Tivoli Storage Update and Directions: Next Generation Storage Management Technologies

Greg Tevis – Tivoli Storage Technical Strategy

PulseANZ 2010

Meet the people who can help advance your infrastructure

Operations have industrialized to become smarter

Telcos automate traffic through switches to assure service and lower cost.

Manufacturers use robotics to improve quality and lower cost.

Banks use automated teller machines to improve service and lower cost.

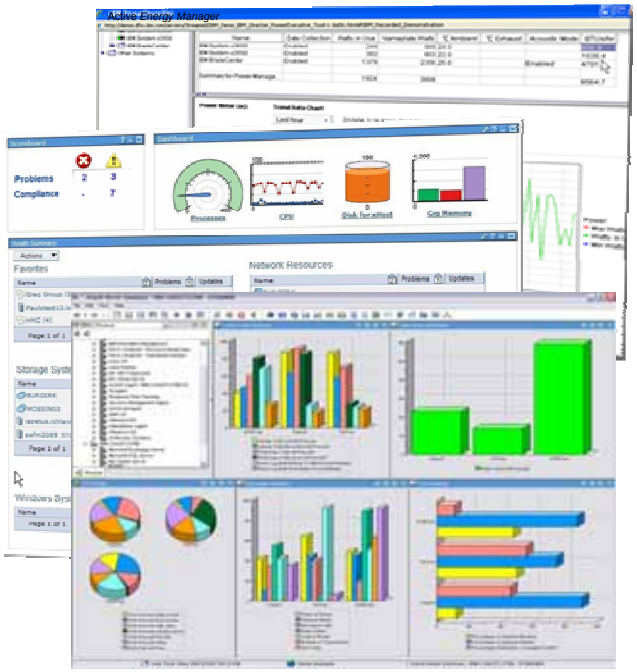
[Storage and information management operations are still labor intensive]

What if you could industrialize your information infrastructure?

Reduce the operational headaches of integrating and maintaining servers, storage & software

With a storage infrastructure that provides:

- Dramatic improvement in information services
- Storage and information when and where they're needed
- Dramatic reductions in cost
- Flexibility to respond to business opportunities



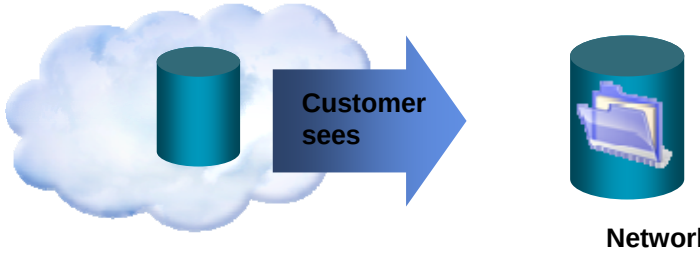
IBM storage and information technologies are instrumented for industrialization

Evolution in Storage Service Delivery Models

Application or Business Services

Compute Services

Network Storage Services

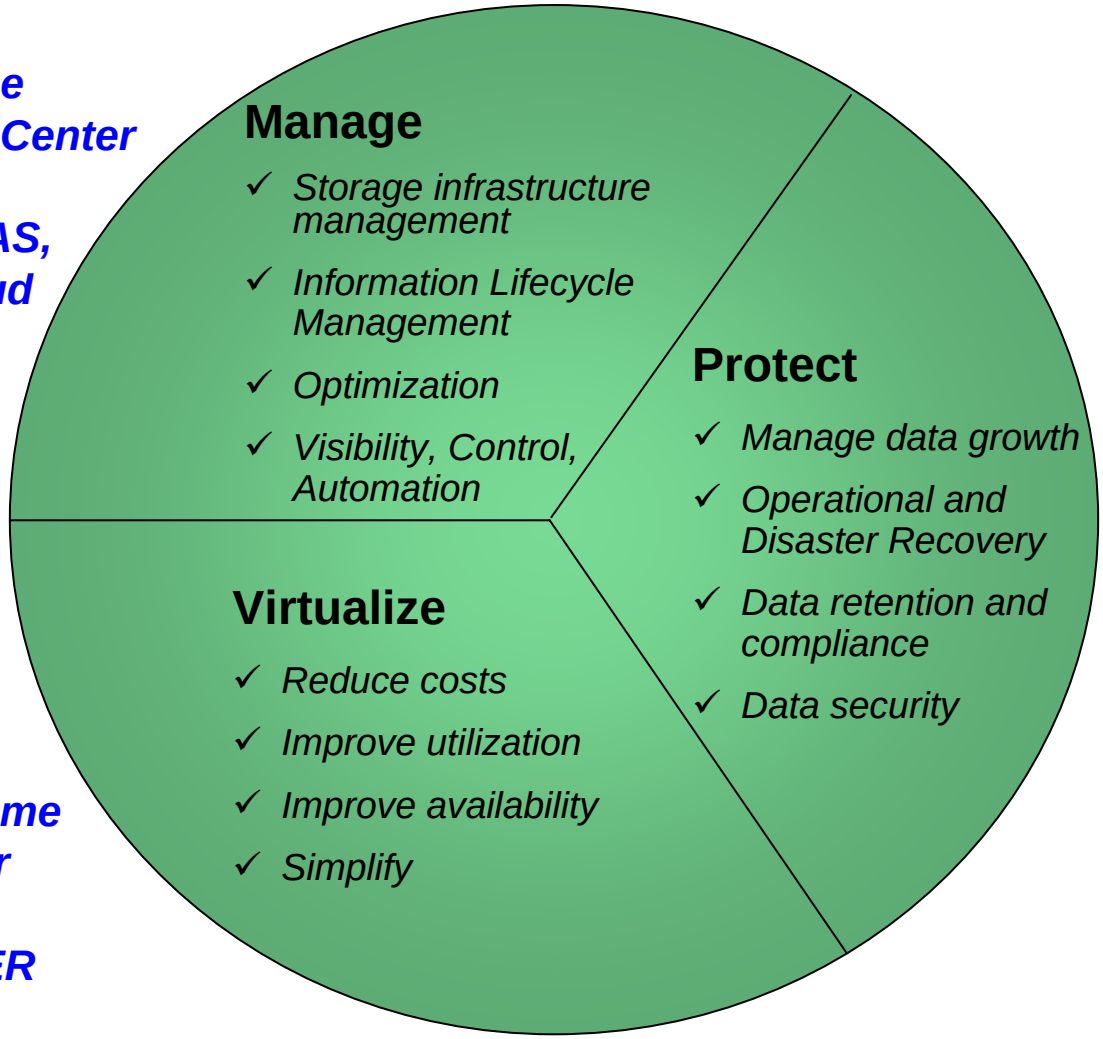


Virtualization - Dynamic Infrastructure - Service Management - Cloud Computing

We're already on the path

IBM Tivoli *Protects, Virtualizes and Manages* the Information Infrastructure

- ✓ ***Tivoli Storage Productivity Center***
- ✓ ***Scale Out NAS, Storage Cloud***



- ✓ ***Tivoli Storage Manager Family***
- ✓ ***Tivoli Storage Manager FastBack***
- ✓ ***FlashCopy Manager***
- ✓ ***IBM Information Archive***

