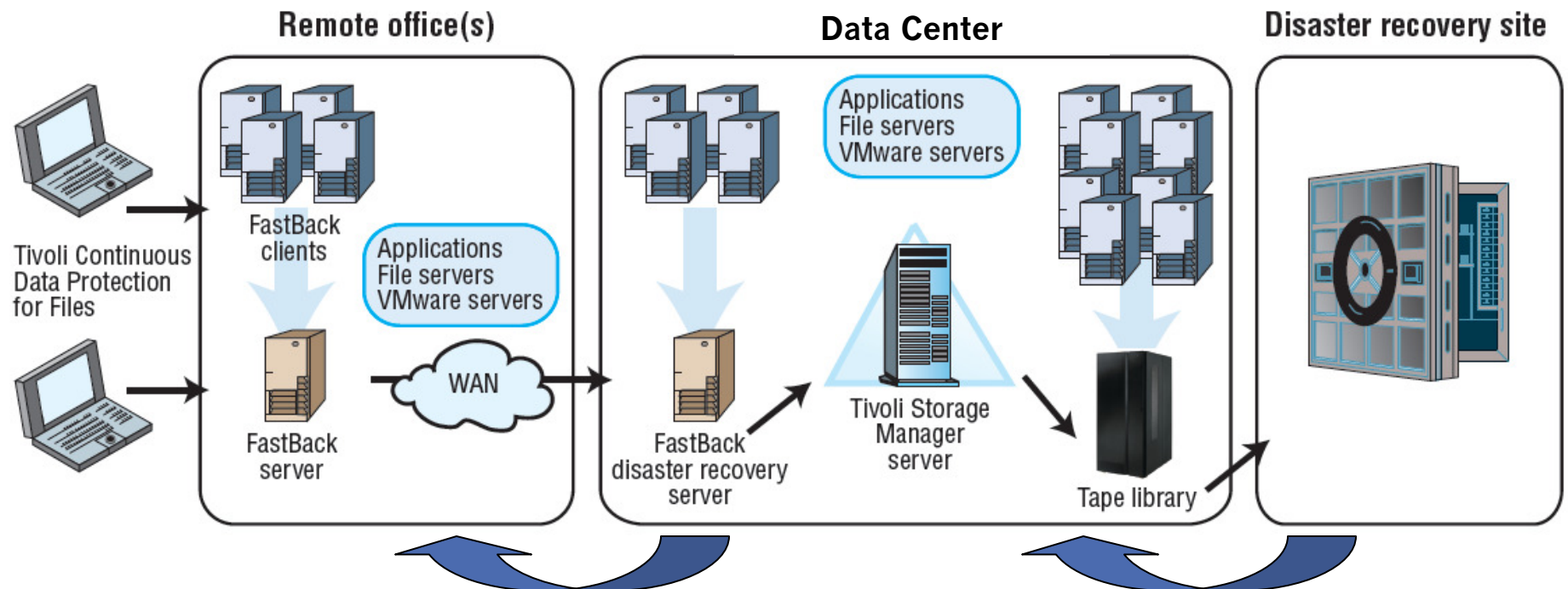




Continuing to Lead the Way in Unified Data Recovery Management

Tivoli Storage Manager 6

Tivoli Storage Manager 6 is the core component of an integrated, end-to-end data protection and unified recovery management solution



- **Tivoli CDP for Files:** Continuous data protection for desktops & mobile users
- **TSM FastBack:** Block Level CDP protection for critical Windows servers
 - Robust remote office data protection & replication
 - Near-instant recovery of any data, anywhere

Tivoli Storage Manager 6 – Overview

- Data Protection: Backup & Recovery
- Data Retention: Archive
- Data Reduction and Data Management
 - Progressive Incremental Backup
 - Data Deduplication
 - Tape Reclamation
 - Collocation
- Architecture
 - Relational Database
 - Policy Management
 - Storage Hierarchy
 - Reporting and Monitoring

Continuing to Lead the Way

Tivoli Storage Manager 6 has been designed to address our customers' most challenging issue: the continuing tidal wave of data growth.

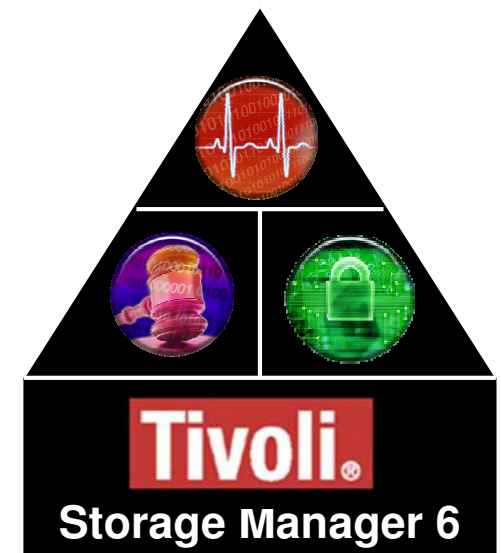
 ***New Simplified deployment and management***

 ***New Increased scalability, availability and performance***

 ***New Built-in Data De-Duplication***

 ***New Improved integration with VMware and NetApp / N series NAS Filers***

**Net Result = Unified Recovery Management
Improved Quality of Service**



IBM Tivoli Storage Manager - Product Family

TSM Server Products

- ✓ Tivoli Storage Manager 6
 - Backup/Recovery
 - Archive/Retrieve
- ✓ TSM 6 Extended Edition (Basic plus..)
 - Tivoli Disaster Recovery Manager (DRM)
 - Backup via NDMP for NAS
 - Large Libraries (additional tape support)
 - Built-in Data Deduplication

Branch Office/Remote Office

- ✓ TSM FastBack
- ✓ TSM FastBack for MS Exchange
- ✓ TSM FastBack for Bare Machine Recovery
- ✓ CDP for Files

z/OS

- ✓ TSM –z/OS
- ✓ TSM EE – z/OS
- ✓ TSM for z/OS for Data Retention
- ✓ TSM for z/OS for Mail

Application Protection

- ✓ TSM for Mail
- ✓ TSM for Databases
- ✓ TSM for Enterprise Resource Planning (ERP)
- ✓ TSM for Microsoft SharePoint

Bare Machine Recovery

- ✓ TSM for System Backup and Recovery (AIX)
- ✓ Cristie Bare Machine Recovery (reseller)
- ✓ Cristie TBMR (reseller)

