IBM Tivoli Storage Manager - TSM Produktneuheiten

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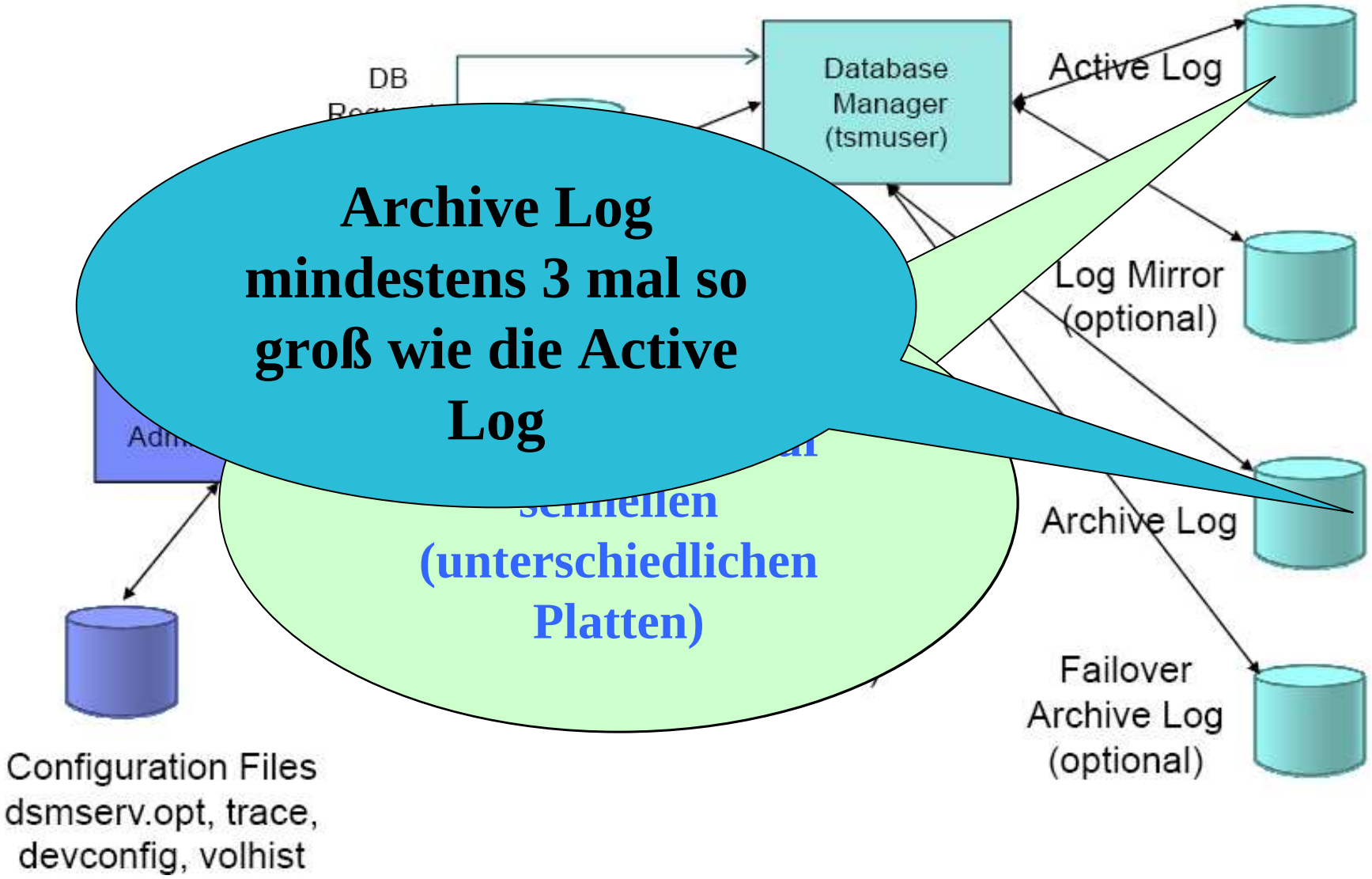
Agenda

- TSM V6.1 Nachlese
- TSM Monitoring und Reporting
- TSM V6.2 Neuigkeiten
- TSM FlashCopy Manager
- TSM Roadmap
- TSM for Virtual Environments
  - Geplante Funktionen
  - Roadmap

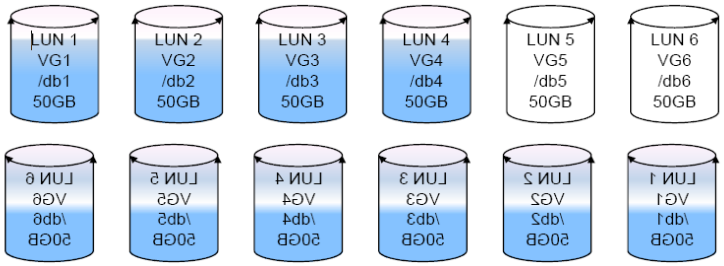

TSM V6.1 Nachlese
IBM

TSM V6 Storage Components

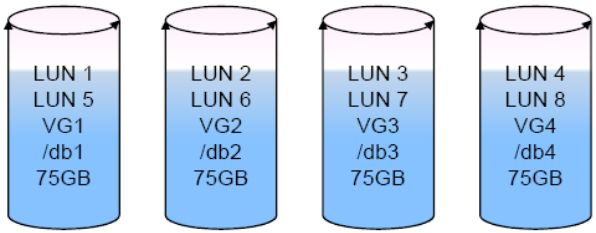


TSM V61 Datenbank Empfehlungen

- **Die DB2 Volumes stellen sich als „set of directories“ dar**
- **Die Volume-Größen für DB und Log sollten großzügig auf zukünftige Anforderungen hin geplant werden.**
- **Volume-Wachstum entweder horizontal (mehr LUNs/Directories) oder vertikal (größere directories)**
- **Metadatengröße in DB2 vergleichbar mit V5.x (600-1000 bytes pro Objekt, deduplication fügt ca. 250 byte/Objekt hinzu)**
- **DB2 kennt derzeit kein Spiegelungsverfahren für die DB-Volumes – externe Lösungen für DR-Szenarien nötig (LVM, Disk-Mirror)**



Horizontales Wachstum



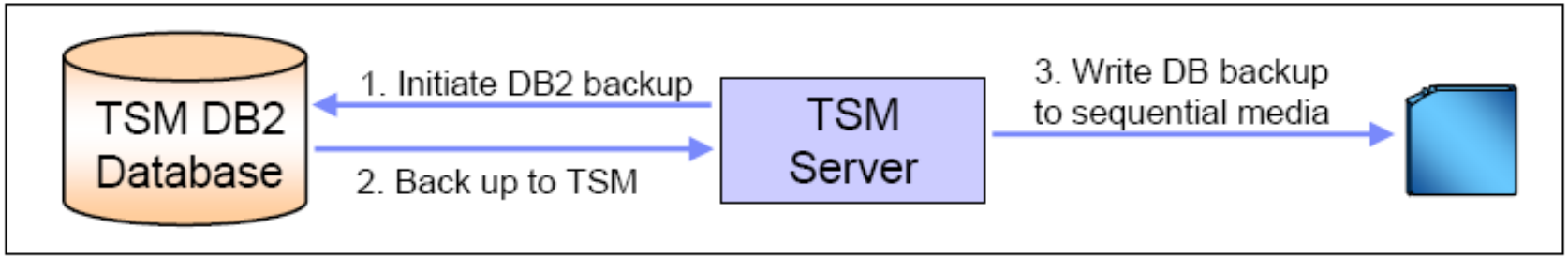
Vertikales Wachstum

TSM V6.1 Log-Empfehlungen

- Logging ist in DB2 komplexer als mit V5.x
- Notwendige Log- directories
  - Active Log directory (enthält alle aktiven Transaktionen)
  - Archive Log directories (enthält alle Transaktionen, die notwendig sind um DB zum letzten Stand zu restaurieren)
- Optionale Log-directories
  - Active Log Mirror directory (Spiegelkopie des Active Log)
  - Failover Archive Log directory (Übernahmekopie für Archive Log)
- Alle Log directories sollten optimiert werden für sequentielles I/O und bis auf Failover Archive Log immer auf separaten LUNs angelegt werden
- Größenempfehlung
  - Active Log 16GB min. etwa doppelt so groß anlegen wie V5 Log Volumes, Performance kritisch – ebenso die Spiegelkopie
  - Archive Log soll die Log-Daten von 2 Tagen halten bei täglicher DB-Sicherung, Performance nicht kritisch – Failover Archive Log evtl. auch auf NFS/CIFS

Backup/Recovery of TSM Database

- Database and recovery log are backed up to and recovered from sequential media (tape, file, virtual volume)
- Backup types
  - FULL (entire database backed up)
  - INCREMENTAL (cumulative changes since last full backup)
  - DBSNAPSHOT (entire database without interrupting full/incremental backup sequence)
- Incremental backups may be much larger with TSM V6 than 5.5, but with improved backup throughput
  - Time to complete incremental backup may be comparable to that for full backup
  - Consider using only full database backups for faster recovery
- Recovery options
  - Restore to most recent state
  - Restore to point in time



TSM V6.1 Hauptspeicher- und CPU-Empfehlungen

- In V6 wird DB Buffer Pool nicht vom TSM-Server sondern von DB2 Prozess verwaltet
  - Hauptspeicherempfehlung für TSM V6 Server sind min. 12GB (ohne Dedup) – und 16GB (mit Dedup) ➔ besser mehr
- CPU-Anforderungen einiges höher
  - Durch externe Funktionen wie **Deduplication** und Multi-Process Expiration
  - Durch interne Funktionen wie DB Reorganisation und DB runstats (Optimierung der Metadaten)

TSM V6.1 Empfehlungen zu Migration V5 nach V6

- **Upgrade Utility README lesen**
- **Letzte Version des Upgrade Utilities vom FTP-Server benutzen**
- **V5 Datenbank Backup VOR der Migration**
- **Keine externe DB2 unterstützt (nur die „imbedded“ Version)**
- **Plattform-Wechsel nur im gleichen Betriebssystem**
  - Win x86->Winx64, Win IA64 -> Win x64, HP PA-RISC -> HP IA64, 32->64 bit auf der gleichen Plattform
- **Derzeit keine Datenbankkonsolidierungen bei der Migration möglich**
- **DB2 Konfiguration ist durch TSM festgelegt – keine Änderungen möglich**
- **Migrationsdurchsatz ist HW-abhängig, Plangröße 5GB/h**
- **Alternative kann sein:**
  - Export/Import, um Migrationsprozess zeitlich zu strecken
  - Neubeginn auf neuer Hardware und Daten auf V5 Server verfallen lassen
- **NDMP TOC und Backupset Support erst mit >=V6.1.2**

TSM V6.1 allgemeine Empfehlungen

- **DB/Log Volumes möglichst jeweils auf separaten LUNs planen**
- **Vor der Migration offline Konsistenzprüfung**
  - DB-Snapshot auf andere Maschine erzeugen – dann Dump/Load Audit
  - bei Fehlern Support einschalten, um Ursache zu analysieren
- **Network-Upgrade ist nicht Restartable, Media-Upgrade ist Restartable**
- V6.2.2.x (YE 2010) **ist ein Stand, der für neue Installationen empfohlen wird, Migrationen von Altsystemen sollten für das 2H10, bzw. 1H11 geplant werden**
- **DB2 Basis-Kenntnisse können hilfreich sein für Planung, Tuning und für die Kommunikation mit IBM-Support**

Hilfreiche Dokumentation zu TSM V6.1 und V6.2

- **Developer Wiki**
  http://www.ibm.com/developerworks/wikis/display/tivolistoragemanager/Home
- **WP für Berechnungsalgorithmen für Log-Größe vor/nach Migration**
  http://www-01.ibm.com/support/docview.wss?uid=swg21389352
- **aktuelle Version für das TSM V6.1 Redbook**
  http://www.redbooks.ibm.com/abstracts/sg247718.html?Open
- **Hinweise für DB-Konfiguration, die in den Perf/Tuning Guide adaptiert wurden**
  http://www.ibm.com/developerworks/data/bestpractices/databasestorage/?S_TACT=105AGX11&S_CMP=LP
- **aktueller Performance/Tuning Guide**
  http://publib.boulder.ibm.com/infocenter/tsminfo/v6r2/topic/com.ibm.itsm.perf.doc/b_perf_tuning_guide.pdf