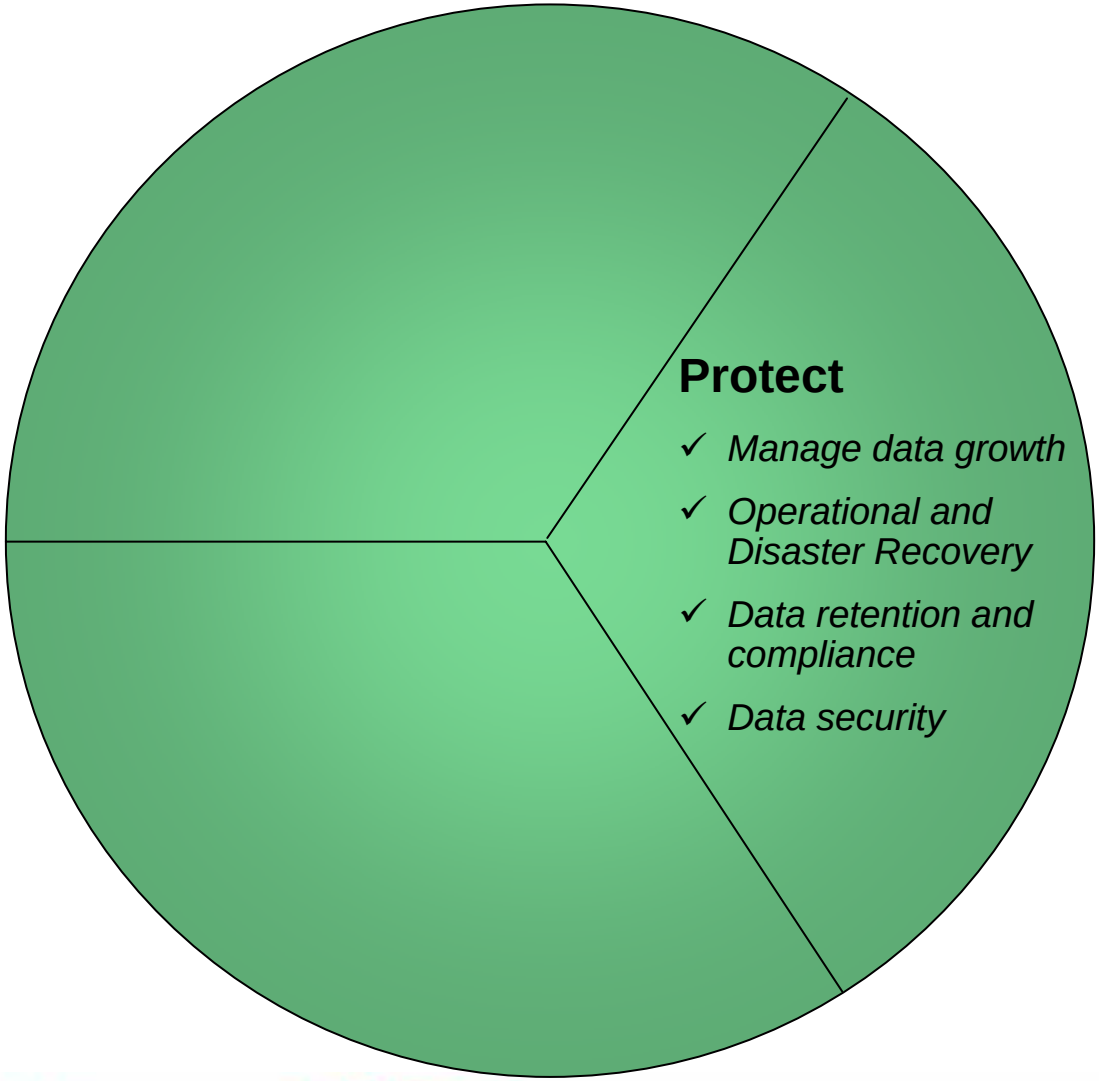
- ✓ ***XIV***
- ✓ ***SAN Volume Controller***
- ✓ ***ProtecTIER***

IBM Storage Management Technologies for the 21st Century

Tivoli Storage Portfolio Strategic Priorities

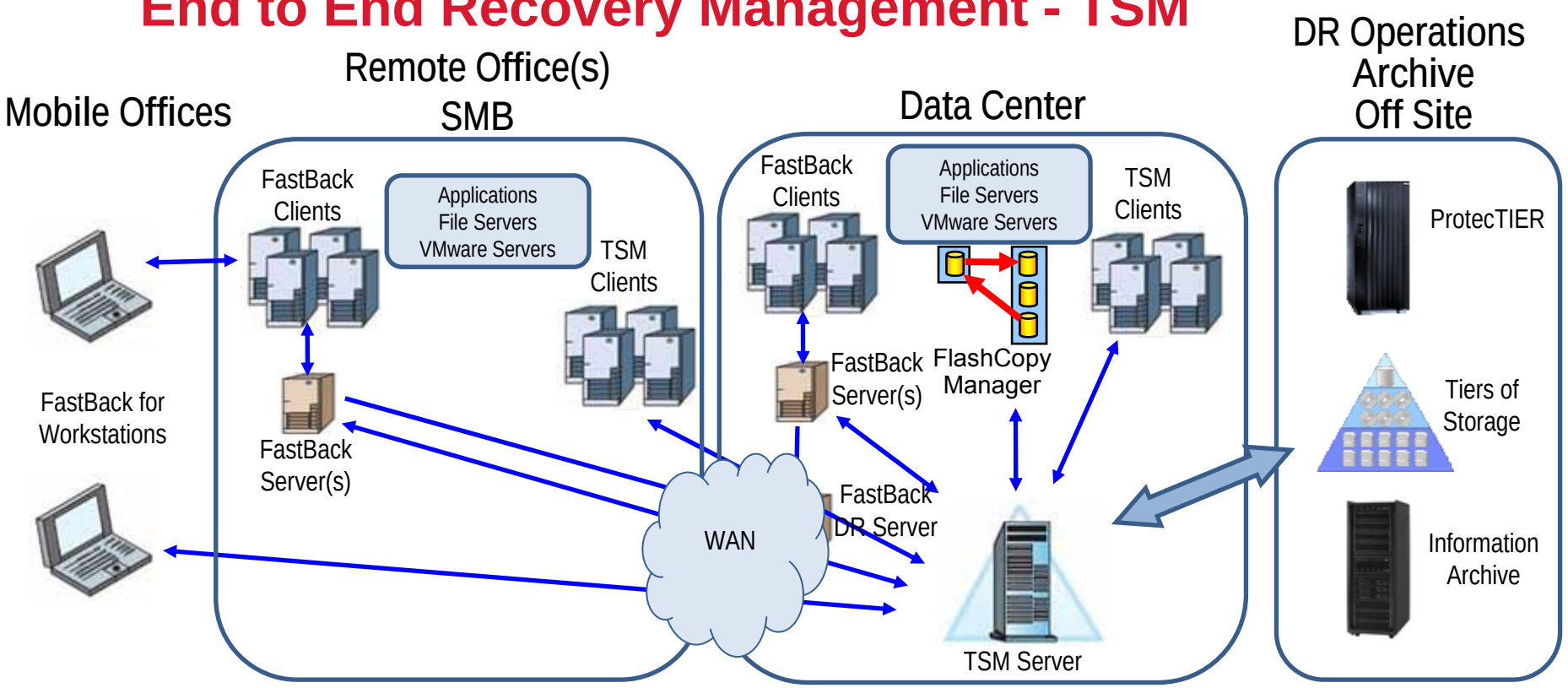
1. Dramatically improve service levels of storage infrastructure
   - Extreme scalability and performance
   - Automation and analytics
   - Mitigate risks with monitoring, data security, predictive analysis
2. Reduce costs through data reduction and optimizations
3. Portfolio integration
   - unified recovery management
   - consolidated server/network/storage management
4. Extension and enablement of technology for alternative delivery methods such as cloud
5. Improved time to value and enhanced consumability

