Simplify and optimize storage infrastructure in the cloud era

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Optimizing the World's Infrastructure
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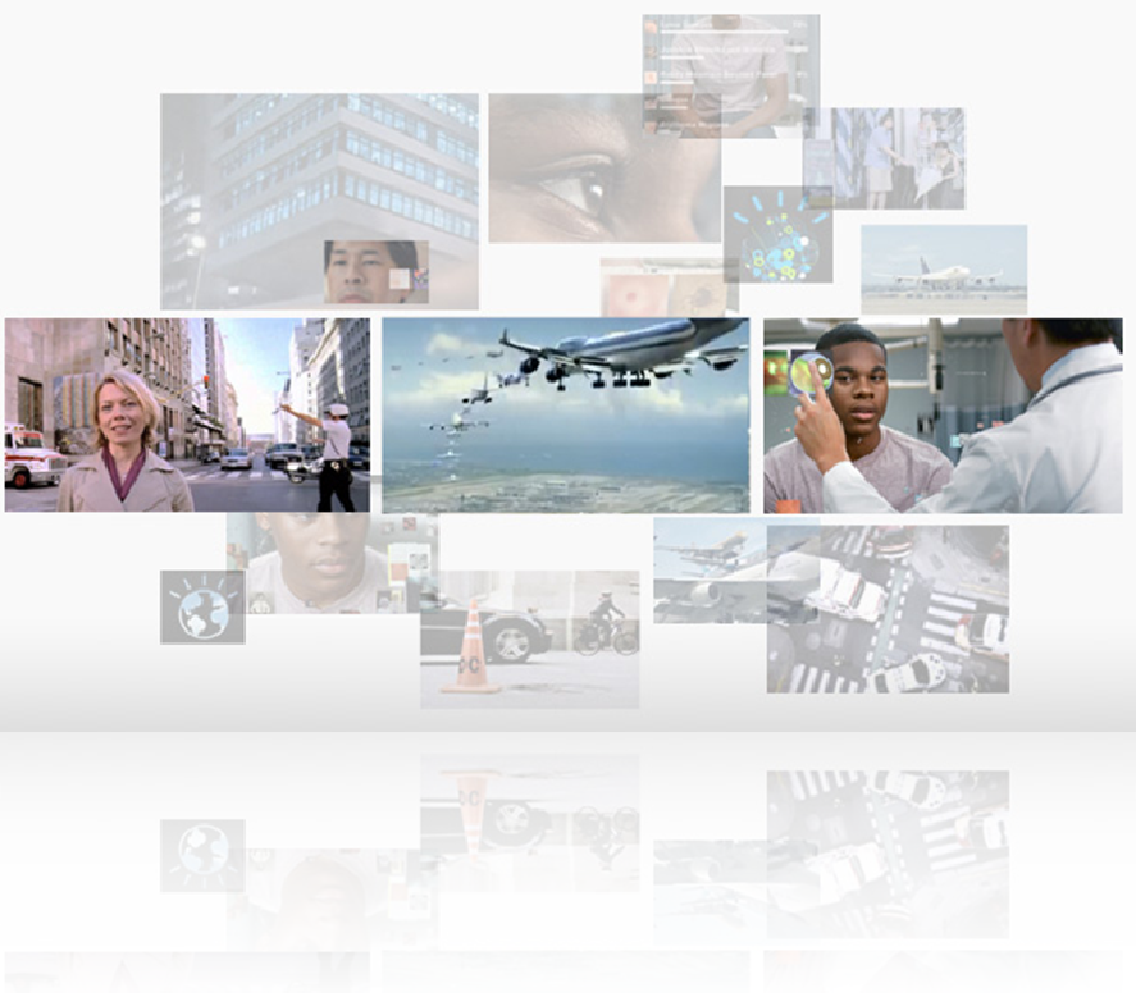
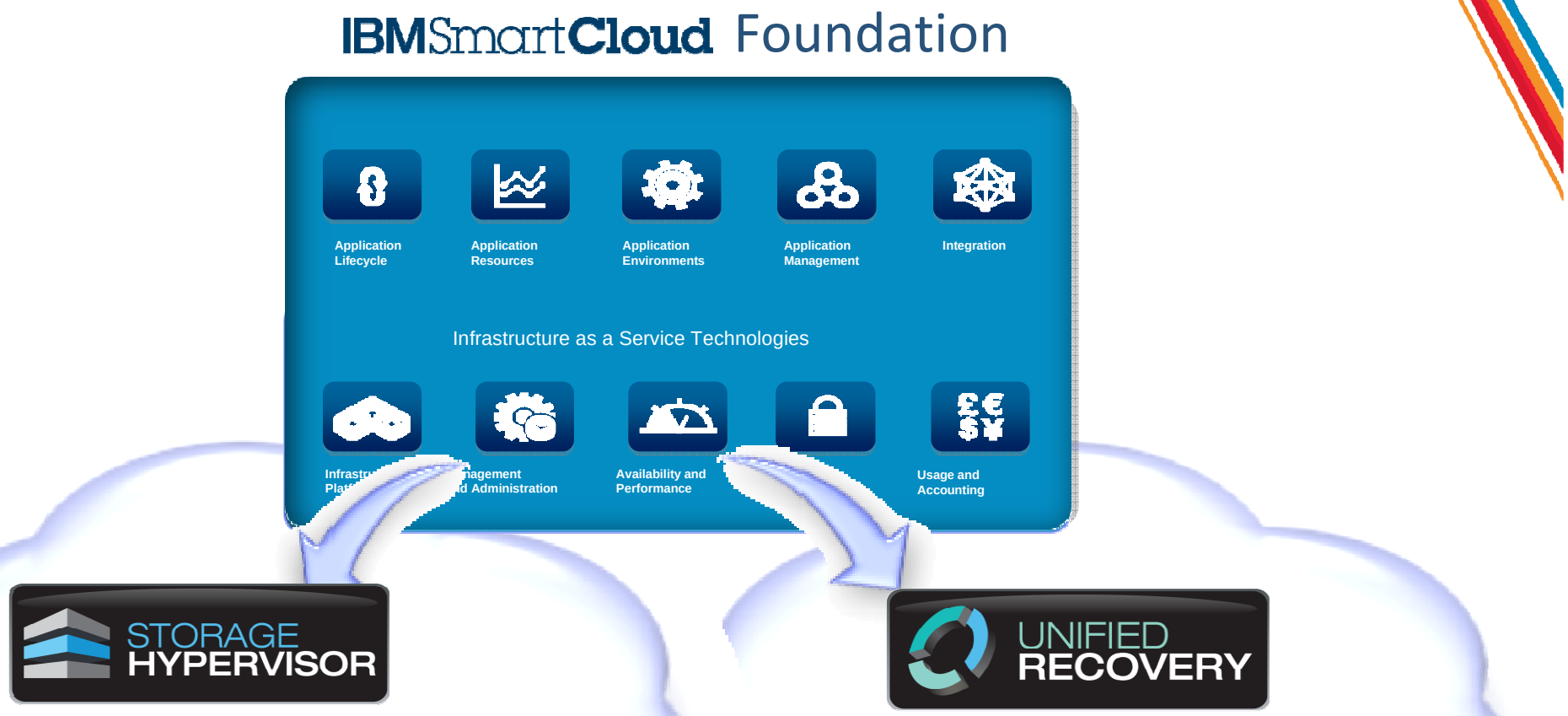
Cloud Computing - NIST* Definition

*(*National Institute of Standards and Technology)*

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.