TSM Monitoring und Reporting
IBM

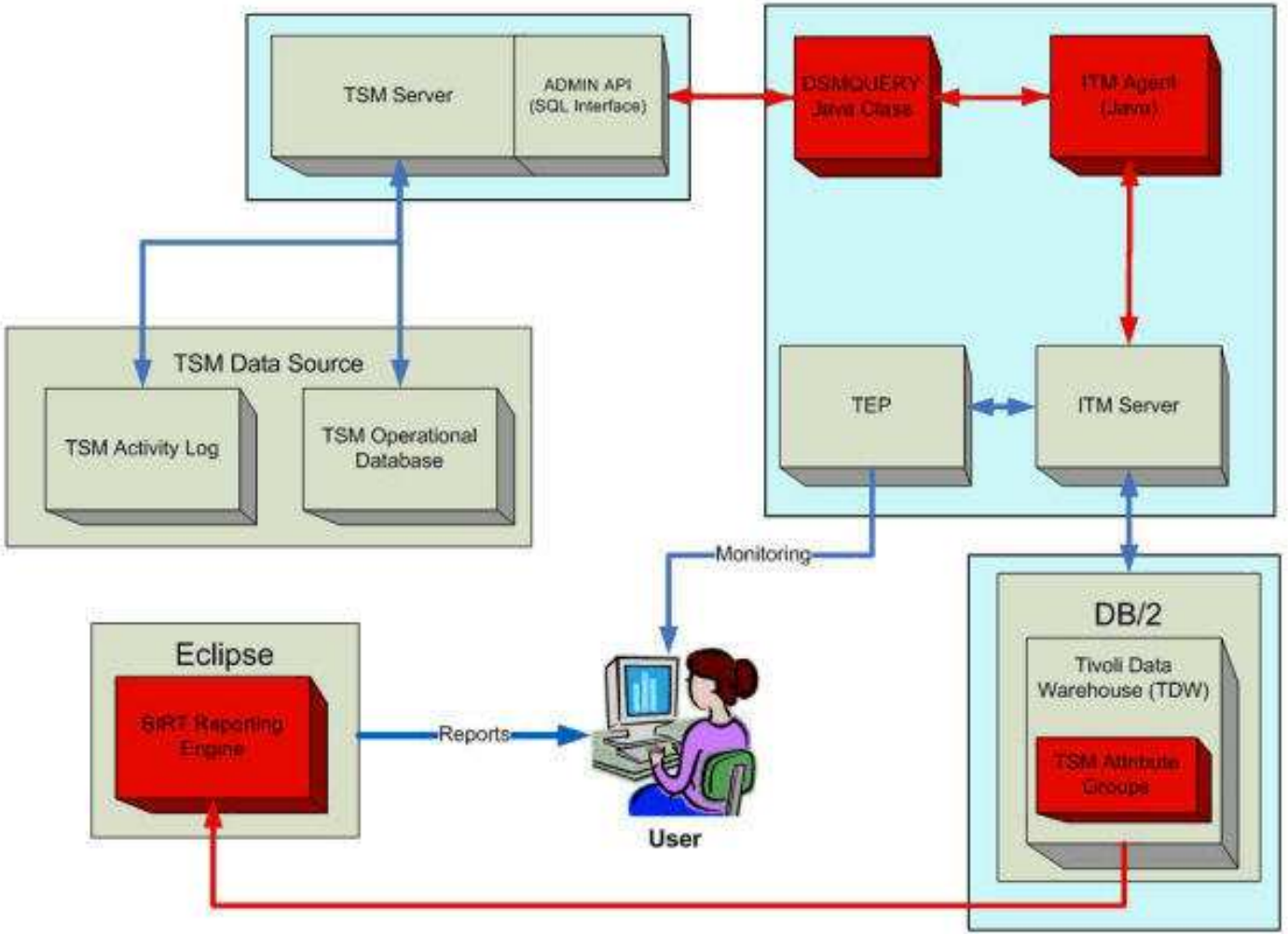
TSM Real-Time Monitoring und Reporting

- Neues Monitoring und Reporting Tool. Basierend auf IBM/Tivoli Monitoring (ITM) und Tivoli Common Reporting (TCR)
- Der Monitoring und Reporting Server kann auf Windows, AIX und Linux86 installiert werden
- Der Monitoring Agent kann entweder direkt auf dem TSM Server (Plattform abhängig) oder auf dem Monitoring Server installiert werden
- Die sogenannte Deployment Engine installiert alle notwendigen Komponenten automatisch
  - DB2
  - IBM/Tivoli Monitoring/Tivoli Enterprise Portal/Tivoli Data Warehouse
  - Tivoli Common Reporting und TSM ISC/Admin Center
  - TSM/TEP Workspaces und TSM/TCR Report Definitionen und Konfigurationen
- Kann folgende TSM Server Versionen monitoren und Reports generieren
  - TSM V5.4,TSM V5.5, TSM V6.1 und 6.2
- DB2, ITM und TCR müssen **nicht** zusätzlich lizenziert werden (solange sie nur für die TSM Überwachung und Reporting eingesetzt werden)

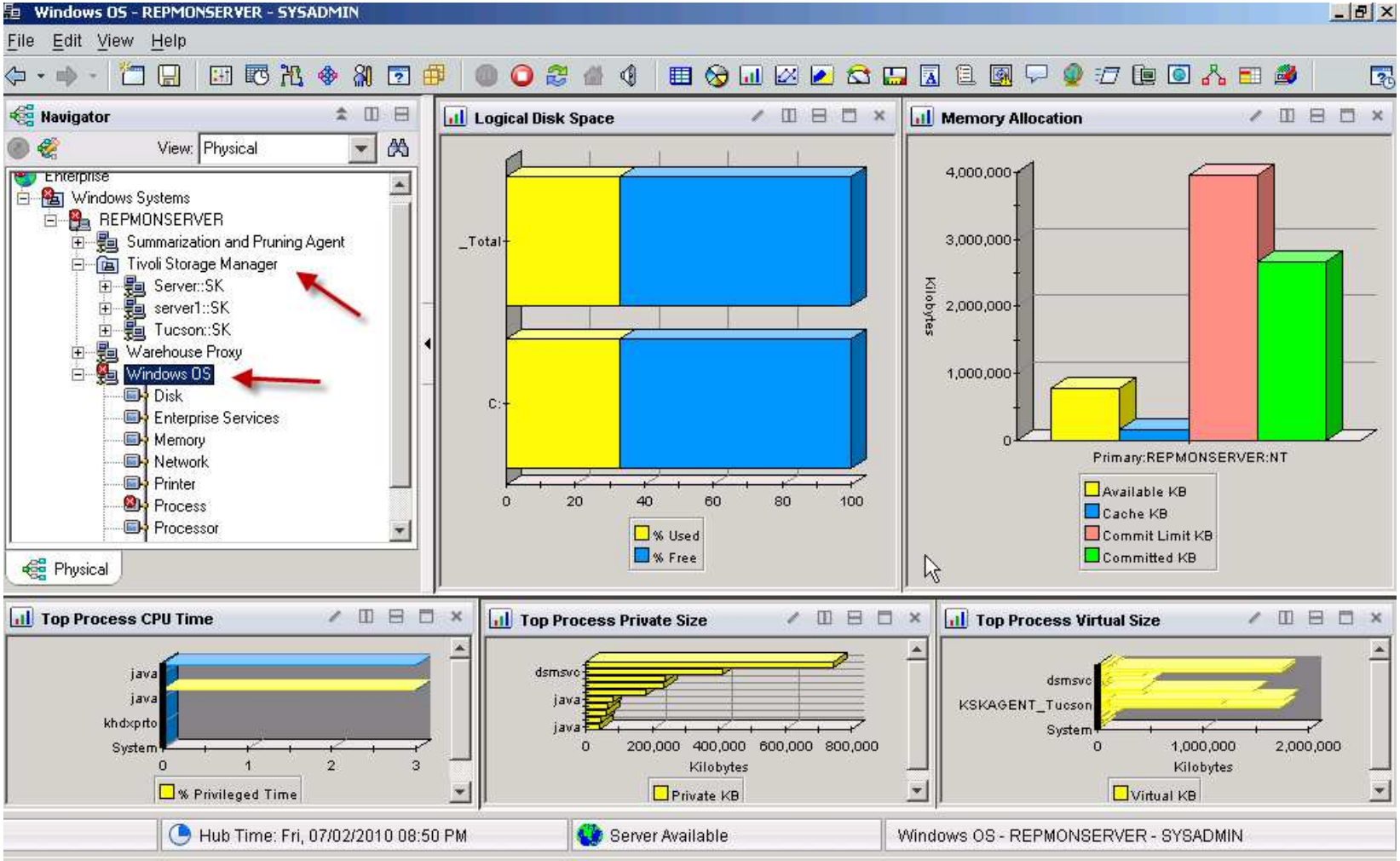
TSM Reporting Monitoring Zusammenfassung

- Reporting und Monitoring für TSM
- Alles auf einem Installations- Medium (DVD)
- Darf nicht auf dem TSM Server installiert werden
- Kann bestehende ITM 6.2 Installationen nutzen oder auch Stand-Alone installiert und betrieben werden
- Keine Zusatzkosten
- Hat schon zahlreiche Out-of-the-Box Reports und vor konfigurierte Monitore mit dabei
- Eigene Kunden Reports: Reports können mittels BIRT (optional) erstellt werden (BIRT wird im nächsten Release durch COGNOS ersetzt)
- Ist in Tivoli Common Reporting integriert

