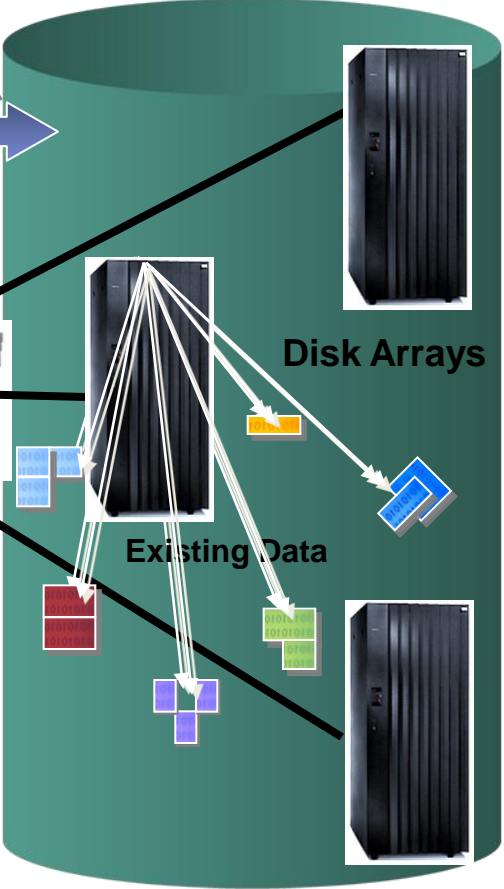
Ratio of Repository to Index: 250,000 : 1



Memory Resident Index

HyperFactor

Repository

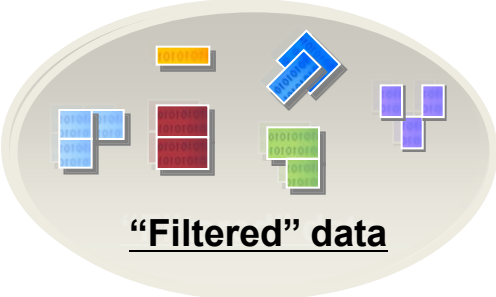


FC Switch

ProtectTIER Server

Disk Arrays

Existing Data



"Filtered" data

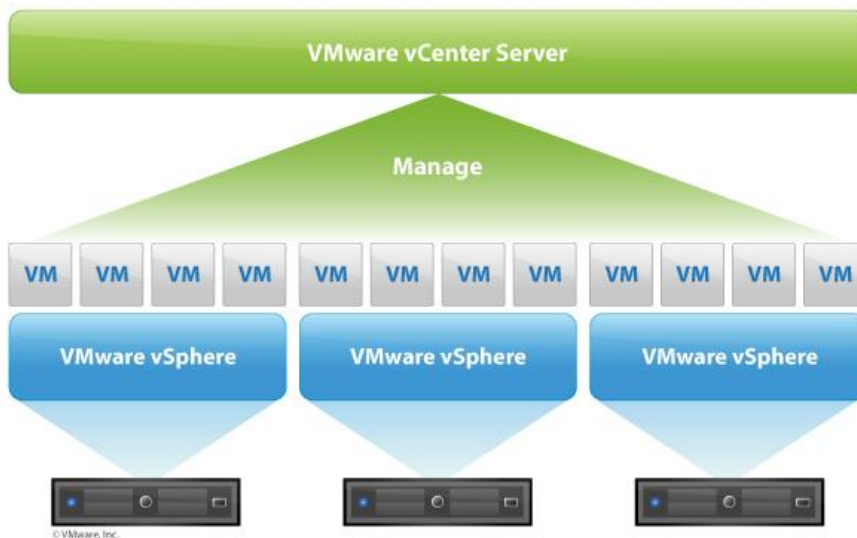
Backup Servers



	<u>IBM TS7650G ProtecTIER Deduplication Solution</u>	<u>Tivoli Storage Manager 6 Data Deduplication</u>
Target Customer Environment	Environments that backup 10-100 TB/night and beyond	Environments where each TSM server backs up <=6 TB/night
Performance	<ul style="list-style-type: none"> ▪Up to 500 MB/s per system (1.75 TB/hour) ▪Up to 900 MB/s per 2 node cluster (3 TB/hour) 	Up to 100 MB/s per TSM server (300 GB/hour)
Deduplication Capacity	20 TB- 1 PB of physical storage per system	45 – 90% Improvement in Storage Utilization
Topology	<ul style="list-style-type: none"> ▪Outboard, In-line deduplication - : occurs on Virtual Tape Library ▪Backup application agnostic 	<ul style="list-style-type: none"> ▪Integrated post-process deduplication: occurs on TSM server ▪Server and disk agnostic ▪TSM specific
Packaging and Pricing	<ul style="list-style-type: none"> ▪Priced hardware appliance 	<ul style="list-style-type: none"> ▪Integrated in Tivoli Storage Manager, no additional software to deploy and no additional cost



vmware®
Virtual Server Infrastructure



IBM®
SmartCloud Virtual Storage Center



Storage Virtualization



Manage
Storage Hypervisor Management