Tivoli Storage Software Strategy



SmartCloud Virtual Storage Center

Higher utilization, data mobility, and simplified management across heterogeneous tiers of storage

Tivoli Storage Manager Suite for Unified Recovery

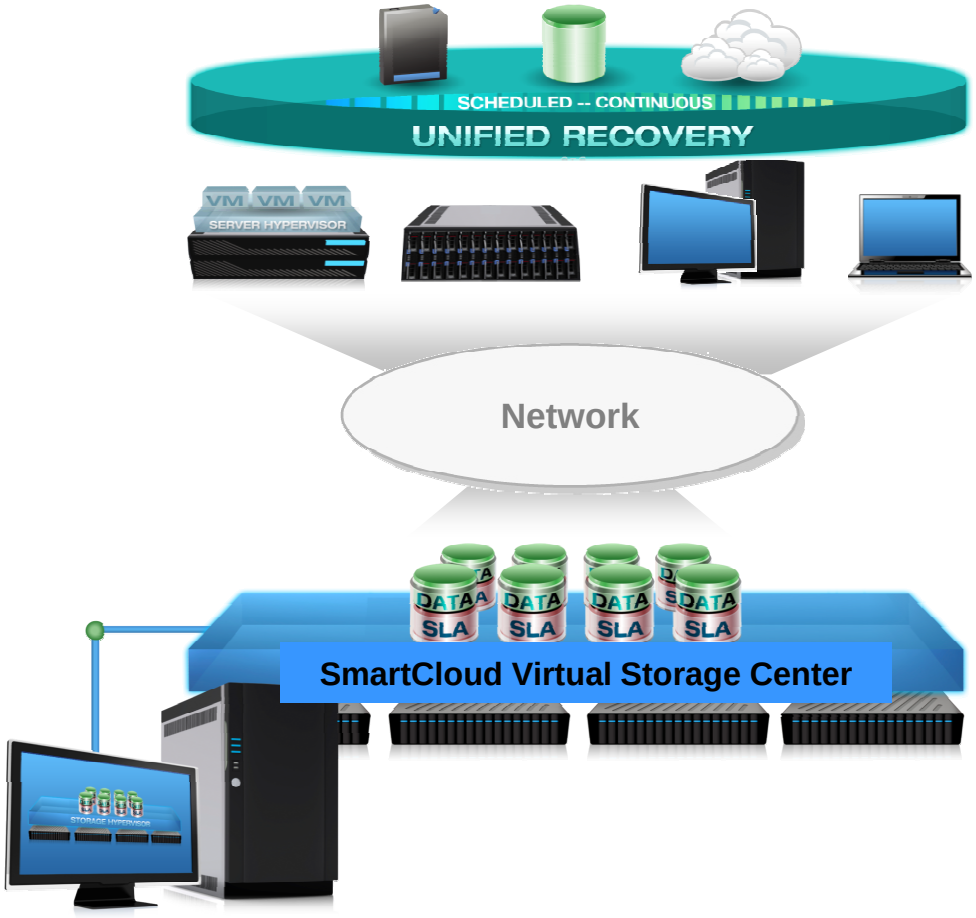
Simplified management of backup and restore of virtual machines and data storage systems in the Cloud

Tivoli Storage Software Strategy

Protect the Information Infrastructure

Tivoli Storage Manager Suite for Unified Recovery

- **Data Protection: Backup & Recovery**
  - Wide range of server and storage support
  - Virtual servers
  - NAS filers
  - File systems, unstructured data
- **Distributed data protection**
  - Remote offices, workstations, laptops,etc
- **Disaster Recovery**
  - Automatic and dynamic DR plan
  - Database replication using DB2 HADR
- **Application-aware quiescing**
  - Databases: DB2, Oracle, SQL
  - Applications: Exchange, Notes, SAP
  - LAN-Free backup / restore



Tivoli Storage Manager Suite for Unified Recovery

- Data Protection: Backup & Recovery
  - Wide range of server and storage support
  - Virtual servers
  - NAS filers
- Data Reduction
  - Progressive incremental backup
  - Source and target data deduplication
  - Highly efficient tape management
- Disaster Recovery
  - Automatic and dynamic DR plan
  - Database replication using DB2 HADR