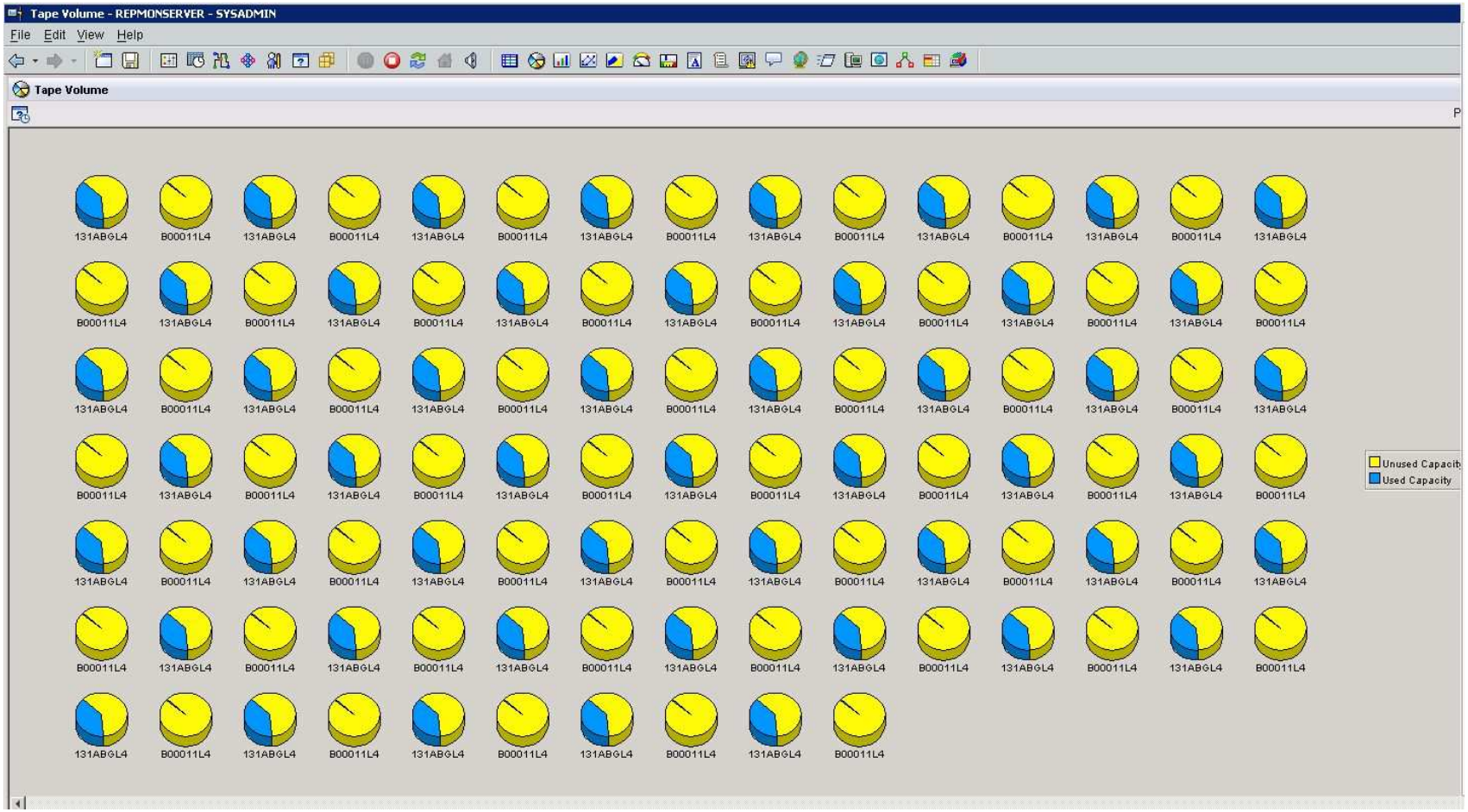
TSM Real-Time Monitoring and Reporting



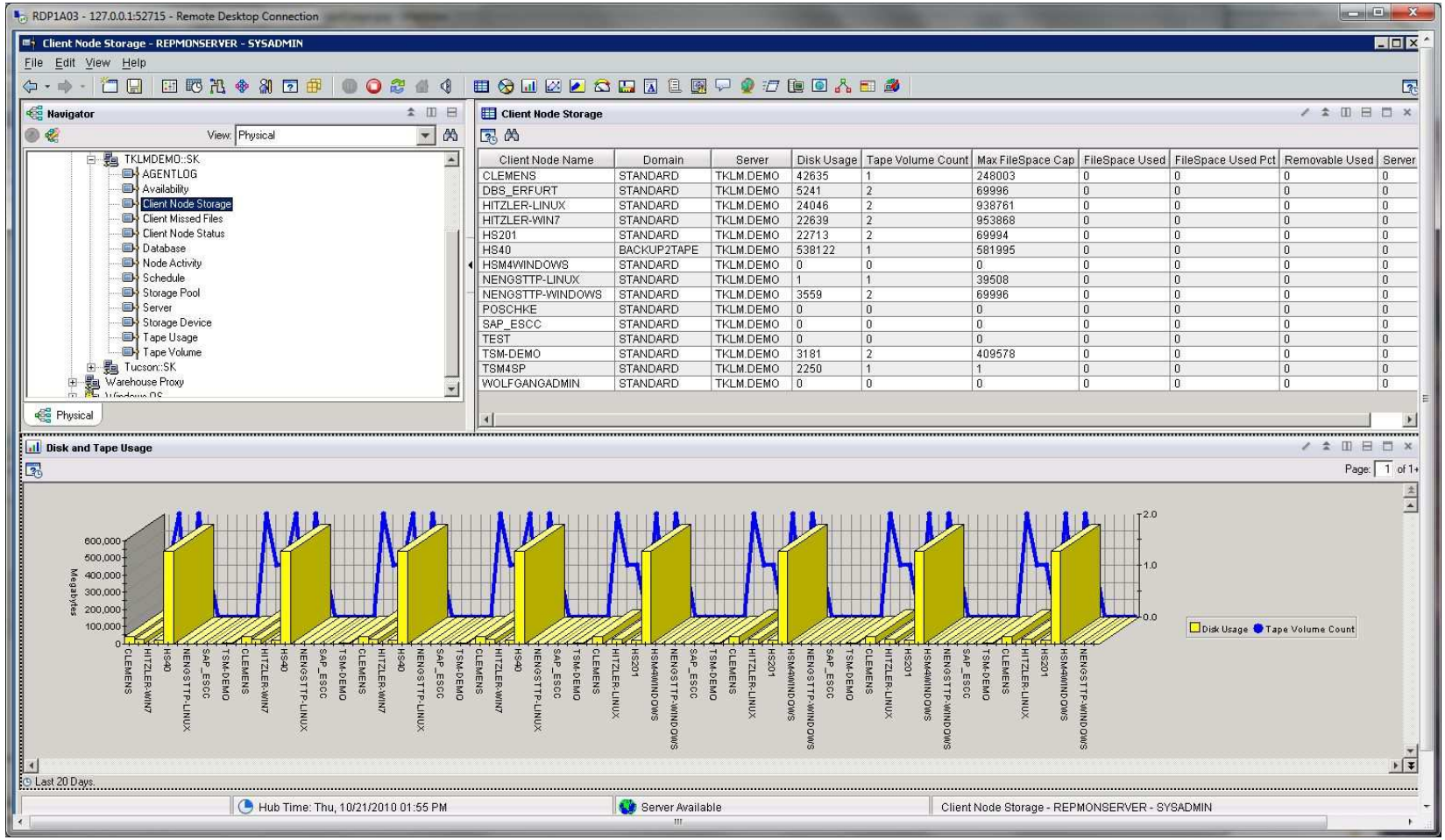
ITM Windows Betriebssystem Agent



Tape Benutzung, bzw. Auslastung



Beispiel – Client Node Storage Monitor



Birt Reporting, mitgelieferte Beispiel Reports

Tivoli IBM

Backup Details

Client Activity Details

Report Period	Last 30 days	**Activity Type**	Backup
Start Date	Sep 21, 2010 12:00 AM	**End Date**	Oct 21, 2010 11:59 PM
Server Name	TKLM.DEMO	**Client Node Name**	%

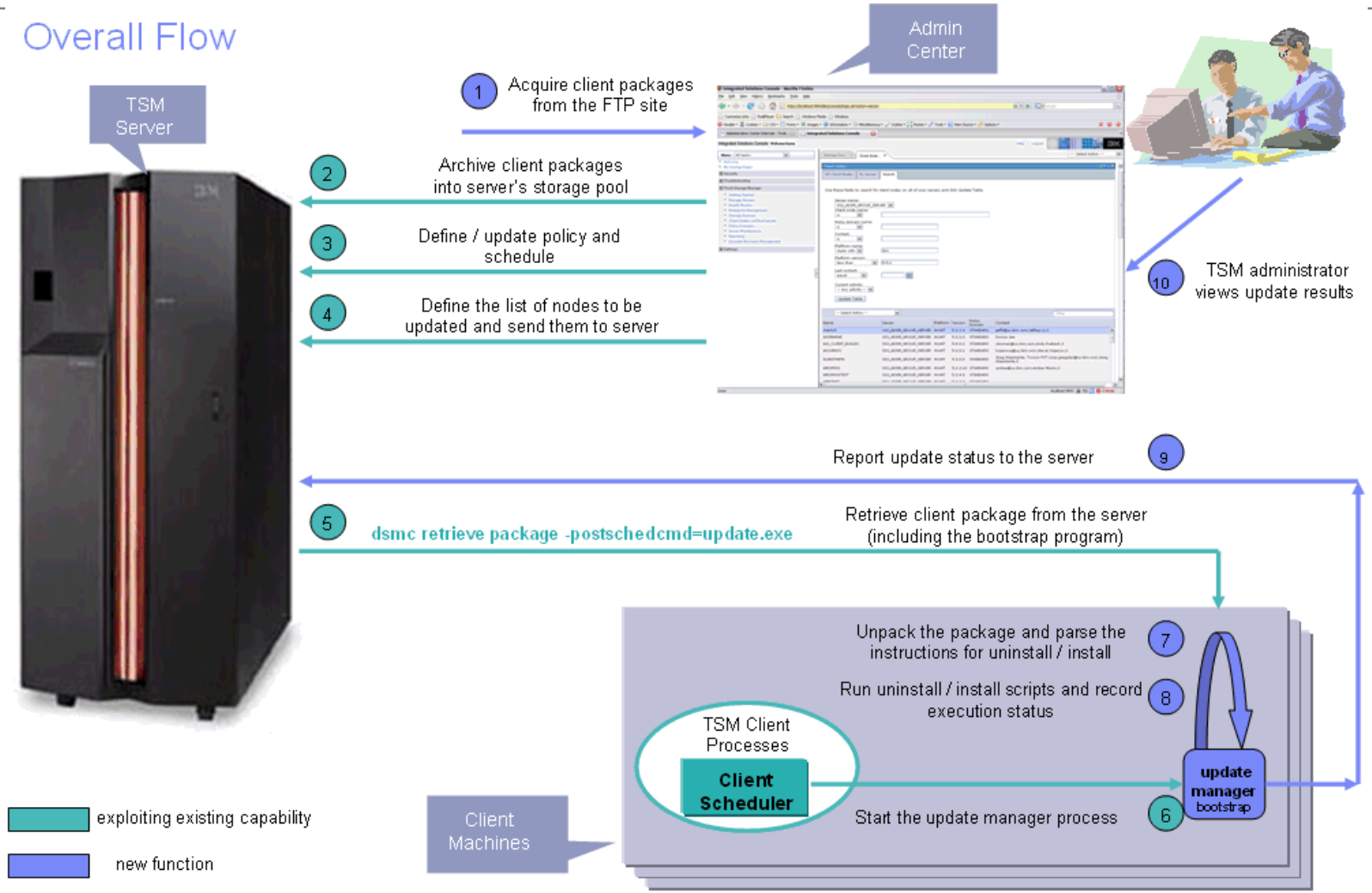
Client Node Name	Duration	Date	Objects Evaluated	Objects Processed	Objects Failed	Bytes Moved (KB)
HITZLER-WIN7	00:22:00	Oct 7, 2010	372	111	0	164,163
HITZLER-WIN7	00:06:19	Oct 12, 2010	660	298	0	406,158
HITZLER-WIN7	00:00:03	Oct 13, 2010	23	23	0	28,347
HITZLER-WIN7	01:11:18	Oct 15, 2010	642	466	1	145,499
HITZLER-WIN7	00:22:01	Oct 17, 2010	175	14	0	22,875
HITZLER-WIN7	00:05:57	Oct 19, 2010	167	80	0	96,047
HITZLER-WIN7	01:12:51	Oct 20, 2010	104,207	14,885	0	12,100,968
NENGSTTP-WINDOWS	00:16:34	Oct 7, 2010	5,262	5,262	0	3,666,401
STORZ	00:01:58	Oct 11, 2010	24	24	0	28,344
STORZ	01:44:10	Oct 13, 2010	3,547	2,080	1	3,034,585

The client activity detail report provides a short summary of the details of a client activity. The report can be limited to specific servers or clients with parameter selections.

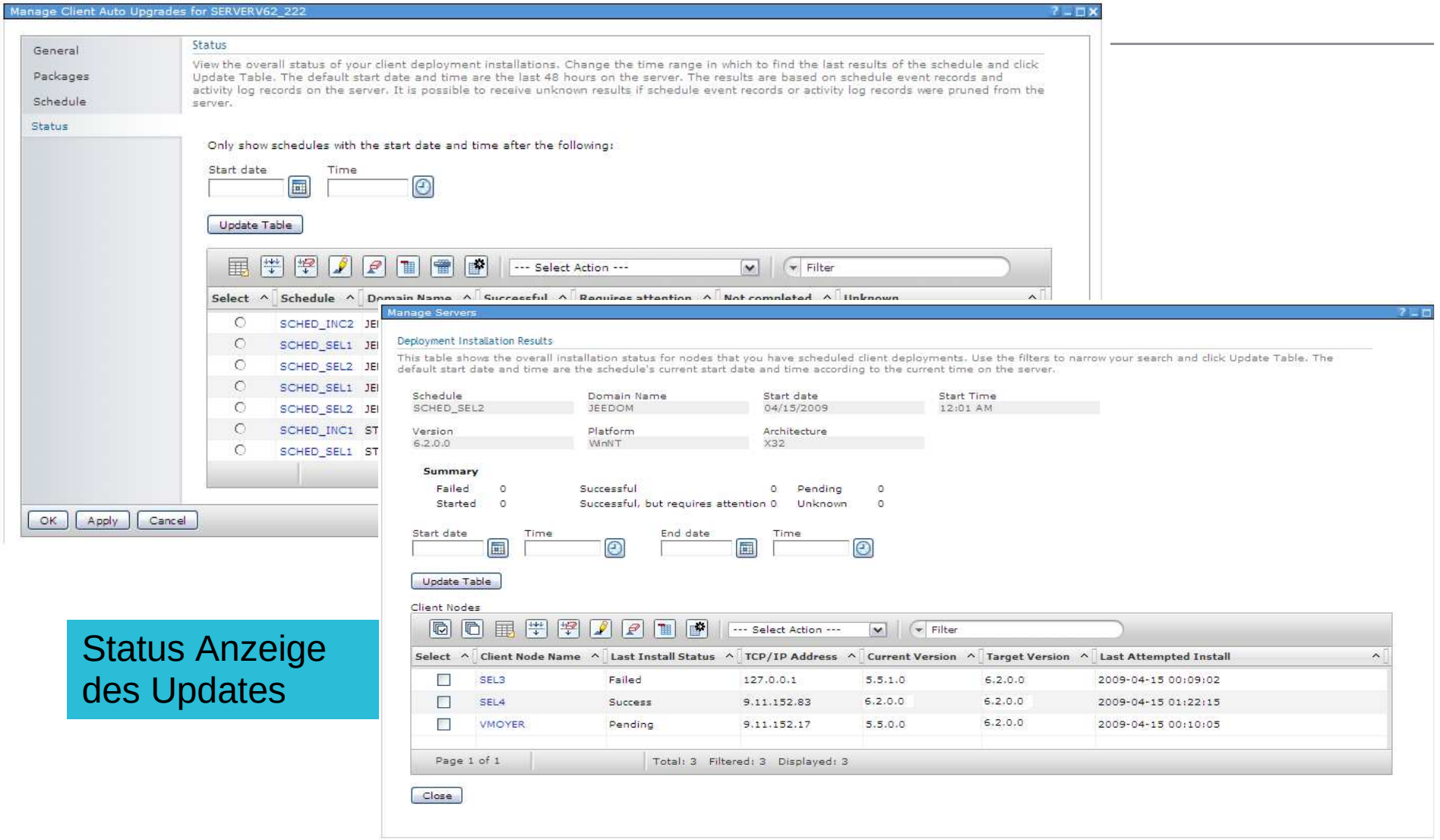
October 21, 2010 1:31:15 PM GMT+02:00 1 / 1


TSM V6.2 Neuigkeiten
IBM

Automatische Windows Client Verteilung (update, keine initiale Installation)