Advanced Replication

- ✓ TSM for Advanced Copy Services
- ✓ TSM for Copy Services

Space Management, Archiving

- ✓ TSM for Space Management
- ✓ TSM HSM for Windows
- ✓ TSM for Storage Area Networks (SAN)
- ✓ System Storage Archive Manager

Improved Performance in TSM 6

- 50% or greater* improvement in backup and restore throughput
 - Reduces backup windows and/or increases the workload being managed
 - Reduces recovery times
 - 400% improvement in backup performance demonstrated in the lab (under optimal conditions on AIX platform)
- Improve DR Planning Management
 - Addition of Active Data Pools to Disaster Recovery Manager (DRM) in **Tivoli Storage Manager 6** Extended Edition
 - Track, manage and recycle active-data pools as required by policies
- 50% improvement* in expiration processing
 - New granular expiration process and parallel process execution
 - Fine-tune expiration policies by specific client nodes, node groups, or nodes belonging to a specified domain

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* Results will vary depending on user's environment, systems/processors, type of data, expiration policies, data change rates, etc.

ESG Lab Report Confirms TSM 6 Improvements

- TSM 6 progressive incremental backup, combined with new data deduplication technology, provided an **impressive 95% data reduction** factor (more than 19:1) over just eleven days.
- ESG Lab confirmed that TSM 6 can **scale to much larger capacities** under management while providing higher performance and more functionality.
- TSM 6 offers **excellent monitoring and reporting**. ESG Lab examined near-real time statistics for servers, clients, and backup media, as well as historic reporting for an active TSM environment.
- TSM has enhanced NAS backup/recovery using integration with NetApp's **Snapshot Differencing API**. ESG Lab was able to reduce the time required for an incremental backup of a file system by 98% using this new technology.
- TSM 6 offers **improved VMware integration**. ESG Lab used TSM 6 to restore a full VMware virtual machine directly from the TSM interface, with no scripting or manual commands needed.

Source: ESG Lab Report, May 2009

DB2 Relational Database – **New in TSM 6**

Powered by



- “Under the covers” in TSM 6
 - No DB2 admin skills required
- Enables next-generation management, scalability, availability and performance
- Celebrating 25 years of innovation
- Rock solid reliability; industry’s best security, scalability and performance
- DB2 customers include:
 - 59 of the top 59 banks in the world
 - 9 of the top 10 global life & health insurance companies
 - 23 of the top 25 U.S. retailers

Powered by



DB2 Relational Database

Even IF something happens to TSM, it can be recovered quickly and easily

Features

- Contents: policy information, authentication and security, logging, media management, and object inventory
- Tracks every file, every version, which client it belongs to, and where it resides in storage
- Advanced Database Protection
 - Mirror - eliminates the single point of failure
 - Automatic volume switching after a media failure
 - Allows for point in time recovery of the TSM Database
- Self managing: dynamically expands or contracts

Benefits

- Robust, Scalable, Available
 - Ready to grow for the future
- High Performance
 - Shorter backup windows
 - Faster recovery
- Easier to Manager
 - Reduce admin expenses
- Ensures Data Integrity
 - Real-time validity checks
 - Automatic error correction

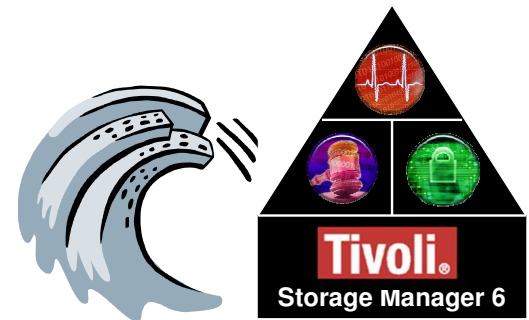
Improved Scalability in TSM 6

- Manage twice* as many objects as the industry-leading TSM 5.5
 - At least double the internal database size (from 512GB to 1TB, minimum)
 - Support to **1 billion objects*** with a single TSM server
 - TSM is ready for the wave of remote office data (from TSM FastBack)
- Run an increased number of concurrent operations*
 - 9x increase in the size of the internal Recovery Log enables running more backup jobs from a greater number of clients, and/or an increase in the size of existing backup jobs
 - Faster backups = **shorter backup windows**

Powered by



TSM 6 can effectively meet the challenges of the 'tidal wave of data'



* Results will vary depending on user's environment, systems/processors, type of data, expiration policies, data change rates, etc.