•Distributed data protection

–Remote offices, workstations, etc

•Application-aware quiescing

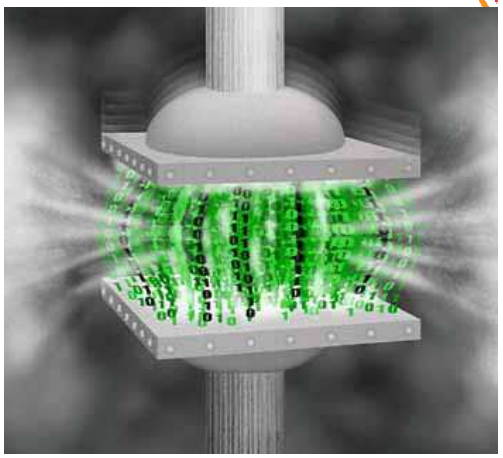
–Databases: DB2, Oracle, SQL

–Applications: Exchange, Notes, SAP

–LAN-Free backup / restore

Tivoli Storage Manager Suite for Unified Recovery

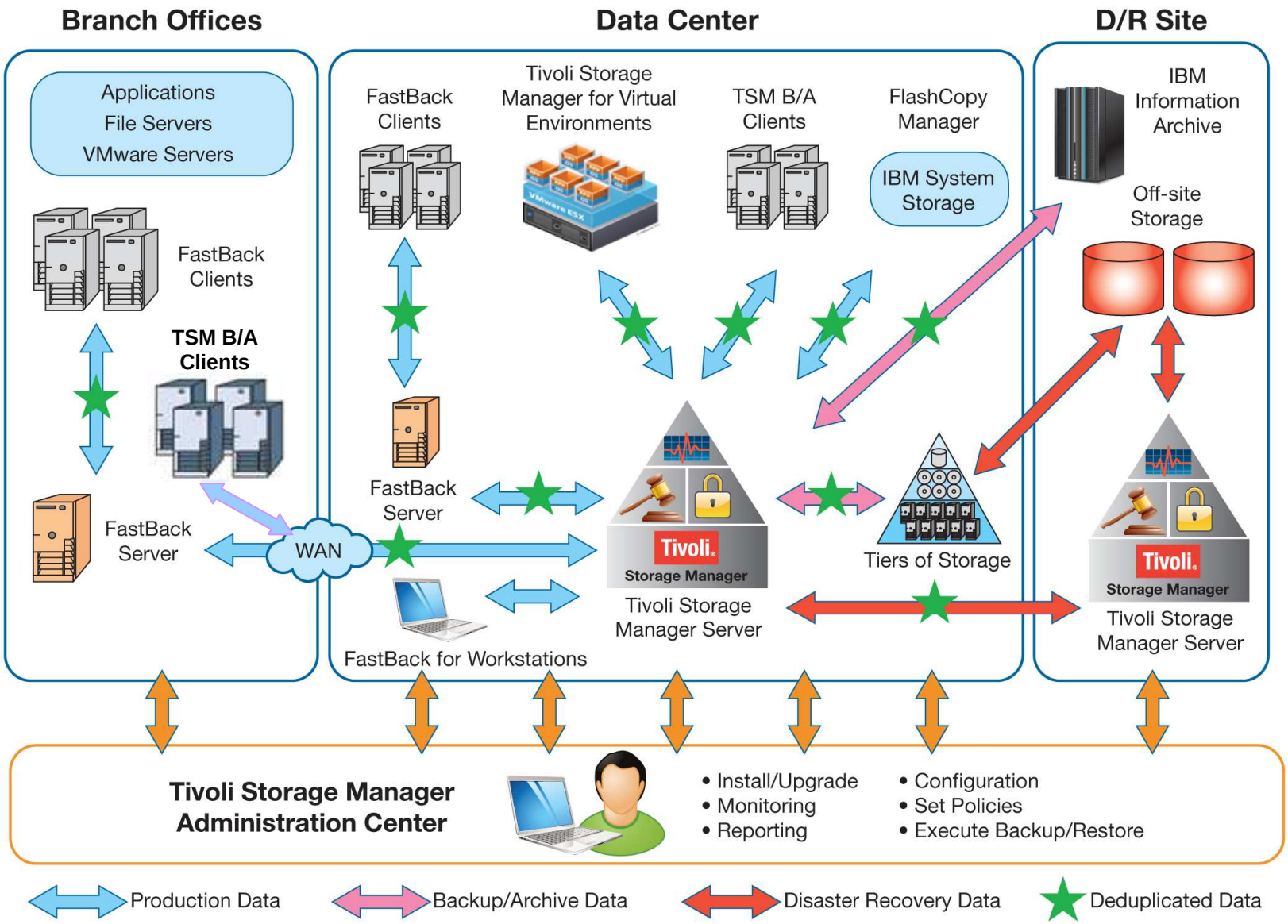
Holistic approach to Data Reduction



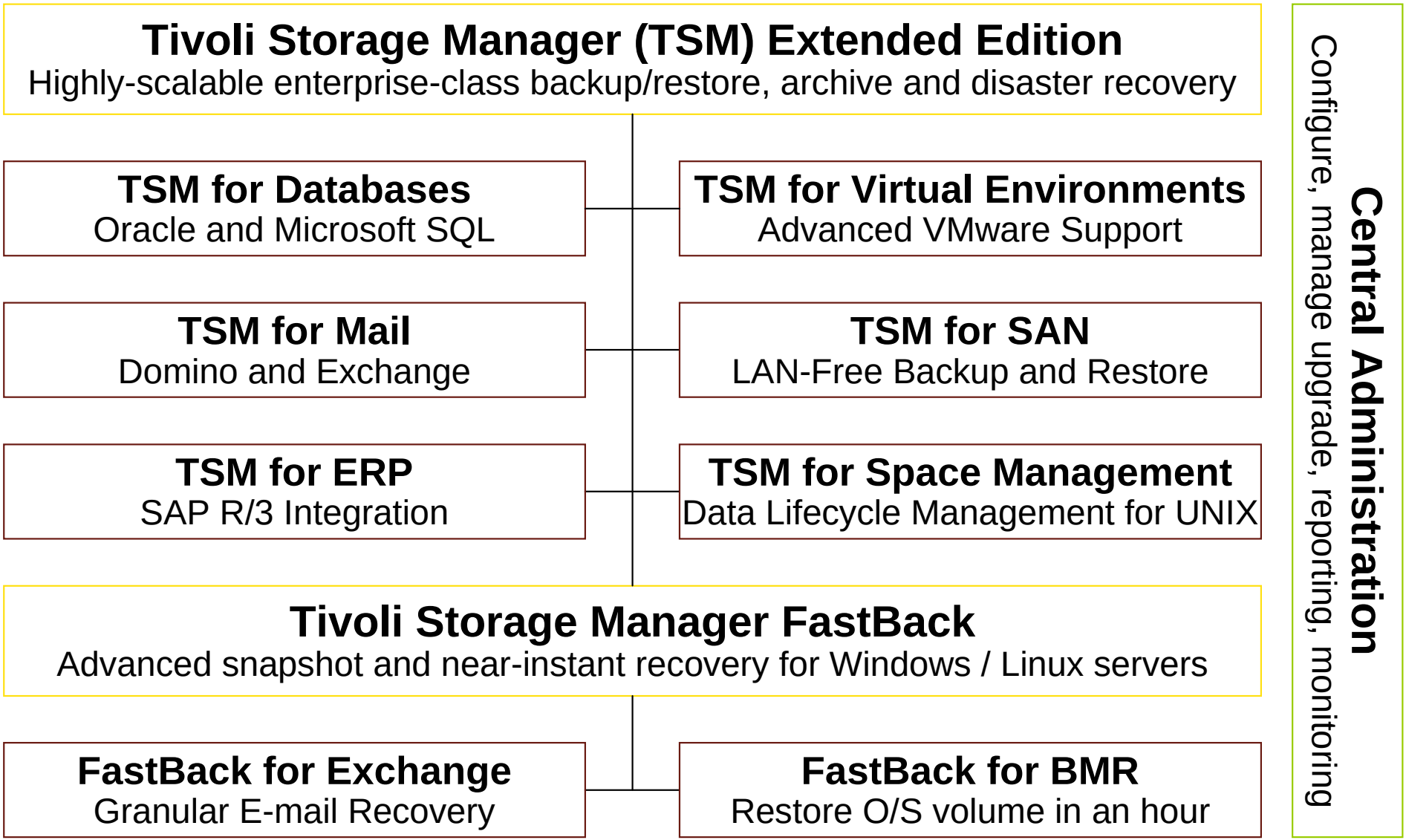
- **Progressive-incremental (“incremental forever”) backup**
  - Eliminates the #1 cause of data duplication – full backups
  - FastBack block-level incremental is extremely efficient
- **Source-side data deduplication (TSM)**
  - Reduces the amount of data sent to the TSM server
  - Reduces bandwidth and storage requirements
- **Target-side data deduplication (TSM and FastBack)**
  - Post-backup process reduces primary storage pools
  - Enables faster restores because more backup data can be stored on disk
- **Automated Data Lifecycle Management (archive and HSM)**
  - Moves older, fixed content to less expensive tiers of storage
  - Reduces the amount of production data to be managed
- **Compression and best-in-class tape utilization**

TSM Suite for Unified Recovery & Retention

From Workstation to Mainframe

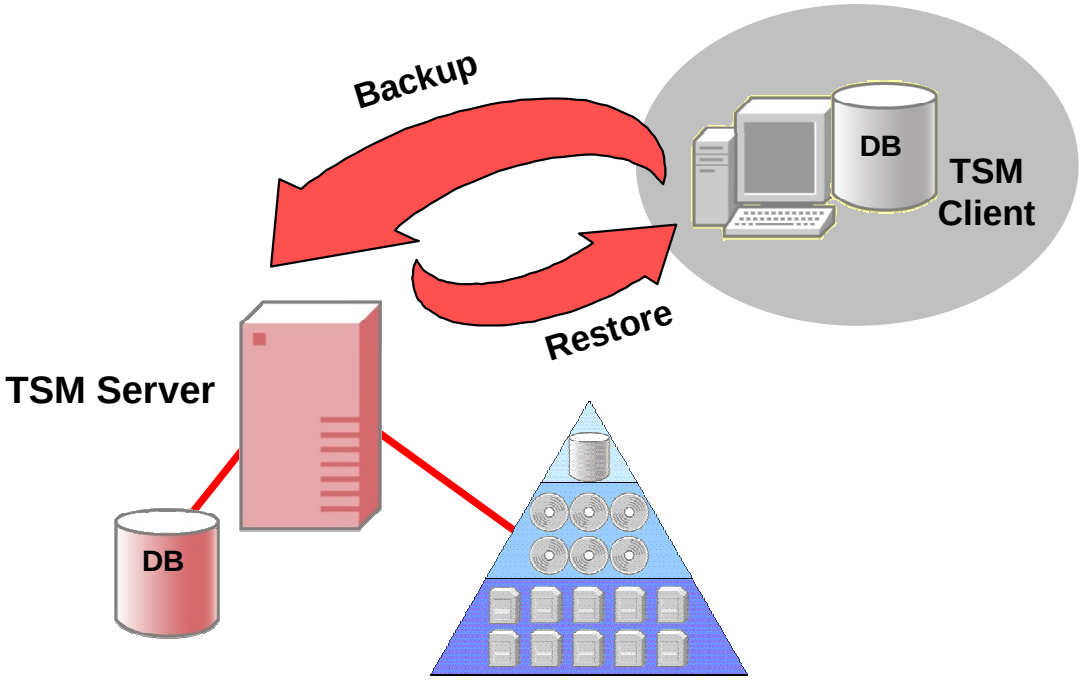


Tivoli Storage Manager Suite for Unified Recovery includes …



Tivoli Storage Manager Suite for Unified Recovery

Protecting Databases and Applications



- **TSM Extended Edition (file servers, DB2, Informix)**
- **TSM for Mail (Lotus Domino, MS Exchange)**
- **TSM for Databases (Oracle, MS SQL)**
- **TSM for Enterprise Resource Planning (SAP/R3)**
- **Support for DB2 built in to TSM**

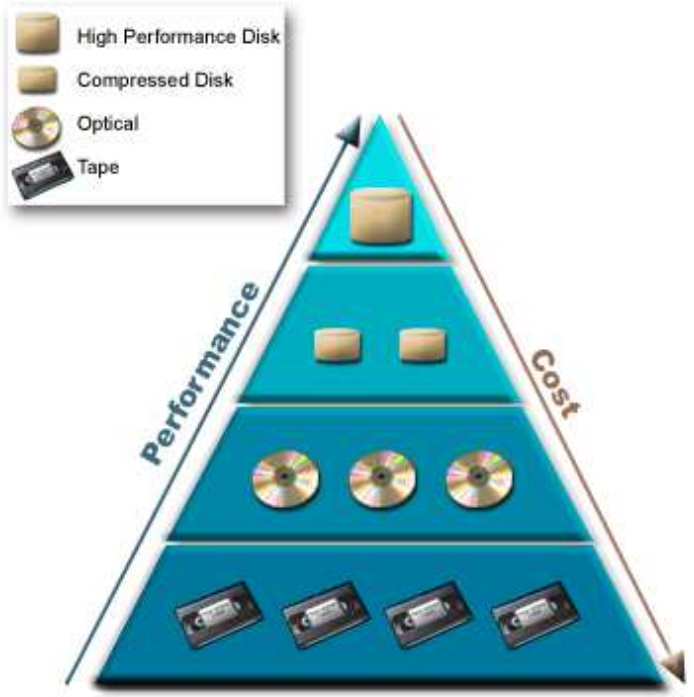
Benefits

- **Online (hot) backup**
  - No downtime for critical applications
  - 24x7 application availability can be guaranteed
- **Incremental backup**
  - Minimize data to store and maintain
  - Faster backups
- **Data integrity**
  - Guaranteed by the use of certified application APIs
  - All required files automatically backed up consistently
- **Automation & Scheduling**
  - No shutdown required
  - Automated restore of consistently backed up files
  - No customized scripts and manual interaction