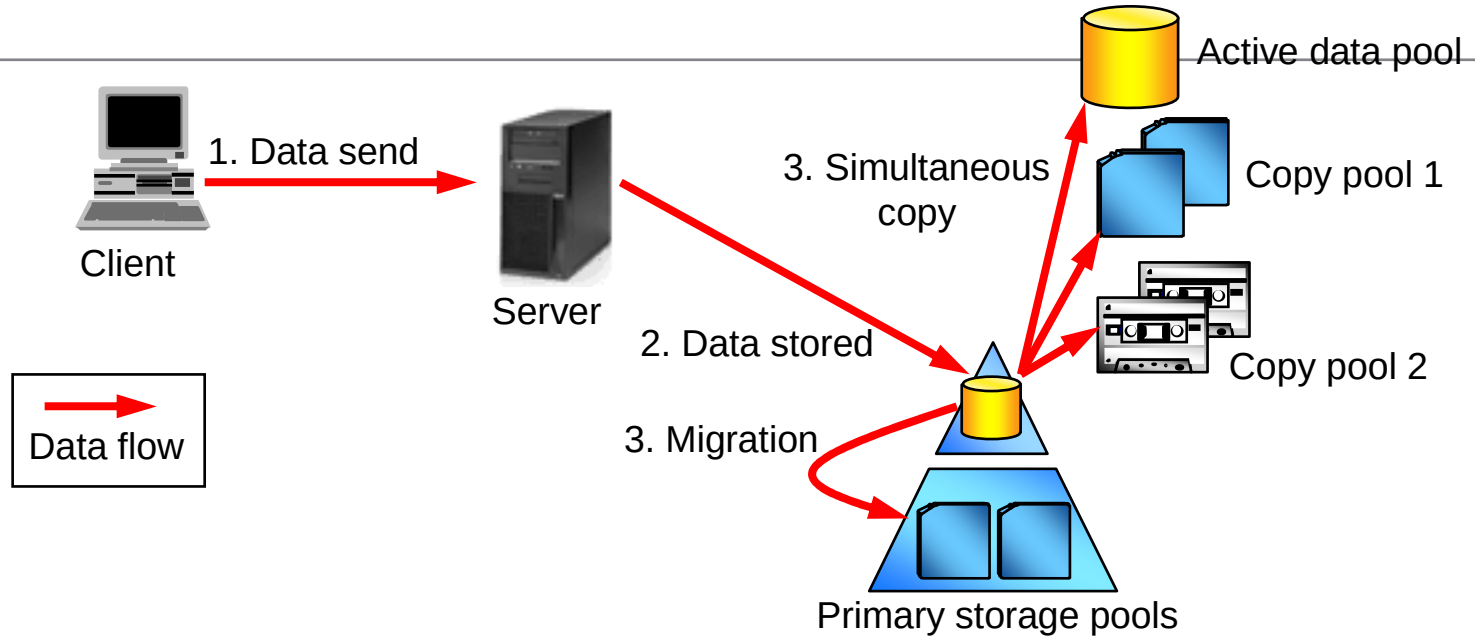


Client Software Verteilung für Windows BA Clients



Status Anzeige des Updates

Simultaneous Write During Storage Pool Migration

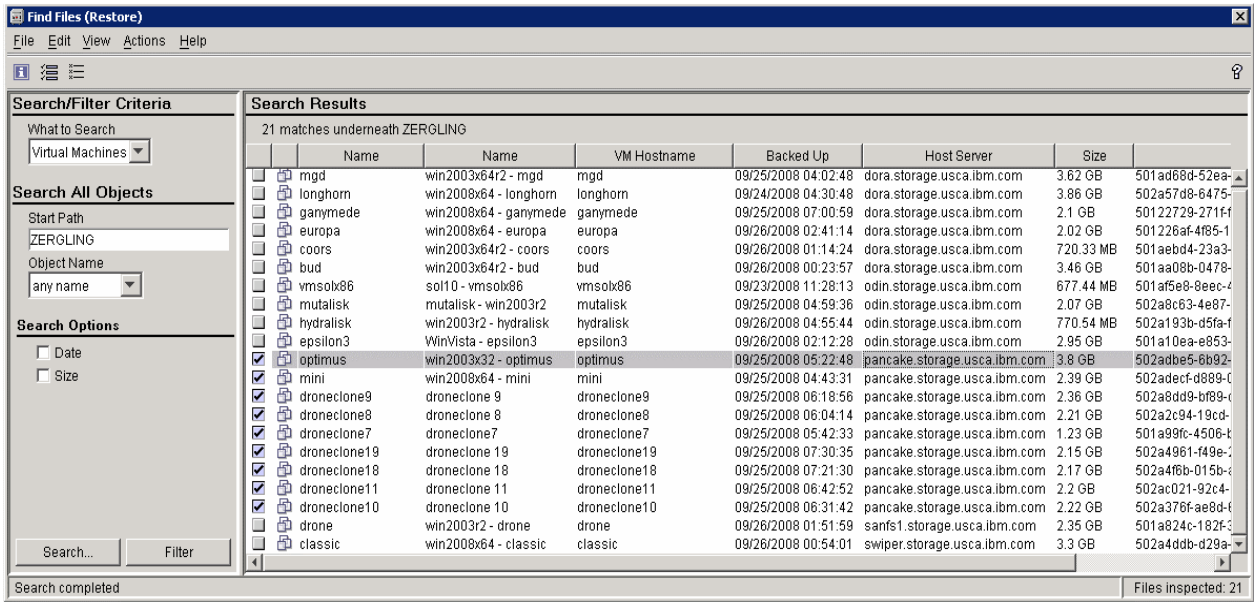


Vorteile:

- **Kombiniert folgende Server Aktivitäten: Migration, Storage Pool Backup, und Copy Active Data**
  - Reduziert die Gesamt Zeitdauer für diese Operationen
  - Gibt Server Ressourcen für andere Operationen frei (wie z.B. Deduplication)
- **Verglichen mit existierenden Simultanen Schreib Funktionen**
  - Reduziert es Tape Mounts während Client Store Operationen (Backup, Archive, Client HSM)
  - Kann das Client Backup Window reduzieren

VMware: Off Host Backup Verbesserungen

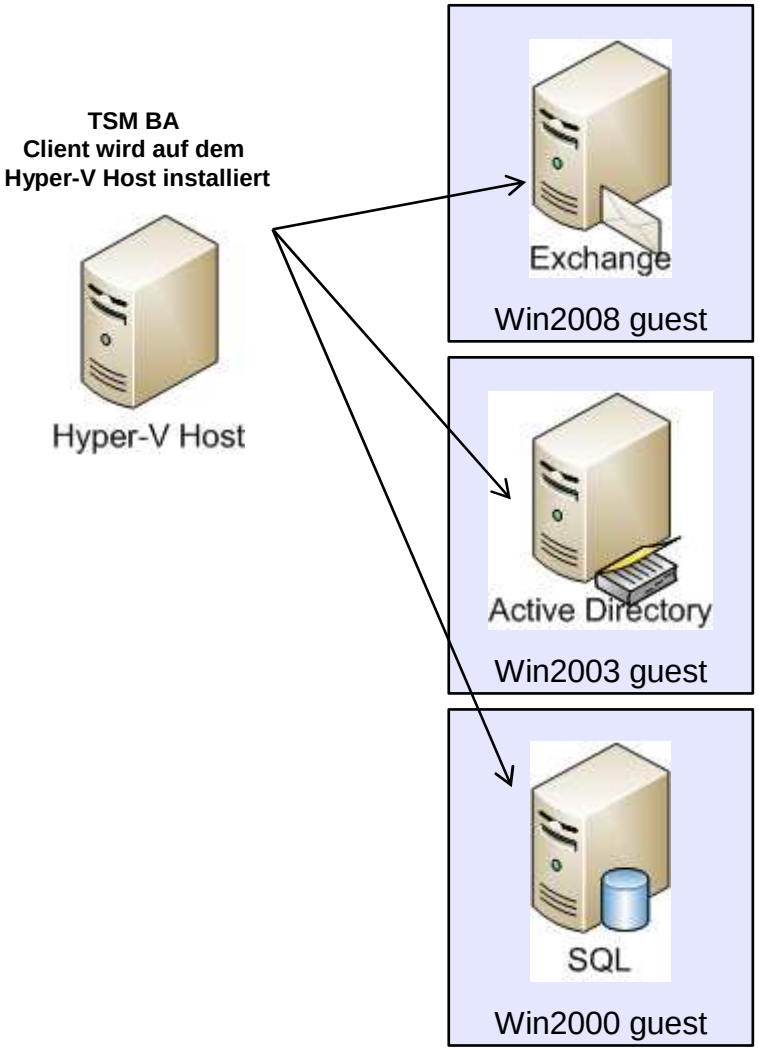
- Auto Discovery von neuen VMware Gast Maschinen
- Nutzt neues vStorage API für Data Protection für File-Level Backup und Recovery (für Windows Gast Maschinen)
  - LAN-Free Backup von Virtuellen Maschinen von einem zentralen (Windows) Proxy Server



Vorteile:

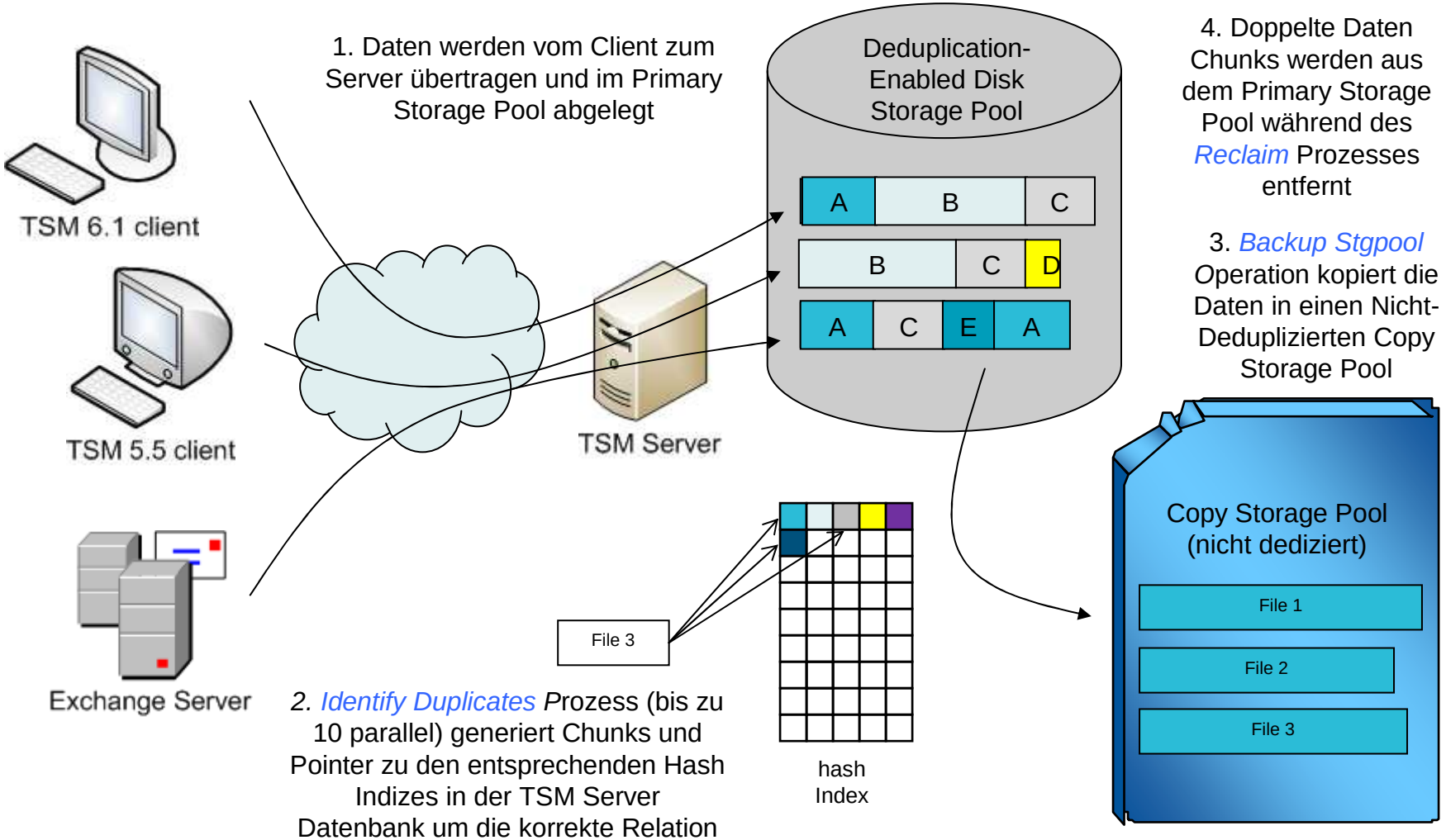
- Macht ein manuelles Überprüfen der VMware Gast Maschinen überflüssig
- Weniger Einfluss (Last) auf dem VMware Server durch Backup Offloading

Microsoft Hyper V guest backup using Volume Shadow Copy Services (VSS)