IBM Tivoli *Protects, Virtualizes and Manages* the Information Infrastructure



- ✓ ***Tivoli Storage Manager***
- ✓ ***Tivoli Storage Manager FastBack***
- ✓ ***FlashCopy Manager***
- ✓ ***IBM Information Archive***

End to End Recovery Management - TSM



- **TSM FastBack**: Block Level Incremental Forever & CDP protection for critical servers
- **FlashCopy Manager**: Robust application protection using hardware snapshot
- **TSM FastBack for Workstations**: data protection for desktops & mobile users
- **Tivoli Storage Manager**:
  - ✓ Industry leading scalability, performance, availability, deduplication
  - ✓ Advanced tape and Disaster Recovery support
  - ✓ Broad OS and HW platform support, application protection

TSM 6.2 and 6.2.1 – Highlights from 1H2010

Extended dedupe offering (source or target side) — Enhanced

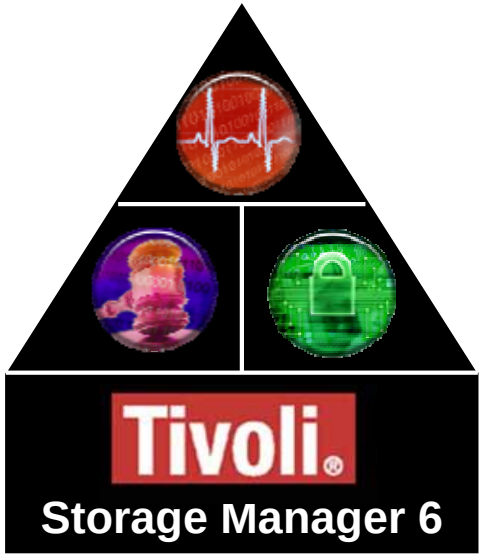
Automated client updates — New

Improved support for virtual environments

Even better performance and scalability — Improved

Multiple language support

Support for LTO5 devices — New

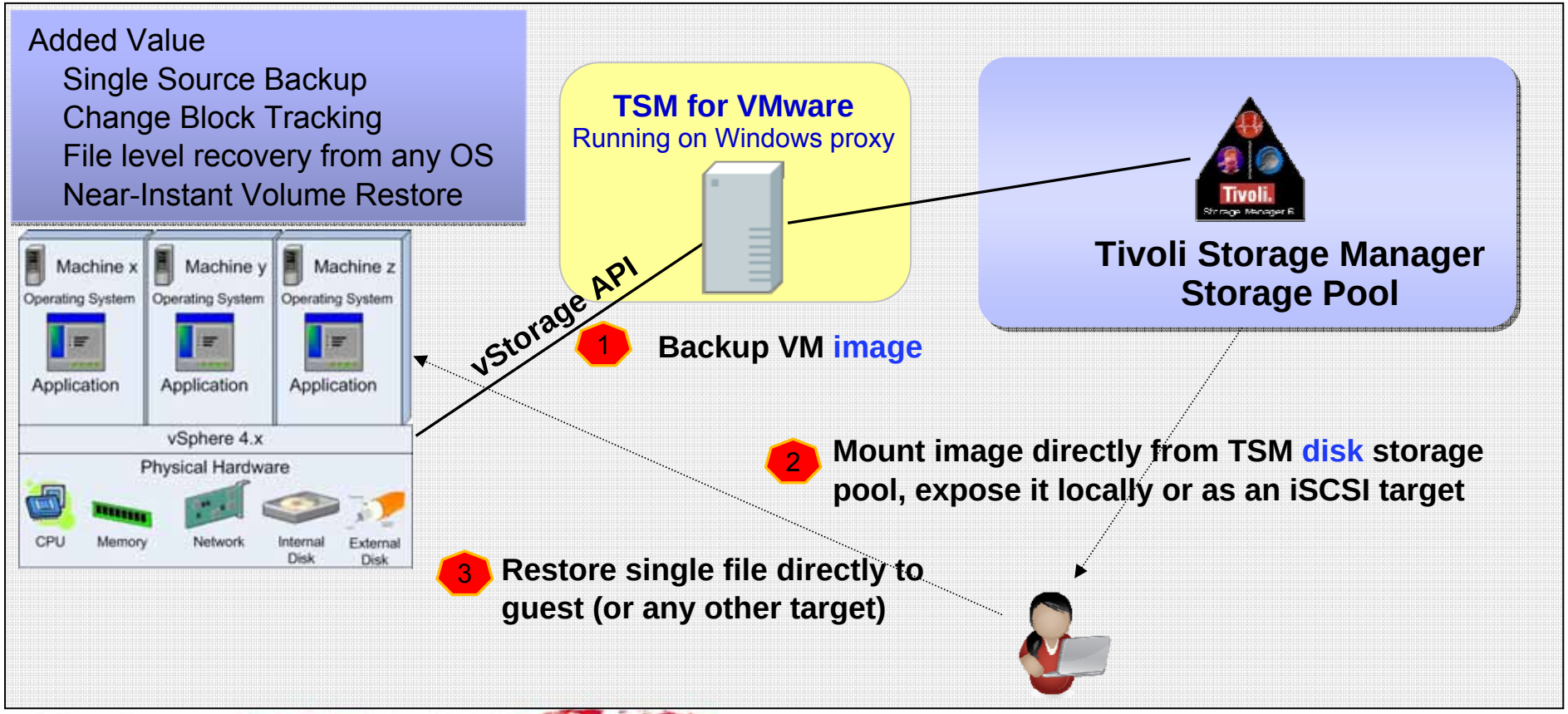


Net Result = Unified Recovery Management
Improved Quality of Service

TSM for Virtual Environments – VMware integration

New TDP
End of 2010

Supports **recovery options** from image backup and vStorage API change block tracking
New TSM for Virtual Environments component enhances the b/a client (Windows only) with:
- Change Block Tracking allowing incremental backups (with periodic fulls)
- File/Volume/Disk/Full VM restores from an image backup (multiple OSs are supported)



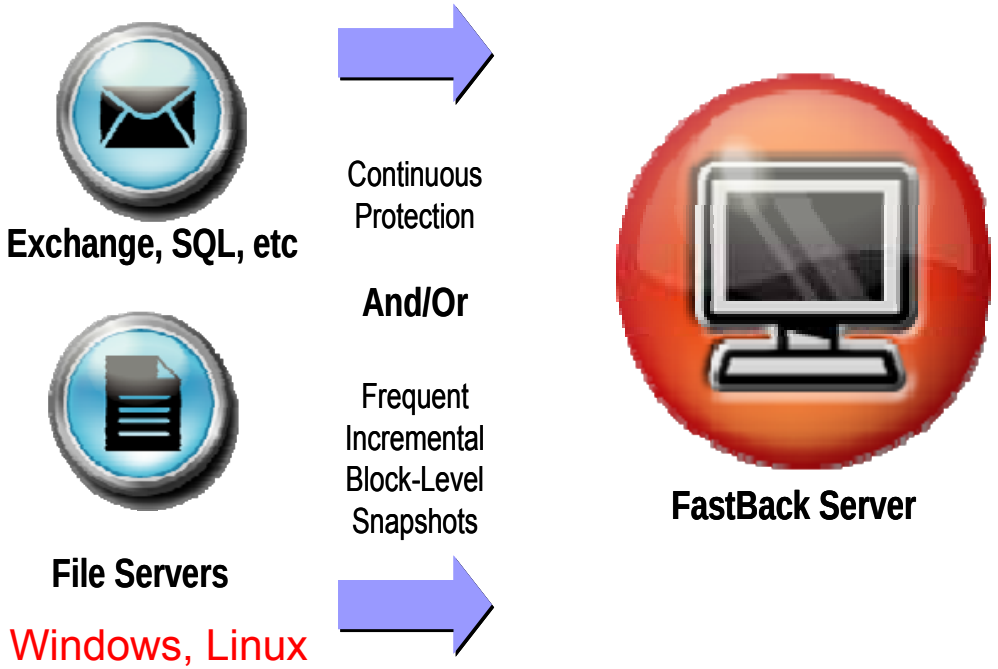
TSM FastBack – *It's All About Recovery*