Tivoli Storage Manager Suite for Unified Recovery

Tivoli Storage Manager for Space Management

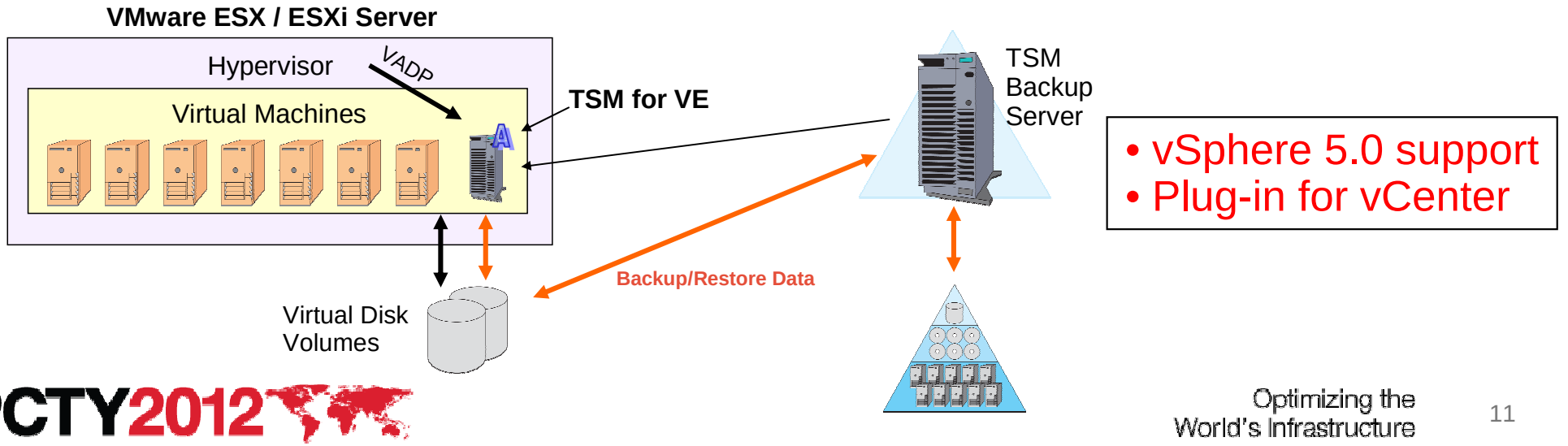
- Move inactive production data to reclaim online disk space
- Frees administrators and users from manual file system pruning tasks
- Defers the need to purchase additional disk storage
- Storage pool “virtualization”
- Optimized restore management
- Transparent to the users and applications
  - Simple pointer replaces data in original location
- Migrations are scheduled and run outside the backup window



Tivoli Storage Manager Suite for Unified Recovery

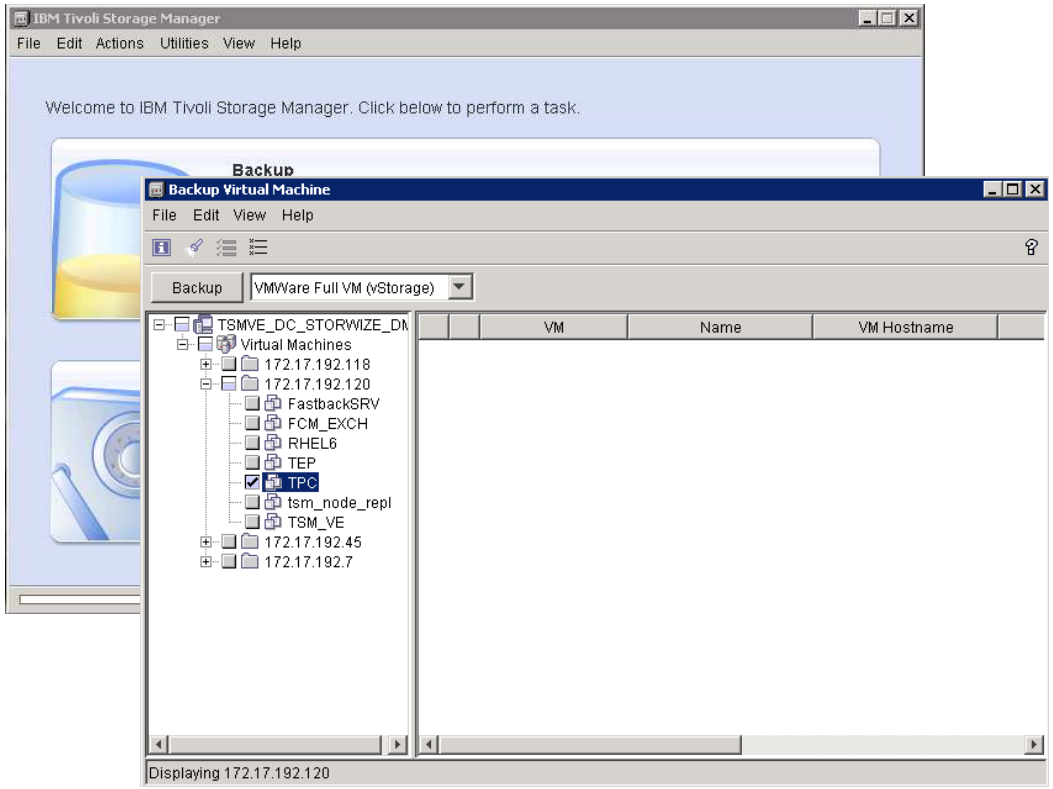
Tivoli Storage Manager for Virtual Environments

- Leverages vStorage APIs for Data Protection (VADP)
- Non-disruptive, single-pass, block-level backup
- Flexible recovery options: file, volume, VM image
- Near-instant restore of files and disk volumes (Windows and Linux)
- No additional hardware required
- Simplified agent management – one agent supports multiple VMs
- Automated discovery and protection of new VMs
- Supports for LAN-free data transfer when using a physical vStorage Server