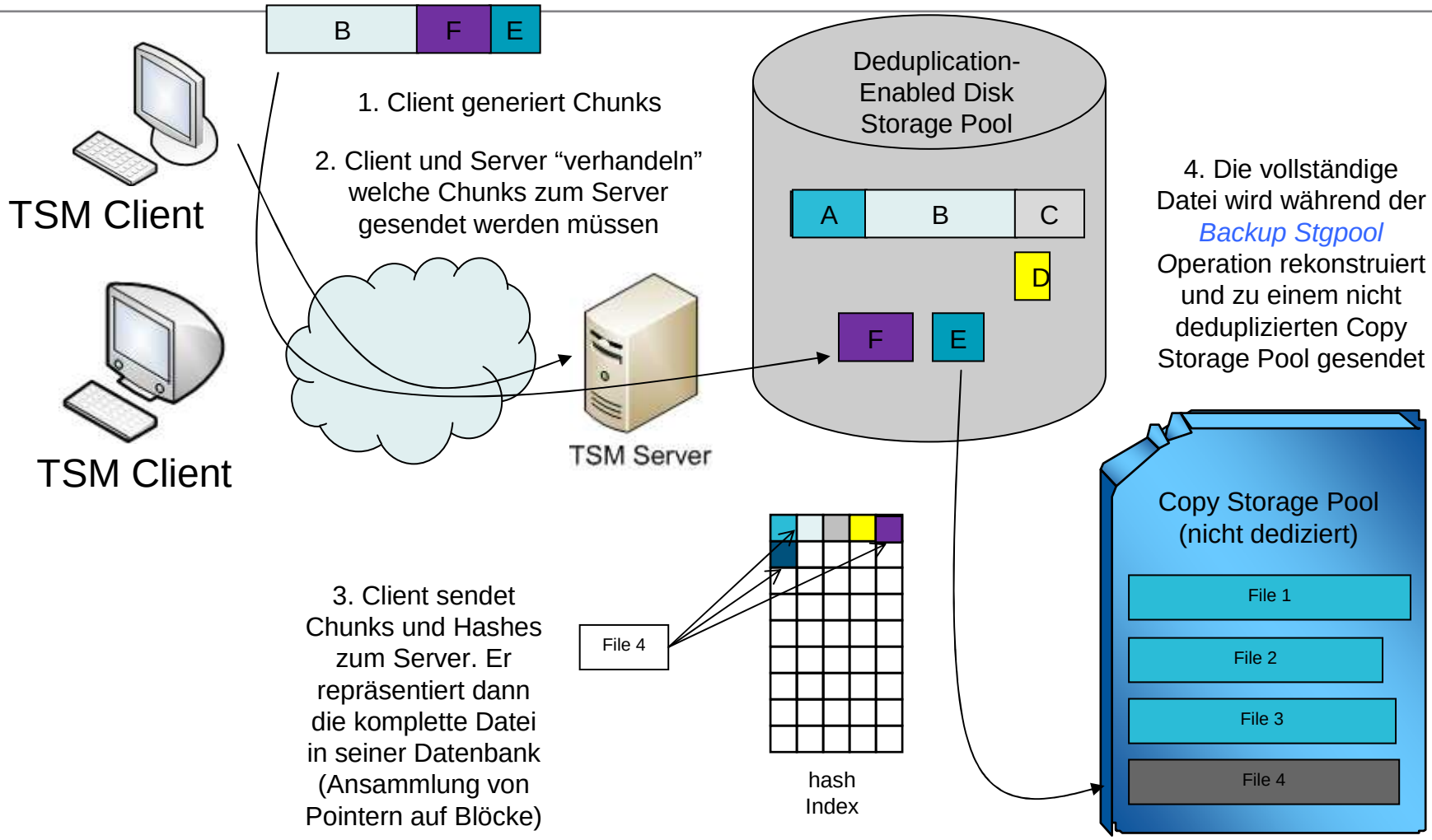


- “Full Snapshot” Backup von Gast Machinen
- Snapshots werden mit Applikationen und File Systemen innerhalb der Gast Maschinen mittels VSS synchronisiert.

TSM Server seitige Daten Deduplikation (TSM 6.1)



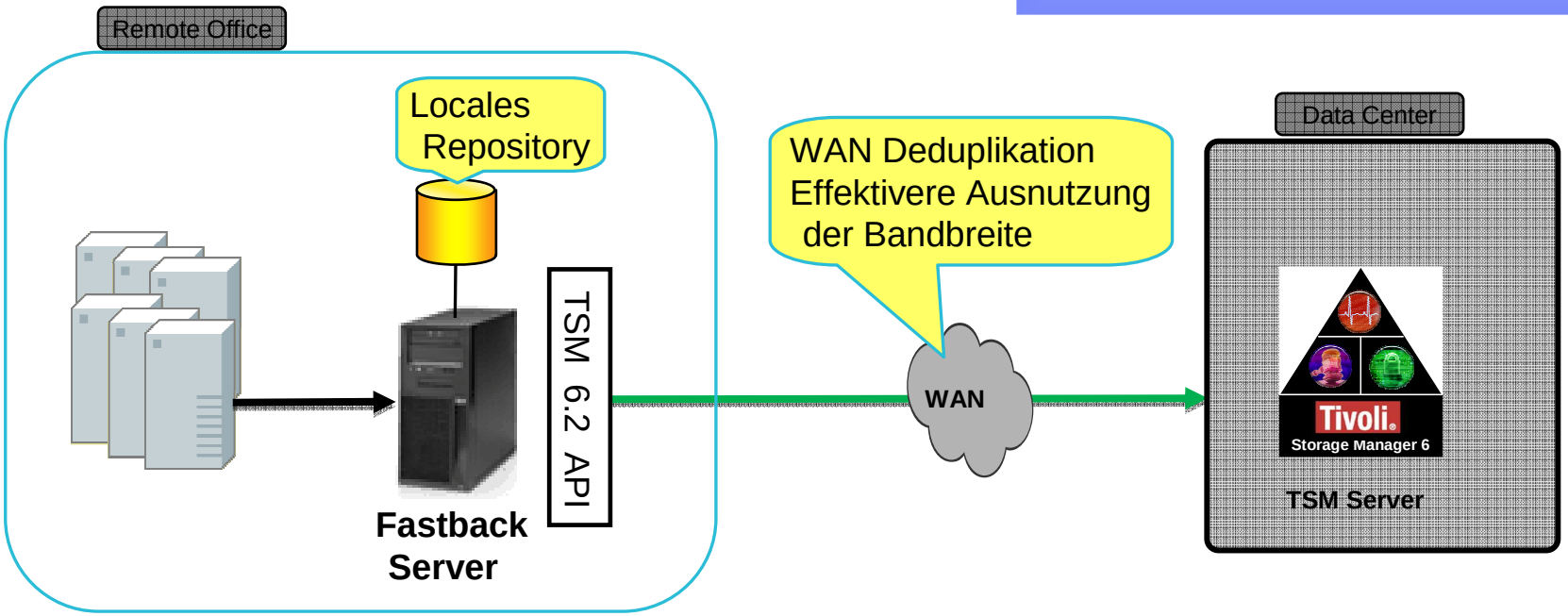
TSM Client Side Data Deduplication



FastBack 6.1.1 – WAN Deduplizierungs Möglichkeiten

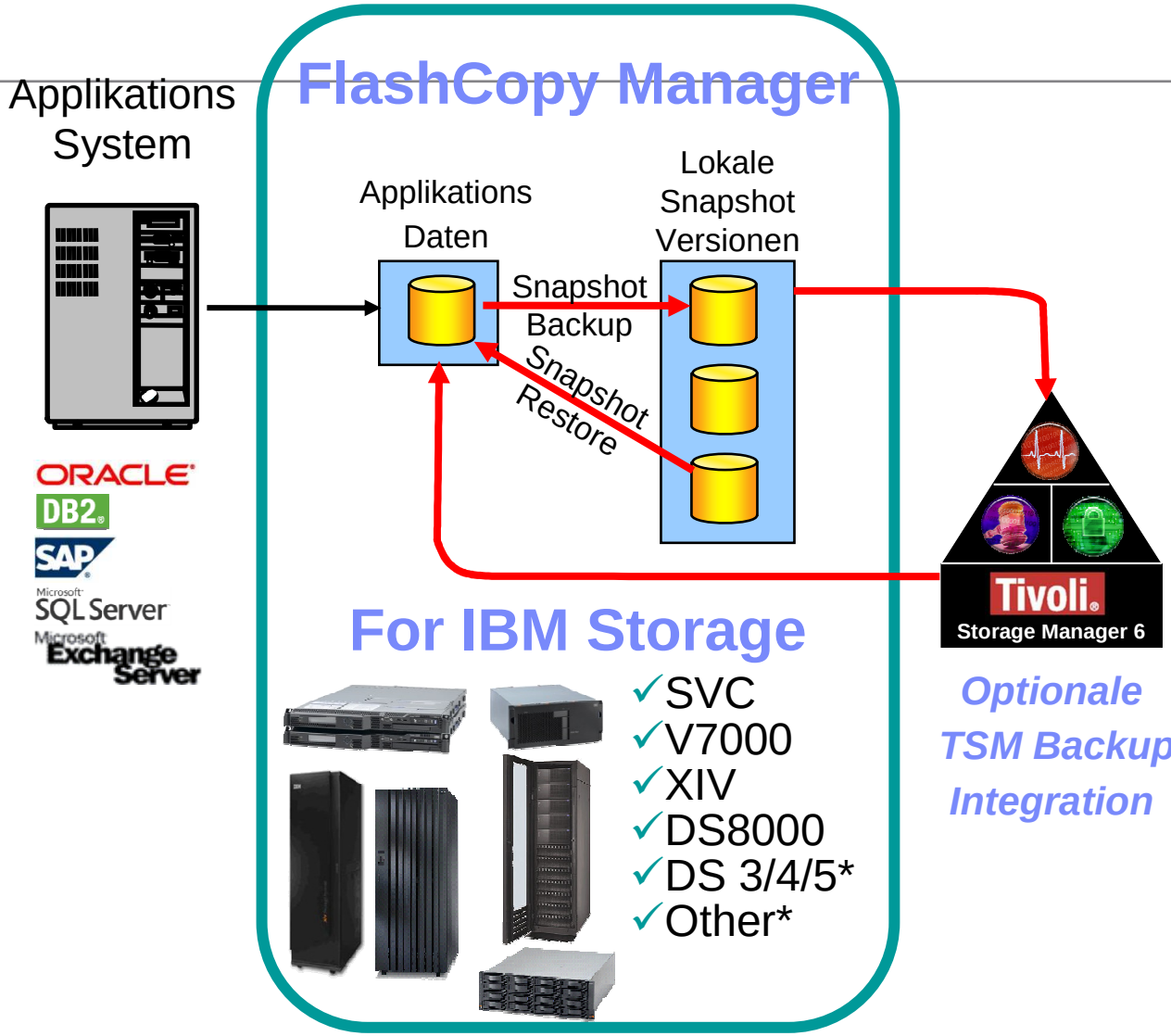
- **Fastback Server sendet Daten über LAN/WAN zum TSM Server**
- **Das TSM 6.2 Client API ist in den FastBack Server integriert**
- **Die TSM 6.2 Client Deduplication API wird dazu benutzt**
- **Das FastBack Repository wird als TSM Diskpool repräsentiert**

Vorteile:
- Vollständige TSM Integration
- Effizientere Ausnutzung der Bandbreite
- Weniger Storage Anforderungen auf der DR Seite




TS FlashCopy Manager

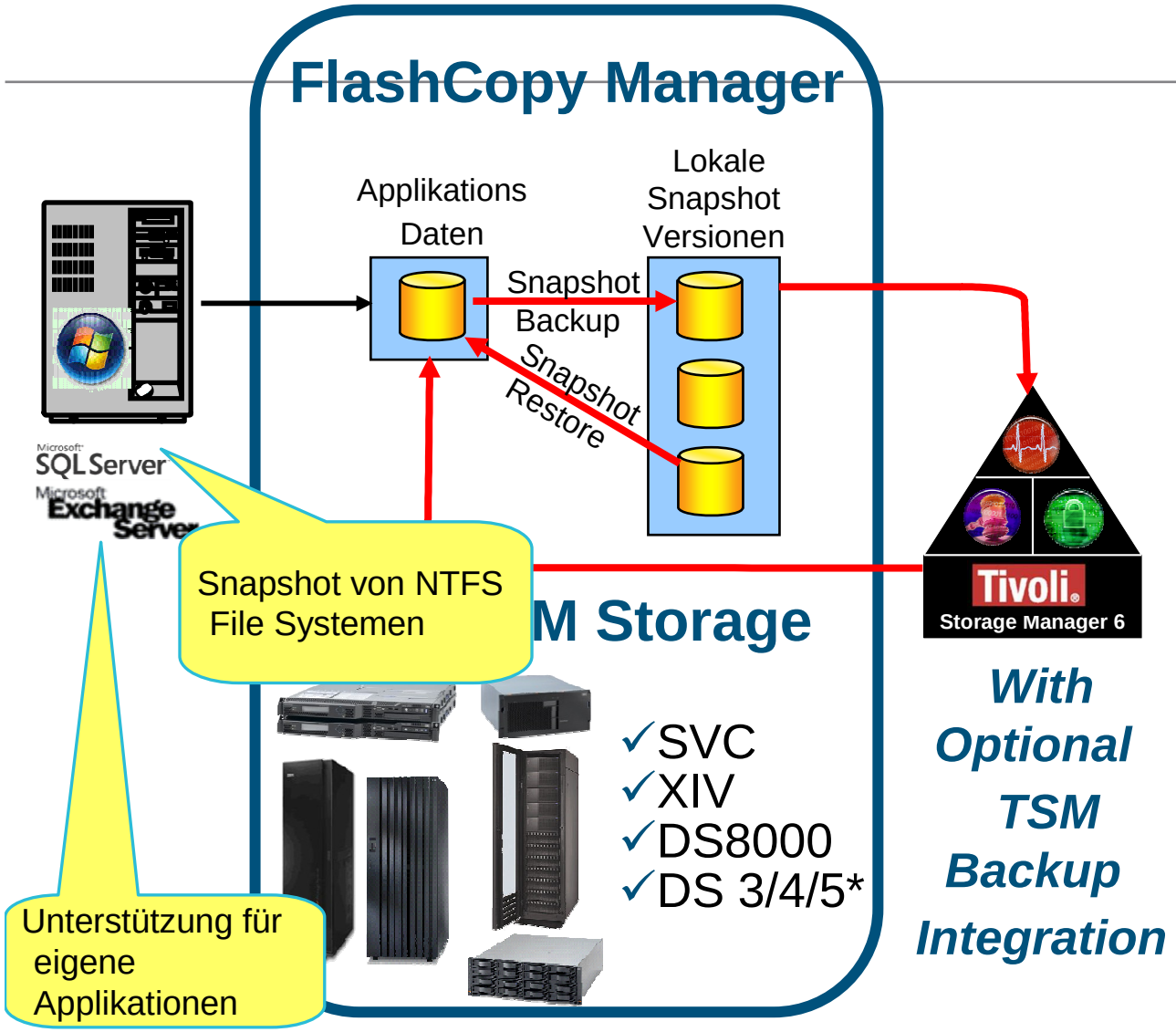
Lösungs Übersicht



- ✓ Online, sofortige Snapshot Backups mit minimalem Einfluss auf die Performance
- ✓ Hoch performante, sofortige Restore Möglichkeiten
- ✓ In IBM Storage Hardware integriert
- ✓ Einfache Installation