Comprehensive Approach to Recover from any Disaster:

- **Lost or deleted files/folders**
- **Crashed disk/server**
- **Corrupt database / virus attack**
- **Local or regional disaster**

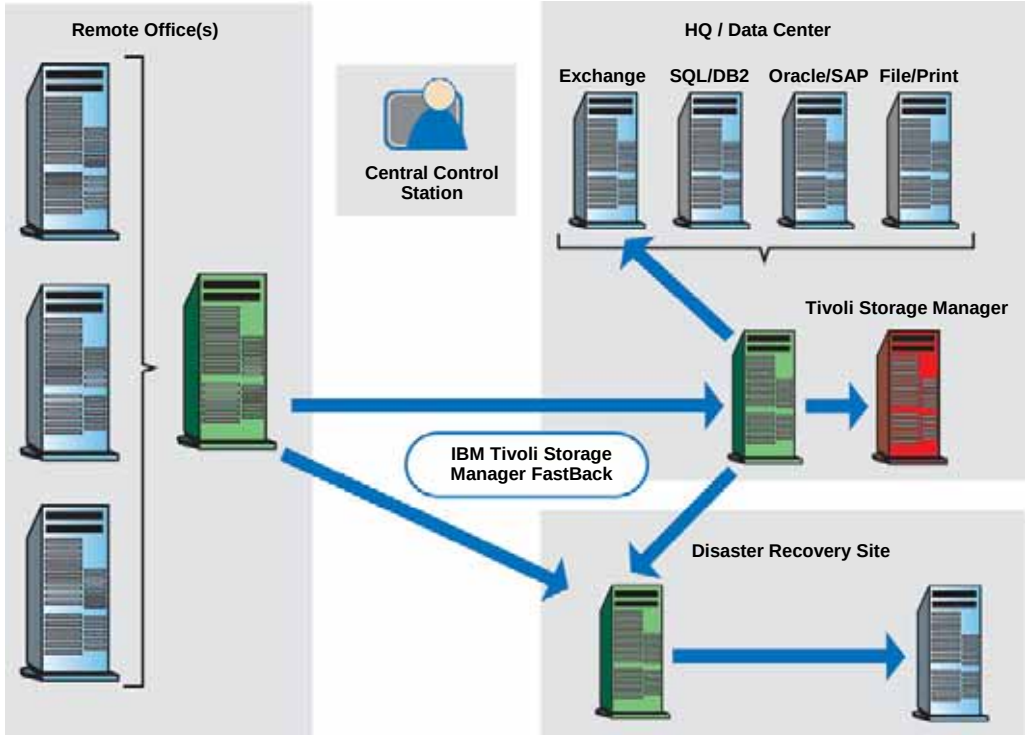
Next Generation Technologies:

- **FastBack Mount**
- **Instant Restore**
- **Granular E-Mail Object Restore**
- **Disaster Recovery**
- **Bare Machine Recovery**



Tivoli Storage Manager FastBack v6.1 2009 Update

- Block-level, incremental-forever, continuous or scheduled backup for Windows and Linux servers (New)
- Near-instant restore of any type / amount of Windows application data
  - Near-instant access to Linux data via FastBack Mount (New)
- Integrated target-side data deduplication (New)
- Built-in 'selective replication'
- Comprehensive reporting, leverages Tivoli Common Reporting
- Tight integration with Tivoli Storage Manager (New)
- TSM FastBack for Workstations: optional protection for laptops & desktops (New)



Introducing TSM FastBack 6.1.1

- FastBack server deep integration with TSM
- FastBack WAN deduplicated replication into TSM storage pool
- Instant Restore for Linux
- Improved Scalability and Performance
  - Cleanup processing enhancements
  - Up to 8TB protected data per FastBack server (up from 4TB)
  - Up to 20 TB FastBack repository size
  - FastBack Mount performance improvements

FastBack 6.1.1 – WAN deduplication

Fastback Server sends data over the LAN/WAN into TSM 6.2 Server

FastBack Server is now a TSM 6.2 API Client

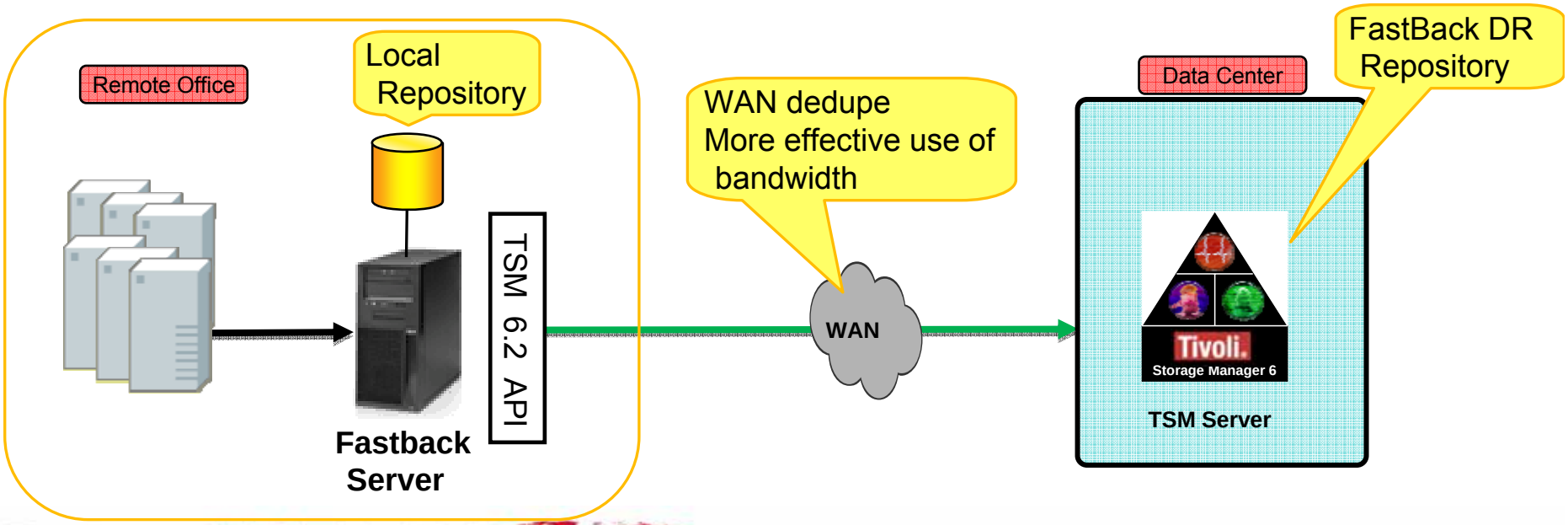
Deduplication across multiple FastBack servers