Enhanced Data Reduction



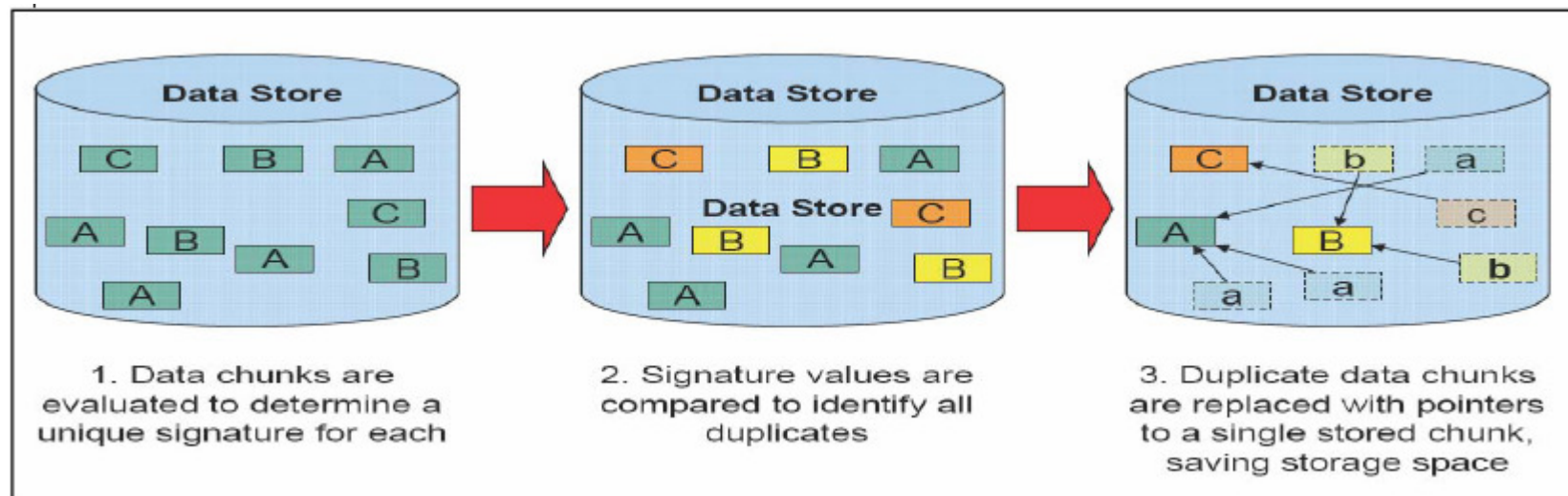
Built-in Data Deduplication

- **Tivoli Storage Manager 6 Extended Edition** includes data deduplication for disk storage pools, *at no extra charge*
- Improves recovery times as many more recovery points can be stored on disk; or reduces the amount of capacity needed
- Operates as a post-process / no impact on backup performance / automatic space reclamation
- Effective with data from any source: API, backup, HSM, archive

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

Data Deduplication in Tivoli Storage Manager 6

- A data reduction technology
 - Complements existing progressive-incremental data capture
- 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



Simplified Management

- Simplified database administration through the Tivoli Storage Manager user interface (UI) and through the exploitation of autonomic computing concepts:
 - No specialized database administration skills required
 - A self-tuning database buffer pool
- **More reliable backup and recovery**
 - Run-time data validity checks
 - Protects the database from corruption
- **Improved Availability**
 - Online database reorganization enables changes and tuning of the database while the system remains operational
 - The **Tivoli Storage Manager 6** server does not need to be taken "offline" for database repair actions
 - Competitive offerings require the servers to be off-line to preserve the integrity of their distributed catalogs and index files.



Powered by





Redesigned Reporting and Monitoring

Tivoli **IBM**

Storage Capacity Projection

Start Date: 2007-04 End Date: 2008-04

Client Node Name	Maximum (GB)	In-use (GB)
FILESRV01	100	100
FILESRV02	160	160
DB2_SRV_FIN	160	160
DB2_SRV_DEV	120	120