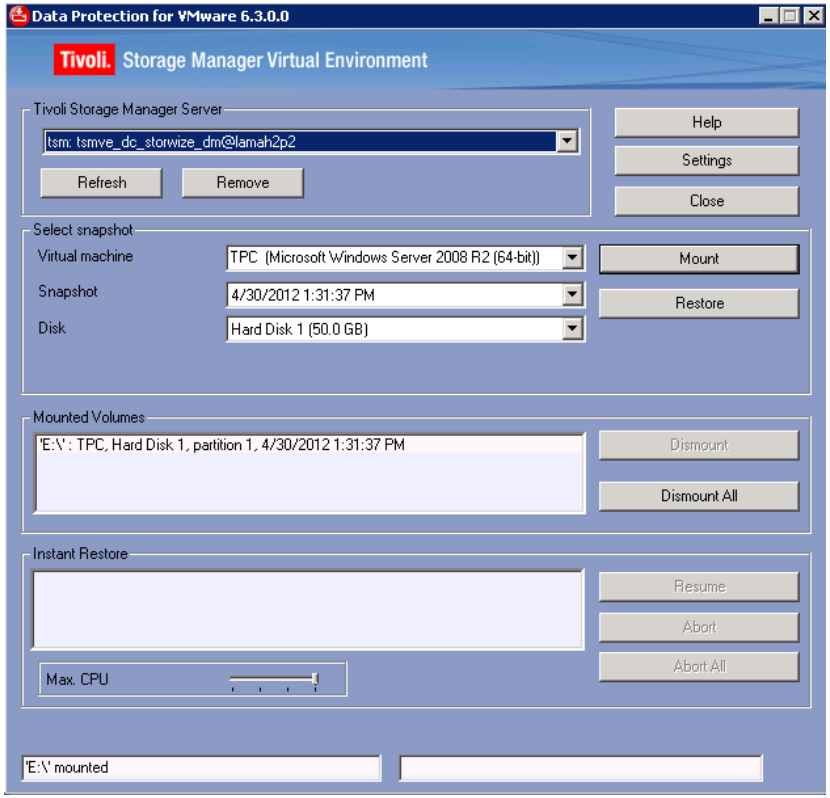


Tivoli Storage Manager Suite for Unified Recovery

Tivoli Storage Manager for Virtual Environments



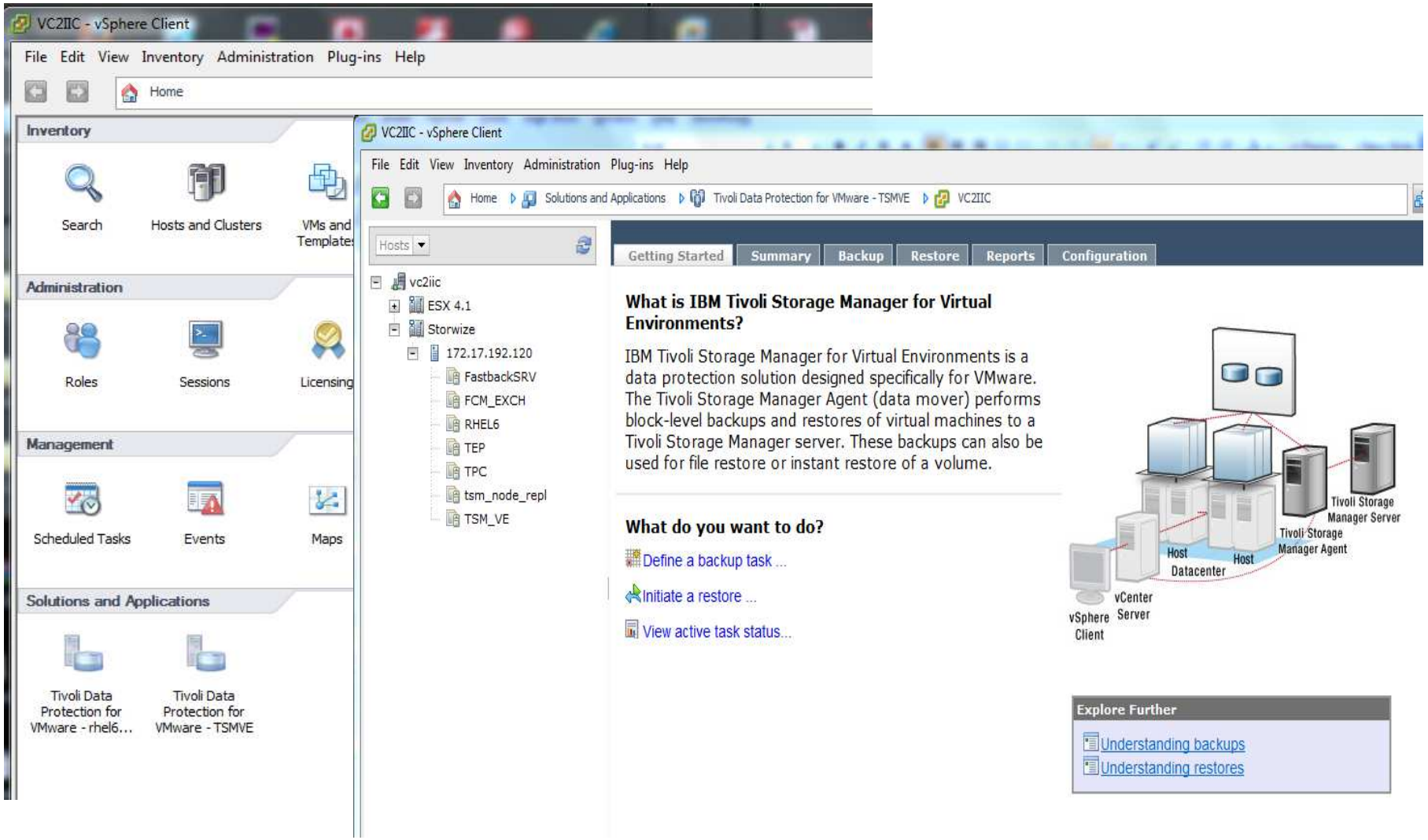
Backup via standard GUI



Mount the snapshot and restore

Tivoli Storage Manager Suite for Unified Recovery

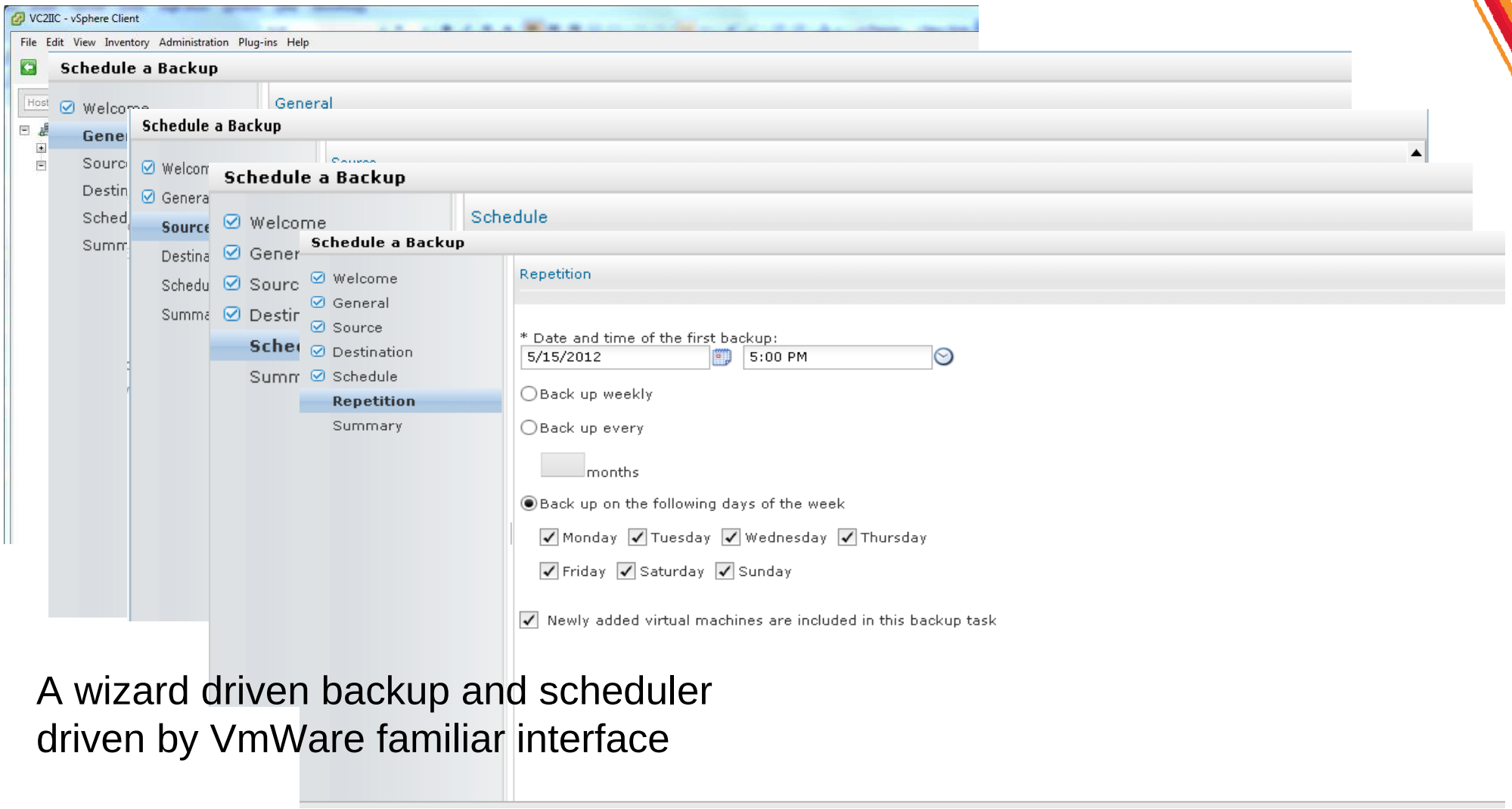
Tivoli Storage Manager for Virtual Environments