FastBack DR Repository stored in TSM

Mount directly from TSM server for recovery

Benefits:

- Deep TSM Integration
- More effective use of bandwidth
- Reduced storage requirements at the DR site



FastBack Mount – Recovering data directly from TSM server

Mount volume directly from TSM Server

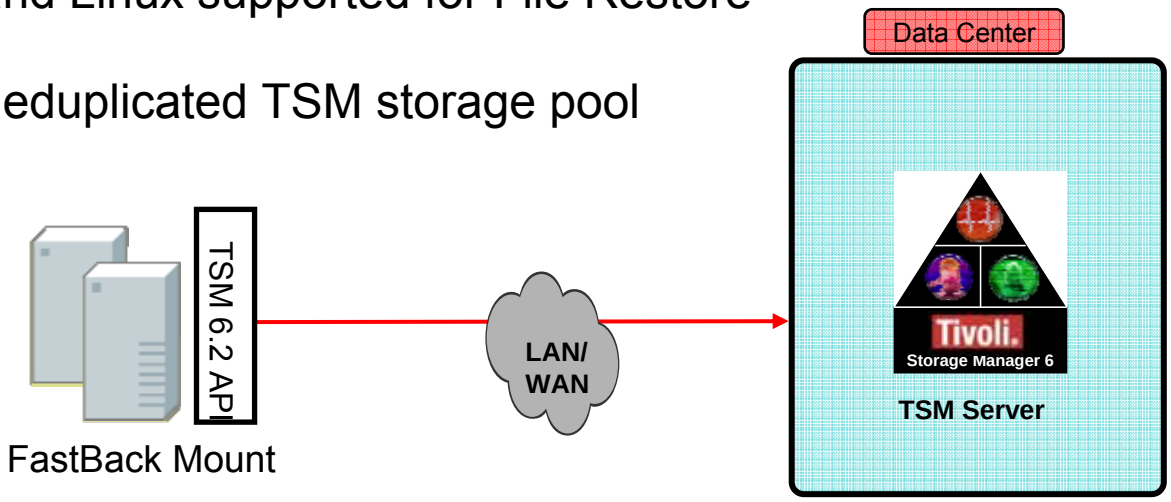
Restore individual files from a replicated Fastback repository

TSM 6.2 API now integrated into FB Mount

No FastBack Server required for File Restore

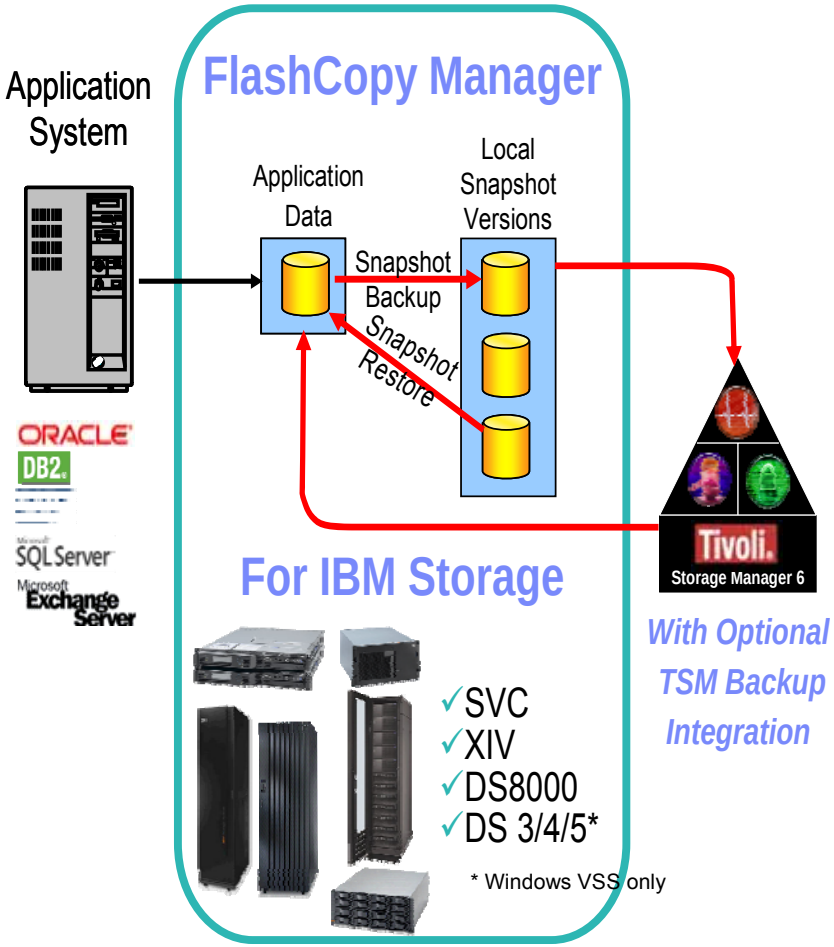
Windows and Linux supported for File Restore

Can be a deduplicated TSM storage pool



IBM Tivoli Storage FlashCopy Manager

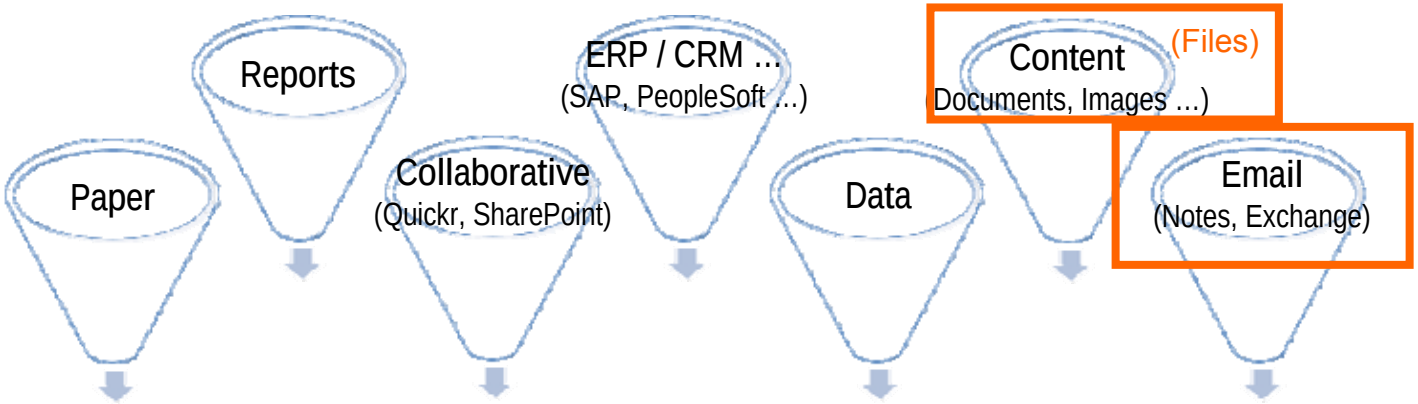
- Performs and manages application-aware backups and restores, leveraging advanced FlashCopy snapshot technologies in IBM storage systems
- Highest levels of protection for mission critical IBM DB2® UDB, SAP, Oracle, Microsoft® Exchange and Microsoft SQL Server applications
- Easy to deploy – 4 hours to first snapshot
- Integrates with TSM for long-term data management and Disaster Recovery
- Replaces TSM for Advanced Copy Services and TSM for Copy Services