2007-10-27 23:02 EST

Included in TSM – no additional licensing

Customizable dashboard

Help project my future storage requirements

Customizable Reports

Client backup Activity

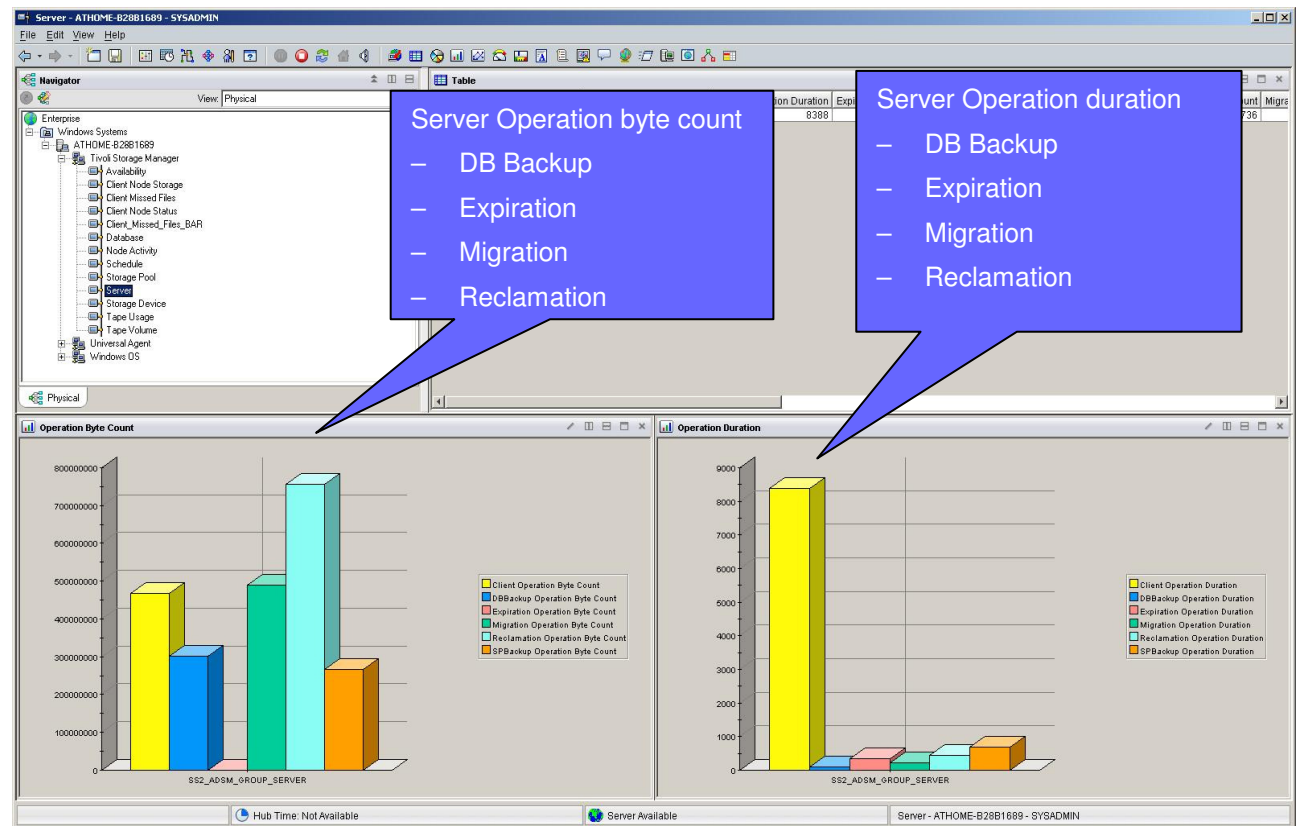
Client Restore Activity

Server Activity

Near Real-Time Monitoring

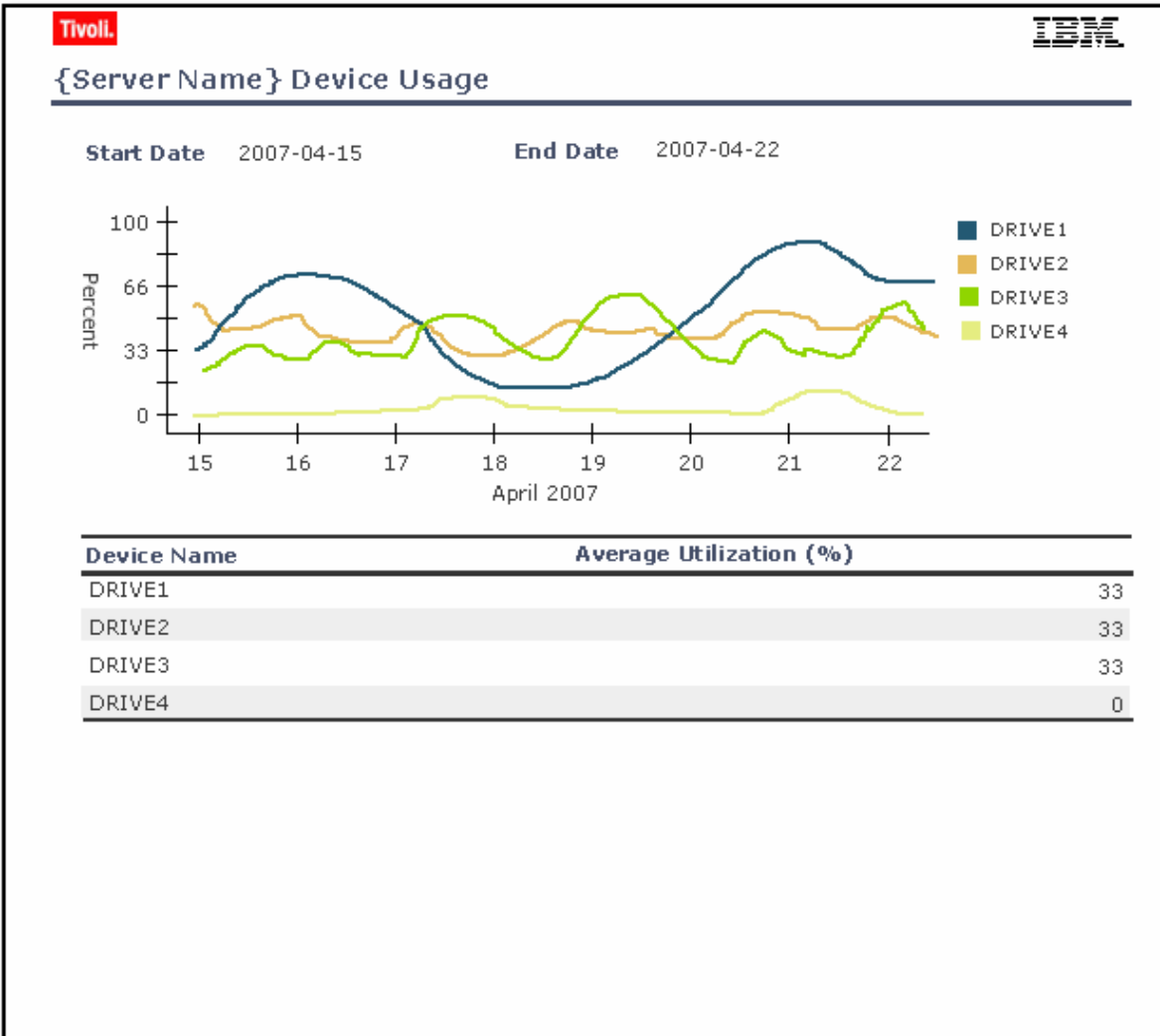
*Customizable end-user "dashboard"
Delivers graphical representation and monitoring of trends and current status*

- Scheduled Client Activity
- Scheduled Server Activity
- Client Current Activity
- Server Current Activity
- Current Errors
- TSM Database Status
- Tape Device Status
- Storage Pool Status
- Client Backup Status



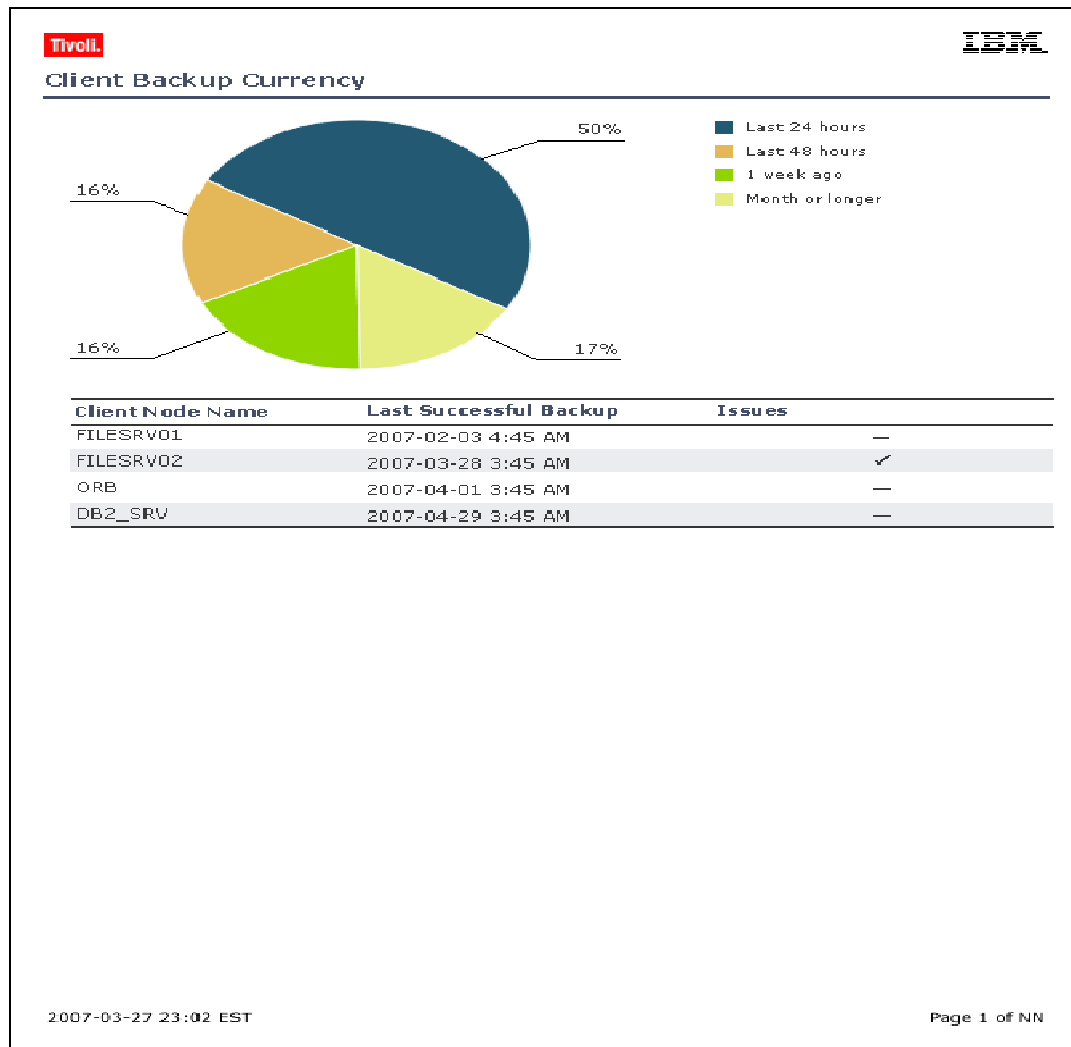
'Out of the Box' Historical Reporting - Server