Backup & Restore via vCenter plugin

Tivoli Storage Manager Suite for Unified Recovery

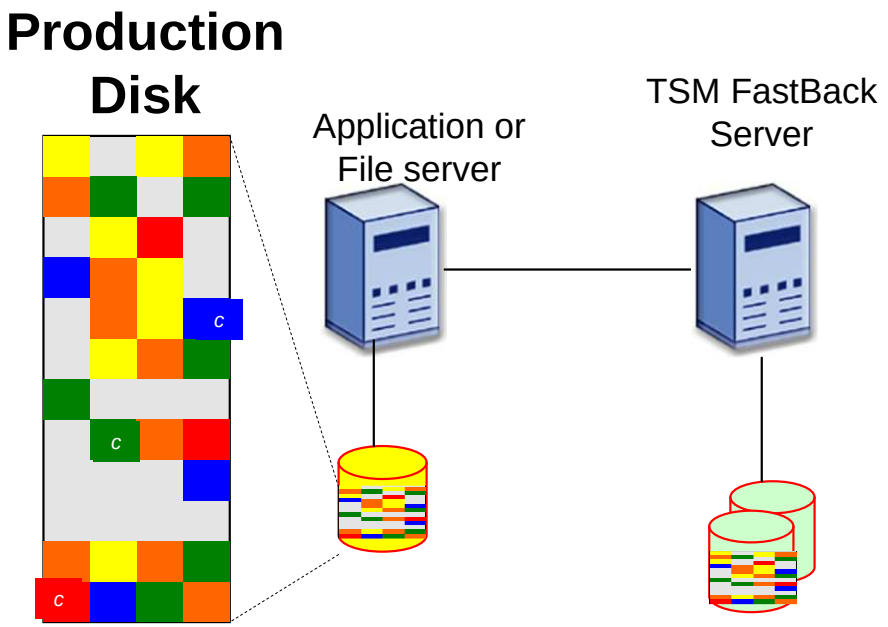
Tivoli Storage Manager for Virtual Environments



A wizard driven backup and scheduler driven by VmWare familiar interface

Tivoli Storage Manager Suite for Unified Recovery

IBM Tivoli Storage Manager FastBack

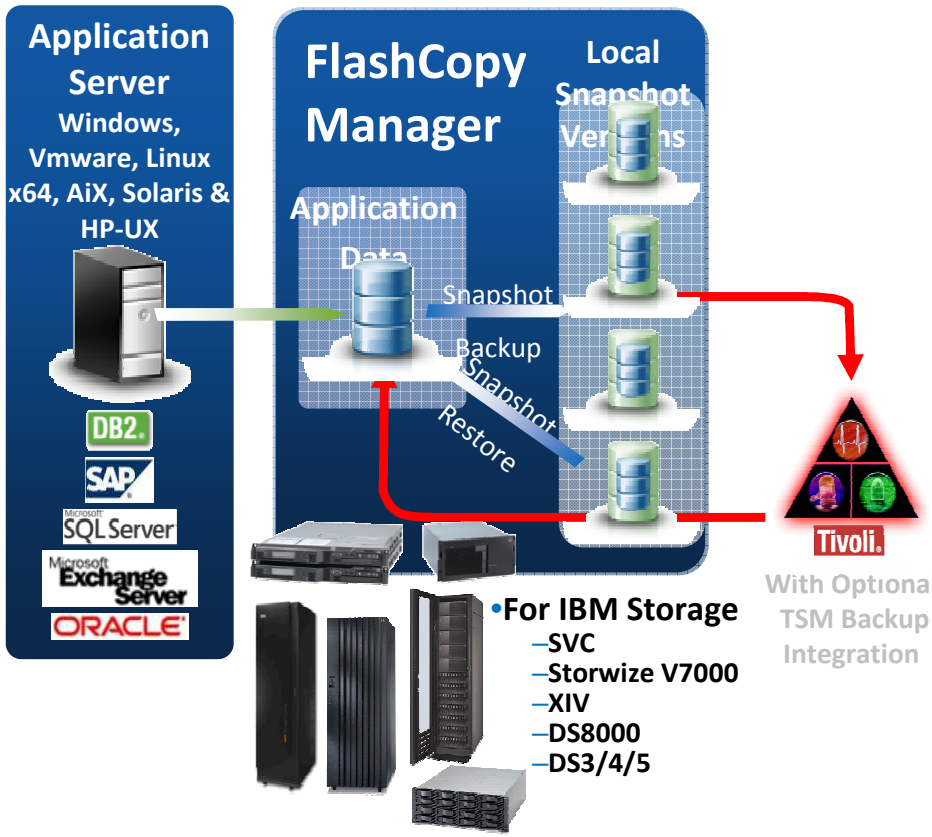


- FastBack is software based snapshot technology
- Disk Block-level
- Incremental-forever
  - Only the blocks that have changed since the last incremental snapshot are backed up

- It allows organizations to perform and manage frequent near-instant, non-disruptive, application-aware snapshots
- Snapshots allow a company to save a “moment in time” view of a volume or application
- Improve application availability and service levels through high-performance, streaming recovery capabilities to reduce downtime
- Allows any sized company to take advantage of Snapshot capabilities without needing to invest in hardware based snapshot technology and at a cost effective price point

TSM FlashCopy Manager

Performs and manages frequent, near-instant, non-disruptive, application-aware backups and restores, leveraging advanced FlashCopy snapshot technologies in IBM storage systems



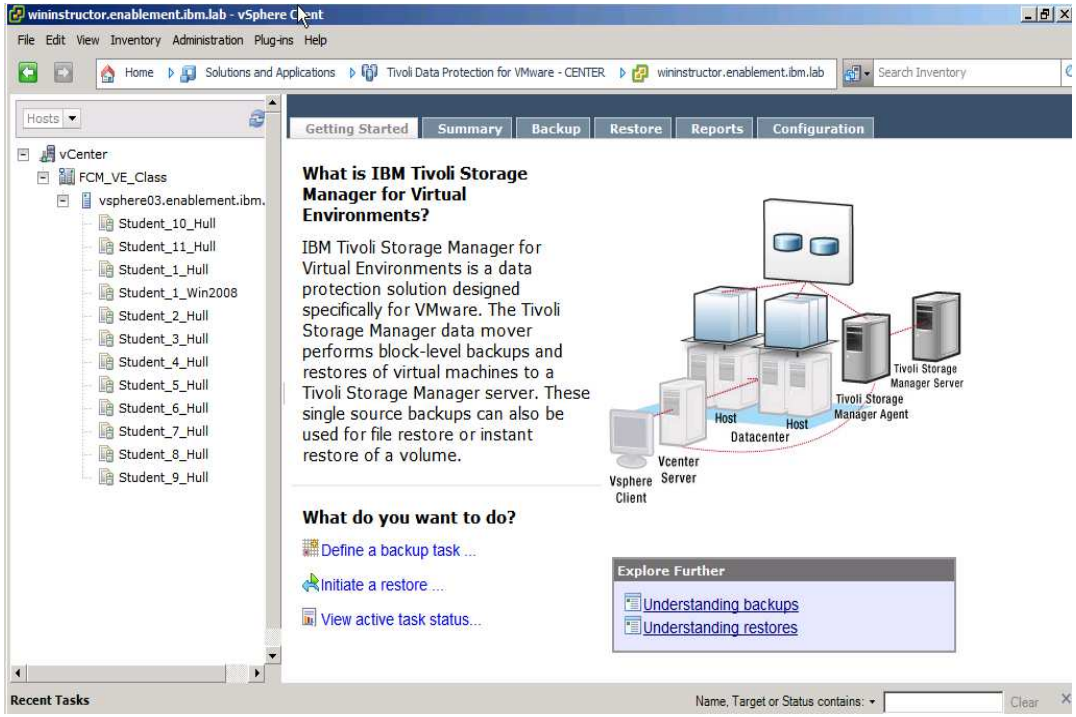
- Integrated with IBM Storage Hardware
- Database Cloning
- Support for multiple, persistent snapshots
  - Persistent snapshots retained locally
  - Very fast restore from the snapshot
- Snapshot backup to TSM server
  - Transfer outboard of application server to minimize impact to application
  - Copies on TSM server provide long-term retention and disaster recovery
- Policy-based management of local, persistent snapshots
  - Retention policies may be different for local snapshots and copies on TSM server
  - Automatic reuse of local snapshot storage as older snapshot versions expire
- File System & Custom Application for Unix & Windows
- FCM for VmWare (vCenter plug-in)