IBM Smart Archive Strategy

New

IBM Information Archive for Email, Files and eDiscovery *is a specific IBM Smart Archive solution delivering the areas denoted in orange*



Value Added Services
- Optimization Services
- System Services
- Managed Services
- Reference Architecture
- Information Governance

Cloud Ready Archive Storage with Optional ECM

Optimized and Unified Assessment, Collection and Classification

Flexible and Secure Infrastructure with Unified Retention and Protection

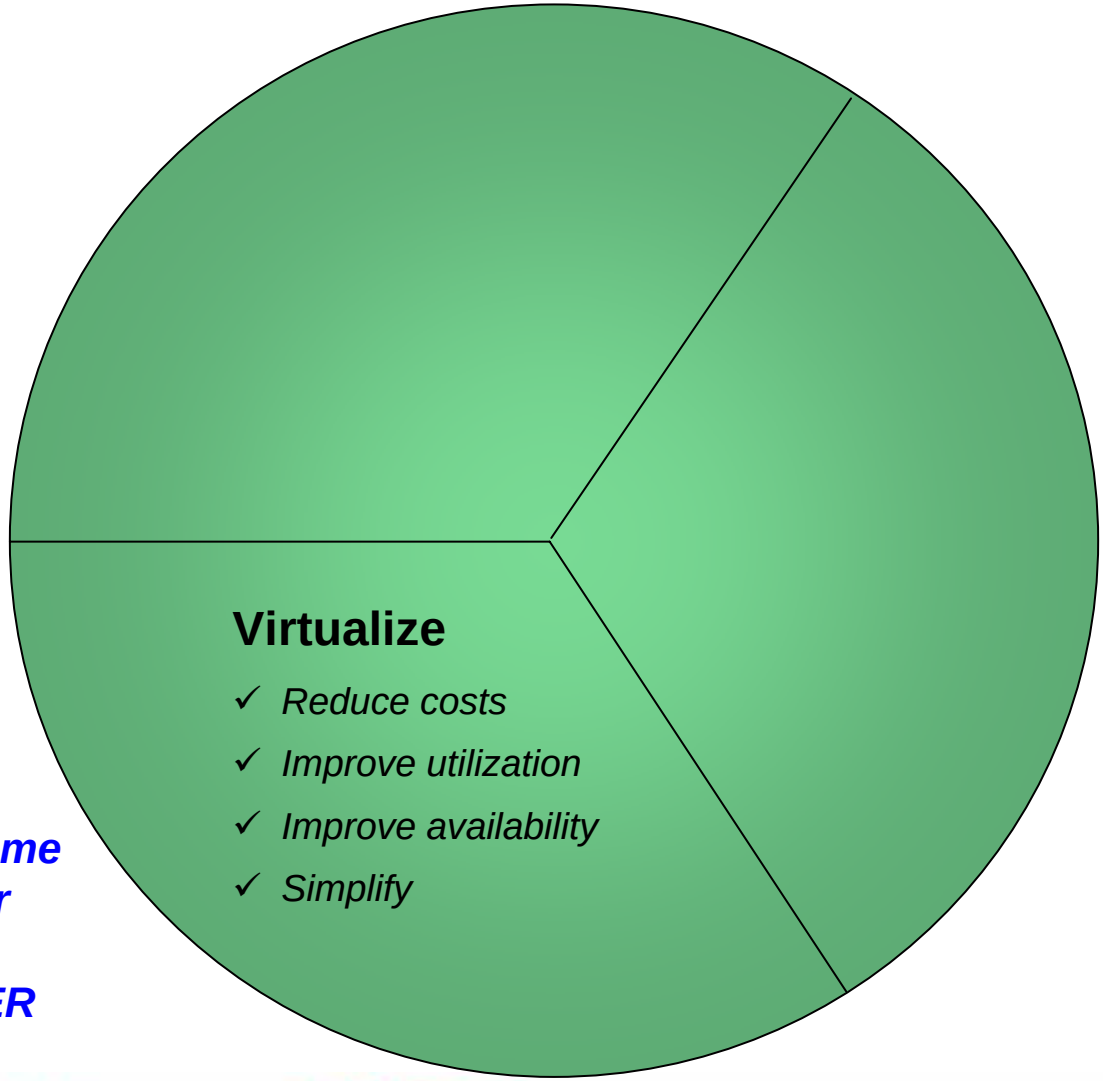
On Premise
(Custom Config)

Appliance
(Pre-Config)
608 TB Disk

As A Service
(SaaS, Multiple Options)

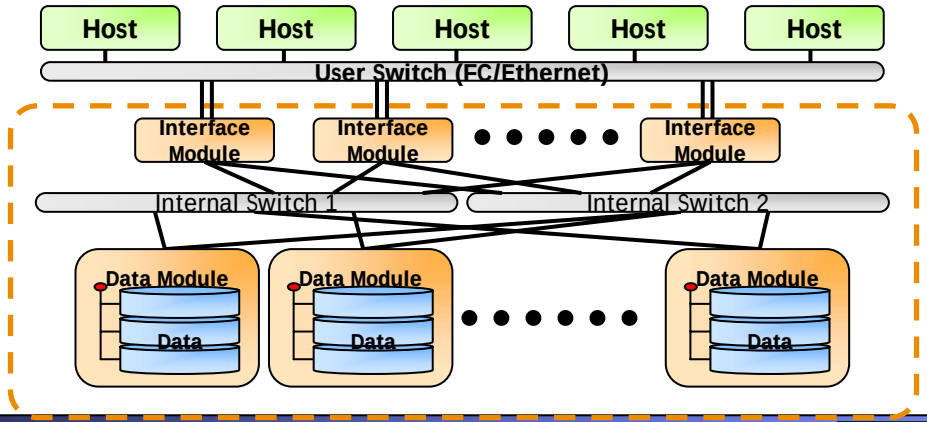
Integrated Compliance, Records Management, Analytics and eDiscovery

IBM Tivoli *Protects, Virtualizes and Manages* the Information Infrastructure



- ✓ ***XIV***
- ✓ ***SAN Volume Controller***
- ✓ ***ProtecTIER***

XIV: Next Generation Storage System



50 to 70% lower total cost of storage (no added charge for XIV software features – mirroring, snapshot, data migration, management)	**Capital Cost**
80 TB useable on one floor tile	**Space**
XIV uses 4 to 9 times less power for the same (or better for same capacity) performance and reliability levels	**Energy**
10-20% of traditional systems space is orphaned and will never be reclaimed. With XIV space is never lost	**Waste**
Using differential snapshots yields 15-30% saving in infrastructure cost	**Snapshots**
Thin provisioning yields 20-50% saving in infrastructure cost over a period of time	**Stretch Your TB**

Highlights of SVC 6.1 Announcement

SVC 6.1

- Automated Volume Management improvements – **Easy/Smart Tiering**
  - Improved SSD usage through moving hotspots of activity at the extent level
- Greater Scalability
  - 1PB MDisks and 8GB extents
  - > 2TB LUNs and virtualize up to 32PB of storage on a single SVC cluster
  - increased controller WWNN limit to 256 from 64
- Console/GUI usability enhancements
  - New web-based design incorporating SVC user feedback
  - SVC objects can be named with up to 63 characters
  - Launch SVC tasks in context from TPC and IBM Director
- RAS enhancements – support matrix available on the System Storage Interoperability Center
- New SVC Entry Engine – replacing the 2145-8A4