Server Reports



- Server Job status
- Server Throughput
- Server Resource Usage
- Database Details
- Disk & File Usage
- Tape Usage
- Other Storage Usage
- Tape Volume Usage Analysis
- Tape Capacity Analysis
- Tape Device Errors
- Device Usage History
- Server Machine Utilization

'Out of the Box' Historical Reporting - Client

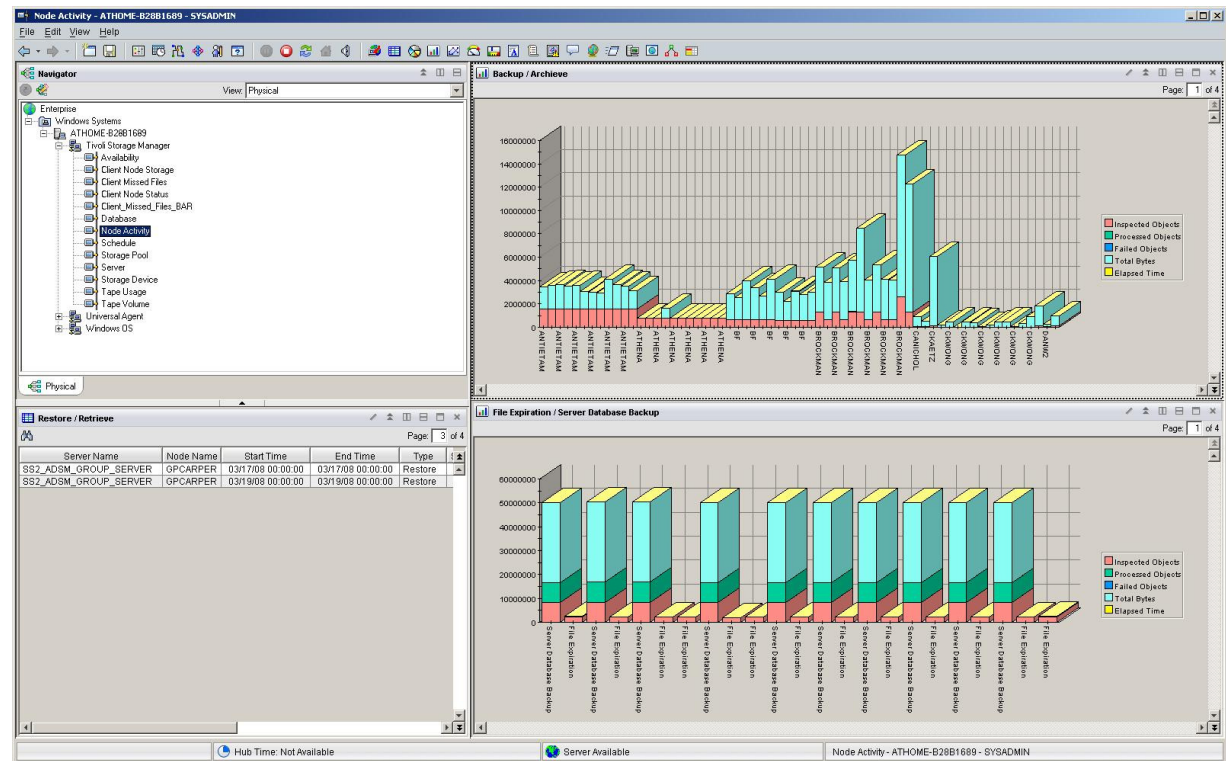


Client Reports

- Client Job status
- Client Backup Currency
- Storage Capacity Projection
- Backup Details
- Top 10 Backups
- Backup Missed files
- Backup History
- Restore Details
- Top 10 Restores
- Restore History
- Archive details
- Top 10 Archives
- Archive History
- Retrieve Details
- Top 10 Retrieves
- Retrieve History