*VSS Integration

IBM Tivoli Storage FlashCopy Manager



❖ Alle Hersteller die Volume Shadow Copy Services (VSS) Provider Funktionalität zur verfügung stellen

Microsoft Exchange

- Snapshot Restore* von Exchange Storage Groups
- File Restore von einer Storage Group oder einer Datenbank von einem “gemounteten” Snapshot Image
  - Restore into a Recovery Storage Group, alternate storage group, or relocated storage group
- Individual Mailbox oder Mail Item Restore von einem Snapshot Backup

Microsoft SQL

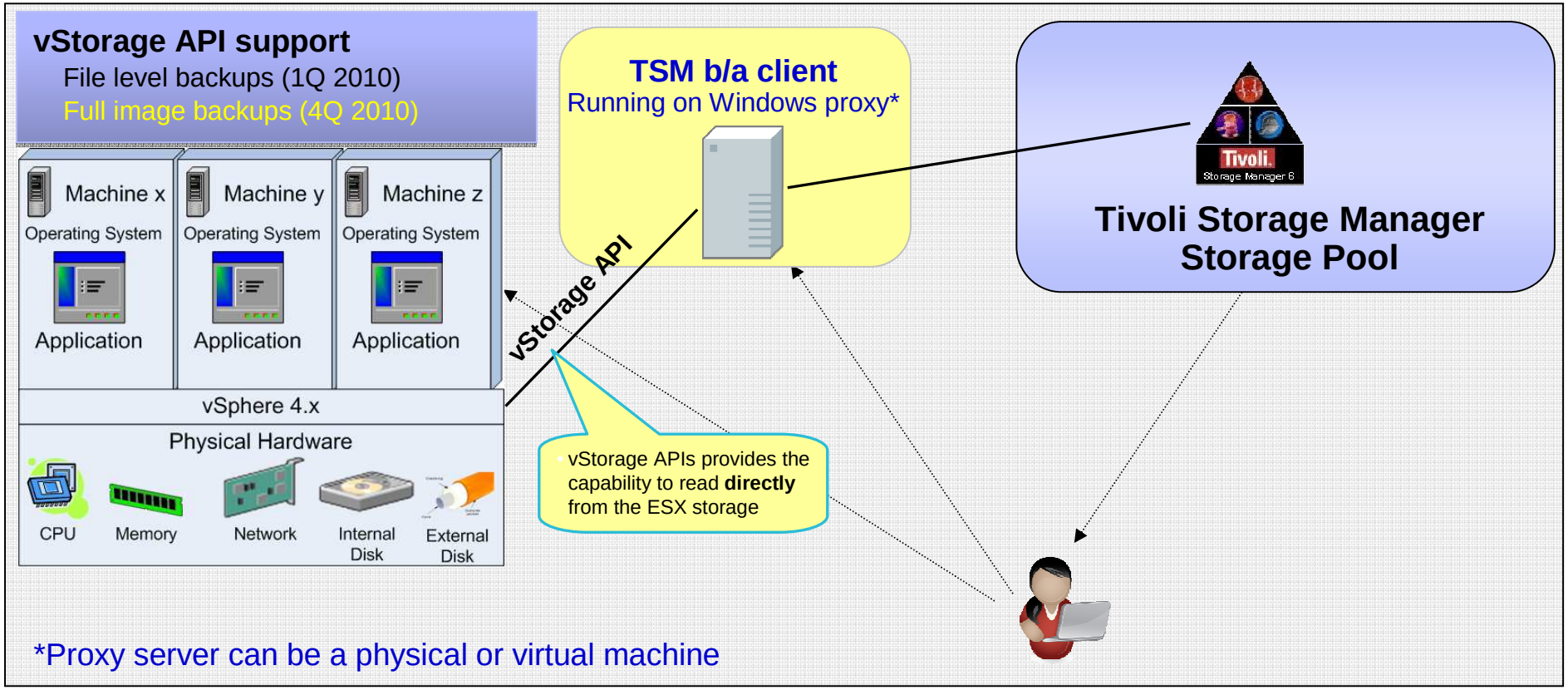
- Snapshot Restore* von einem kompletten Datenbank Backup
- File Copy Restore von einer kompletten Datenbank von einem “gemountetetn” Snapshot Image
  - To an alternate database name
  - To an alternate location


TSM Roadmap
IBM

TSM b/a client support for vStorage API*

Utilize VMware vStorage APIs for Data Protection for image-level backup and recovery
File level backup through Proxy server, File level recovery through b/a client (Windows only)
Full image backup through Proxy server (using vStorage), Full image restore through the Proxy server
vStorage APIs allow direct data move from the ESX host to the target system.

New



*TSM b/a client already supports multiple ways of protecting VM environments, including in guest (TSM or Fastback), Console and VCB

TSM Backup Client with Snapshot Differencing for nSeries

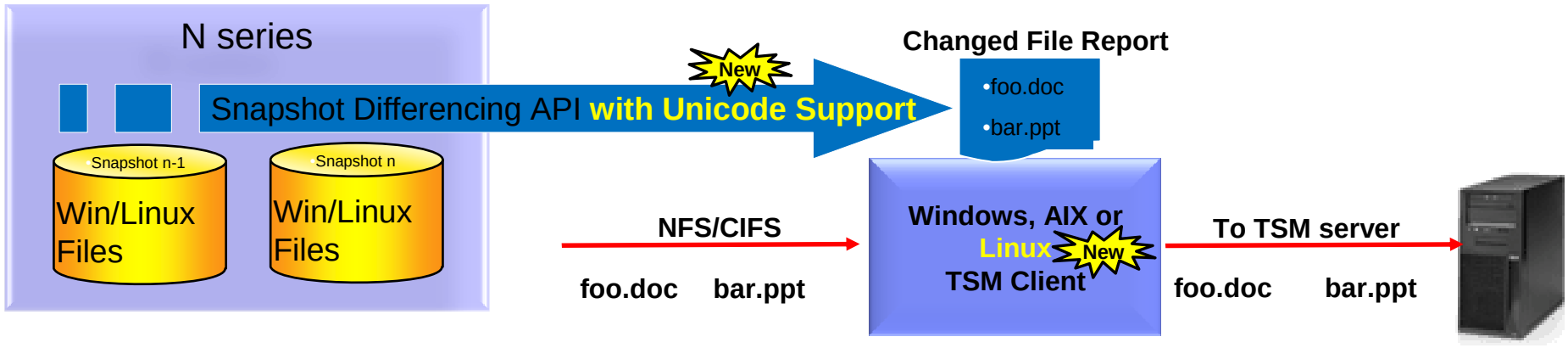
Initial backup

- TSM client creates a Snapshot version*
- TSM backs up all files from Snapshot
- Snapshot name is stored in the TSM server

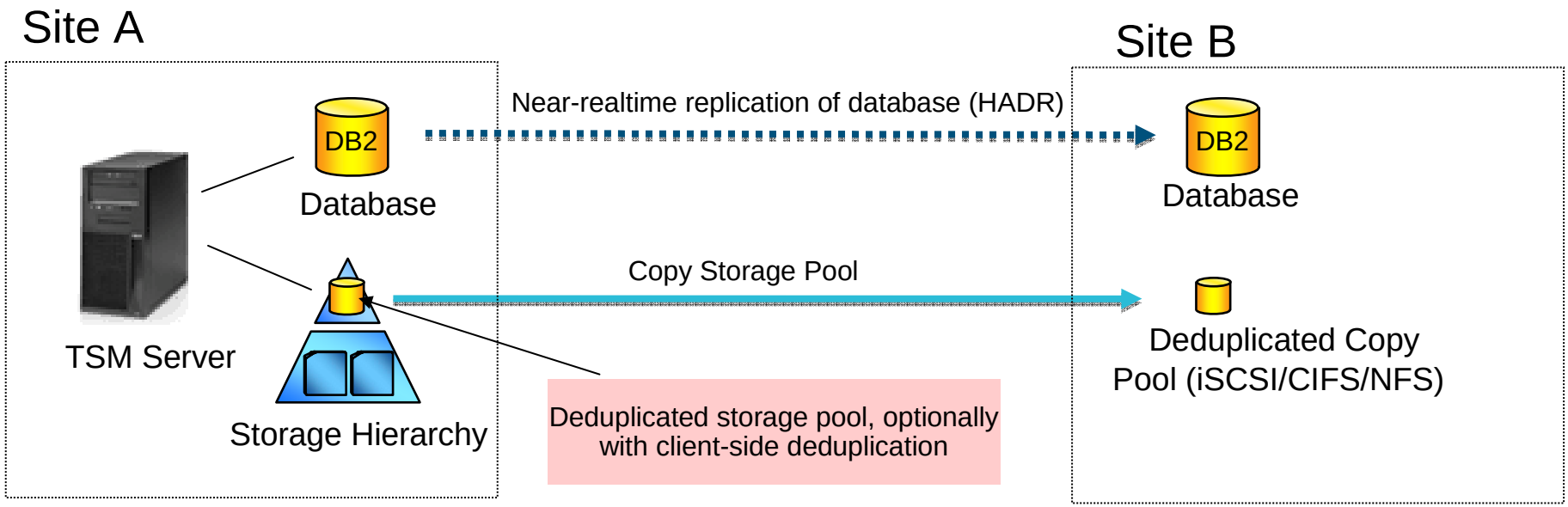
* Initial snapshot is always a full snapshot, use *diffsnapshot* option on subsequent snapshots

Subsequent incrementals

- Name of the previous Snapshot retrieved from TSM server
- TSM client creates a new Snapshot version*
- Snapshot differencing API compares previous and new Snapshot versions and reports file and directory differences to TSM client, **Unicode names are supported (Data ONTAP 7.3.3)** New
- TSM client backs up files identified in the report
- New Snapshot name is stored in the TSM server for use in the next incremental
- TSM client deletes the previous Snapshot version*

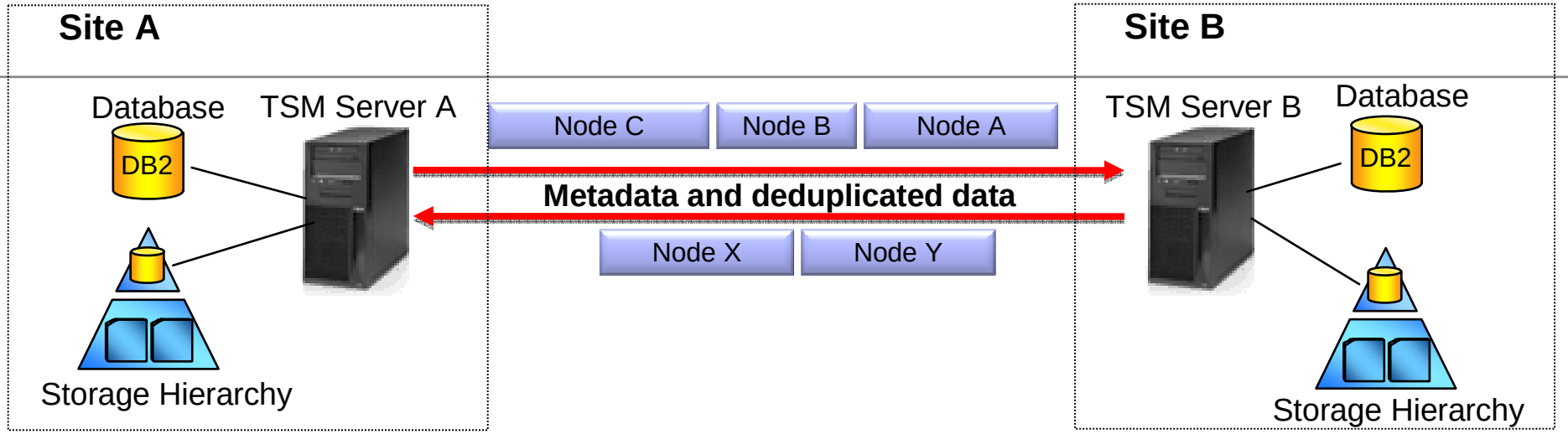


Offsite Vaulting Using DB2 HADR



- No special hardware/software required
- Deduplication gives storage/bandwidth savings
- All data in primary hierarchy could be replicated, after initially being stored in deduplicated primary pool
- 1:1 replication only
- TSM Server in Site B spins up **only in a DR scenario**
- **Pay attention to suitability of network-attached storage (resiliency, performance)**