TSM FlashCopy Manager for VMWare

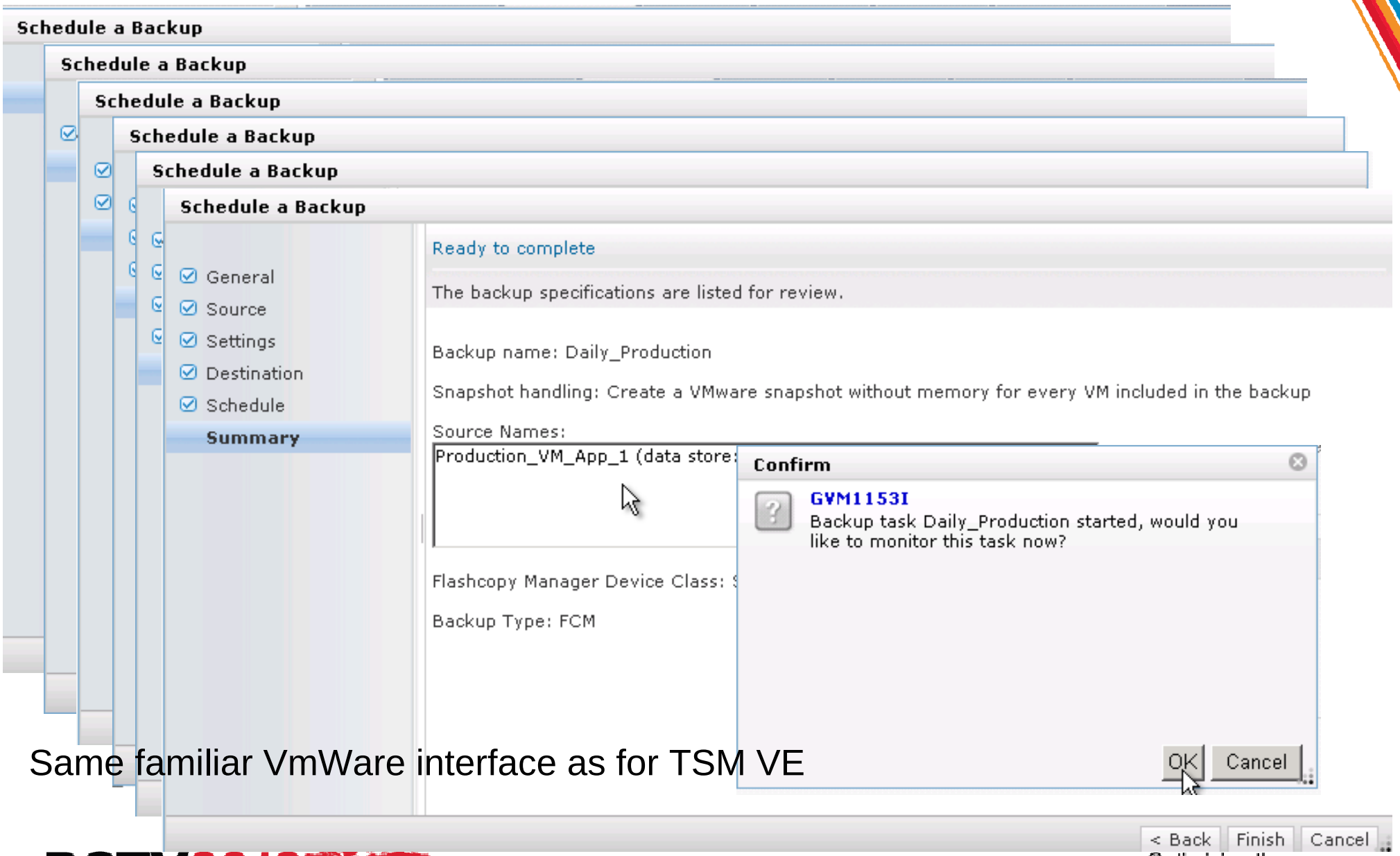
- IBM FlashCopy Manager for VMWare uses a vCenter plugin to save vmware virtual machines
- Can share the same TSM for VE plugin
- Requires a Linux proxy system (data mover)
  - Redhat
  - Suse

- Backup / Restore via vStorage API
- vCenter integrated GUI

- **Support VMFS disks**



TSM FlashCopy Manager for VMWare



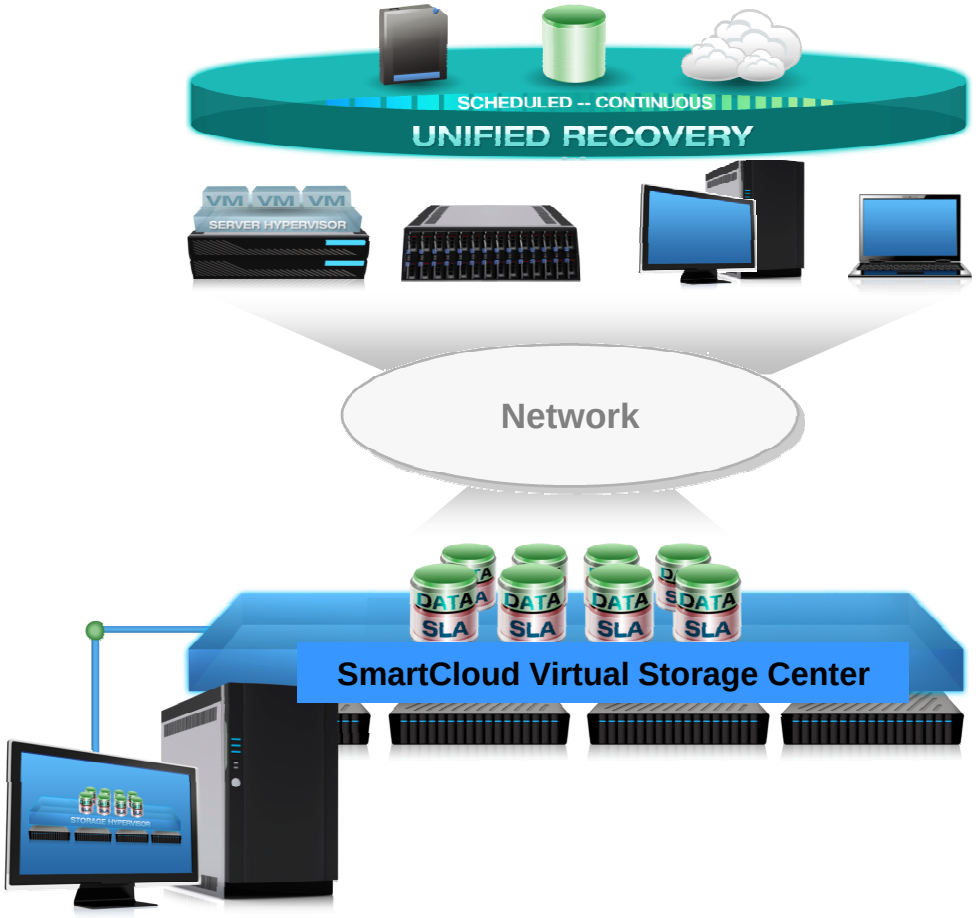
Same familiar VmWare interface as for TSM VE