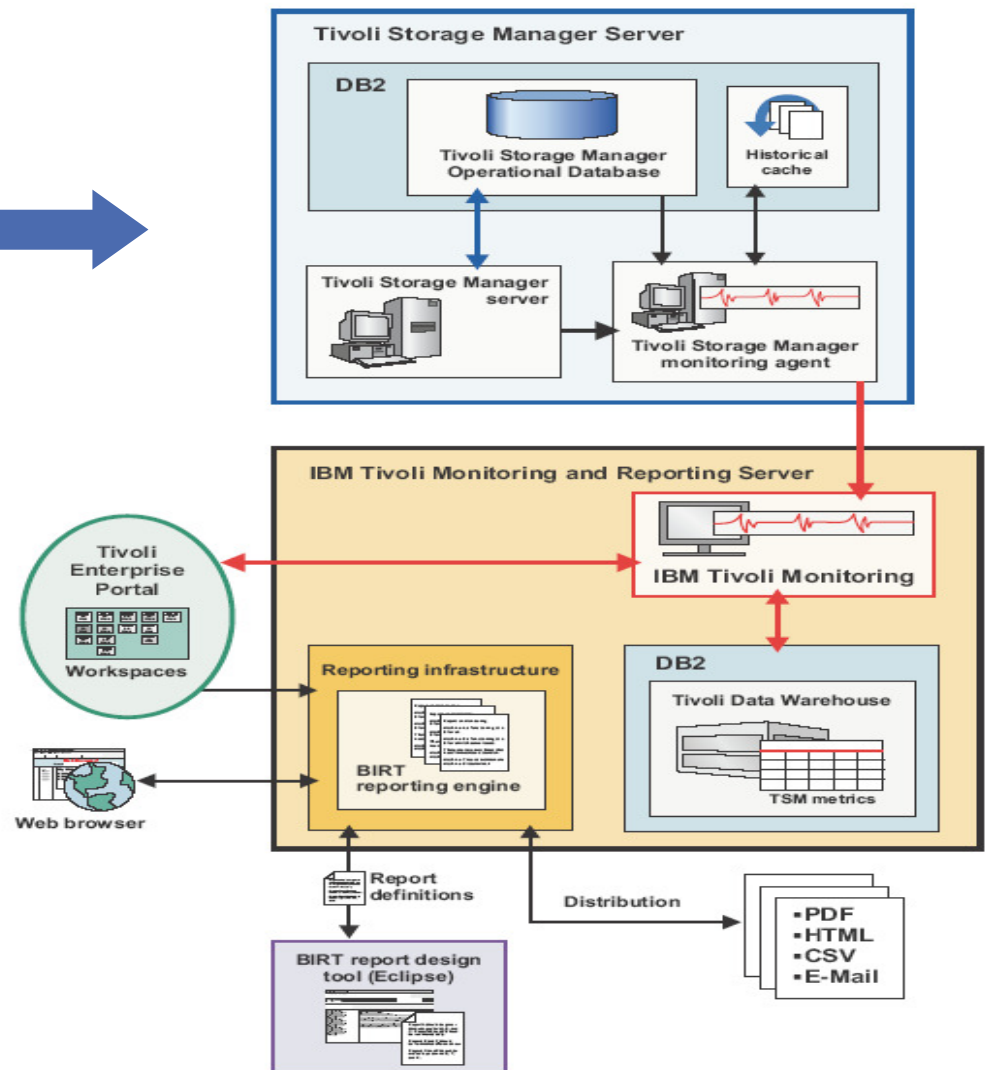
Leveraging Proven IBM Components

- IBM Tivoli Monitoring
 - IBM Tivoli Enterprise Portal
 - IBM Tivoli Enterprise Management Server
 - Tivoli Data Warehouse
- IBM DB2
 - Stores historical data obtained from TSM servers that are monitored using IBM Tivoli Monitoring.
- TSM monitoring agent
 - Queries and formats data to be presented reports and monitors
- Use Business Intelligence and Reporting Tools (BIRT) to create custom reports



Leveraging Proven IBM Components

- Tivoli Storage Manager reporting and monitoring infrastructure and data flow
- Supported platforms (Reporting Server)
 - Microsoft Windows 2003
 - Red Hat Enterprise Linux V5
 - SUSE Linux Enterprise 10
 - AIX



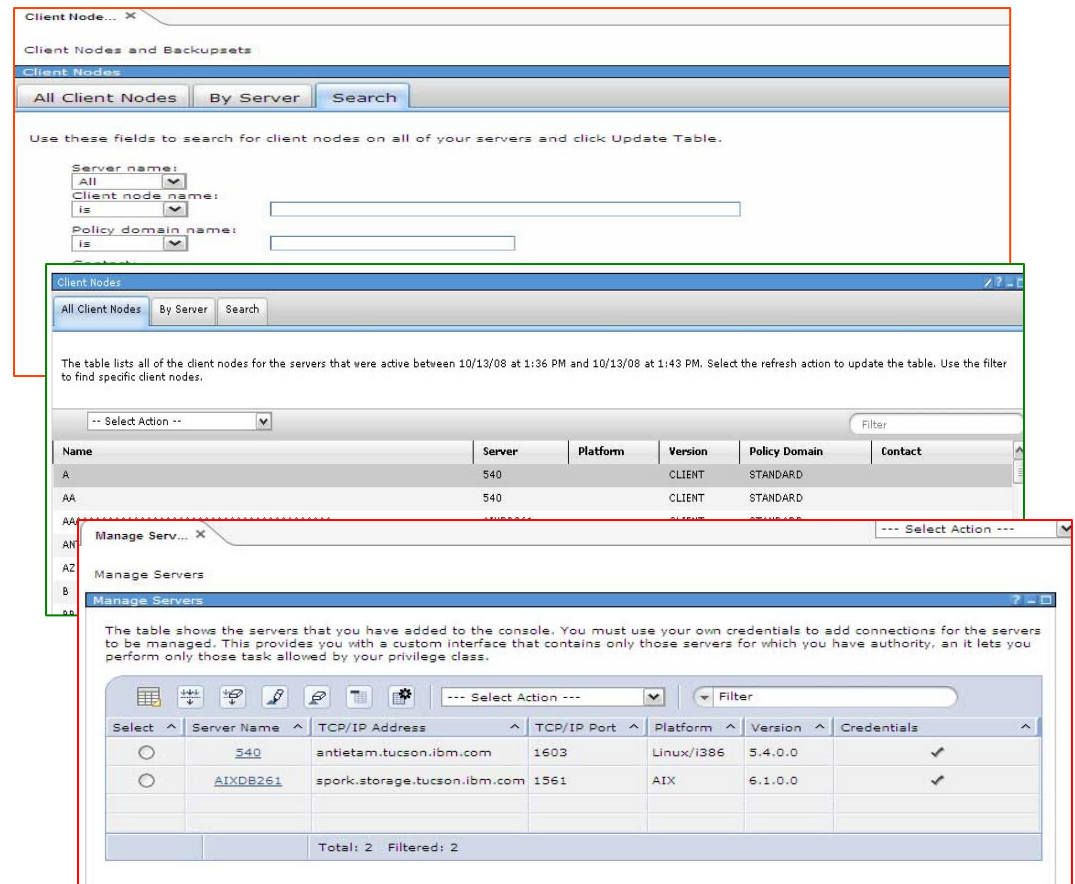
Administration Center

New, lighter-weight version of Integrated Solutions Console (ISC) infrastructure

Faster Installation < 30 Min

Reduced Footprint

- Improved Performance
 - Reduced time for initial page load and page switches
 - Enhanced processing of large queries
 - Progress indicators
 - Improvements in overall response time
- Easier UI navigation of backup sets, client nodes, and client node groups
- Easier configuration of server actions with a consolidated, central local location for managing server actions



The image displays two screenshots of the Tivoli Storage Management Administration Center interface. The top screenshot shows the 'Client Nodes' section, which includes a search form with fields for 'Server name', 'Client node name', and 'Policy domain name'. Below the search form is a table listing client nodes. The bottom screenshot shows the 'Manage Servers' section, which includes a table listing servers with columns for 'Server Name', 'TCP/IP Address', 'TCP/IP Port', 'Platform', 'Version', and 'Credentials'.