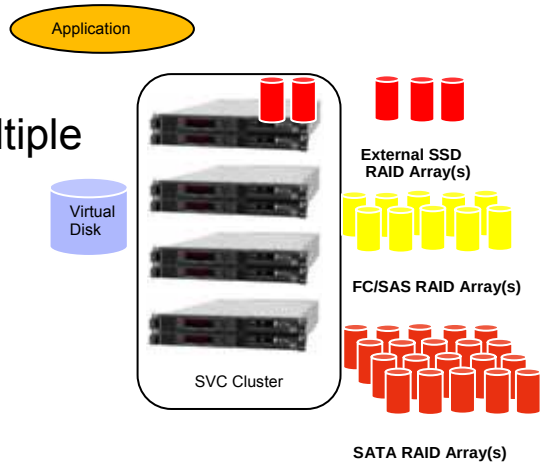
SVC 6.1.1:

- Replication enhancement to use FlashCopy Targets as Remote Copy sources
  - Enables a lesser-bandwidth remote copy solution
- Scalability options with larger SSD offerings

SVC 6.1

Easy Tier

- What is Easy Tier?
  - A function that dynamically re-distributes active data across multiple tiers of storage class based on workload characteristics.
  - The goal being to reduce response time.
  - Users will have automatic and semi-automatic extent based placement and migration management



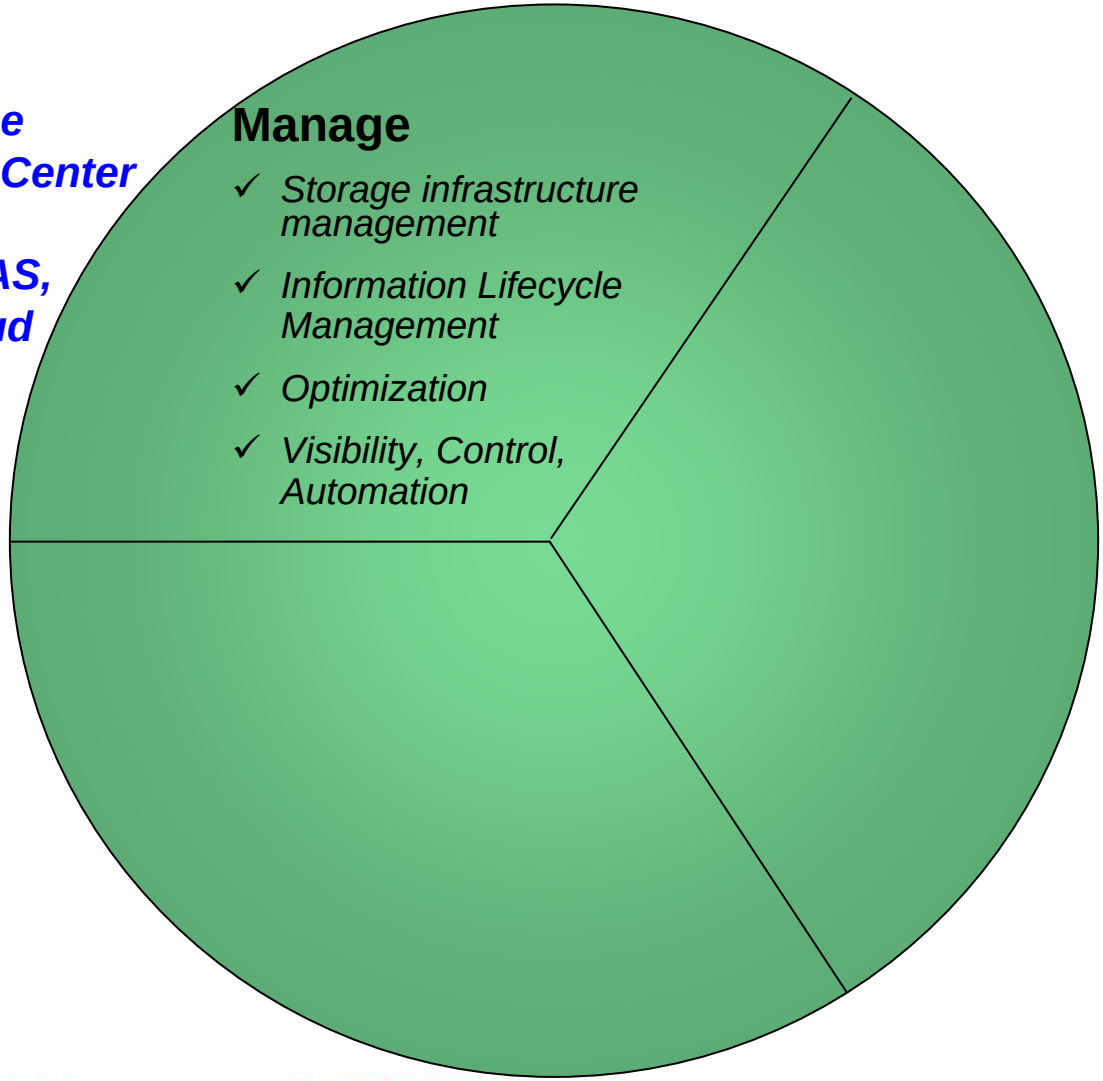
- Why it matters?
  - Solid State Storage has orders of magnitude better throughput and response time.
  - Full vdisk allocation to SSD only benefits a small number of volumes, and use cases.
  - Allowing dynamic movement of the hottest extents to be transferred to the highest performance storage enables a small number of SSD to benefit the entire infrastructure.
  - Will work with SEV disks, unlike EMC FAST v2

Deduplication with ProtecTIER Virtual Tape

- **Performance**
  - Fastest deduplication solution in industry (>1 GB/sec)
- **Scalable**
  - Highest scaling deduplication solution in industry (up to 1PB raw storage, 10-20+PB data)
- **Data Integrity**
  - Doesn't rely on a hash algorithm; performs a byte level differential to ensure data is a duplicate for enterprise class data integrity
- **Reliable**
  - ProtecTIER features all IBM best of breed components
- **Production Proven**
  - There is more capacity deployed behind ProtecTIER servers in production than any other deduplication vendor
- **Many to 1 replication** New

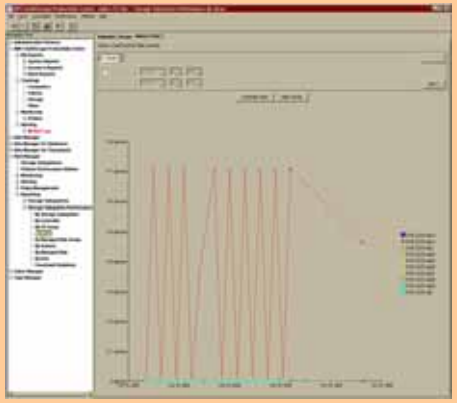
IBM Tivoli *Protects, Virtualizes and Manages* the Information Infrastructure

- ✓ ***Tivoli Storage Productivity Center***
- ✓ ***Scale Out NAS, Storage Cloud***



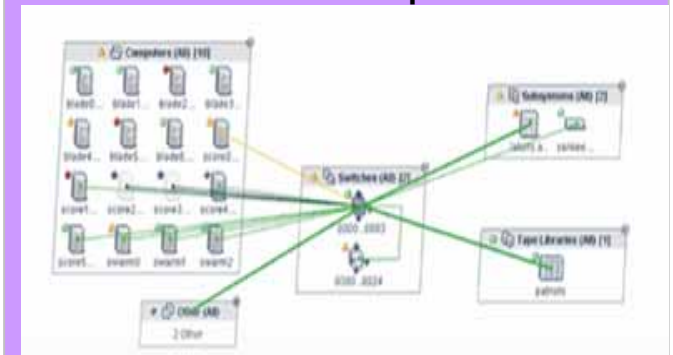
TPC - Much More Than Storage Resource Management

Bottlenecks??