Tivoli Storage Software Strategy

Virtualize, Manage and Optimize the Storage Infrastructure

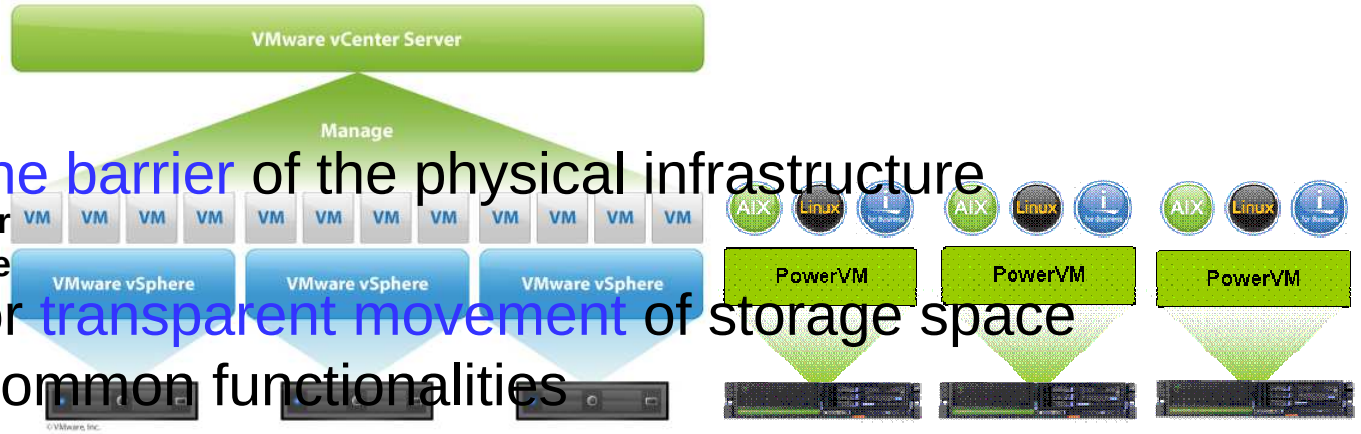
SmartCloud Virtual Storage Center

- Virtualize and manage etherogeneous storage infrastructures
- Optimize storage resources
- Simplify Management and reduce skill requirements
- Change the rules of storage provisioning



Tivoli Storage Software Strategy

Treat your storage the same way You treat your server !



Cross the barrier of the physical infrastructure

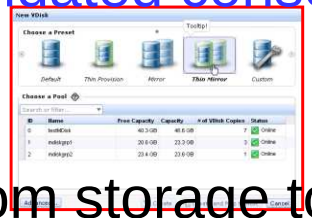
Virtual Server Infrastructure

Allow for transparent movement of storage space

Share common functionalities

Manage from a single consolidated console , no matter what the HW is.

Midrange Storwize V7000

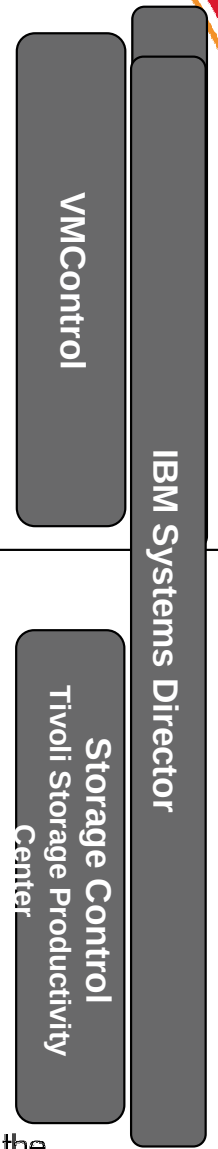


Enterprise SAN Volume Controller

Virtual Storage Infrastructure

Extend your management from storage to fabric and hosts

Storage Hyperviso



Tivoli Storage Software Strategy

Insight Performances

Best Practices

Insight of the Service level

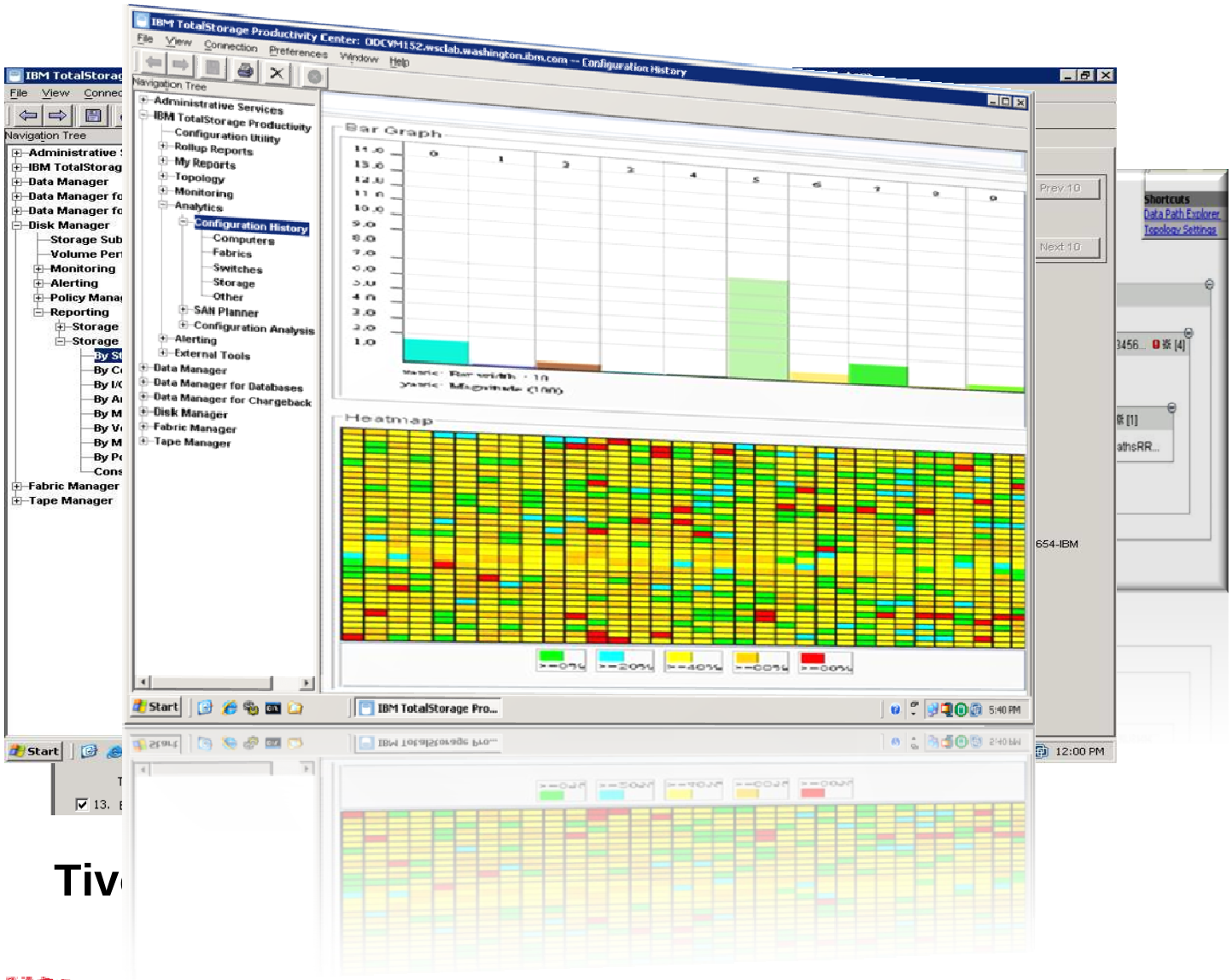
Storage environment management through policy driven recommendations

Service levels improvements data optimization for better ROI

Graphical representation, storage configuration, fault analysis and proactive transparent migration between storage tiers

Heat maps, Value of data is storage and fault and cluster and SAN

Best Practices for configuration and thresholds reporting for asset performances ,zoning etc



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Tivoli Storage Software Strategy

Storage Service Catalog: Storage requests are sized and satisfied according to application requirements, data type and business needs

With TPC Your Storage provisioning can be reduced to few steps

A complete cycle for : Storage Volume, Host Assignment, SAN Zoning, Host Multipath software, Volume replication

Based on profiles defining space and performances charactristics

The most appropriated resources automatically selected and used

Tivoli Storage Software Strategy

IBM Storage products for a Storage Cloud ?

1. **Storage resources are virtualized**
   - IBM SmartCloud Storage Virtual Center
   - System Storage SAN Volume Controller
   - Tivoli Storage Productivity Center

2. **Storage Services are standardized**
   - Tivoli Storage Productivity Center
3. **Storage provisioning is automated**
   - Tivoli Storage Productivity Center
4. **Storage is paid per use**
   - Tivoli Usage and Accounting Manager
5. **Storage data are safe**
   - Tivoli Storage Manager

Tivoli Storage Software Strategy

The road to a Cloud Storage:

Standardize and automize

- Standardized services
- Riduction in provisioning cycle
- Better scalability
- Better flexibility
- Easier chargeback

Virtualize

- Remove physical barriers
- Optimize Hw utilization
- Reduction of hardware costs
- Semplified management and provisioning

Consolidate

- Reduction of the infrastructure complexity
- Reduction of skills and staff requirements
- Manage more with less
- Lower operating costs

Protect

Thank You

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