Name	Server	Platform	Version	Policy Domain	Contact
A	540	CLIENT	STANDARD		
AA	540	CLIENT	STANDARD		

Select	Server Name	TCP/IP Address	TCP/IP Port	Platform	Version	Credentials
<input type="radio"/>	540	antietam.tucson.ibm.com	1603	Linux/i386	5.4.0.0	✓
<input type="radio"/>	AIXDB261	spork.storage.tucson.ibm.com	1561	AIX	6.1.0.0	✓

Enhanced support for IBM N series and NetApp Filers

- Faster full image backup with new Network Data Management Protocol (NDMP) integration
 - SnapMirror to Tape integration enables backup of large NetApp filesystems to secondary media for disaster recovery
- Extremely fast incremental backup
 - IBM's '**First-to-Market**' integration with NetApp eliminates the need to scan the file system looking for changed files
 - Less impactful; enables more frequent backups



IBM System
Storage N6000

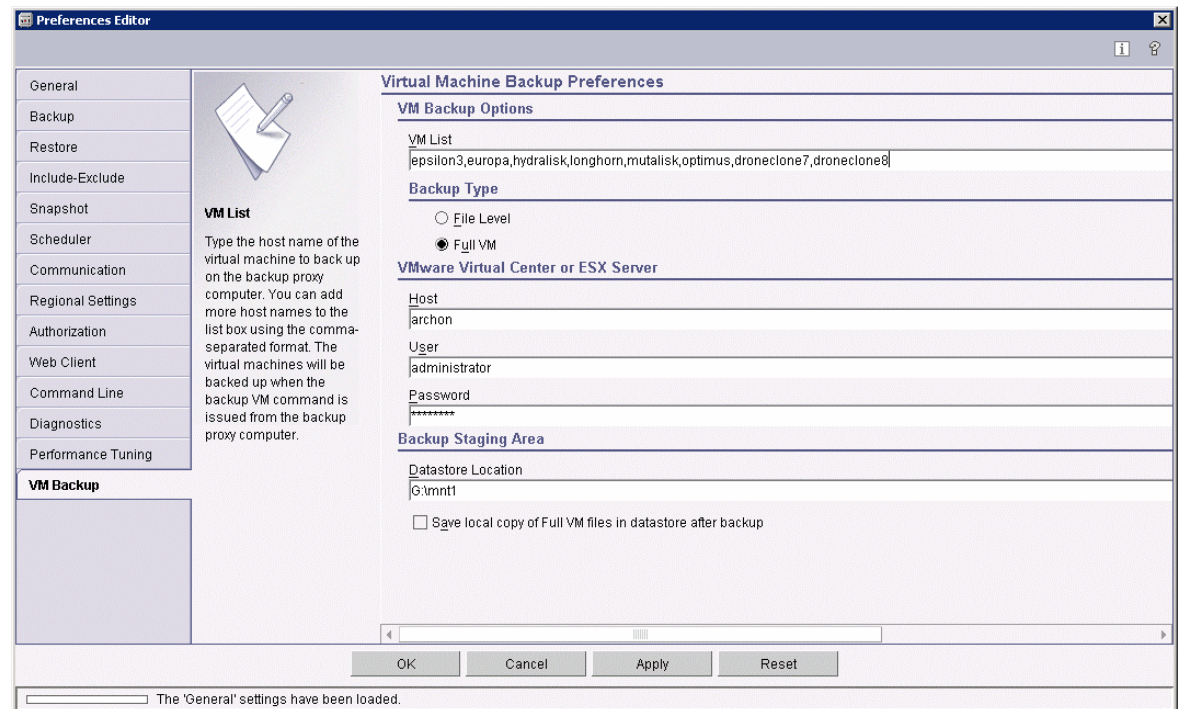
IBM enjoys a strong
relationship with NetApp

Enhanced support for VMware



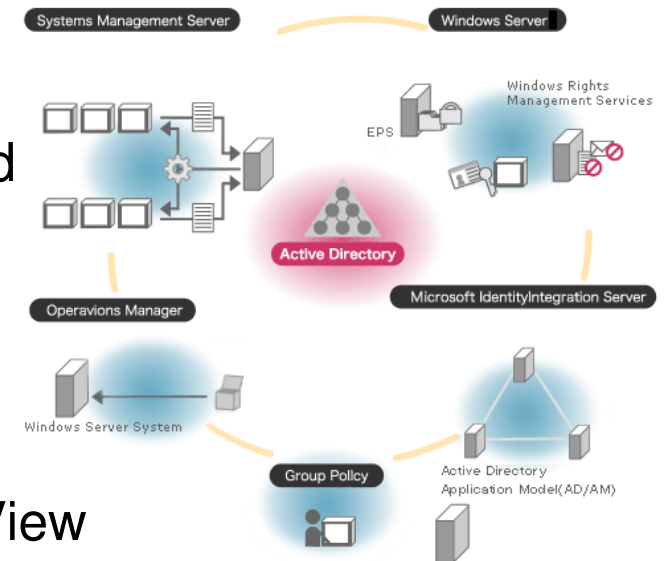
Full image backup of Virtual Machines

- Provides enhanced business continuity and disaster recovery
- New VM-friendly, sub-capacity pricing model
- Builds on TSM 5.5 support
 - VCB support
 - Single agent on proxy server vs. agent on every VM
 - Reduced load on ESX server
 - Faster recovery
 - Eliminates LAN traffic



Granular Support for Windows Active Directory

- Individual object recovery from System State backups of user and group objects
 - For Windows Server 2008 Active Directory environments.
 - An example is the restoration of an individual or group that may have been deleted from the Active Directory
- Support for un-deletion (reanimation) of objects from the Active Directory's tombstone
 - Assists in manual recovery of individual objects
 - Recovery and reanimation is accomplished without having to shut down or restart the Active Directory server
- Leverages Microsoft-approved programming interfaces
- Fully integrated into the Client Restore Tree View



Tivoli Storage Manager 6 for Mail

- More granular support for Microsoft Windows Exchange Mail Servers
- Tivoli Storage Manager 6 for Mail now supports the restoration of a user's mailbox or items from within a mailbox that may have been accidentally deleted, and restoration of the mailbox as it existed at a previous point in time. Examples of what can be recovered are an entire inbox, deleted items, email drafts, journal, calendar, notes, tasks, and user folders.
- Search filters are provided to easily locate individual items based on Sender Name, Subject Text, Attachment name, Folder Name, Message Delivery Date and Time or text strings within the message body
- Support for Microsoft Exchange 2003 and Exchange 2007.
- Leverage of the Microsoft Exchange Recovery Storage Group and Microsoft-approved interfaces.