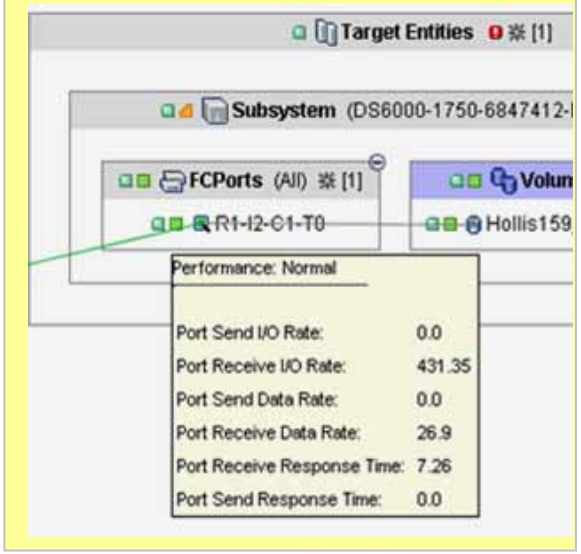
Trending and Planning

Data Path Explorer

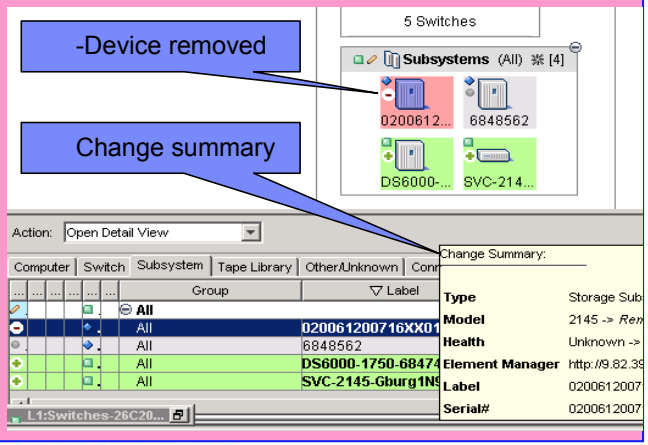


Energy Management Tools

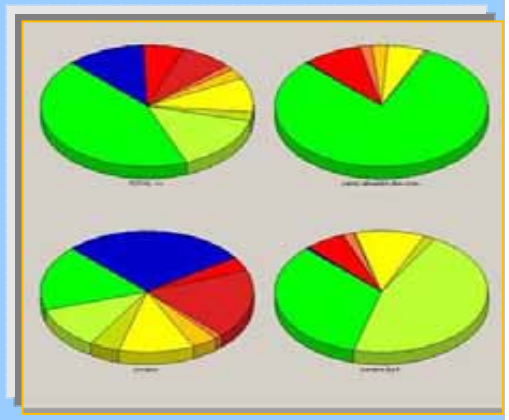
Performance & Health Checking



Changed Configuration History



Disk Utilization



Tivoli Productivity Center 2010 Plan Highlights

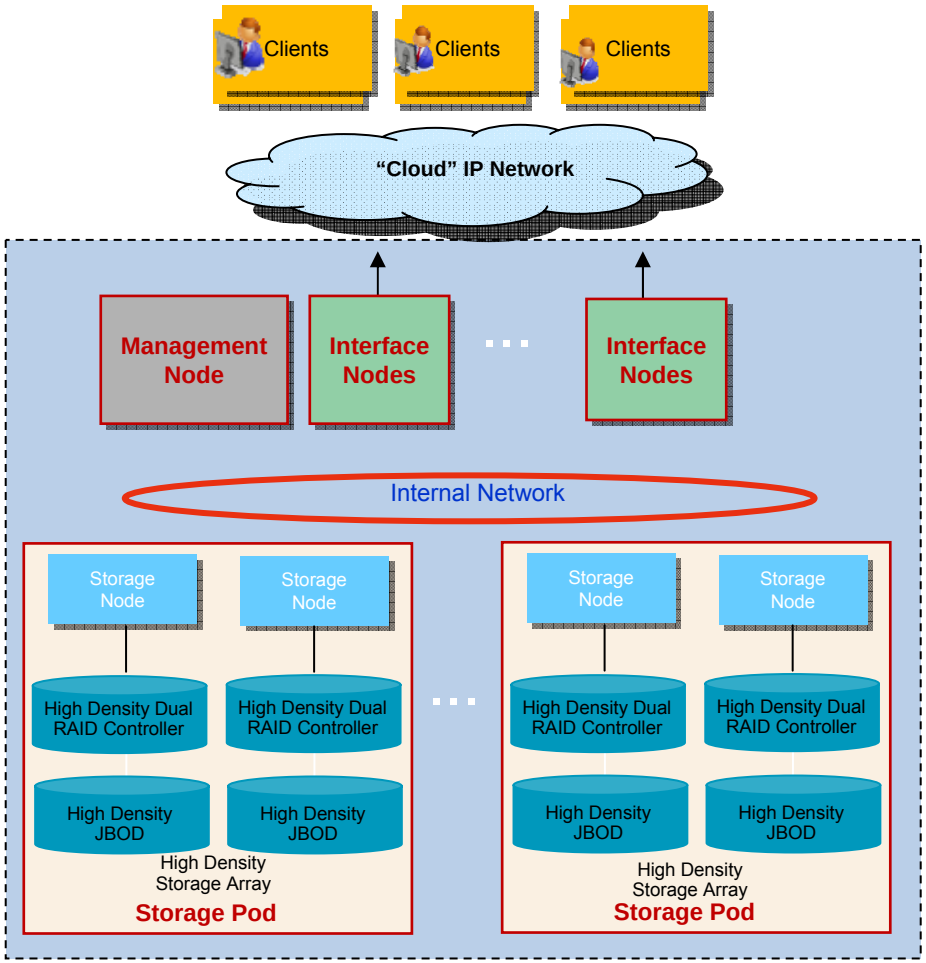
1H 2010

- New solution that integrates Tivoli System Automation with Tivoli Storage Productivity Center
  - Performs full site-switch in the event of a disaster
  - Automated stop, move and start of tiered applications

2H 2010

- New TPC Release that will include:
  - Simplified deployment (agents, CIMOMs) and management enhancements
  - Automated end-to-end storage provisioning for all supported storage systems (added XIV and non-IBM)
  - New provisioning wizard with Disaster Recovery planning
  - Open systems high availability volume management

IBM Scale Out NAS – System Managed Storage in a Box



- Enterprise class solution for IP based file system storage (NFS, CIFS, FTP, ..)
- One global repository for application and user files: >1B files per file system, 256 filesystems per SoNAS, simplified management of PBs of storage
- Extreme performance (near linear aggregate throughput) and extreme capacity scaling
- Work load and data is evenly distributed across all nodes and disk pools, eliminating hot spots
- Policy based tiered storage - high-performance SAS and high-capacity SATA HDD's
- Provision, monitor, report, chargeback by application, user, department, etc
- Accelerated backup, HSM and recovery by TSM

Can deploy as private or public (future) cloud

Trademarks and disclaimers