Node Replication with Deduplication

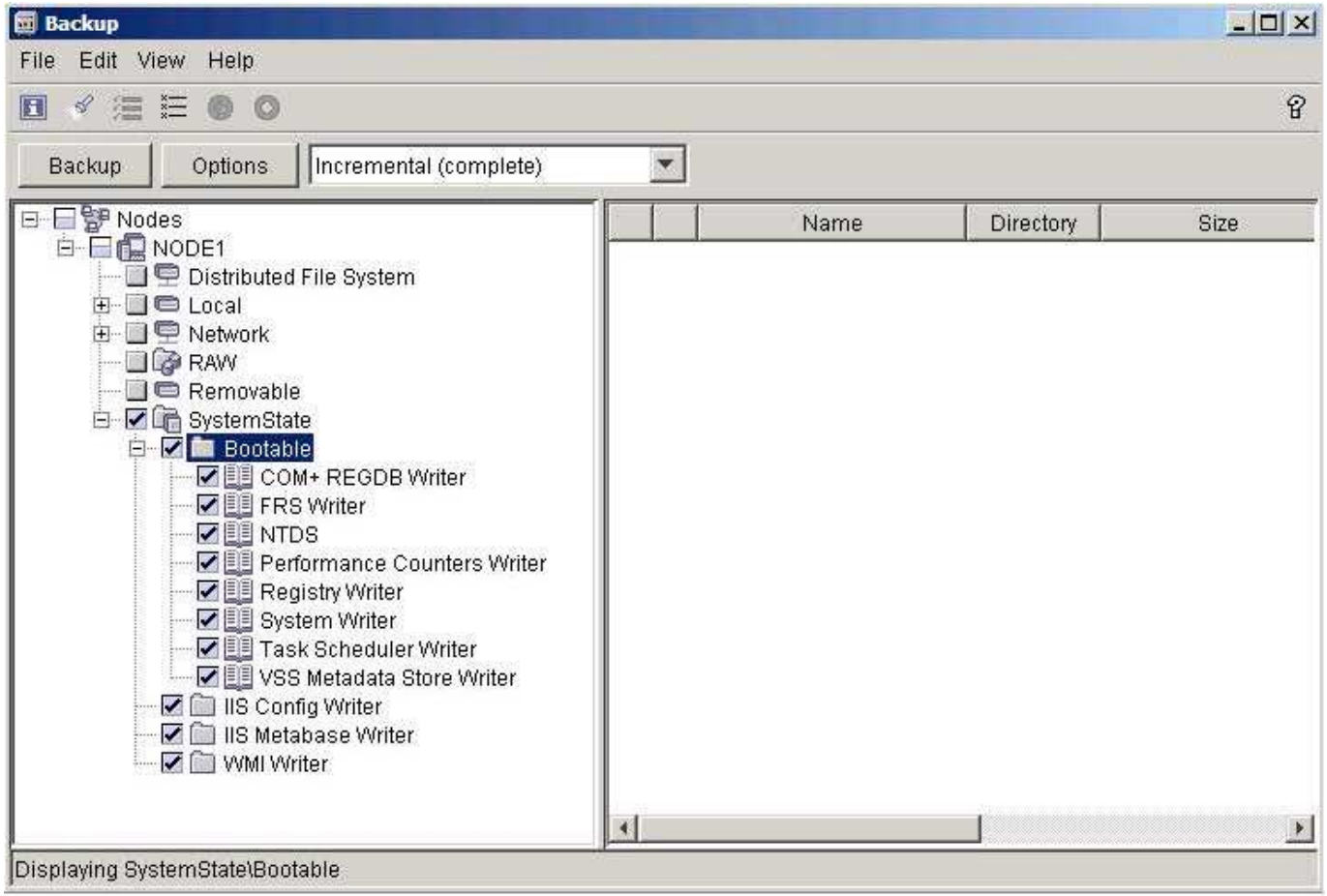


- TSM server would replicate all data and metadata for specified nodes to another server, ensuring node completeness and consistency of data/metadata
- Incremental client data transfer with deduplication to minimize bandwidth consumption
- Remote TSM server could be hot standby for primary server, for improved RTO
- Native TSM solution with no dependency on specific storage device
- Many-to-1 transfer to target server (recovery manageability)
- Supports dissimilar hardware, configuration and retention at primary and remote sites

- Remote vaulting without manual tape transfer
- Efficient use of bandwidth through deduplicated replication
- Allows hot standby at remote site

ASR for Windows 2008, Vista and Windows 7*

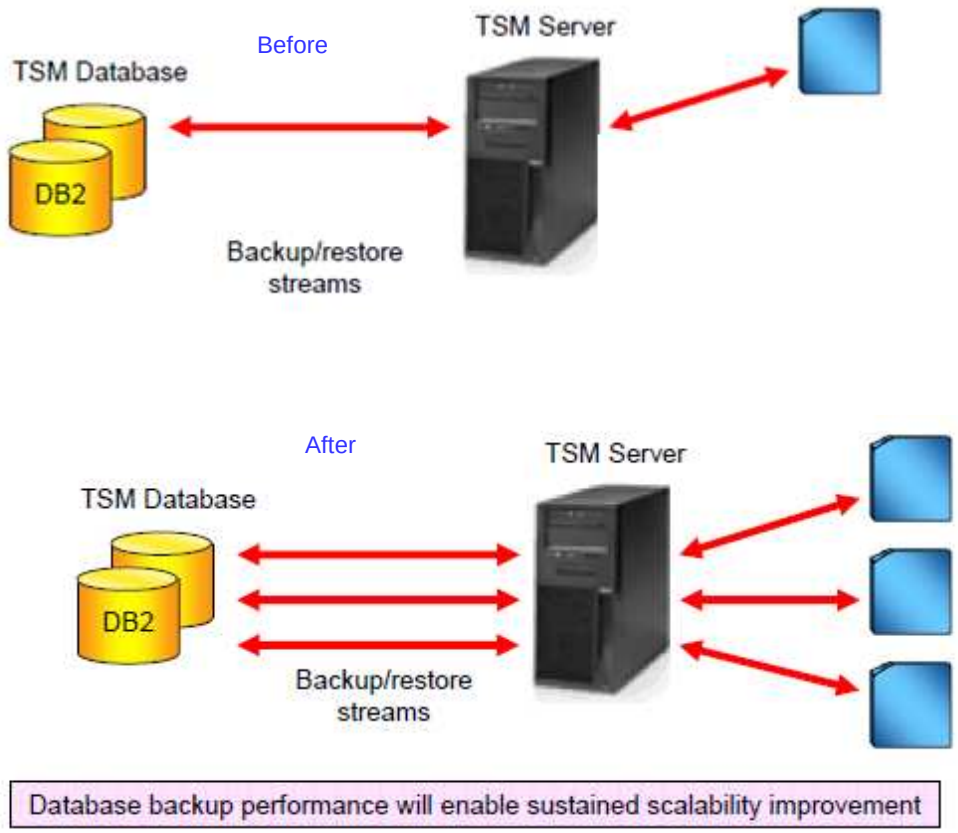
The ASR process allows restoring the system disks (usually the C: drive) including the Windows files, all Registry settings and all user programs and data, allowing to recover a completely crashed system. During the restore process all data previously found on the System partition (usually C:) will be erased**.**



***ASR Support already exists for XP and Windows 2003 (shown above)**

Faster TSM Internal Database Backup

Faster backup and restore of TSM internal database



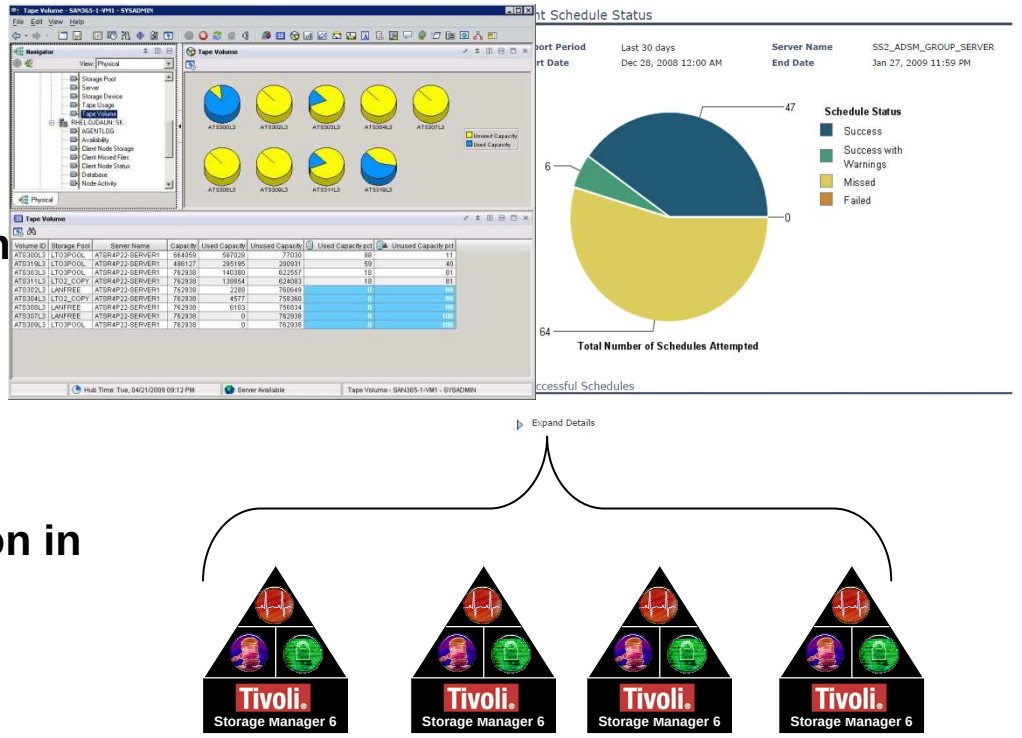
- Parallel streams for backup/restore processing give improved throughput
- Reduced time for database backup/restore
- Increased scalability of TSM server without expanding database backup window

TSM Reporting

- Easier Installation – install, configure and use reporting and monitoring within 2 hours
- Automated post-installation configuration
- Additional ‘out of the box' reports

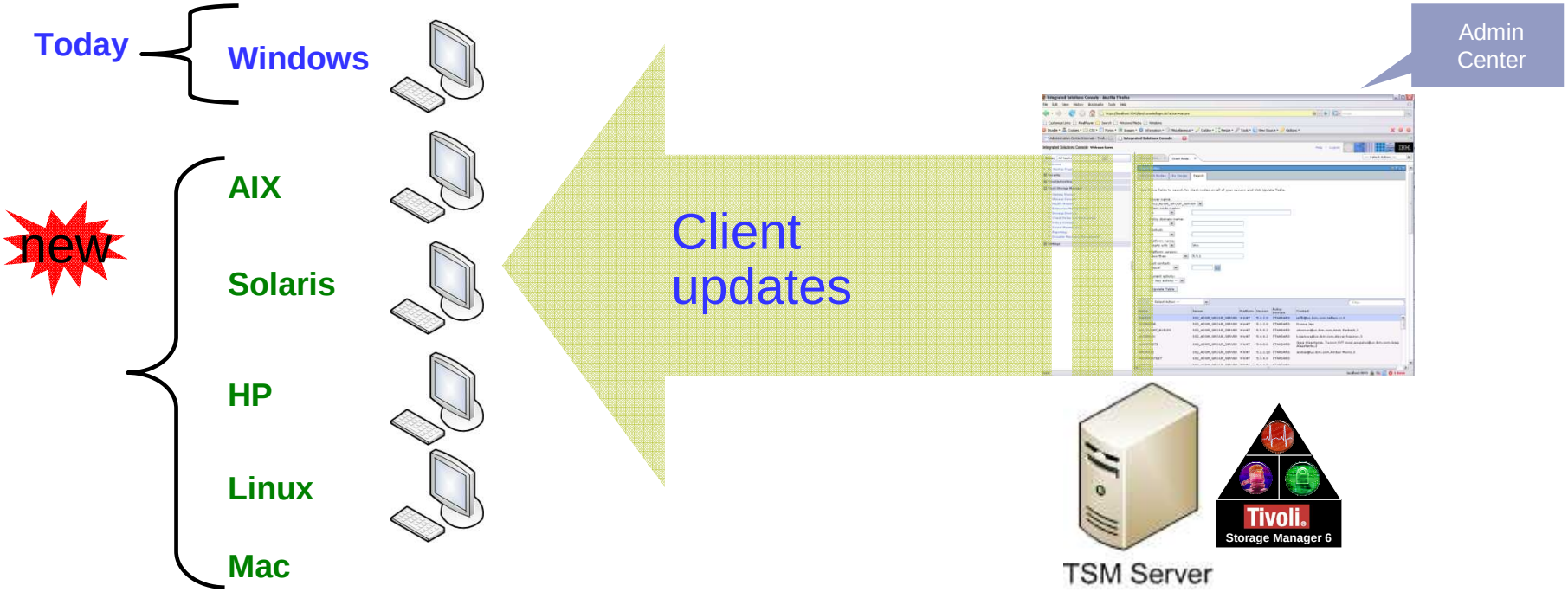
An aggregated view of reporting and monitoring for the entire TSM environment

- **Integrated Cognos reporting engine providing better creation of 'custom reports' capabilities –Create a custom report in 30 mins or less**
- **Ability to build 'custom data collection agents' with the newest IBM Tivoli Monitoring end-user license**
- **More TSM data-collection agent performance features**
- **TSM activity log custom-data collection in the TSM data-collection agent**