Summary

Tivoli Storage Manager 6 keeps IBM on the leading edge of enterprise-class data protection and recovery management, staying ahead of the ever-increasing growth in digital information, no matter where it resides.

You need Tivoli Storage Manager 6 if you want to:

- Reduce data protection infrastructure and operational costs
- Improve service levels by reducing backup and recovery times; and through improved integration with Microsoft Windows, VMware and NetApp/N series
- Simplify administration and gain better visibility into your data management environment



General Backup policies with best practise

Tivoli Storage Manager 6

IBM Tivoli Storage Manager

In order to [shorten the backup time](#) in cost-effective way, we propose the following best practice.

- **For large and critical files such as e-mail database files, application database files are backup directly to tape library [through SAN](#). It is the [most cost-effective](#) way for systems with large files.**
- **For the small files in File server and Personal drive, we suggest backup to staging diskpool and then migrate to tape.**
 - Backup to disk allows backup jobs from multiple clients can be run in parallel, [save backup time, better bandwidth utilization](#).
 - Backup to disk and backup to tape can be run at the same time, [save backup time, maximize the utilization of tape drives](#).
 - Data on disk can be migrated to tape automatically. The migration job will be done by a dedicated TSM server, it does not affect the performance of the production environment. [Increase service level of the production systems](#).

General Client-Backup Approach

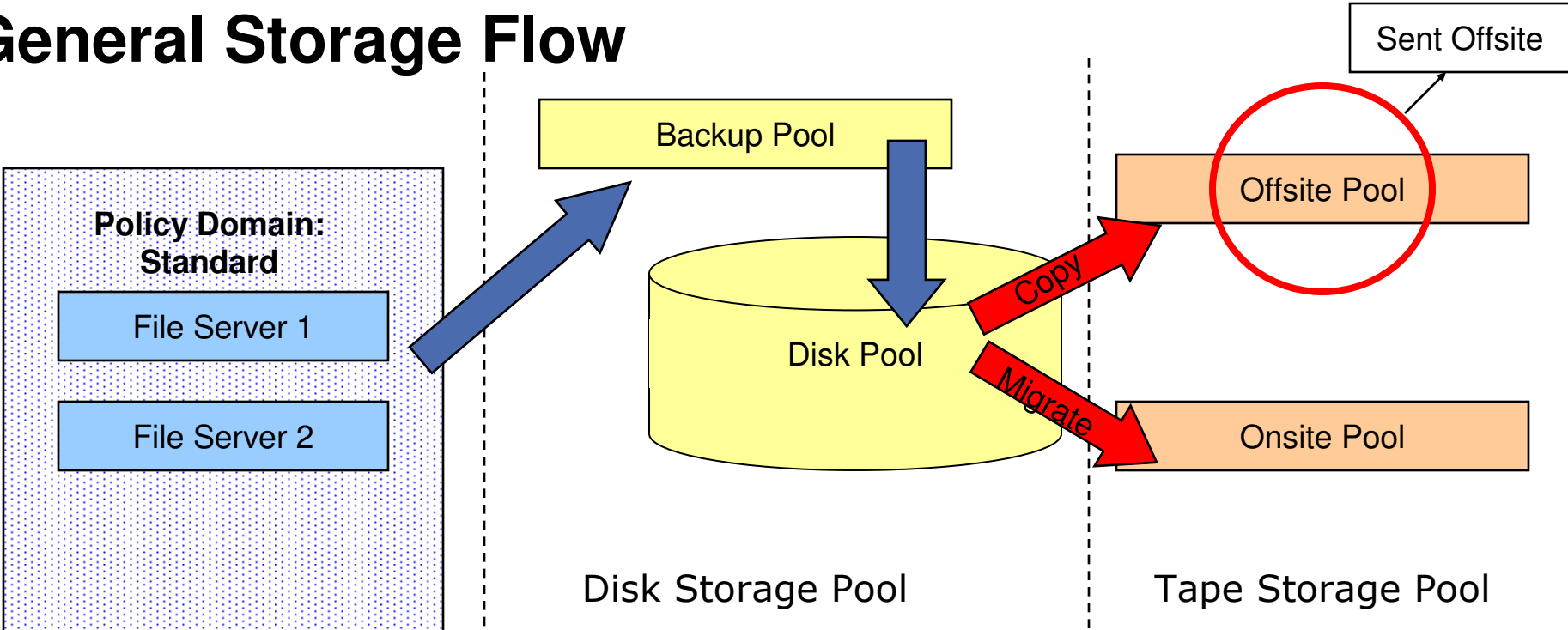
- Backup Approach

Data Type	Backup Approach	Data Path	Backup Method
Doc. & files	Disk-to-Disk-to-Tape	LAN	Progressive Incremental forever
Exchange Mail	Direct to Tape	SAN	Always Full
Oracle & MSSQL	Direct to Tape	SAN	Always Full

- Offsite Approach

Data Cat.	Onsite Sets?	Offsite Arrangement
Doc. & files	Yes, Storage Repository	Generate Offsite Tape
Exchange Mail	Tape	Send source tapes offsite
Oracle & MSSQL	Tape	Send source tapes offsite

General Storage Flow



Pool Name	Type	Device Class	Next Pool
BACKUPPOOL	Primary	DISK	DISKPOOL
DISKPOOL	Primary	DISK	ONSITE
ONSITE	Primary	TAPE	
OFFSITE	Copy	TAPE	

General Retention Setting

Data Cat.	Daily Backup Retention	Daily Clone Retention	Monthly Backup Retention	Yearly Backup Retention
Doc. & File	Incr./7 days	7 days	Full/18 months	Full/7 years
Exchange Mail	Full/7 days	N/A	Full/18 months	Full/7 years
Oracle & MSSQL	Full/7 days	N/A	Full/18 months	Full/7 years