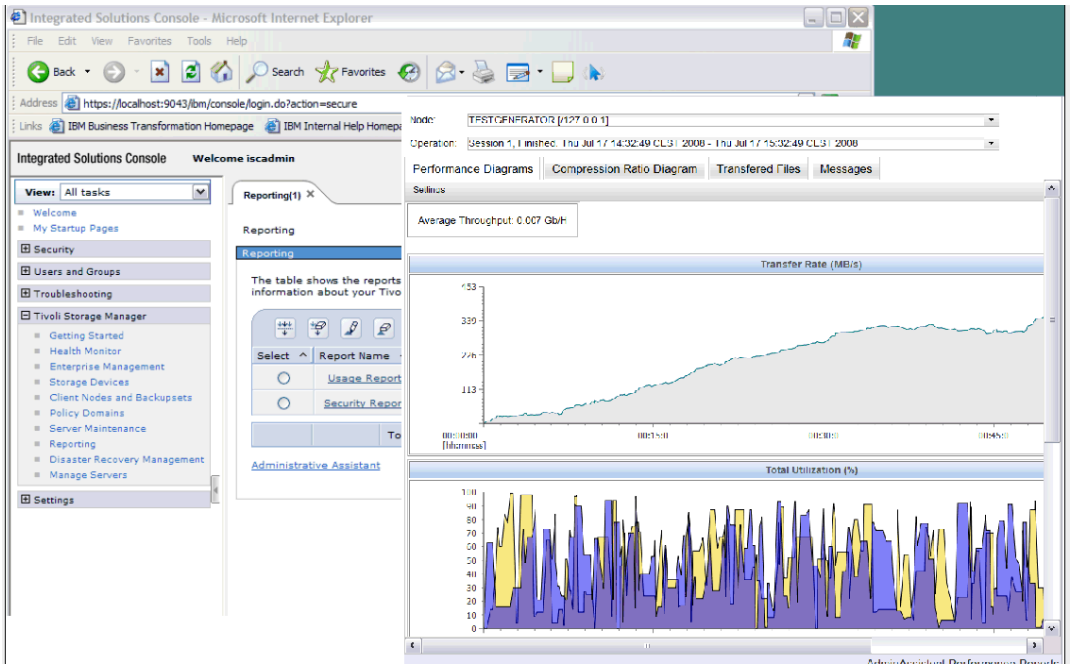
Client Updates

- **Deploy maintenance updates to non-Windows platforms**
  - AIX, Solaris, HP-UX, Linux, Macintosh
- **Allow Backup-Archive client to upgrade to 5.5 or 6.1 versions**
  - Client updates in TSM 6.2 only allows Backup-Archive clients to upgrade to version 6.2; this would allow administrators to update clients to lower (supported) versions of the client, e.g., 5.5 or 6.1



Monitoring ‘TSM for …’ performance

- TSM API Performance Monitoring Functions
- API Performance analysis built into the TSM Admin Center



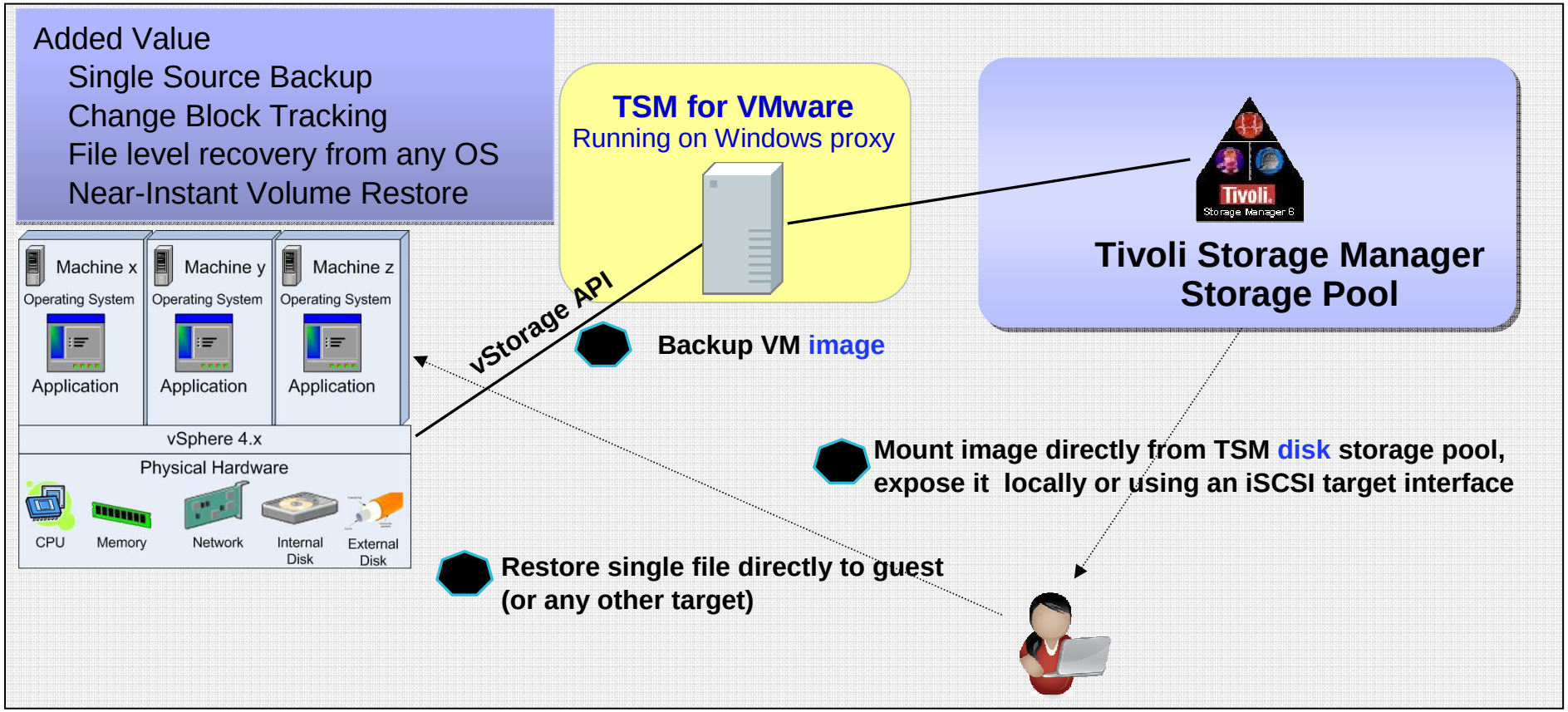
- Bottleneck analysis:
  - Disk I/O
  - Network / Tape
- Simulated backup and restore
  - Helps with tuning TSM for products for optimal throughput


TSM for Virtual Environments
IBM

TSM for Virtual Environment – VMware integration

New TDP

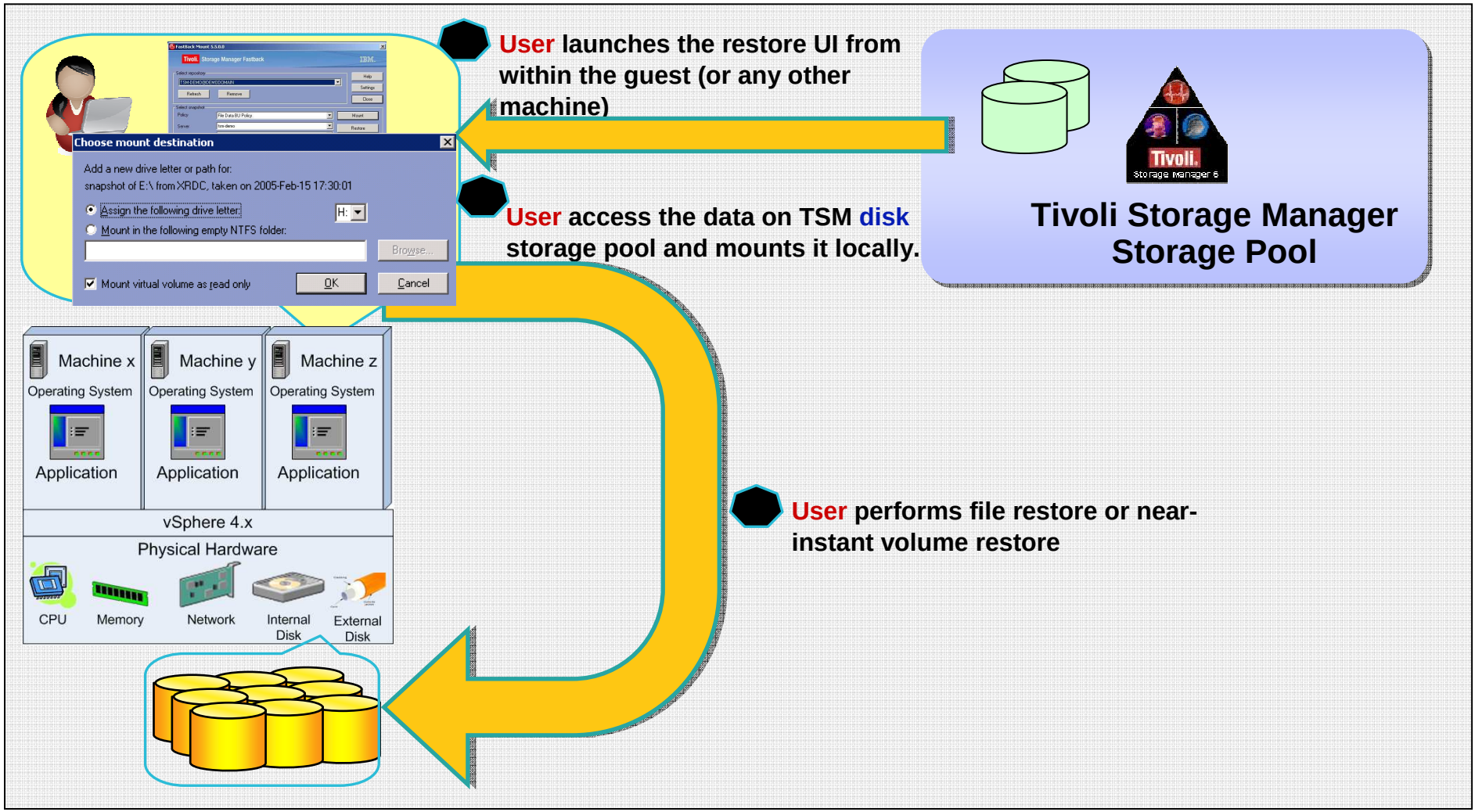
Support **multiple recovery options** from image backup and vStorage API change block tracking (CBT)
New TSM for * (additional component) enhancing the b/a client (Windows only) support to include
- CBT allowing incremental backups (with periodic fulls)
- File/Volume/Disk/Full VM restores from an image backup (multiple OSs are supported)



TSM for Virtual Environment – VMware integration

New TDP

Full VM recovery will be handled in a similar way to what currently exists, other, more granular recovery options will be handled differently, here is an outline of the recovery methodologies.



TSM for Virtual Environment – VMware integration

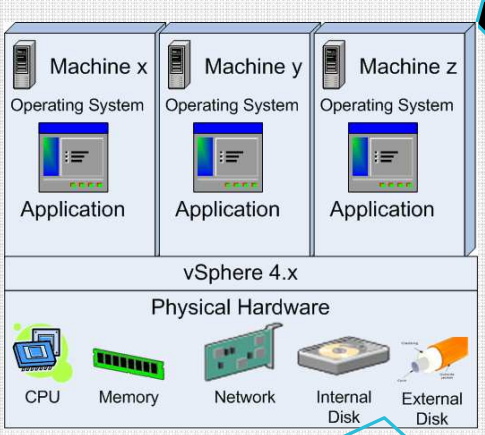
New TDP

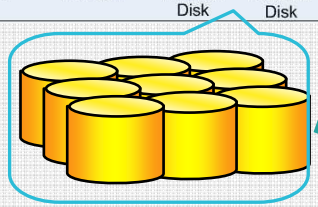
Full VM recovery will be handled in a similar way to what currently exists, other, more granular recovery options will be handled differently, here is an outline of the recovery methodologies.

Administrator launches the restore UI on the proxy server (or any other windows machine)

Tivoli Storage Manager Storage Pool

Administrator access the data on TSM disk storage pool and exposes it using an iSCSI target interface

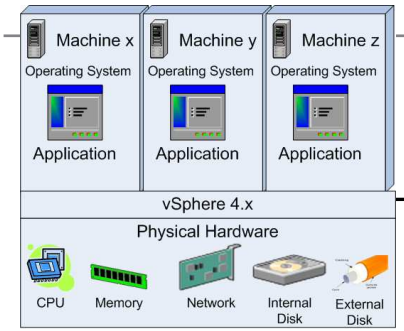




User/Administrator maps the mounted volume back to the guest (or any other machine) and performs the restore

TSM for Virtual Environments

A common solution for VMware that works with TSM, FastBack and FlashCopy Manager



vStorage API

2010

TSM for Virtual Environments

2011

FlashCopy Manager

Common solution for VMware:

Shares a common UI

Can configure three possible targets

1. TSM Storage Pool
2. FlashCopy Manager
3. TSM FastBack Repository

Various combination of the above solutions

Common UI integrated with:

VMware vCenter

TSM Admin Center

2011

Hardware Snapshot

Target 2012

TSM FastBack Repository

Tivoli Storage Manager Storage Pool


Fragen